



**EMC® AVAMAR®**

**5.0**

**SYSTEM ADMINISTRATION GUIDE**

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**EMC CORPORATION**

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# TABLE OF CONTENTS

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<b>Foreword</b> .....	<b>13</b>
Scope and Intended Audience .....	13
Product Information .....	13
Your Comments .....	13
Typeface Conventions .....	14
Notes, Tips, and Warnings .....	14
<b>Introduction</b> .....	<b>15</b>
Important Terms and Concepts .....	16
Functional Overview .....	18
Avamar Servers .....	18
Avamar Clients .....	19
Avamar Administrator .....	20
Encryption .....	20
<b>Avamar Administrator</b> .....	<b>21</b>
Installing Avamar Administrator on Microsoft Windows .....	21
Uninstalling and Upgrading Avamar Administrator on Microsoft Windows .....	23
Installing Avamar Administrator on Linux .....	23
Downloading the Install Package .....	23
Install Avamar Administrator Software .....	25
Uninstalling Avamar Administrator on Linux .....	26
Upgrading Avamar Administrator on Linux .....	26
Starting Avamar Administrator .....	27
Special Features .....	29
<b>Domains, Clients and Users</b> .....	<b>33</b>
Domains and Subdomains .....	33
Adding a New Domain .....	34
Editing Domain Information .....	36
Deleting a Domain .....	37
Clients .....	38
Registration .....	38
Activation .....	39
Adding a New Client .....	39
Activating a New Client .....	41
Editing Client Information .....	42
Viewing Client Properties .....	44

Disabling a Client . . . . .	46
Enabling a Client . . . . .	47
Retiring a Client . . . . .	48
Moving a Client to a New Domain . . . . .	50
Deleting a Client . . . . .	51
Changing Client Paging Settings . . . . .	52
Batch Client Registration . . . . .	55
Create Clients Definition File . . . . .	55
Validate and Import Client Definition File . . . . .	57
Users and Roles . . . . .	59
Users . . . . .	59
Roles . . . . .	60
Adding a New User to a Client . . . . .	66
Adding a New User to a Domain . . . . .	68
Editing User Information . . . . .	70
Deleting a User . . . . .	72
<b>Backup, Restore and Backup Management . . . . .</b>	<b>73</b>
Performing an On-Demand Client Backup . . . . .	74
Monitoring Backup, Restore and Validation Activities . . . . .	76
Activity Window Information . . . . .	77
Select for Restore Overview . . . . .	82
Locating and Selecting a Backup by Calendar Date . . . . .	82
Locating and Selecting a Backup by Content . . . . .	83
Performing a Restore . . . . .	84
Backup Management Window Overview . . . . .	87
Locating Backups by Calendar Day . . . . .	87
Locating Backups by Date Range . . . . .	87
Locating Backups by Retention Type . . . . .	88
Changing a Backup Expiration Date . . . . .	88
Changing Backup Retention Types . . . . .	90
Validating a Backup . . . . .	92
Backup Statistics . . . . .	94
Viewing Backup Statistics From the Backup Management Window . . . . .	94
Viewing Backup Statistics From the Activity Window . . . . .	96
Deleting a Backup . . . . .	98
Canceling an Activity . . . . .	99
<b>Datasets, Schedules and Retention Policies . . . . .</b>	<b>100</b>
Datasets . . . . .	100
Dataset Properties . . . . .	100
Dataset Catalog . . . . .	102
Creating a New Dataset . . . . .	104
Editing a Dataset . . . . .	107
Copying a Dataset . . . . .	108
Deleting a Dataset . . . . .	108
Schedules . . . . .	109
Important Terms and Concepts . . . . .	109
Schedule Properties . . . . .	111
Schedule Catalog . . . . .	113
Creating a New Schedule . . . . .	114
Editing a Schedule . . . . .	116
Copying a Schedule . . . . .	117
Deleting a Schedule . . . . .	117
Running a Schedule Now . . . . .	118

Retention Policies . . . . .	119
Basic Retention Settings . . . . .	119
Advanced Retention Settings . . . . .	120
Minimal Retention . . . . .	120
Retention Policy Catalog . . . . .	121
Creating a New Retention Policy . . . . .	122
Editing a Retention Policy . . . . .	124
Copying a Retention Policy . . . . .	125
Deleting a Retention Policy . . . . .	125
Disabling the Minimal Retention Policy . . . . .	126
Enabling the Minimal Retention Policy . . . . .	127
<b>Groups and Group Policies . . . . .</b>	<b>128</b>
Policy Window Overview . . . . .	130
Adding a New Group . . . . .	133
Editing Group Properties . . . . .	138
Editing a Single Group . . . . .	138
Editing Multiple Groups . . . . .	140
Copying a Group . . . . .	142
Disabling a Group . . . . .	143
Enabling a Group . . . . .	144
Deleting a Group . . . . .	145
Viewing the Group Summary Reports . . . . .	146
Viewing the Group Status Summary . . . . .	148
Managing Group Membership . . . . .	149
Adding Clients To a Group . . . . .	149
Removing Clients From a Group . . . . .	151
Adding Groups To a Client . . . . .	152
Removing Groups From a Client . . . . .	153
Overriding Group Policy Settings . . . . .	155
Assigning a Different Dataset to a Client . . . . .	155
Assigning a Different Retention Policy to a Client . . . . .	156
Changing the Client Encryption Method . . . . .	158
Allowing Scheduled Backups to Run Overtime . . . . .	160
Allowing Users to Initiate Backups . . . . .	162
Initiating On-Demand Group Backups . . . . .	165
<b>Events, Notifications and Profiles . . . . .</b>	<b>166</b>
Important Terms and Concepts . . . . .	166
Events . . . . .	166
Audit Logging . . . . .	167
Customizing Error Events . . . . .	167
Notifications . . . . .	167
Profiles . . . . .	169
Profile Catalog . . . . .	169
Editing System Event Profile Properties . . . . .	170
Creating a New Custom Event Profile . . . . .	171
Editing Custom Event Profile Properties . . . . .	178
Copying an Existing Custom Event Profile . . . . .	179
Testing Custom Event Profile Notifications . . . . .	180
Disabling a Custom Event Profile . . . . .	181
Enabling a Custom Event Profile . . . . .	181
Deleting a Custom Event Profile . . . . .	182

Configuring and Enabling the “Email Home” Feature . . . . .	183
Modify mcserver.xml Email Home Settings . . . . .	184
Configure and Enable the High Priority Events Profile . . . . .	185
Enable Scheduled Operations . . . . .	187
Monitoring the Avamar Server Using syslog . . . . .	188
Configure a Custom Event Profile . . . . .	189
Configure syslogd . . . . .	190
Monitoring the Avamar Server Using SNMP . . . . .	191
Configure Net-SNMP Agent . . . . .	193
Configure a Custom Event Profile . . . . .	195
<b>Reporting . . . . .</b>	<b>197</b>
Avamar Reports . . . . .	197
Creating a New Report . . . . .	200
Editing a Report . . . . .	202
Running a Report . . . . .	203
Deleting a Report . . . . .	204
Viewing the Client Summary Report . . . . .	205
Viewing the Activity Report . . . . .	209
Viewing the Replication Report . . . . .	214
Exporting Displayed Tabular Data as CSV Files . . . . .	217
Activity Report . . . . .	217
Replication Report . . . . .	218
Client Summary Report . . . . .	219
Event Management . . . . .	220
Session Monitor . . . . .	221
Support for Third-Party Reporting Tools . . . . .	222
Setting Up the PostgreSQL ODBC Driver . . . . .	223
Crystal Reports Templates . . . . .	225
Other Third-Party Support . . . . .	226
<b>Avamar Client Agent and Plugin Management . . . . .</b>	<b>227</b>
Important Terms and Concepts . . . . .	227
Agents Summary View . . . . .	229
Plugins Summary View . . . . .	231
Adding a New Build Record . . . . .	233
Editing Version or Build Record Settings . . . . .	235
Deleting a Build Record . . . . .	236
Enabling All Client Initiated Activations . . . . .	237
Disabling All Client Initiated Activations . . . . .	238
Enabling All Client Initiated Backups . . . . .	239
Disabling All Client Initiated Backups . . . . .	240
<b>Server Monitoring . . . . .</b>	<b>241</b>
Recommended Daily Server Monitoring . . . . .	241
Monitoring the Server . . . . .	242
Verifying System Integrity . . . . .	255
Viewing System Events . . . . .	256
Filtering the Event Monitor Display . . . . .	258
Viewing the Audit Log . . . . .	261
Filtering the Audit Log Display . . . . .	264
Viewing Services Information . . . . .	267
Viewing a Detailed Client Session Log . . . . .	269
Collecting and Viewing Log Files . . . . .	270

<b>Basic Server Administration</b> .....	<b>271</b>
Avamar Server Functional Block Diagram .....	271
Data Server .....	271
Management Console Server (MCS) .....	272
Enterprise Manager Server (EMS) .....	272
Avamar Server Maintenance Activities and Backup/Maintenance Windows .....	273
Maintenance Activities .....	273
Backup/Maintenance Windows .....	273
Best Practices .....	275
Acknowledging System Events .....	276
Suspending Backups/Restores .....	277
Resuming Backups/Restores .....	278
Suspending Scheduled Operations .....	279
Resuming Scheduled Operations .....	279
Enabling Scheduled Group Backups .....	280
Disabling Scheduled Group Backups .....	281
Suspending Maintenance Activities .....	282
Resuming Maintenance Activities .....	282
Changing Backup/Maintenance Window Settings .....	283
Managing Services .....	284
Canceling a Client Session .....	285
Resetting a Client .....	286
<b>Server Shutdown and Restart</b> .....	<b>287</b>
Shutting Down the Server .....	287
Restarting the Server .....	289
Stopping the MCS .....	290
Starting the MCS .....	290
Getting MCS Status .....	291
<b>Avamar Enterprise Manager</b> .....	<b>292</b>
Capabilities and Limitations .....	292
Shutting Down the EMS .....	294
Restarting the EMS .....	294
Logging Into Avamar Enterprise Manager .....	295
Dashboard .....	296
System .....	300
Individual System Information Page .....	300
All Servers Information (Detailed Dashboard) Page .....	310
Capacity .....	311
Policy .....	311
Reports .....	312
Running a Report .....	313
Exporting a Report as a CSV File .....	313
Replicator .....	315
Configure .....	315
Monitoring Multiple Systems .....	316
Suspending and Resuming System Monitoring .....	318
Removing a System from the Systems List .....	319
Launching Avamar Administrator From Avamar Enterprise Manager .....	320
<b>Capacity Management</b> .....	<b>322</b>
Limits and Thresholds .....	322
Obtaining Basic Utilization Information .....	323
Capacity Forecasting .....	325

Detailed Utilization and Forecasting . . . . .	326
Customizing Capacity Limits and Behavior . . . . .	327
Avamar Administrator Settings . . . . .	327
Avamar Enterprise Manager Settings . . . . .	328
Updating Avamar Application Preference Files . . . . .	329
Server and Client Average Daily Change Rates . . . . .	330
Server Data . . . . .	330
Client Data . . . . .	331
<b>Replication . . . . .</b>	<b>333</b>
Important Terms and Concepts . . . . .	334
Capabilities and Limitations . . . . .	335
Best Practices . . . . .	336
Managing Replication with Avamar Administrator . . . . .	337
Viewing Replication Statistics with Avamar Administrator . . . . .	341
Managing Replication with Avamar Enterprise Manager . . . . .	342
Replicator Setup Page . . . . .	342
Replicator Status Page . . . . .	344
Configuring or Modifying Replication Settings . . . . .	346
Getting Replication Status . . . . .	349
Starting and Stopping Daily Replications . . . . .	350
<b>Advanced Server Administration and Maintenance . . . . .</b>	<b>351</b>
Checkpoints . . . . .	351
Creating a Checkpoint . . . . .	352
Validating a Checkpoint . . . . .	353
Deleting a Checkpoint . . . . .	354
Rolling Back to a Checkpoint . . . . .	355
MCS Configuration Settings . . . . .	357
Backing Up MCS Data . . . . .	358
Performing an On-Demand MCS Flush . . . . .	358
Finding MCS Backups in the System . . . . .	359
Restoring MCS Data . . . . .	360
Reverting to Default MCS Preference Settings . . . . .	361
Manually Changing Your Avamar Administrator Client Preferences . . . . .	362
Updating Your Server Licensing . . . . .	363
Changing Avamar Passwords . . . . .	369
Run change-passwords . . . . .	369
Manually Update EMS Settings . . . . .	377
Changing Single-Node Server Network Settings . . . . .	379
Adding a Custom Security Notification to Web Login Pages . . . . .	384
Manually Updating the Plugin Catalog . . . . .	385
<b>Client System Recovery . . . . .</b>	<b>386</b>
Windows Client System Recovery . . . . .	386
Red Hat Linux System Recovery . . . . .	387
Prerequisites . . . . .	387
Procedure . . . . .	387
Sun Solaris System Recovery . . . . .	391
Prerequisites . . . . .	391
Procedure . . . . .	391
<b>Avamar System Migration . . . . .</b>	<b>393</b>
Important Terms and Concepts . . . . .	393
Capabilities and Limitations . . . . .	395



Migrating Avamar Servers . . . . .	396
Manually Migrating Backup Clients to a New Server . . . . .	400
Migrating Pageable Clients . . . . .	400
Migrating Non-Pageable Clients . . . . .	400
<b>Avamar Activation Manager . . . . .</b>	<b>401</b>
Workflow Overview . . . . .	402
Preparing to use Avamar Activation Manager . . . . .	402
Using Avamar Activation Manager . . . . .	402
Environment . . . . .	403
Network . . . . .	403
Directory Service Domain . . . . .	403
Avamar System . . . . .	404
Avamar Administrative Account . . . . .	404
Administrator's Computer . . . . .	405
Preventing Long-Running JavaScript Warnings . . . . .	406
Configure Kerberos Realms Information . . . . .	407
Remote Push Install of the Client Software . . . . .	408
Systems Management Tools . . . . .	408
Push Install on Windows Computers . . . . .	409
Push Install on Mac Computers . . . . .	410
Post-Installation Restart . . . . .	411
Uninstalling . . . . .	412
Starting Avamar Activation Manager . . . . .	413
Client Data Source . . . . .	413
Query Directory Service . . . . .	413
Import Client List . . . . .	415
The Avamar Activation Manager UI . . . . .	418
Directory Information . . . . .	419
Group Assignments . . . . .	420
Avamar Server Information . . . . .	421
Directory Details . . . . .	421
Controls . . . . .	422
Session Timeout . . . . .	423
Activating Clients . . . . .	424
Understanding Client Activation . . . . .	424
Searching for Clients to Activate . . . . .	425
Search Results Views . . . . .	428
Using Directory Information Search . . . . .	429
Register and Activate Clients . . . . .	431
Activation Failure . . . . .	432
Clients Activated in Multiple Groups . . . . .	432
Finding Clients . . . . .	433
Client Selected for Activation with Multiple Servers . . . . .	434
Removing Clients . . . . .	435
Re-inviting Clients . . . . .	436
Creating New Groups . . . . .	437
Creating a New Group using Drag and Drop . . . . .	437
Creating a New Group using Right-Click . . . . .	438
Moving Clients to a Different Avamar server . . . . .	439
Preconditions for Moving Clients . . . . .	439
How to Move Activated Clients . . . . .	440
Process Viewer . . . . .	441

Avamar Activation Manager Log . . . . .	443
Opening the Log . . . . .	443
Queued Activation Invitations . . . . .	444
Refreshing the View. . . . .	445
Clearing the Log . . . . .	445
Maximum Size of Log . . . . .	445
Searching the Log . . . . .	445
Exporting the Log. . . . .	446
Printing the Current Log View . . . . .	447
Log Messages . . . . .	447
<b>Avamar Desktop/Laptop . . . . .</b>	<b>450</b>
Environment Requirements . . . . .	451
Computers . . . . .	451
Network . . . . .	452
LDAP Authentication . . . . .	453
Avamar Authentication. . . . .	453
Avamar System . . . . .	454
Avamar Desktop/Laptop Server Configuration. . . . .	455
Starting Avamar Desktop/Laptop . . . . .	455
Choosing an Authentication Mechanism . . . . .	455
Configure Kerberos Realms Information . . . . .	456
Configuring Avamar Authentication . . . . .	461
Public Key Infrastructure Configuration . . . . .	462
Installing a Trusted Public Key Certificate . . . . .	463
Rebranding the Web UI . . . . .	469
Deleting a Browser's Cache . . . . .	469
Checking the Status of Avamar Desktop/Laptop Server . . . . .	470
Stopping and Starting Avamar Desktop/Laptop Server . . . . .	470
User Selectable Backup Schedules . . . . .	471
Enable Selectable Backup Schedules. . . . .	472
Configure Selectable Backup Schedules. . . . .	472
Client Installation using Systems Management Tools . . . . .	474
Local Installation of the Client . . . . .	474
Client Log Location. . . . .	475
Mac Clients with Entourage . . . . .	475
Creating the Dataset . . . . .	475
Client Backup Message. . . . .	476
<b>Appendix A — Command Shell Sessions . . . . .</b>	<b>477</b>
Starting the Command Shell Sessions. . . . .	477
Switching User IDs. . . . .	478
<b>Appendix B — Plugin Options . . . . .</b>	<b>479</b>
Important Terms and Concepts . . . . .	479
AIX File System Plugin Options . . . . .	481
Avamar FreeBSD File System Plugin Options. . . . .	486
HP-UX File System Plugin Options . . . . .	491
Linux File System Plugin Options. . . . .	496
Macintosh File System Plugin Options. . . . .	501
NetWare File System Plugin Options. . . . .	506
SCO OpenServer File System Plugin Options. . . . .	512
Solaris File System Plugin Options . . . . .	517
Windows File System Plug-in Options . . . . .	522
DB2 Plug-in Options. . . . .	529

Lotus Domino Plug-in Options . . . . .	532
NDMP Plugin Options . . . . .	538
Oracle RMAN Plug-in Options . . . . .	539
Microsoft Office SharePoint Server Plug-in Options . . . . .	548
Windows Exchange Database Plugin Options . . . . .	549
Windows Exchange Message Plugin Options . . . . .	553
Windows SQL Server Plugin Options . . . . .	554
Windows VSS Plug-in Options . . . . .	559
Replicate Plugin Options . . . . .	560
<b>Appendix C — MCS and EMS Database Views . . . . .</b>	<b>561</b>
Data Types . . . . .	561
MCS Database Views . . . . .	562
v_activities . . . . .	562
v_activities_2 . . . . .	565
v_activity_errors . . . . .	568
v_audits . . . . .	569
v_clients . . . . .	570
v_clients_2 . . . . .	573
v_compatibility . . . . .	576
v_datasets . . . . .	577
v_dpnsuammary . . . . .	577
v_dpn_stats . . . . .	578
v_ds_commands . . . . .	578
v_ds_excludes . . . . .	579
v_ds_includes . . . . .	579
v_ds_targets . . . . .	579
v_ev_catalog . . . . .	579
v_ev_cus_body . . . . .	581
v_ev_cus_cc_list . . . . .	581
v_ev_cus_codes . . . . .	581
v_ev_cus_prof . . . . .	582
v_ev_cus_prof_params . . . . .	582
v_ev_cus_rpt . . . . .	583
v_ev_cus_snmp_contact . . . . .	583
v_ev_cus_syslog_contact . . . . .	584
v_ev_cus_to_list . . . . .	584
v_ev_unack . . . . .	585
v_events . . . . .	586
v_gcstatus . . . . .	587
v_group_members . . . . .	588
v_groups . . . . .	589
v_node_space . . . . .	590
v_node_util . . . . .	591
v_plugin_can_restore . . . . .	591
v_plugin_catalog . . . . .	592
v_plugin_depends_upon . . . . .	593
v_plugin_flag_groups . . . . .	593
v_plugin_flag_pulldown . . . . .	593
v_plugin_flags . . . . .	594
v_plugin_options . . . . .	595
v_plugin_state . . . . .	595
v_plugins . . . . .	596
v_repl_activities . . . . .	596
v_report_filter . . . . .	599

---

v_reports .....	599
v_retention_policies .....	600
v_sch_recurrence .....	601
v_schedules .....	602
v_schedules_2 .....	604
v_serial_numbers .....	605
v_systems .....	605
EMS Database Views .....	606
v_avamar_server .....	606
v_compatibility .....	607
<b>Glossary .....</b>	<b>608</b>

# FOREWORD

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## Scope and Intended Audience

**Scope.** This publication describes how to administer an operational Avamar system following successful system installation, setup and configuration.

**Intended Audience.** The information in this publication is primarily intended for system administrators who are responsible for maintaining servers and clients on a network, as well as operators who monitor daily backups and storage devices.

## Product Information

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

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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 <b>OK</b> . or Select <b>File &gt; Close</b> .	Bold text denotes actual buttons, commands, menus and options that initiate action. Sequential commands are separated by a greater-than (>) character. For example, the second example instructs you to select the <b>Close</b> command from the <b>File</b> menu.
Type: <b>cd /tmp</b>	Bold fixed-width text denotes shell commands that must be entered exactly as they appear.
--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, 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 the product. Tips never contain information that will cause a failure if ignored.

---

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**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 introduces and discusses the Avamar online data protection solution. You should familiarize yourself with these concepts before attempting to administer an Avamar system.

Avamar® solves the challenges associated with traditional backup, enabling fast, reliable backup and recovery for remote offices, data center LANs and VMware environments. Avamar is backup and recovery software 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 differentiators 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
- 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 EMC Corporation Avamar Data Store package

## Important Terms and Concepts

This topic introduces and discusses important terms and concepts that you should familiarize yourself with before attempting to administer an Avamar system.

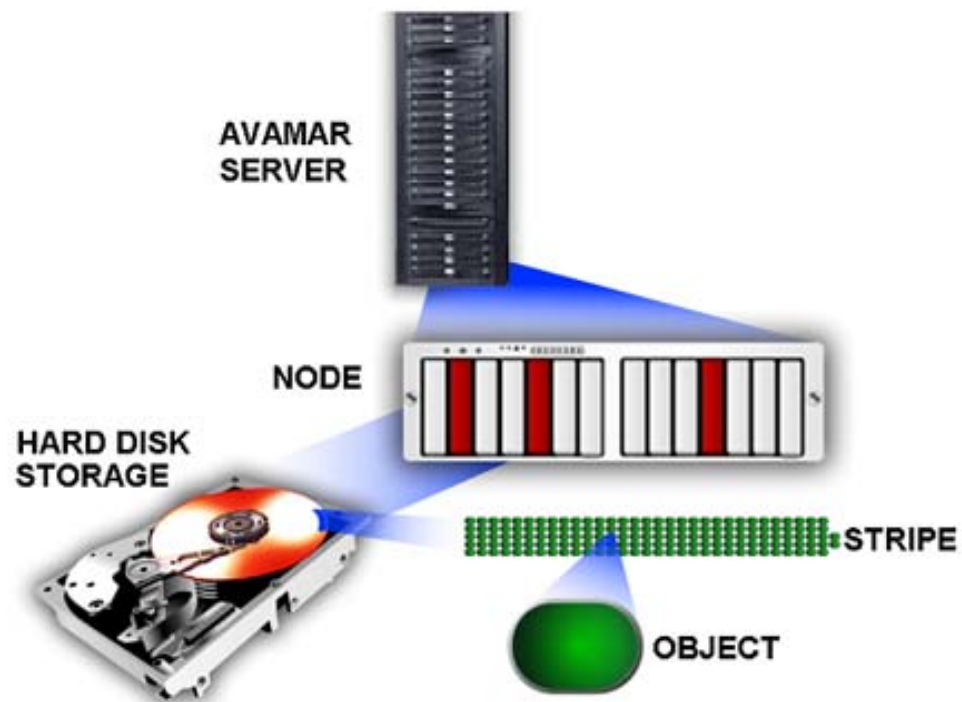
**Avamar System.** An Avamar system is a client/server network backup and restore solution consisting of one or more Avamar servers and the network servers or desktop clients that back up data to those servers. The Avamar system also provides centralized management through the Avamar Administrator graphical management console software application.

**Avamar Server.** An Avamar server is a logical grouping of one or more nodes that is used to store and manage client backups.

---

**NOTE:** Hardware manufacturers typically call their equipment servers (for instance, the Dell PowerEdge 2950 server). In the context of an Avamar system, this equipment is called a "node."

---



**Node.** An Avamar node is a self-contained rack-mountable network-addressable computer that runs Avamar server software on the Linux operating system.

**Hard Disk Storage.** Avamar is a hard-disk based IP network backup and restore solution. Avamar servers manufactured by EMC use internal hard disk storage.

**Stripes.** A stripe is a unit of disk drive space managed by Avamar to ensure fault tolerance.



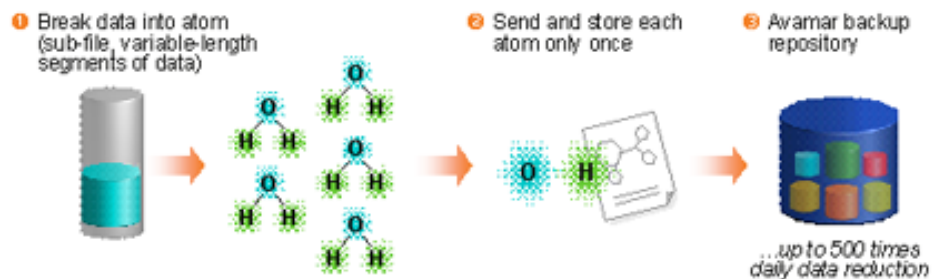
**Object.** In the Avamar system, an object is a single instance of deduplicated data. Each Avamar object inherently has a unique ID. Objects are stored and managed within stripes on the Avamar server.

**Data Deduplication.** Data deduplication is a key feature of the Avamar system. Data deduplication ensures that each unique sub-file, variable length object is stored only once across sites and servers.

During backups, Avamar client software examines the client filesystem and applies a data deduplication algorithm that identifies redundant data sequences and breaks the client filesystem into sub-file, variable length data segments. Each data segment is assigned a unique ID. The client software then determines whether or not this unique ID has already been stored on the Avamar server. If this object resides on the Avamar server, a link to the stored object is referenced in this backup. Once an object has been stored on the server, it never has to be re-sent over the network, no matter how many times it is encountered on any number of clients. This feature greatly reduces network traffic and provides for greatly enhanced storage efficiency on the server.

## How it Works

### Avamar Global Data De-Duplication



**Replication.** Replication is a feature that enables efficient, encrypted and asynchronous replication of data stored in an Avamar server to another Avamar server deployed in remote locations without the need to ship tapes. Replication is a scheduled process between two independent Avamar servers, providing a higher level of reliability for stored backups. Replication can be scheduled to run at off-peak hours to minimize bandwidth impact.

---

## Functional Overview

This topic provides detailed information about each part of the Avamar client/server system and describes how the various parts interact with one another.

### Avamar Servers

All Avamar servers store client backups and also provide essential processes and services required for client access and remote system administration.

**A Word About Avamar Server Hardware Configurations.** Avamar servers are available in either single-node or scalable multi-node configurations. For the most part, when using Avamar Administrator management console software, all Avamar servers look and behave the same. The main differences among various Avamar server configurations is the number of nodes and disk drives reported in the server monitor.

Documenting specific differences in Avamar server hardware configurations is beyond the scope of this publication. Whenever specific limitations and best practices for certain configurations are known, they will be noted for your convenience. However, these occasional notes should not be considered definitive or exhaustive. Consult EMC Technical Support or your EMC reseller for additional information about your specific hardware.

**Nodes.** The primary building block in any Avamar server is a “node.” Each node is a self-contained rack-mountable network-addressable computer that runs Avamar server software on the Linux operating system. Nodes can also contain internal storage in the form of hard disk drives. If the node is configured with internal storage (that is, a single-node server), it is internally mirrored to provide robust fault tolerance.

**Utility Node** A node dedicated to scheduling and managing background Avamar server jobs. In scalable multi-node Avamar servers, a single utility node provides essential internal services for the server (Management Console Server (MCS), cronjob, External authentication, Network Time Protocol (NTP) and Web access). Because utility nodes are dedicated to running these essential services, they cannot be used to store backups.

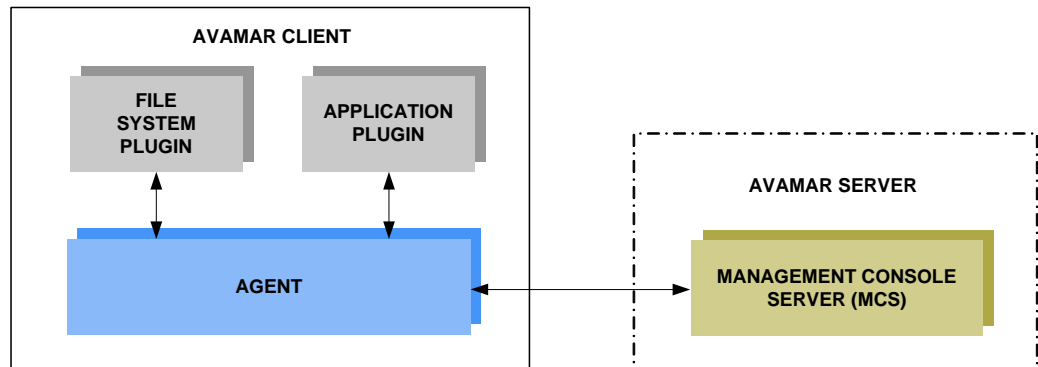
**Storage Nodes** Nodes that store the actual backup data. Multiple storage nodes are configured with multi-node Avamar servers based upon performance and capacity requirements. Storage nodes can be added to an Avamar server over time to expand performance with no downtime required. Avamar clients connect directly with Avamar storage nodes; client connections and data are load balanced across storage nodes.

**NDMP Accelerator** A specialized node that utilizes NDMP in order to provide data protection for NAS devices (EMC Celerra IP storage systems and Network Appliance filers).

**Single-Node Servers.** Single-node Avamar servers combine all the features and functions of utility and storage nodes on a single node.

## Avamar Clients

Avamar provides client software for various computing platforms. Each client comprises a client agent and one or more plugins.



**Agents.** Avamar agents are platform-specific software processes running on the client that communicate with the Management Console Server (MCS) and with any plugins installed on that client.

**Plugins.** There are two basic types of Avamar plugins:

**Filesystem plugins** Filesystem plugins are used to browse, back up and restore files or directories on a specific client filesystem. Avamar currently provides the following operating system plugins:

- Free BSD
- HP-UX
- IBM AIX
- Linux
- Mac OS X
- Microsoft Windows
- Microsoft Windows Volume Shadow Copy Service (VSS)
- SCO OpenServer
- SCO UnixWare
- Sun Solaris
- Novell NetWare
- VMware

**Application plugins** Application plugins support backup and restore of databases or other special application. Avamar currently provides the following application plugins:

- IBM DB2
- Lotus Domino
- Microsoft Exchange
- Microsoft Office SharePoint Server (MOSS)
- Microsoft SQL Server
- NDMP for NAS devices (EMC Celerra IP storage systems and Network Appliance filers)
- Oracle

## Avamar Administrator

Avamar Administrator is a graphical management console software application that is used to remotely administer an Avamar system from a supported Windows client computer.

## Encryption

Avamar can encrypt all data sent between clients and the server “in flight.” Each individual Avamar server can also be configured to encrypt data stored on the server “at rest.”

**“In-Flight” Encryption.** In order to provide enhanced security during client/server data transfers, Avamar supports two levels of “in-flight” encryption (medium and high), which can be set on a client-by-client basis in client properties, or for an entire group of clients in group properties. You can also turn off “in-flight” encryption entirely.

**“At-Rest” Encryption.** The decision to encrypt all data stored in an Avamar server is typically a one-time decision that is made when the server is initially deployed at a customer site.

# AVAMAR ADMINISTRATOR

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Avamar Administrator is a graphical management console software application that is used to remotely administer an Avamar system from a supported Windows or client computer.

## Installing Avamar Administrator on Microsoft Windows

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**TIP:** You can also launch Avamar Administrator directly from an Avamar Enterprise Manager session. Refer to *Launching Avamar Administrator From Avamar Enterprise Manager* (page 320) for additional information.

---

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 Downloads and Documentation page appears.
6. Click the appropriate operating system hyperlink for your client computer.  
A directory listing appears in your browser.

Install JRE as  
 Required

7. Do one of the following:

IF	DO THIS
Your computer already has Java Runtime Environment (JRE) 1.6 Update 12 installed.	Skip this step and proceed directly to step 8.
Your computer does not have Java Runtime Environment (JRE) 1.6 Update 12 installed.	Click the <b>jre-6u12-windows-i586-p</b> 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. Follow the on-screen instructions to complete the JRE installation.

8. Click the **AvamarConsoleMultiple** install package.

Your browser might 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.

9. Either open the installation file in place (on the server) or double-click the downloaded installation file.

If a security warning appears, click **Run**.

The installation wizard appears.

10. Click **Accept** for the license agreement.

The installation destination window appears.

11. Do one of the following:

IF	DO THIS
You accept the default destination.	Go to step 12.
You want to change the installation destination.	Click <b>Browse</b> and select a different destination.

---

**IMPORTANT:** This installation procedure allows you to install multiple versions of the Avamar Administrator on the same computer. Each version is identified by its full version number (for instance, 4.1.0.420). To ensure against inadvertently overwriting an existing one that you want to keep, select this destination folder carefully.

---

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

## Uninstalling and Upgrading Avamar Administrator on Microsoft Windows

Unlike other platforms, previous versions of Avamar Administrator software do not have to be explicitly uninstalled before a new version can be installed.

If you decide to install Avamar Administrator on a computer that already has it installed, select a destination folder carefully in step 11 of the previous procedure. To keep an older version, select a different installation destination. The two versions will be identified by their full version numbers.

To uninstall a version of Avamar Administrator, double-click **Uninstall Avamar Administrator** in the following path:

**Start > Programs > EMC Avamar > Administrator > VERSION**

Where **VERSION** is the specific version you want to uninstall.

## Installing Avamar Administrator on Linux

---

**IMPORTANT:** Uninstall (page 26) any previous version of Avamar Administrator software before installing the new version.

---

### 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 Downloads and Documentation page appears.

Install JRE as Required

6. Do one of the following:

IF	DO THIS
Your computer already has Java Runtime Environment (JRE) 1.6 Update 12 installed.	Skip this step and proceed directly to step 7.
Your computer does not have Java Runtime Environment (JRE) 1.6 Update 12 installed.	Click <b>Downloads &gt; Red Hat Enterprise Linux 3</b> and download <b>jre-6u12-linux-amd64.rpm</b> to any convenient temporary install directory on your system (for example, /tmp) and run this installation program from a command shell.  Follow the on-screen instructions to complete the JRE installation.

7. Click **Downloads > Linux**.

Download the Avamar Administrator (AvamarConsole) install package to any convenient temporary install directory on your system.

---

**IMPORTANT:** Use the Red Hat Enterprise Linux 3.0 installer for Red Hat Enterprise Linux 9.0.

---



---

**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 Administrator (AvamarConsole) install package.

---

**NOTE:** AVAMARLINUXCONSOLE.rpm is used as an example filename for the Avamar Administrator (AvamarConsole) install package in the remainder of this chapter. Your actual filename will be different.

---

Download Avamar Administrator (AvamarConsole) Package



## Install Avamar Administrator Software

Log in as root

1. Open a command shell and log into the computer onto which you want to install this software as root.

Install Avamar  
Linux Client  
Software

2. Change directory to your temporary install directory (page 24). For example:

```
cd /tmp
```

3. Type:

```
rpm -ih AVAMARLINUXCONSOLE.rpm
```

The following appears in the command shell:

```
Please run /usr/local/avamar/bin/avsetup_mcc to configure MC Client
```

Configure Avamar  
Administrator

4. Type:

```
/usr/local/avamar/bin/avsetup_mcc
```

The following appears in the command shell:

```
Enter the location of your JRE 1.5 installation [/usr/java/jre1.6u12]:
```

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

The following appears in the command shell:

```
Enter the root directory of your EMC installation [/usr/local/avamar]:
```

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

The following appears in the command shell:

```
Avamar Administrator 5.0.2-31 has been configured correctly. Type mcgui command to use it.
```

## Uninstalling Avamar Administrator on Linux

1. Close Avamar Administrator.

---

**IMPORTANT:** You must close all open Avamar Administrator sessions before you can uninstall Avamar Administrator. Otherwise, the uninstall will not complete. Any incomplete uninstall will complicate future Avamar Administrator upgrades.

---

Log in as root

2. Open a command shell and log into the computer that is currently running Avamar Administrator as root.

Uninstall Avamar  
Software

3. Type:

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

The following appears in the command shell:

```
AvamarConsole-VERSION
```

4. Note the package name.

5. Type:

```
rpm -e AvamarConsole-VERSION
```

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

## Upgrading Avamar Administrator on Linux

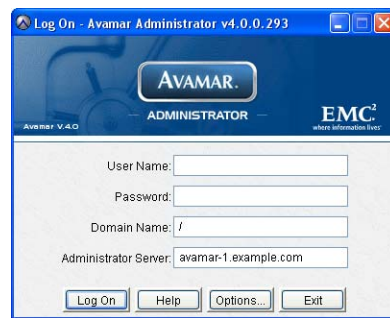
In order to upgrade your Avamar Administrator software on the Linux platform, you must completely uninstall the old software (page 26) and install the new software (page 23). Use of the Linux software upgrade command (`rpm -Uh`) is not supported.

# Starting Avamar Administrator

1. Do one of the following:

PLATFORM	DO THIS
Microsoft Windows	Double-click the Avamar Administrator icon on your Windows desktop.
Linux	Open a command shell and type: <b>mcgui</b>

The login window appears.



2. Type the following:

FIELD	DESCRIPTION
User Name	<p>Your Avamar username.</p> <p><b>NOTE:</b> In order to access all Avamar Administrator features and functions, this user account must be assigned the role of Administrator. Other roles provide reduced functionality. Refer to <i>Roles</i> (page 60) for additional information.</p> <p>If you are using an external authentication system such as Network Information Service (NIS), Open Lightweight Directory Access Protocol (OpenLDAP) and Windows Active Directory, your entry must be in the following format:</p> <p>USER@EXT-AUTH-SERVER</p> <p>Where USER is your username and EXT-AUTH-SERVER is the name of your external authentication server.</p> <p>If only the username is entered, the internal Avamar authentication system ("avs") is used.</p>
Password	Your Avamar password.

FIELD	DESCRIPTION
Domain Name	Administrative domain (node on the client tree) you want to log into. If logging into the root domain, use the default entry (that is, a single slash (/) character). If logging into a specific domain or subdomain, use the following syntax: /domain/subdomain1/subdomain2 Refer to <i>Domains and Subdomains</i> (page 33) for additional information.
Administrator Server	Avamar Administrator server name, as defined in the corporate Domain Name Server (DNS), that you want to log into.

**TIP:** If you consistently log on to the same Avamar server or domain, click **Options...** and type that server name and domain in the Default Administrator Server and Default Domain fields, respectively. The next time you start Avamar Administrator, the login window Administrator Server and Domain Name fields will be prepopulated with this information.

3. Click **Log On**.

The Administrator launcher appears.



**NOTE:** Full launcher functionality is only available to users assigned the role of Administrator. Other roles provide reduced functionality. Refer to *Roles* (page 60) for additional information.

Each of the buttons invokes a different persistent window for performing specific tasks. You can invoke and switch among the various windows using the **Navigation** menu or status bar shortcuts.

## Special Features

This topic introduces and discusses various time-saving features and shortcuts found in the Avamar Administrator user interface.

**Status Bar.** Each Avamar Administrator persistent window contains a status bar near the bottom of the screen:



This status bar not only conveys status information but each icon and status indicator also provides a single-click shortcut to specific features and functions.

**Launcher Shortcuts.** The six icons on the left side of the status bar provide shortcuts to any of the six main windows. Clicking any of these icons is the same as clicking the corresponding Launcher button or selecting the corresponding **Navigation** menu command.



Clicking this status bar icon displays the Policy window, which is used to create and manage groups, datasets, schedules and retentions policies. Refer to *Groups and Group Policies* (page 128) for additional information.



Clicking this status bar icon displays the Backup and Restore window, which is used to perform on-demand backups and restores. Refer to *Performing an On-Demand Client Backup* (page 74) and *Performing a Restore* (page 84) for additional information.



Clicking this status bar icon displays the Administration window, which is used to create and manage domains, clients, users, system events and services. Refer to *Domains, Clients and Users* (page 33) and *Advanced Server Administration and Maintenance* (page 351) for additional information.



Clicking this status bar icon displays the Backup Management window, which is used to change backup expiration dates, as well as validate backups or delete them from the system. Refer to *Changing a Backup Expiration Date* (page 88), *Validating a Backup* (page 92) and *Deleting a Backup* (page 98) for additional information.



Clicking this status bar icon displays the Activity window, which is used to monitor backup and restore activity. Refer to *Monitoring Backup, Restore and Validation Activities* (page 76) for additional information.



Clicking this status bar icon displays the Avamar Server window, which is used to monitor server activity and client sessions. Refer to *Advanced Server Administration and Maintenance* (page 351) for additional information.

**Status Indicators.** The right side of the status bar contains three important status indications:

**Scheduler** The scheduler controls whether or not scheduled backups occur. "Scheduler: Running" indicates that scheduled backups are enabled and will occur at the scheduled time. "Scheduler: Suspended" indicates that scheduled backups are disabled and will not occur until you reenables the scheduler. Clicking the scheduler status icon or text label displays the Manage All Schedules dialog box. From there, you can click **Resume All** or **Suspend All** to enable or disable scheduled backups, respectively. Refer to *Suspending Scheduled Operations* (page 279) and Refer to *Resuming Scheduled Operations* (page 279) for additional information.

**Unacknowledged Events** Certain system events can be configured to require acknowledgement by an Avamar server administrator each time they occur. "Have Unacknowledged Events" indicates that there are entries in the unacknowledged events list that must be explicitly acknowledged by an Avamar server administrator. "No Unacknowledged Events" indicates that the unacknowledged events list contains no entries. Clicking the Unacknowledged Events status icon or text label displays the Administration window Unacknowledged Events pane (tab). Refer to *Acknowledging System Events* (page 276) for additional information.

<b>Server</b>	Indicates one of the following overall Avamar server operational states:
Full Access	Indicates the normal operational state for an Avamar server. All operations are allowed.
Admin	Indicates that the Avamar server is in an administrative state in which the Avamar server and root user can read and write data; other users are only allowed to read data.
Admin Only	Indicates that the Avamar server is in an administrative state in which the Avamar server or root user can read or write data; other users are not allowed access.
Admin Read Only	Indicates that the Avamar server is in an administrative read-only state in which the Avamar server or root user can read data; other users are not allowed access.
Degraded	Indicates that the Avamar server has experienced a disk failure on one or more nodes. All operations are allowed, but immediate action should be taken to fix the problem.
Inactive	Indicates that Avamar Administrator was unable to communicate with Avamar server.
Node Offline	Indicates that one or more Avamar server nodes are in an OFFLINE state.
Read Only	Indicates that the Avamar server is in a read-only administrative state in which all users can read data, but writing data is not allowed.
Suspended	Indicates that Avamar Administrator was able to communicate with the Avamar server, but normal operations have been temporarily suspended.
Synchronizing	Indicates that the Avamar server is in a transitional state. It is normal for the server to be in this state during startup and for short periods of time during maintenance operations.
Unknown State	Indicates that Avamar Administrator could not determine the Avamar server state.

Clicking the Server status icon or text label displays the Avamar Server window Session Monitor pane (tab). From there, you can select **Actions > Resume Backups/Restores** or **Actions > Suspend Backups/Restores** to resume or suspend server activities, respectively.

Refer to *Suspending Backups/Restores* (page 277) for additional information.

**Mouse Shortcuts.** The Avamar Administrator user interface supports various context-sensitive left-click, right-click and double-click shortcuts.

**Right-Clicking** All GUI elements that can enable features or functions when clicked, have right-click support added to them. However, if the GUI element only acts as a navigation mechanism, there is no right-click support. For example, the Policy window client tree has a right-click pop-up menu because specific features and functions become available, based on selection context (which node of the tree is selected).

**Double-Clicking** For all tables where properties or edit dialog boxes can be invoked, double-clicking any row of that table displays the appropriate properties or edit dialog box. Additionally, when lists are used rather than tables, double-clicking any element in those lists displays the appropriate edit dialog box.

**Click Column Heading to Sort Tables** Clicking any table column heading sorts that display by values in that column. For example, double-clicking the Activity Monitor State column sorts the entire Activity Monitor display by the state of each backup.

**Shift-Click Column Heading to Reverse-Sort Tables** Shift-clicking any table column heading reverse-sorts that display by values in that column.



# DOMAINS, CLIENTS AND USERS

---

This chapter discusses how to administer Avamar domains, clients and user accounts.

## Domains and Subdomains

Avamar domains are distinct zones within the Avamar server that are used to organize and segregate clients. This provides enhanced security by allowing administrative user accounts to be defined on a domain-by-domain basis.

It should be understood that Avamar domains are completely internal to the Avamar server and have nothing to do with Internet domains.

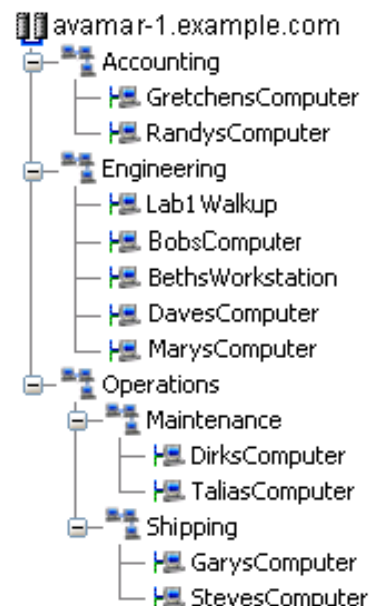
**Nested Structure.** Domains can be nested to create a rich tree structure. Consider the example Avamar domain (right).

This root (avamar-1.example.com) domain contains three departmental domains (Accounting, Engineering and Operations). The Operations domain contains Maintenance and Shipping subdomains.

It should also be understood that there is no functional difference between domains and subdomains. “Subdomain” is merely a term that refers to any domain nested within another higher level domain.

**Hierarchical Management.** The real power of domains is that they provide the ability to add specific administrators to a specific level on the client tree. These domain-level administrators can then manage the clients and policies within that domain.

For example, any administrative user added to our example root (avamar-1.example.com) domain can administer clients and policies anywhere in the system. However, an administrative user added to the Operations domain can only



administer clients and policies within that domain and below (including the Maintenance and Shipping subdomains); that user cannot administer clients in the Accounting or Engineering domains.

The remainder of this publication assumes that the administrator has logged into the root domain. Be aware that if you log into a lower-level domain, you may not have access to specific clients, datasets, groups and event management features outside that particular domain.

**Special Domains.** The following domains are permanent (they cannot be deleted or moved) and used for the following special purposes:

**MC\_RETIRED** MC\_RETIRED contains clients that have been retired (page 48). Its primary purpose is to facilitate restores from retired client backups.

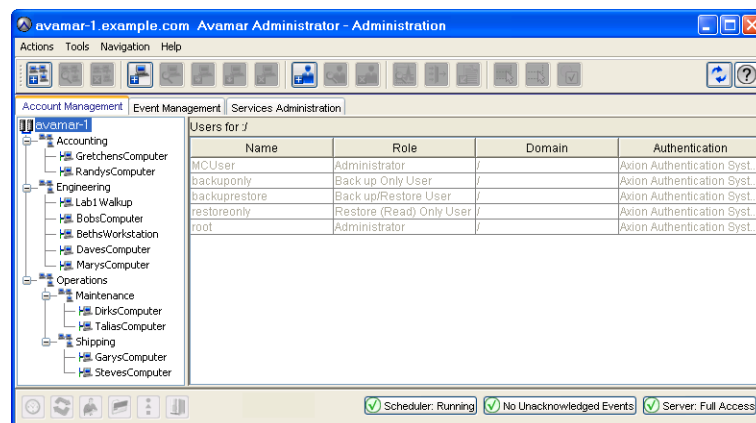
**REPLICATE** REPLICATE contains replicated data from other servers. Refer to *Replication* (page 333) for additional information.

## Adding a New Domain

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

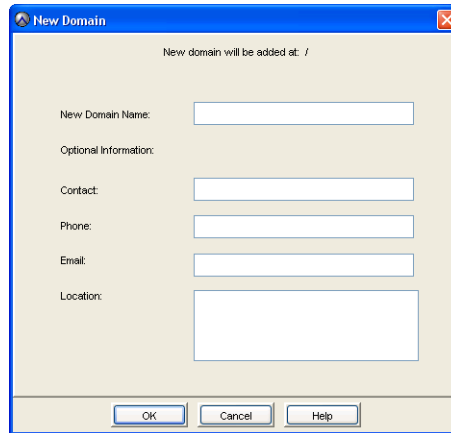


3. Click the Account Management tab.
4. In the tree, select where you want to add the new domain.



5. Select **Actions > Account Management > New Domain...** or click the toolbar icon shown immediately to the left.

The New Domain dialog box appears.




---

**IMPORTANT:** The complete client name and domain path cannot exceed 63 characters. Therefore, when creating new domains, try to minimize the number of subdomains you will use and keep domain names as short as practical.

---

6. Type the following:

FIELD	DESCRIPTION
New Domain Name	Type the new domain name here.
Contact	Optional contact name.
Phone	Optional contact telephone number.
Email	Optional contact email address.
Location	Optional contact location.

7. Click **OK**.

A confirmation message appears.

8. Click **OK**.

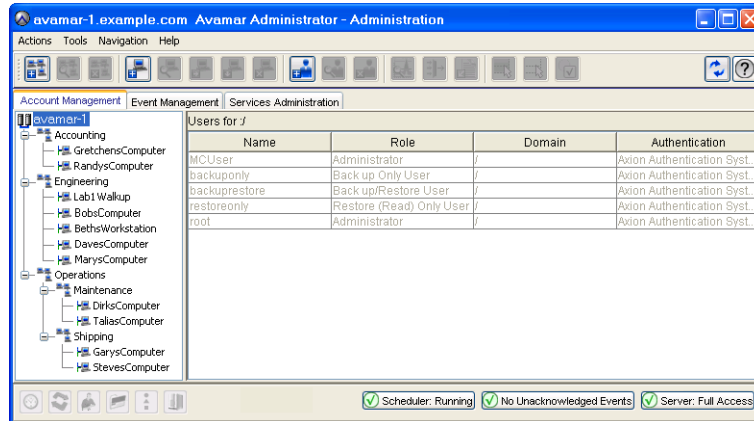
The confirmation message closes, the New Domain dialog box closes and the new domain appears in the Account Management tree.

## Editing Domain Information

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



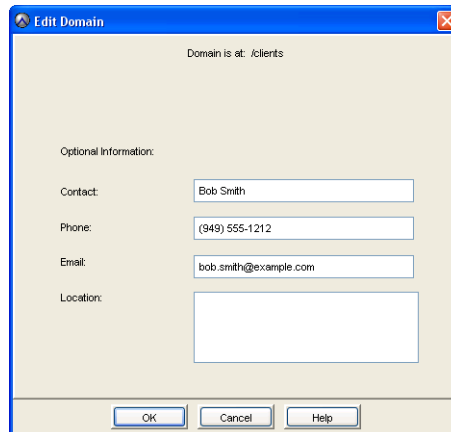
The Administration window appears.



3. Click the Account Management tab.
4. In the tree, select the domain you want to edit.
5. Select **Actions > Account Management > Edit Domain...** or click the toolbar icon shown immediately to the left.



The Edit Domain dialog box appears.



6. Edit the information you want to change.  
Refer to *Adding a New Domain* (page 34) for additional information about domain properties and settings.
7. Click **OK**.  
A confirmation message appears.
8. Click **OK**.  
The confirmation message closes and the Edit Domain dialog box closes.

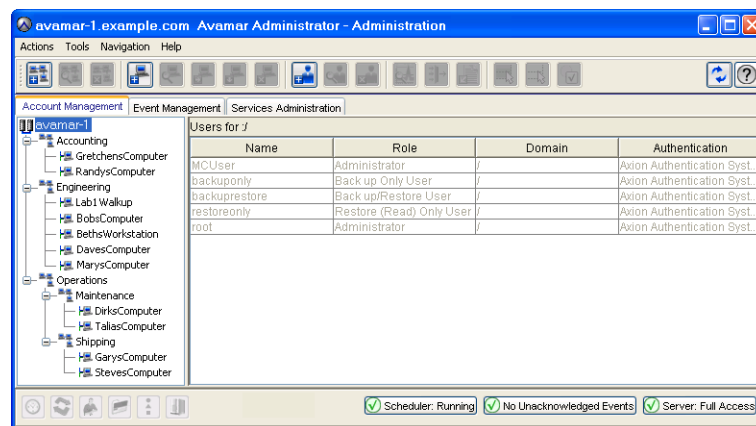
## Deleting a Domain

**IMPORTANT:** Deleting a domain also deletes any clients within that domain. Unless you want to permanently delete all clients within a domain, you should move the clients to a new domain (page 50) prior to performing this procedure.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



3. Click the Account Management tab.
4. In the tree, select the domain you want to delete.
5. Select **Actions > Account Management > Delete Domain...** or click the toolbar icon shown immediately to the left.



A message appears asking you to confirm this action.

6. Click **Yes** to permanently delete this domain.

A second message appears confirming that this action has successfully completed.

7. Click **OK**.

The second confirmation message closes.

## Clients

Avamar clients are networked computers or workstations accessing the Avamar server over a network connection.

Before a client can actually use the Avamar system to back up or restore data, it must be added to the system (registered), then activated.

Registration and Activation Occur Asynchronously.

In order to provide maximum flexibility in deploying Avamar clients, registration and activation are distinct and separate events that occur asynchronously. Although they often occur at nearly the same time, they can also occur hours, days or even weeks apart.

### Registration

Client registration is the process of establishing an identity with the Avamar server. Once Avamar “knows” the client, it assigns a unique client ID (CID), which it will eventually pass back to the client during activation.

There are three ways to register a client:

- Client-side registration
- Interactive server-side registration
- Batch client registration

**Client-Side Registration.** Following client installation, Avamar Windows clients can initiate the registration process by right-clicking the Avamar server tray icon and selecting **Activate**.

During client software installation on Linux and Unix platforms, installers are asked whether they want to register the client at that time.

Both client-side registration methods also activate the client at the same time. For this reason, client-side registration is very popular. However, because client-side registration uses certain inherited assignments (the client is added to the Default Group and must use the default dataset, schedule and retention policy), this method may not provide enough control for some sites. Refer to *Editing Group Properties* (page 138) for additional information about group properties such as datasets, schedules and retention policies.

**Interactive Server-Side Registration.** You can also interactively use Avamar Administrator to add the client to the system in the desired domain and group. This provides a high degree of control (for example, you can assign a specific dataset, schedule and retention policy) but can be very time consuming if you need to add many clients.

**Batch Client Registration.** In order to support large sites with many clients, Avamar provides a batch client registration feature that allows you to define multiple clients by way of a single “client definition” file, then import that file into the Avamar server. Batch client registration is very popular at large sites because it provides nearly as much control as interactively adding the client using Avamar Administrator but is much faster. Refer to *Batch Client Registration* (page 55) for additional information.

## Activation

Client activation is the process of passing the client ID (CID) back to the client, where it is stored in an encrypted file on the client filesystem. There are two ways to activate a client:

You can wait for the client to initiate activation (for example, right-click Avamar system tray icon and select **Activate**).

You can invite the client to activate with the server using the Avamar Administrator **Actions > Account Management > Invite Client...** command.

---

**IMPORTANT:** In order for immediate activation using Avamar Administrator to succeed, the client must be present on the network, the Avamar client software must be installed and running and the Avamar server must be able to resolve the hostname that was used to register the client. Refer to *Activating a New Client* (page 41) for additional information.

---



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**NOTE:** HP-UX, Linux and Solaris clients can either be activated during installation or from Avamar Administrator. There is no client-side command for initiating client activation on these computing platforms.

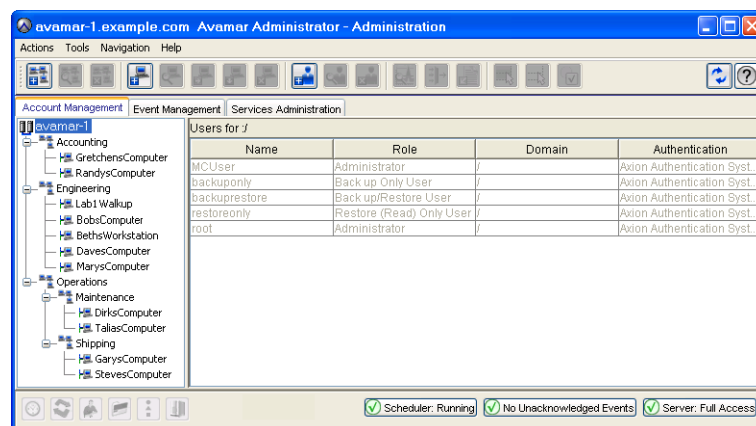
---

## Adding a New Client

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



3. Click the Account Management tab.

**TIP:** In the Account Management tree, client status is shown as follows: disabled clients have an x placed next to their icon, unregistered clients have question mark placed next to their icon and active clients have no special icon designation.

4. In the tree, select the domain to which you want to add this client.
5. Select **Actions > Account Management > New Client...** or click the toolbar icon shown immediately to the left.



The New Client dialog box appears.

6. For Client Type, select Normal.

**NOTE:** VMware vCenter, Image Proxy and Virtual Machine client types are discussed in another publication. Refer to your *Avamar VMware Guide* for additional information.

7. Select or type the following:

FIELD	DESCRIPTION
New Client Name	Type the new client name here. <b>IMPORTANT:</b> The complete client name and domain path cannot exceed 63 characters. Therefore, when adding new clients, try to keep client names as short as practical.
Contact	Optional contact name.
Phone	Optional contact telephone number.
Email	Optional contact email address.
Location	Optional contact location.

8. Click **OK**.  
A confirmation message appears.
9. Click **OK**.  
The confirmation message closes, the New Client dialog box closes and the new client appears in the Account Management tree.

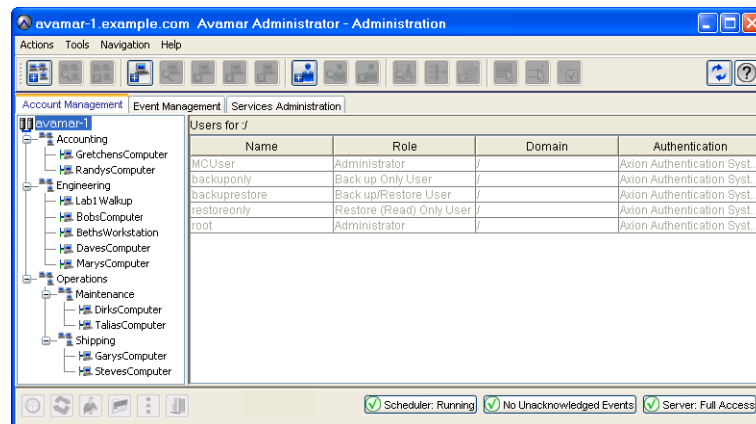


## Activating a New Client

1. Ensure that Avamar client software is installed and running on the client.
2. Start Avamar Administrator (page 21).
3. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



4. Click the Account Management tab.

**TIP:** In the Account Management tree, client status is shown as follows: disabled clients have an x placed next to their icon, unregistered clients have question mark placed next to their icon and active clients have no special icon designation.

5. In the tree, select the client you want to activate.
6. Select **Actions > Account Management > Invite Client...**

The following status message appears: Client has been sent invitation to activate with the server.

7. Click **OK**.
8. Repeat steps 5 through 7 for each new client you want to activate.

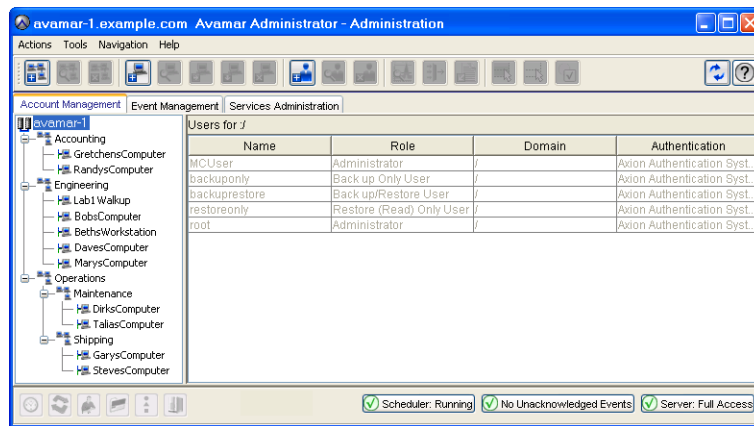
## Editing Client Information

**IMPORTANT:** If you intend to change this client's name, you must first shut down the Avamar software on the client computer, change the client name by way of this procedure, then restart the Avamar client software. This is the only way to ensure that this client maintains its registration with the Management Console Server (MCS) database.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



3. Click the Account Management tab.

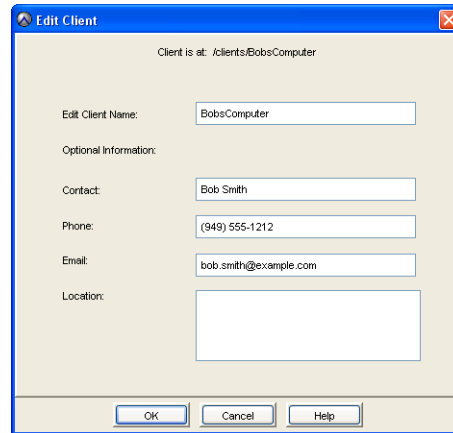
**TIP:** In the Account Management tree, client status is shown as follows: disabled clients have an x placed next to their icon, unregistered clients have question mark placed next to their icon and active clients have no special icon designation.

4. In the tree, select the client you want to edit.



5. Select **Actions > Account Management > Edit Client...** or click the toolbar icon shown immediately to the left.

The Edit Client dialog box appears.



6. Edit the information you want to change.

Refer to *Adding a New Client* (page 39) for additional information about client properties and settings.

7. Click **OK**.

A confirmation message appears.

8. Click **OK**.

The confirmation message closes and the Edit Client dialog box closes.

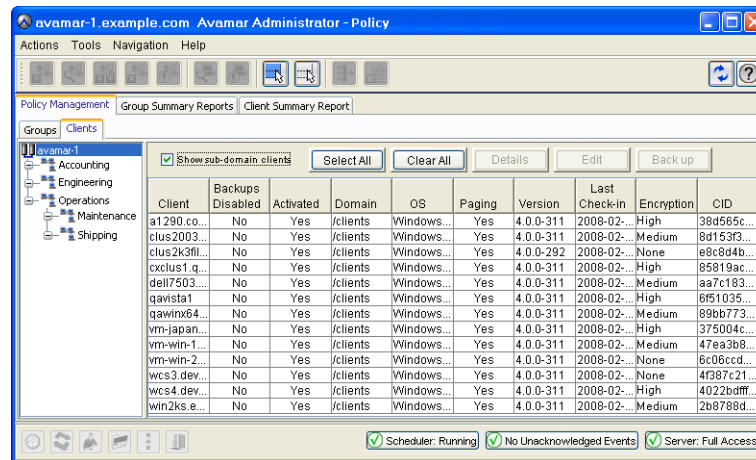
## Viewing Client Properties

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Policy Management tab.
4. Click the Clients tab.



5. Select the client for which you want to view properties.

### Client Properties Summary

COLUMN	DESCRIPTION
Client	Descriptive client name.
Backups Disabled	If yes, backups cannot be performed on this client. However, client can restore files as long as a previous backup exists in the system.
Activated	If yes, client is activated (page 39).
Domain	Avamar domain (page 33) where this client resides.
OS	Client computer operating system.
Paging	If yes, client has provided Avamar server with a page address and port number, thereby allowing it to perform on-demand backups and restores, as well as allowing Avamar Administrator to browse its filesystem during Avamar Administrator-initiated backups and restores (page 73).
Version	Avamar client software version.
Last Check-in	Date and time that Avamar client agent last checked in with the Avamar server.

COLUMN	DESCRIPTION
Encryption	<p>Encryption method used for client/server data transfer. Choices are:</p> <p>High      Strongest available encryption setting for that specific client platform.</p> <p>Medium    Medium strength encryption.</p> <p>None      No encryption.</p> <p><b>NOTE:</b> The exact encryption technology and bit strength used for any given client/server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.</p>
CID	<p>Client ID. Unique identifier for this client in the Avamar server. CIDs are assigned during client activation (page 38).</p>

## Disabling a Client

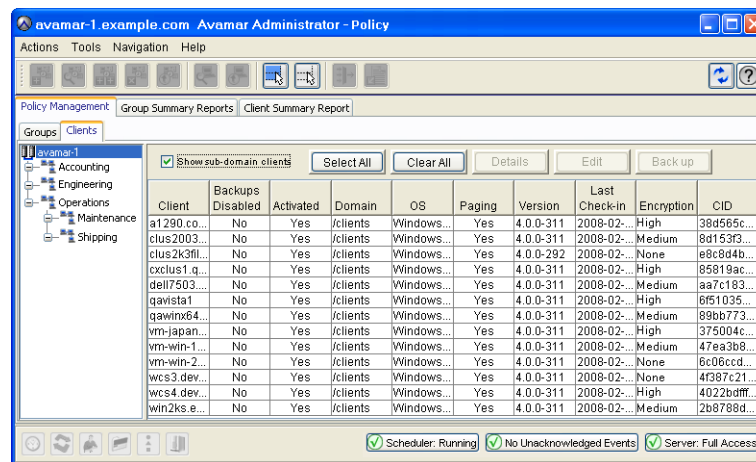
An Avamar Administrator can disable any client so that it cannot use the Avamar server to back up files until it is enabled (page 47). This is typically done to place the system in a state that will support various maintenance activities.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Policy Management tab.
4. Click the Clients tab.



5. Select the client you want to disable.
6. Select **Actions > Client > Disable all backups of selected client**.

This sets the **Disable all backups of selected client** option on the **Actions > Client** menu.

A confirmation message appears.

7. Click **Yes** to disable this client.

## Enabling a Client

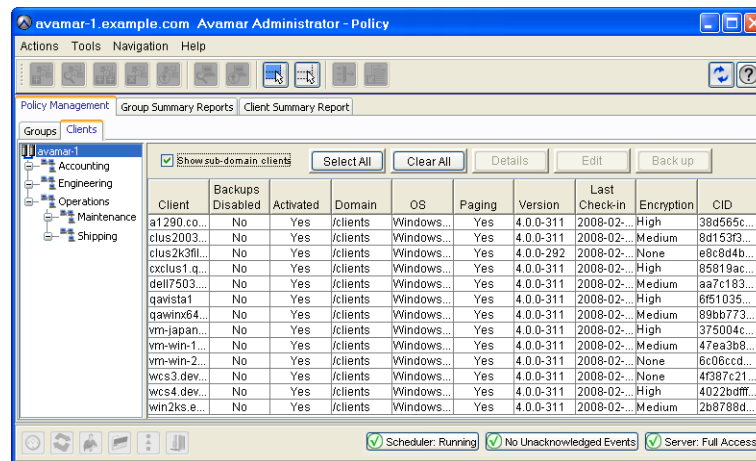
If a client has previously been disabled (page 46), it must be reenabled before it can resume backups.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Policy Management tab.
4. Click the Clients tab.



5. Select the client you want to enable.
6. Select **Actions > Client > Disable all backups of selected client**.

This clears the **Disable all backups of selected client** option on the **Actions > Client** menu.

A confirmation message appears.

7. Click **Yes** to enable this client.

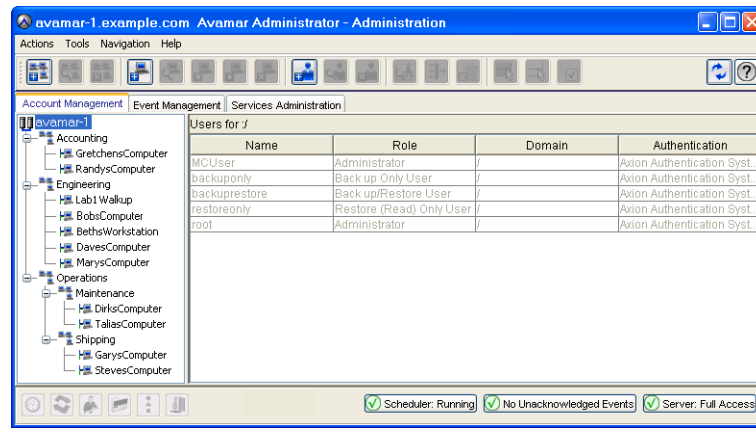
## Retiring a Client

Retiring a client is less destructive than deleting it (page 51). Retired clients do not actively participate in the Avamar system with regular backups. However, old backups associated with a retired client are maintained in the system (subject to backup retention settings) and files can still be restored using Avamar Administrator (page 73).

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



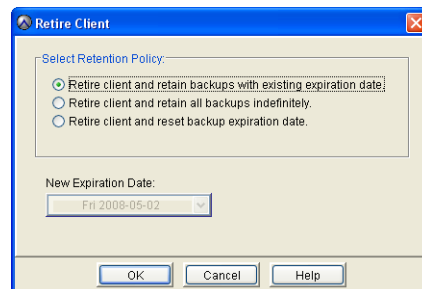
3. Click the Account Management tab.

**TIP:** In the Account Management tree, client status is shown as follows: disabled clients have an x placed next to their icon, unregistered clients have question mark placed next to their icon and active clients have no special icon designation.

4. In the tree, select the client you want to retire.
5. Select **Actions > Account Management > Retire Client...** or click the toolbar icon shown immediately to the left.



The Retire Client dialog box appears.





6. Do one of the following:

IF	DO THIS
You want to keep backups for this client until their existing expiration dates.	Select the <b>Retire client and retain backups with existing expiration date</b> option.
You want to keep all backups for this client indefinitely, regardless of the existing backup expiration dates.	Select the <b>Retire client and retain all backups indefinitely</b> option.
You want to keep backups for this client but select a new expiration date.	Select the <b>Retire client and reset backup expiration date</b> option and select a new backup expiration date.

7. Click **OK**.

A confirmation message appears.

8. Click **Yes** to retire this client.

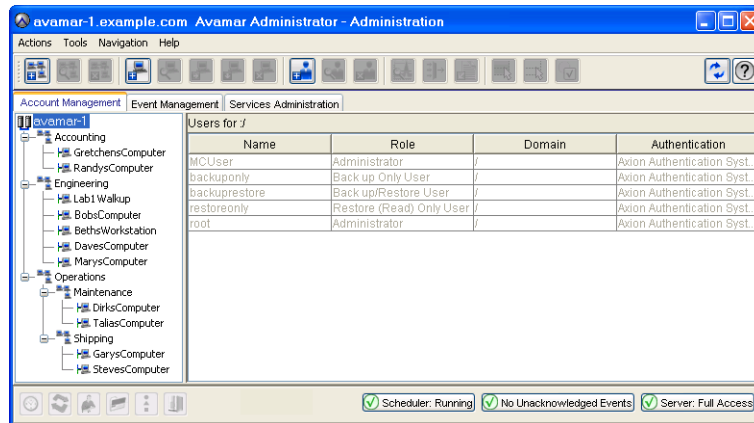
The Retire Client dialog box closes and the client no longer appears in the Account Management tree.

## Moving a Client to a New Domain

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



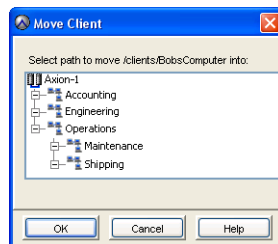
3. Click the Account Management tab.

**TIP:** In the Account Management tree, client status is shown as follows: disabled clients have an x placed next to their icon, unregistered clients have question mark placed next to their icon and active clients have no special icon designation.

4. In the tree, select the client you want to move.
5. Select **Actions > Account Management > Move Client...** or click the toolbar icon shown immediately to the left.



The Move Client dialog box appears.



6. Select the domain to which you want to move this client.
7. Click **OK**.

The Move Client dialog box closes and the client appears under the new domain.

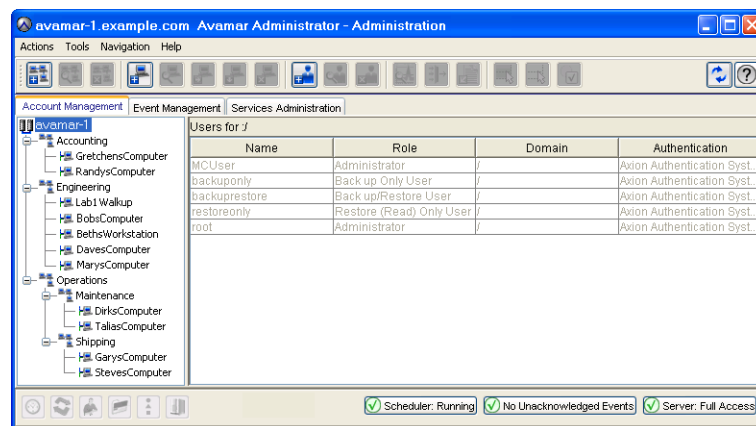
## Deleting a Client

**IMPORTANT:** Deleting a client permanently deletes all backups stored for that client. Therefore, you should only delete a client when you are absolutely certain that there is no reason whatsoever to retain the backups. If there is any doubt, retire the client (page 48) instead.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



3. Click the Account Management tab.

**TIP:** In the Account Management tree, client status is shown as follows: disabled clients have an x placed next to their icon, unregistered clients have question mark placed next to their icon and active clients have no special icon designation.

4. In the tree, select the client you want to delete.
5. Select **Actions > Account Management > Delete Client...** or click the toolbar icon shown immediately to the left.



A message appears asking you to confirm this action.

6. Click **Yes** to delete this client and all backups.

A second message appears confirming that this action has successfully completed.

7. Click **OK**.

The second confirmation message closes.

## Changing Client Paging Settings

Paging settings are used for communication between the MCS and the client. Avamar Administrator offers two distinct client paging modes:

**Automatic** Automatic is the default mode. When paging is set to **Automatic**, the MCS attempts to automatically determine appropriate paging settings for client. If it is successful in doing so, the MCS sets the **Enabled** option and populates the Address and Port Number fields with the hostname or IP address and data port values, respectively. In **automatic** mode, these fields are read only.

In **automatic** mode, if the MCS receives updated paging information from the client, it automatically updates these fields with the new values.

**Manual** When paging is set to **Manual**, the **Enabled** option can be cleared to turn off automatic client paging and the Address and Port Number fields will accept new entries.

Turning off automatic client paging (by clearing the **Enabled** option) is useful for supporting clients that might be off the network for extended periods of time, as can be the case with laptop computers. If client paging is turned off, these clients must initiate their own on-demand backups in order to protect their data. For this reason, client paging should be turned on (enabled) whenever possible.

If Network Address Translation (NAT) is used at your site, the MCS probably will not be able to automatically determine the correct client paging settings. If this is the case, set the paging mode to **manual** and type the correct IP address and data port in the Address and Port Number fields, respectively.

In **manual** mode, the MCS never overwrites the Address and Port Number settings.

---

**NOTE:** Paging settings are completely independent of the method used to register (page 38) or activate (page 39) the client.

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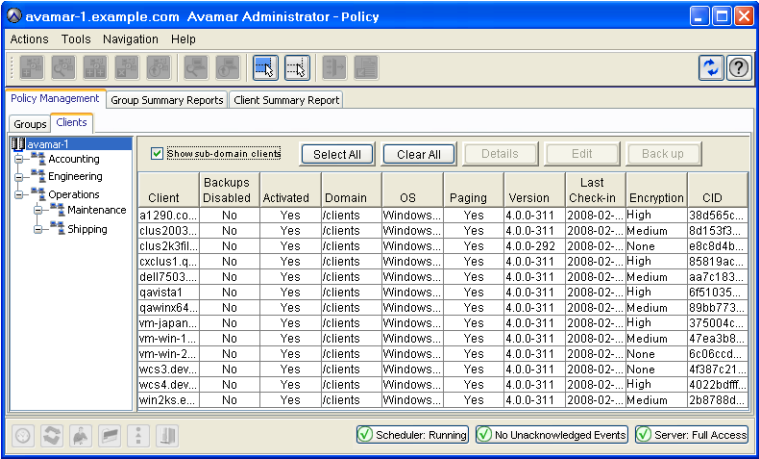
1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.

3. Click the Policy Management tab.



4. Click the Clients tab.



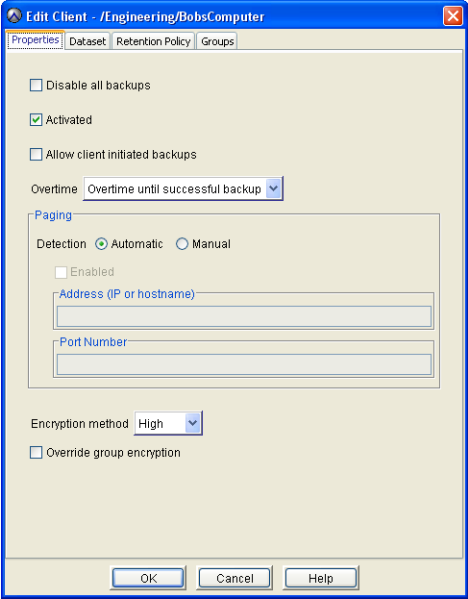
5. Select the client for which you want to change paging settings.

6. Select **Actions > Client > Edit Client...** or click the toolbar icon shown immediately to the left.



The Edit Client window appears.

7. Click the Properties tab.



8. Do one of the following:

IF	DO THIS
The paging mode is currently manual and you want to revert back to automatic mode.	Select the <b>Automatic</b> option, then go directly to step 10.

IF	DO THIS
The paging mode is currently automatic and you want to specify your own paging settings.	Select the <b>Manual</b> option, then go to step 9.

9. Type the following:

FIELD	DESCRIPTION
Address	Type a valid (un-NAT'd) IP address for this client. <b>IMPORTANT:</b> If the MCS was unable to automatically determine a hostname for this client in automatic mode, you will need to type an IP address in this field; a hostname will probably not be resolvable.
Port Number	Type the data port number for client-MCS communications. The default data port is 28002.

10. Click **OK**.

The Edit Client window closes.

## Batch Client Registration

In order to support large sites with many clients, Avamar provides a batch client registration feature that allows you to define multiple clients by way of a single “clients definition” file, then import that file into the Avamar server.

In order to import multiple clients, you must:

- Create the clients definition file
- Validate and import the clients definition file

Following batch client registration, you can activate these Avamar clients using either activation method (page 39).

### Create Clients Definition File

Avamar supports two formats for the clients definition file:

- Extensible Markup Language (XML)
- Comma-Separated Values (CSV)

**XML Format.** Extensible Markup Language (XML) clients definition files must have a .xml file extension and conform to the following structure and format:

```
<?xml version="1.0" encoding="UTF-8" ?>
  <registration_stream>
    <registrants>
      <entry
        host_name="MyClient.Example.com"
        mcs_domain="clients"
        mcs_group="MyGroup"
        dataset="MyDataset"
        retention_policy="MyRetentionPolicy"
        contact_address="192.168.31.5"
        contact_port="28002"
        access_list="user1@avamar:password, user2@LDAP"
        encryption="high"
        encryption_override="false"
      />
    </registrants>
  </registration_stream>
```

---

**NOTE:** The previous clients definition file is shown for reference purposes only. Do not attempt to cut and paste this example into your clients definitions file. Invisible formatting characters will prevent you from successfully doing so.

---

Each client is defined using a separate “entry” element. Attributes are:

ELEMENT	DESCRIPTION
host_name	Network hostname or IP address for this client.
mcs_domain	Optional Avamar domain you want to add this client to; overrides default domain (clients).

ELEMENT	DESCRIPTION
mcs_group	Optional default group this client will be added to; overrides assignment to the Default Group. Refer to <i>Groups and Group Policies</i> (page 128) for additional information.
dataset	Optional default dataset this client will use during backups; overrides default dataset that would normally be inherited from the group. Refer to <i>Datasets</i> (page 100) for additional information.
retention_policy	Optional default backup retention policy for this client; overrides default retention policy that would normally be inherited from the group. Refer to <i>Retention Policies</i> (page 119) for additional information.
contact_address	Optional client IP address.
contact_port	Set this to 28002, the default Avamar data port.
access_list	Optional list of users who can access the Avamar server from this client. The format is: <p style="margin-left: 40px;">USER@AUTHENTICATION:password</p> If using the internal Avamar authentication system, the actual word "password" must follow the colon. This will cause the system to prompt users for authentication when they access the system. If using an external authentication system, omit ":password." If defining multiple users, separate each user entry with a comma (,) and enclose the entire list of users in double-quotes.
encryption	Encryption method used for client/server data transfer. Choices are: <p>High      Strongest available encryption setting for that specific client platform.</p> <p>Medium    Medium strength encryption.</p> <p>None      No encryption.</p> <p><b>NOTE:</b> The exact encryption technology and bit strength used for any given client/server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.</p>
encryption_override	Optional encryption override. If TRUE, this client does not use the group encryption method.



**TIP:** Optional elements may be completely omitted from an XML clients definition file.

**CSV Format.** Comma-Separated Values (CSV) clients definition files use the same element and attribute names as the XML format. However, each client is defined on a single line and each attribute value is separated by a comma as follows:

```
host_name,mcs_domain,mcs_group,dataset,retention_policy,contact_address,
contact_port,access_list,encryption,encryption_override
```

**IMPORTANT:** Space limitations in this publication prevent showing a client entry as it should appear (on a single line). However, your CSV file must define each client on a single line — no line feeds or carriage returns are allowed within a client entry. Actual values must be supplied in place of the attribute names and NULL must be specified for fields that have no value (you cannot leave them blank).

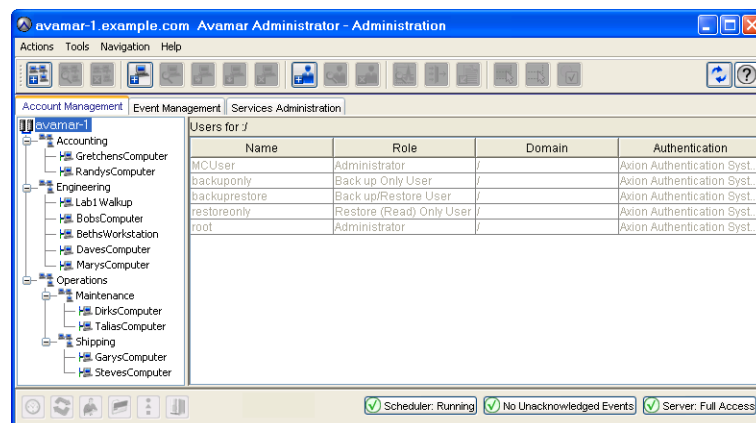
**NOTE:** The previous clients definition file is shown for reference purposes only. Do not attempt to cut and paste this example into your clients definitions file. Invisible formatting characters will prevent you from successfully doing so.

## Validate and Import Client Definition File

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



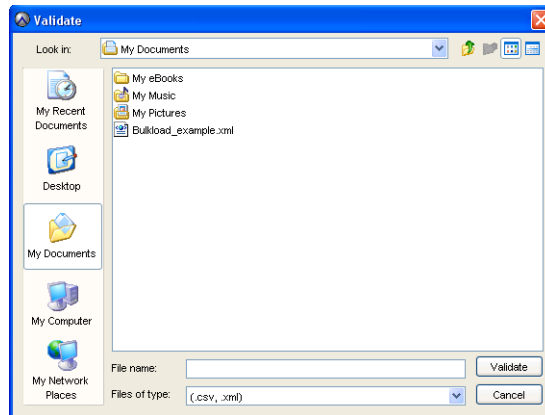
The Administration window appears.



3. Click the Account Management tab.

4. Select **Actions > Account Management > Import Multiple Clients...**

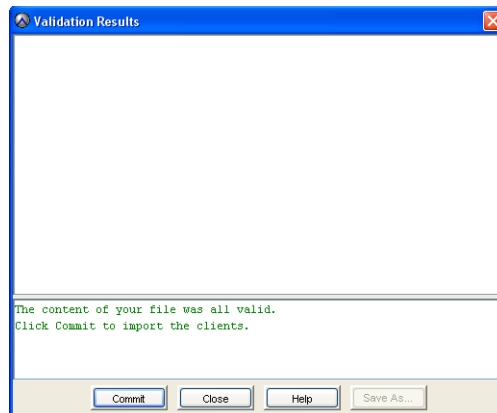
The Validate dialog box appears.



5. Browse to your saved clients definition file and select it.

6. Click **Validate**.

The Validation Results dialog box appears.



7. Do one of the following:

IF	DO THIS
Your clients definition file contains errors.	Correct the errors, resave the file and repeat steps 1 through 6.
Your clients definition file is error-free.	Click <b>Commit</b> to import your client list.

The Validation Results dialog box closes and the new clients appear in the Account Management tree.

# Users and Roles

This topic introduces the concepts of users and roles. This material should be read and understood before adding new user accounts, or modifying any of the default user accounts.

## Users

In the Avamar system, user accounts can be added to domains (in order to administer that domain and any subdomains beneath it) or individual clients (in order to perform backups and restores of that client and access backups belonging to that client in the system).

Avamar user accounts comprise the following pieces of information:

- Username
- Authentication system
- Role

**Username.** The username must be in the format your authentication system accepts. For example, the internal Avamar authentication system uses case-sensitive usernames, whereas Windows Active Directory usernames are case-insensitive.

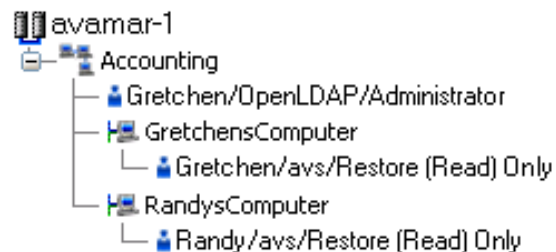
---

**IMPORTANT:** Usernames cannot be longer than 31 characters.

---

**Authentication System.** An authentication system is a username/password system that is used to grant users access to the Avamar server. Avamar supports its own internal authentication system ("avs"), as well as several external authentication systems such as Network Information Service (NIS), Open Lightweight Directory Access Protocol (OpenLDAP) and Windows Active Directory. Roles are discussed in greater detail elsewhere in this publication. Refer to *Roles* (page 60) for additional information.

**User Access Lists.** In Avamar, users are not reusable objects; they are simply entries in a domain or client access list. When you add a new user account to the Avamar system, you are actually adding a new entry to the domain or client user access list. Consider the following example:



User "Gretchen" has been added to both the Accounting domain and her computer. However, the authentication system and role are different. These are in fact two completely separate user accounts that happen to have the same username.

---

## Roles

Roles define various allowable operations for each user account. There are three basic categories of roles:

- Administrator roles
- Operator roles
- User roles

**Administrator Roles.** Administrators are generally responsible for maintaining the system.

The role of administrator can only be assigned to user accounts at a domain level; this role cannot be assigned to user accounts at a client level. The role of administrator can be assigned to user accounts at the top-level (root) domain, or any other domain or subdomain.

**Root Administrators** Administrators at the top-level (root) domain have full control of the system. They are sometimes referred to as "root administrators."

**Domain Administrators** Administrators at lower level domains (other than root) generally have access to most of the features described in this publication, but typically can only view or operate on objects (backups, policy objects, user accounts and so forth) within that domain. Any activity that might allow a domain administrator to view data outside that domain is disallowed. Therefore, access to server features of a global nature (for example, suspending or resuming scheduled operations, changing run times for maintenance activities and so forth) is disallowed.

**Operator Roles.** Operator roles are generally implemented to allow certain users limited access to certain areas of the system in order to perform backups and restores, or obtain status and run reports. These roles allow greater freedom in assigning backup, restore and reporting tasks to persons other than administrators.

As with administrator roles, operator roles can only be assigned to user accounts at the domain level; these roles cannot be assigned to user accounts at the client level. Furthermore, in order to add the user account to subdomains, you must have administrator privileges on the parent domain or above.

There are four operator roles:

- Restore only operator
- Back up only operator
- Back up/restore operator
- Activity operator

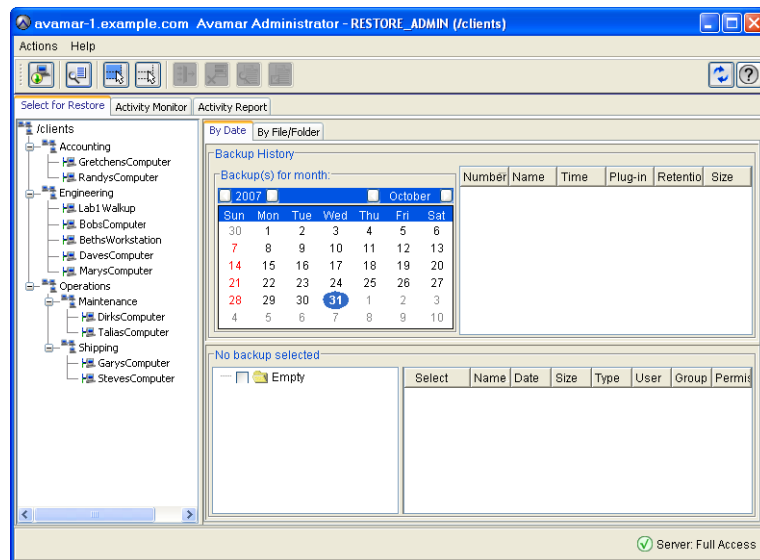
Users who have been assigned an operator role will not have access to the entire Avamar Administrator application. Instead, following login, they will be presented with a single window, which provides easy access to the specific features they are allowed to use.

## Restore Only Operator

Restore only operators are generally only allowed to perform restores and to monitor those activities to determine when they complete and if they completed without errors.

As with roles assigned to other domain user accounts, restore only operators at the top-level (root) domain can perform restores for any client in the system; restore only operators at lower level domains (other than root) can only perform restores for clients within that domain.

In order to enforce these constraints, restore only operators will not have access to the full Avamar Administrator application. Instead, following login, restore only operators will be presented with the following window, which provides easy access to the specific features they are allowed to use.



Restore only operators can perform the following tasks within the allowable domain:

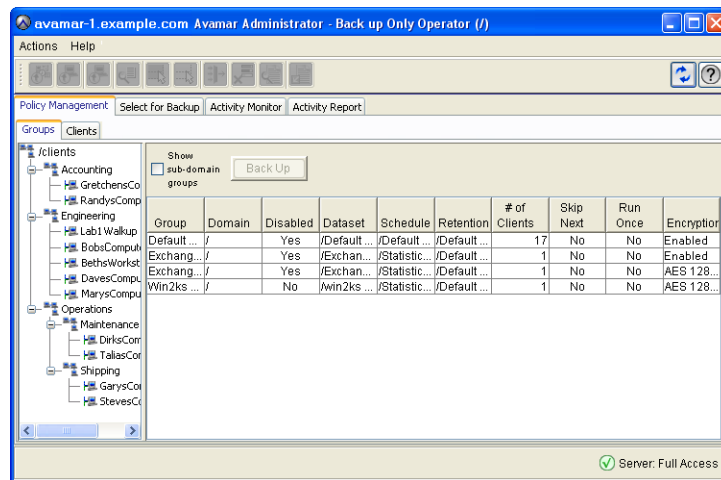
- *Perform a Restore* (page 84)
- *Monitor Activities* (page 76)

## Back Up Only Operator

Back up only operators are generally only allowed to perform backups and to monitor those activities to determine when they complete and if they completed without errors.

As with roles assigned to other domain user accounts, back up only operators at the top-level (root) domain can perform backups for any client or group in the system; back up only operators at lower level domains (other than root) can only perform backups for clients or groups within that domain.

In order to enforce these constraints, back up only operators will not have access to the full Avamar Administrator application. Instead, following login, back up only operators will be presented with the following window, which provides easy access to the specific features they are allowed to use.



Back up only operators can perform the following tasks within the allowable domain:

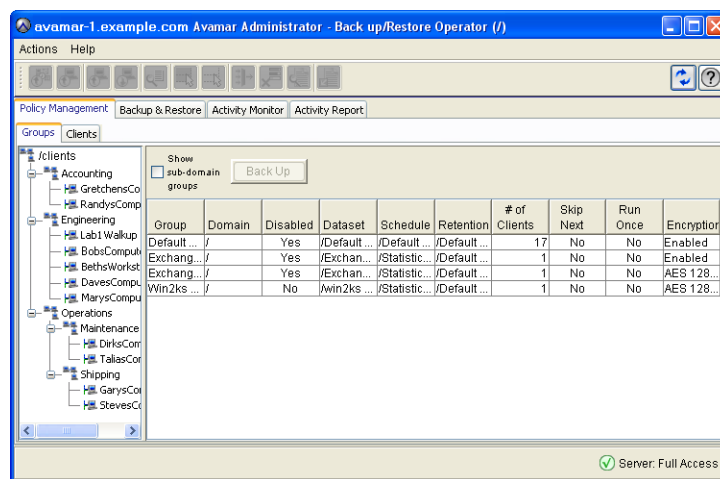
- *Perform On-Demand Client Backups* (page 74)
- *Monitor Activities* (page 76)
- *Initiate On-Demand Group Backups* (page 165)

## Back Up/Restore Operator

Back up/restore operators are generally only allowed to perform backups or restores and to monitor those activities to determine when they complete and if they completed without errors.

As with roles assigned to other domain user accounts, back up/restore operators at the top-level (root) domain can perform backups and restores for any client or group in the system; back up/restore operators at lower level domains (other than root) can only perform backups and restores for clients or groups within that domain.

In order to enforce these constraints, back up/restore operators will not have access to the full Avamar Administrator application. Instead, following login, back up/restore operators will be presented with the following window, which provides easy access to the specific features they are allowed to use.



Back up/restore operators can perform the following tasks within the allowable domain:

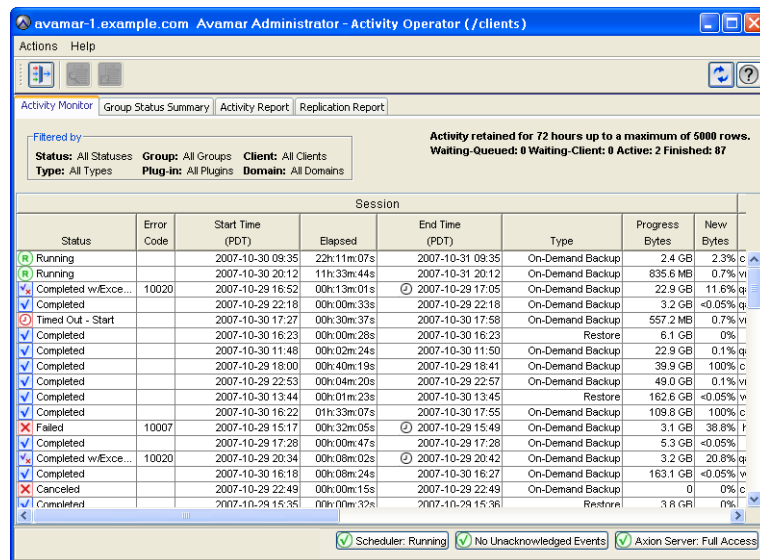
- *Perform On-Demand Client Backups* (page 74)
- *Monitor Activities* (page 76)
- *Perform a Restore* (page 84)
- *Initiate On-Demand Group Backups* (page 165)

## ActivityOperator

Activity operators are generally only allowed to monitor backup and restore activities and create certain reports.

Activity operators at the top-level (root) domain can view or create reports for backup and restore activities within the entire system (all domains and subdomains); activity operators at lower level domains (other than root) can only view or create reports for backup and restore activities within that domain.

In order to enforce these constraints, activity operators will not have access to the full Avamar Administrator application. Instead, following login, activity operators will be presented with the following window, which provides easy access to the specific features they are allowed to use:



Activity operators can perform the following tasks within the allowable domain:

- *Monitor Activities* (page 76)
- *View the Group Status Summary* (page 148)
- *View the Activity Report* (page 209)
- *View the Replication Report* (page 214)



**User Roles.** User roles are always assigned to a user account for a specific client. As such, allowable operations are inherently constrained to that specific client.

---

**IMPORTANT:** Users assigned any of the following roles cannot log into Avamar Administrator.

---

There are four user roles:

- |  |   |
|--|---|
| <b>Back Up Only User</b>                           | Users assigned this role can initiate backups directly from the client using the <b>avtar</b> command line.   |
| <b>Restore (Read) Only User</b>                    | Users assigned this role can initiate restores directly from the client using the <b>avtar</b> command line or Avamar Web Services.   |
| <b>Back Up/Restore User</b>                        | Users assigned this role can initiate backups and restores directly from the client using the <b>avtar</b> command line or Avamar Web Services.   |
| <b>Restore (Read) Only/Ignore File Permissions</b> | <p>This role is similar to the Restore (Read) Only User role except that operating system file permissions are ignored during restores, thereby effectively allowing this user to restore any file stored for that Avamar client.</p> <p>All Windows client user accounts should be assigned this role in order to ensure trouble-free restores.</p> <p>This role is only available when external authentication is used.</p> |

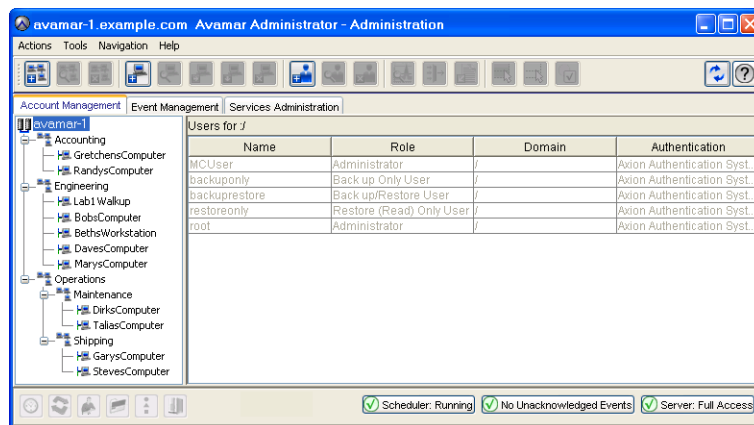
## Adding a New User to a Client

**IMPORTANT:** You cannot add any new user accounts to clients within the MC\_RETIRED domain.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



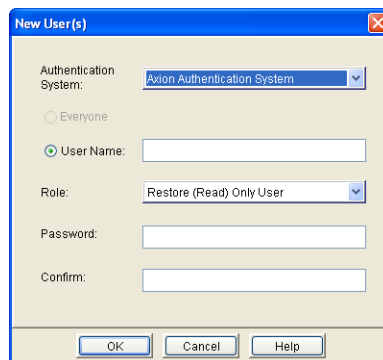
The Administration window appears.



3. Click the Account Management tab.
4. In the tree, select the client to which you want to add the new user.
5. Select **Actions > Account Management > New User(s)...** or click the toolbar icon shown immediately to the left.



The New User dialog box appears.



6. Type or select the following:

FIELD/OPTION	DESCRIPTION
Authentication System	Select either the default internal Avamar Authentication System, or any external authentication system you have configured to work with Avamar.
Everyone	Select this option if you want to designate roles for all users on this client. This field is not used if you are using the internal Avamar authentication system.
User Name	Select this option and type the new username. <b>IMPORTANT:</b> If you are using an external authentication system, this must be the username you use to log into that system. <b>IMPORTANT:</b> Usernames cannot be longer than 31 characters.
Role	Select a role (page 60) for this user.
Password	Type your password. If using the internal Avamar authentication system, Avamar passwords are case-sensitive and must: <ul style="list-style-type: none"> <li>• Be 6-12 characters in length</li> <li>• Contain only alphanumeric, hyphen, period or underscore characters</li> <li>• Contain at least one alphanumeric character</li> </ul> This field is not used if you are using an external authentication system.
Confirm	Retype your password to confirm that you did not type it incorrectly in the Password field. This field is not used if you are using an external authentication system.

7. Click **OK**.

A confirmation message appears.

8. Click **OK**.

The confirmation message closes, the New User dialog box closes and the new user appears in that client's list of users.

# Adding a New User to a Domain

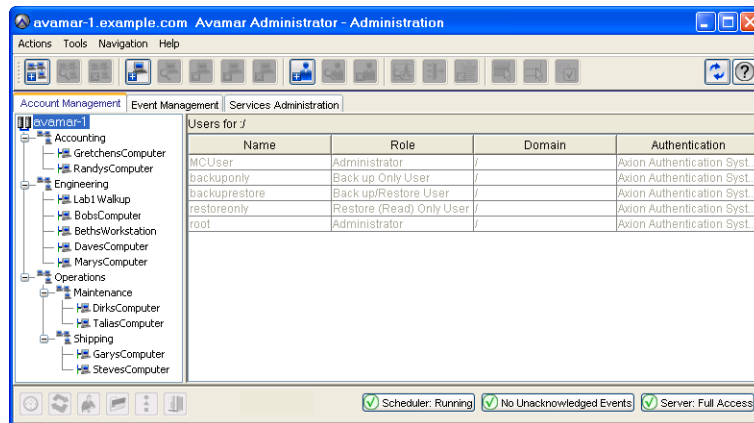
**TIP:** Prior to adding this user account, review *Roles* (page 60) to ensure that this user is assigned the correct role.

**IMPORTANT:** You cannot add any user accounts to the MC\_RETIRE domain.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



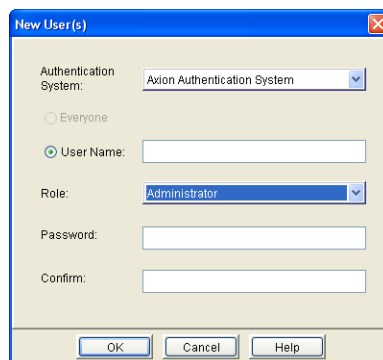
The Administration window appears.



3. Click the Account Management tab.
4. In the tree, select the domain to which you want to add the new user.
5. Select **Actions > Account Management > New User(s)...** or click the toolbar icon shown immediately to the left.



The New User dialog box appears.



6. Type or select the following:

FIELD/OPTION	DESCRIPTION
Authentication System	Select either the default internal Avamar Authentication System, or any external authentication system you have configured to work with Avamar.
Everyone	Select this option if you want to designate roles for all users on this client.
User Name	Select this option and type the new username. <b>IMPORTANT:</b> If you are using an external authentication system, this must be the username you use to log into that system. <b>IMPORTANT:</b> Usernames cannot be longer than 31 characters.
Role	Select a role (page 60) for this user.
Password	Type your password. If using the internal Avamar authentication system, Avamar passwords are case-sensitive and must: <ul style="list-style-type: none"> <li>• Be 6-12 characters in length</li> <li>• Contain only alphanumeric, hyphen, period or underscore characters</li> <li>• Contain at least one alphanumeric character</li> </ul> This field is not used if you are using an external authentication system.
Confirm	Retype your password to confirm that you did not type it incorrectly in the Password field. This field is not used if you are using an external authentication system.

7. Click **OK**.

A confirmation message appears.

8. Click **OK**.

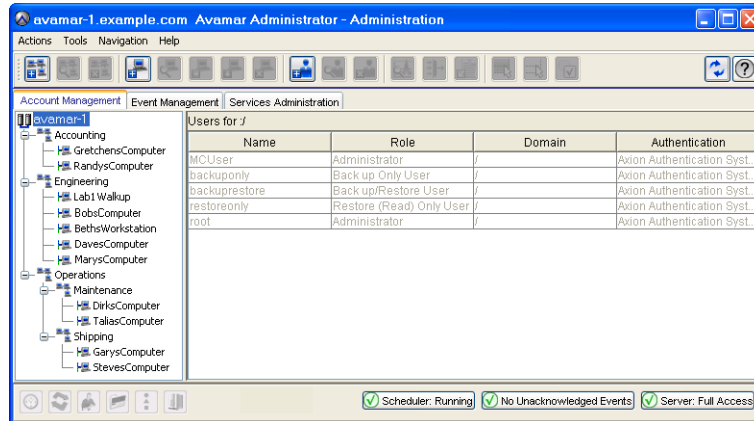
The confirmation message closes, the New User dialog box closes and the new user appears in that domains list of users.

## Editing User Information

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.



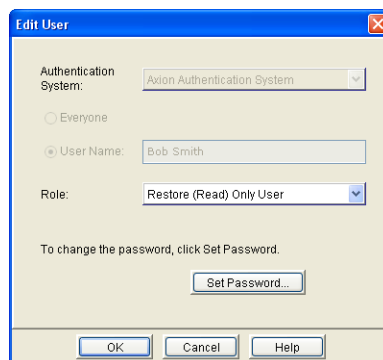
3. Click the Account Management tab.

**TIP:** In the Account Management tree, client status is shown as follows: disabled clients have an x placed next to their icon, unregistered clients have question mark placed next to their icon and active clients have no special icon designation.

4. In the tree, select the domain or client containing the user you want to edit.
5. Select the user you want to edit from the user data table.
6. Select **Actions > Account Management > Edit User...** or click the toolbar icon shown immediately to the left.



The Edit User dialog box appears.



7. Edit the information you want to change.

Refer to *Adding a New User to a Client* (page 66) for additional information about user account properties and settings.

8. Do one of the following:

IF	DO THIS
You want to change this user's password.	Click <b>Set Password</b> . The Set Password dialog box appears. Type the new password into both the New Password and Confirm Password fields. Click <b>OK</b> . The Set Password dialog box closes.
You do not want to change this user's password.	Go directly to step 9.

9. Click **OK**.

A confirmation message appears.

10. Click **OK**.

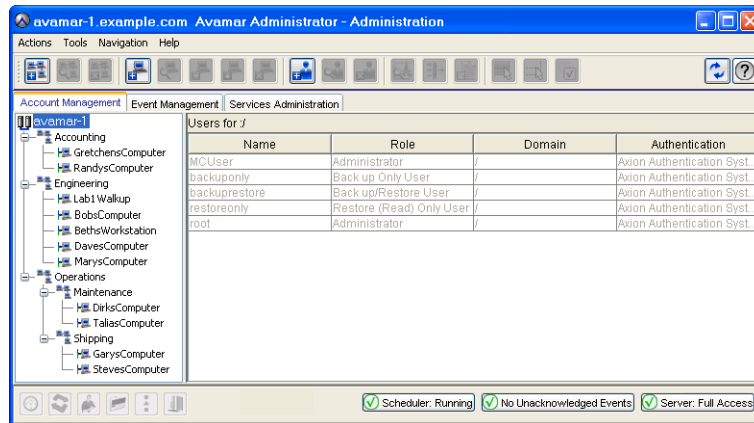
The confirmation message closes, the Verify Info dialog box closes, the Edit User dialog box closes and the user data table shows the updated information.

## Deleting a User



1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.

The Administration window appears.



3. Click the Account Management tab.
4. In the tree, select the domain or client containing the user you want to delete.
5. Select the user you want to delete from the user data table.
6. Select **Actions > Account Management > Delete User...** or click the toolbar icon shown immediately to the left.



A message appears asking you to confirm this action.

7. Click **Yes** to permanently delete this user.

A second message appears confirming that this action has successfully completed.

8. Click **OK**.

The second confirmation message closes.



# BACKUP, RESTORE AND BACKUP MANAGEMENT

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After a client has been activated (page 38), you can perform “on-demand” client backups and file restores directly from Avamar Administrator.

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**TIP:** You can also automate backups by implementing a group policy to perform regularly scheduled backups for an entire group of clients. Refer to *Groups and Group Policies* (page 128) for additional information.

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**Backup Retention Settings.** When a backup is taken, its retention settings control how long it will be kept before it is purged. Possible retention settings are:

- No end date (keep backup indefinitely)
- Keep backup for a specific number of days, weeks, months or years
- Keep backup until a specific calendar date

**Retention Types.** In order to support certain advanced features, Avamar Administrator automatically assigns one or more retention types to every backup. For example, the very first backup created on Avamar system will be tagged as a daily, weekly, monthly and yearly. You can also manually change the retention types assigned to a backup after it resides in the system.

**Validating Backups.** You can also verify that files can be restored from an existing backup. This validation initiates a “virtual” restore of all files in the backup but does not actually restore any files to the client filesystem.

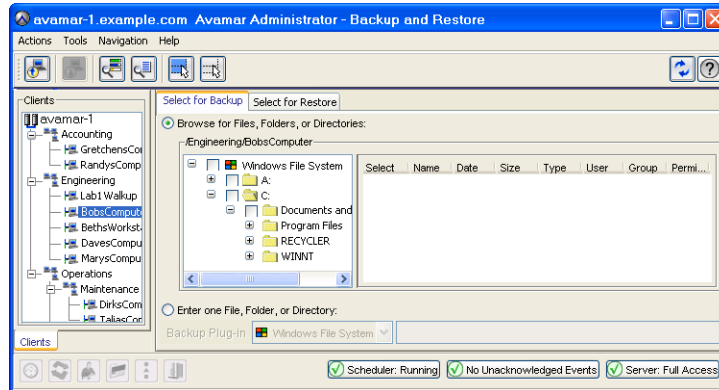
**A Word About International Characters.** Avamar generally supports the use of specific supported international characters in directory, folder and filenames. However, proper display of international language characters is contingent on the client computer Java locale and installed system fonts being 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.

## Performing an On-Demand Client Backup



1. Start Avamar Administrator (page 21).
2. Select **Navigation > Backup and Restore** or click the **Backup & Restore** launcher button.

The Backup and Restore window appears.



3. Click the Select for Backup tab.
4. Select a Client in the clients tree.

That client filesystem appears as a browsable directory tree immediately to the right of the Clients tree. Placing a check mark next to a directory or file selects it for backup.

5. Select one or more directories and files.

---

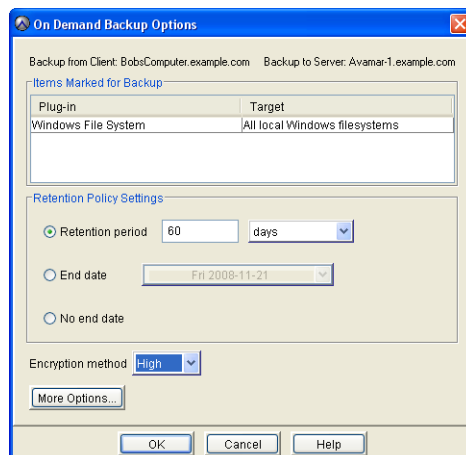
**TIP:** Select **Actions > Preview List...** to view a summary of all directories and files you have just selected for an on-demand backup.

---



6. Select **Actions > Backup Now...** or click the toolbar icon shown immediately to the left.

The On Demand Backup Options dialog box appears.



7. Review your backup settings.

Clicking **Cancel** returns you to the Backup and Restore window where you can modify your backup selections.

8. Select the client plugin (page 19) you want to use for this backup.

Retention Policy Settings control how long this backup will be kept for potential restores.

9. If you want to change your backup retention setting, select or type the following:

FIELD/OPTION	DESCRIPTION
Retention period	If you want this backup to be deleted from the Avamar server after a specific number of days, weeks, months or years, select this option and type the number of days, weeks, months or years.
End date	If you want this backup to be deleted from the Avamar server on a specific calendar date, select this option and browse to that date on the calendar.
No end date	If you want to keep this backup for as long as this client remains active in the Avamar server, select this option.

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

Choices are:

High      Strongest available encryption setting for that specific client platform.

Medium    Medium strength encryption.

None      No encryption.

**NOTE:** The exact encryption technology and bit strength used for any given client/server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your *Avamar Product Security Guide* for additional information.

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**TIP:** If you want to include plugin options with this backup, click **More Options...**, then select or clear the desired options and type values where applicable.

Refer to *Appendix B — Plugin Options* (page 479) for additional information about plugin options.

---

11. Click **OK**.

The On Demand Backup Options dialog box closes and the following status message appears: Backup initiated.

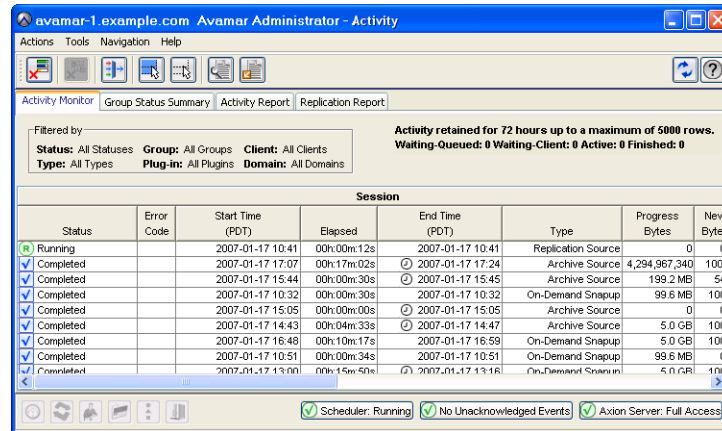
12. Click **OK**.

# Monitoring Backup, Restore and Validation Activities

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.



The Activity window appears.



3. Click the Activity Monitor tab.

By default, the Activity Monitor tab shows the most recent 5,000 client activities during the past 72 hours.

**TIP:** You can increase or reduce the amount of information shown in the backup activity monitor by manually modifying the value stored in the `/usr/local/avamar/var/mc/server_data/prefs/mcserver.xml` `com.avamar.mc.wo_completed_job_retention_hours` preference, then restarting the MCS (page 290).

## Activity Window Information

COLUMN	DESCRIPTION
<b>SESSION</b>	<p>Status</p> <p>One of the following:</p>
	<p>Canceled                      Activity was cancelled, either by the client or from Avamar Administrator.</p>
	<p>Client Backup Disabled      All client-initiated backups have been turned off (disabled) for this plugin. Refer to <i>Avamar Client Agent and Plugin Management</i> (page 227) for additional information.</p>
	<p>Completed                      Activity successfully completed.</p>
	<p>Completed w/ Exception(s)      Activity completed with minor errors or warnings.  Double-click entry to view full error log, which contains the activity failure codes.</p>
	<p>Dropped Session              Activity was successfully initiated but because MCS could not detect any progress, the activity was forcefully cancelled.</p>
	<p>Failed                              Client failed to perform the activity; activity ended in an error condition.  Double-click entry to view full error log, which contains the activity failure codes.</p>
	<p>Fault Tolerant                  Backup failed because virtual machine client is running in fault tolerance mode.  If you want to backup this virtual machine while in fault tolerance mode, install the correct type and version Avamar client software and use guest backups to protect the data.</p>
	<p>No Client Contact              Scheduled client did not check in.</p>
	<p>No Data                              Dataset did not define any data to back up or client does not have matching data to backup.</p>

COLUMN	DESCRIPTION	
<b>SESSION</b>	Status - continued	<p>No proxy</p> <p>Failed to initiate a backup or restore for a virtual machine because no proxy was found to service the virtual machine.</p> <p>Verify that proxy clients have the desired datastores checked for protection. The proxy client datastores checked must match datastores for virtual machines requiring protection.</p> <p>Additionally, for scheduled group backups, also verify that the group has desired proxies checked for protection of virtual machines belonging to the group.</p> <p>Verify proxy clients are powered on, enabled, and registered.</p> <p>For restores, verify there is an available proxy in the destination datacenter.</p>
	No Status	<p>Activity is not progressing as expected and Avamar server cannot provide status.</p>
	No vm	<p>Activity failed because virtual machine client does not exist in vCenter.</p>
	Option Incompatibility	<p>Activity failed due to incompatible plugin option specified.</p> <p>This is often due to using an older client version that does not support a particular plugin option.</p>
	Partial Replication	
	Plugin Disabled	<p>All operations have been turned off (disabled) for this plugin. Refer to <i>Avamar Client Agent and Plugin Management</i> (page 227) for additional information.</p>
	Restore Disabled	<p>All restore operations have been turned off (disabled) for this plugin. Refer to <i>Avamar Client Agent and Plugin Management</i> (page 227) for additional information.</p>
	Retention date expired	<p>Backup failed because retention policy has already expired (that is, retention policy is set to a past date).</p>

COLUMN		DESCRIPTION
SESSION	Status - continued	<p>Running Client is performing the activity.</p> <p>Scheduled Backup Disabled All scheduled backups have been turned off (disabled) for this plugin. Refer to <i>Avamar Client Agent and Plugin Management</i> (page 227) for additional information.</p> <p>Stalled Activity is not progressing as expected. Because Avamar server can provide status, problem is assumed to be on the client.</p> <p>Suspended Activity has been suspended (work order suspended).</p> <p>Timed Out - End Client did not complete the activity in the allotted time.</p> <p>Timed Out - Response Client checked in and was sent backup activity but did not acknowledge.</p> <p>Timed Out - Start Activity failed to start (work order start time-out).</p> <p>Undefined Activity does not have a work order associated with it.</p> <p>Unknown Activity was passed an unknown exit code from the client agent.</p> <p>Unsupported backup Some aspect of this backup activity is not supported. For example, attempting to back up a VMware proxy client with a VMware Image backup dataset will return a status of Unsupported.</p> <p>Validate Disabled All backup validation operations have been turned off (disabled) for this plugin. Refer to <i>Avamar Client Agent and Plugin Management</i> (page 227) for additional information.</p>
	Error Code	If the activity did not successfully complete, a numeric error code will be shown. Double-click the error code to view a detailed explanation.
	Start Time	Date and time this activity was initiated, adjusted for the prevailing time zone (shown in parentheses).
	Elapsed Time	Elapsed time for this activity.
	End Time	Date and time this activity completed, adjusted for the prevailing time zone (shown in parentheses).

COLUMN		DESCRIPTION
SESSION	Type	This activity is one of the following: <ul style="list-style-type: none"> <li>• On-Demand Backup (page 74)</li> <li>• Scheduled Backup (page 109)</li> <li>• Restore (page 84)</li> <li>• Validate (page 92)</li> <li>• Replication Source</li> <li>• Replication Destination</li> </ul> <p><b>NOTE:</b> Replication is an optional feature that might not be available to all users.</p>
	Progress Bytes	Total number of bytes examined during this activity.
	New Bytes	Percentage of new bytes backed up. Low numbers indicate high levels of data deduplication.
CLIENT	Client	Avamar client name.
	Domain	Full location of the client in the Avamar server.
	OS	Client operating system.
	Client Release	Avamar client software version. <p><b>NOTE:</b> If this activity is a VMware image backup or restore, this is Avamar client software version running on the image proxy client.</p>
	Proxy	If this activity is a VMware image backup or restore, this is the name of the proxy client performing the backup or restore on behalf of the virtual machine. It is blank for all other activities.
POLICY	Sched. Start Time	Date and time this activity was scheduled to begin.
	Sched. End Time	Date and time this activity was scheduled to end.
	Elapsed Wait	Total amount of time this activity spent in the activity queue (that is, scheduled start time minus actual start time).
	Group	If the activity was a scheduled backup, this is the group that this client was a member of when this particular scheduled activity was initiated (clients can be members of more than one group). On-demand is shown for all other activities.
	Plug-in	Plugin (page 19) used for this activity.



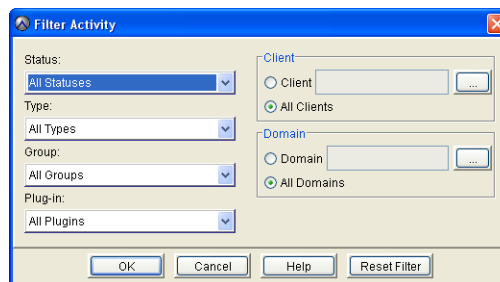
POLICY		COLUMN	DESCRIPTION
POLICY	Retention		Retention types (page 73) assigned to this backup. One or more of the following:  D Backup has been tagged as a daily backup. W Backup has been tagged as a weekly backup. M Backup has been tagged as a monthly backup. Y Backup has been tagged as a yearly backup. N Backup has been tagged as having no specific retention type.
	Schedule		If the activity was a scheduled backup, this is the schedule that initiated this activity.  On-Demand or End User Request is shown for all other activities initiated from Avamar Administrator or the client, respectively.
	Dataset		Name of the dataset used to take the backup.  If activity is a replication job (page 333), this column lists the source system name on the destination system and the destination name on the source system.
	WID		Work order ID. Unique identifier for this activity.

**TIP:** You can also reduce the amount of displayed information by “filtering” the Activity display to only show backups with a specific state, type, group, client or plugin.



4. Select **Actions > Filter...** or click the toolbar icon shown immediately to the left.

The Filter Activity dialog box appears.



5. Define your filtering criteria and click **OK**.

The Filter Activity dialog box closes and the Activity Monitor shows only those backups that meet your filtering criteria.

**TIP:** Click **Reset Filter** to clear any previous filter settings.

## Select for Restore Overview

The Backup and Restore window Select for Restore tab provides two different ways to locate and select a backup stored on the server:

- By calendar date (page 82)
- By content (page 83)

### Locating and Selecting a Backup by Calendar Date

In order to locate backups stored on the server by calendar date, perform the following:

1. Select a Client in the clients tree.
2. Click the By Date tab.

Clicking the By Date tab displays a browsable calendar for locating backups in the Avamar server.

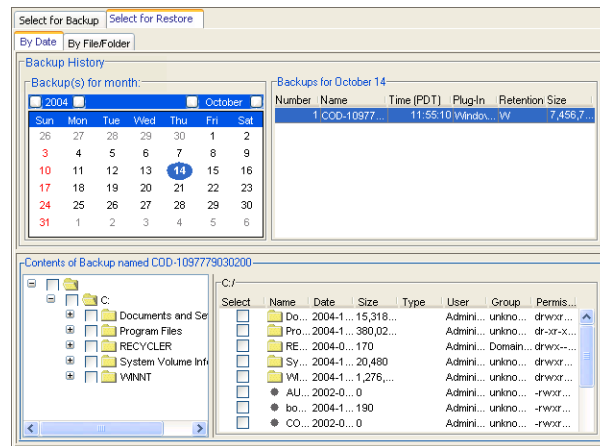
Dates highlighted in yellow indicate that a backup was performed on that date.

Selecting a valid backup date on the calendar populates the backups list immediately to the right of the calendar.

Selecting a backup populates the contents list directly below the Backup History pane.

Backup(s) for month: 2009 January

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7



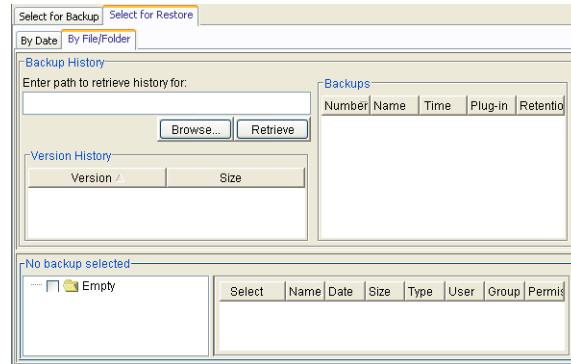
3. In the Backup History pane, browse to a valid backup date in the Calendar (highlighted in yellow).
4. Select the backup from which you want to restore directories, folders or files.

## Locating and Selecting a Backup by Content

In order to locate backups by content (that is, specific directories, folders or files within that backup), perform the following:

1. Select a Client in the clients tree.
2. Click the By File/Folder tab.

Clicking the By File/Folder tab displays a Backup History pane that can be used to retrieve all backups that contain a specified client directory, folder or file.



3. Do one of the following:

IF	DO THIS
You know the full path to the desired client directory, folder or file.	Type that path in the Enter path to retrieve history for field.
You do not know the full path to the desired client directory, folder or file.	Click <b>Browse</b> and locate the desired directory, folder or file.

4. Click **Retrieve**.

The Version History table lists all versions and sizes for that directory, folder or file that have been backed up from this client.

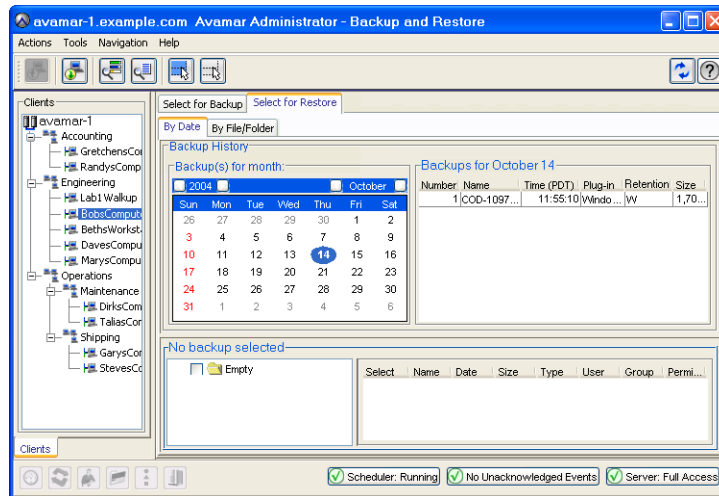
Selecting a row in the Version History table shows all backups for the selected client that contains the selected version of the directory, folder or file.

5. Select the backup from which you want to restore directories, folders or files.

## Performing a Restore



1. Start Avamar Administrator (page 21).
2. Select **Navigation > Backup and Restore** or click the **Backup & Restore** launcher button.  
The Backup and Restore window appears.
3. Click the Select for Restore tab.



4. Select a client in the clients tree.
5. Locate and select a backup from which you want to restore directories or files.

---

**TIP:** Refer to *Locating and Selecting a Backup by Calendar Date* (page 82), *Locating and Selecting a Backup by Content* (page 83) for additional information about locating backups by calendar date or content, respectively.

---

6. Select one or more directories or files you want to restore.

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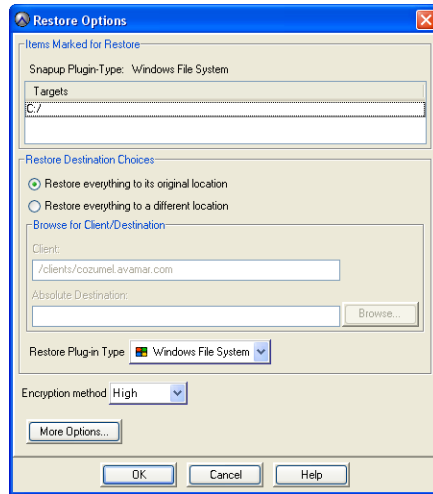
**TIP:** Select **Actions > Preview List...** to view a summary of all directories and files you have just selected for an on-demand restore.

---



7. Select **Actions > Restore Now...** or click the toolbar icon shown immediately to the left.

The Restore Options dialog box appears.



8. Review your restore settings.

Clicking **Cancel** returns you to the Backup and Restore window where you can modify your restore selections.

Restore destination choices allows you to specify which client and top-level (root) directory will receive the restored files.

9. If you want to change your restore destination choices, select or type the following:

FIELD/OPTION	DESCRIPTION
Restore Everything to its original location	<b>Restore Everything to its original location</b> is the default destination — all files are restored to original client in the original top-level (root) directory.
Restore Everything to a different location	<b>Restore Everything to a different location</b> allows you to specify another client or another directory on the same client. <b>IMPORTANT:</b> When redirecting a restore to a new location (a target directory other than the original directory that was backed up), restoring a single directory to the new location only restores the contents of the directory; the original parent directory is not restored as part of this operation. However, if you restore two or more directories to a new location, then the original parent directories do get restored along with the contents of those directories.
Browse for Client/ Destination	Click <b>Browse</b> to locate a client or directory for the restore. You can also type this information directly in the Absolute Destination field.

FIELD/OPTION	DESCRIPTION
Restore Plug-in Type	Specifies which client plugin will be used to perform this restore. The default selection is the same plugin used to take the original backup.
Encryption Method	<p>Encryption method used for client/server data transfer. Choices are:</p> <p>High      Strongest available encryption setting for that specific client platform.</p> <p>Medium    Medium strength encryption.</p> <p>None      No encryption.</p> <p><b>NOTE:</b> The exact encryption technology and bit strength used for any given client-server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.</p>

---

**TIP:** If you want to include plugin options with this restore, click **More Options...**, then select or clear the desired options and type values where applicable.

Refer to *Appendix B — Plugin Options* (page 479) for additional information about plugin options.

---

10. Click **OK**.

The Restore Options dialog box closes and the following status message appears: Restore initiated.

11. Click **OK**.

## Backup Management Window Overview

The Backup Management window provides the features and functions necessary to manage backups on the Avamar server. This includes:

- *Changing a Backup Expiration Date* (page 88)
- *Validating a Backup* (page 92)
- *Backup Statistics* (page 94)
- *Deleting a Backup* (page 98)

In most cases, you will want to locate one or more backups, belonging to a single client so that you can perform one of the previously mentioned tasks.

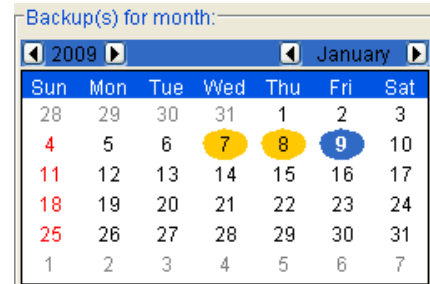
The Backup Management window provides three ways to locate and select backups of interest, by calendar day (page 87), by date range (page 87) or by retention type (page 88).

### Locating Backups by Calendar Day

In order to locate backups stored on the server by a specific calendar day, perform the following:

1. Select a client in the Clients tree.
2. Select the **By Day** option.

The Backup Management window provides a browsable calendar for locating a specific backup according to when it was taken.



Dates highlighted in yellow indicate that a backup was performed on that date.

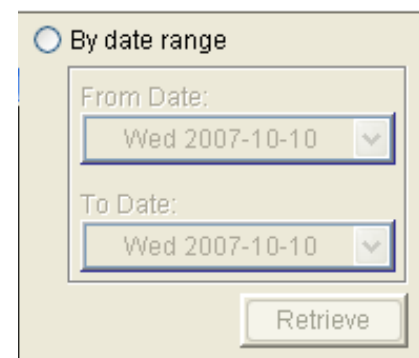
3. Browse to a valid backup date in the Calendar (highlighted in yellow).

Selecting a valid backup date on the calendar populates the Backup History list, located below the calendar.

### Locating Backups by Date Range

In order to locate backups stored on the server by a range of dates, perform the following:

1. Select a client in the Clients tree.
2. Select the **By Date Range** option.
3. Click the arrow next to From Date and browse to the desired date in the Calendar.
4. Click the arrow next to To Date and browse to the desired date in the Calendar.
5. Click **Retrieve**.



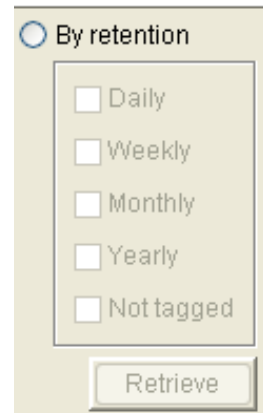
The Backup History list, located below the calendar, is populated with backups that match this date range.

## Locating Backups by Retention Type

In order to locate backups stored on the server by the retention type, perform the following:

1. Select a client in the Clients tree.
2. Select the **By Retention** option.
3. Select one or more retention type options.
4. Click **Retrieve**.

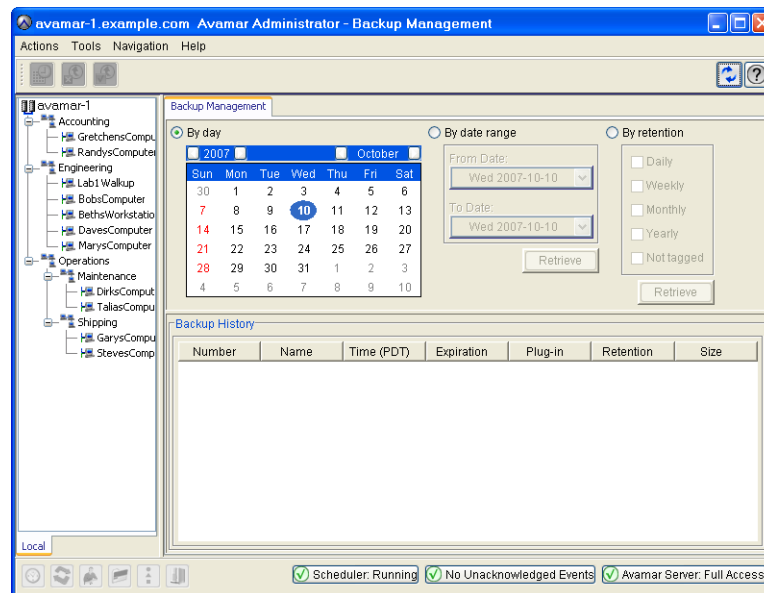
The Backup History list, located below the calendar, is populated with backups that match this retention type.



## Changing a Backup Expiration Date

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Backup Management** or click the **Backup Management** launcher button.

The Backup Management window appears.



3. Select a Client in the clients tree.
4. Locate and select one or more backups.



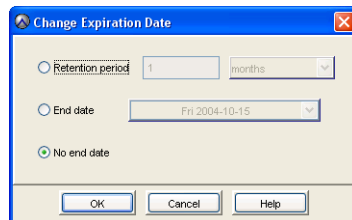
**TIP:** Refer to *Locating Backups by Calendar Day* (page 87), *Locating Backups by Date Range* (page 87) or *Locating Backups by Retention Type* (page 88) for additional information about locating backups by calendar date, content or retention type, respectively.

**TIP:** You can select multiple backups by pressing and holding **CTRL** while selecting the desired backups.



5. Select **Actions > Change Expiration Date...** or click the toolbar icon shown immediately to the left.

The Change Expiration Date dialog box appears.



6. Type or select the following:

FIELD/OPTION	DESCRIPTION
Retention period	If you want this backup to be deleted from the Avamar server after a specific number of days, weeks, months or years, select this option and select the number of days, weeks, months or years.
End date	If you want this backup to be deleted from the Avamar server on a specific calendar date, select this option and browse to that date on the calendar.
No end date	If you want to keep this backup for as long as this client remains active in the Avamar server, select this option.

7. Click **OK**.

The Change Expiration Date dialog box closes and the following message appears: Are you sure you want to change the expiration of the backups?

8. Click **Yes**.

An event code dialog box appears.

9. Click **OK**.

## Changing Backup Retention Types

This topic describes how to change the retention types assigned (page 73) to an existing backup.

---

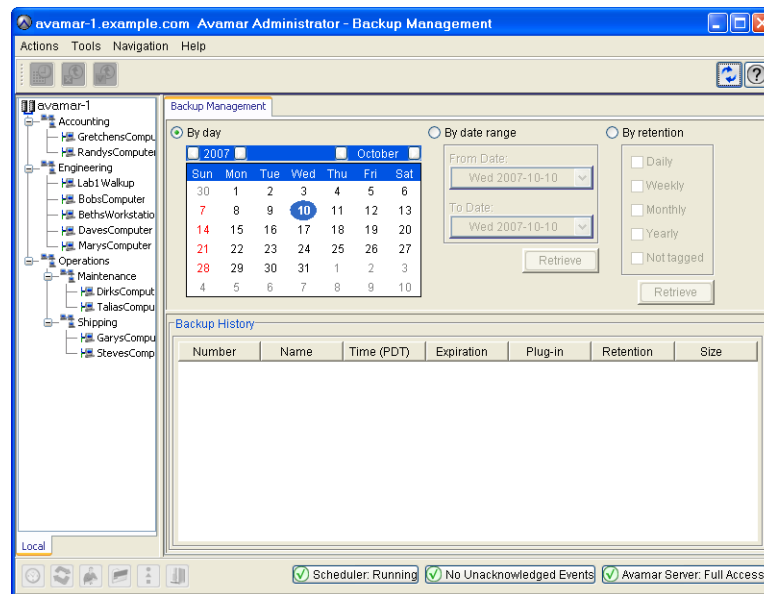
**IMPORTANT:** When manually changing the retention types assigned to an existing backup, especially one that has multiple retention types assigned to it, be certain that you are not inadvertently removing a weekly, monthly or yearly from the system that you need to retain. For example, consider a backup that is assigned daily, weekly, monthly and yearly retention types. If you remove that yearly retention type designation, you might not have another yearly backup in your system for quite a long time.

---

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Backup Management** or click the **Backup Management** launcher button.



The Backup Management window appears.



3. Select a Client in the clients tree.
4. Locate and select one or more backups.

---

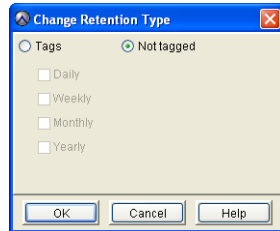
**TIP:** Refer to *Locating Backups by Calendar Day* (page 87), *Locating Backups by Date Range* (page 87) or *Locating Backups by Retention Type* (page 88) for additional information about locating backups by calendar date, content or retention type, respectively.

---

**TIP:** You can select multiple backups by pressing and holding **CTRL** while selecting the desired backups.

5. Select **Actions > Change Retention Type...**

The Change Retention Type dialog box appears.



6. Do one of the following:

IF	DO THIS
You want to explicitly assign a daily, weekly, monthly or yearly retention type to this backup.	Select the <b>Tags</b> option, then select one or more retention type options.
You want to designate this backup as “untagged” (that is, not explicitly assigned a daily, weekly, monthly or yearly retention type).	Select the <b>Not tagged</b> option.

7. Click **OK**.

The Change Retention Type dialog box closes and the following message appears: Are you sure you want to change the retention type of the backup?

8. Click **Yes**.

A confirmation message appears.

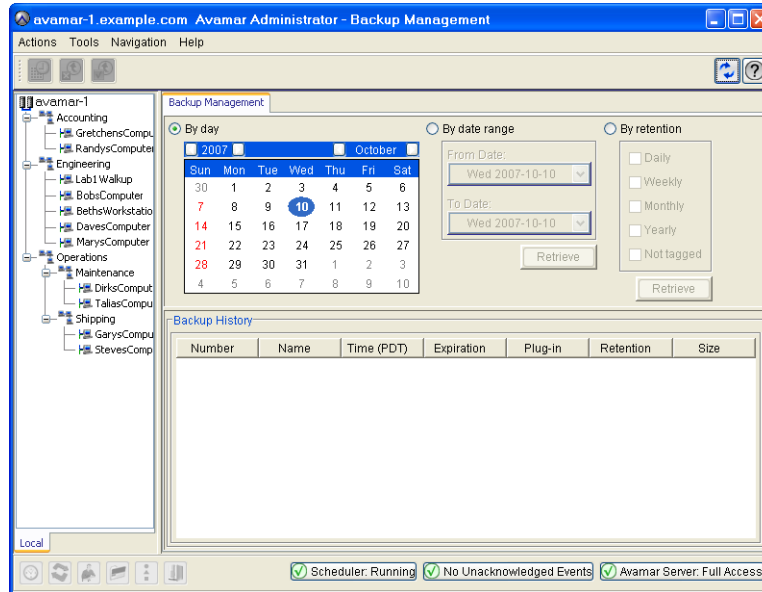
9. Click **OK**.

## Validating a Backup

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Backup Management** or click the **Backup Management** launcher button.



The Backup Management window appears.



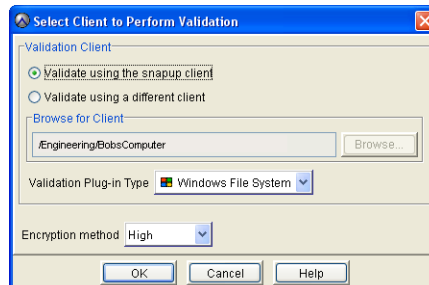
3. Select a Client in the clients tree.
4. Locate and select a backup.

**TIP:** Refer to *Locating Backups by Calendar Day* (page 87), *Locating Backups by Date Range* (page 87) or *Locating Backups by Retention Type* (page 88) for additional information about locating backups by calendar date, content or retention type, respectively.

5. Select **Actions > Validate Backup...** or click the toolbar icon shown immediately to the left.



The Select Client to Perform Validation dialog box appears.



The default settings are to validate the backup on the same client from which the backup was originally taken and to use the same data source plugin that was used during the original backup. However, the encryption setting for backup validations always defaults to High regardless of the encryption setting used for the original backup.

6. Do one of the following:

IF	DO THIS
You want to validate the backup using the default settings.	Proceed directly to step 7.
You want to validate the backup using new settings.	<p>Select a new client on which to perform the validation by setting the <b>Validate using a different client</b> option, then clicking <b>Browse...</b> and selecting the new client in the client tree.</p> <p>Select another encryption method to be used for client/server data transfer during this validation.</p> <p>Select a different plugin from the Validate Plug-in Type list box. These selections are context-sensitive (only those plugins installed on the selected client will be available).</p>

7. Click **OK**.

The Select Client to Perform Validation dialog box closes and the following status message appears: Backup validation initiated.

8. Click **OK**.

# Backup Statistics

Various detailed statistics are available for completed backups. You can obtain backup statistics two ways:

- From the Backup Management window (page 94)
- From the Activity window (page 96)

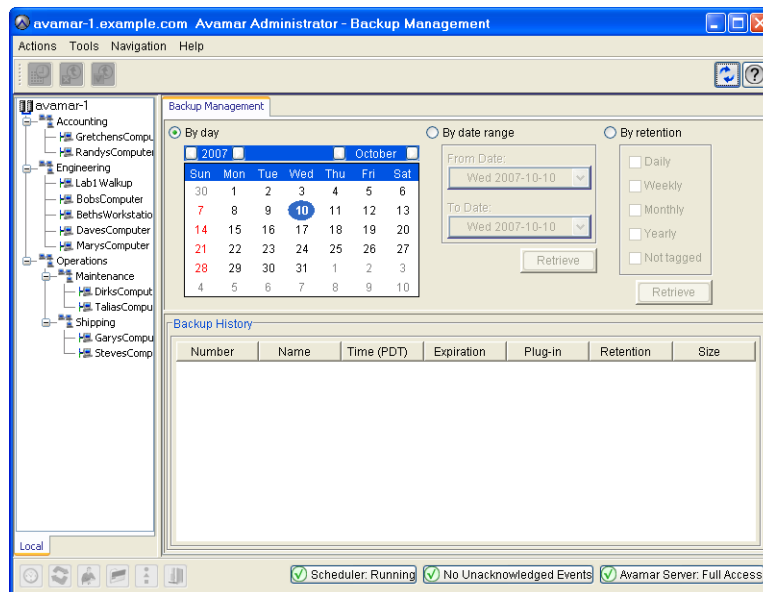
It is possible to obtain statistics for any stored backup from the Backup Management window. However, the Activity windows only shows recent backup activity (that is, typically the most recent backups within the past 72 hours). Therefore, if the backup of interest occurred more than 72 hours ago, you must obtain those statistics from the Backup Management window.

## Viewing Backup Statistics From the Backup Management Window

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Backup Management** or click the **Backup Management** launcher button.



The Backup Management window appears.



3. Select a Client in the clients tree.
4. Locate and select a backup.

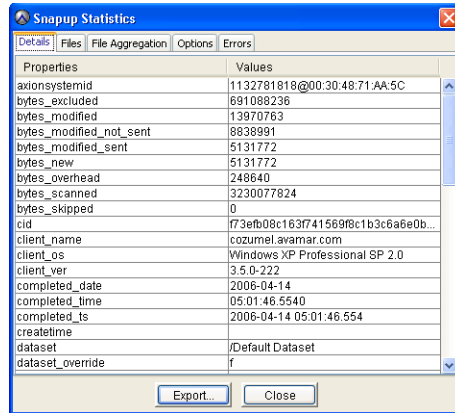
---

**TIP:** Refer to *Locating Backups by Calendar Day* (page 87), *Locating Backups by Date Range* (page 87) or *Locating Backups by Retention Type* (page 88) for additional information about locating backups by calendar date, content or retention type, respectively.

---

5. Select **Actions > View Statistics...**

The Backup Statistics dialog box appears.



TAB	DESCRIPTION
Details	Shows detailed information obtained from the v_activities_2 database view. Refer to v_activities_2 (page 565) for additional information.
Files	Shows a list of files included in this backup.
File Aggregation	Shows a representative sampling of resource-intensive file types included in this backup and summarizes (aggregates) deduplication statistics by file type.
Options	Shows any special options used to take that backup.
Errors	Shows any errors that occurred during that backup.

6. Click **Close**.

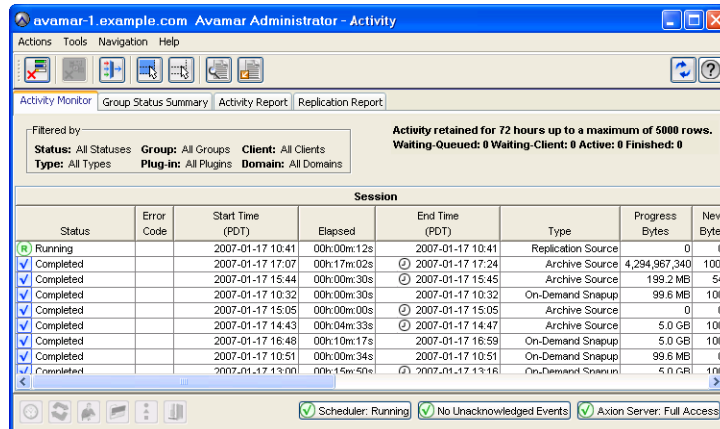
The Backup Statistics dialog box closes.

## Viewing Backup Statistics From the Activity Window

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.

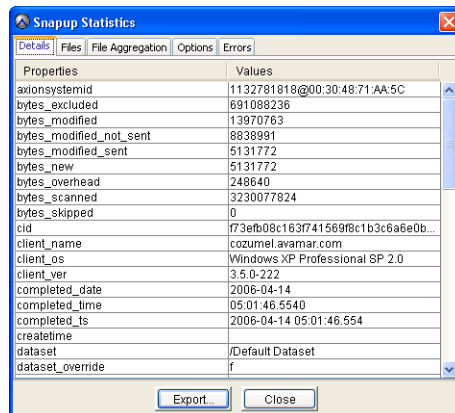


The Activity window appears.



3. Click the Activity Monitor tab.
4. Select a backup activity from the list.
5. Select **Actions > View Statistics...**

The Backup Statistics dialog box appears.



TAB	DESCRIPTION
Details	Shows detailed information obtained from the <code>v_activities_2</code> database view. Refer to <code>v_activities_2</code> (page 565) for additional information.
Files	Shows a list of files included in this backup.
File Aggregation	Shows a representative sampling of resource-intensive file types included in this backup and summarizes (aggregates) deduplication statistics by file type.



TAB	DESCRIPTION
Options	Shows any special options used to take that backup.
Errors	Shows any errors that occurred during that backup.

6. Click **Close**.

The Backup Statistics dialog box closes.

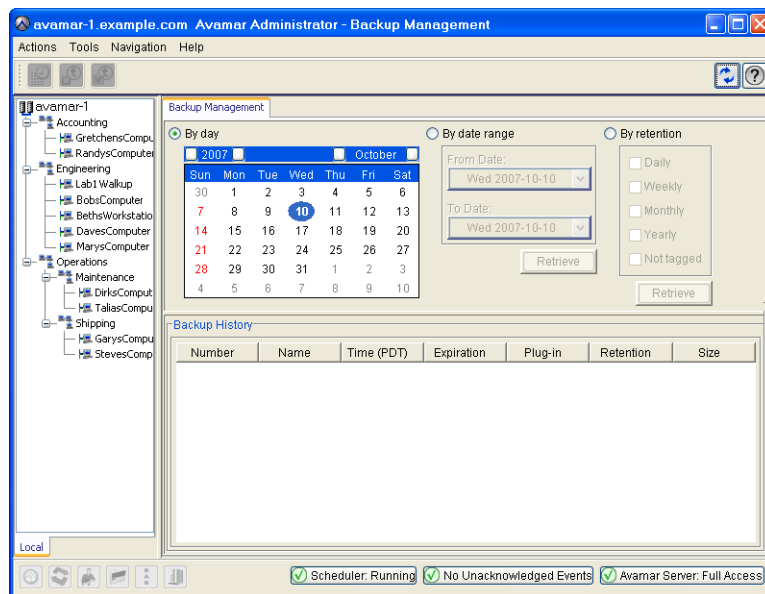
## Deleting a Backup

**IMPORTANT:** Deleting a backup from the system immediately and permanently deletes all data inside that backup.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Backup Management** or click the **Backup Management** launcher button.



The Backup Management window appears.



3. Select a Client in the clients tree.
4. Locate and select a backup.

**TIP:** Refer to *Locating Backups by Calendar Day* (page 87), *Locating Backups by Date Range* (page 87) or *Locating Backups by Retention Type* (page 88) for additional information about locating backups by calendar date, content or retention type, respectively.



5. Select **Actions > Delete Backup...** or click the toolbar icon shown immediately to the left.

A confirmation message appears.

6. Click **OK** to permanently delete these backups.

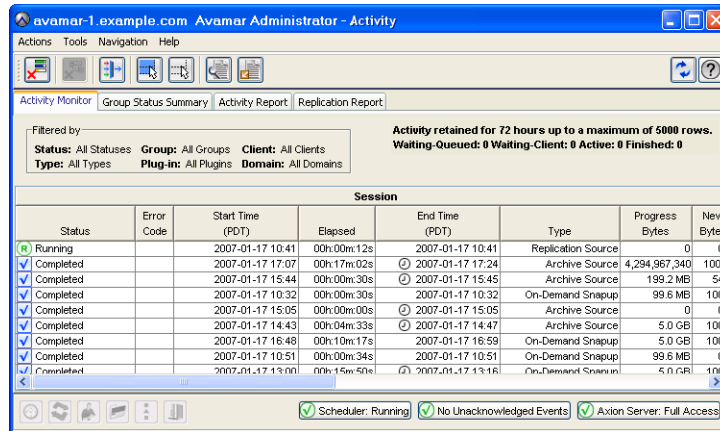
## Canceling an Activity

You can cancel any activity (backup, restore or validation) any time before it actually completes. However, it can take up to five minutes to cancel any activity. If during this time, the activity completes, it will not be cancelled.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.



The Activity window appears.



3. Click the Activity Monitor tab.

The Activity Monitor tab shows the most recent 5,000 client activities during the past 72 hours.

4. Select one or more activities you want to cancel.
5. Select **Actions > Cancel Activity** or click the toolbar icon shown immediately to the left.



A message appears asking you to confirm this action.

6. Click **Yes** to cancel these activities.

---

**NOTE:** If you selected several activities in step 4, a progress indicator might appear, which will continuously show what percentage of this task is complete.

---

# DATASETS, SCHEDULES AND RETENTION POLICIES

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Datasets, schedules and retention policies are reusable objects that can be assigned to more than one client or group. This “reusability” greatly reduces the amount of labor needed to automate and customize the Avamar server to satisfy your specific site requirements.

## Datasets

In *Performing an On-Demand Client Backup* (page 74), you were shown how to browse a client filesystem and mark certain directories and files for backup. However, selections made this way are only valid for that particular backup — they are not persistent.

**Persistent Selections.** Avamar datasets are a list of directories and files that will be backed up from a client. Assigning a dataset to a client or group is a way to make persistent backup selections.

### Dataset Properties

Each dataset defines:

- Source data list
- Exclusion list
- Inclusion list
- Plugin options (page 479)

**Source Data List.** Dataset definitions always start with a source data list, consisting of:

- Data from one or more plugins (page 19)
- A defined filesystem hierarchy (entire filesystem or selected directories) within each plugin

**Exclusion and Inclusion Lists.** Datasets can also narrow the scope of the source data list by explicitly defining certain directories and file types to exclude or include in each backup.

Because default dataset behavior is to include everything in the source data list, the explicit exclusion and inclusion lists typically contain only a few entries.

---

**NOTE:** When specifying exclusions and inclusions, case sensitivity will vary according to the target computing platform you are backing up. Exclusions and inclusions specified for Windows platforms are not case-sensitive; exclusions and inclusions specified for most other platforms are case-sensitive.

---

---

**NOTE:** Inclusion and exclusion lists cannot be defined for VMware Image Backups.

---

**Processing Relationship.** Avamar processes these dataset elements in the following order:

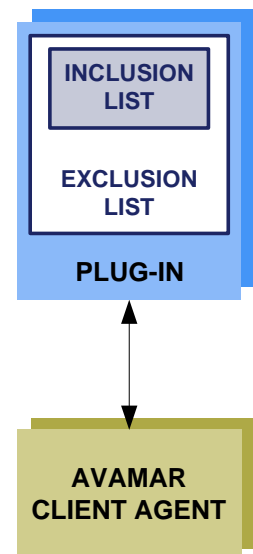
- Source data
- Exclusion list
- Inclusion list

First, source data from one or more plugins is defined. The default behavior is to include all data from all defined plugins.

Next, the exclusion list is used to eliminate certain directories and file types from this dataset.

Finally, the inclusion list is used to add back any files that were eliminated from the dataset in the exclusion list.

**Plugin Options.** Plugin options are a way to further customize the behavior of a dataset. Refer to *Appendix B — Plugin Options* (page 479) for additional information about plugin options.



## Dataset Catalog

**Base Dataset.** The Base Dataset defines a set of minimum (baseline) backup requirements. The initial settings in the Base Dataset are:

- Use no source data plugins
- No explicit exclusion or inclusion list entries

This is essentially an empty dataset.

**Default Dataset.** The Default Dataset defines persistent backup selections for the Default Group (page 128). The initial settings in the Default Dataset are:

- Use all available source data plugins
- No explicit exclusion or inclusion list entries

This ensures that all members of the Default Group can back up their client computers regardless of platform type.

You can modify these settings to meet your specific site requirements. Doing so enforces these changes on all members of the Default Group (page 128), unless another dataset is assigned at the client level (page 155).

The following directories are also inherently excluded from all backups even though they do not explicitly appear in the Exclusion list:

- .snapshot/ (Network Appliance mounts)
- VARDIR/f\_cache.dat (local **avtar** file cache)
- VARDIR/p\_cache.dat (local **avtar** "is present" cache)

**Unix Dataset.** The Unix dataset is optimized for use with HP-UX, Linux and Solaris clients. The initial settings in the Unix Dataset are:

- Use only AIX, HP-UX, Linux, Mac OS X and Solaris filesystem source data plugins
- Explicitly exclude various Unix temp directories (/tmp, /var/tmp, /usr/tmp), core dump files (core) and local cache (\*cache.dat, \*scan.dat) files
- No explicit inclusion list entries

The following directories are also inherently excluded from all backups even though they do not explicitly appear in the Exclusion list:

- .snapshot/ (Network Appliance mounts)
- VARDIR/f\_cache.dat (local **avtar** cache files)
- VARDIR/p\_cache.dat (local **avtar** cache files)
- /proc (pseudo filesystem that cannot be restored)
- /dev (if not running as root)
- /devices (Solaris only)

**Windows Dataset.** The Windows Dataset is optimized for use with Microsoft Windows clients.

The initial settings in the Windows Dataset are:

- Use only Windows filesystem plugin source data plugin
- No explicit exclusion or inclusion list entries

The following directories are also inherently excluded from all backups even though they do not explicitly appear in the Exclusion list:

- .snapshot/ (Network Appliance mounts)
- VARDIR/f\_cache.dat (local **avtar** cache files)
- VARDIR/p\_cache.dat (local **avtar** cache files)
- All files referenced by the HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\BackupRestore\FilesNotToBackup registry key (files explicitly designated by Microsoft to not be backed up)
- All files referenced by the HKEY\_CURRENT\_USER\SYSTEM\CurrentControlSet\Control\BackupRestore\FilesNotToBackup registry key (files explicitly designated by Microsoft to not be backed up)
- Temporary Internet files (Internet Explorer temporary files)
- outlook.ost (Outlook local cache files)
- outlook\\*.ost (Outlook local cache files)

**VMware Image Dataset.** The VMware Image Dataset is the default dataset that is assigned to the Default Virtual Machine Group (page 129), and other vCenter groups (page 129) when they are first added.

The VMware Image Dataset is in many respects simpler than most other datasets:

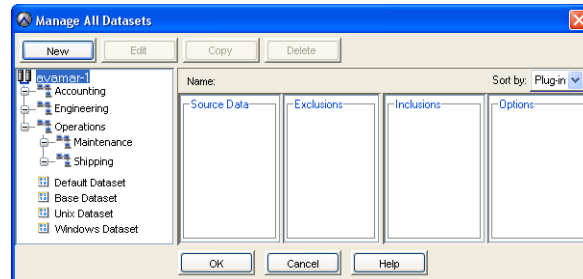
- The only source data plugins shown are Linux and Windows virtual disks; both are selected by default.
- The **Select Files and/or Folders** option, as well as the Exclusions and Inclusions tabs are disabled.
- Change block tracking is enabled by default using an embedded `utilize_changed_block_list=true` plugin option statement.

Refer to your *Avamar VMware Guide* for additional information about using the VMware Image Dataset to back up virtual machine data.

## Creating a New Dataset

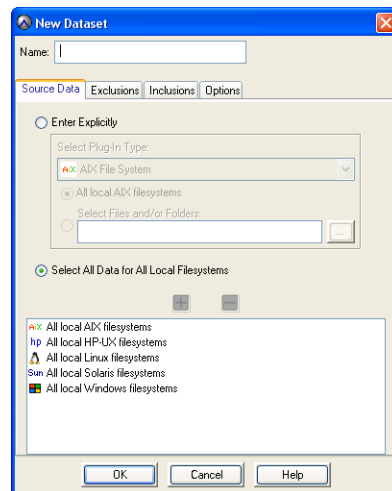
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Datasets...**

The Manage All Datasets window appears.



3. Click **New**.

The New Dataset dialog box appears.



4. Type a name for this new dataset.

---

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

---

5. Click the Source Data tab.

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



6. Type or select the following:

FIELD/OPTION	DESCRIPTION
<b>Enter Explicitly</b>	Select this option to define which plugins will be used by this particular source data entry. To add a plugin type to this dataset, select it from the list box. <b>IMPORTANT:</b> When creating an explicit dataset, first remove any unwanted plugin types by selecting each one and clicking -.
Select Plug-in Type	This list is only available when <b>Enter Explicitly</b> is selected. Select a plugin type from the list and click + to add it to the plugin list.
Select Files and/or Folders	This list is only available when <b>Enter Explicitly</b> is selected. If you want this plugin to point to a specific client subdirectory (somewhere other than the root directory), click ... and browse to the directory before you click +. You can also type the full path to any client directory directly in this field. <b>IMPORTANT:</b> Do not use any of the following characters in your entry: ~!@\$%^&(){}[] ,` ;#\ / : * ? < > ' " & . <b>NOTE:</b> The Select Files and/or Folders option is not available for VMware Image Backups.
Select All Data for All Local File Systems	Select this option to include all data on all client filesystems. This adds all plugin types to the source data list.

The remaining dialog box tabs are used to select optional parameters such as exclusion and inclusion list (page 101) entries and plugin options (page 479).

If you do not need to select these optional parameters in this dataset, skip steps 7 through 11 and go directly to step 12.

7. Click the Exclusions tab.

The Exclusions tab is where you explicitly define directories and files that will not be backed up.

Typical exclusion lists include /temp files and directories and Unix core dumps.

---

**NOTE:** Exclusion lists cannot be defined for VMware Image Backups.

---

8. Repeat the following for each exclusion list entry you want to add:

- (a) Select a plugin type from the Select Plug-in Type list box.
- (b) Type a directory name or file type (wildcards are supported) in the Select Files and/or Folders field.
- (c) Click +.

This entry is added to the exclusion list.

9. Click the Inclusions tab.

The Inclusions tab is where you explicitly define directories and files that will be backed up.

---

**NOTE:** The inclusion list is a subset of the exclusion list. You only need to explicitly include file types that would have otherwise been excluded by way of the exclusion list. Refer to *Processing Relationship* (page 101) for additional information.

---

---

**NOTE:** Inclusion lists cannot be defined for VMware Image Backups.

---

10. Repeat the following for each inclusion list entry you want to add:

- (a) Select a plugin type from the Select Plug-in Type list box.
- (b) Type a directory name file type (wildcards are supported) in the Select Files and/or Folders field.
- (c) Click +.

This entry is added to the inclusion list.

11. Click the Options tab.

The Options tab is where you set various plugin options (page 479).

Plugin options can be set two ways: by using the graphical controls or by typing option names and values as free text.

If you want to include plugin options with future backups, select or clear the desired options and type values where applicable.

---

**IMPORTANT:** When typing option names and values as free text, it must be understood that no error checking or validation is performed on these free-text entries and that free text entries override settings made using the graphical controls.

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Refer to *Appendix B — Plugin Options* (page 479) for additional information about plugin options.

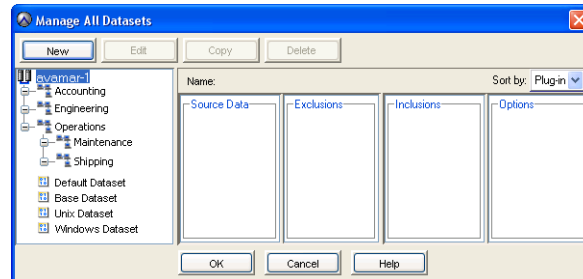
12. Click **OK**.

The New Dataset dialog box closes.

## Editing a Dataset

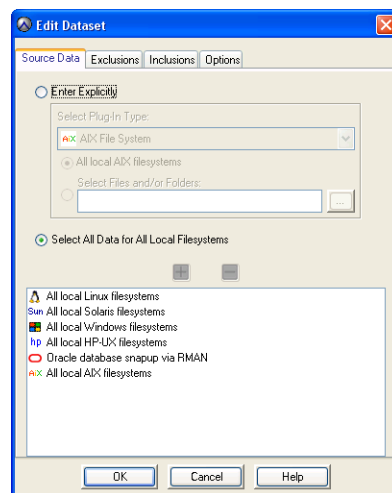
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Datasets...**

The Manage All Datasets window appears.



3. Select a dataset from the list and click **Edit**.

The Edit Dataset dialog box appears.



4. Edit the information you want to change.

Refer to *Creating a New Dataset* (page 104) for additional information about dataset properties and settings.

5. Click **OK**.

The Edit Dataset dialog box closes.

---

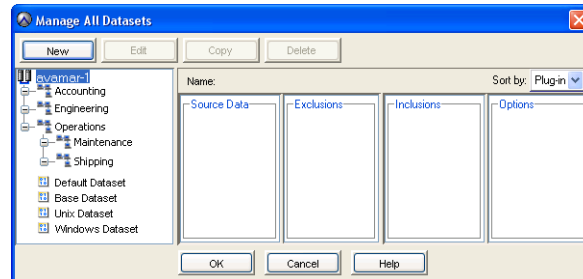
**NOTE:** Dataset changes take effect on the next scheduled backup. Backups that have already begun or have been completed are not affected.

---

## Copying a Dataset

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Datasets...**

The Manage All Datasets window appears.



3. Select a dataset from the list and click **Copy**.  
The Save As dialog box appears.
4. Type a name for the new dataset and click **OK**.  
The Save As dialog box closes.

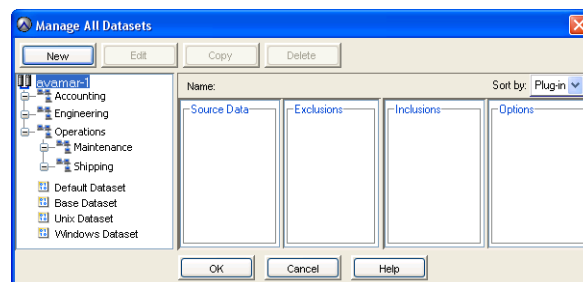
## Deleting a Dataset

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**IMPORTANT:** You cannot delete a dataset if it is currently assigned to a client or group.

---

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Datasets...**  
The Manage All Datasets window appears.



3. Select a dataset from the list and click **Delete**.  
A confirmation message appears.
4. Click **Yes** to permanently delete this dataset.

## Schedules

Schedules are reusable objects that control the timing of certain server activities. Currently, schedules control:

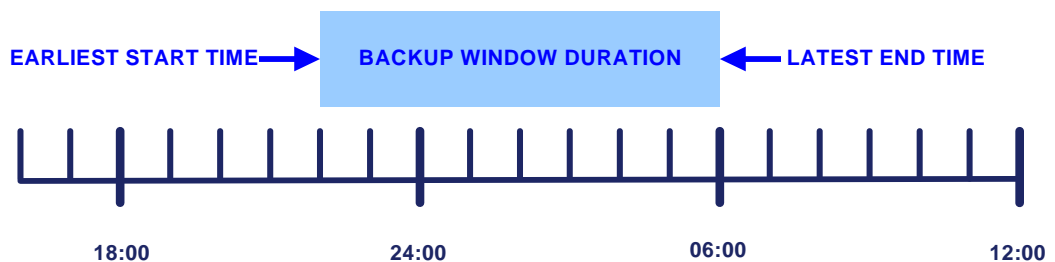
- When group backups will be taken (page 128)
- When custom event profile email notifications will be sent (page 169)

### Important Terms and Concepts

Each schedule inherently defines the following behavior:

- Start time — the earliest time of day this system activity can be initiated
- Duration — the number of hours this system activity will be allowed to run before it is terminated, regardless of whether it is finished or not
- Recurrence — how many times per day or week this system activity will be initiated
- Effectivity — when this schedule should take effect and when it should be discontinued

**Start Time, End Time and Duration.** In order to understand how start time, end time and duration interact with one another, consider the following diagram:



This particular system activity would begin at 10:00 P.M. (22:00) and be allowed to run until 6:00 A.M. (06:00) the following morning, creating an effective eight-hour duration.

---

**NOTE:** This diagram shows the initial settings of the Default schedule (page 113).

---

In actual practice, scheduled activities rarely start or end precisely on time. Actual start times are affected by server load; actual end times are affected by the complexity of the activity (for example, the amount of new client data that must be backed up, the number of group backups initiated, the number of email messages that must be sent and so forth).

**Earliest Start Time and Latest End Time.** It must therefore be understood that specifying a schedule start time means that this is the *earliest possible time* that this particular system activity can begin and that specifying a duration or end time establishes the *latest possible end time* for this particular system activity.

**Recurrence.** Schedule recurrence is simply the ability to repeat the designated system activity at regular predictable intervals. Avamar schedules allow you to repeat activities on designated hours of the day or designated days of the week.

For example, you could use various schedules to send noncritical event profile emails hourly during your normal working hours (for example, on the hour between 9:00 A.M. and 5:00 P.M.), schedule a particular group's backups once per day at 10:00 P.M. and another group's backups only on Saturdays at 2:00 P.M.

**Effectivity.** Finally, it is sometimes useful to define a specific effectivity range for a schedule. For example, if you know that client computers used for a specific development project will be obsolete at some known future date, you could easily create a special schedule for those group backups that would automatically cease backups on a date of your choice. Similarly, if administering a large site, you could create schedules ahead of time, assign them to groups, then activate them on a date of your choice. These group backups would not occur until the schedule took effect.

**All Displayed Times Are Relative to That Avamar Administrator Client**

**Locality.** When schedules are created or edited, all times are shown relative to that Avamar Administrator client's local time zone. For example, consider a schedule created by an administrative user in Pacific Standard Time zone, with a next run time of 10:00 P.M. If an administrative user in Eastern Standard Time views that same schedule in his Avamar Administrator session, the next run time would be localized and shown as 1:00 A.M. the following day (3 hours later).

**Run Now.** The Manage All Schedules window provides a **Run Now** button, which is used to initiate all actions associated with a particular schedule right now.

---

**NOTE:** Initiating all actions associated with a particular schedule using the **Run Now** button does not affect the next time the schedule is regularly run.

---

## Schedule Properties

Avamar schedules offer three basic options for defining recurrence:

- Repeat this schedule daily
- Repeat this schedule weekly
- Repeat this schedule on-demand

**Repeat This Schedule Daily.** The Repeat this schedule daily option allows you establish a scheduling pattern comprising one or more hours of the day. This pattern will be repeated daily. In other words, system activities scheduled in this manner occur at the specified times every day of the year.

Repeat this schedule

Daily
  Weekly
  Monthly
  On-Demand

<input checked="" type="checkbox"/> 12AM	<input type="checkbox"/> 6AM	<input type="checkbox"/> 12PM	<input type="checkbox"/> 6PM
<input type="checkbox"/> 1AM	<input type="checkbox"/> 7AM	<input type="checkbox"/> 1PM	<input type="checkbox"/> 7PM
<input type="checkbox"/> 2AM	<input type="checkbox"/> 8AM	<input type="checkbox"/> 2PM	<input type="checkbox"/> 8PM
<input type="checkbox"/> 3AM	<input type="checkbox"/> 9AM	<input type="checkbox"/> 3PM	<input type="checkbox"/> 9PM
<input type="checkbox"/> 4AM	<input type="checkbox"/> 10AM	<input type="checkbox"/> 4PM	<input type="checkbox"/> 10PM
<input type="checkbox"/> 5AM	<input type="checkbox"/> 11AM	<input type="checkbox"/> 5PM	<input type="checkbox"/> 11PM

Limit each run to (hours):

---

**TIP:** If you need to schedule system activities for certain days of the week, use the **Repeat this schedule weekly** option.

---

Additionally, in order to prevent job overlap, you must limit the duration of these activities. For example, if you scheduled backups to occur every six hours (for example, at 1:00 A.M., 7:00 A.M., 1:00 P.M. and 7:00 P.M.), you should limit each run to no more than six hours so that the previous backup completes before the next backup is begun.

**Repeat This Schedule Weekly.** The **Repeat this schedule weekly** option allows you to establish a scheduling pattern comprising one or more days of the week. This pattern will be repeated weekly. In other words, system activities scheduled in this manner occur on the specified days of the week every week of the year.

Repeat this schedule

Daily
  Weekly
  Monthly
  On-Demand

Sunday
  Monday
  Tuesday
  Wednesday

Thursday
  Friday
  Saturday

Because only one activity scheduled in this manner occurs on each of the specified days, you must precisely define the activity operating hours using Earliest start time and End no later than values.

**Repeat This Schedule Monthly.** The **Repeat this schedule monthly** option allows you to schedule operations to run on a specific calendar date or run on a designated day and week each month.

Repeat this schedule

Daily
  Weekly
  Monthly
  On-Demand

Day 1 of every month

The first Sunday of every month

**Repeat This Schedule On-Demand.** The **Repeat this schedule on-demand** option allows to you define a schedule that does not run. This is useful for creating schedules that you can assign today but activate in the future.



**Activation Constraints.** Schedule effectivity is controlled by the activation constraints:

- To make a schedule effective immediately, select the **Delay until** date to today
- To make a schedule run indefinitely, select the **No End Date** option
- To obsolete a schedule at some future date of your choice, select the **End after** option and select a date of your choice

The screenshot shows a dialog box titled "Activation Constraints". It contains two radio button options. The first option, "No End Date", is selected and has a green dot next to it. The second option, "End after:", is unselected and has a white dot next to it. To the right of the "End after:" label is a date dropdown menu showing "Fri 2004-10-15". To the left of the "No End Date" label is a "Delay until:" label with a date dropdown menu also showing "Fri 2004-10-15".

**Timing of Activation Constraints.** Because scheduled activities often straddle two calendar days, it should be understood that Avamar will allocate the full window of time to any activity initiated by a schedule. For example, consider a schedule with an earliest start time of 10:00 P.M., a latest end time of 6:00 A.M. (the following morning) and an end after date of December 31 of the current calendar year. On the evening of December 31, the activity will be initiated as expected and run until completed, typically some time during the morning of January 1 the following year. However, beginning January 1 of the following year, no new scheduled activities will be initiated by way of this schedule.

## Schedule Catalog

**Default Schedule.** The Default Schedule controls backup scheduling for the Default Group (page 128). It is initially configured to run once per day at 10:00 P.M. You can modify these settings to meet your specific site requirements. However, doing so enforces these changes on all members of the Default Group (page 128).

**Daily Schedule.** Avamar also supplies a predefined Daily Schedule.

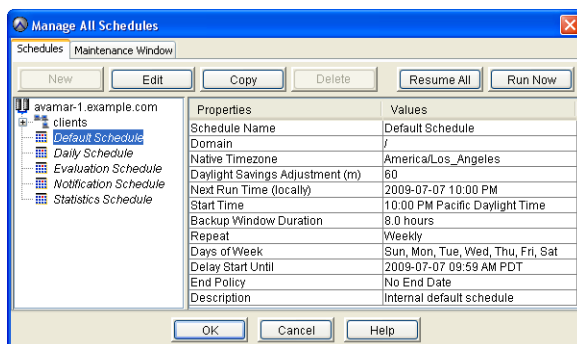
**Evaluation Schedule.** The Evaluation Schedule is primarily intended to be used to support system evaluations by controlling when the Evaluation Profile (page 169) email notification is sent. It is initially configured to run each Monday morning at 6:00 A.M.

**Notification Schedule.** The Notification Schedule controls when custom event profile email notification messages are sent. Refer to *Custom Profiles* (page 169) for additional information.

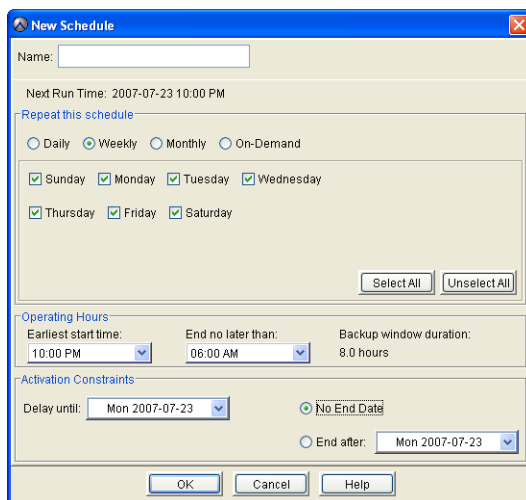
**Statistics Schedule.** The Statistics Schedule controls how often various Avamar server statistics (for example, the Avamar server detail (page 244) Bytes protected value) are retrieved or calculated. The default setting for this schedule is hourly.

## Creating a New Schedule

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**  
The Manage All Schedules window appears.



3. Click **New**.  
The New Schedule dialog box appears.



4. Type or select the following:

FIELD/OPTION	DESCRIPTION
Name	Type a name for this new schedule. <b>IMPORTANT:</b> Do not use any of the following characters in your schedule name: ~!@\$^%(){}[] ,` ;# \: *? < > ' " & .

FIELD/OPTION	DESCRIPTION
Repeat this schedule	<p>Select either <b>daily</b>, <b>weekly</b>, <b>monthly</b> or <b>on-demand</b>.</p> <p>If <b>daily</b> is selected, you can schedule operations to occur at any hour of the day. You can also limit each run to a specified number of hours in order to prevent overlapping backups.</p> <p>If <b>weekly</b> is selected, you can schedule operations to occur on any day of the week.</p> <p>If <b>monthly</b> is selected, you can schedule operations to occur on any calendar day of the month.</p> <p>If <b>on-demand</b> is selected, this schedule will never run. Schedules using this setting are typically assigned to groups that only take on-demand backups (for example, groups that only contain laptop clients and so forth).</p>
Operating Hours	<p>Specifies an <b>Earliest start time</b> and an <b>End no later than</b> time for each scheduled backup. These two values define a logical window of time during which a backup can potentially be performed. Server workload will affect the actual start time.</p> <p><b>NOTE:</b> The first time a backup is performed for any client, the backup is allowed to continue past the specified end time. The reason for this is that initial backups can take significantly longer than subsequent backups of the same client.</p>
Activation Constraints	<p>Specifies schedule effectivity:</p> <p>To make a schedule effective immediately, select the <b>Delay until</b> date to today.</p> <p>To make a schedule run indefinitely, select the <b>No End Date</b> option.</p> <p>To obsolete a schedule at some future date of your choice, select the <b>End after</b> option and select a date of your choice.</p>

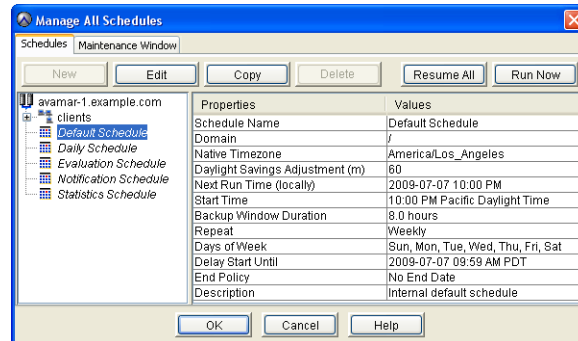
5. Ensure that the Next Run Time (directly under the Name field) is the expected date and time.
6. Click **OK**.

The New Schedule dialog box closes.

## Editing a Schedule

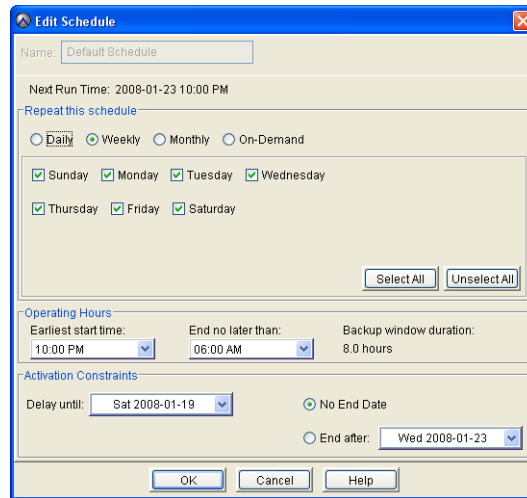
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**

The Manage All Schedules window appears.



3. Select a schedule from the list and click **Edit**.

The Edit Schedule dialog box appears.



4. Edit the information you want to change.

Refer to *Creating a New Schedule* (page 114) for additional information about schedule properties and settings.

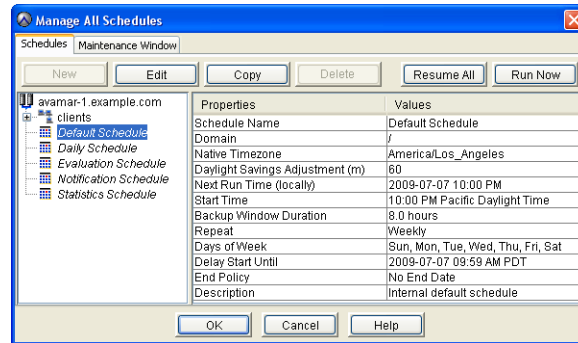
5. Click **OK**.

The Edit Schedule dialog box closes.

## Copying a Schedule

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**

The Manage All Schedules window appears.



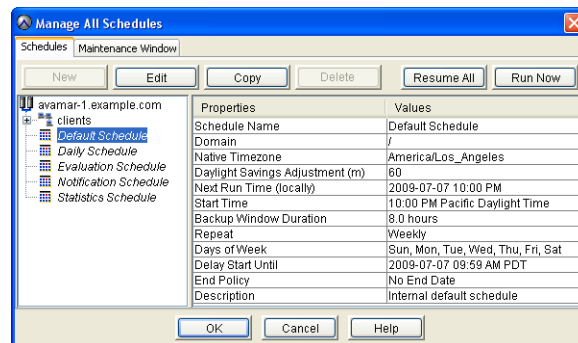
3. Select a schedule from the list and click **Copy**.  
The Save As dialog box appears.
4. Type a name for the new schedule and click **OK**.  
The Save As dialog box closes.

## Deleting a Schedule

**IMPORTANT:** You cannot delete a schedule if it is currently assigned to a group.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**

The Manage All Schedules window appears.



3. Select a schedule from the list and click **Delete**.  
A confirmation message appears.
4. Click **Yes** to permanently delete this schedule.

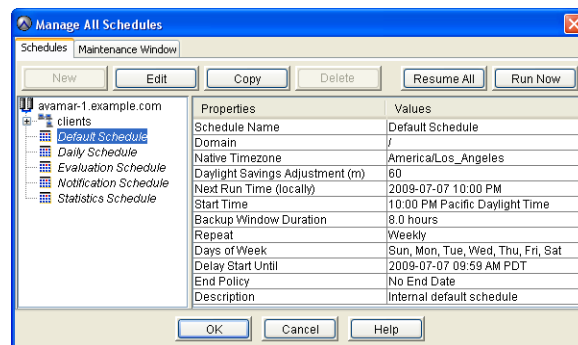
## Running a Schedule Now

Occasionally, you might want to perform scheduled operations on an on-demand basis. By selecting a schedule and clicking **Run Now**, all operations associated with that schedule are run immediately.

**NOTE:** The scheduler need not running in order to use the **Run Now** feature.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**

The Manage All Schedules window appears.



3. Select a schedule from the list and click **Run Now**.

---

## Retention Policies

Backup retention policies allow you to specify how long to keep a particular backup in the system. Backups are automatically marked for deletion after they expire. However, actual deletion from the system is done in batches during times of low system activity.

**Expiration Date.** The result of a retention policy is always some future expiration date. Retention policies are merely a set of rules, applied as each backup is taken, for determining that future calendar expiration date.

---

**IMPORTANT:** Changing retention policy settings does not affect past backups in the system. Every backup is assigned an expiration date at the time the backup is taken. Although you can manually change any individual backup expiration date (page 88), this must be done on a backup-by-backup basis and can be very time-consuming for large sites. Therefore, it is extremely important that you carefully consider the best retention policy for your site and implement that retention policy before taking too many backups.

---

Each retention policy defines:

- Basic settings for determining a fixed expiration date
- Optional advanced settings, which specify the number of past backups to keep of each type

### Basic Retention Settings

Basic retention settings are used to assign a fixed expiration date to a backup using any one the following methods:

The **Retention period** option allows you to define a fixed retention period, relative to the schedule start time. This retention period can be any number of days, weeks, months or years. Expiration dates assigned in this manner create a moving window of backup retention. For example, this setting would be useful for always retaining the latest 30 days of backups in the system. Any backups older than 30 days would automatically be dropped from the system.

The **End date** option allows you to assign a calendar date as the expiration date. All backups assigned this retention policy would expire on the same calendar date.

The **No end date** option allows you to keep backups indefinitely. This setting is useful for ensuring that all backups assigned this retention policy are retained for the life of the system.

## Advanced Retention Settings

Advanced retention settings are an optional alternative set of rules for dynamically assigning backup expiration dates, based on the number of daily, weekly, monthly and yearly backups you want to retain in the system.

Keep dailies for	<input type="text" value="1"/>	weeks <input type="button" value="v"/>
Keep weeklies for	<input type="text" value="1"/>	months <input type="button" value="v"/>
Keep monthlies for	<input type="text" value="1"/>	years <input type="button" value="v"/>
Keep yearlies for	<input type="text" value="1"/>	years <input type="button" value="v"/>

Initial tagging of scheduled backups as one or more specific types (that is, daily, weekly, monthly or yearly) is made when the backup is performed. You can also manually change a backup's type assignment at any time. Refer to *Changing Backup Retention Types* (page 90) for additional information.

**Advanced Retention Works Best With Daily Backups.** Retention policies that implement advanced retention settings should always be used in conjunction with daily scheduled backups. The reason for this is that the “Always keep: n weeks of daily backups” setting will have no effect unless there are actually daily backups in the system. However, depending on which schedule you use, this may not always be the case. For example, if you assign a schedule (page 109) to a group (page 128) that only takes weekly backups, there will be no daily backups in the system.

### Advanced Retention Settings Never Apply to On-Demand

**Backups.** Advanced retention settings cannot be applied to on-demand backups. The reason for this is that on-demand backups can occur at any time and are therefore inherently asynchronous — the system cannot assign a “type” (for example, daily, weekly, monthly or yearly) to them.

## Minimal Retention

Minimal retention is a special feature, that when enabled, enforces a minimum basic retention setting across an entire site (for example, keep all backups for at least 90 days regardless of what other retention policies specify). This feature is intended to address the need of some enterprises to enforce site-wide minimum retention standards regardless of what individual organizations might decide to implement with other retention policies.

By default, the minimal retention feature is disabled. In order to use this feature at your site, you must enable the Minimal Retention policy. Refer to *Enabling the Minimal Retention Policy* (page 127) and *Disabling the Minimal Retention Policy* (page 126) for additional information about turning on or turning off the minimal retention feature, respectively.



## Retention Policy Catalog

**“Minimal Retention” Policy.** The Minimal Retention policy is a special retention policy that controls the minimal retention feature (page 120).

---

**IMPORTANT:** The Minimal Retention policy is a global system object whose only purpose is to control the minimal retention feature (page 120). Therefore, you cannot assign the Minimal Retention policy to a group.

---

**“Default Retention” Policy.** The Default Retention policy defines backup retention settings for the Default Group (page 128). It initially has the same settings as the Minimal Retention policy. You can modify these settings to meet your specific site requirements. Doing so enforces these changes on all members of the Default Group (page 128), unless another dataset is assigned at the client level (page 155).

**“End User On Demand Retention” Policy.** End User On Demand Retention is a special retention policy that controls how long on-demand backups initiated by the client (for example, using the Avamar Windows client **Back Up Now** command) are kept in the system. Advanced retention settings are disabled on this retention policy because advanced retention settings never apply to on-demand backups.

---

**IMPORTANT:** The End User On Demand Retention policy is a global system object whose only purpose is to control how long on-demand backups initiated by the client are retained in the system. Therefore, you cannot assign the End User On Demand Retention policy to a group.

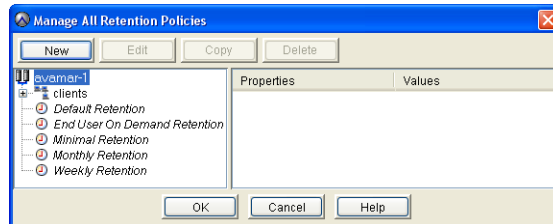
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**“Monthly” and “Weekly” Retention Policies.** The Monthly and Weekly retention policies have their basic expiration dates set for one month and one week, respectively.

## Creating a New Retention Policy

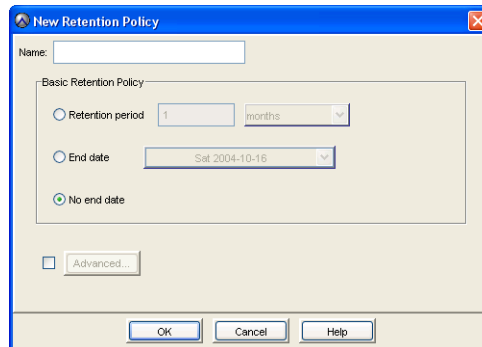
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Retention Policies...**

The Manage All Retention Policies window appears.



3. Click **New**.

The New Retention Policy dialog box appears.



4. Type or select the following:

FIELD/OPTION	DESCRIPTION
Name	Type a name for this new retention policy. <b>IMPORTANT:</b> Do not use any of the following characters in your retention policy name: ~!@\$%^%({}[] ,` ;#\/:*?<>'"&.
Retention period	If you want future backups to be deleted from the Avamar server after a specific number of days, weeks, months or years, select this option and type the number of days, weeks, months or years.
End date	If you want future backups to be deleted from the Avamar server on a specific calendar date, select this option and browse to that date on the calendar.
No end date	If you want to keep future backups for as long as this client remains active in the Avamar server, select this option.

5. Do one of the following:

IF	DO THIS
You want to use basic retention settings (page 119).	Skip steps 6-8; go directly to step 9.
You want to use advanced retention settings (page 120).	Go to step 6.

6. Select **Override basic retention policy for scheduled backups** and click **Advanced...**

The Edit Advanced Retention Policy dialog box appears.



7. Type the maximum number of daily, weekly, monthly and yearly backups you want to retain on your server.

8. Click **OK**.

The Edit Advanced Retention Policy dialog box closes.

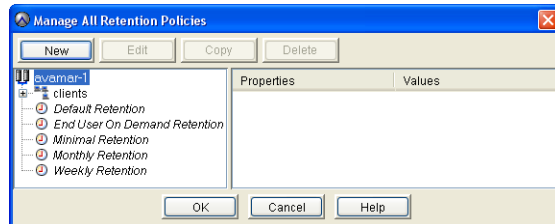
9. Switch to Edit Retention Policy dialog box and click **OK**.

The Edit Retention Policy dialog box closes.

## Editing a Retention Policy

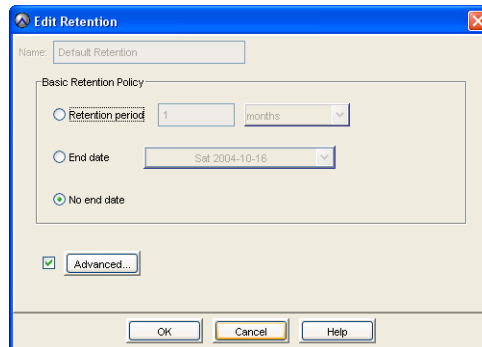
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Retention Policies...**

The Manage All Retention Policies window appears.



3. Select a retention policy from the list and click **Edit**.

The Edit Retention Policy dialog box appears.



4. Edit the information you want to change.

Refer to *Creating a New Retention Policy* (page 122) for additional information about retention policy properties and settings.

---

**IMPORTANT:** The **End date** and **No end date** options are not available on the Minimal Retention policy.

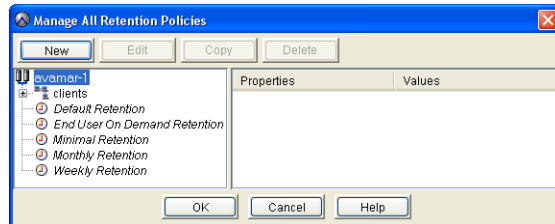
---

5. Click **OK**.

The Edit Retention Policy dialog box closes.

## Copying a Retention Policy

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Retention Policies...**  
The Manage All Retention Policies window appears.



3. Select a retention policy from the list and click **Copy**.  
The Save As dialog box appears.
4. Type a name for the new retention policy and click **OK**.  
The Save As dialog box closes.

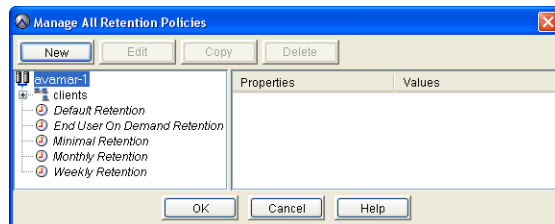
## Deleting a Retention Policy

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**IMPORTANT:** You cannot delete a retention policy if it is currently assigned to a client or group.

---

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Retention Policies...**  
The Manage All Retention Policies window appears.

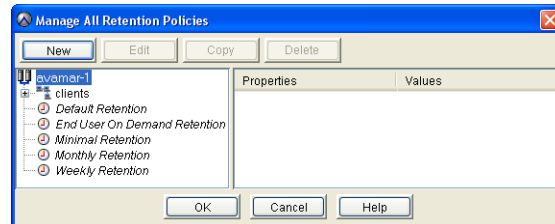


3. Select a retention policy from the list and click **Delete**.  
A confirmation message appears.
4. Click **Yes** to permanently delete this retention policy.

## Disabling the Minimal Retention Policy

1. Start Avamar Administrator (page 27).
2. Select **Tools > Manage Retention Policies...**

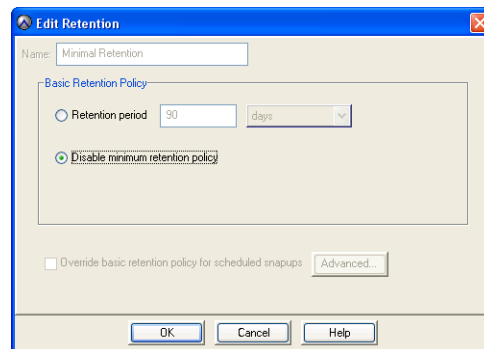
The Manage All Retention Policies window appears.



3. Select the Minimal Retention policy from the list and click **Edit**.

The Edit Retention Policy dialog box appears.

4. Select **Disable minimum retention policy**.



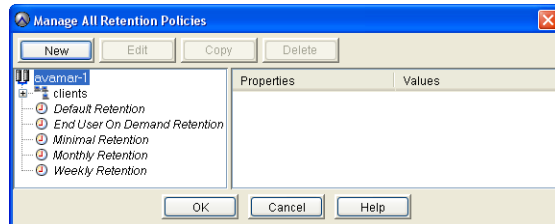
5. Click **OK**.

The Edit Retention Policy dialog box closes.

## Enabling the Minimal Retention Policy

1. Start Avamar Administrator (page 27).
2. Select **Tools > Manage Retention Policies...**

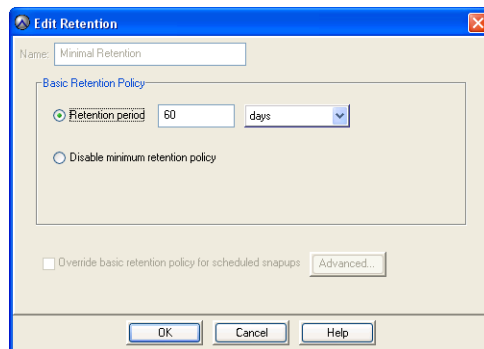
The Manage All Retention Policies window appears.



3. Select the Minimal Retention policy from the list and click **Edit**.

The Edit Retention Policy dialog box appears.

4. Select **Retention period**.



5. Select the desired minimal retention period.

The default setting is 60 days.

6. Click **OK**.

The Edit Retention Policy dialog box closes.

# GROUPS AND GROUP POLICIES

---

Thus far in this publication, we have explored how to manage various aspects of the Avamar server. However, these operations have been performed on an as-needed basis on specific clients, users, backups and so forth.

Avamar uses groups to implement various policies for automating backups and enforcing consistent rules and system behavior across an entire segment (group) of the user community.

**Group Members.** Group members are client machines that have been added to a particular group for purposes of performing scheduled backups.

Because the normal rules for domain administrators apply, these clients must be located within the same domain or within a subdomain (page 33) of where the group exists.

**Group Policy.** In addition to specifying which clients belong to that group, groups also specify:

- Dataset (page 100)
- Schedule (page 109)
- Retention policy (page 119)

These three objects comprise the “group policy.” Group policy controls backup behavior for all members of the group unless these settings are overridden at the client level.

**Default Group.** Every client in the Avamar server is a member of at least one group. If no other groups have been created, new clients will automatically be added to the Default Group.

In the default Avamar server configuration, the Default Group always uses the system default dataset, schedule and retention policy. These system default assignments cannot be changed. However, you can modify the settings within the system default dataset, schedule and retention policy to meet your specific site requirements. Refer to *Datasets, Schedules and Retention Policies* (page 100) for additional information.



**Default Proxy Group.** By default, the Default Proxy Group is where VMware Image Proxy clients reside. This group cannot be deleted. Enabling the Default Proxy Group does not conflict with scheduled backups performed by other plugins configured on the proxy client.

**Default Virtual Machine Group.** By default, the Default Virtual Machine Group is where new virtual machine clients are automatically added when they are registered. This group cannot be manually deleted but is automatically deleted if the vCenter Domain is deleted.

**vCenter Groups.** Any group created under the vCenter domain is considered a "vCenter" group, which behaves like any other group except that it contains provisions for specifying which VMware Image Proxy clients are assigned to perform backups on behalf of its group members.

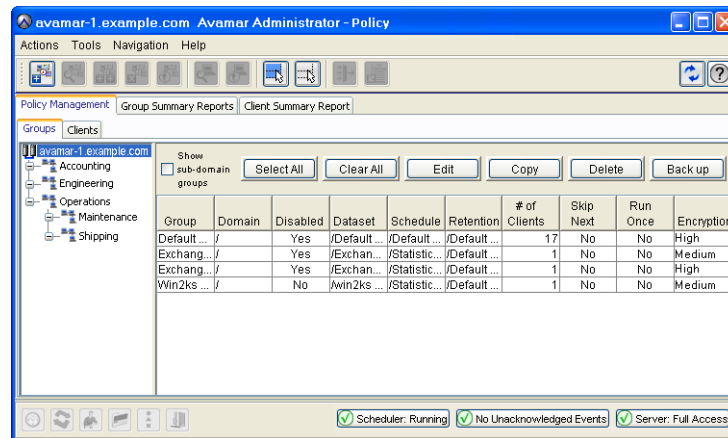
Refer to your *Avamar VMware Guide* for additional information about using the Default Proxy Group, Default Virtual Machine Group and vCenter groups to manage the VMware Image backup and restore feature.

**Inheritance and Client Overrides.** Clients inherit the dataset, schedule and retention policy settings by way of their membership in a specific group. For example, all members of the Default Group inherit the system default dataset, Default Schedule and retention policy.

You can override inherited dataset and retention policy settings by making explicit dataset (page 155) or retention policy (page 156) assignments on a client-by-client basis. However, schedules are only applicable to groups, not individual clients.

## Policy Window Overview

The Policy window allows you to assign members (clients) to a group and specify which dataset, retention policy and schedule each group should use.



**Groups Tab.** The Groups tab shows the various groups in the system on a domain-by-domain basis and allows you to easily view group properties in a tabular format.

**TIP:** Setting **Show sub-domain groups** allows you to view groups in the current domain and all subdomains.

The Groups tab also provides the following action buttons:

BUTTON	DESCRIPTION
<b>Select All</b>	Clicking <b>Select All</b> selects all groups for modification.
<b>Clear All</b>	Clicking <b>Clear All</b> clears all groups (opposite of <b>Select All</b> ).
<b>Edit</b>	<p>Selecting one or more groups and clicking <b>Edit</b> displays the Edit Group dialog box, which allows you to modify various group properties and settings.</p> <p>If multiple groups are selected, the following properties and settings are modifiable for all selected groups:</p> <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Dataset</li> <li>• Schedule</li> <li>• Retention Policy</li> <li>• Encryption</li> </ul> <p><b>IMPORTANT:</b> Your login domain (page 28) controls which specific datasets, retention policies and schedules are available to be assigned in the Groups tab. Only those datasets, retention policies and schedules residing at the current and higher are shown. Datasets, retention policies and schedules residing in lower subdomains are not shown.</p>

BUTTON	DESCRIPTION
<b>Copy</b>	<p>Selecting a group and clicking <b>Copy</b> displays the Save As dialog box, which you can use to copy this group (and all group properties) to another domain.</p> <p><b>IMPORTANT:</b> You cannot copy more than one group at a time.</p>
<b>Delete</b>	<p>Selecting a group and clicking <b>Delete</b> permanently removes that group from the system.</p> <p>Deleting a group does not affect any member (client) backups stored in the system. However, a client must always be a member of at least one group. Therefore, if you attempt to delete a group in which client members do not belong to another group, you will be advised to move those clients to another group and the delete operation will not succeed.</p> <p><b>IMPORTANT:</b> You cannot delete more than one group at a time.</p>
<b>Back up</b>	<p>Selecting a group and clicking <b>Back up</b> initiates and on-demand backup of that group.</p>

**Clients Tab.** The clients tab shows clients assigned to various groups in the system on a domain-by-domain basis and allows you to easily view client properties in a tabular format.

---

**TIP:** Setting **Show sub-domain clients** allows you to view clients assigned to groups in the current domain and all sub-domains.

---

The Clients tab also provides the following action buttons:

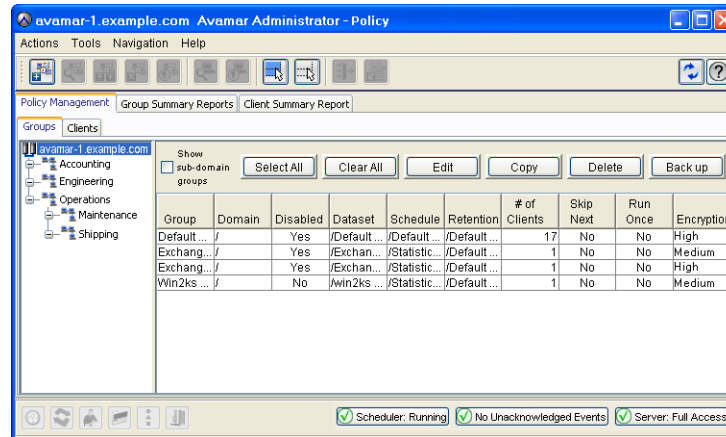
BUTTON	DESCRIPTION
<b>Select all</b>	Clicking <b>Select All</b> selects all clients for modification.
<b>Clear all</b>	Clicking <b>Clear All</b> clears all clients (opposite of <b>Select all</b> ).
<b>Details</b>	Selecting a client and clicking <b>Details</b> displays the Client Details dialog box, which shows that client's properties. <b>IMPORTANT:</b> You cannot view details for more than one client at a time. Refer to <i>Viewing Client Properties</i> (page 44) for additional information about specific client properties.
<b>Edit</b>	Selecting one or more clients and clicking <b>Edit</b> displays the Edit Multiple Clients dialog box, which allows you to override various group policy settings (page 155) on a client-by-client basis. If multiple clients are selected, you can override the following group policy settings for all selected clients: <ul style="list-style-type: none"> <li>• Enable or disable all scheduled backups</li> <li>• Activate or deactivate a client</li> <li>• Allow or disallow client-initiated backups</li> <li>• Change the backup window overtime behavior</li> <li>• Change the encryption method</li> </ul>
<b>Back up</b>	Selecting a client and clicking <b>Back up</b> initiates and on-demand backup of that client (page 74).

## Adding a New Group

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



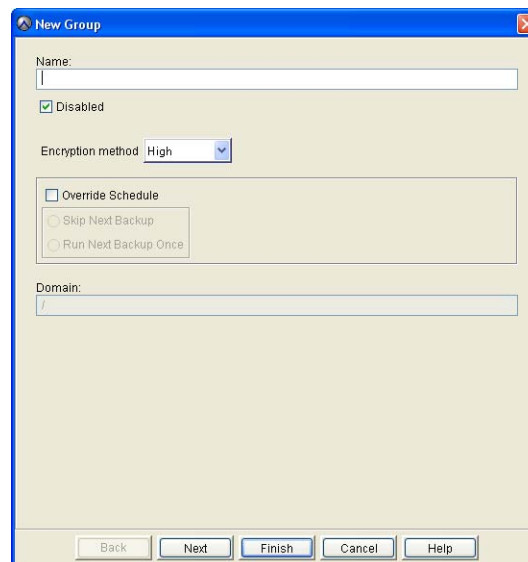
The Policy window appears.



3. Select **Actions > New Group...**, right-click **New Group...** or click the toolbar icon shown immediately to the left.



The New Group wizard appears.



4. Type or select the following:

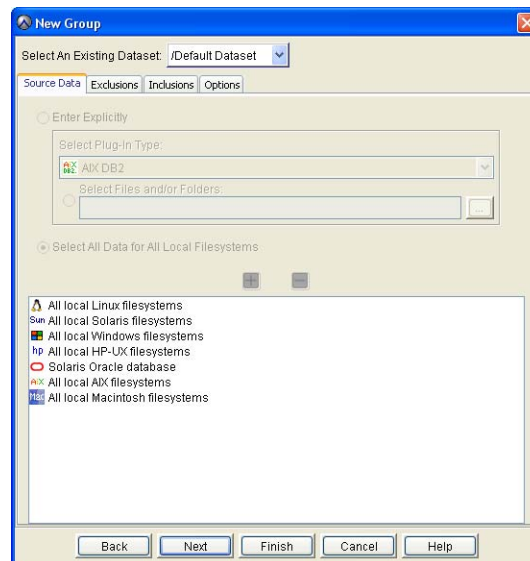
FIELD/OPTION	DESCRIPTION
Name	Type a name for this new group. <b>IMPORTANT:</b> Do not use any of the following characters in your group name: ~!@\$%^&(){}[] ,` ;# \ / : * ? < > " ' & .
Disabled	This option is selected by default. Clear this option if you want to immediately use this group to take regularly scheduled client backups.
Encryption Method	Encryption method used for client/server data transfer. Choices are:  High      Strongest available encryption setting for that specific client platform.  Medium    Medium strength encryption.  None      No encryption.  <b>NOTE:</b> The exact encryption technology and bit strength used for any given client-server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.
Override Schedule	Select this option if you want to override the assigned schedule for this group.  You can also skip the next scheduled backup entirely ( <b>Skip Next Backup</b> ) or perform the next scheduled backup one time only ( <b>Run Next Backup Once</b> ).
Domain	Location in the Avamar server where this group should reside.

The remaining wizard screens are used to select a dataset (page 100), schedule (page 109) and retention policy (page 119), as well as build a client list for this group.

You can click **Finish** at any time. Doing so will cause the new group to be created using system default settings and an empty client list. You can change those settings by editing the group properties (page 138).

5. Click **Next**.

The next New Group wizard screen appears.



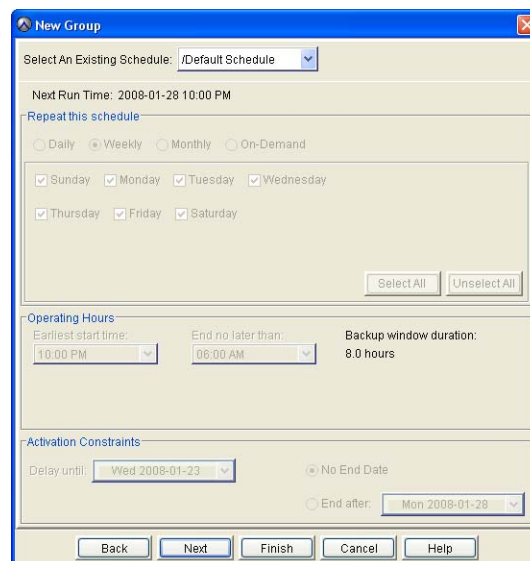
This screen is used to select a dataset (page 100) for use with this group.

6. Select a dataset from the **Select an Existing Dataset** list box.

**NOTE:** Datasets are not modifiable from this screen. Detailed dataset properties are shown so that you can review them prior to making your selection. Refer to *Editing a Dataset* (page 107) for additional information about editing dataset properties.

7. Click **Next**.

The next New Group wizard screen appears.



This screen is used to select a schedule (page 109) for use with this group.

8. Select a schedule from the **Select an Existing Schedule** list box.

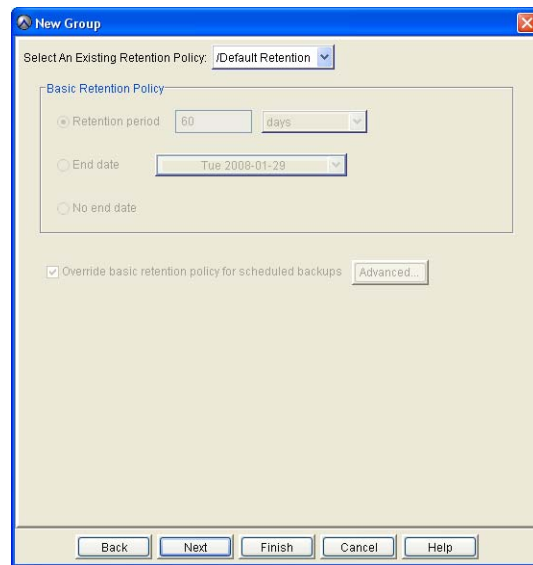
---

**NOTE:** Schedules are not modifiable from this screen. Detailed schedule properties are shown so that you can review them prior to making your selection. Refer to *Editing a Schedule* (page 116) for additional information about editing schedule properties.

---

9. Click **Next**.

The next New Group wizard screen appears.



This screen is used to select a retention policy (page 119) for use with this group.

10. Select a retention policy from the **Select an Existing Retention Policy** list box.

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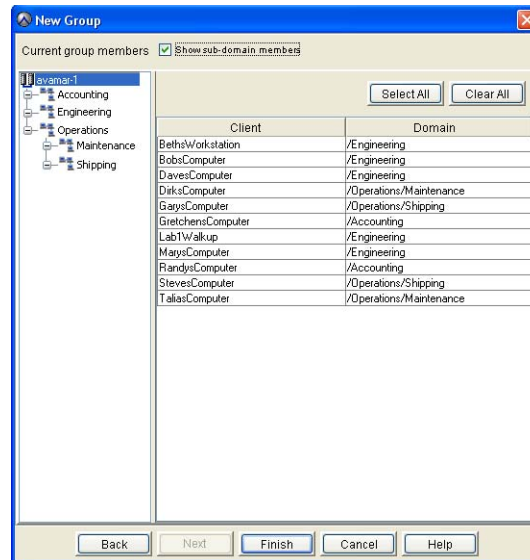
**NOTE:** Retention policies are not modifiable from this screen. Detailed retention policy properties are shown so that you can review them prior to making your selection. Refer to *Editing a Retention Policy* (page 124) for additional information about editing retention policy properties.

---



11. Click **Next**.

The final New Group wizard screen appears.



This screen is used to build a list of clients that will be members of this group.

12. Select one or more clients.

**TIP:** Clicking **Select All** selects all clients; clicking **Clear All** clears all clients (opposite of **Select All**).

13. Click **Finish**.

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

## Editing Group Properties

You can edit properties for a single group or for multiple groups. However, the extent to which certain properties are available for modification differs according to the context:

**Single Group Edits** If you select one group from the Policy window Groups tab, you can edit any property for that group. Refer to *Editing a Single Group* (page 138) for additional information.

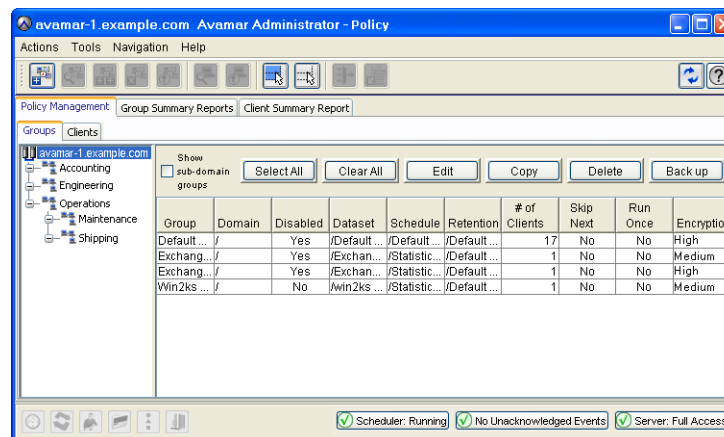
**Multiple Groups Edits** If you select multiple groups from the Policy window Groups tab, you can only edit a constrained subset of group properties. However, any changes you make are applied to all selected groups. Refer to *Editing Multiple Groups* (page 140) for additional information.

The Default Proxy Group, Default Virtual Machine Group contain special settings that are only of interest to persons managing the VMware Image backup and restore feature. Refer to your *Avamar VMware Guide* for additional information about these special settings.

### Editing a Single Group

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.

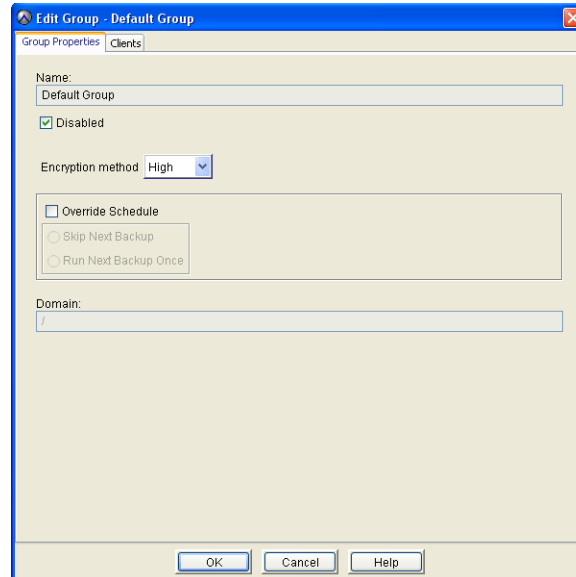


3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group you want to edit.



6. Select **Actions > Group > Edit Group...**, right-click **Edit Group...**, click **Edit** or click the toolbar icon shown immediately to the left.

The Edit Group dialog box appears.



7. Edit the information you want to change.

---

**NOTE:** Only basic group properties such as the name, client list and the dataset, schedule and retention policy assigned to this group are modifiable. The actual dataset, schedule and retention policy objects are not modifiable from this dialog box. Refer to *Editing a Dataset* (page 107), *Editing a Schedule* (page 116) or *Editing a Retention Policy* (page 124) for additional information.

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**NOTE:** Default Group (page 128) policy object assignments cannot be changed. The Default Group always uses the default dataset (page 102), default schedule (page 113) and default retention policy (page 121). Therefore, the Dataset, Schedule and Retention Policy tabs do not appear when editing the Default Group.

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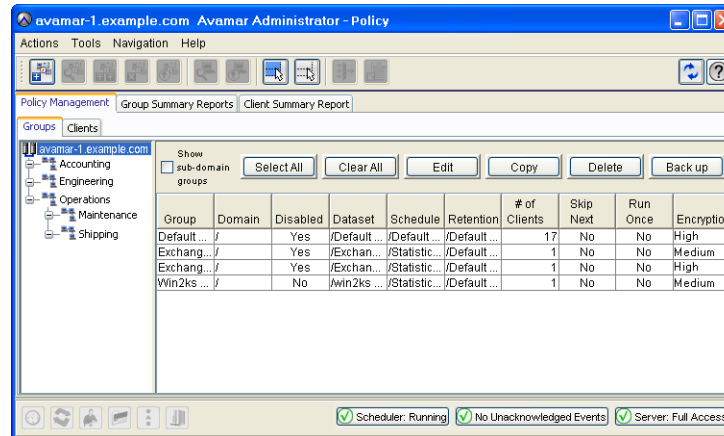
8. Click **OK**.

The Edit Group dialog box closes.

## Editing Multiple Groups

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

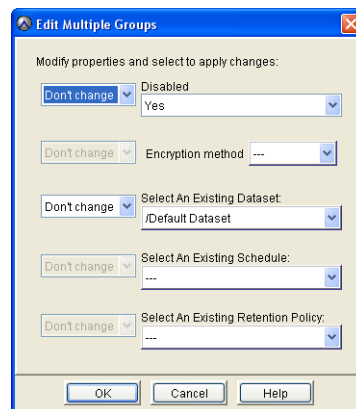
The Policy window appears.



3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the groups you want to edit.
6. Select **Actions > Group > Edit Group...**, right-click **Edit Group...** or click the toolbar icon shown immediately to the left.



The Edit Multiple Groups dialog box appears.



**NOTE:** Only basic group properties such as whether or not the group is enabled or disabled, encryption setting and the dataset, schedule and retention policy assigned to this group are modifiable. The actual dataset, schedule and retention policy objects are not modifiable from this dialog box. Refer to *Editing a Dataset* (page 107), *Editing a Schedule* (page 116) or *Editing a Retention Policy* (page 124) for additional information.

7. Do one or more of the following:

IF	DO THIS
You want to explicitly change a setting for all selected groups	Select the new setting from one of the list boxes.
You want to leave a setting unchanged for all selected groups	Ensure that <b>Don't Change</b> is shown for that particular setting.

8. Click **OK**.

The Edit Multiple Groups dialog box closes.

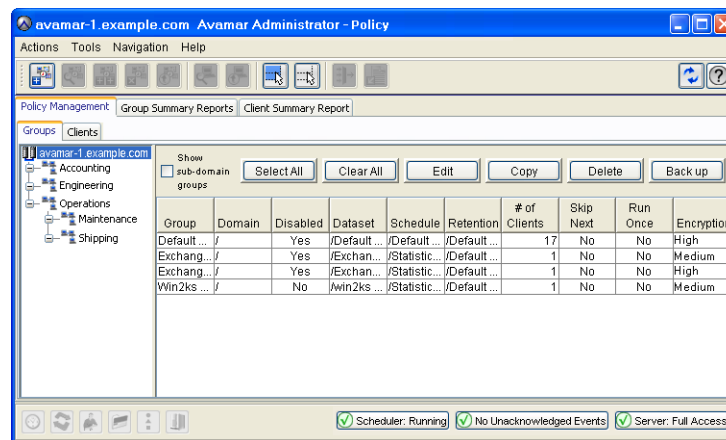
## Copying a Group

**IMPORTANT:** You must copy groups within the same domain. You cannot copy a group to another domain under any circumstances.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the Policy launcher button.



The Policy window appears.



3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group you want to copy.
6. Select **Actions > Group > Copy Group...**, right-click **Copy Group...**, click **Copy** or click the toolbar icon shown immediately to the left.



The Save As dialog box appears.

7. Type or select the following:

FIELD/OPTION	DESCRIPTION
Save As	Type a name for the new group.
Domain	Current domain. This field is read-only.
<b>Include Client Members</b>	Select this option if you want to copy the entire client list to this new group.

8. Click **OK**.

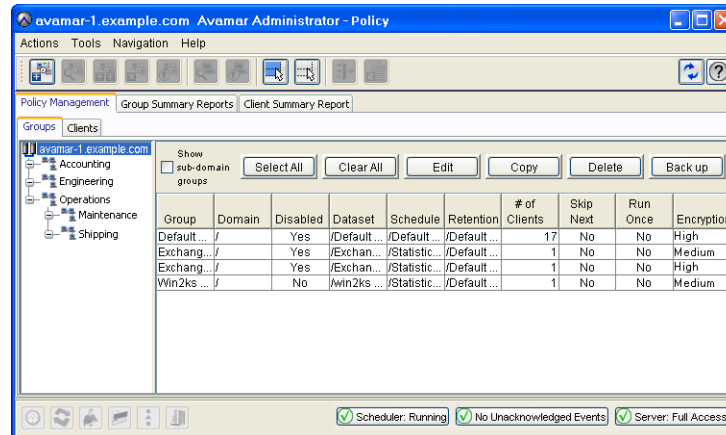
The Save As dialog box closes.

## Disabling a Group

An Avamar Administrator can disable any group so that scheduled group backups will not be performed until it is reenabled (page 144). This is typically done to place the system in a state that will support various maintenance activities.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.



3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group you want to disable.
6. Select **Actions > Group > Disable Group** or right-click **Disable Group**.

This sets the **Disable Group** option on the **Actions > Group** and right-click menus.

A confirmation message appears.

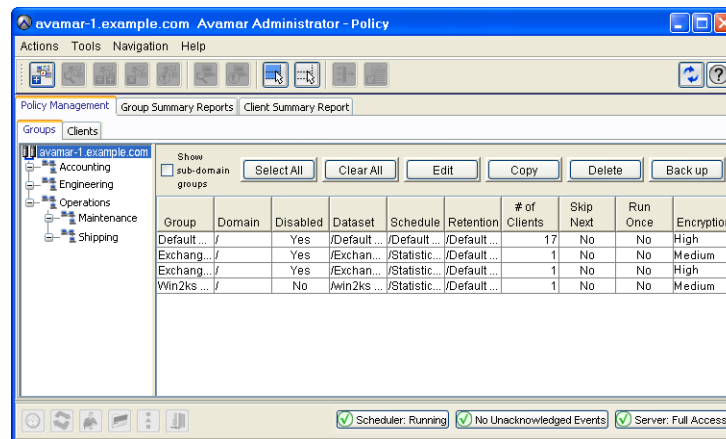
7. Click **Yes** to disable this group.

## Enabling a Group

If a group has previously been disabled (page 143), it must be reenabled before scheduled group backups will be performed.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.



3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group you want to enable.
6. Select **Actions > Group > Disable Group** or right-click **Disable Group**.  
This clears the **Disable Group** option on the **Actions > Group** and right-click menus.  
A confirmation message appears.
7. Click **Yes** to enable this group.

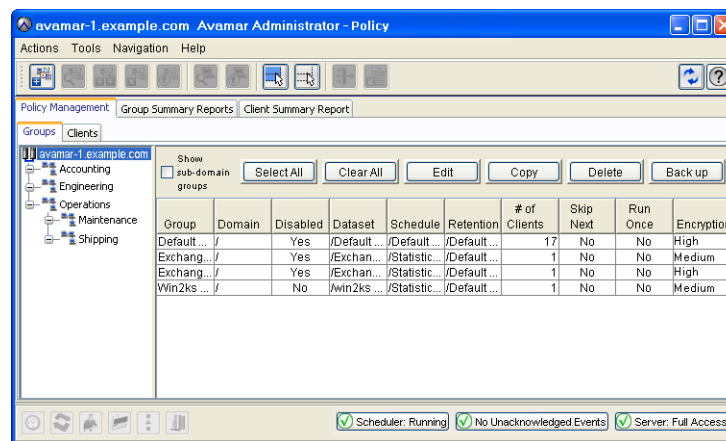


## Deleting a Group

**TIP:** Prior to deleting this group, you should make this group's clients members of another group so that regularly scheduled backups continue uninterrupted. Refer to *Editing Client Information* (page 42) for additional information about adding clients to other groups.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.



3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group you want to delete.
6. Select **Actions > Group > Delete Group**, right-click **Delete Group...** or click the toolbar icon shown immediately to the left.



A message appears asking you to confirm this action.

7. Click **Yes** to permanently delete this group.

A second message appears confirming that this action has successfully completed.

8. Click **OK**.

The second confirmation message closes.

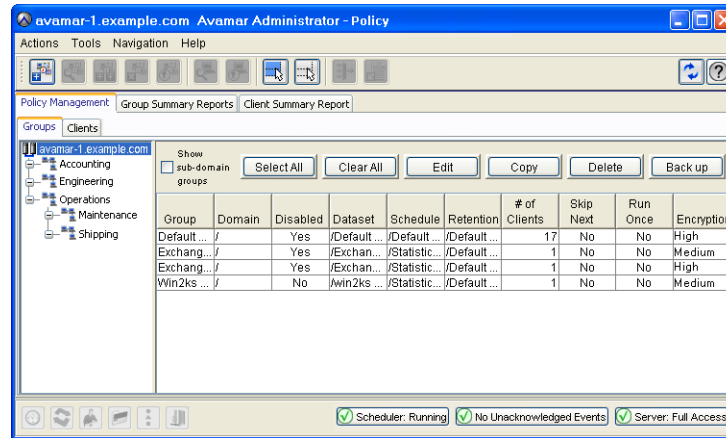
## Viewing the Group Summary Reports

The Group Summary Reports are a combined “at a glance” view of all current group properties and settings (including group policy overrides), as well as the resources (datasets, schedules, retention policies) assigned to various groups.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.



3. Click the Group Summary Reports tab.

The Group Summary Reports appear.

TAB	DESCRIPTION
Datasets	Shows which datasets (page 100) are assigned to which groups, as well as the current properties and settings for those datasets. Refer to <i>Creating a New Dataset</i> (page 104) for additional information about dataset properties and settings.
Schedules	Shows which schedules (page 109) are assigned to which groups, as well as the current properties and settings for those schedules. Refer to <i>Creating a New Schedule</i> (page 114) for additional information about schedule properties and settings.
Retention Policies	Shows which retention policies (page 119) are assigned to which groups, as well as the current properties and settings for those retention policies. Refer to <i>Creating a New Retention Policy</i> (page 122) for additional information about retention policy properties and settings.

TAB	DESCRIPTION
Clients	<p>Shows which clients are assigned to which group, as well as any group policy overrides in effect for a particular client.</p> <p>Refer to <i>Adding a New Group</i> (page 133) and <i>Overriding Group Policy Settings</i> (page 155) for additional information about assigning clients to a group and group policy override settings, respectively.</p>

## Viewing the Group Status Summary

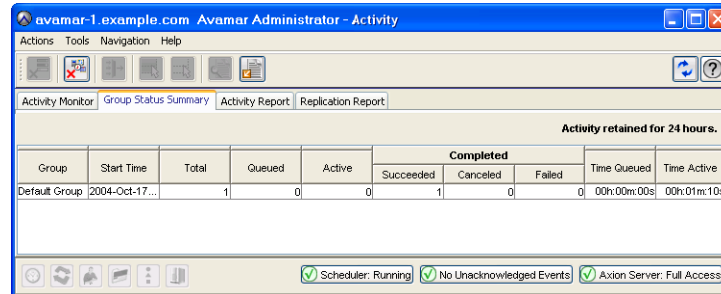
The Group Status Summary is a simplified presentation of all backup activity initiated as a result of group policies.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.



The Activity window appears.

3. Click the Group Status Summary tab.



COLUMN	DESCRIPTION
Group	Group name or "on-demand." On-demand is a special logical grouping that summarizes all on-demand backup activity initiated from Avamar clients or Avamar Administrator. However, it is not an actual group in the Avamar server.
Start Time	Time that this group became eligible to be run.
Total	Total number of backups initiated by way of this group policy.
Queued	Total number of backups, initiated by way of this group policy, that are currently in the scheduler queue.
Active	Total number of backups, initiated by way of this group policy, that are currently being performed.
Succeeded	Total number of backups, initiated by way of this group policy, that successfully completed.
Canceled	Total number of backups, initiated by way of this group policy, that were canceled before they could complete.
Failed	Total number of backups, initiated by way of this group policy, that did not successfully complete.
Time Queued	Interval from start time until the first client work order is started by any client in this group.
Time Active	Total amount of time used to actually perform all backup activities for this group (that is, interval from the time the first client work order is started until the last client work order is finished).

## Managing Group Membership

Avamar Administrator allows you to manage group membership by adding new clients or removing existing clients from any existing group

Avamar Administrator provides two basic methods for managing group membership:

- Group-centric** From group properties, you can add (page 149) or remove (page 151) one or more member clients.
- Client-centric** From client properties, you can add (page 152) or remove (page 153) one or more groups of which this client is a member.

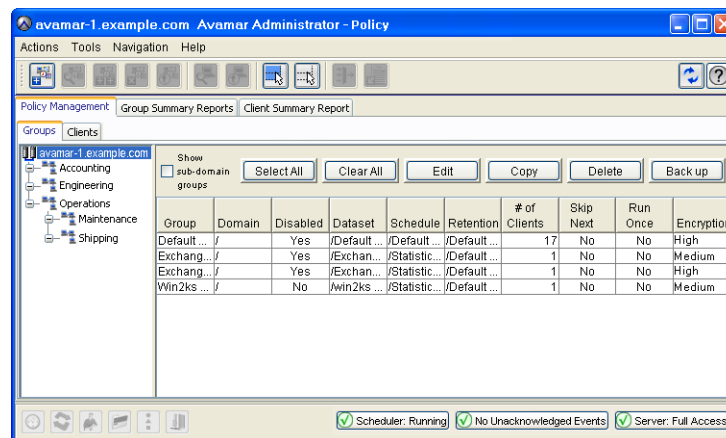
Either method supports multiple additions or deletions in the same operation and either method accomplishes the same objective. However, the flexibility of performing either a group-centric or client-centric operation allows you to decide which method is most efficient for you in a given situation.

For example, if adding or deleting multiple clients from a single group, the group-centric method of editing that group's properties is going to be the most efficient way to accomplish this objective. Conversely, if adding or removing a single client from multiple groups, then the client-centric method of editing that client's properties is going to be the most efficient way to accomplish that objective.

### Adding Clients To a Group

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.



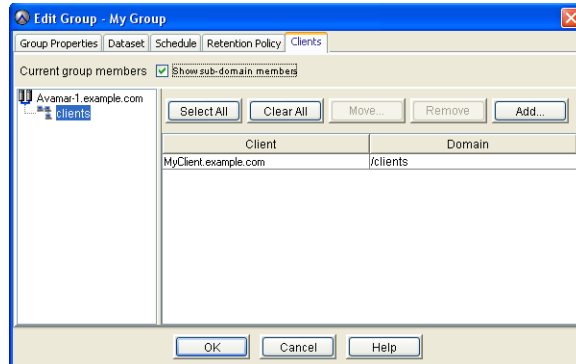
3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group you want to edit.



6. Select **Actions > Group > Edit Group...**, right-click **Edit Group...**, click **Edit** or click the toolbar icon shown immediately to the left.

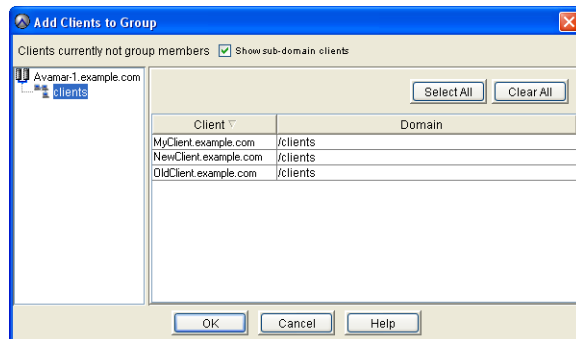
The Edit Group dialog box appears.

7. Click the Clients tab.



8. Click **Add**.

The Add Clients to Group dialog box appears.

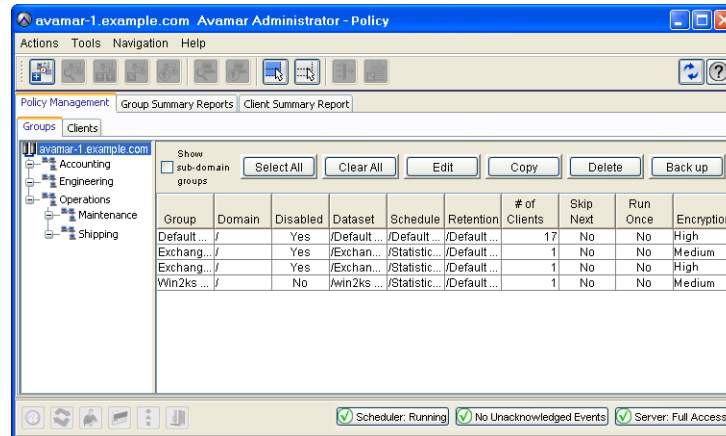


9. Select one or more clients.
10. Click **OK**.  
The Add Clients to Group dialog box closes.
11. Switch to Edit Group dialog box and click **OK**.  
The Edit Group dialog box closes.

## Removing Clients From a Group

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.

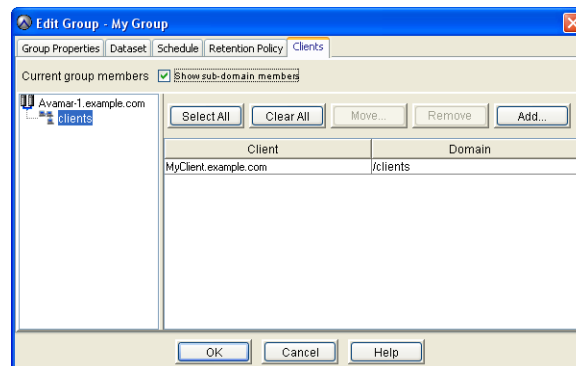


3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group you want to edit.
6. Select **Actions > Group > Edit Group...**, right-click **Edit Group...**, click **Edit** or click the toolbar icon shown immediately to the left.



The Edit Group dialog box appears.

7. Click the Clients tab.



8. Select one or more clients you want to remove from this group.
9. Click **Remove**.
10. Click **OK**.

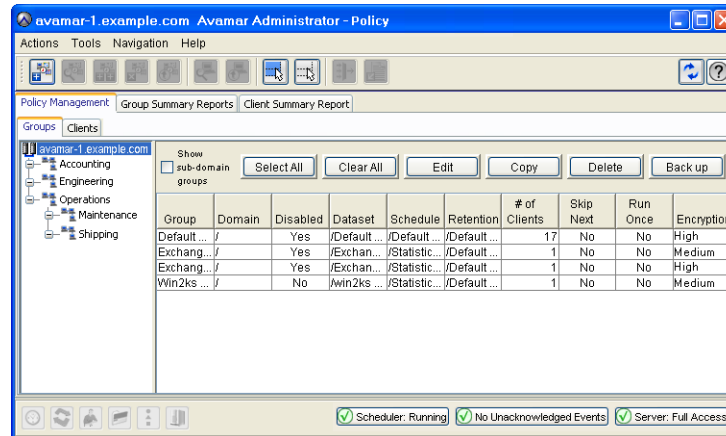
The Edit Group dialog box closes.

## Adding Groups To a Client

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

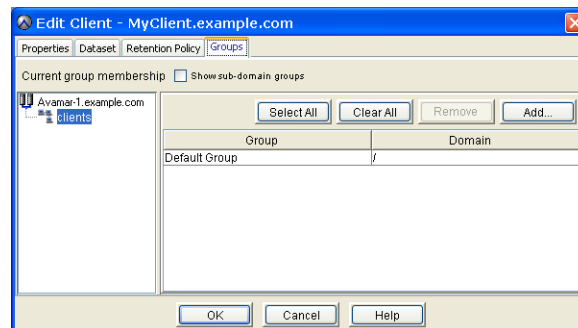


3. Click the Policy Management tab.
4. Click the Clients tab.
5. Select the client you want to edit.
6. Select **Actions > Client > Edit Client...**, right-click **Edit Client...**, click **Edit** or click the toolbar icon shown immediately to the left.



The Edit Client dialog box appears.

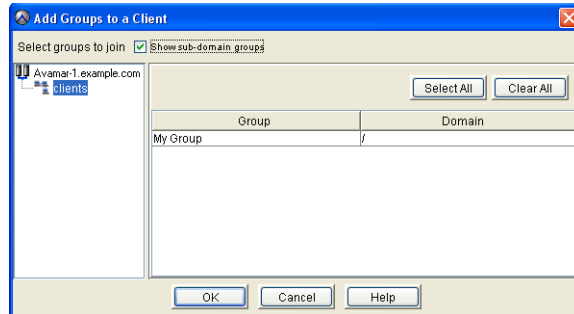
7. Click the Groups tab.





8. Click **Add**.

The Add Group to Client dialog box appears.



9. Select one or more groups.

10. Click **OK**.

The Add Group to Client dialog box closes.

11. Switch to Edit Client dialog box and click **OK**.

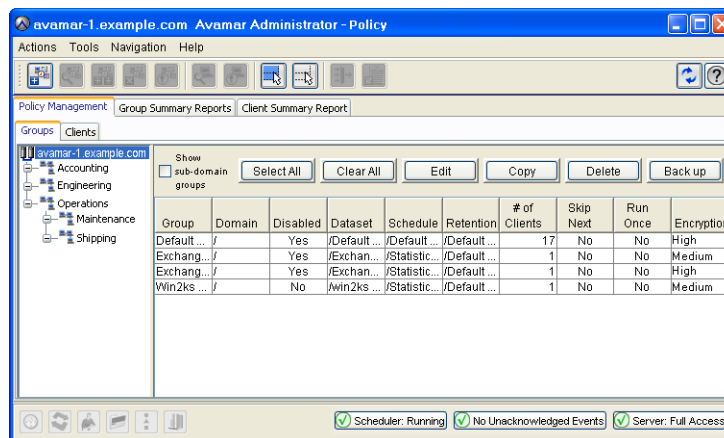
The Edit Client dialog box closes.

## Removing Groups From a Client

1. Start Avamar Administrator (page 21).

2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.



3. Click the Policy Management tab.

4. Click the Clients tab.

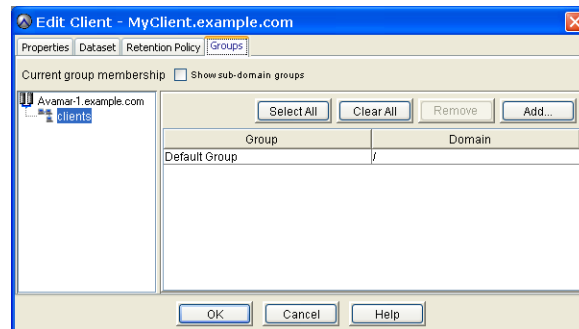
5. Select the client you want to edit.

6. Select **Actions > Client > Edit Client...**, right-click **Edit Client...**, click **Edit** or click the toolbar icon shown immediately to the left.



The Edit Client dialog box appears.

7. Click the Groups tab.



8. Select one or more groups you want to remove from this client.

9. Click **Remove**.

10. Click **OK**.

The Edit Client dialog box closes.

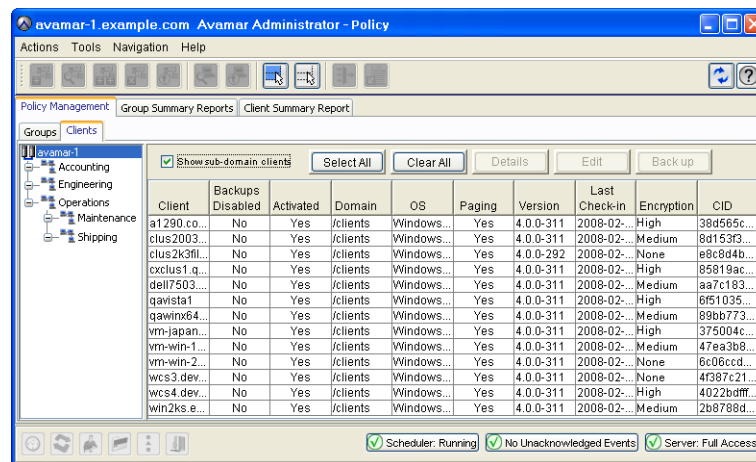
## Overriding Group Policy Settings

Occasionally, one might want to override the group policy settings for a particular client. You can assign datasets and retention policies, as well as change the encryption method on a client-by-client basis.

**IMPORTANT:** It should be understood that too many overrides can make group policies less effective. In some cases, it might be better to implement a new group policy rather than repeatedly override an existing policy at the client level.

### Assigning a Different Dataset to a Client

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.  
The Policy window appears.
3. Click the Policy Management tab.
4. Click the Clients tab.

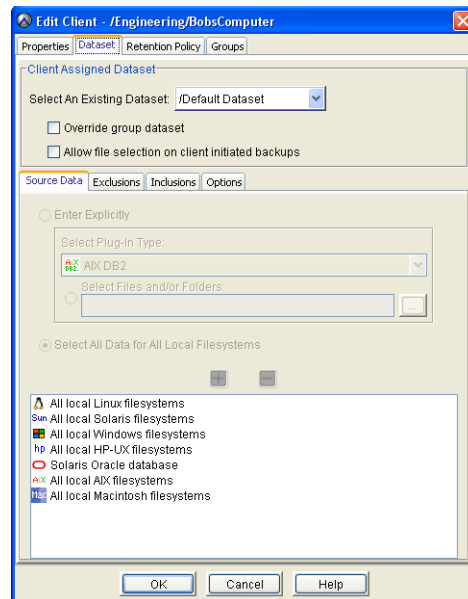


5. Select the client to which you want to assign this dataset.
6. Select **Actions > Client > Edit Client...** or click the toolbar icon shown immediately to the left.



The Edit Client window appears.

7. Click the Dataset tab.



8. Select a dataset from the **Select an Existing Dataset** list box.

**NOTE:** Datasets are not modifiable in this window. Detailed dataset properties are shown so that you can review them prior to making your selection. Refer to *Editing a Dataset* (page 107) for additional information about editing dataset properties.

9. Select **Override group dataset**.

10. Click **OK**.

The Edit Client window closes.

## Assigning a Different Retention Policy to a Client

This is the retention policy that will be used for on-demand backups (page 74) of this client.

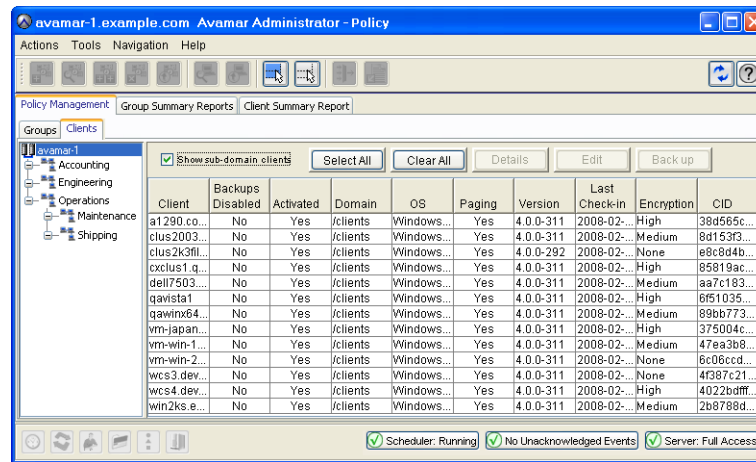
1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.

3. Click the Policy Management tab.



4. Click the Clients tab.



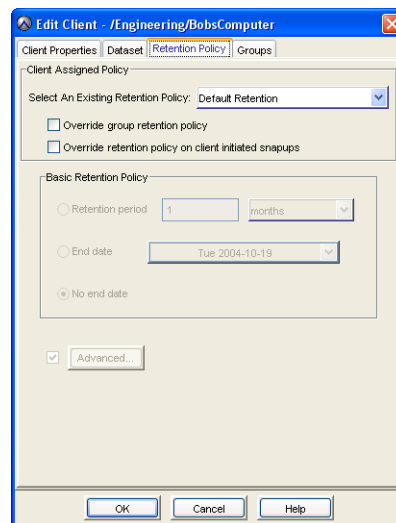
5. Select the client to which you want to assign this retention policy.

6. Select **Actions > Client > Edit Client...** or click the toolbar icon shown immediately to the left.



The Edit Client window appears.

7. Click the Retention Policy tab.



8. Select a retention policy from the **Select an Existing Retention Policy** list box.

---

**NOTE:** Retention policies are not modifiable in this window. Detailed retention policy properties are shown so that you can review them prior to making your selection. Refer to *Editing a Retention Policy* (page 124) for additional information about editing retention policy properties.

---

9. Select **Override group retention policy**.

10. Click **OK**.

The Edit Client window closes.

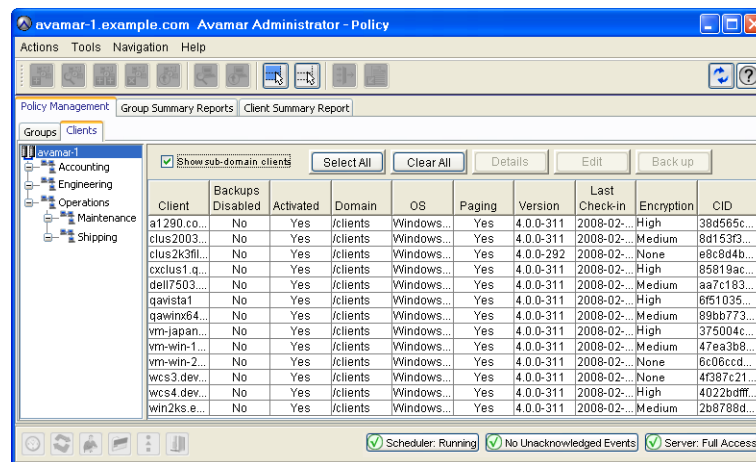
## Changing the Client Encryption Method

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Policy Management tab.
4. Click the Clients tab.

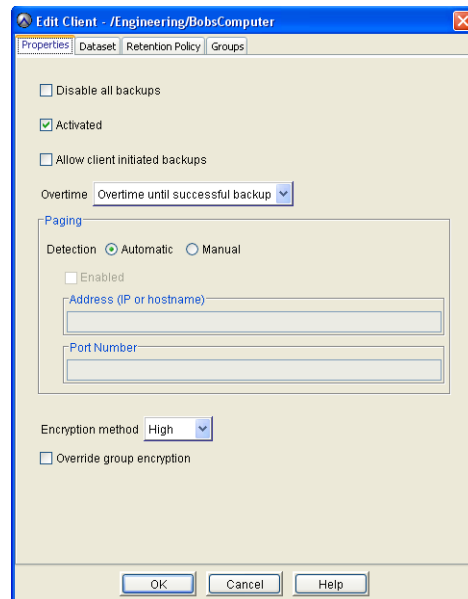


5. Select the client for which you want to change the encryption method.
6. Select **Actions > Client > Edit Client...** or click the toolbar icon shown immediately to the left.



The Edit Client window appears.

7. Click the Properties tab.



8. Select an encryption method from the **Select an Encryption Method** list box.

Choices are:

High      Strongest available encryption setting for that specific client platform.

Medium    Medium strength encryption.

None      No encryption.

**NOTE:** The exact encryption technology and bit strength used for any given client/server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your *Avamar Product Security Guide* for additional information.

9. Select **Override Group Encryption**.

10. Click **OK**.

The Edit Client window closes.

## Allowing Scheduled Backups to Run Overtime

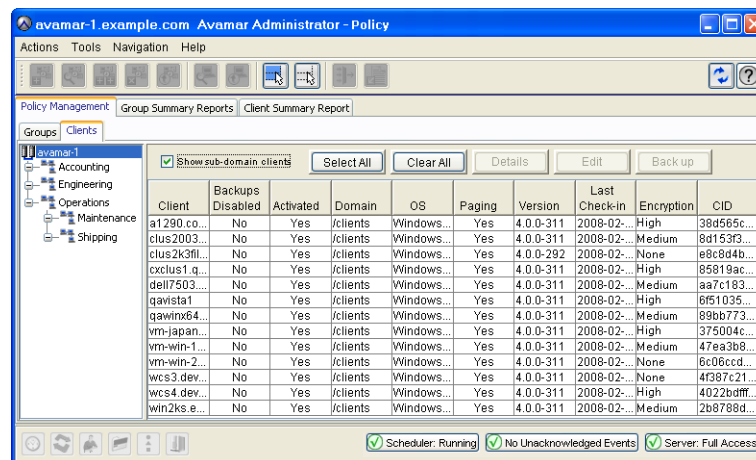
You can override the group schedule duration setting on a client-by-client basis. This will allow scheduled group backups initiated on these selected clients to run as long as necessary in order for the backup to complete, regardless of the group schedule duration setting.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Policy Management tab.
4. Click the Clients tab.



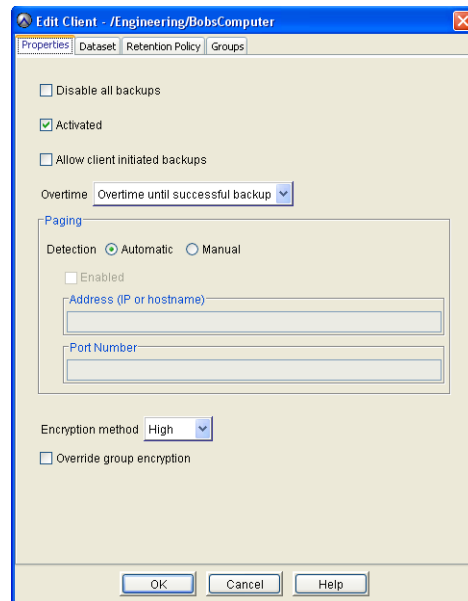
5. Select the client for which you want to allow overtime backups.
6. Select **Actions > Client > Edit Client...** or click the toolbar icon shown immediately to the left.



The Edit Client window appears.



7. Click the Properties tab.



8. Select one of these settings from the Overtime list:

SETTING	DESCRIPTION
No overtime allowed	Scheduled group backups are never allowed to run past the schedule duration setting.
<b>Always allow overtime</b>	Scheduled group backups are always allowed to run past the schedule duration setting.
<b>Overtime on next backup only</b>	Only the next scheduled group backup is allowed to run past the schedule duration setting.
<b>Overtime until successful backup</b>	Scheduled group backups are allowed to run past the schedule duration setting until a successful backup is completed.

9. Click **OK**.

The Edit Client window closes.

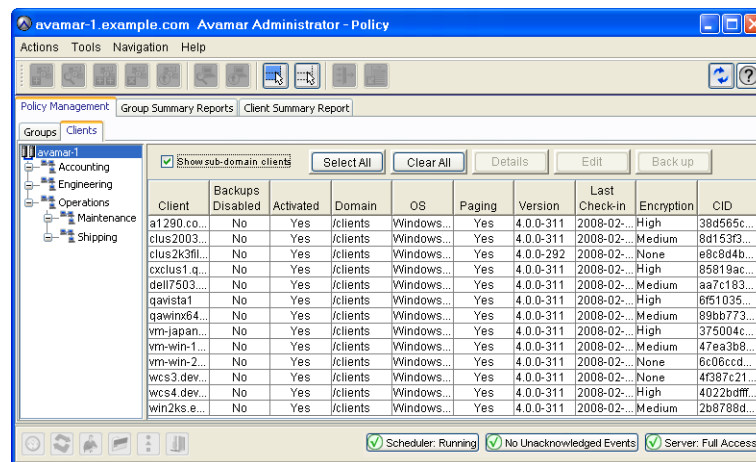
## Allowing Users to Initiate Backups

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Policy Management tab.
4. Click the Clients tab.



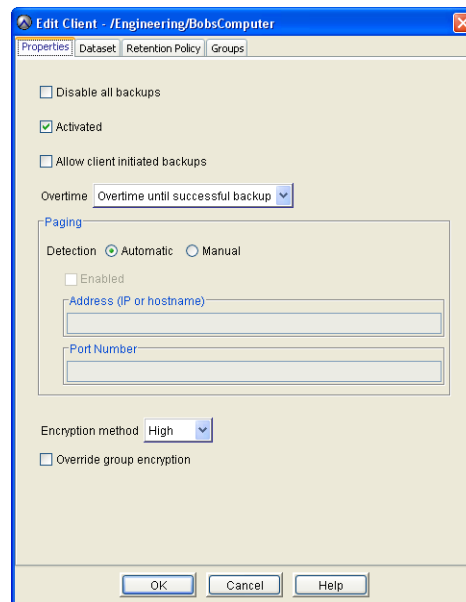
5. Select the client for which you want to allow users to initiate backups.

6. Select **Actions > Client > Edit Client...** or click the toolbar icon shown immediately to the left.



The Edit Client window appears.

7. Click the Properties tab.

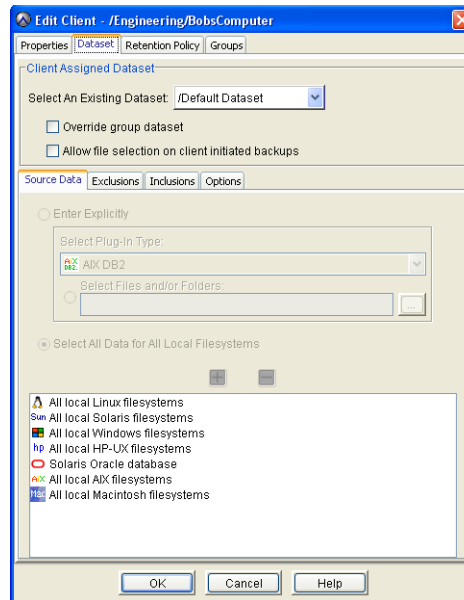


8. Select **Allow client initiated backups**.

If no additional configuration is performed, backups initiated by this client will include only those files selected by the user at the time the backup is initiated and End User On-Demand Retention (page 121) will be applied. However, you can enforce use of a particular dataset and retention policy for all client-initiated backups.

9. If you want to enforce use of a particular dataset for all client-initiated backups, perform the following:

(a) Click the Dataset tab.

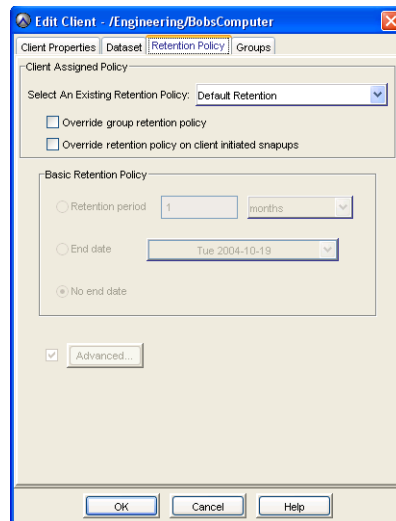


**NOTE:** Datasets are not modifiable in this window. Detailed dataset properties are shown so that you can review them prior to making your selection. Refer to *Editing a Dataset* (page 107) for additional information about editing dataset properties.

(b) Do one of the following:

IF	DO THIS
You want to use the dataset assigned to this group for all client-initiated backups.	Clear <b>Override group dataset</b> .
You want to enforce use of a specific dataset for all client-initiated backups.	<ol style="list-style-type: none"> <li>1. Select a dataset from the <b>Select an Existing Dataset</b> list box..</li> <li>2. Select <b>Override group dataset</b>.</li> </ol>

10. If you want to enforce use of a particular retention policy for all client-initiated backups, perform the following:
- (a) Click the Retention Policy tab.



**NOTE:** Retention policies are not modifiable in this window. Detailed retention policy properties are shown so that you can review them prior to making your selection. Refer to *Editing a Retention Policy* (page 124) for additional information about editing retention policy properties.

- (b) Do one of the following:

IF	DO THIS
You want to use the retention policy assigned to this group for all client-initiated backups.	Clear <b>Override group retention policy</b> .
You want to enforce use of a specific retention policy for all client-initiated backups.	<ol style="list-style-type: none"> <li>1. Select a retention policy from the <b>Select an Existing Retention Policy</b> list box.</li> <li>2. Select <b>Override group retention policy</b>.</li> <li>3. Select <b>Override retention policy on client initiated backups</b>.</li> </ol>

11. Click **OK**.

The Edit Client window closes.

## Initiating On-Demand Group Backups

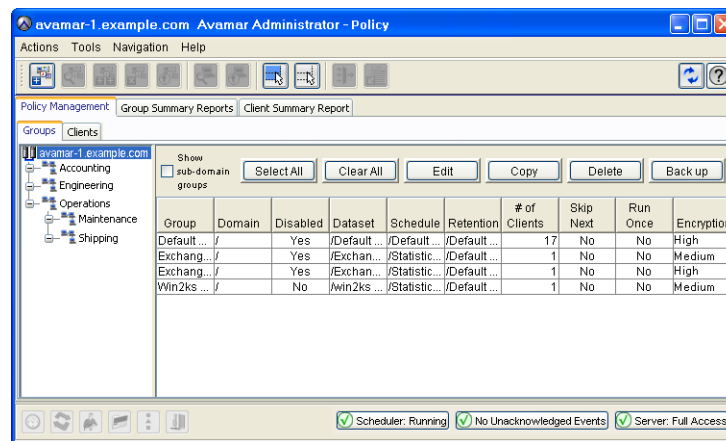
Occasionally, you may want to backup an entire group of clients at some time other than the regularly-scheduled time. While you certainly could perform individual on-demand backups (page 74) for each of these clients, this could be time-consuming if there are many clients. Furthermore, on-demand backups cannot be managed using advanced retention settings (page 120), they can only be assigned a static expiration date.

**“Back Up Group Now” Feature.** In most cases, a better way to accomplish this objective is to use the “Back Up Group Now” feature, which initiates an on-demand group backup for one particular group. Backups taken in this manner are true group backups, which allow you to manage the resultant backups using advanced retention settings.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.



3. Click the Policy Management tab.
4. Click the Groups tab.
5. Select the group for which you want to initiate a backup.
6. Select **Actions > Group > Back Up Group Now**, right-click **Back Up Group Now** or click **Back up**.

A Backup initiated message appears.

7. Click **OK**.

# EVENTS, NOTIFICATIONS AND PROFILES

---

This chapter introduces and discusses Avamar events, as well as various features that can be used to generate various notifications when specific events occur.

## Important Terms and Concepts

This topic discusses the basic concepts and fundamental principles of Avamar events, notifications and profiles.

### Events

All Avamar system activity and operational status is reported as various events to the MCS. Examples of various Avamar events include client registration and activation, successful and failed backups, hard disk status and others. Each event contains the following information for the specific instance of the activity, condition or status reported:

Event code	Unique identifier.
Date and Time	Date and time event was reported.
Category	Category of event (SYSTEM, APPLICATION, USER, SECURITY).
Type	Type of event (INTERNAL, ERROR, WARNING, INFORMATION, DEBUG).
Summary	A one-line summary description of event reported.
Hardware source	System node that reported the event.
Software source	System or application module that reported the event.

## Audit Logging

Certain system events (events with a category of SECURITY and type of AUDIT) are used to implement the Avamar audit logging feature. This feature keeps a permanent log of system actions initiated by users. The data in this log allows enterprises deploying the Avamar to enforce security policies, detect security breaches or deviation from policies and hold appropriate users accountable for those actions.

---

**NOTE:** It must be understood that only actions initiated by users are logged; actions initiated by the system without a user account such as scheduled backups, maintenance activities and so forth are not logged.

---

Because the underlying data for audit log entries are system events, this information is available two places:

- Event Monitor (as with any other system event)
- Audit Log (which only contains events that are also audit log entries)

## Customizing Error Events

By default, Avamar software continually monitors `/var/log/messages` for any occurrence of the case-insensitive search string "error." Any occurrences of "error" create an event code of the type ERROR.

This default behavior can be customized by defining additional search strings that will also create Avamar ERROR events. These additional search case-insensitive strings must be added to `/usr/local/avamar/var/mc/server_data/adminlogpattern.xml`.

## Notifications

Avamar provides a number of features and functions used to generate various notifications when specific events occur.

**Pop-Up Alerts.** Events can be configured on an event-by-event basis to generate a graphical pop-up alert each time one of those events occurs. One significant limitation of this feature is that Avamar Administrator software must be running in order for the pop-up alerts to be displayed.

**Acknowledgement Required List.** Events can be configured on an event-by-event basis such that when events of this type occur, an entry will be added to a list of events that requires interactive acknowledgement by the Avamar system administrator.

**Email Messages.** Events can be configured on an event-by-event basis to send an email message to a designated list of recipients. Email notifications can be sent immediately or in batches at regularly-scheduled times.

A typical batch email notification message looks like this:

```
MCS: avamar-1.example.com
MCS Version: 5.0.2-31
Avamar Server: avamar-1.example.com
Avamar Server Version: 5.0.2-31
```

```
Event profile: My Custom Profile
Count of events: 3
```

Summary of events:

Type	Code	Count	Summary
INFORMATION	22207	1	New group created
INFORMATION	22208	1	Group modified
INFORMATION	22209	1	Group deleted

```
Event Code = 22207
Event Date/Time = 5/10/10 09:58:20 PDT
Event Type = INFORMATION
Event Severity = OK
Event Summary = New group created
Software Source = MCS:CR
```

```
Event Code = 22209
Event Date/Time = 5/10/10 09:58:25 PDT
Event Type = INFORMATION
Event Severity = OK
Event Summary = Group deleted
Software Source = MCS:CR
```

```
Event Code = 22208
Event Date/Time = 5/10/10 10:55:28 PDT
Event Type = INFORMATION
Event Severity = OK
Event Summary = Group modified
Software Source = MCS:CR
```

**Syslog Support.** Events can be configured on an event-by-event basis to log information to local or remote syslog files based on filtering rules configured for the syslog daemon receiving the events. Third-party monitoring tools and utilities capable of examining log entries can access the syslog files and process them in order to integrate Avamar event information into larger site activity and status reports. Refer to *Monitoring the Avamar Server Using syslog* (page 188) for additional information.

**SNMP Support.** The Avamar SNMP implementation provides two distinct ways to access Avamar server events and activity completion status:

SNMP requests provide a mechanism for SNMP management applications to “pull” information from a remote SNMP-enabled client (in this case, the Avamar server).

SNMP traps provide a mechanism for the Avamar server to “push” information to SNMP management applications whenever designated Avamar events occur. Events can be configured on an event-by-event basis to output SNMP traps.

Refer to *Monitoring the Avamar Server Using SNMP* (page 191) for additional information.



## Profiles

Profiles are a notification management feature that are used to logically group certain event codes together and specify which notifications should be generated when these events occur. There are two basic types of event profiles:

**System Profile.** There is only one System event profile. It contains all possible system event codes.

**Custom Profiles.** Custom profiles are used to send various notifications when certain system events occur. You can create as many custom profiles as you need to organize your system events and generate the desired notifications when any of those events occur.

## Profile Catalog

**System Profile.** There is only one System event profile. It contains all possible system event codes.

**Evaluation Profile.** The default Avamar configuration includes a special Evaluation Profile profile that is primarily intended to be used to support system evaluations. If enabled, this profile generates an email notification and attaches two weeks worth of Activities - DPN Summary report (page 198) information to the email message.

**High Priority Events Profile.** The default Avamar configuration includes a special High Priority Events profile. If enabled with the default settings, this custom event profile will automatically email the following information to EMC Technical Support (emailhome@avamar.com) twice daily:

- Status of the daily data integrity check
- Selected Avamar server warnings and information messages
- Any Avamar server errors

---

**IMPORTANT:** The existing (factory default) High Priority Events profile is read-only. You can enable it using the factory settings but you cannot directly modify it. If you require custom High Priority Events profile settings, you must copy it, then modify the copy.

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Refer to *Configuring and Enabling the "Email Home" Feature* (page 183) for additional information.

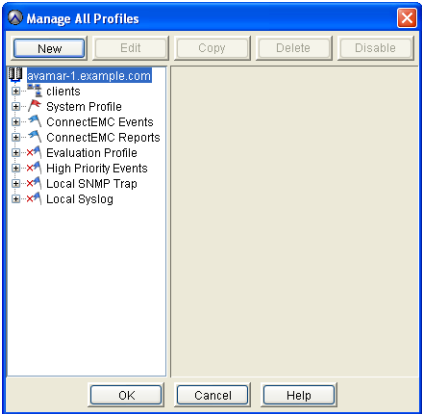
**Local SNMP Trap Profile.** The default Avamar configuration includes a special Local SNMP Trap profile. This profile is read-only. You cannot directly modify it. Furthermore, it is intended to be used for test purposes only (to verify that traps are successfully generated and received by the local snmptrapd process, which will then write the trap information to a syslog file). Refer to *Monitoring the Avamar Server Using SNMP* (page 191) for additional information.

**Local Syslog Profile.** The default Avamar configuration includes a special Local Syslog profile. If enabled, this profile will report status by way of the local syslogd process on the Avamar server. Refer to *Monitoring the Avamar Server Using syslog* (page 188) for additional information.

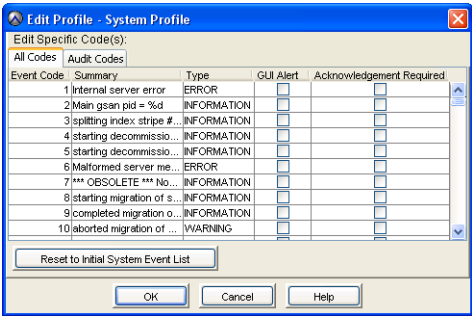
# Editing System Event Profile Properties

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**

The Manage All Profiles dialog box appears.



3. Select the System Profile in the tree pane and click **Edit**.
- The Edit Profile dialog box appears.



4. Select or clear either of the following options for one or more system events:

OPTION	DESCRIPTION
GUI Alert	If selected, show a graphical pop-up alert on the Avamar Administrator client each time this event occurs.
Acknowledgement Required	If selected, add an entry to the common unacknowledged events list each time this event occurs.

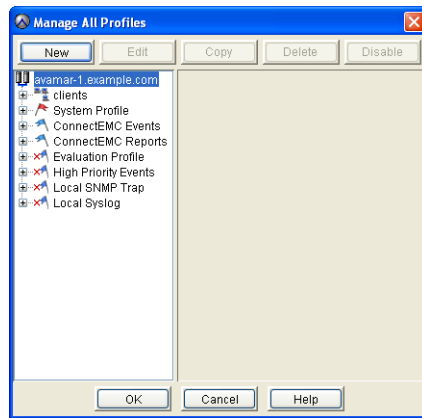
5. Click **OK**.
- The Edit Profile dialog box closes.

## Creating a New Custom Event Profile

**IMPORTANT:** You cannot view system events and profiles outside your domain (page 33). This directly affects the profiles you can edit and the specific events you can add to any profile.

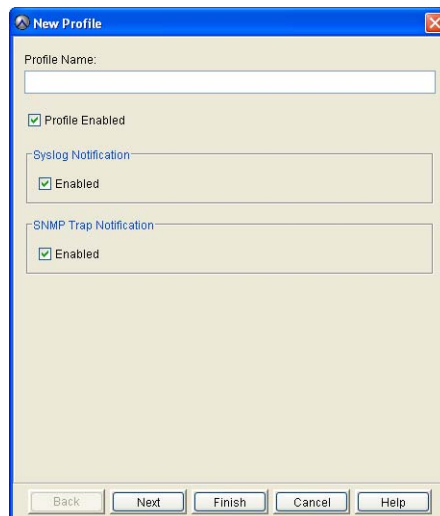
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**

The Manage All Profiles dialog box appears.



3. In the tree, select the domain to which you want to add this custom event profile and click **New**.

The New Event Profile wizard appears.



4. Type or select the following:

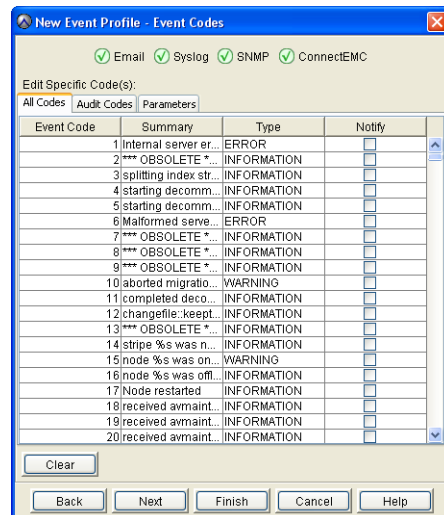
FIELD/OPTION	DESCRIPTION
Profile Name	Type a name for this event profile
<b>Profile Enabled</b>	Select this option if you want this event profile to be active; clear this option if you want this event profile to be inactive. You can enable it (page 181) at any time.
Syslog Notification - <b>Enabled</b>	Clear this option if you do not want to use the syslog notification feature with this profile.
SNMP Trap Notification - <b>Enabled</b>	Clear this option if you do not want to use the SNMP notification feature with this profile.

5. Click **Next**.

The Event Codes wizard screen appears.

This is where you specify which error and audit codes will trigger notifications.

Additionally, if you are adding this custom event profile at the top-level (that is, not to a domain or subdomain), you can also change the parameters used to control capacity forecast alerts.



#### Error Codes

6. Specify which error codes will trigger notifications as follows:

- (a) Click the All Codes tab.
- (b) Select the **Notify** option for one or more error codes.

---

**NOTE:** An asterisk (\*) next to a **Notify** option indicates an event of such severity that a notification will be sent when that event occurs, if even if other event notifications are sent on a schedule.

---

Audit Codes

7. Specify which audit codes will trigger notifications as follows:

- (a) Click the Audit Codes tab.
- (b) Select the **Notify** option for one or more error codes.

**NOTE:** An asterisk (\*) next to a **Notify** option indicates an event of such severity that a notification will be sent when that event occurs, if even if other event notifications are sent on a schedule.

Parameters

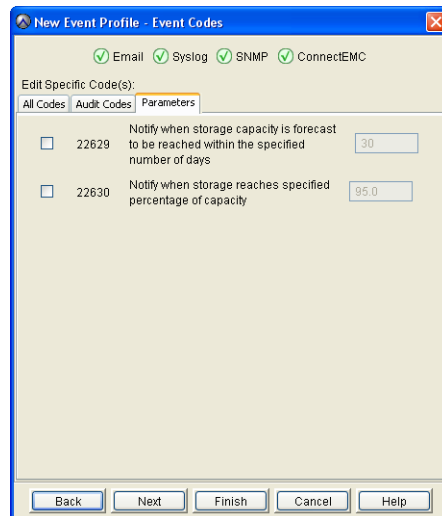
8. Do one of the following:

IF	DO THIS
You want to change the parameters used to control capacity forecast alerts.	Perform step 9.
You do not want to change these settings, or the Parameters tabs does not appear (typically, because you are adding this custom event profile to a domain or subdomain).	Skip step 9 and go directly to step 10.

9. Change the parameters used to forecast capacity usage alerts as follows:

**IMPORTANT:** This feature is only available if you are adding this custom event profile at the top-level (that is, not to a domain or subdomain).

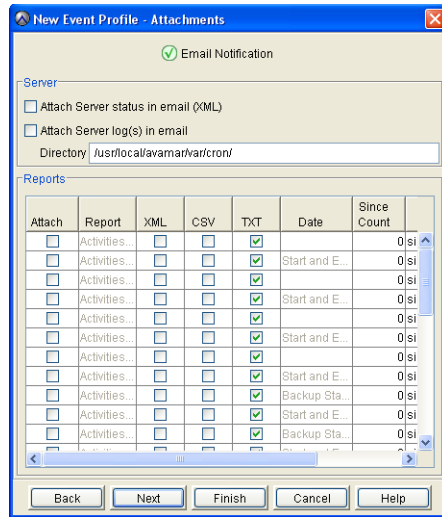
- (a) Click the Parameters tab.



- (b) Select the option corresponding to the parameter you want to change.
- (c) Type a new value for that parameter.
- (d) Repeat steps b through c for each parameter you want to modify.

10. Click **Next**.

The Attachments wizard screen appears.



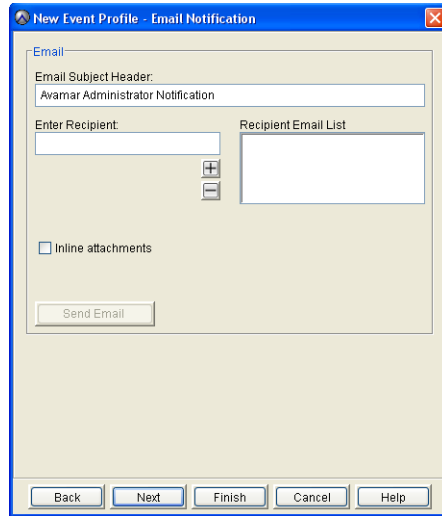
This screen is used to select which attachments will be sent with notification messages and to specify file formats for each attachment.

11. Type or select the following:

FIELD/OPTION	DESCRIPTION
<b>Attach Server status in email (XML)</b>	If selected, a report of overall Avamar server status, in XML format, is included in email notification messages.
<b>Attach Server logs in email</b>	If selected, Avamar server logs are included in email notification messages.
Directory	If <b>Attach Server logs in email (XML)</b> is selected, type the full path to the location of Avamar server logs. Default location is /usr/local/avamar/var/cron/.
Reports - <b>Attach</b>	Select the <b>Attach</b> option next to each report you want include with this notification message.
Reports - <b>XML</b>	Send this attachment as an Extensible Markup Language (XML) file (useful for sharing data with other applications).
Reports - <b>CSV</b>	Send this attachment as a Comma-Separated Values (CSV) text file (useful for importing into a spreadsheet).
Reports - <b>TXT</b>	Send this attachment as a plain text file.

12. Click **Next**.

The Email Notification wizard screen appears.



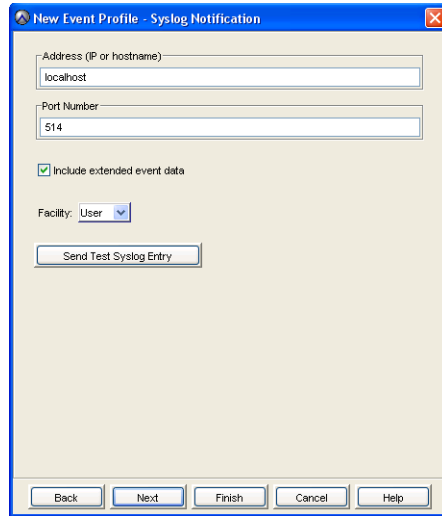
This screen is used to specify recipients that will receive email notification messages.

13. Type or select the following:

FIELD/OPTION	DESCRIPTION
Email Subject Header	Type an email subject line for this notification message.
Enter Recipient	To add a recipient, type one or more email addresses in user@domain format and click +. <b>TIP:</b> If you need to remove a recipient from the Recipient Email list, select it, then click -.
<b>Inline attachments</b>	Select this option if you want all attachments to be inserted directly into the body of these email notification message. <b>IMPORTANT:</b> Selecting this option might create very long email messages.
Send Email	Click this button to immediately send a test email message. If the test email message is successfully sent, an Email accepted by transport layer confirmation message appears.

14. Click **Next**.

The next wizard screen appears.



This screen is used to set various syslog notification parameters.

15. Type or select the following:

FIELD/OPTION	DESCRIPTION
Address (IP or hostname)	IP address or hostname of the Avamar server node running the syslogd process.
Port Number	Port number used for syslog communication.
<b>Include extended event data</b> option	<p>If selected, additional (extended) event code information is included in the syslog message. This extended information is delimited using the following tags:</p> <ul style="list-style-type: none"> <li>• &lt;Code&gt;</li> <li>• &lt;Type&gt;</li> <li>• &lt;Severity&gt;</li> <li>• &lt;Category&gt;</li> <li>• &lt;HwSource&gt;</li> <li>• &lt;Summary&gt;</li> <li>• &lt;active&gt;</li> <li>• &lt;lastEmailSendDate&gt;</li> <li>• &lt;domain&gt;</li> <li>• &lt;scheduleID&gt;</li> <li>• &lt;num_prefs&gt;</li> <li>• &lt;name&gt;</li> <li>• &lt;isSystem&gt;</li> </ul>
Facility	One of the following: user, local0, local1, local2, local3, local4, local5, local6 or local7.



**TIP:** To test your syslog notification parameters, click **Send Test Syslog Entry**.

16. Click **Next**.

The next wizard screen appears.

This screen is used to set various SMNP notification parameters.

17. Type or select the following:

FIELD/OPTION	DESCRIPTION
SNMP Trap Address (IP or hostname)	IP address or hostname of machine running an application capable of receiving and processing an SNMP trap.
Port Number	Port number on host machine that is listening for SNMP traps. Default data port is 162.
SNMP Community	Name of the SNMP community that the SNMP trap listener is configured to use. <b>NOTE:</b> The SNMP community is a text string that the local Net-SNMP agent will use to authenticate itself with the SNMP management application.

**TIP:** To test your SMNP notification parameters, click **Send Test SNMP Trap**.

18. Click **Finish**.

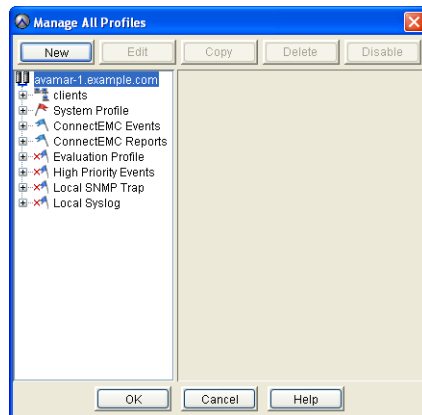
The New Event Profile wizard closes and the new event profile appears in the Manage All Profiles dialog box tree pane.

## Editing Custom Event Profile Properties

**IMPORTANT:** You cannot view system events and profiles outside your domain (page 33). This directly affects the profiles you can edit and the specific events you can add to any profile.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**

The Manage All Profiles dialog box appears.



3. Select a custom event profile in the tree pane and click **Edit**.

The Edit Profile dialog box appears.

4. Edit the information you want to change.

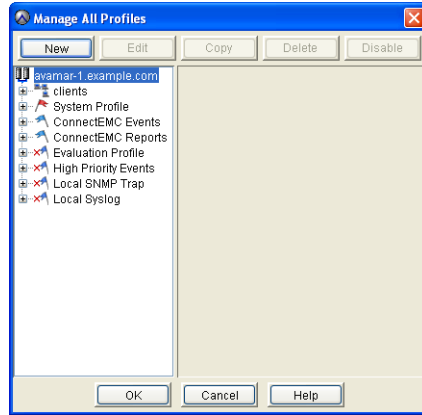
Refer to *Creating a New Custom Event Profile* (page 171) for additional information about custom event profile properties and settings.

5. Click **OK**.

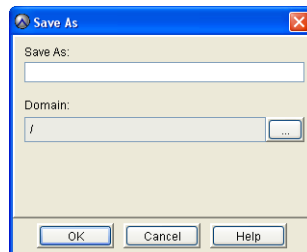
The Edit Profile dialog box closes.

## Copying an Existing Custom Event Profile

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**  
The Manage All Profiles dialog box appears.



3. In the tree, select the profile you want to copy and click **Copy**.  
The Save As dialog box appears.



4. Type a name for the new custom event profile in the Save As field.  
By default, the domain field is populated with the domain of the custom event profile you are copying.
5. Do one of the following:

IF	DO THIS
You want to copy the new custom event profile to the same domain.	Go directly to step 6.
You want to copy the new custom event profile to a new domain.	Click ... (next to the domain field). The Select domain dialog box appears. Browse to the desired domain location in the tree and click <b>OK</b> . The Select domain dialog box closes; the domain you selected appears in the Save As dialog box Domain field.

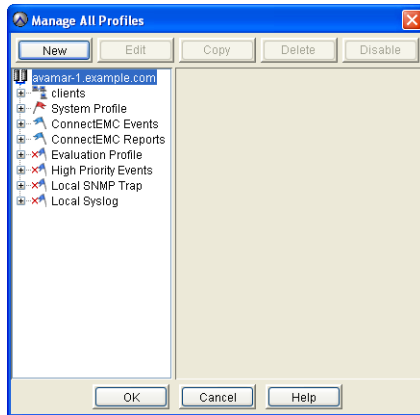
6. Click **OK**.  
The Save As dialog box closes.  
The new custom event profile appears in the tree pane.

## Testing Custom Event Profile Notifications

You can test your custom event profile notification mechanisms by sending a short email message or writing a short message to the syslog file.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**

The Manage All Profiles dialog box appears.



3. Select a custom event profile in the tree pane and click **Edit**.

The Edit Profile dialog box appears.

4. Do one of the following:

IF	DO THIS
You want to send a test email message.	<p>Click the Email Notification tab.</p> <p>Click <b>Send Email</b>.</p> <p>If the test email message is successfully sent, an Email accepted by transport layer confirmation message appears.</p> <p>Click <b>OK</b> to close the confirmation message dialog box.</p>
You want to write a test message to the syslog file.	<p>Click the Syslog Notification tab.</p> <p>Click <b>Send Test Syslog Entry</b>.</p> <p>If the test syslog message is successfully written, an Initiated syslog notification confirmation message appears.</p> <p>Click <b>OK</b> to close the confirmation message dialog box.</p>
You want to send a test SNMP trap message.	<p>Click the SNMP Trap Notification tab.</p> <p>Click <b>Send Test SNMP Trap</b>.</p> <p>If the test SNMP trap message is successfully sent, an Initiated SNMP trap notification confirmation message appears.</p> <p>Click <b>OK</b> to close the confirmation message dialog box.</p>

5. Click **OK**.

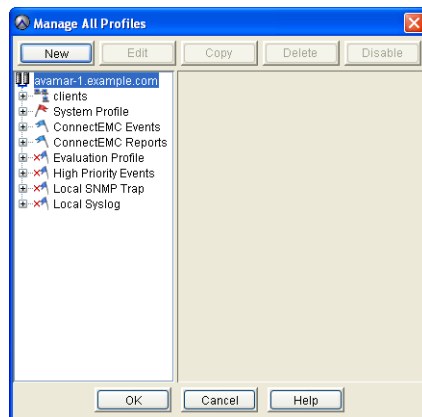
The Edit Profile dialog box closes.

## Disabling a Custom Event Profile

An Avamar administrator can disable any event profile so that email notifications are not sent until it is reenabled.

**IMPORTANT:** You cannot disable the System events profile (page 169).

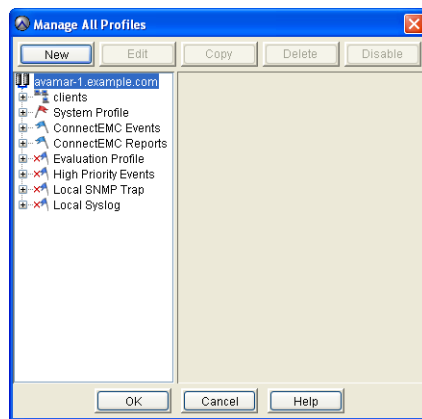
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**  
The Manage All Profiles dialog box appears.



3. Select an event profile in the tree pane and click **Disable**.  
The **Disable** button changes to **Enable**.

## Enabling a Custom Event Profile

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**  
The Manage All Profiles dialog box appears.



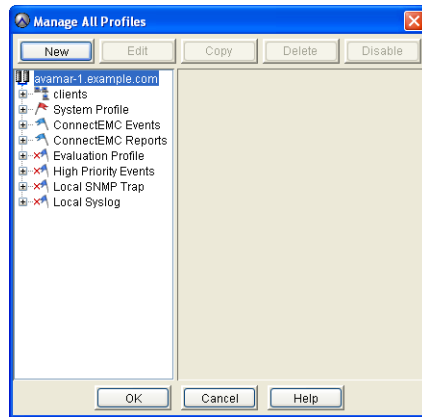
3. Select an event profile in the tree pane and click **Enable**.  
The **Enable** button changes to **Disable**.

## Deleting a Custom Event Profile

**IMPORTANT:** You cannot delete the System events profile (page 169).

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**

The Manage All Profiles dialog box appears.



3. Select an event profile in the tree pane and click **Delete**.  
A confirmation message appears.
4. Click **Yes** to delete the event profile.

## Configuring and Enabling the “Email Home” Feature

When configured and enabled, the Email Home feature automatically emails configuration, capacity, and general system information to EMC Technical Support once daily, and critical alerts in near-real time on an as needed basis.

**Notification Schedule.** By default, these email messages are sent at 6:00 A.M. and 3:00 P.M. each day. The timing of these messages is controlled by the Notification Schedule. Refer to *Schedules* (page 109) for additional information.

**Mail Settings.** In order to properly configure the Email Home feature, you need the following information:

**Outgoing SMTP  
Mail Server Name**

This is the corporate outgoing SMTP mail server that will be used to send Email Home messages.

Typically, the outgoing SMTP mail server name is asked for and stored during initial Avamar server deployment. This procedure asks that you verify this setting. If you need to change this setting, you can do so as part of this procedure.

**IMPORTANT:** In most cases, some arrangement must be made to allow emails originating from the Avamar server to be forwarded through the outgoing SMTP mail server to EMC Technical Support over the Internet.

**Administrative Mail  
Sender Address**

In order for Email Home messages to be received by EMC Technical Support, they must be sent using a valid email address with access to your corporate outgoing SMTP mail server.

**IMPORTANT:** If you do not configure the Email Home feature to send messages from a valid email address, messages generated by the Email Home feature will be rejected by the EMC incoming email server. Furthermore, EMC Technical Support will be completely unaware that these programmatically-generated messages were rejected and because a valid sending email account is not known, programmatically-generated warnings to the sender that these messages could not be sent will never be viewed by anyone who can correct the problem.

**Task Overview.** To fully configure and enable the Email Home feature, you must:

- *Modify mcserver.xml Email Home Settings* (page 184)
- *Configure and Enable the High Priority Events Profile* (page 185)
- *Enable Scheduled Operations* (page 187)

## Modify mcserver.xml Email Home Settings

1. Open a command shell (page 477) and do one of the following:

IF	DO THIS
Configuring a multi-node server	Log into the utility node as user admin.
Configuring a single-node server	Log into the single-node server as user admin.

2. Load the admin OpenSSH key by typing:

```
ssh-agent bash
```

```
ssh-add ~admin/.ssh/admin_key
```

You are prompted to type a passphrase.

3. Type the admin user account passphrase and press **ENTER**.

4. Change directories by typing:

```
cd /usr/local/avamar/var/mc/server_data/prefs
```

5. Open mcserver.xml in a Unix text editor.

6. Find the com.avamar.asn.module.mail node (shown next).

```
<root type="system">
  <node name="com">
    <node name="avamar">
      <node name="asn">
        <node name="module">
          <node name="mail">
            <entry key="smtpHost" value="mail"/>
            <entry key="admin_mail_sender_address" value=""/>
          </node>
        </node>
      </node>
    </node>
  </node>
</root>
```

---

**NOTE:** Substantial portions of mcserver.xml have been omitted for clarity.

---

7. Verify that the smtpHost entry (mail) is the actual name of your outgoing SMTP mail server as defined in corporate DNS (for example, smtp.example.com).

If this entry is not correct, you must change it now.

8. Change the admin\_mail\_sender\_address entry to a valid email address.

For example: jsmith@example.com.

9. Save your changes.

10. Restart the MCS by typing:

```
dpnctl stop mcs
```

```
dpnctl start
```

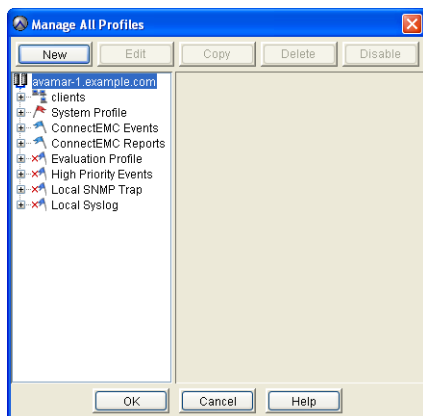
11. Close the command shell.



## Configure and Enable the High Priority Events Profile

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Profiles...**

The Manage All Profiles dialog box appears.




---

**IMPORTANT:** The existing (factory default) High Priority Events profile is read-only. You can enable it using the factory settings but you cannot modify any of the settings. If you require custom High Priority Events profile settings, you must copy it, then modify the copy.

---

3. Do one of the following:

IF	DO THIS
You want to use the (un-modifiable) factory default settings.	Select the existing High Priority Events profile. Perform steps 4 through 5, then go directly to step 10 (skip steps 6 through 9 because the default High Priority Events profile is not modifiable).
You want to use new custom settings.	Create a copy of the existing High Priority Events profile by selecting it and clicking <b>Copy</b> . The Save As dialog box appears. Type a name for this new profile in the Save As field and click <b>OK</b> . The Save As dialog box closes. Select the High Priority Events profile copy you just created.

4. Clear the **Disabled** option.

---

**IMPORTANT:** The Manage Event Codes tab is used to select which event codes will trigger an email notification. However, the High Priority Events profile has been preconfigured to only send notifications for specific high priority events. EMC Technical Support recommends that you use the default settings.

---

5. Select the High Priority Events profile copy you created in step 3 and click **Edit**.

The Edit Profile — Custom Profile High Priority Events dialog box appears.

6. Click the Email Notification tab.

7. Type:

FIELD	SETTING
Email Subject Header	<p><b>IMPORTANT:</b> Unless you have a good reason to change this, EMC Technical Support recommends that you use the default email header:</p> <p>Avamar Administrator Notification — High Priority Events</p>
Recipient Email List	<p>Ensure that emailhome@avamar.com is listed.</p> <p><b>TIP:</b> To add additional recipients, type a valid Internet email address in the Enter Recipient field and click +. To remove a recipient, select that recipient in the Recipient Email List and click -.</p>

8. Click **OK**.

The Edit Profile — Custom Profile High Priority Events dialog box closes.

9. Switch to Manage All Profiles dialog box and click **OK**.

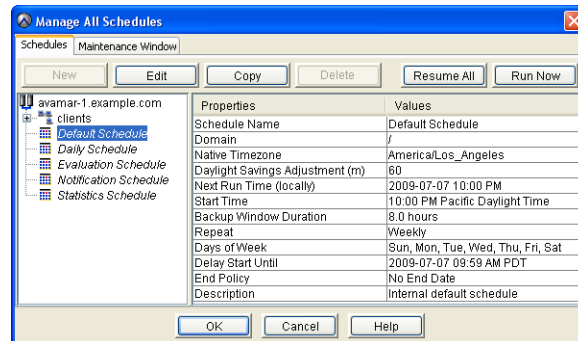
The Manage All Profiles dialog box closes.

## Enable Scheduled Operations

Because the Email Home feature sends email notifications on a predefined schedule, you must enable scheduled server operations before you will actually receive notification email messages.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**

The Manage All Schedules window appears.



3. Click **Resume All**.

The **Resume All** button changes to **Suspend All**.

---

**NOTE:** You can test this events profile by selecting the Notification Schedule and clicking **Run Now**. Check with EMC Technical Support to determine whether the Email Home message was received.

---

## Monitoring the Avamar Server Using syslog

Unix and Linux systems provide a feature called syslog that is used to collect system log messages and write them to a designated log file. Avamar servers are capable of outputting Avamar server event codes in syslog format.

The actual service used to implement this feature is the syslog daemon (syslogd). This service can be hosted locally on the Avamar server or on a remote client as long as that client can communicate with the Avamar server over a network connection.

The following table shows how Avamar event data is mapped into various syslog fields:

SYSLOG FIELDS	AVAMAR EVENT CODE DATA
Facility	One of the following (set by way of the custom event profile Facility field): user, local0, local1, local2, local3, local4, local5, local6 or local7.
Priority	One of the following (based on the Avamar event type): <ul style="list-style-type: none"> <li>• debug - if Avamar event type is DEBUG</li> <li>• err - if Avamar event type is ERROR</li> <li>• info - if Avamar event type is INFO</li> <li>• none - if Avamar event type is INTERNAL</li> <li>• warning - if Avamar event type is WARNING</li> </ul>
Date	Avamar event date.
Time	Avamar event time.
Hardware Source	Avamar event hardware source.
Software Source	Avamar event software source.
Message	The following fields from the Avamar event code: event code, category, summary and event data.

The following is an example Avamar server syslog message:

```
Feb 9 08:23:57 MyAvamar MCS: <Code> 22254 <Category> SYSTEM <Summary> Client Adhoc Backup Request Error - Unknown ID. <Data> Client = ivory
```

In order to monitor an Avamar server using syslog, you must:

- Configure a custom event profile that will output designated Avamar server events to a local or remote syslogd process (page 189)
- Configure syslogd (page 190) so that it can collect information from the Avamar server

## Configure a Custom Event Profile

**Local Syslog Profile.** As previously mentioned, the default Avamar configuration includes a special Local Syslog profile. If enabled, this profile will output Avamar server event messages to the local syslogd process on the Avamar server.

**IMPORTANT:** The existing (factory default) Local Syslog profile is read-only. You can enable it using the factory settings but you cannot directly modify it. If you require custom Local Syslog profile settings, you must copy it, then modify the copy.

**Using a Custom Event Profile.** If you create a new custom event profile (page 171) to support syslog monitoring, ensure that Syslog Notification **Enabled** option is selected on the first wizard screen.

**Continue through the various wizard setup screens until the syslog wizard screen appears.**

Type or select the following:

FIELD/OPTION	DESCRIPTION
Address (IP or hostname)	IP address or hostname of the Avamar server node running the syslogd process.
Port Number	Port number used for syslog communication.

FIELD/OPTION	DESCRIPTION
<b>Include extended event data</b> option	<p>If selected, additional (extended) event code information is included in the syslog message. This extended information is delimited using the following tags:</p> <ul style="list-style-type: none"> <li>• &lt;Code&gt;</li> <li>• &lt;Type&gt;</li> <li>• &lt;Severity&gt;</li> <li>• &lt;Category&gt;</li> <li>• &lt;HwSource&gt;</li> <li>• &lt;Summary&gt;</li> <li>• &lt;active&gt;</li> <li>• &lt;lastEmailSendDate&gt;</li> <li>• &lt;domain&gt;</li> <li>• &lt;scheduleID&gt;</li> <li>• &lt;num_prefs&gt;</li> <li>• &lt;name&gt;</li> <li>• &lt;isSystem&gt;</li> </ul>
Facility	One of the following: user, local0, local1, local2, local3, local4, local5, local6 or local7.

## Configure syslogd

The syslog daemon (syslogd) is configured by way of settings in the `/etc/sysconfig/syslog` configuration file. These settings implement various filtering rules and control where syslog messages are logged.

By default, Avamar writes to syslogd by way of localhost udp port 514. In order for the local syslogd process to monitor these messages, `/etc/syslog.conf` file must be modified to configure syslogd to listen on this data port.

The `/etc/sysconfig/syslog` file typically contains an entry similar to this:

```
SYSLOGD_OPTIONS="-m 0"
```

This entry line must be modified to add the `-r` parameter:

```
SYSLOGD_OPTIONS="-r -m 0"
```

Additionally, after modifying `/etc/sysconfig/syslog`, you must restart the syslogd daemon using the following command:

```
kill -SIGHUP `cat /var/run/syslogd.pid`
```

A complete discussion of configuring syslogd is beyond the scope of this publication. Refer to your Unix or Linux operating system documentation for additional information.

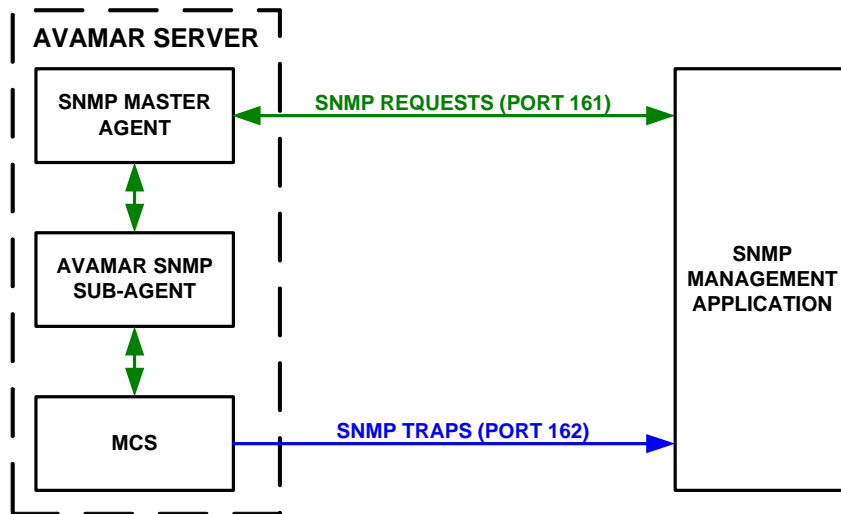
## Monitoring the Avamar Server Using SNMP

Simple Network Management Protocol (SNMP) is a protocol for communicating and monitoring event notification information between an application, hardware device or software application and any number of monitoring applications or devices.

**Prerequisite Knowledge.** Persons configuring an Avamar server to send event information over SNMP should be familiar with basic SNMP concepts. A complete discussion of basic SNMP concepts and implementation is beyond the scope of this publication. Go to [www.net-snmp.org](http://www.net-snmp.org) for additional information.

The Avamar SNMP implementation provides two distinct ways to access Avamar server events and activity status:

- SNMP requests
- SNMP traps



**SNMP Requests.** SNMP requests provide a mechanism for SNMP management applications to “pull” information from a remote SNMP-enabled application or device (in this case, the Avamar server). The SNMP management application sends a request to an SNMP master agent running on the Avamar server. The SNMP master agent then communicates with the Avamar SNMP sub-agent, which passes the request to the MCS. The MCS retrieves the data, sends it back to the Avamar SNMP sub-agent, which passes it back to the management application by way of the SNMP master agent. Data port 161 is the default data port for SNMP requests.

**SNMP Master Agent.** Avamar servers purchased directly from EMC use the Net-SNMP master agent. Avamar servers built with other industry standard hardware will likely use an SNMP master agent provided by the hardware manufacturer.

**SNMP Traps.** SNMP traps provide a mechanism for the Avamar server to “push” information to SNMP management applications whenever designated Avamar events occur. Data port 162 is the default data port for SNMP traps. Typically, the SNMP management application will listen for any SNMP traps generated by designated remote hosts.

**Management Information Base (MIB).** Each SNMP application or device defines what specific information can be monitored or which traps are sent and stores this information in a Management Information Base (MIB). SNMP management applications load various MIBs in order to determine what information can be expected from the respective SNMP applications or devices.

In order to enable an SNMP management application to monitor an Avamar server, the Avamar MIB definition file (AVAMAR-MCS-MIB.txt) must be loaded into the master MIB used by the SNMP management application. The Avamar MIB definition file can be found in the following locations:

- Single-node servers in /usr/local/avamar/doc
- Multi-node servers in utility node /usr/local/avamar/doc
- Computers running Avamar Administrator in INSTALL-DIR/doc

Where INSTALL-DIR is typically C:\Program Files\avs\administrator on Microsoft Windows computers, /usr/local/avamar on Linux computers or /opt/AVMRconsl on Solaris computers.

A copy of Avamar MIB definition file (AVAMAR-MCS-MIB.txt) also resides in the /usr/share/snmp/mibs directory on single-node servers and utility nodes. This copy is used by the Avamar SNMP sub-agent and should not be moved or distributed.

**Task List.** In order to monitor an Avamar server using SNMP, you must:

1. Install and configure an AgentX compliant master agent.

If your Avamar server was purchased directly from EMC, the Net-SNMP master agent is already installed. However, you must configure the Net-SNMP agent (page 193).

If your Avamar server is built with other industry standard hardware, you must install and configure the AgentX compliant master agent provided by your hardware vendor.

2. Configure a custom event profile that will output designated Avamar server events to an SNMP trap (page 195).



## Configure Net-SNMP Agent

Avamar provides a command-line utility (`avsetup_snmp`) for configuring the Net-SNMP agent to communicate with the Avamar server by way of the Avamar SNMP sub-agent.

---

**IMPORTANT:** `avsetup_snmp` must be run as root and should be run from the `/root` directory.

---

1. Open a command shell (page 477) and do one of the following:

IF	DO THIS
Configuring a multi-node server	Log into the utility node as root.
Configuring a single-node server	Log into the single-node server root.

2. Type:

```
cd /root
```

```
avsetup_snmp
```

The following information appears in the command shell:

```
avsetup_snmp will help you set up your snmpd config file: /etc/snmp/snmpd.conf
```

```
Enter the port to listen for SNMP requests on [161]:
```

3. Do one of the following:

IF	DO THIS
You want to use the default SNMP request data port (port 161).	Press <b>ENTER</b> to accept the default data port assignment.
You want to use a different SNMP request data port.	Type the data port number and press <b>ENTER</b> .

If `avsetup_snmp` was not able to detect any existing SNMP communities, the following information appears in the command shell:

```
No snmp v1/2 communities configured. Forcing access_control configuration.
```

```
Running snmpconf to configure access_control group.
```

```
reading: /etc/snmp/snmpd.conf
```

```
Do you want to allow SNMPv3 read-write user based access (default = y):
```

4. Type **n** and press **ENTER**.

The following information appears in the command shell:

```
Do you want to allow SNMPv3 read-only user based access (default = y):
```

5. Type **n** and press **ENTER**.

The following information appears in the command shell:

```
Do you want to allow SNMPv1/v2c read-write community access (default = y):
```

6. Type **n** and press **ENTER**.

The following information appears in the command shell:

```
Do you want to allow SNMPv1/v2c read-only community access (default = y):
```

7. Press **ENTER**.

The following information appears in the command shell:

```
Configuring: rocommunity
Description:
  a SNMPv1/SNMPv2c read-only access community name
arguments: community [default|hostname|network/bits] [oid]
The community name to add read-only access for:
```

The SNMP community is a text string that the local Net-SNMP agent will use to authenticate itself with the SNMP management application. MyCommunity is used as an example SNMP community for the remainder of this procedure.

8. Type your SNMP community and press **ENTER**.

The following information appears in the command shell:

```
The hostname or network address to accept this community name from [RETURN for all]:
```

9. Press **ENTER**.

The following information appears in the command shell:

```
The OID that this community should be restricted to [RETURN for no-restriction]:
```

10. Press **ENTER**.

The following information appears in the command shell:

```
Finished Output: rocommunity public MyCommunity
Do another rocommunity line? (default = y):
```

11. Type **n** and press **ENTER**.

The following information appears in the command shell:

```
The following files were created:
  snmpd.conf installed in /etc/snmp
System settings not configured. Forcing system_setup configuration.
Running snmpconf to configure system_setup group.
reading: /etc/snmp/snmpd.conf
```

```
Configuring: syslocation
Description:
  The [typically physical] location of the system.
  Note that setting this value here means that when trying to
  perform an snmp SET operation to the sysLocation.0 variable
  will make the agent return the "notWritable" error code. IE,
  including this token in the snmpd.conf file will disable
  write access to the variable.
arguments: location_string
```

```
The location of the system:
```

12. Type the physical location of the Avamar server and press **ENTER**.

The following information appears in the command shell:

```
Finished Output: syslocation "MyLocation"
```

```
Configuring: syscontact
Description:
```

```
The contact information for the administrator
Note that setting this value here means that when trying to
perform an snmp SET operation to the sysContact.0 variable
will make the agent return the "notWritable" error code. IE,
including this token in the snmpd.conf file will disable
write access to the variable.
arguments: contact_string
```

The contact information:

13. Type your contact information (for example, email address, telephone extension and so forth) and press **ENTER**.

The following information appears in the command shell:

```
Finished Output: syscontact "root@example.com Extension: 1234"
Do you want to properly set the value of the sysServices.0 OID (if you don't
know, just say no)? (default = y):
```

14. Type **n** and press **ENTER**.

The following information appears in the command shell:

```
The following files were created:
snmpd.conf installed in /etc/snmp
Enabling snmpd.
```

## Configure a Custom Event Profile

**Local SNMP Trap Profile.** As previously mentioned, the default Avamar configuration includes a special Local SNMP Trap profile. If enabled, this profile will output Avamar server event messages to the local Net-SNMP trap listener (snmptrapd process).

---

**IMPORTANT:** The Local SNMP Trap profile is read-only. You cannot directly modify it. Furthermore, it is intended to be used for test purposes only (to verify that traps are successfully generated and received by the local snmptrapd process, which will then write the trap information to a syslog file).

In most cases, another custom profile will have to be configured to send Avamar SNMP traps to a remote Net-SNMP trap listener as shown in the diagram on the previous page.

---

**Using a Custom Event Profile.** If you create a new custom event profile (page 171) to support syslog monitoring, ensure that the SNMP Trap Notification - **Enabled** option is selected on the first wizard screen.

Continue through the various wizard setup screens until the SNMP Trap wizard screen appears.

Type or select the following:

FIELD/OPTION	DESCRIPTION
SNMP Trap Address (IP or hostname)	IP address or hostname of machine running an application capable of receiving and processing an SNMP trap.
Port Number	Port number on host machine that is listening for SNMP traps.
SNMP Community	Name of the SNMP community that the SNMP trap listener is configured to use.

**TIP:** To test your SMNP notification parameters, click **Send Test SNMP Trap**.

# REPORTING

---

Avamar provides several features and functions that allow you to output various system information (reports) in various output formats.

Each method of generating reports is covered in greater detail elsewhere in this chapter. Refer to the following topics for detailed information about creating these various reports:

- *Avamar Reports* (page 197)
- *Viewing the Client Summary Report* (page 205)
- *Viewing the Activity Report* (page 209)
- *Viewing the Replication Report* (page 214)
- *Exporting Displayed Tabular Data as CSV Files* (page 217)
- *Support for Third-Party Reporting Tools* (page 222)

## Avamar Reports

The Avamar reports feature allows you to create, manage and run various system reports. When Avamar reports are run, the results are shown in a separate dialog box. The report results can also be exported as a Comma-Separated Values (CSV) text file.

**“Predefined” Reports.** The following “predefined” reports are provided with your Avamar system:

REPORT	DESCRIPTION
Activities - Bytes Protected Client	This report lists the quantity of primary data protected by the system (in bytes) for each client.
Activities - Bytes Protected Client - 2	Same as Activities - Bytes Protected Client, except that an effective date range can be specified.

REPORT	DESCRIPTION
Activities - Bytes Protected Total	This report lists the total quantity of primary data protected by the system (in bytes).
Activities - Bytes Protected Total - 2	Same as Activities - Bytes Protected Total, except that an effective date range can be specified.
Activities - Client Stats	This report lists various client statistics.
Activities - DPN Summary	This report lists summary information about data stored in the Avamar server and statistical data for each client backup.
Activities - Exceptions	This report lists all activities within specified period that succeeded with exceptions.
Activities - Failed	This report lists all activities within specified period that failed due to errors.
Activities - License Bytes Protected Client	This report lists the quantity of primary data protected by the system (in bytes) for each client in the past 14 days. <b>NOTE:</b> This 14-day time frame ensures that any backups belonging to clients that might have migrated to another Avamar server are not included in this server's licensing calculations.
Activities - License Bytes Protected Total	This report lists the total quantity of primary data protected by the system (in bytes) in the past 14 days. <b>NOTE:</b> This 14-day time frame ensures that any backups belonging to clients that might have migrated to another Avamar server are not included in this server's licensing calculations.
Activities - License Client Stats	This report lists various client statistics in the past 14 days. <b>NOTE:</b> This 14-day time frame ensures that any backups belonging to clients that might have migrated to another Avamar server are not included in this server's licensing calculations.
Activities - Plugin Client Stats	This report lists various plugin statistics in the past 14 days. <b>NOTE:</b> This 14-day time frame ensures that any backups belonging to clients that might have migrated to another Avamar server are not included in this server's licensing calculations.

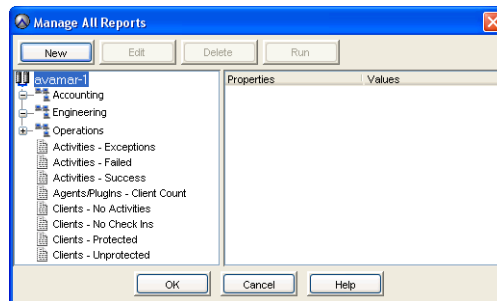
REPORT	DESCRIPTION
Activities - Plugin Stats	This report lists various plugin statistics.
Activities - Success	This report lists all activities within specified period that succeeded without exceptions.
Agents/PlugIns - Client Count	This report lists all agents and plugins installed by all clients and the count for each type.
Capacity Usage	This report lists past server storage capacity utilization. Refer to <i>Capacity Management</i> (page 322) for additional information.
Capacity Forecast	This report lists expected future (that is, forecast) server storage capacity utilization. Refer to <i>Capacity Management</i> (page 322) for additional information.
Clients - No Activities	This report lists all clients that did not have any activities in specified period.
Clients - No Check Ins	This report lists all clients with last check in time not in specified period.
Clients - Protected	This report lists: <ul style="list-style-type: none"> <li>• All clients with at least one backup stored in Avamar server</li> <li>• Plugins and counts for all clients</li> <li>• Client operating systems</li> <li>• Maximum bytes protected for each client</li> <li>• Total bytes protected for all clients</li> </ul>
Clients - Unprotected	This report lists all clients known to MCS but has no clients in Avamar server.
System - Configuration Audit	This report lists all currently installed server operating system RPMs and compares it against a master list that was used to initialize the system.
System - GSAN Perf Stats	This report lists various data server (also known as GSAN) performance statistics that are useful for system tuning and debugging purposes. By default, this report is enabled in the High Priority Events profile (page 169).

# Creating a New Report

**IMPORTANT:** If you intend to send this report as a custom event profile attachment (page 169), you must create this report in the root domain; reports created at lower levels cannot be sent as custom event profile attachments.

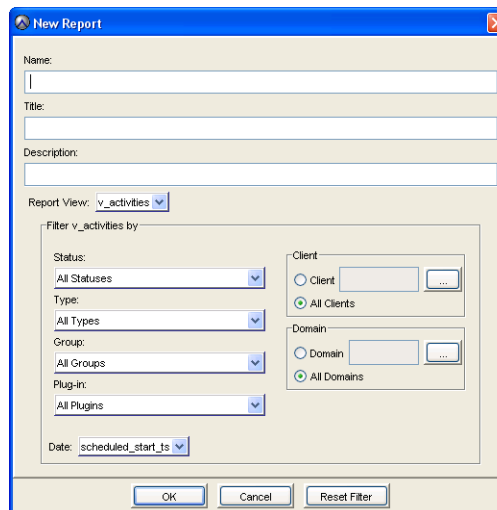
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Reports...**

The Manage All Reports dialog box appears.



3. In the clients tree, select the domain to which you want to add the new report and click **New**.

The New Report dialog box appears.



4. Type or select the following:

FIELD/OPTION	DESCRIPTION
Name	Type a name for this new report.
Title	Type a display title for this report.
Description	Type a short descriptive comment (optional).



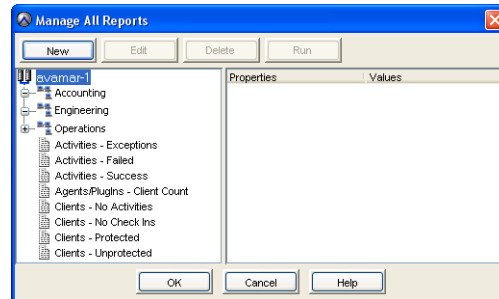
FIELD/OPTION	DESCRIPTION
Report View	<p>Select a database view to use for this report.</p> <p>Refer to <i>Appendix C — MCS and EMS Database Views</i> (page 561) for detailed information about each database view and the individual columns storing data within each view.</p>
Filter by	<p>You can customize your report using the following filtering criteria:</p> <ul style="list-style-type: none"> <li>• Status (for example, all statuses, all failures, all completed and so forth)</li> <li>• Type (all types, on-demand backup, restore, scheduled backup, validate, all backups)</li> <li>• Group (all groups or a specific group)</li> <li>• Plugin (for example, Microsoft Windows filesystem, Solaris Oracle RMAN database and so forth)</li> <li>• Date (for example, scheduled start date, scheduled end date, completed date and so forth)</li> <li>• Domain (all domains or a specific domain)</li> <li>• Client name (all clients or a specific client)</li> </ul>

5. Click **OK**.

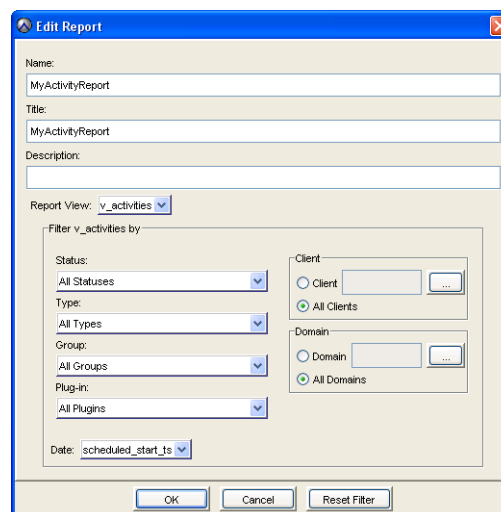
The New Report dialog box closes.

## Editing a Report

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Reports...**  
The Manage All Reports dialog box appears.



3. In the client tree, select the report you want to edit and click **Edit**.  
The Edit Report dialog box appears.

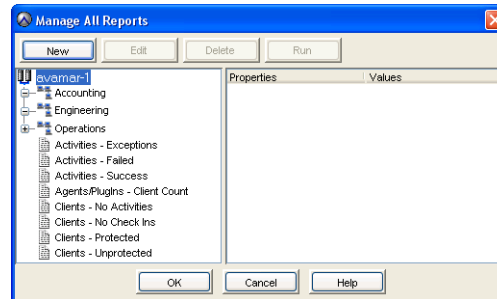


4. Edit the information you want to change.  
Refer to *Creating a New Report* (page 200) for additional information about report properties and settings.
5. Click **OK**.  
The Edit Report dialog box closes.

## Running a Report

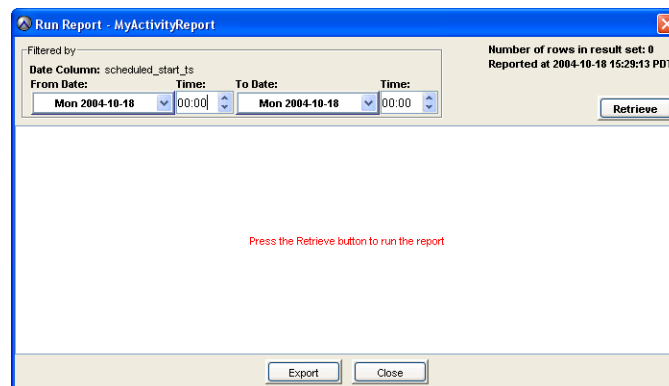
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Reports...**

The Manage All Reports dialog box appears.



3. In the client tree, select the report you want to run and click **Run**.

The Run Report dialog box appears.



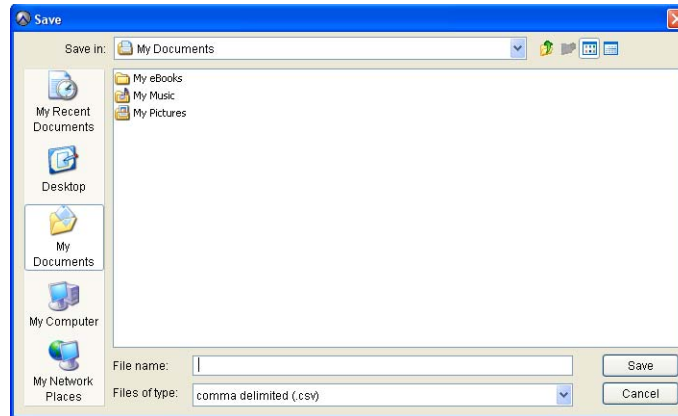
4. Click **Retrieve** to display the report output.

The Run Report dialog box is populated with the current results of this report.

5. If you want to export this data as a Comma-Separated Values (CSV) text file, do the following:

(a) Click **Export**.

The Save dialog box appears.



(b) Browse to the desired folder (directory) and type a descriptive filename in the File name field.

(c) Click **OK**.

The Save dialog box closes.

6. Click **Close**.

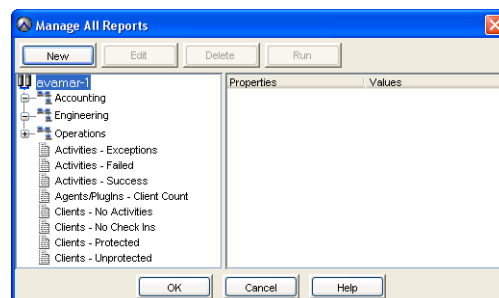
The Run Report dialog box closes.

## Deleting a Report

1. Start Avamar Administrator (page 21).

2. Select **Tools > Manage Reports...**

The Manage All Reports dialog box appears.



3. In the client tree, select the report you want to delete and click **Delete**.

A confirmation message appears.

4. Click **Yes** to permanently delete this report.

## Viewing the Client Summary Report

The Client Summary Report is a combined view of important client properties for all clients registered with this Avamar server.

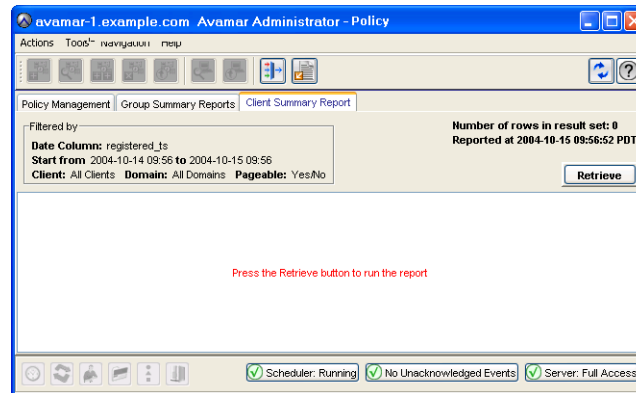
1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Client Summary Report tab.

A blank Client Summary Report window appears.



4. Click **Retrieve**.

The client summary report displays the following information for each client registered on this server:

COLUMN	DESCRIPTION
agent_version	Version of agent installed.
allow_overtime	True if client can ignore scheduling window end time. See also overtime_option (page 207).
allow_userinit_snapup_file_sel	Allow file selection on user initiated backups.
allow_userinit_snapups	Allow user initiated backups.
backed_up_ts	Last backup date/time.
can_page	True if MCS can call out to client.
checkin_ts	Last check-in date/time.
cid	Client ID.
client_addr	Client IP address.
client_name	Client name.

COLUMN	DESCRIPTION
client_type	Client type. Valid values are: <ul style="list-style-type: none"><li>• REGULAR</li><li>• VMware vCenter</li><li>• VMware Image Proxy</li><li>• VMware Virtual Machine</li></ul>
contact_email	Contact email address.
contact_location	Contact location.
contact_name	Person to contact regarding issues with this client.
contact_notes	Contact notes.
contact_phone	Contact phone number.
created	Creation date.
ds_override	True if client can override group dataset
enabled	True if client can generate activities.
full_domain_name	Fully qualified client location.
has_snapups	True if the client has backups.
modified	Date that client information was last modified.
os_type	Client OS type.
override_userinit_retpol	Override standard retention policy on user initiated backups.

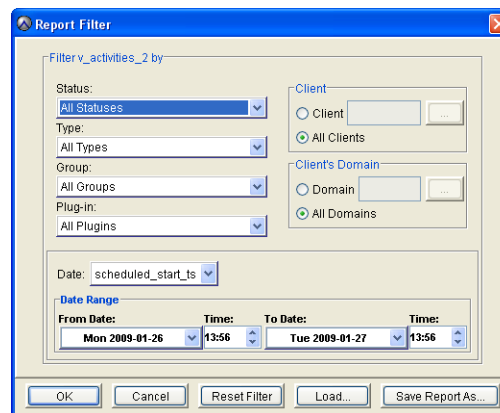
COLUMN	DESCRIPTION
overtime_option	<p>One of the following:</p> <p>ALWAYS            Scheduled group backups are always allowed to run past the schedule duration setting.</p> <p>NEXT                Only the next scheduled group backup is allowed to run past the schedule duration setting.</p> <p>NEXT_SUCCESS    Scheduled group backups are allowed to run past the schedule duration setting until a successful backup is completed.</p> <p>NEVER              Scheduled group backups are never allowed to run past the schedule duration setting.</p> <p>This value is automatically set to NEXT_SUCCESS when client initially registers and is cleared after one backup successfully completes.</p>
page_addr	IP address used to contact this client.
page_port	Data port used to contact this client.
pageadr_locked	
plugin_for_last_backup	Plugin used for the last backup.
rc_override	True if client can override group retry count setting.
registered	True if client has checked into MCS.
registered_ts	Registered date/time.
restore_only	True if client can only do restores.
retry_cnt	Connection retry count.
rp_override	True if client can override group retention policy.

COLUMN	DESCRIPTION
timeout	Connection timeout value.
tp_override	True if client can override group timeout period setting.

**TIP:** You can also reduce the amount of displayed information by “filtering” the Client Summary Report to only show records within a specified range of dates, within a specified client domain or for one specific client.

5. Select **Actions > Filter...**

The Report Filter dialog box appears.



6. Define your filtering criteria and click **OK**.

The Report Filter dialog box closes and the Client Summary Report shows only those records that satisfy your filtering criteria.

**TIP:** Click **Reset Filter** to clear any previous filter settings.



## Viewing the Activity Report

The Activity Report provides detailed information for recent backup, restore and validation activities.

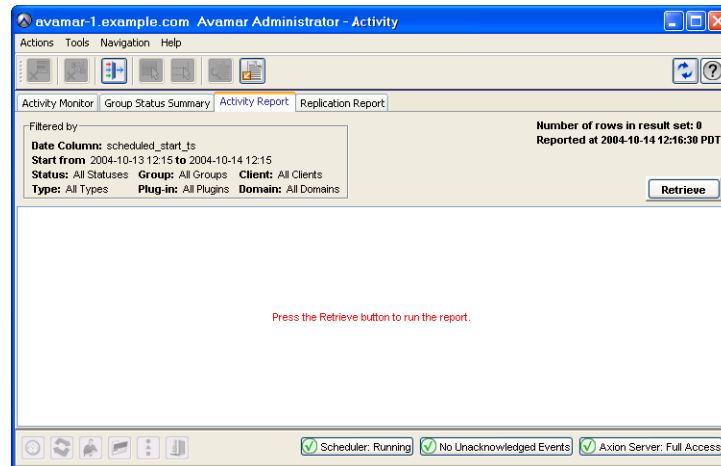
1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.



The Activity window appears.

3. Click the Activity Report tab.

A blank Activity Report window appears.



4. Click **Retrieve**.

The activity report displays the following information for each activity:

COLUMN	DESCRIPTION
backup_label	Backup label. Is blank for replication activities.
backup_number	Backup number. Is blank for replication activities.
bytes_excluded	Total number of bytes intentionally excluded during this activity.
bytes_new	Total number of bytes processed during this activity after data deduplication.
bytes_overhead	Total number of overhead bytes.
bytes_scanned	Total number of bytes processed during this activity.
bytes_skipped	Total number of bytes unintentionally skipped (errors and so forth) during this activity.
cid	Client ID.

COLUMN	DESCRIPTION
client_name	Avamar client name.
client_os	Client operating system.
client_ver	Avamar client software version.
completed_ts	Actual date and time this activity ended, adjusted for the prevailing time zone (shown in parentheses).
current_retention	<p>Current retention types (page 73) assigned to this backup. One or more of the following:</p> <p>D Backup has been tagged as a daily backup.</p> <p>W Backup has been tagged as a weekly backup.</p> <p>M Backup has been tagged as a monthly backup.</p> <p>Y Backup has been tagged as a yearly backup.</p> <p>N Backup has been tagged as having no specific retention type.</p>
dataset	Dataset (page 100) used to perform this backup.
dataset_override	If true, the group dataset was not used for this activity.
domain	Full location of the client in the Avamar server.
effective_expiration	Actual calendar date and time that this backup will expire.
effective_path	Actual dataset used in backup (applies to group-based backups only).
encryption_method	<p>Encryption method used for client/server data transfer. Choices are:</p> <ul style="list-style-type: none"> <li>• proprietary</li> <li>• ssl</li> </ul>

COLUMN	DESCRIPTION
encryption_method2	<p>Encryption method used for client/server data transfer. Choices are:</p> <p>High      Strongest available encryption setting for that specific client platform.</p> <p>Medium    Medium strength encryption.</p> <p>None      No encryption.</p> <p><b>NOTE:</b> The exact encryption technology and bit strength used for any given client-server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.</p>
encrypt_method2_sa	
error_code	<p>If the activity successfully completed, zero appears in this column.</p> <p>If the activity did not successfully complete, a numeric error code will be shown.</p> <p>Refer to your <i>Avamar Event Codes Listing</i> for additional information.</p>
error_code_summary	<p>If activity did not successfully complete, a short summary of this error code.</p>
group_name	<p>If the activity was a scheduled backup, this is the group that this client was a member of when this particular scheduled activity was initiated (clients can be members of more than one group). On-demand is shown for all other activities.</p>
initiated_by	<p>Activity initiated by (applies to On-Demand Backup activity only).</p>
num_files_skipped	<p>Total number of files unintentionally skipped (errors and so forth) during this activity.</p>
num_of_files	<p>Total number of files processed during this activity.</p>

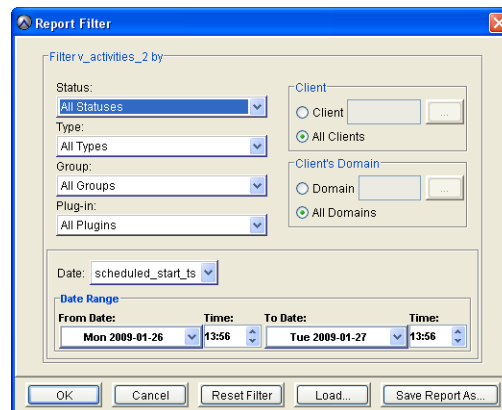
COLUMN	DESCRIPTION
original_retention	<p>Original retention types (page 73) that were programmatically assigned to this backup when it occurred. One or more of the following:</p> <p>D Backup has been tagged as a daily backup.</p> <p>W Backup has been tagged as a weekly backup.</p> <p>M Backup has been tagged as a monthly backup.</p> <p>Y Backup has been tagged as a yearly backup.</p> <p>N Backup has been tagged as having no specific retention type.</p>
plugin_number	Plugin (page 19) used for this activity.
proxy_cid	VMware proxy client unique ID.
retention_policy	Retention policy (page 119) used to perform this backup.
retention_policy_override	If true, the group retention policy was not used for this activity.
schedule	<p>If the activity was a scheduled backup, this is the schedule (page 109) that initiated this activity.</p> <p>On-Demand or End User Request is shown for all other activities initiated from Avamar Administrator or the client, respectively.</p>
scheduled_end_ts	Latest date and time this activity was scheduled to end, adjusted for the prevailing time zone (shown in parentheses).
scheduled_start_ts	Earliest date and time this activity was scheduled to begin, adjusted for the prevailing time zone (shown in parentheses).
session_id	Work order ID. Unique identifier for this activity.
started_ts	Actual date and time this activity was started, adjusted for the prevailing time zone (shown in parentheses).

COLUMN	DESCRIPTION
status_code	Numeric event code describing latest status of this activity. Refer to your <i>Avamar Event Codes Listing</i> for additional information.
status_code_summary	Short summary of this status code.
type	One of the following: <ul style="list-style-type: none"> <li>• On-Demand Backup (page 84)</li> <li>• Scheduled Backup (page 109)</li> <li>• Restore (page 84)</li> <li>• Validate (page 92)</li> </ul>

**TIP:** You can also reduce the amount of displayed information by “filtering” the Activity Report to only show records within a specified range of dates, within a specified client domain or for one specific client.

5. Select **Actions > Filter...**

The Report Filter dialog box appears.



6. Define your filtering criteria and click **OK**.

The Report Filter dialog box closes and the Activity Report shows only those records that satisfy your filtering criteria.

**TIP:** Click **Reset Filter** to clear any previous filter settings.

## Viewing the Replication Report

The Replication Report provides detailed information for recent replication operations.

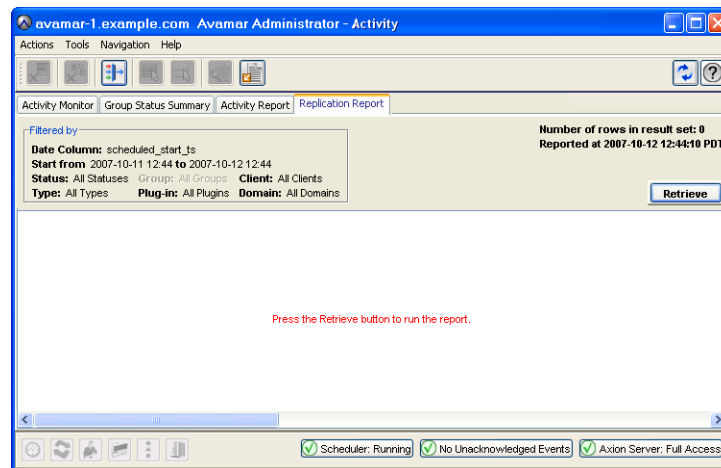
1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.



The Activity window appears.

3. Click the Replication Report tab.

A blank Replication Report window appears.



4. Click **Retrieve**.

The Replication report displays the following information for each replication operation:

COLUMN	DESCRIPTION
bytes_excluded	Total number of bytes intentionally excluded during this replication operation.
bytes_new	Total number of bytes processed during this replication operation after data deduplication.
bytes_overhead	Total number of overhead bytes.
bytes_scanned	Total number of bytes processed during this replication operation.
bytes_skipped	Total number of bytes unintentionally skipped (errors and so forth) during this replication operation.
cid	Client ID.
client_name	Avamar client name.
client_os	Client operating system.

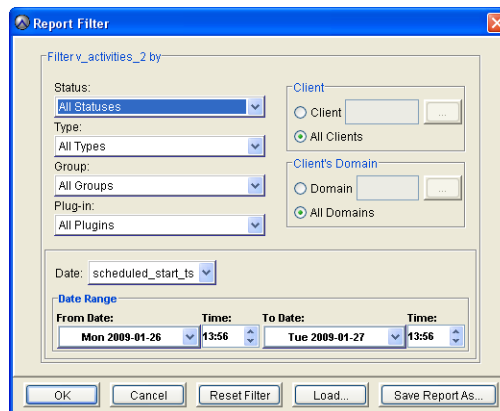
COLUMN	DESCRIPTION
client_ver	Avamar client software version.
completed_ts	Actual calendar date and time this replication operation ended.
domain	Full location of the client in the Avamar server.
encryption_method	Encryption method used for client/server data transfer. Choices are: <ul style="list-style-type: none"> <li>• proprietary</li> <li>• ssl</li> </ul>
encryption_method2	Encryption method used for client/server data transfer. Choices are: <p>Medium    Medium strength encryption.</p> <p>High       Strongest available encryption setting for that specific client platform.</p> <p>None       No encryption.</p> <p><b>NOTE:</b> The exact encryption technology and bit strength used for any given client-server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.</p>
encrypt_method2_sa	
error_code	If replication operation did not successfully complete, a numeric error code will be shown.
error_code_summary	If replication operation did not successfully complete, a short summary of this error code.
num_files_skipped	Total number of files unintentionally skipped (errors and so forth) during this replication operation.
num_of_files	Total number of files processed during this replication operation.
plugin_number	Plugin (page 19) used for this replication operation.
scheduled_end_ts	Calendar date and time this replication operation was scheduled to end.
scheduled_start_ts	Calendar date and time this replication operation was scheduled to occur.

COLUMN	DESCRIPTION
session_id	Work order ID. Unique identifier for this replication operation.
started_ts	Actual calendar date and time this replication operation was started.
status_code	Numeric event code returned by this replication operation.
status_code_summary	Short summary of this status code.

**TIP:** You can also reduce the amount of displayed information by “filtering” the Replication Report to only show records within a specified range of dates, within a specified client domain or for one specific client.

5. Select **Actions > Filter...**

The Report Filter dialog box appears.



6. Define your filtering criteria and click **OK**.

The Report Filter dialog box closes and the Replication Report shows only those records that satisfy your filtering criteria.

**TIP:** Click **Reset Filter** to clear any previous filter settings.



## Exporting Displayed Tabular Data as CSV Files

Avamar also provides a simple mechanism for exporting certain tabular data displayed within Avamar Administrator as Comma-Separated Values (CSV) text files.

The following areas of Avamar Administrator support exporting displayed tabular data as Comma-Separated Values (CSV) text files:

- *Activity Report* (page 217)
- *Replication Report* (page 218)
- *Client Summary Report* (page 219)
- *Event Management* (page 220)
- *Session Monitor* (page 221)

### Activity Report

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.



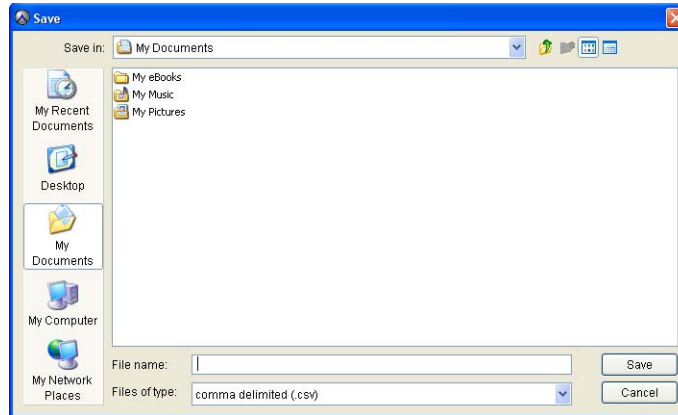
The Activity window appears.

Status	Error Code	Start Time (PDT)	Elapsed	End Time (PDT)	Type	Progress Bytes	New Bytes
Running		2007-01-17 10:41	00h:00m:12s	2007-01-17 10:41	Replication Source	0	0
Completed		2007-01-17 17:07	00h:17m:02s	2007-01-17 17:24	Archive Source	4,294,967,340	1005
Completed		2007-01-17 15:44	00h:00m:30s	2007-01-17 15:45	Archive Source	199.2 MB	54
Completed		2007-01-17 10:32	00h:00m:30s	2007-01-17 10:32	On-Demand Snapup	99.6 MB	100
Completed		2007-01-17 15:05	00h:00m:00s	2007-01-17 15:05	Archive Source	0	0
Completed		2007-01-17 14:43	00h:04m:33s	2007-01-17 14:47	Archive Source	5.0 GB	100
Completed		2007-01-17 16:48	00h:10m:17s	2007-01-17 16:59	On-Demand Snapup	5.0 GB	100
Completed		2007-01-17 10:51	00h:00m:34s	2007-01-17 10:51	On-Demand Snapup	99.6 MB	0
Completed		2007-01-17 13:00	00h:15m:50s	2007-01-17 13:16	On-Demand Snapup	5.0 GB	100

3. Click the Activity Report tab.
4. Click **Retrieve** to populate this screen with information.

5. Select **Actions > Export Report...**

The Save dialog box appears.



6. Browse to the desired folder (directory) and type a descriptive filename in the File name field.

7. Click **OK**.

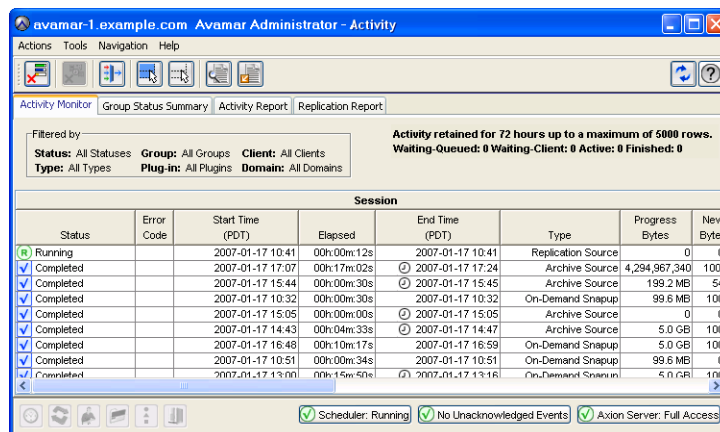
The Save dialog box closes.

## Replication Report

1. Start Avamar Administrator (page 21).

2. Select **Navigation > Activity** or click the **Activity** launcher button.

The Activity window appears.

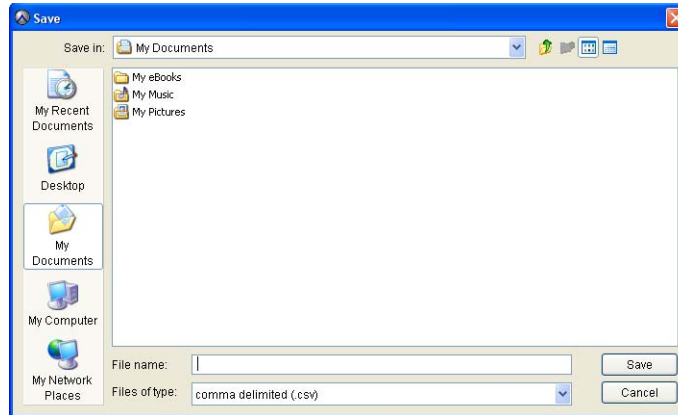


3. Click the Replication Report tab.

4. Click **Retrieve** to populate this screen with information.

5. Select **Actions > Export Report...**

The Save dialog box appears.



6. Browse to the desired folder (directory) and type a descriptive filename in the File name field.

7. Click **OK**.

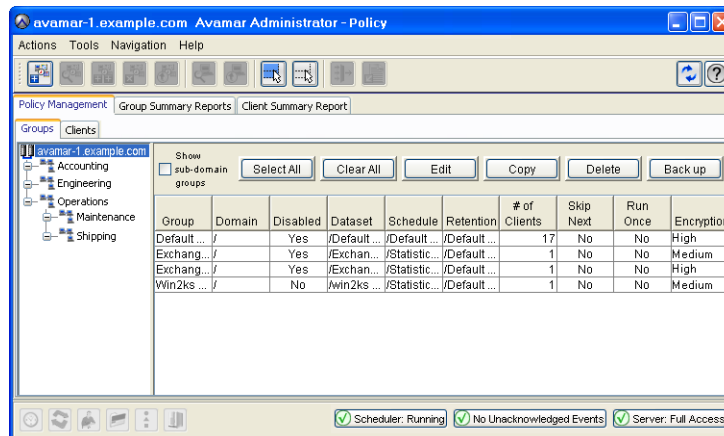
The Save dialog box closes.

## Client Summary Report

1. Start Avamar Administrator (page 21).

2. Select **Navigation > Policy** or click the **Policy** launcher button.

The Policy window appears.

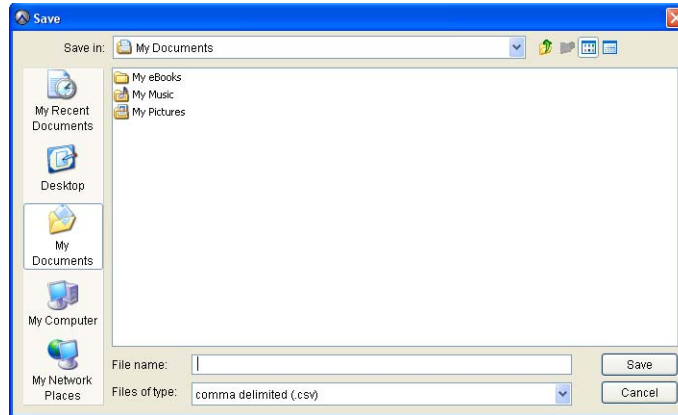


3. Click the Client Summary Report tab.

4. Click **Retrieve** to populate this screen with information.

5. Select **Actions > Export Report...**

The Save dialog box appears.



6. Browse to the desired folder (directory) and type a descriptive filename in the File name field.

7. Click **OK**.

The Save dialog box closes.

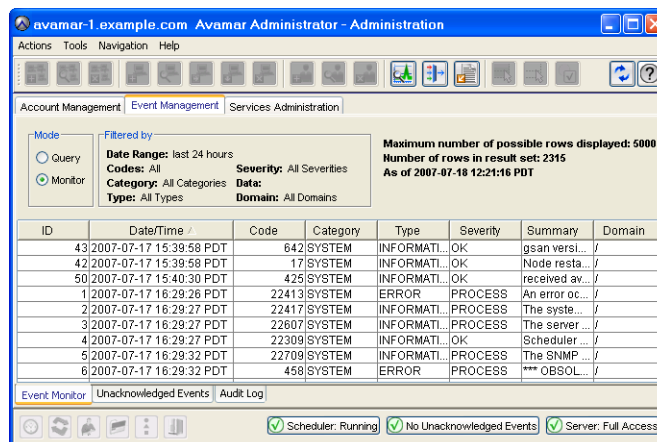
## Event Management

1. Start Avamar Administrator (page 21).

2. Select **Navigation > Administration** or click the **Administration** launcher button.

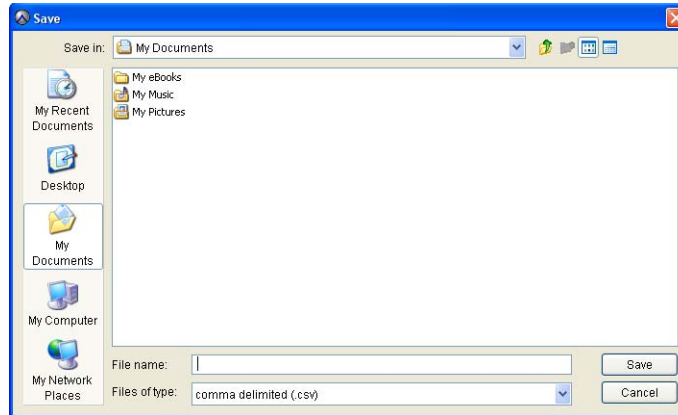
The Administration window appears.

3. Click the Event Management tab.



4. Select **Actions > Event Monitor > Export Events Report...**

The Save dialog box appears.



5. Browse to the desired folder (directory) and type a descriptive filename in the File name field.

6. Click **OK**.

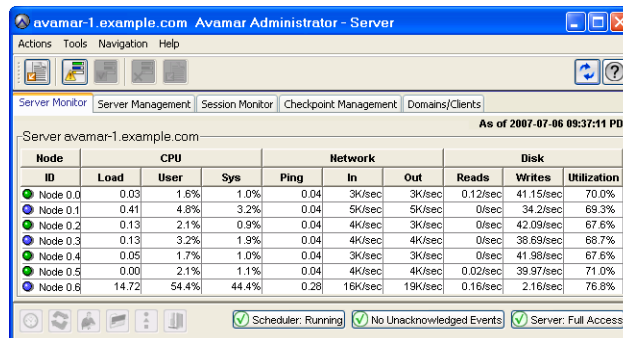
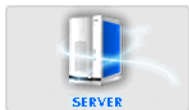
The Save dialog box closes.

## Session Monitor

1. Start Avamar Administrator (page 21).

2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.

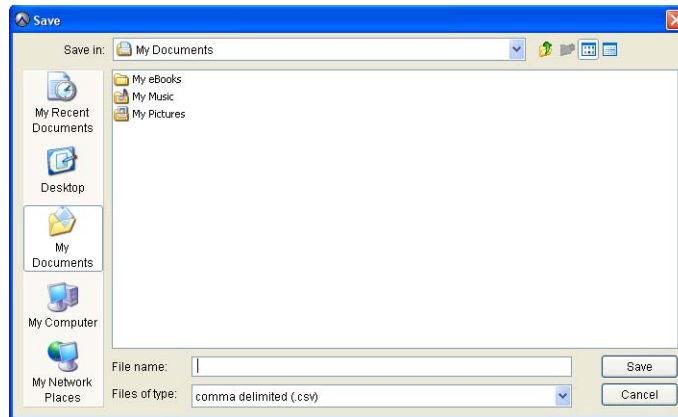
The Avamar Server window appears.



3. Click the Session Monitor tab.

4. Select **Actions > Export Sessions Report...**

The Save dialog box appears.



5. Browse to the desired folder (directory) and type a descriptive filename in the File name field.

6. Click **OK**.

The Save dialog box closes.

## Support for Third-Party Reporting Tools

**PostgreSQL.** Avamar uses a PostgreSQL database to store various data. PostgreSQL is a highly regarded open-source Relational Database Management System (RDMS). Information in the Avamar database is accessible through any PostgreSQL-compliant Open DataBase Connectivity (ODBC) interface.

**Crystal Reports Templates.** Crystal Reports is a popular database reporting tool. Avamar Administrator provides several Crystal Reports templates you can use to quickly generate various Avamar system reports. You can also customize these templates for your specific needs or create new ones.

## Setting Up the PostgreSQL ODBC Driver

This topic describes how to set up and configure the Microsoft Windows PostgreSQL ODBC Driver on your local Windows client in order to support common third-party reporting packages such as Crystal Reports.

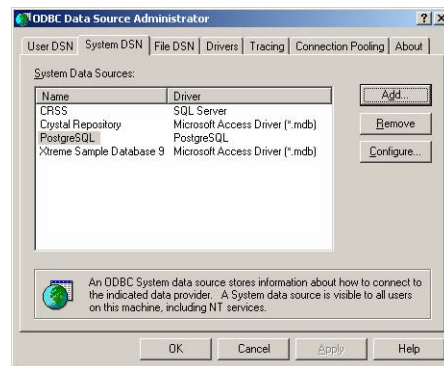
1. Download and install the latest driver from the PostgreSQL web site ([www.postgresql.org](http://www.postgresql.org)).
2. Select **Start > Settings > Control Panel > Administrative Tools**.

The Administrative Tools window appears.

3. Double-click Data Sources (ODBC).

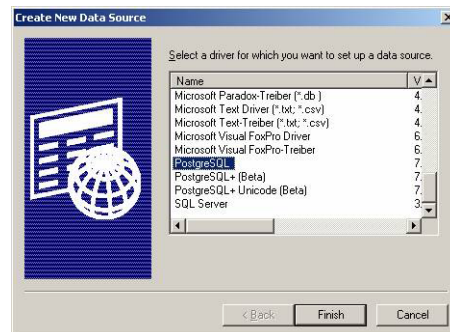
The ODBC Data Source Administrator appears.

4. Click the System DSN tab.



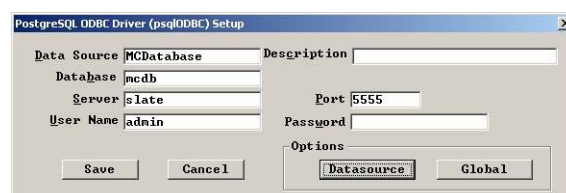
5. Click **Add...**

The Create New Data Source dialog box appears.



6. Select the PostgreSQL Driver and click **Finish**.

The PostgreSQL ODBC Driver (psqlODBC) Setup dialog box appears.

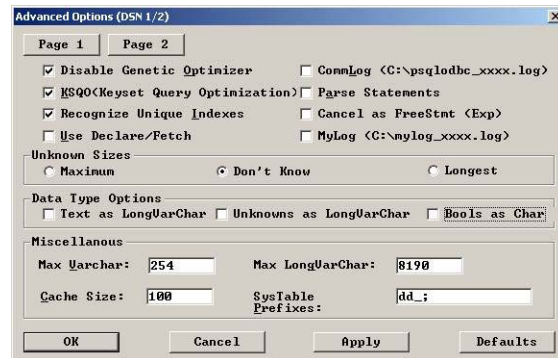


7. Type the following:

FIELD	DESCRIPTION
Data Source	Type a short name (for example, MCDatabase).
Description	Leave this blank.
Database	Type <b>mcdB</b> .
Server	Hostname where mcdB is running (for example, dpn50mcs).
Port	Leave this set to 5555.
User name	Type <b>viewuser</b> .
Password	Type <b>viewuser1</b> .

8. Click **Options > Datasource**.

The Advanced Options (DSN 1 / 2) dialog box appears.



9. Select or clear the following:

- (a) Under Unknown Sizes, select **Don't Know**.
- (b) Clear **Text as LongVarChar**.
- (c) Clear **Bools as Char**.

10. Click **OK**.

The Advanced Options (DSN 1 / 2) dialog box closes.

11. Switch to PostgreSQL ODBC Driver (psqlODBC) Setup dialog box and click **Save**.

The PostgreSQL ODBC Driver (psqlODBC) Setup dialog box closes.

12. Switch to ODBC Data Source Administrator and click **OK**.

The ODBC Data Source Administrator closes.

13. Close the Administrative Tools and Control Panel windows.



## Crystal Reports Templates

Avamar provides a set of Crystal Reports templates you can use to quickly generate various reports.

The default location for these templates is:

- C:\Program Files\avs\administrator\doc on Windows
- /usr/local/avamar/doc on Linux

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**TIP:** A complete discussion of how to use Crystal Reports templates is beyond the scope of this publication. Refer to your Crystal Reports documentation for additional information.

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The following table lists the various default Avamar Crystal Reports templates:

TEMPLATE NAME (FILENAME)	DESCRIPTION
Client Installation Report (ClientInstallation.rpt)	This report contains information for all clients installed on the MCS when the report is run.
Errors and Warning Events Report (ErrorWarningEvents.rpt)	This report contains all events of warning or error severity within a specified date and time interval.
Events Report (AllEvents.rpt)	This report contains all events recorded by the MCS within a specified date and time interval.
Failed Restores Report (FailedRestores.rpt)	This report contains information for all failed restores within a specified date and time interval for all clients or for a specific client.
Failed Backups Report (FailedBackup.rpt)	This report contains information for all failed backups within a specified date and time interval for all clients or for a specific client.
Group Backup By Group Report (GroupbackupByGroup.rpt)	This report contains group backup statistics for all groups or for a specific group.
Group Backup By Schedule Report (GroupbackupByScheduled.rpt)	This report contains group backup statistics for backups initiated within a specified date and time interval.
Server Drive Capacity Report (ServerDriveCapacity.rpt)	This report provides hard drive capacity statistics for each server node based on the specified date and time interval.
Successful Restores Report (SuccessfulRestores.rpt)	This report contains information for all successful restores within a specified date and time interval for all clients or for a specific client.

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TEMPLATE NAME (FILENAME)	DESCRIPTION
Successful Backups Report (SuccessfulBackup.rpt)	This report contains information for all successful backups within a specified date and time interval for all clients or for a specific client.

## Other Third-Party Support

**dbviews.sql.** You can also generate Avamar reports using any third-party PostgreSQL-compliant ODBC database reporting tool that runs on your platform. However, you must create your own report templates using the schema listings found in `dbviews.sql`. This file is located in the utility node `/usr/local/avamar/lib/sql` directory.

Refer to *Appendix C — MCS and EMS Database Views* (page 561) for detailed information about each view in `dbviews.sql` view and the individual columns storing data within each view.

# AVAMAR CLIENT AGENT AND PLUGIN MANAGEMENT

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This chapter introduces and discusses the manage all client agents and plugins feature.

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**TIP:** Refer to *Avamar Clients* (page 19) for a general discussion of client agents and plugins and their role in the Avamar system.

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## Important Terms and Concepts

Each time a client communicates with an Avamar server, it identifies itself by sending the client ID, the specific agent version and build running on that client, as well as a list of plugins (version and build) currently installed on that client. Occasionally, because of known incompatibilities, system administrators may want to deny Avamar server access to all clients running a specific version (all builds) or a specific build of a client agent or plugin. The manage all client agents and plugins feature provides the mechanism for accomplishing this.

**Disabling a Version or Build.** System administrators can deny all access to the server on a version-by-version (all builds) or build-by-build basis. This is done by editing the properties for a particular agent or plugin version or build and setting the **Disable** option. Once an agent or plugin is disabled, it is denied all access to the server.

**Selective Management of Plugin Operations.** System administrators can also selectively allow or disallow individual plugin operations for all clients running a specific plugin version (all builds) or build. These individual operations are:

- Client activations initiated from the client
- On-demand backups initiated from the client
- Scheduled backups
- Restores
- Backup validation
- Ability to browse stored backups on the server

Refer to *Editing Version or Build Record Settings* (page 235) for additional information.

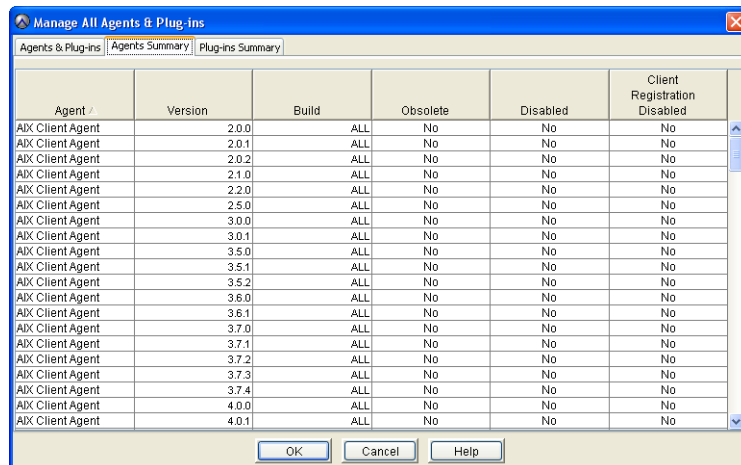
**Obsolete Versions and Builds.** Any specific version (all builds) or build designated as “obsolete” is completely denied all access to the Avamar server. The reason for this is that designating a build as “obsolete” is only done in cases of known incompatibility between the client agent or plugin and the specific version of server software that was just installed. Therefore, in order to prevent potential problems, this obsolete designation is absolute and final and cannot be overridden by using the manage all agents and plugins feature to edit properties for that version or build.

## Agents Summary View

The agents summary view shows a current list of all client agent versions and builds potentially known to this Avamar server.

**IMPORTANT:** Agent versions and builds not supported by this specific version of Avamar server software are shown as "obsolete." Clients running these specific versions or builds are completely denied access to the server. This designation is absolute and final and cannot be overridden. Clients running these obsolete versions or builds must upgrade before they can access this server. Contact EMC Technical Support for additional information.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**  
 The Manage All Agents & Plug-ins window appears.
3. Click the Agents Summary tab.



### Client Agent Properties

The following table lists and explains the properties shown for each client agent:

PROPERTY	DESCRIPTION
Name	Name of this client agent.
Version	Specific version of this client agent.
Build	Specific software build of this client agent or ALL, if this entry is applicable to all builds.
Obsolete	Yes or no. If yes, the agents and plugins definition file has reported that this specific client agent version (all builds) or build has been superseded by a newer version or build.

PROPERTY	DESCRIPTION
Disabled	Yes or no. If yes, the MCS will not respond to communication requests from any client running this specific client agent version (all builds) or build.
Client Registration Disabled	Yes or no. If yes, clients running this agent version (all builds) cannot register with this Avamar server.

## Plugins Summary View

The plugins summary view shows a current list of all client plugins versions and builds potentially known to this Avamar server.

**IMPORTANT:** Specific plugin versions and builds not supported by this specific version of Avamar server software are shown as “obsolete.” Clients running these specific versions or builds are completely denied access to the server. This designation is absolute and final and cannot be overridden. Clients running these obsolete versions or builds must upgrade before they can access this server. Contact EMC Technical Support for additional information.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.

3. Click the Plug-ins Summary tab.

Plug-in	Version	Build	Obsolete	Disabled	Client Backups Disabled	Scheduled Backups Disabled	Restore Disabled	Browse Disabled	Validate Disabled
AIX DB2	3.0.1	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.5.0	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.5.1	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.5.2	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.6.0	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.6.1	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.7.0	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.7.1	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.7.2	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.7.3	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	3.7.4	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	4.0.0	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	4.0.1	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	4.0.2	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	4.0.3	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	4.1.0	ALL	No	No	No	No	No	No	Unsupported
AIX DB2	4.1.100	ALL	No	No	No	No	No	No	Unsupported
AIX File Sy...	2.0.2	ALL	No	No	No	No	No	No	No
AIX File Sy...	2.1.0	ALL	No	No	No	No	No	No	No
AIX File Sy...	2.2.0	ALL	No	No	No	No	No	No	No

### Plugin Properties

The following tables lists and explains the properties shown for each plugin:

PROPERTY	DESCRIPTION
Name	Name of this plugin.
Version	Specific version of this plugin.
Build	Specific software build of this plugin or ALL, if this entry is applicable to all versions.
Obsolete	Yes or no. If yes, the agents and plugins definition file has reported that this specific client plugin version (all builds) or build has been superseded by a newer version or build.

PROPERTY	DESCRIPTION
Disabled	Yes or no. If yes, any client running this specific client plugin version (all builds) or build will be prevented from performing any backup, restore or validation activities.
Client Backups Disabled	Yes or no. If yes, on-demand backups cannot be initiated by clients running this specific client plugin version (all builds) or build.
Scheduled Backups Disabled	Yes or no. If yes, scheduled backups will not be performed on clients running this specific client plugin version (all builds) or build.
Restore Disabled	Yes or no. If yes, restores (page 84) cannot be performed on clients running this specific client plugin version (all builds) or build.
Browse Disabled	Yes or no. If yes, clients running this specific plugin version (all builds) or build will not be allowed to browse the restore calendar.  Unsupported denotes that this specific plugin version does not support selective management of this feature.
Validate Disabled	Yes or no. If yes, backup validations (page 92) cannot be performed using this specific plugin version.  Unsupported denotes that this specific plugin version does not support selective management of this feature.
Extended Cancel Timeout	Yes or no. If yes, clients running this specific plugin version (all builds) or build will be allowed additional time to cancel a work order before Avamar Administrator forcibly cancels it.

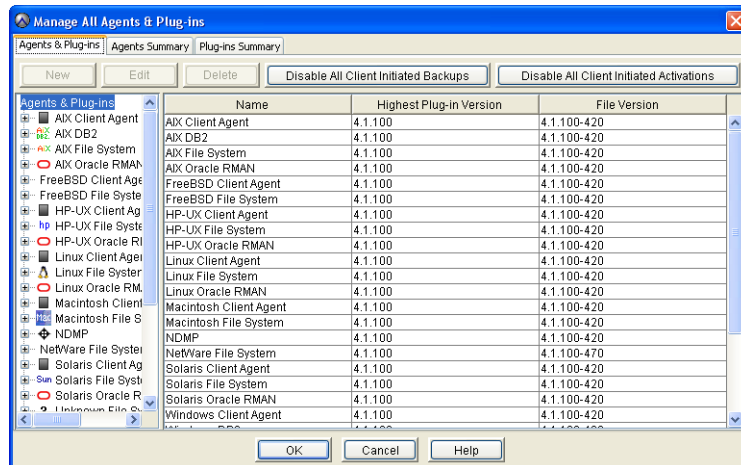


## Adding a New Build Record

This procedure adds a new MCS database record for a specific client agent or plugin build. You can only add new records at the build level; you cannot add a record for a new version (all builds). New version records are automatically added following Avamar server software upgrades.

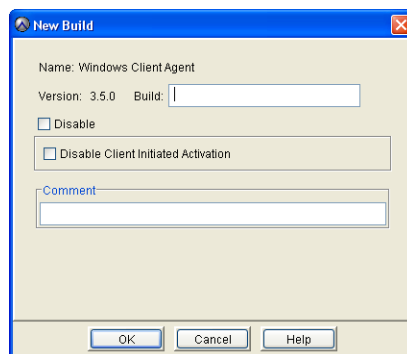
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.



3. In the tree, select the agent or plugin version to which you want to add a new build.
4. Click **New**.

The New Build dialog box appears.



5. Type or select the following:

<b>FIELD/OPTION</b>	<b>DESCRIPTION</b>
Build	Type a valid agent or plugin build number in this field.
<b>Disable</b> option	Select this option if you want to deny Avamar server access to any clients running this specific agent or plugin build.
<b>Disable Client Initiated Registration</b> option	Select this option if you want to prevent any clients running this specific agent or plugin build from registering with the Avamar server.
Comment	Type a short descriptive comment in this field (optional).

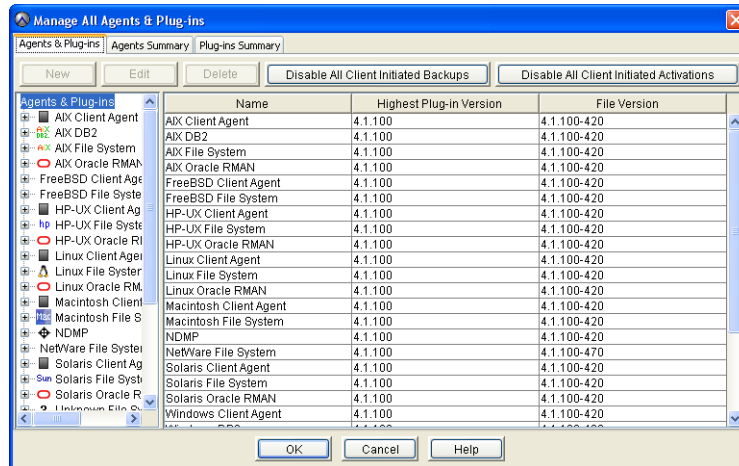
6. Click **OK**.

The New Build dialog box closes.

## Editing Version or Build Record Settings

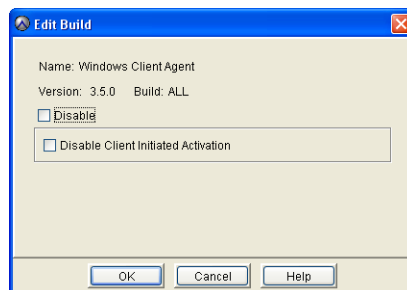
1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.



3. In the tree, select the agent or plugin version or build you want to edit.
4. Click **Edit**.

The Edit Build dialog box appears.



5. Edit the information you want to change.

Refer to *Adding a New Build Record* (page 233) for additional information about agent and plugin build settings.

6. Click **OK**.

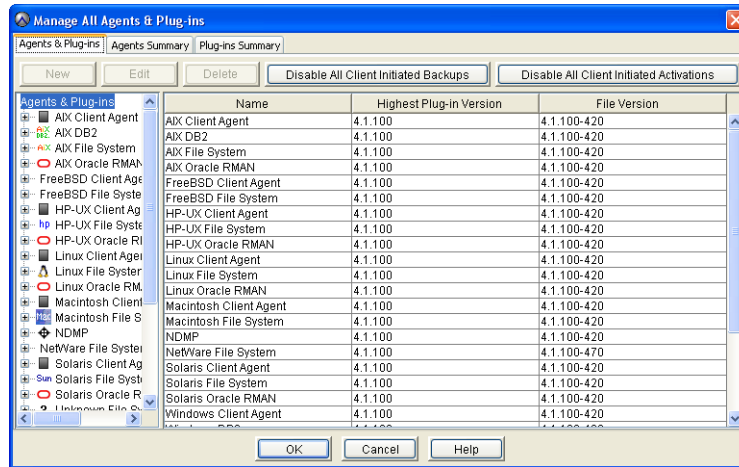
The Edit Build dialog box closes.

## Deleting a Build Record

This procedure deletes an existing MCS database record for a specific client agent or plugin build. You can only delete records at the build level; you cannot delete a record for an entire version.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.



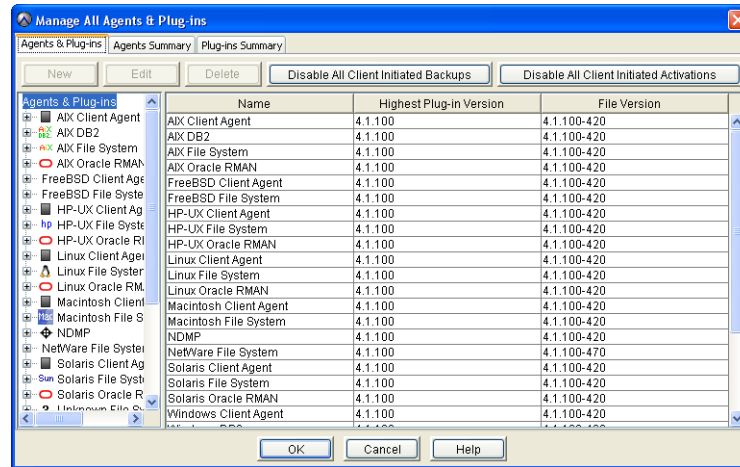
3. In the tree, select the agent or plugin build you want to delete.
4. Click **Delete**.

## Enabling All Client Initiated Activations

If all client initiated activations have previously been disabled (page 238), you must reenable them before any new Avamar clients can initiate activation with the Avamar server.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.



3. Click **Enable All Client Initiated Activations**.

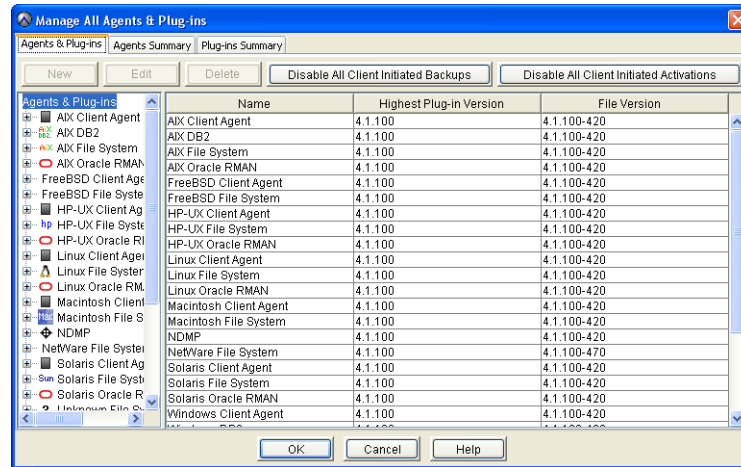
The **Enable All Client Initiated Activations** button changes to **Disable All Client Initiated Activations**.

## Disabling All Client Initiated Activations

An Avamar administrator can disable all new client initiated client activations until such time as they are reenabled (page 237). This is typically done to place the system in a state that will support various maintenance activities.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.



3. Click **Disable All Client Initiated Activations**.

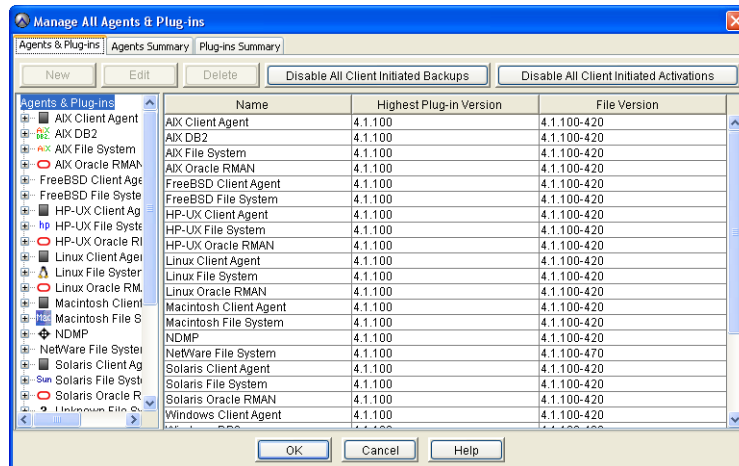
The **Disable All Client Initiated Activations** button changes to **Enable All Client Initiated Activations**.

## Enabling All Client Initiated Backups

If all client backups have previously been disabled (page 240), you must reenable them before any Avamar clients can initiate on-demand backups.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.



3. Click **Enable All Client Initiated Backups**.

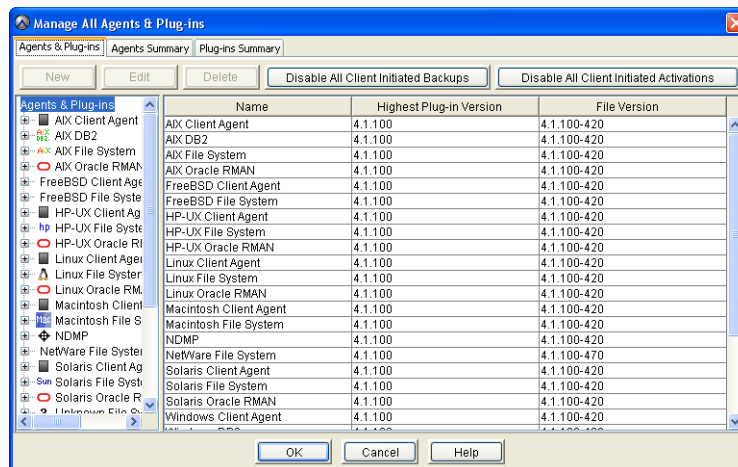
The **Enable All Client Initiated Backups** button changes to **Disable All Client Initiated Backups**.

## Disabling All Client Initiated Backups

An Avamar administrator can disable the ability of Avamar clients to initiate on-demand backups until such time as they are reenabled (page 239). This is typically done to place the system in a state that will support various maintenance activities.

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Agents & Plug-ins...**

The Manage All Agents & Plug-ins window appears.



3. Click **Disable All Client Initiated Backups**.

The **Disable All Client Initiated Backups** button changes to **Enable All Client Initiated Backups**.



# SERVER MONITORING

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This chapter describes how to monitor various aspects of Avamar server performance.

## Recommended Daily Server Monitoring

To ensure that your Avamar server is working properly, EMC recommends performing these system monitoring tasks on a daily basis:

- From the Activity Monitor (page 76) — investigate any abnormal client activity
- From the Server Monitor (page 242) — confirm that last checkpoint and validated checkpoint are recent (ideally within the past 24 hours)
- From the Event Monitor (page 256) — investigate any error or warning messages
- From the Unacknowledged Events list (page 276) — investigate and clear (acknowledge) any unacknowledged events

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**TIP:** EMC recommends that you enable the “Email Home” feature (page 183), which will automatically email EMC Technical Support with status of the daily data integrity check and other important server messages.

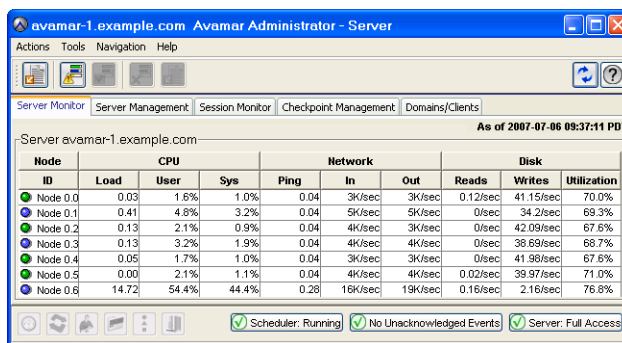
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# Monitoring the Server

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.








The Avamar Server window appears.



## Server Monitor Tab

The Server Monitor tab presents a summarized view of CPU, network and hard drive performance statistics for each node.

PROPERTY	DESCRIPTION
NODE	<p>Status indicators</p> <p>One of the following:</p> <p>Online (green)  Node is functioning properly.</p> <p>Read-Only (blue)  This occurs normally as background operations are performed and when backups have been suspended (page 277).</p> <p>Time-Out (gray)  MCS could not communicate with this node.</p> <p>Unknown (yellow)  Node status cannot be determined.</p> <p>Offline (red)  Node has experienced a problem. Contact EMC Technical Support for additional information.</p>
	<p>NODE ID</p> <p>Each node in the Avamar server has a unique logical identifier. This node ID is expressed in the following format:</p> <p>MODULE.NODE</p> <p><b>NOTE:</b> Module and node numbering begins with zero. Therefore, the ID for the third node in the first module is 0.2.</p>

	PROPERTY	DESCRIPTION
CPU	Load	Average number of CPU threads over the past minute.
	User	Percentage of CPU capacity consumed by executing actual server instructions (anything other than operating system overhead).
	Sys	Percentage of CPU capacity consumed by operating system overhead.
NETWORK	Ping	Time in seconds this node took to respond to a ping request.
	In	Received packet throughput reported in KB/second.
	Out	Sent packet throughput reported in KB/second.
DISK	Reads	Average number of hard drive reads per second as reported by the operating system.
	Writes	Average number of hard drive writes per second as reported by the operating system.
	Utilization	Percentage of total available server storage capacity currently used.

### Server Management Tab

The Server Management tab shows a detailed view of the server hardware resources. The display is context-sensitive:

- Selecting the top-level server folder in the tree pane shows detailed information for the Avamar server
- Selecting a module folder in the tree pane shows detailed information for that module
- Selecting a node icon in the tree pane shows detailed information for that node
- Selecting a partition icon in the tree pane shows detailed information for that logical hard drive partition

## Server Information

	PROPERTY	DESCRIPTION
SERVER DETAILS	Active sessions	Current number of active client sessions. Click the Session Monitor tab (page 252) for additional information.
	Total capacity	Total amount of server storage capacity.
	Capacity used	Total amount of server storage capacity that has been used for any reason.
	Server utilization	Percentage of total available server storage capacity currently used. <b>NOTE:</b> This value is derived from the largest Disk Utilization value shown in the Server Monitor tab (page 242) and therefore represents the absolute maximum Avamar server utilization; actual utilization across all modules, nodes and drives might actually be slightly lower.
	Bytes protected	Total amount of client data in bytes that has been backed up (protected) on this server.
	Bytes protected quota	Maximum amount of client data in bytes that is licensed for protection on this server.
	License expiration	Calendar date on which this server's licensing expires, or never if licensing is perpetual.
	Time since Server initialization	Number of hours, days and minutes that have elapsed since this Avamar server was initialized.
	Last checkpoint	Date and time last server checkpoint was performed. Checkpoints are typically taken twice daily.
	Last validated checkpoint	Date and time server checkpoint was last validated. Checkpoint validation normally occurs once per day. Therefore, the Last validated checkpoint time and Last checkpoint time might be different depending on the time of day you view this information. <b>IMPORTANT:</b> If the Last validated checkpoint and Last checkpoint times are more than 36 hours apart, this indicates that checkpoint validation is not occurring. This is a problem. Contact EMC Technical Support for additional information.
	System Name	User-assigned name of this Avamar server.
	System ID	Unique identifier for this Avamar server.






PROPERTY		DESCRIPTION
<b>SERVER DETAILS</b>	HFSAddr	Hash Filesystem (HFS) address (Addr). This is the hostname or IP address backup clients use to connect to this Avamar server.
	HFSPort	Hash Filesystem (HFS) data port. This is the data port backup clients use to connect to this Avamar server. Default is port 27000.
	IP Address	Actual IP address of this Avamar server. If the HFSAddr is an IP address, this value will be the same as the HFSAddr.
<b>MAINTENANCE ACTIVITIES DETAILS</b>	Suspended	<p>One of the following:</p> <p>No            Server maintenance activities are not currently suspended (that is, server maintenance activities will run normally during next maintenance (page 275) or blackout (page 274) window).</p> <p>Yes            Server maintenance activities are currently suspended.</p>

PROPERTY		DESCRIPTION
GARBAGE COLLECTION DETAILS	Status	One of the following:  Idle            Garbage collection is not currently taking place.  Processing    Garbage collection is currently taking place.
	Result	One of the following:  OK             Last garbage collection activity successfully completed.  Error code    Last garbage collection activity did not successfully complete.
	Start time	Date and time that last garbage collection activity began.
	End time	Date and time that last garbage collection activity ended.
	Passes	Total number of passes during last garbage collection activity.
	Bytes recovered	Total amount of storage space (in bytes) that was recovered during last garbage collection activity.
	Chunks deleted	Total number of data chunks that were deleted during last garbage collection activity.
	Index stripes	
	Index stripes processed	Total number of index stripes that were processed during last garbage collection activity.

### Module Detail

PROPERTY	DESCRIPTION
Total capacity	Total amount of server storage capacity.
Capacity used	Total amount of server storage capacity that has been used for any reason.
Avamar Server utilization	Percentage of total available server storage capacity currently used.  <b>NOTE:</b> This value is derived from the largest Disk Utilization value shown in the Server Monitor tab (page 242) and therefore represents the absolute maximum Avamar server utilization in this module; actual utilization across all modules, nodes and drives might actually be slightly lower.
Number of Nodes	Total number of nodes in this module.
IP Address	Base IP address of this module.

Node Detail

		PROPERTY	DESCRIPTION
<b>AVAMAR SERVER DETAILS</b>	Status indicators	<p>One of the following:</p> <p>Online (green)  Node is functioning properly.</p> <p>Read-Only (blue)  This occurs normally as background operations are performed and when backups have been suspended (page 277).</p> <p>Time-Out (gray)  MCS could not communicate with this node.</p> <p>Unknown (yellow)  Node status cannot be determined.</p> <p>Offline (red)  Node has experienced a problem. Contact EMC Technical Support for additional information.</p>	
	State	<p>Current operational state of the server. One of the following:</p> <p>ONLINE Node is functioning properly.</p> <p>DEGRADED One or more disk errors have been detected.</p> <p>OFFLINE Node has experienced a problem. Contact EMC Technical Support for additional information.</p> <p>READONLY This occurs normally as background operations are performed and when backups have been suspended (page 277).</p>	





PROPERTY	DESCRIPTION
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">AVAMAR SERVER DETAILS</p>	<p>Runlevel</p> <p>Current operational state of the server. One of the following:</p>
	<p>fullaccess</p> <p>This Avamar server is fully operational.</p>
	<p>admin</p> <p>Avamar server is fully operational but only the administrator root account can access the server.</p>
	<p>adminonly</p> <p>Avamar server is fully operational but only the administrator root account can access the server.</p>
	<p>adminreadonly</p> <p>Avamar server is in a read-only condition and only the administrator root account can access the server.</p>
	<p>readonly</p> <p>Avamar server is in a read-only condition. Restores are allowed but no new backups can be taken.</p>
	<p>suspended</p> <p>Scheduled backups are disabled and will not occur until you reenable the scheduler. Refer to <i>Suspending Scheduled Operations</i> (page 279) for additional information.</p>
	<p>synchronizing</p> <p>Avamar server is priming or synchronizing stripes. This is a temporary condition. Some operations might be delayed.</p>



PROPERTY	DESCRIPTION
AVAMAR SERVER DETAILS	<p>Accessmode</p> <p>Current access level of the server. The full server access mode is typically represented as three four-bit fields. For example:            mhpu+mhpu+0000</p> <p>The most significant bits show server privileges, the middle bits show root user privileges and the least significant bits show privileges for all other users. Individual bits in these fields convey the following information:</p> <p>m Maintenance allowed.            h Hash Filesystem (HFS) is writable.            p Persistent store is writable.            u User accounting is writable.</p>
	<p>Port</p> <p>Data port used for intra-node communication.</p>
	<p>Dispatcher</p> <p>Data port used by various utilities to communicate with this node.</p>
	<p>Avamar Server uptime</p> <p>Number of hours, days and minutes that have elapsed since this Avamar server was initialized.</p>
	<p>Total capacity</p> <p>Total amount of server storage capacity.</p>
	<p>Capacity used</p> <p>Total amount of server storage capacity that has been used for any reason.</p>
	<p>Avamar Server utilization</p> <p>Percentage of total available node storage capacity currently used.</p> <p><b>NOTE:</b> This value is derived from the largest Disk Utilization value shown in the Server Monitor tab (page 242) and therefore represents the absolute maximum Avamar server utilization in this node; actual utilization across all modules, nodes and drives might actually be slightly lower.</p>
	<p>Num stripes</p> <p>Number of stripes on this node.</p>
	<p>Avamar Server version</p> <p>Version of the Avamar software running on this node.</p>

	PROPERTY	DESCRIPTION
<b>OS DETAILS</b>	Version	Current operating system version running on this node.
	Node uptime	Number of hours, days and minutes that have elapsed since this node was last booted.
	Load average	The average number of CPU threads over the past minute.
	CPU %	Percentage of this node's CPU currently being used.
	Ping time (sec)	Time in seconds this node took to respond to a ping request.
	Disk reads	Number of hard drive read operations per second.
	Disk writes	Number of hard drive write operations per second.
	Network reads	Number of Kilobytes per second read by way of this node's network connection.
	Network writes	Number of Kilobytes per second written by way of this node's network connection.
<b>HARDWARE DETAILS</b>	IP address	IP address of this node.
	MAC address	Media Access Control (MAC) address. A low-level hardware address that uniquely identifies this node in the Avamar server.
	Number of partitions	Total number of logical hard drive partitions in this node.

Partition Detail

PROPERTY		DESCRIPTION
<b>AVAMAR SERVER DETAILS</b>	Status indicators	<p>One of the following:</p> <p>Online (green)  Partition is functioning properly.</p> <p>Offline (yellow)  Partition has one or more offline stripes. Contact EMC Technical Support for additional information.</p> <p>Read-Only (blue)  Partition is read-only.</p> <p>Nonfunctional (red)  Partition is not functioning. Contact EMC Technical Support for additional information.</p>
	Total capacity	Total amount of server storage capacity.
	Capacity used	Total amount of server storage capacity that has been used for any reason.
	Avamar Server utilization	Percentage of total available partition storage capacity currently used.
	State	<p>Current operational state of this partition. One of the following:</p> <p>ONLINE Partition is functioning properly.</p> <p>MIGRATING Transitional state that might or might not be due to normal operation.</p> <p>OFFLINE Transitional state that might or might not be due to normal operation.</p> <p>READY Transitional state that might or might not be due to normal operation.</p> <p>RESTARTING Transitional state that might or might not be due to normal operation.</p>
	Number of offline stripes	Total number of stripes on this partition that are offline due to media errors.
	Number of transitioning stripes	Total number of stripes on this partition that are in a transitional state that might or might not be due to normal operation.





## Session Monitor Tab

The Session Monitor tab shows a list of active client backup and restore sessions.

	PROPERTY	DESCRIPTION
<b>USER</b>	User	Avamar user ID (account name).
	Path	Specifies a hierarchical location in the Avamar server. This option is relative to the user's home location unless slash (/) is prefixed to the path designation, in which case an absolute path is assumed.
	Domain	Avamar domain (page 33) where this user resides.
	Client ID	Unique identifier for this Avamar client.
<b>SESSION</b>	Type	This activity is one of the following: <ul style="list-style-type: none"> <li>• avtarbackup</li> <li>• avtarrestore</li> </ul>
	Root	Top-level of the filesystem being backed up, restored or validated.
	Start time	Date and time this client session started.
	Plug-in	Plugin (page 19) used for this activity.
	Session ID	Unique identifier for this client session.
	Work order ID	Unique identifier for this activity.
	Elapsed	Length of time this client session has been running.
	Progress bytes	Total number of bytes examined during this activity.
	New bytes	Percentage of new bytes backed up. Low numbers indicate high levels of data deduplication.
<b>SYSTEM</b>	Name	Client hostname.
	OS name	Operating system used by this client.
	App version	Avamar client software version.

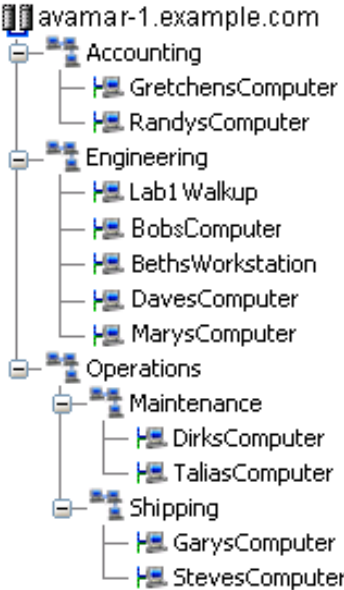
## Checkpoint Management Tab

The Checkpoint Management tab shows detailed information for all system checkpoints taken for this Avamar server. Refer to *Checkpoints* (page 351) for additional information.

PROPERTY	DESCRIPTION
Status indicators	<p>One of the following:</p> <ul style="list-style-type: none"> <li> Checkpoint failed validation.</li> <li> Checkpoint has not yet been validated.</li> <li> Validation is currently being performed on this checkpoint.</li> <li> Checkpoint passed validation.</li> </ul>
Tag	Unique identifier for this checkpoint.
Time	Date and time that this checkpoint was taken.
Nodes	Total number of nodes involved in this checkpoint.
Stripes	Total number of stripes involved in this checkpoint.
Checkpoint Validation - Start Time	Date and time that this checkpoint validation was initiated.
Checkpoint Validation - Finished Time	Date and time that this checkpoint validation completed.
Checkpoint Validation - Errors	Number of errors encountered during this checkpoint validation.
Checkpoint Validation - Type	<p>One of the following:</p> <ul style="list-style-type: none"> <li>Full                      Validation performed all checks.</li> <li>Rolling                    All new and modified stripes were fully validated and a subset of unmodified stripes were validated.</li> </ul>

### Domains/Clients Tab

The Domains/Clients tab shows the nested domain structure on this server and all clients currently registered to this server. Refer to *Domains and Subdomains* (page 33) and *Clients* (page 38) for additional information.



## Verifying System Integrity

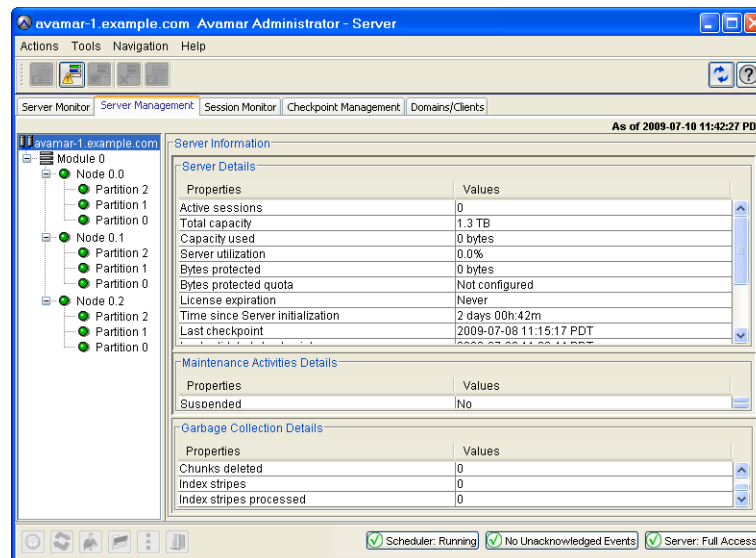
To verify Avamar server integrity, you must first ensure that a validated server checkpoint exists. You might also want to collect and examine the server log files (page 270) to ensure that no errors have occurred since that checkpoint was taken.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.



The Avamar Server window appears.

3. Click the Server Management tab.



4. Verify that the **Last validated checkpoint** field shows a recent calendar date.

You should also manually collect and view server log files for errors. Refer to *Collecting and Viewing Log Files* (page 270) for additional information.

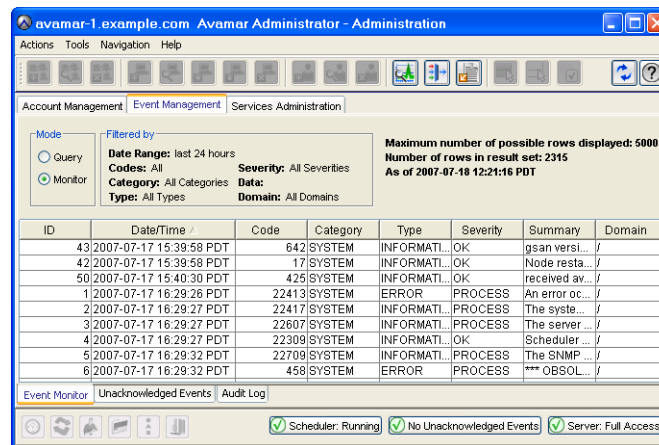
## Viewing System Events

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

3. Click the Event Management tab.



The Event Monitor provides two basic display modes: query mode or monitor mode.

**Query Mode** Setting the **Query** option places the Event Monitor in query mode, which shows the most recent 5,000 system events for a defined range of dates. Refer to *Filtering the Event Monitor Display* (page 258) for additional information about displaying a specific range of dates in the Event Monitor.

**Monitor Mode** Setting the **Monitor** option places the Event Monitor in monitor mode, which shows the most recent 5,000 system events during the past 24 hours.

**Filtered by** The Filtered by fields show your current Event Monitor filtering settings. Refer to *Filtering the Event Monitor Display* (page 258) for additional information about filtering your Event Monitor display to show specific events.

4. Click the Event Monitor tab (near the bottom).

The Event Monitor appears.

COLUMN	DESCRIPTION
Date/Time	Date and time this event occurred.
Code	Event code number.



COLUMN	DESCRIPTION
Category	Event category. One of the following: <ul style="list-style-type: none"> <li>• System</li> <li>• Application</li> <li>• User</li> <li>• Security</li> </ul>
Type	Event type. One of the following: <ul style="list-style-type: none"> <li>• Debug</li> <li>• Audit</li> <li>• Information</li> <li>• Warning</li> <li>• Error</li> <li>• Internal</li> </ul>
Severity	Event severity. One of the following: <ul style="list-style-type: none"> <li>• OK</li> <li>• USER</li> <li>• PROCESS</li> <li>• NODE</li> <li>• USER_FATAL</li> <li>• PROCESS_FATAL</li> <li>• NODE_FATAL</li> <li>• SYSTEM_FATAL</li> </ul>
Summary	Short description of this event.
Domain	Domain where this event occurred.
More Data	If Yes, additional detailed information is available by double-clicking the event entry or selecting the event (row) in the list and selecting <b>Actions &gt; Event Management &gt; View Detail...</b>

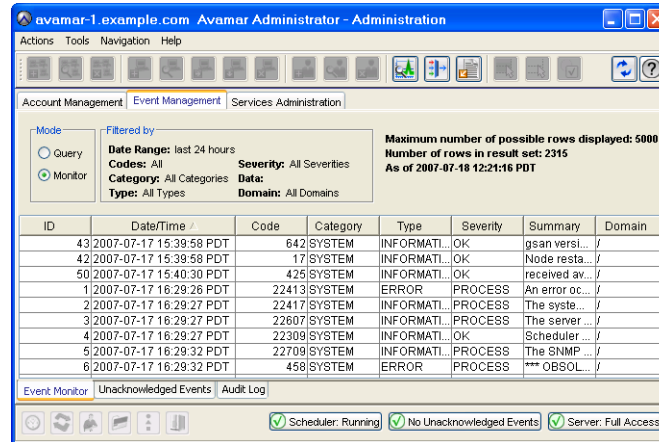
## Filtering the Event Monitor Display

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

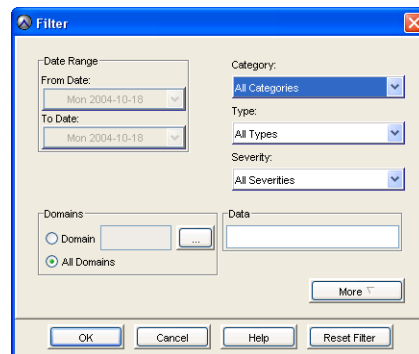
3. Click the Event Management tab.
4. Click the Event Monitor tab (near the bottom).



5. Select **Actions > Event Management > Filter...** or click the toolbar icon shown immediately to the left.



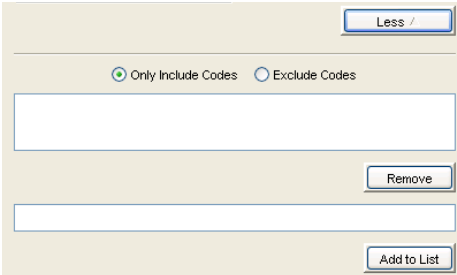
The Filter dialog box appears.



6. Define one or more of the following filtering criteria:

FIELD/OPTION	DESCRIPTION
From Date	Used with To Date field to define a specific range of dates in the Event Monitor. <b>IMPORTANT:</b> If you want to type a range of dates, the Event Monitor must already be in query mode (page 256). Otherwise, the From Date and To Date fields will be disabled.

FIELD/OPTION	DESCRIPTION
To Date	<p>Used with From Date field to define a specific range of dates in the Event Monitor.</p> <p><b>IMPORTANT:</b> If you want to type a range of dates, the Event Monitor must already be in query mode (page 256). Otherwise, the From Date and To Date fields will be disabled.</p>
Code	<p>Show all event codes (All Codes) is the only available selection.</p>
Category	<p>Display events from the following categories:</p> <ul style="list-style-type: none"> <li>• All Categories</li> <li>• System</li> <li>• Application</li> <li>• User</li> <li>• Security</li> </ul>
Type	<p>Display events of the following types:</p> <ul style="list-style-type: none"> <li>• All Types</li> <li>• Debug</li> <li>• Audit</li> <li>• Information</li> <li>• Warning</li> <li>• Error</li> <li>• Internal</li> </ul>
Severity	<p>Display events of the following severities:</p> <ul style="list-style-type: none"> <li>• All Severities</li> <li>• OK</li> <li>• USER</li> <li>• PROCESS</li> <li>• NODE</li> <li>• USER_FATAL</li> <li>• PROCESS_FATAL</li> <li>• NODE_FATAL</li> <li>• SYSTEM_FATAL</li> </ul>
Data	<p>Only display events that contain these case-sensitive key words in the event code data XML element.</p> <p>This promotes easy filtering on important key words across event attributes. For example, filtering the Event Monitor display on "error" would return all events that contained the word "error" in any XML attribute (for example, category, type or severity).</p>

FIELD/OPTION	DESCRIPTION
Domains	<p>Select the <b>All Domains</b> option to display all events from all domains.</p> <p>To only show events from one domain, select the <b>Domain</b> option and type a domain for which you want to show events.</p> <p><b>TIP:</b> Click ... to browse to a domain for which you want to show events.</p>
<b>More/Less</b>	<p>The <b>More/Less</b> button is used to display or hide advanced filtering features that allow you to include or exclude specific event codes.</p> <p>Clicking <b>More</b> displays an additional lower pane and the button name changes to <b>Less</b> (as shown next).</p>  <p>Clicking <b>Less</b> hides the additional lower pane and the button name changes to <b>More</b>.</p>
Only include codes	<p>Setting <b>Only include codes</b> filters the Event Monitor to display only those event codes in the list.</p> <p>The <b>Only include codes</b> and <b>Exclude codes</b> options are mutually exclusive (you cannot both exclude and include specific event codes at the same time).</p>
Exclude codes	<p>Setting <b>Exclude codes</b> causes the Event Monitor to not display any event codes in the list.</p> <p>The <b>Only include codes</b> and <b>Exclude codes</b> options are mutually exclusive (you cannot both exclude and include specific event codes at the same time).</p>
Remove	<p>Selecting an event code from the list and clicking <b>Remove</b> removes it from the include or exclude list.</p>
Add to list	<p>Typing a numeric event code in the entry field and clicking <b>Add to list</b> adds that event code to the include or exclude list.</p>

**IMPORTANT:** If you want to type a range of dates, the Event Monitor must be in query mode (page 256). Otherwise, the From Date and To Date fields will be disabled.

7. Click **OK**.

The Filter dialog box closes and the Event Monitor only shows events that meet your filtering criteria.

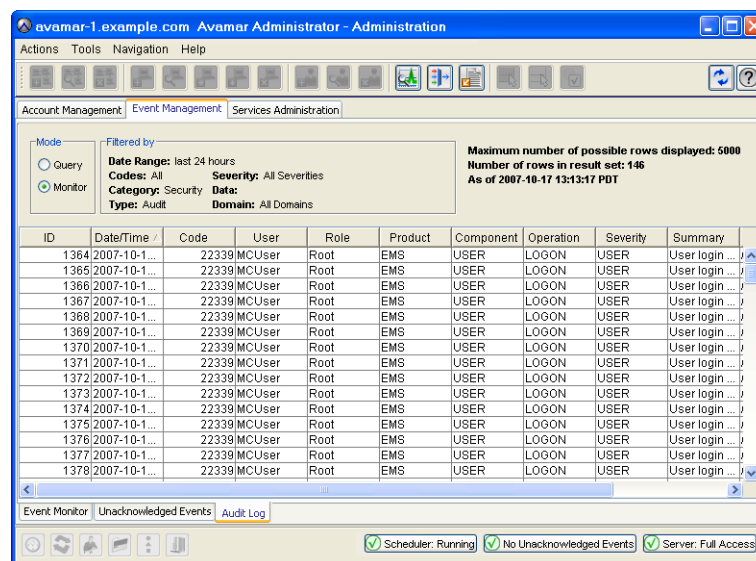
## Viewing the Audit Log

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

3. Click the Event Management tab.
4. Click the Audit Log tab (near the bottom).



The Audit Log provides two basic display modes: query mode or monitor mode.

**Query Mode** Setting the **Query** option places the Audit Log in query mode, which shows the most recent 5,000 audit log entries for a defined range of dates. Refer to *Filtering the Audit Log Display* (page 264) for additional information about displaying a specific range of dates in the Audit Log.

**Monitor Mode** Setting the **Monitor** option places the Audit Log in monitor mode, which shows the most recent 5,000 audit log entries during the past 24 hours.

**Filtered by** The Filtered by fields show your current Audit Log filtering settings. Refer to *Filtering the Audit Log Display* (page 264) for additional information about filtering your Audit Log display to show specific audit log entries.

5. Click the Audit Log tab (near the bottom).

The Audit Log appears.

COLUMN	DESCRIPTION
ID	Unique identifier for the audit log entry.
Date/Time	Date and time this action occurred.
Code	Event code number.
User	User ID that initiated this action.
Role	Role in effect when this action was initiated.
Product	One of the following: EM Avamar Enterprise Manager. EMS Avamar Enterprise Manager server. END_USER MCCLI Avamar Administrator Command Line Interface (CLI). MCGUI Avamar Administrator. MCS Avamar Administrator server. NONE SNMP_SUB_AGENT TEST WEB_RESTORE Avamar web restore feature.
Component	Specific area within the product.
Operation	Specific action taken.
Severity	Event severity. One of the following: <ul style="list-style-type: none"> <li>• OK</li> <li>• USER</li> <li>• PROCESS</li> <li>• NODE</li> <li>• USER_FATAL</li> <li>• PROCESS_FATAL</li> <li>• NODE_FATAL</li> <li>• SYSTEM_FATAL</li> </ul>
Summary	Short description of this action.

COLUMN	DESCRIPTION
Domain	Domain where this action occurred.
More Data	If Yes, additional detailed information is available by double-clicking the event entry or selecting the event (row) in the list and selecting <b>Actions &gt; Event Management &gt; View Detail...</b>

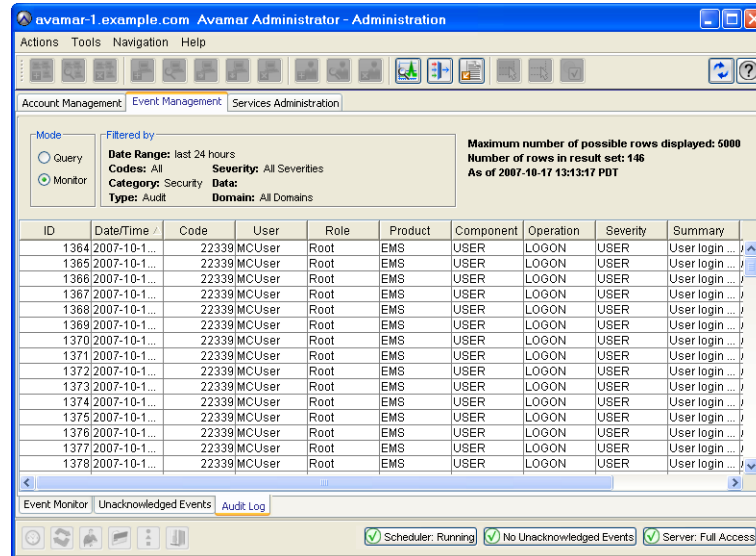
## Filtering the Audit Log Display

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

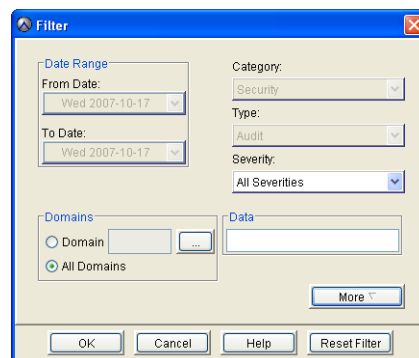
3. Click the Event Management tab.
4. Click the Audit Log tab (near the bottom).



5. Select **Actions > Event Management > Filter...** or click the toolbar icon shown immediately to the left.



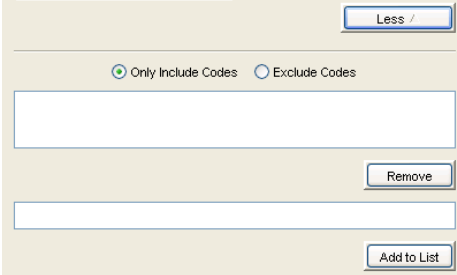
The Filter dialog box appears.





6. Define one or more of the following filtering criteria:

FIELD/OPTION	DESCRIPTION
From Date	<p>Used with To Date field to define a specific range of dates in the Audit Log.</p> <p><b>IMPORTANT:</b> If you want to type a range of dates, the Audit Log must already be in query mode (page 256). Otherwise, the From Date and To Date fields will be disabled.</p>
To Date	<p>Used with From Date field to define a specific range of dates in the Audit Log.</p> <p><b>IMPORTANT:</b> If you want to type a range of dates, the Audit Log must already be in query mode (page 256). Otherwise, the From Date and To Date fields will be disabled.</p>
Code	<p>Show all event codes (All Codes) is the only available selection.</p>
Category	<p>Security is the only available selection.</p>
Type	<p>Audit is the only available selection.</p>
Severity	<p>Display audit log entries of the following severities:</p> <ul style="list-style-type: none"> <li>• All Severities</li> <li>• OK</li> <li>• USER</li> <li>• PROCESS</li> <li>• NODE</li> <li>• USER_FATAL</li> <li>• PROCESS_FATAL</li> <li>• NODE_FATAL</li> <li>• SYSTEM_FATAL</li> </ul>
Data	<p>Only display audit log entries that contain these case-sensitive key words in the event code data XML element.</p> <p>This promotes easy filtering on important key words across audit log entry attributes. For example, filtering the Audit Log display on "error" would return all audit log entries that contained the word "error" in any XML attribute (for example, category, type or severity).</p>
Domains	<p>Select the <b>All Domains</b> option to display all audit log entries from all domains.</p> <p>To only show audit log entries from one domain, select the <b>Domain</b> option and type a domain for which you want to show audit log entries.</p> <p><b>TIP:</b> Click ... to browse to a domain for which you want to show audit log entries.</p>

FIELD/OPTION	DESCRIPTION
<p><b>More/Less</b></p>	<p>The <b>More/Less</b> button is used to display or hide advanced filtering features that allow you to include or exclude specific event codes.</p> <p>Clicking <b>More</b> displays an additional lower pane and the button name changes to <b>Less</b> (as shown next).</p>  <p>Clicking <b>Less</b> hides the additional lower pane and the button name changes to <b>More</b>.</p>
<p>Only include codes</p>	<p>Setting <b>Only include codes</b> filters the Audit Log to display only those event codes in the list.</p> <p>The <b>Only include codes</b> and <b>Exclude codes</b> options are mutually exclusive (you cannot both exclude and include specific event codes at the same time).</p>
<p>Exclude codes</p>	<p>Setting <b>Exclude codes</b> causes the Audit Log to not display any event codes in the list.</p> <p>The <b>Only include codes</b> and <b>Exclude codes</b> options are mutually exclusive (you cannot both exclude and include specific event codes at the same time).</p>
<p>Remove</p>	<p>Selecting an event code from the list and clicking <b>Remove</b> removes it from the include or exclude list.</p>
<p>Add to list</p>	<p>Typing a numeric event code in the entry field and clicking <b>Add to list</b> adds that event code to the include or exclude list.</p>

---

**IMPORTANT:** If you want to type a range of dates, the Audit Log must be in query mode (page 256). Otherwise, the From Date and To Date fields will be disabled.

---

7. Click **OK**.

The Filter dialog box closes and the Audit Log only shows events that meet your filtering criteria.

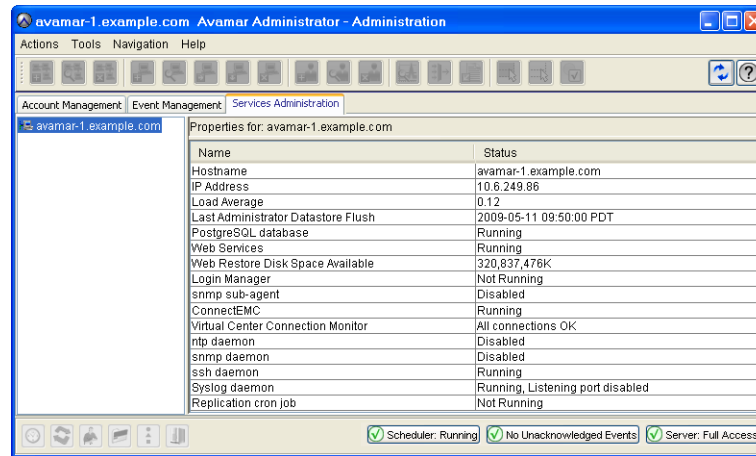
## Viewing Services Information

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

3. Click the Services Administration tab.



The Services Administration tab provides information about essential Avamar services (for example, syslog, NTP, Login Manager, and so forth).

SERVICE NAME	DESCRIPTION
Hostname	Avamar server network hostname as defined in DNS.
IP Address	Avamar server IP address.
Load Average	The average number of CPU threads over the past minute.
Last Administrator Datastore Flush	Date and time of last MCS flush.
PostgreSQL database	Status of the MCS database (page 291).
Web Services	Status of the Avamar Web Access service.
Web Restore Disk Space Available	Number of hard drive bytes Avamar Web Access can use to create the restore zip file. Refer to <i>Avamar Backup Clients User Guide</i> for additional information about restoring client files using the Avamar Web Access feature.
Login Manager	Status of the Avamar Login Manager service.
snmp sub-agent	Status of the Avamar SNMP sub-agent service
ConnectEMC	Status of the ConnectEMC service.

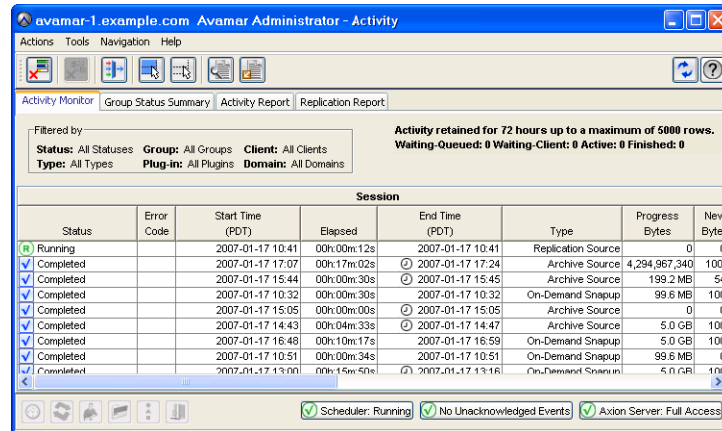
SERVICE NAME	DESCRIPTION
VMware vCenter Connection Monitor	Status of the VMware vCenter connections. <b>NOTE:</b> This service is only present if a vCenter client has been added to the system. Refer to your <i>Avamar VMware Guide</i> for additional information.
ntp daemon	Status of the Avamar Network Time Protocol (NTP) service.
snmp daemon	Status of the Avamar SNMP master agent service.
ssh daemon	Status of the Avamar Secure Shell (SSH) service.
Syslog daemon	Status of the Avamar syslog service.
Replication cron job	Status of the Avamar replication cron job. Refer to <i>Replication</i> (page 333) for additional information.

## Viewing a Detailed Client Session Log

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Activity** or click the **Activity** launcher button.



The Activity window appears.



3. Click the Activity Monitor tab.

By default, the Activity Monitor shows a detailed log of all client backup activity for the past 72 hours.

4. Select one activity (row) in the list.
5. Select **Actions > View Session Log...** or click the toolbar icon shown immediately to the left.



The Activity Session Drill-down dialog box appears.

6. Click **OK**.

The Activity Session Drill-down dialog box closes.

## Collecting and Viewing Log Files

By default, the Avamar storage process log file (gsan.log) is limited to 25 MB in size and always contains the most recent information. Additional historic log files (for example, gsan.log.1, gsan.log.2 and so forth) might also exist.

User=admin

1. Open a command shell (page 477) and log into the utility node as user admin.

2. Load the admin OpenSSH key by typing:

```
cd ~admin
ssh-agent bash
ssh-add ~/.ssh/admin_key
```

You are prompted to type a passphrase.

3. Type the admin user account passphrase and press **ENTER**.
4. Create a new user-defined temporary directory and change directory into it by typing:

```
mkdir DIR
cd DIR
```

Where DIR is a new user-defined temporary directory. This directory will be deleted following this procedure.

5. Retrieve copies of the storage node log files by typing:

```
getlogs
```

**getlogs** gathers the important log files from a particular node, compresses them into a single tar file (nodelogs.tgz), then copies these nodelogs.tgz files to numbered subdirectories in your current working directory.

You must examine these nodelogs.tgz files for any entry containing the string "ERROR." The recommended method for accomplishing this is to run the following shell commands, which write any nodelogs.tgz entries containing the string "ERROR" to a user-defined temporary file.

6. Type:

```
for p in [01].[!sm]*/nodelogs.tgz; do
tar xzf $p
grep ERROR: cur/gsan.log*
rm -rf cur/*
done
```

7. If any errors are found, contact EMC Technical Support.
8. Remove the user-defined temporary directory by typing:

```
cd ../
rm -rf DIR
```

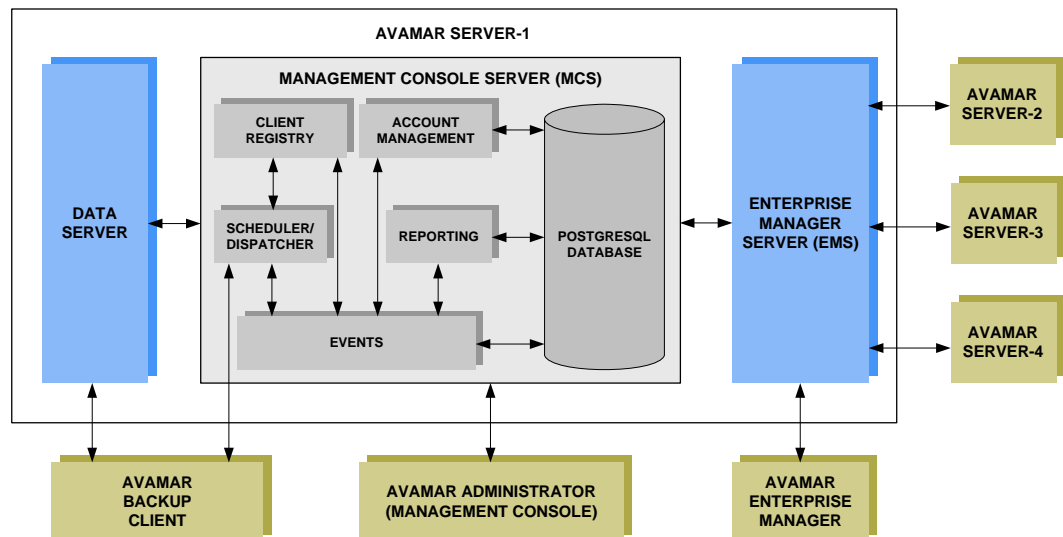
Where DIR is the user-defined temporary directory created in step 3.

# BASIC SERVER ADMINISTRATION

This chapter introduces and discusses basic Avamar server administrative concepts and tasks.

## Avamar Server Functional Block Diagram

The following diagram shows the major Avamar server functional blocks:



### Data Server

When performing a backup (page 74), restore (page 84) or validation (page 92), Avamar backup clients communicate directly with the data server. All scheduled backups are initiated by the MCS scheduler.

## Management Console Server (MCS)

The Management Console Server (MCS) provides centralized administration (scheduling, monitoring and management) for the Avamar server. The MCS also runs the server-side processes used by the Avamar Administrator graphical management console.

**Client Registry.** The client registry function controls client registration and activation. Refer to *Clients* (page 38) for additional information.

**Account Management.** The account management function is used to create and manage domains, clients, users and groups. Refer to *Domains, Clients and Users* (page 33) and *Groups and Group Policies* (page 128) for additional information.

**Reporting.** The reporting function is used to create and export various reports. Refer to *Reporting* (page 197) for additional information.

**Events.** The events function is used to display various system events and activities. Refer to *Basic Server Administration* (page 271) for additional information.

**Scheduler/Dispatcher.** The scheduler/dispatcher function controls when backup and restore jobs are performed, or if they are allowed to be queued for processing. Refer to *Backup, Restore and Backup Management* (page 73) for additional information.

**PostgreSQL Database.** The MCS uses a PostgreSQL database to store various kinds of data. PostgreSQL is an open architecture. Information in the MCS database is accessible through any PostgreSQL-compliant ODBC interface.

The MCS database filename is mcdb and it is located on the utility node in the `/usr/local/avamar/var/mc/server_data/postgres` directory.

MCS database contents are fully backed up on the Avamar server and can be restored as needed should the MCS fail.

---

**IMPORTANT:** The MCS database is intended for read-only access for reporting or query purposes. Do not manually modify any data in mcdb tables unless instructed to do so by EMC Technical Support. Directly modifying MCS operational data can cause loss of referential integrity, which could result in irretrievable loss of data.

---

## Enterprise Manager Server (EMS)

The Avamar Enterprise Manager Server (EMS) provides essential services required to display Avamar server information and provides a mechanism for managing Avamar servers using a standard web browser. The EMS also communicates directly with existing MCSs, which are an integral part of the all Avamar systems in your enterprise. Refer to *Avamar Enterprise Manager* (page 292) for additional information.



# Avamar Server Maintenance Activities and Backup/Maintenance Windows

This topic introduces and discusses Avamar server maintenance activities and backup/maintenance windows.

## Maintenance Activities

Avamar server maintenance comprises three essential activities:

- Checkpoint
- Checkpoint validation (also known as HFS check)
- Garbage collection

**Checkpoint.** A checkpoint is a snapshot of the Avamar server taken for the express purpose of facilitating server rollbacks.

**Checkpoint Validation (Also Known as HFS Check).** A Hash Filesystem check (also known as HFS check) is an internal operation that validates the integrity of a specific checkpoint. Once a checkpoint has passed an HFS check, it can be considered reliable enough to be used for a server rollback.

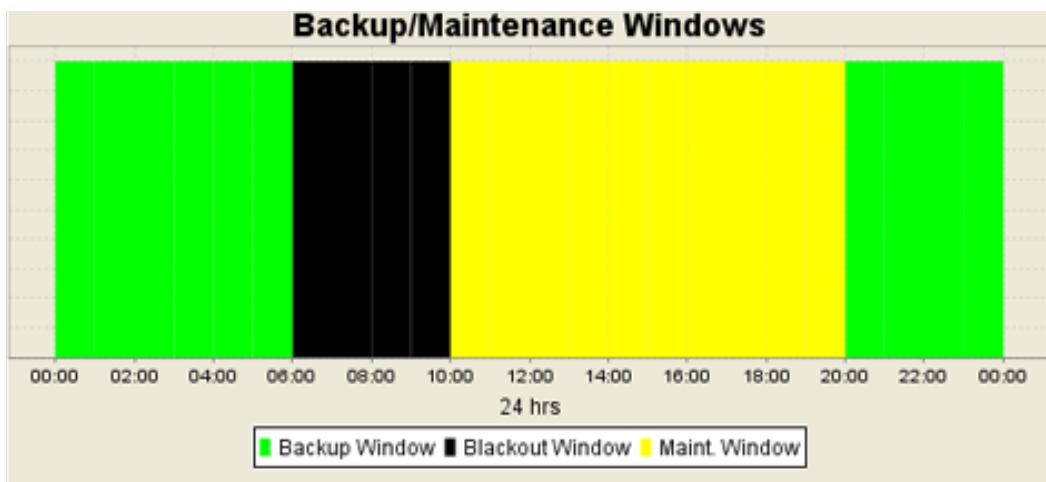
**Garbage Collection.** Garbage collection is an internal operation that recovers storage space from deleted or expired backups.

## Backup/Maintenance Windows

Each 24-hour day is divided into three operational windows, during which various system activities are performed:

- Backup window
- Blackout window
- Maintenance window

The following figure shows the default backup, blackout and maintenance windows:



**Backup Window.** The backup window is that portion of each day reserved for performing normal scheduled backups.

**Operational Impact** No maintenance activities are performed during the backup window.

**Default Settings** The default backup window begins at 8:00 P.M. local server time and continues uninterrupted for 10 hours until 6:00 A.M. the following morning.

**Customization** Both backup window start time and duration can be customized to meet your specific site requirements.

**Blackout Window.** The blackout window is that portion of each day reserved for performing server maintenance activities (primarily checkpoint and garbage collection) that require unrestricted access to the server.

**Operational Impact** No backup or administrative activities are allowed during the blackout window. You can however perform restores.

**Default Settings** The default blackout window begins at 6:00 A.M. local server time and continues uninterrupted for 4 hours until 10:00 A.M. that same morning.

**Customization** Blackout window duration can be customized to meet your specific site requirements. Any changes to blackout window duration also affect maintenance window duration. For example, changing the blackout window duration from 4 hours to 3 hours, will extend the maintenance window duration 1 hour because it begins 1 hour earlier. The backup window is not affected.

**IMPORTANT:** Setting the blackout window duration too short might adversely impact the server's ability to recover storage space from deleted or expired backups. If you shorten your blackout window duration, you should closely monitor your server capacity utilization and forecasting on a regular basis (at least weekly) to ensure that adequate garbage collection is taking place. Refer to *Capacity Management* (page 322) for additional information.

**Maintenance Window.** The maintenance window is that portion of each day reserved for performing routine server maintenance activities (primarily checkpoint validation).

**Operational Impact** There might be brief periods of time when backup or administrative activities will not be allowed. Although backups can be initiated during the maintenance window, doing so will impact both the backup and maintenance activities. For this reason, you should minimize any backup or administrative activities during the maintenance window. You can however perform restores.

**Default Settings** The default maintenance window begins at 10:00 A.M. local server time and continues uninterrupted for 10 hours until 8:00 P.M. that evening.

**Customization** Although the maintenance window is not directly customizable, its start time and duration is derived from backup and blackout window settings (that is, it starts immediately after the blackout window and continues until the backup window start time).

## Best Practices

**Do Not Schedule Backups Close to or During Blackout Window.** In order to ensure that all morning maintenance activities complete in a timely manner, EMC recommends that you do not schedule any group backups close to or during the blackout window (6:00-10:00 A.M. local time for most systems).

**Limit On-Demand Backups During Maintenance Window.** You might want to advise users to avoid initiating any on-demand backups from their client computers during the first hour and thirty minutes of the maintenance window (10:00 A.M.-8:00 P.M. local time for most systems).

**Avoid Initiating On-Demand Maintenance Activities.** Manually initiating maintenance activities such as checkpoint, checkpoint validation or garbage collect will temporarily disable all scheduled maintenance activities until such time the manually-initiated operation completes. Unless there is a pressing need to initiate an on-demand maintenance activity, it is best to rely on scheduled maintenance activities in order to ensure that sufficient time is allocated for each activity daily.

# Acknowledging System Events

System events that are configured to require acknowledgement each time they occur, remain in the unacknowledged events list until they are explicitly cleared (acknowledged) by an Avamar server administrator.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

3. Click the Event Management tab.
4. Click the Unacknowledged Events tab (near the bottom).

ID	Date/Time	Code	Category	Type	Severity	Summary	Domain
43	2007-07-17 15:39:58 PDT	642	SYSTEM	INFORMATI...	OK	gsan versi...	/
42	2007-07-17 15:39:58 PDT	17	SYSTEM	INFORMATI...	OK	Node resta...	/
50	2007-07-17 15:40:30 PDT	425	SYSTEM	INFORMATI...	OK	received av...	/
1	2007-07-17 16:29:26 PDT	22413	SYSTEM	ERROR	PROCESS	An error oc...	/
2	2007-07-17 16:29:27 PDT	22417	SYSTEM	INFORMATI...	PROCESS	The syste...	/
3	2007-07-17 16:29:27 PDT	22607	SYSTEM	INFORMATI...	PROCESS	The server ...	/
4	2007-07-17 16:29:27 PDT	22309	SYSTEM	INFORMATI...	OK	Scheduler ...	/
5	2007-07-17 16:29:32 PDT	22709	SYSTEM	INFORMATI...	PROCESS	The SNMP ...	/
6	2007-07-17 16:29:32 PDT	458	SYSTEM	ERROR	PROCESS	*** OBSOL...	/

5. Select one or more entries.

**TIP:** Press and hold the **SHIFT** key to select an entire range of entries; press and hold the **CTRL** key to select several individual (noncontiguous) entries.

6. Select **Actions > Event Management > Acknowledge Unacknowledged Events** or click the toolbar icon shown immediately to the left.



The events you previously selected no longer appear in the list.

**TIP:** Select **Actions > Event Management > Clear All Alerts** to clear the entire unacknowledged events list.

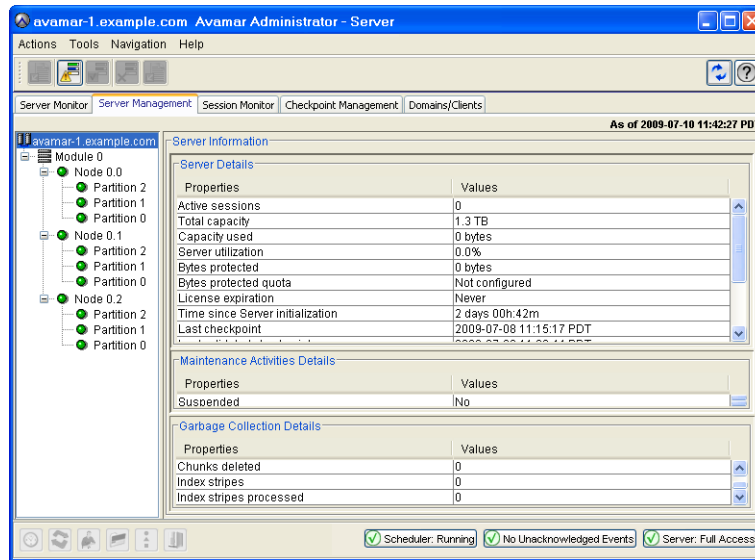
# Suspending Backups/Restores

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.



The Avamar Server window appears.

3. Click the Server Management tab.



4. In the tree pane, select the root node of the tree.
5. Select **Actions > Suspend Backups/Restores** or click the toolbar icon shown immediately to the left.



A confirmation message appears.

6. Click **Yes** to suspend backups.

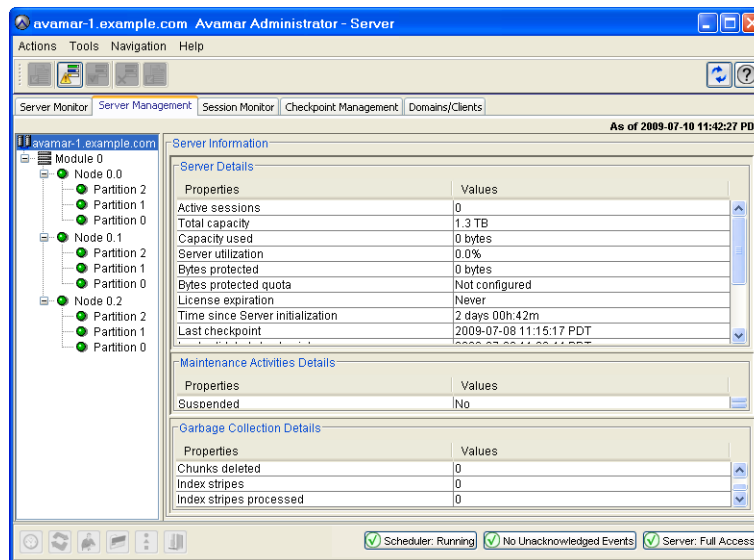
## Resuming Backups/Restores



1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.

The Avamar Server window appears.

3. Click the Server Management tab.



4. In the tree pane, select the root node of the tree.
5. Select **Actions > Resume Backups/Restores** or click the toolbar icon shown immediately to the left.



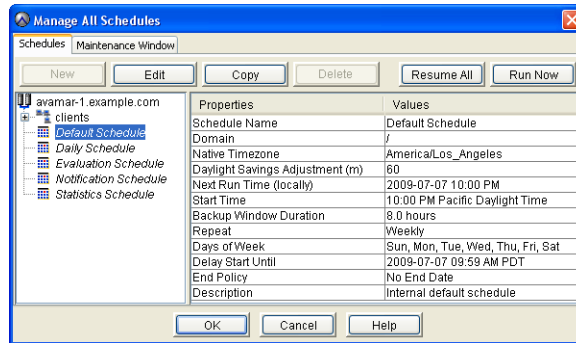
A confirmation message appears.

6. Click **Yes** to resume backups.

## Suspending Scheduled Operations

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**

The Manage All Schedules window appears.



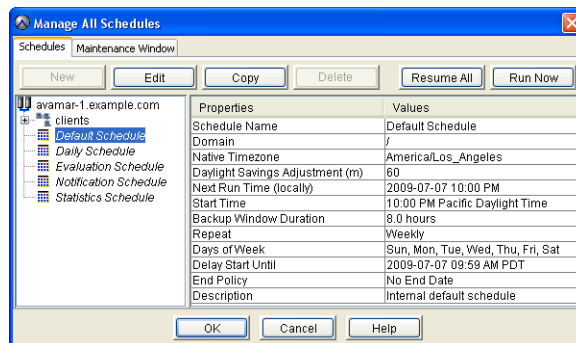
3. Click **Suspend All**.

The **Suspend All** button changes to **Resume All**.

## Resuming Scheduled Operations

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**

The Manage All Schedules window appears.



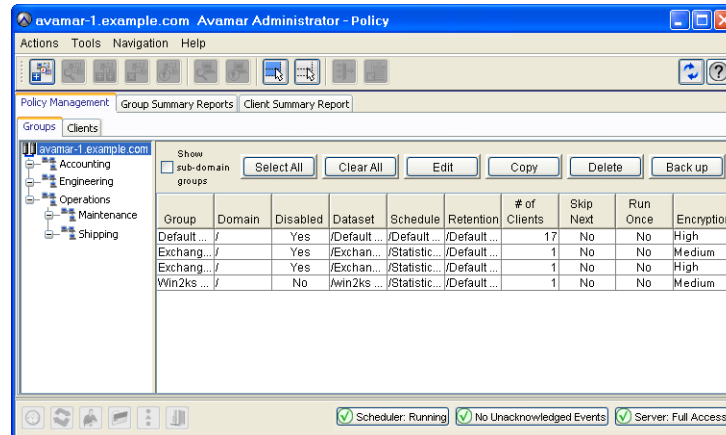
3. Click **Resume All**.

## Enabling Scheduled Group Backups

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.



3. Click the **Policy Management** tab.
4. Click the **Groups** tab.
5. Select the group you want enabled.
6. Select **Actions > Group > Disable Group**.  
 This clears the **Disable Group** option on the **Actions > Group** menu.  
 A status message appears.
7. Click **Yes** to enable this group.
8. Repeat steps 4 through 6 until all groups have been enabled.

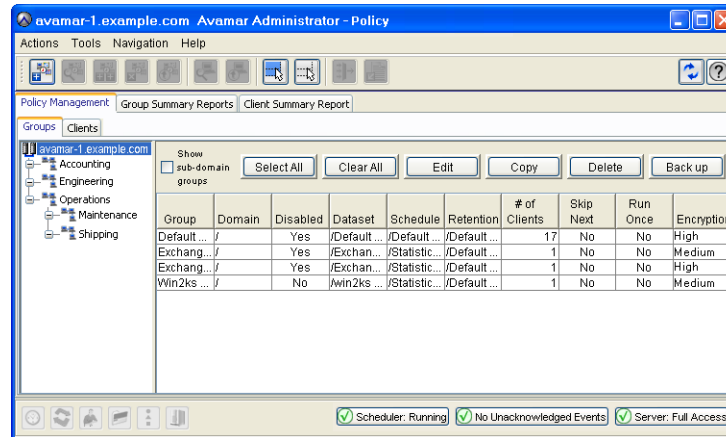


## Disabling Scheduled Group Backups

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.



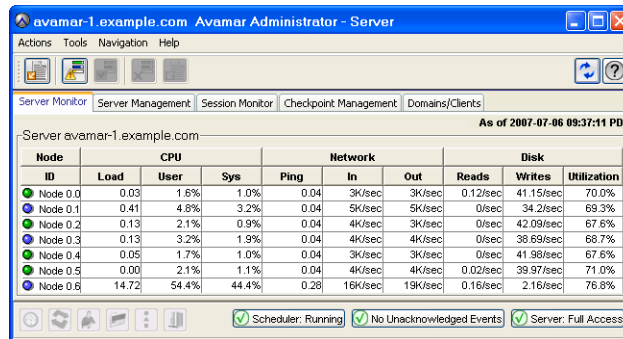
3. Click the **Policy Management** tab.
4. Click the **Groups** tab.
5. Select the group you want to disable.
6. Select **Actions > Group > Disable Group**.  
 This sets the **Disable Group** option on the **Actions > Group** menu.  
 A status message appears.
7. Click **Yes** to disable this group.
8. Repeat steps 4 through 6 until all groups have been disabled.

## Suspending Maintenance Activities



1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.

The Avamar Server window appears.



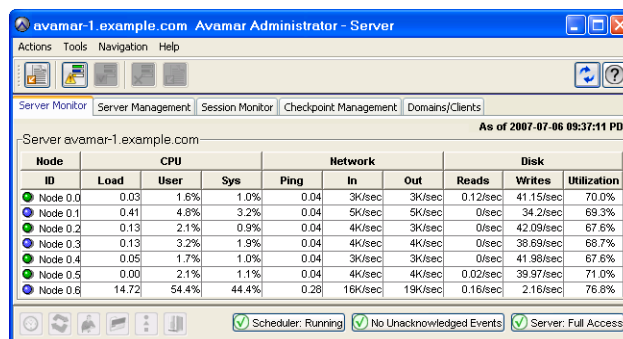
3. Select **Actions > Suspend Maintenance Activities**.  
A confirmation message appears.
4. Click **OK** to suspend maintenance activities.

## Resuming Maintenance Activities



1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.

The Avamar Server window appears.



3. Select **Actions > Resume Maintenance Activities**.  
A confirmation message appears.
4. Click **OK** to resume maintenance activities.

## Changing Backup/Maintenance Window Settings

You can customize any of the following backup/maintenance window settings to meet your specific site requirements:

- Backup window start time
- Backup window duration
- Blackout window duration

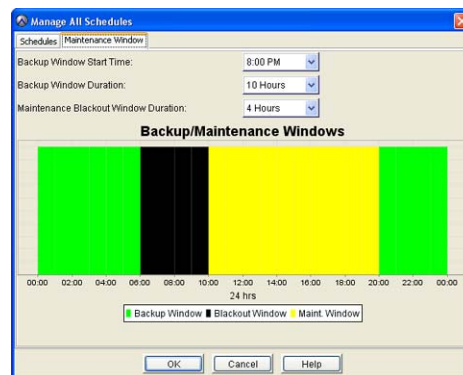
Any changes to blackout window duration also affect maintenance window duration. For example, changing the blackout window duration from 4 hours to 3 hours, will extend the maintenance window duration 1 hour because it begins 1 hour earlier.

---

**IMPORTANT:** Setting the blackout window duration too short might adversely impact the server's ability to recover storage space from deleted or expired backups. If you shorten your blackout window duration, you should closely monitor your server capacity utilization and forecasting on a regular basis (at least weekly) to ensure that adequate garbage collection is taking place. Refer to *Capacity Management* (page 322) for additional information.

---

1. Start Avamar Administrator (page 21).
2. Select **Tools > Manage Schedules...**  
 The Manage All Schedules window appears.
3. Click the Maintenance Window tab.



4. Do any of the following:

IF	DO THIS
You want to change the backup window start time.	Select a new start time from the Backup Window Start Time list.
You want to change the backup window duration.	Select a new duration from the Backup Window Duration list.
You want to change the blackout window duration.	Select a new duration from the Blackout Window Duration list.

5. Click **OK**.  
 The Manage All Schedules window closes.

## Managing Services

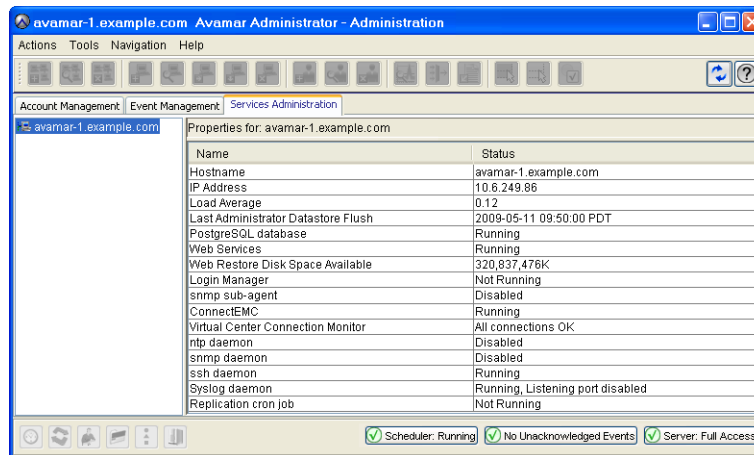
The Administration window Services Administration tab allows you to start, stop, suspend or resume individual services.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



The Administration window appears.

3. Click the Services Administration tab.



4. Select the service you want to start, stop, suspend or resume.
5. Do one of the following:

IF	DO THIS
You want to start a service.	Right-click <b>Start</b> .
You want to stop a service.	Right-click <b>Stop</b> .
You want to temporarily suspend a service until you explicitly resume it.	Right-click <b>Suspend</b> .
You want to resume a service that you previously suspended.	Right-click <b>Resume</b> .

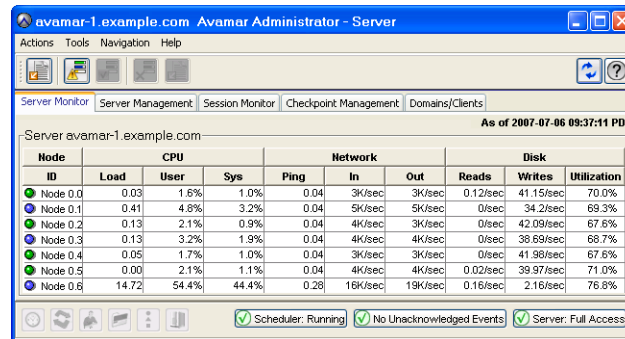
## Canceling a Client Session

Occasionally, a client might experience unexpected system behavior while it is taking a backup or restoring files. In these cases, it might be necessary to force an end to these client sessions from Avamar Administrator.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.



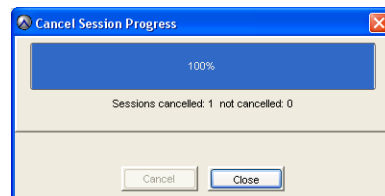
The Avamar Server window appears.



3. Click the Session Monitor tab.
4. Select the client session you want to cancel.
5. Select **Actions > Cancel Session...** or click the toolbar icon shown immediately to the left.



The Cancel Session Progress dialog box appears.



This dialog box shows the progress of this cancel client operation. You can cancel the operation at any time by clicking **Cancel**.

6. When the Cancel Session Progress dialog box shows 100%, click **Close**.  
 The Cancel Session Progress dialog box closes.

**TIP:** If you are unable to successfully cancel this client session, resetting the client (page 286) will immediately and forcibly terminate (kill) any active **avtar** session on that client.

## Resetting a Client

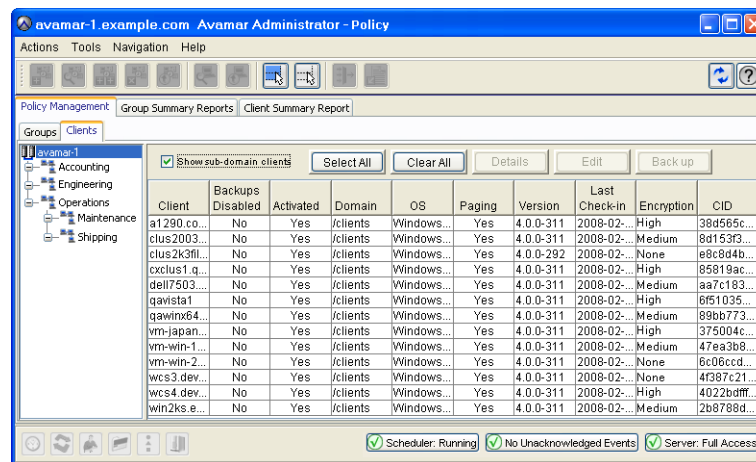
Resetting a client immediately and forcibly terminates (kills) any active client **avtar** session on that client. In most cases, you should try to cancel the client session (page 285) before resetting it.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Policy** or click the **Policy** launcher button.



The Policy window appears.

3. Click the Policy Management tab.
4. Click the Clients tab.



5. Select the client you want to reset.
6. Select **Actions > Client > Reset Client**.

# SERVER SHUTDOWN AND RESTART

---

This chapter describes how to gracefully shut down and restart the entire Avamar server, or selected subsystems within the server using the `dpnctl` program.

## Shutting Down the Server

**Best Practice.** Whenever possible, also perform these tasks as part of a full system shutdown:

- Verify system integrity (page 255)
- Create (page 352) and validate (page 353) a server checkpoint

---

**NOTE:** If the system passed integrity checks, you do not need to create or validate a server checkpoint. However, there is no harm in doing so.

---

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <code>ssh-agent bash</code> <code>ssh-add ~admin/.ssh/admin_key</code> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Type:

**dpnctl stop**

The following information might appear in your command shell.

```
Do you wish to shut down the local instance of EMS?
  Answering  y(es) will shut down the local instance of EMS
             n(o) will leave up the local instance of EMS
             q(uit) exits without shutting down
y(es), n(o), q(uit/exit):
```

4. Do one of the following:

IF	DO THIS
You want to shut down this local EMS instance.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to shut down this local EMS instance.	Type <b>n</b> and press <b>ENTER</b> .

Information similar to the following appears in your command shell:

```
dpnctl: INFO: Suspending backup scheduler...
dpnctl: INFO: Backup scheduler suspended.
dpnctl: INFO: Suspending maintenance cron jobs...
dpnctl: INFO: Checking for active checkpoint maintenance...
dpnctl: INFO: Terminating hfs integrity maintenance (hfscheck)...
dpnctl: INFO: Shutting down dtlt...
dpnctl: INFO: dtlt shut down.
dpnctl: INFO: Shutting down MCS...
dpnctl: INFO: MCS shut down.
dpnctl: INFO: Shutting down gsan...
dpnctl: INFO: gsan shut down.
```



## Restarting the Server

Use this procedure to bring an Avamar server back online after a system shutdown.

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Type:

**dpnctl start**

The following information appears in your command shell:

```
Identity added: /home/admin/.ssh/dpnid (/home/admin/.ssh/dpnid)
dpnctl: INFO: Checking that gsan was shut down cleanly...
dpnctl: INFO: Restarting the gsan (this may take some time)...
dpnctl: INFO: To monitor progress, run in another window: tail -f /tmp/dpnctl-
gsan-restart-output-7416
dpnctl: INFO: Restarting gsan succeeded.
dpnctl: INFO: gsan started.
dpnctl: INFO: Updating MCS...
dpnctl: INFO: To monitor progress, run in another window: tail -f /tmp/dpnctl-
mcs-update-output-7416
dpnctl: INFO: MCS updated.
dpnctl: INFO: Starting MCS...
dpnctl: INFO: To monitor progress, run in another window: tail -f /tmp/dpnctl-
mcs-start-output-7416
dpnctl: INFO: MCS started.
dpnctl: INFO: Starting EMS...
dpnctl: INFO: To monitor progress, run in another window: tail -f /tmp/dpnctl-
ems-start-output-7416
dpnctl: INFO: EMS started.
dpnctl: INFO: Resuming scheduler...
dpnctl: INFO: Scheduler resumed.
dpnctl: INFO: Resuming maintenance cron jobs...
dpnctl: INFO: Maintenance cron jobs resumed.
```

## Stopping the MCS

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Type:

```
dpnctl stop mcs
```

## Starting the MCS

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Type:

```
dpnctl start mcs
```

4. Resume scheduled operations (page 279).

## Getting MCS Status

This command returns the status of each MCS service and any available performance statistics.

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Type:

```
dpnctl status mcs
```

# AVAMAR ENTERPRISE MANAGER

---

Avamar Enterprise Manager is a web-based multi-system management console application that provides centralized Avamar system administration capabilities for larger businesses and enterprises.

## Capabilities and Limitations

This topic discusses various capabilities and limitations of Avamar Enterprise Manager.

**Multi-System Management.** With Avamar Enterprise Manager, you can monitor all Avamar systems in your enterprise from a single web browser session. Refer to *Monitoring Multiple Systems* (page 316) for additional information.

**Dashboard.** The integrated dashboard (page 296) provides an “at-a-glance” view that allows you to quickly assess the operational status of each Avamar system and determine if backups are completing successfully.

**Only One Avamar Enterprise Manager Server is Required.** The Avamar Enterprise Manager Server (EMS) provides essential services required to display Avamar system information and provides a mechanism for managing Avamar systems using a standard web browser. The EMS also communicates directly with existing MCSs, which are an integral part of all Avamar systems in your enterprise. Therefore, it is important to understand that only one operational EMS is required per enterprise; you do not need to run EMS on every Avamar system, nor is it desirable to do so.

**Avamar Enterprise Manager Can Only Manage Like Version Avamar Servers.** Due to known limitations with Java web services, Avamar Enterprise Manager can only connect to, and manage Avamar Administrator servers running the same version Avamar software. Effectively, this means that Avamar Enterprise Manager can only manage Avamar servers running the same version Avamar software.

### **Use Local MCS to Authenticate Avamar Enterprise Manager**

**Logins.** Because only one operational EMS is required per enterprise and there is usually no good reason to authenticate Avamar Enterprise Manager logins using a remote MCS running on another Avamar host. Therefore, it is best to simply use the default installation and configuration options, which configure the EMS to use the local MCS (the MCS running on the same Avamar host) to authenticate Avamar Enterprise Manager logins.

### **Avamar Enterprise Manager is Functionally Similar to Avamar Administrator.**

Although the Avamar Enterprise Manager user interface is different than Avamar Administrator, the fundamental administrative principles and operations are similar. Once you are familiar with how to administer an Avamar system using Avamar Administrator, you should be able to perform those same tasks using Avamar Enterprise Manager. The primary difference will be that you can centrally administer every Avamar system in your enterprise from a single application, rather than having to launch multiple Avamar Administrator sessions.

**Web Browser Security Settings.** The information presented in the remainder of this chapter assumes that you are using Microsoft Internet Explorer 6 with the default security settings. If you are using another web browser or other security settings, you should be prepared to answer Yes when presented with additional or different security prompts.

**Session Time-Out Information.** The default session time-out setting for most Avamar Enterprise Manager features and functions is 72 hours. However, the dashboard (page 296) and replicator (page 315) pages automatically refresh themselves every minute. Effectively, this means that if you leave your web browser pointed to the dashboard or replicator pages, your Avamar Enterprise Manager session will continue indefinitely. However, if you leave your web browser pointed to any other page, your Avamar Enterprise Manager session will automatically time out after 72 hours of inactivity. The default session time-out setting is modifiable by changing the session-timeout preference in `/usr/local/jakarta-tomcat-6.0.18/webapps/cas/WEB-INF/web.xml`.

## Shutting Down the EMS

These instructions are provided in case you need to perform an orderly shutdown of your EMS.

1. Open a command shell (page 477).
2. Log into the utility node as user admin.
3. Type:  
`dpnctl stop ems`
4. Wait for `dpnctl stop ems` to complete.

## Restarting the EMS

These instructions are provided should you need to restart your EMS following a shutdown (page 294).

1. Ensure that Avamar Enterprise Manager has been properly shut down (stopped) (page 294)
2. Open a command shell (page 477).
3. Log into the utility node as user admin.
4. Type:  
`dpnctl start ems`
5. Wait for `dpnctl start ems` to complete.

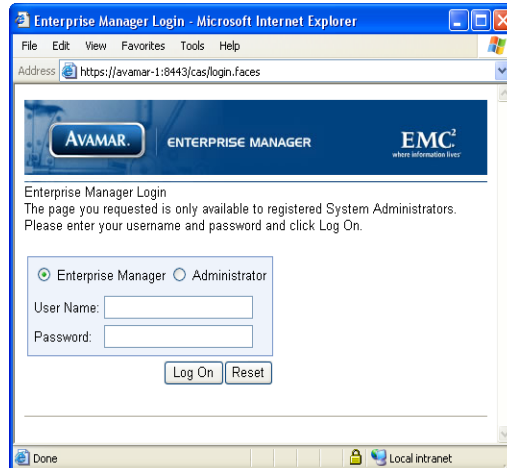
## Logging Into Avamar Enterprise Manager

1. Point your web browser to the following URL:

**http://AVAMARSERVER/em**

Where AVAMARSERVER is the hostname as defined in DNS.

The Avamar Enterprise Manager Login page appears.



2. Type your Avamar administrative user account ID and password in the User Name and Password fields, respectively.

---

**TIP:** Clicking **Reset** clears the User Name and Password fields.

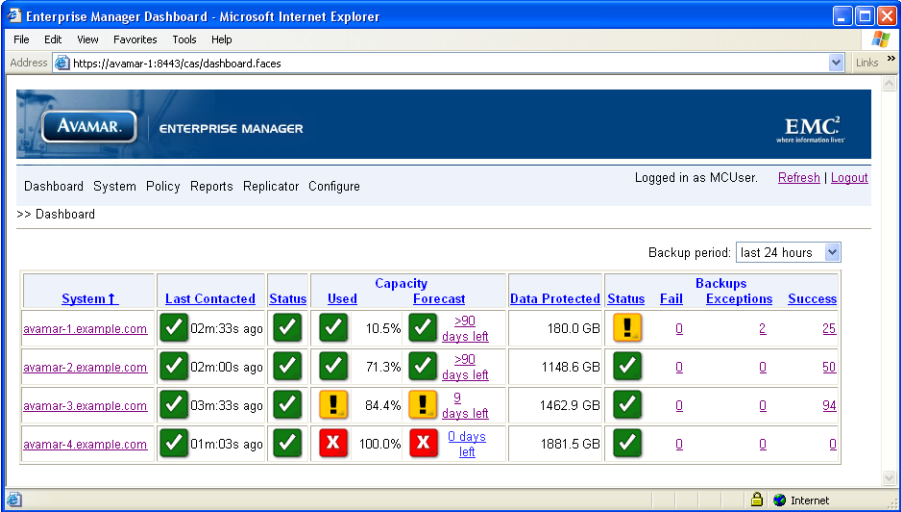
---

3. Click **Log On**.
4. If a Security Warning dialog box appears, click **Yes** to proceed with the login.

The Dashboard page (page 296) appears.

# Dashboard

The Dashboard page provides an “at-a-glance” view that allows you to quickly assess each Avamar server’s operational status and capacity utilization, as well as determine if scheduled backups are successfully completing.












Selecting **Dashboard** from any other page displays the Dashboard page.




The following table explains each Dashboard page element:

PAGE ELEMENT	DESCRIPTION
Backup period	This list box allows you to select an effective period of time for status shown in the Backups column. Choices are: <ul style="list-style-type: none"> <li>last 24 hours</li> <li>last week</li> <li>last two weeks</li> </ul>
System	This column shows each server’s hostname as defined in corporate DNS. Clicking the server name takes you to individual system information page (page 300) for that Avamar server.



PAGE ELEMENT	DESCRIPTION
Last Contacted	<p>This column shows elapsed time since each Avamar server was last contacted by Avamar Enterprise Manager and data was collected.</p> <p><b>IMPORTANT:</b> If the last updated indicator shows a status other than green, all other displayed information for that system should be considered stale and might not reflect actual Avamar system status.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li style="margin-bottom: 10px;">  Avamar Enterprise Manager is operating normally and is able to communicate and collect data at the specified refresh/polling interval from this Avamar server. The elapsed time since Avamar Enterprise Manager last communicated with this Avamar server is shown next to the status icon. </li> <li style="margin-bottom: 10px;">  Last attempt by Avamar Enterprise Manager failed to communicate or collect data from this Avamar server failed. <p>Avamar Enterprise Manager will wait one minute and retry again for up to three times before considering that refresh/polling cycle a failure. The specific reason for this condition displayed next to the status icon.</p> <p>This condition can happen intermittently if network access to the Avamar server is slow or unreliable. It can also occur if that Avamar server is not running or has encountered an error or warning condition.</p> </li> <li>  One of the following conditions: <ul style="list-style-type: none"> <li>Avamar Enterprise Manager failed to communicate and or collect data from an Avamar server for a specified number of refresh/polling cycles.</li> <li>Avamar server hostname could not be resolved.</li> <li>Avamar server login credentials (user name or password) were refused.</li> </ul> <p>The default polling setting is three cycles (30 minutes total elapsed time based on a 10 minute refresh/polling cycle). The specific reason for this condition displayed next to the status icon.</p> <p><b>IMPORTANT:</b> Any red status condition should be immediately investigated and remedied to ensure that system operation is not adversely affected.</p> </li> </ul>

PAGE ELEMENT	DESCRIPTION
Capacity - Used	<p>This column shows summary status of how storage capacity is being utilized on that Avamar server.</p> <p>Detailed information includes the amount of storage capacity consumed (in bytes) and the amount of free storage capacity available (as a percentage of total available storage capacity).</p> <p>Used state icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li> Avamar server has used less than 80% of total storage capacity.</li> <li> Avamar server has used more than 80% but less than 95% of total storage capacity. Consider adding additional capacity or deleting old backups.</li> <li> Avamar server has used more than 95% of total storage capacity. <b>IMPORTANT:</b> No new backups will be taken until additional capacity is added or old backups are deleted. Contact EMC Technical Support.</li> </ul> <p><b>TIP:</b> Clicking a capacity forecast icon takes you directly to the Capacity Utilization and Forecast page (page 326).</p>
Capacity - Forecast	<p>Forecast state icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li> Avamar server is forecast to have 90 days or more storage capacity.</li> <li> Avamar server is forecast to have less than 90 days of storage capacity.</li> <li> Avamar server is forecast to have less than 30 days of storage capacity.</li> </ul> <p><b>TIP:</b> Clicking a capacity forecast icon takes you directly to the Capacity Utilization and Forecast page (page 326).</p>
Data Protected	<p>This column shows how much data is currently being protected on each Avamar server.</p>

PAGE ELEMENT	DESCRIPTION
Backups	<p>This column provides a quick overview of scheduled backup status for each Avamar server.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li>  All scheduled backups successfully completed within the allotted period of time.         </li> <li>  One or more scheduled backups successfully completed with exceptions.         </li> <li>  One or more scheduled backups did not successfully complete within the allowed period of time.         </li> </ul> <p><b>TIP:</b> Clicking a backup status icon takes you directly to the Reports page (page 312).</p>

# System

Avamar Enterprise Manager offers two distinct kinds of system information pages:

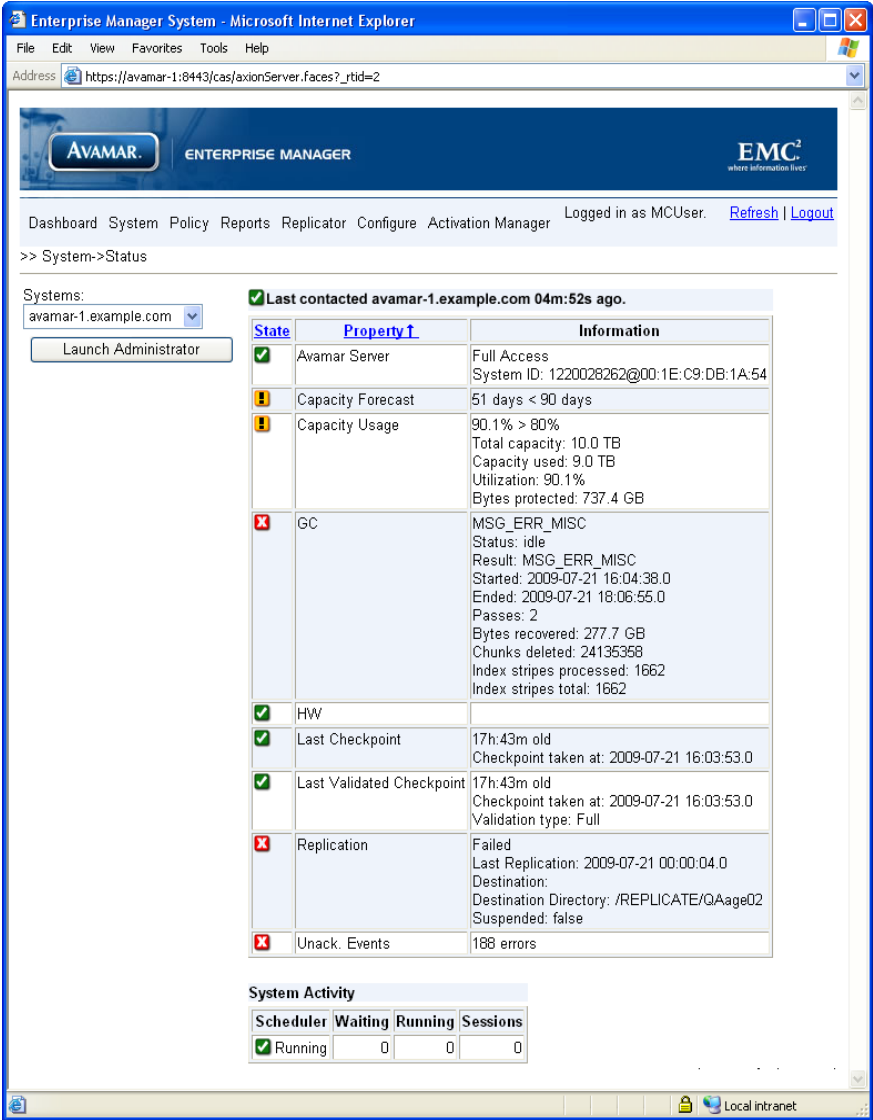
Individual system information pages (page 300) allow you to view detailed information for a single Avamar server.

The all systems information (detailed dashboard) page (page 310) provides a consolidated detailed view of all Avamar servers.

## Individual System Information Page




The individual system information page allows you to view detailed information for a specific Avamar server.



Clicking a system name on the Dashboard page (page 296) or selecting an Avamar server from the Systems list box displays the individual properties page for that server.
















## Server Status

The following table explains server status information:




INFORMATION	DESCRIPTION
Last contacted	<p>This row shows elapsed time since each Avamar server was last contacted by Avamar Enterprise Manager and data was collected.</p> <p><b>IMPORTANT:</b> If Last updated shows a status other than green, all other displayed information for that server should be considered stale and might not reflect actual Avamar server status.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li>  Avamar Enterprise Manager is able to communicate and collect data from this Avamar server. The elapsed time since Avamar Enterprise Manager last communicated with this Avamar server is shown next to the status icon. </li> <li>  Last attempt by Avamar Enterprise Manager failed to communicate or collect data from this Avamar server failed. Refer to <i>Dashboard</i> (page 296) for additional information about refresh/polling intervals and associated status conditions. </li> <li>  One of the following conditions:  <ul style="list-style-type: none"> <li>Avamar Enterprise Manager failed to communicate and or collect data from an Avamar server for a specified number of refresh/polling cycles.</li> <li>Avamar server hostname could not be resolved.</li> <li>Avamar server login credentials (user name or password) were refused.</li> </ul> </li> </ul> <p><b>IMPORTANT:</b> Any red status condition should be immediately investigated and remedied to ensure that server operation is not adversely affected. Contact EMC Technical Support.</p> <p>Refer to <i>Dashboard</i> (page 296) for additional information about refresh/polling intervals and associated status conditions.</p>







INFORMATION	DESCRIPTION												
Avamar Server	<p>This row shows the Avamar server operational run level.</p> <p>State icons communicate the following conditions:</p> <p> Full access. This Avamar server is fully operational.</p> <p> This Avamar server is less than fully operational due to one of the following conditions:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Admin</td> <td style="padding: 5px;">Avamar server is fully operational but only the administrator root account can access the server.</td> </tr> <tr> <td style="padding: 5px;">Admin Only</td> <td style="padding: 5px;">Avamar server is fully operational but only the administrator root account can access the server.</td> </tr> <tr> <td style="padding: 5px;">Admin Read Only</td> <td style="padding: 5px;">Avamar server is in a read-only condition and only the administrator root account can access the server.</td> </tr> <tr> <td style="padding: 5px;">Read Only</td> <td style="padding: 5px;">Avamar server is in a read-only condition. Restores are allowed but no new backups can be taken.</td> </tr> <tr> <td style="padding: 5px;">Suspended</td> <td style="padding: 5px;">Scheduled backups are disabled and will not occur until you reenable the scheduler. Refer to <i>Suspending Scheduled Operations</i> (page 279) for additional information.</td> </tr> <tr> <td style="padding: 5px;">Synchronizing</td> <td style="padding: 5px;">Avamar server is priming or synchronizing stripes. This is a temporary condition. Some operations might be delayed.</td> </tr> </table>	Admin	Avamar server is fully operational but only the administrator root account can access the server.	Admin Only	Avamar server is fully operational but only the administrator root account can access the server.	Admin Read Only	Avamar server is in a read-only condition and only the administrator root account can access the server.	Read Only	Avamar server is in a read-only condition. Restores are allowed but no new backups can be taken.	Suspended	Scheduled backups are disabled and will not occur until you reenable the scheduler. Refer to <i>Suspending Scheduled Operations</i> (page 279) for additional information.	Synchronizing	Avamar server is priming or synchronizing stripes. This is a temporary condition. Some operations might be delayed.
Admin	Avamar server is fully operational but only the administrator root account can access the server.												
Admin Only	Avamar server is fully operational but only the administrator root account can access the server.												
Admin Read Only	Avamar server is in a read-only condition and only the administrator root account can access the server.												
Read Only	Avamar server is in a read-only condition. Restores are allowed but no new backups can be taken.												
Suspended	Scheduled backups are disabled and will not occur until you reenable the scheduler. Refer to <i>Suspending Scheduled Operations</i> (page 279) for additional information.												
Synchronizing	Avamar server is priming or synchronizing stripes. This is a temporary condition. Some operations might be delayed.												




INFORMATION	DESCRIPTION								
Avamar Server (continued)	<p> This Avamar server is experiencing one of the following conditions that requires immediate attention:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; vertical-align: top;">Inactive</td> <td>One or more storage nodes are unresponsive to communication requests from local MCS (that is, nodes are functioning but frequently timing out on communication requests).</td> </tr> <tr> <td style="vertical-align: top;">Node Offline</td> <td>One or more storage nodes has experienced a problem. Contact EMC Technical Support for additional information.</td> </tr> <tr> <td style="vertical-align: top;">Not available</td> <td>Avamar Enterprise Manager cannot obtain any information from this Avamar server. This might indicate communication problems or errors in retrieving data. <b>TIP:</b> Ensure that Last updated status indicator is green.</td> </tr> <tr> <td style="vertical-align: top;">Unknown State</td> <td>Avamar server is in an unknown state. It is either not running or does not respond to communication requests.</td> </tr> </table> <p><b>IMPORTANT:</b> Any red status condition should be immediately investigated and remedied to ensure that server operation is not adversely affected. Contact EMC Technical Support for assistance.</p>	Inactive	One or more storage nodes are unresponsive to communication requests from local MCS (that is, nodes are functioning but frequently timing out on communication requests).	Node Offline	One or more storage nodes has experienced a problem. Contact EMC Technical Support for additional information.	Not available	Avamar Enterprise Manager cannot obtain any information from this Avamar server. This might indicate communication problems or errors in retrieving data. <b>TIP:</b> Ensure that Last updated status indicator is green.	Unknown State	Avamar server is in an unknown state. It is either not running or does not respond to communication requests.
Inactive	One or more storage nodes are unresponsive to communication requests from local MCS (that is, nodes are functioning but frequently timing out on communication requests).								
Node Offline	One or more storage nodes has experienced a problem. Contact EMC Technical Support for additional information.								
Not available	Avamar Enterprise Manager cannot obtain any information from this Avamar server. This might indicate communication problems or errors in retrieving data. <b>TIP:</b> Ensure that Last updated status indicator is green.								
Unknown State	Avamar server is in an unknown state. It is either not running or does not respond to communication requests.								
Capacity - Forecast	<p>Forecast state icons communicate the following conditions:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; vertical-align: top;"></td> <td>Avamar server is forecast to have 90 days or more storage capacity.</td> </tr> <tr> <td style="vertical-align: top;"></td> <td>Avamar server is forecast to have less than 90 days of storage capacity.</td> </tr> <tr> <td style="vertical-align: top;"></td> <td>Avamar server is forecast to have less than 30 days of storage capacity.</td> </tr> </table>		Avamar server is forecast to have 90 days or more storage capacity.		Avamar server is forecast to have less than 90 days of storage capacity.		Avamar server is forecast to have less than 30 days of storage capacity.		
	Avamar server is forecast to have 90 days or more storage capacity.								
	Avamar server is forecast to have less than 90 days of storage capacity.								
	Avamar server is forecast to have less than 30 days of storage capacity.								




INFORMATION	DESCRIPTION
Capacity Usage	<p>This row shows how much storage capacity is being utilized on that Avamar server.</p> <p>Detailed information includes:</p> <ul style="list-style-type: none"> <li>• Total capacity</li> <li>• Capacity used</li> <li>• Total bytes protected</li> </ul> <p>State icons communicate the following conditions:</p> <p> Avamar server has used less than 80% of total storage capacity.</p> <p> Avamar server has used more than 80% but less than 95% of total storage capacity.            Consider adding additional capacity or deleting old backups.</p> <p> Avamar server has used more than 95% of total storage capacity.  <b>IMPORTANT:</b> No new backups will be taken until additional capacity is added or old backups are deleted. Contact EMC Technical Support.</p>






INFORMATION	DESCRIPTION				
GC	<p>This row shows whether or not garbage collection (GC) is running or has successfully freed additional storage space on this Avamar server.</p> <p>Detailed information includes:</p> <ul style="list-style-type: none"> <li>• Started timestamp</li> <li>• Ended timestamp</li> <li>• Number of passes</li> <li>• MB scanned</li> <li>• Bytes recovered</li> <li>• Chunks deleted</li> <li>• Number of index stripes affected</li> <li>• Total number of index stripes scanned</li> </ul> <p>State icons communicate the following conditions:</p> <p> Garbage collection successfully completed on this Avamar server within the past 30 hours.</p> <p> Garbage collection has not successfully completed on this Avamar server within the past 30 hours, possibly due to one of the following conditions:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">In progress</td> <td style="padding-left: 100px;">Garbage collection is currently running.</td> </tr> <tr> <td style="padding-left: 20px;">None</td> <td style="padding-left: 100px;">Garbage collection has never successfully completed on this Avamar server.</td> </tr> </table> <p> Garbage collection encountered an error the last time it was run.</p> <p><b>IMPORTANT:</b> Any red status condition should be immediately investigated and remedied to ensure that server operation is not adversely affected. Contact EMC Technical Support for assistance.</p>	In progress	Garbage collection is currently running.	None	Garbage collection has never successfully completed on this Avamar server.
In progress	Garbage collection is currently running.				
None	Garbage collection has never successfully completed on this Avamar server.				

INFORMATION	DESCRIPTION
HW	<p>This row shows whether or not Avamar server hardware (HW) is functioning correctly.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li> Avamar server hardware is functioning correctly (there are no hardware related error or warning events).</li> <li> One or more warning events specifically related to server hardware have been encountered on this Avamar server.  Server logs should be reviewed to ensure that these conditions do not adversely affect server operation.</li> <li> One or more serious error events specifically related to server hardware have been encountered on this Avamar server.  <b>IMPORTANT:</b> Any red status condition should be immediately investigated and remedied to ensure that server operation is not adversely affected. Contact EMC Technical Support.</li> </ul>
Last Checkpoint	<p>This row shows whether or not regularly scheduled checkpoints are successfully completing.</p> <p>The elapsed time since last successful checkpoint and the checkpoint time stamp are shown if at least one successful checkpoint has completed on this Avamar server.</p> <p>“None” indicates that no checkpoints are stored on this Avamar server.</p> <p>“Init” indicates that this is a new Avamar server and that the initial checkpoint has not yet completed.</p> <p>Refer to <i>Checkpoints</i> (page 351) for additional information.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li> Checkpoint successfully completed on this Avamar server within the past 24 hours.</li> <li> More than 24 hours but less than 48 hours have elapsed since a checkpoint successfully completed on this Avamar server.</li> <li> More than 48 hours have elapsed since a checkpoint successfully completed on this Avamar server.</li> </ul>



INFORMATION	DESCRIPTION				
Last Validated Checkpoint	<p>This row shows whether or not regularly scheduled checkpoint validations are successfully completing on this Avamar server.</p> <p>“None” indicates that no checkpoints have ever successfully been validated on this Avamar server.</p> <p>“Errors” indicates that the last checkpoint validation operation failed.</p> <p>“Not configured” indicates that checkpoint validation is not enabled on this server.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li> Checkpoint validation successfully completed on this Avamar server within the past 48 hours.</li> <li> More than 48 hours but less than 72 hours have elapsed since a checkpoint validation successfully completed on this Avamar server.</li> <li> More than 72 hours have elapsed since a checkpoint validation successfully completed on this Avamar server.</li> </ul> <p>Validation type describes the extent of checking performed during the checkpoint. One of the following:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Full</td> <td>A full checkpoint (all checks) was performed.</td> </tr> <tr> <td>Rolling</td> <td>A rolling checkpoint (all new and modified stripes fully validated and a subset of unmodified stripes were validated) was performed.</td> </tr> </table>	Full	A full checkpoint (all checks) was performed.	Rolling	A rolling checkpoint (all new and modified stripes fully validated and a subset of unmodified stripes were validated) was performed.
Full	A full checkpoint (all checks) was performed.				
Rolling	A rolling checkpoint (all new and modified stripes fully validated and a subset of unmodified stripes were validated) was performed.				

INFORMATION	DESCRIPTION
Replication	<p>This row shows whether or not regularly scheduled replication is successfully completing on each Avamar server.</p> <p>“Failed” indicates that the last replication operation failed.</p> <p>“Disabled” indicates that the Avamar data replication feature is not enabled on this server.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li style="margin-bottom: 10px;">  Replication successfully completed on this Avamar server within the past 48 hours or the Avamar data replication feature is not enabled on this server.         </li> <li style="margin-bottom: 10px;">  More than 48 hours but less than 72 hours have elapsed since replication successfully completed on this Avamar server.         </li> <li style="margin-bottom: 10px;">  More than 72 hours have elapsed since replication successfully completed on this Avamar server or the last replication operation failed.         </li> </ul> <p><b>IMPORTANT:</b> Any red status condition should be immediately investigated and remedied to ensure that server operation is not adversely affected. Contact EMC Technical Support.</p> <p><b>TIP:</b> The optional replication management feature is discussed elsewhere in this publication. Refer to <i>Replication</i> (page 333) for additional information.</p>

INFORMATION	DESCRIPTION
Unack. Events	<p>This row shows whether or not there are any unacknowledged events (Unack. Events) on each Avamar server.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li style="margin-bottom: 10px;">  No warning or error events have occurred on this Avamar server that have not been explicitly acknowledged by an Avamar server administrator. Refer to <i>Acknowledging System Events</i> (page 276) for additional information. </li> <li style="margin-bottom: 10px;">  One or more warning events have been encountered on this Avamar server and these events have not been explicitly acknowledged by an Avamar server administrator. Server logs should be reviewed to ensure that these conditions do not adversely affect server operation. </li> <li>  One or more serious error events have been encountered on this Avamar server and these events have not been explicitly acknowledged by an Avamar server administrator. <b>IMPORTANT:</b> Any red status condition should be immediately investigated and remedied to ensure that server operation is not adversely affected. Contact EMC Technical Support. </li> </ul>

### System Activity

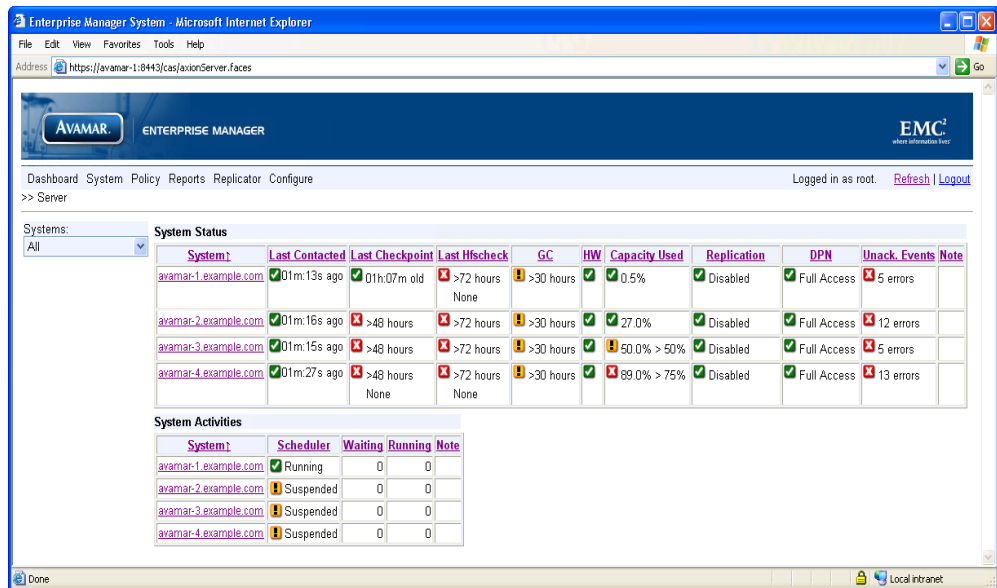
The following table explains each piece of System Activity information:

INFORMATION	DESCRIPTION
Scheduler	<p>This column shows whether or not regularly scheduled server activities (for example, backups, maintenance activities) are enabled for this Avamar server.</p> <p>State icons communicate the following conditions:</p> <ul style="list-style-type: none"> <li style="margin-bottom: 10px;">  Regularly scheduled activities are enabled (resumed) on this Avamar server. </li> <li>  Regularly scheduled activities are suspended on this Avamar server. Refer to <i>Suspending Scheduled Operations</i> (page 279) for additional information. </li> </ul>
Waiting	Number of jobs in the server wait queue.
Running	Number of server jobs that are currently running.
Sessions	Number of active client sessions.

## All Servers Information (Detailed Dashboard) Page

All systems page provides a consolidated detailed view of all Avamar server status and information. This page is similar to the dashboard (page 296), but provides more detailed information.

Selecting **System** from any other page or selecting **All** from an individual system information page (page 300) Systems list box displays the all systems information (detailed dashboard) page.



The information displayed is the same as shown for individual servers. Refer to *Individual System Information Page* (page 300) for additional information.

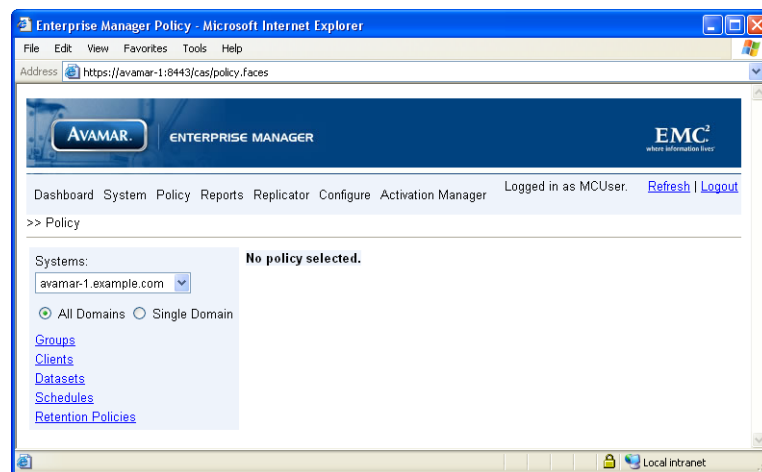
## Capacity

Avamar Enterprise Manager provides advanced capacity forecasting and reporting features that can assist you with monitoring and managing your server storage capacity.

This feature is discussed elsewhere in this publication. Refer to *Capacity Management* (page 322) for additional information.

## Policy

The Policy page lists the various policies (page 128) in use for each Avamar server you are monitoring.



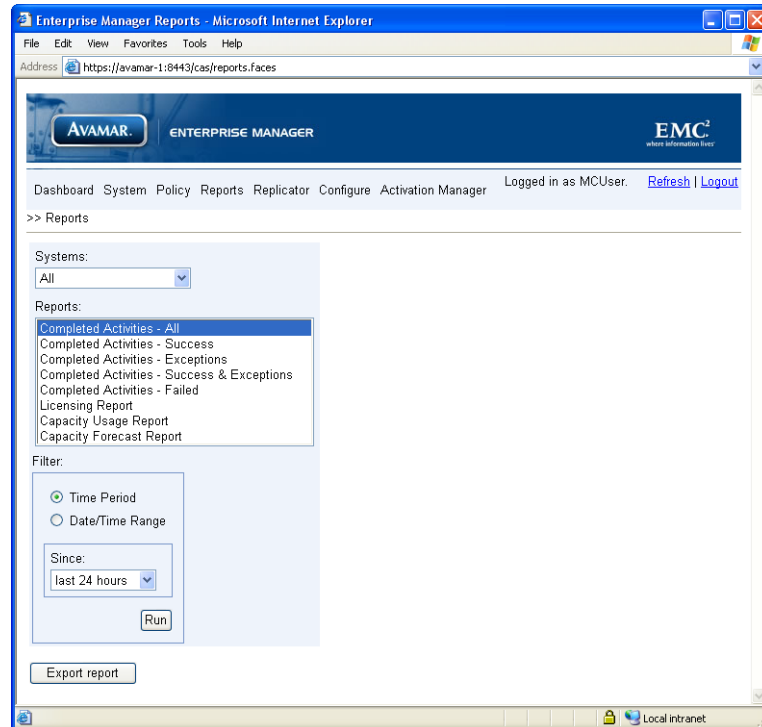
Only one kind of policy object can be shown at a time. Select which kind of policy object you want to view by selecting **Groups**, **Clients**, **Datasets**, **Schedules** or **Retention Policies**.

After deciding which kind of policy object you want to view, you can further refine the display by showing policy objects that reside in all domains or a single domain by setting the **All Domains** or **Single Domain** options, respectively.

Selecting **Policy** from any other page displays the Policy page.

## Reports

The Reports page allows you to run various Avamar reports and export that information as a Comma-Separated Values (CSV) text file. Refer to *Avamar Reports* (page 197) for additional information.



Selecting **Reports** from any other page displays the Reports page.

**Date and Time Filtering.** The Reports page provides two ways to specify an effective period of time each time a report is run:

Setting the **Backup Period** option allows you to quickly run a report that shows the past day (24 hours), past week or past two weeks worth of information.

Setting the **Date/Time Range** option allows you to define a specific range of calendar dates and times of day for a report. Only information occurring within that range of dates and times will be present in the report.



## Running a Report

To run a system report, perform the following:

1. Select a report from the Reports list.
2. Do one of the following:

IF	DO THIS
You want to include information for the past day (24 hours), past week or past two weeks.	Select the <b>Backup Period</b> option and select the desired length of time from the list box.
You want to define a specific range of calendar dates for this report.	Select the <b>Date/Time Range</b> option and use the From Date/Time and To Date/Time fields to define your desired range of calendar dates.  <b>TIP:</b> Clicking ... shows a browsable calendar from which you can select specific calendar dates.

3. Click **Run**.

The report information appears.

## Exporting a Report as a CSV File

To export report information as a CSV file, perform the following:

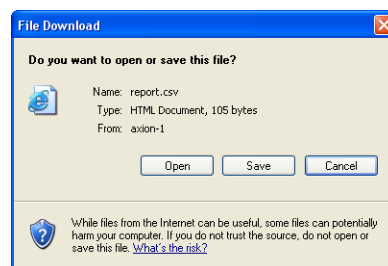
1. Run a report (page 313).
2. Click **Export this report**.

---

**NOTE:** The remainder of this procedure uses Microsoft Internet Explorer 6 with the default security settings as an example. If you are using another web browser or other security settings, the exact actions you need to perform in order to complete this procedure might be different.

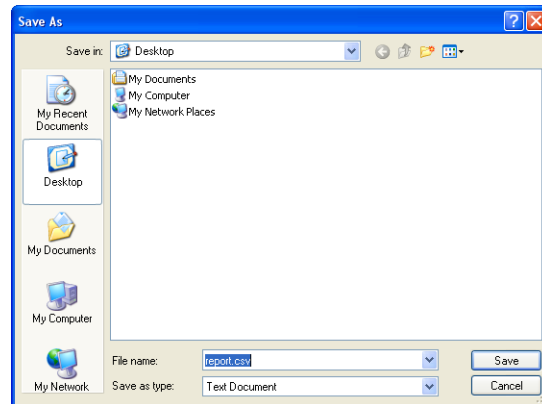
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The Open Save dialog box appears.



3. Click **Save**.

The Save As dialog box appears.



4. Browse to the desired location and click **Save**.

The Save As and Open Save dialog boxes both close and the CSV file is saved to the location you selected.

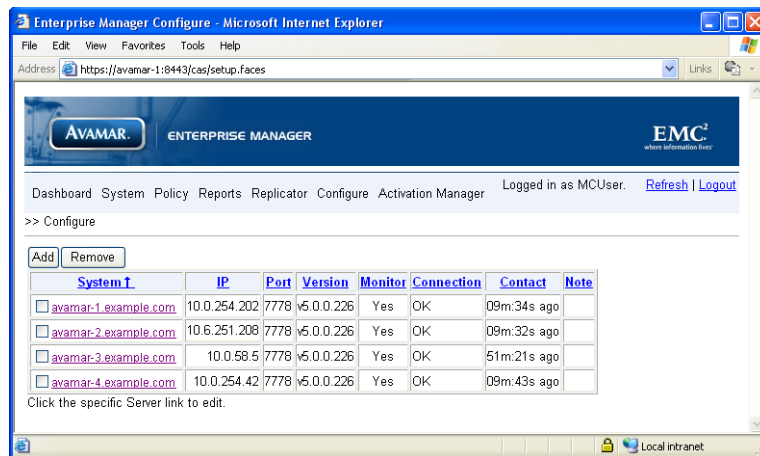
## Replicator

Replication is a feature that allows one Avamar server to store a read-only copy of its data on another Avamar server in order to support future disaster recovery of that server.

This feature is discussed elsewhere in this publication. Refer to *Replication* (page 333) for additional information.

## Configure

The Configure page allows you configure which Avamar systems in your enterprise you want to monitor.



Selecting **Setup** from any other page displays the Configure page.

The Configure page displays the following information for each Avamar system you have added to your Avamar Enterprise Manager configuration:

COLUMN	DESCRIPTION
System	Avamar server hostname (as defined in corporate DNS).
IP	Avamar server IP address.
Port	Data port used to communicate with this Avamar system. Default is port 7778.
Version	Specific version Avamar software this server is running.
Monitor	If Yes, this Avamar system is being monitored with Avamar Enterprise Manager. If No, this Avamar system has been added to the Configure page Systems list, but is not being monitored.
Connection	If OK, connection with this Avamar system is functioning properly.
Contact	Elapsed time since this Avamar server was last contacted by Avamar Enterprise Manager and data was collected.
Note	Optional note or comment.

## Monitoring Multiple Systems

By default, Avamar Enterprise Manager only shows operational status for the Avamar system that is running this instance of the EMS. In order to manage other Avamar systems in your enterprise, you must explicitly add them by performing the following:

1. Open your web browser and log into Avamar Enterprise Manager (page 295).

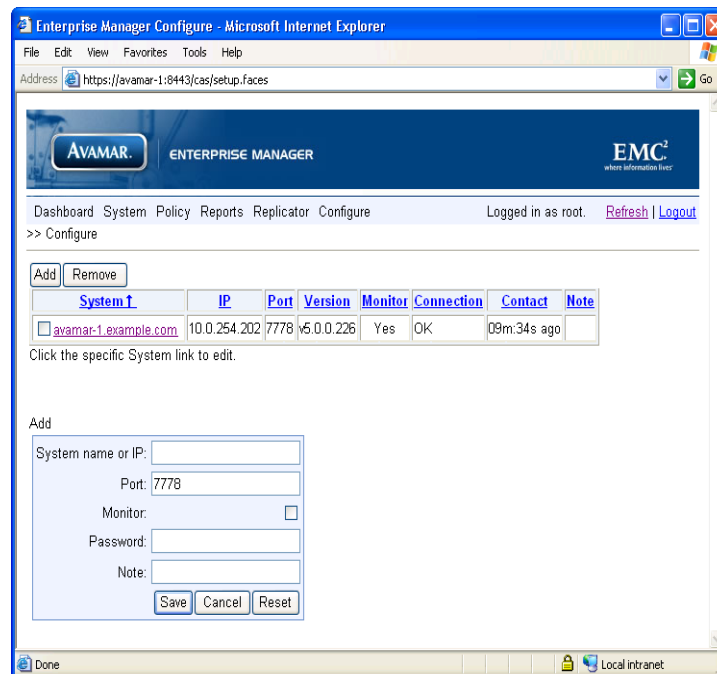
The Dashboard page (page 296) appears.

2. Select **Configure**.

The Configure page (page 315) 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.
<b>Monitor</b>	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.

## Suspending and Resuming System Monitoring

At some point you might want to suspend or resume monitoring of one or more Avamar systems. This typically occurs when a system is taken offline and placed back in service at a later date.

1. Open your web browser and log into Avamar Enterprise Manager (page 295).

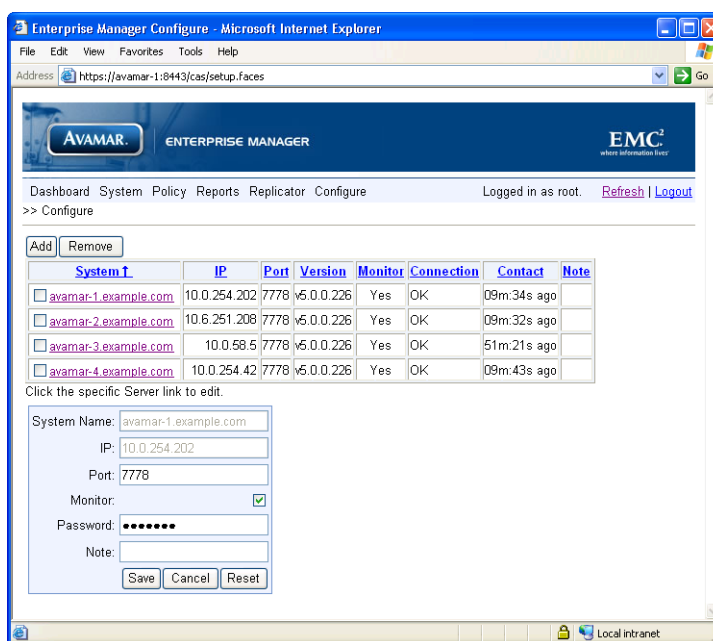
The Dashboard page (page 296) appears.

2. Select **Configure**.

The Configure page (page 315) appears.

3. Click the server name you want to edit.

An Edit block appears below the systems list.



4. Do one of the following:

IF	DO THIS
You want to suspend monitoring of a system in the Configure page Systems list.	Clear the <b>Monitor</b> option.
You want to resume monitoring a system in the Configure page Systems list.	Select the <b>Monitor</b> option.

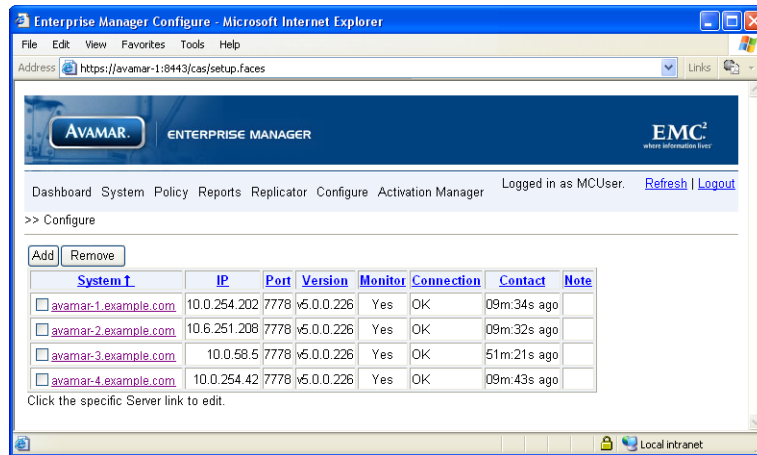
## Removing a System from the Systems List

1. Open your web browser and log into Avamar Enterprise Manager (page 295).

The Dashboard page (page 296) appears.

2. Select **Configure**.

The Configure page (page 315) appears.



3. Select the option (checkbox) next to the system you want to remove.

4. Click **Remove**.

The system no longer appears in the Configure page Systems list.

## Launching Avamar Administrator From Avamar Enterprise Manager

An important feature of Avamar Enterprise Manager is the capability of launching Avamar Administrator directly from an Avamar Enterprise Manager session.

Avamar Enterprise Manager uses the Java Webstart technology from Sun Microsystems to implement this feature. Webstart is an environment for automatic downloading of the latest version of an application from the Web. By incorporating this technology into Avamar Enterprise Manager, you no longer have to manually install individual versions of Avamar Administrator software to maintain any Avamar system in your enterprise.

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**IMPORTANT:** Under certain circumstances, stale Java temporary internet files can cause errors when attempting to launch Avamar Administrator directly from an Avamar Enterprise Manager session. If this occurs on Windows computers, select **Start > Control Panel > Java**. The Java Control Panel Appears. In the Temporary Internet Files area, click **Delete Files...** A confirmation dialog box appears. Ensure that all temporary internet file types are selected and click **OK**.

---

1. Point your web browser to the following URL:

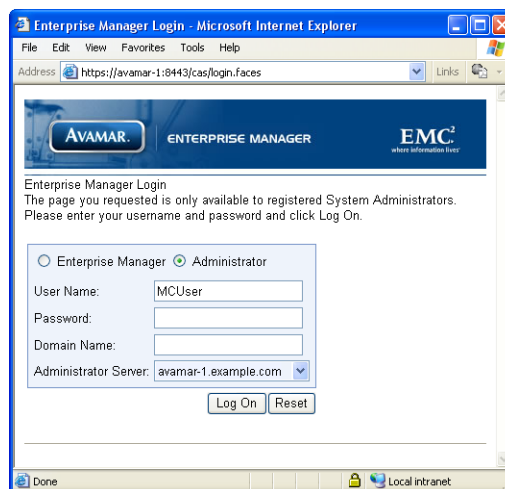
**http://AVAMARSERVER:8080/em**

Where AVAMARSERVER is the hostname as defined in DNS.

The default Enterprise Manager Login page appears.

2. Select the **Administrator** option.

The Avamar Enterprise Manager Login page for Avamar Administrator downloading appears.



3. Type your Avamar administrative user account ID and password in the User Name and Password fields, respectively.



**TIP:** Clicking **Reset** clears the User Name and Password fields.

Java Runtime Environment (JRE)

4. Click **Log On**.
5. If you do not already have the required Java Runtime Environment (JRE) installed, you must install it now.

If you do not already have the required JRE installed, you will be sent specific area of the Sun Microsystems web site that will allow you to download and install the correct version JRE.

If this occurs, read and follow the instructions on the Sun Microsystems web page.

The Java loading... prompt appears.

6. If a Security Warning dialog box appears, click **Yes** to proceed with the login.

The Avamar Administrator login window appears.



The fields are prepopulated with the information you typed in step 3.

7. Click **Log On**.

The Administrator launcher appears.



# CAPACITY MANAGEMENT

---

Managing your server storage capacity is one of the most important aspects of administering an Avamar server. This chapter describes the various features, functions and tools available to assist you with properly monitoring and managing your server storage capacity.

## Limits and Thresholds

This topic describes how your server will behave as it crosses various consumed storage thresholds.

**100% — The “Server Read-Only Limit”.** When server utilization reaches 100% of total storage capacity, it automatically becomes read-only. This is done to protect the integrity of the data already stored on the server.

Before you reach this point, you should contact EMC Technical Support to discuss measures that can be taken to prolong data storage on your Avamar server. This might include changing retention policies or migrating data.

**95% — The “Health Check Limit”.** Although an Avamar server could be allowed to consume 100% of available storage capacity (that is, hit the server read-only limit), it is not a good practice to actually let that occur. Consuming all available storage can prevent certain server maintenance activities from running, which might otherwise free additional storage capacity for backups.

For that reason, a second limit is established called the “health check limit.” This is the amount of storage capacity that can be consumed and still have a “healthy” server.

This health check limit is derived by subtracting some percentage of server storage capacity from the server read-only limit. The default health check limit is 95%. You can customize this setting to meet your specific site requirements Refer to *Customizing Capacity Limits and Behavior* (page 327). Although, setting this limit higher than 95% is not recommended.

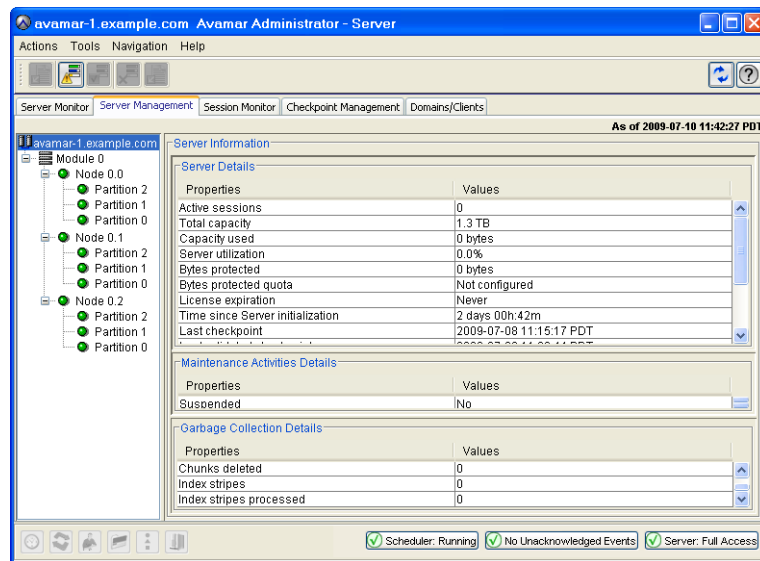
When server utilization reaches the health check limit, existing backups are allowed to complete, but all new backup activity is suspended. A notification is sent in the form of a pop-up alert when you log into the Avamar Administrator. That system event must be acknowledged before future backup activity can resume. Refer to *Acknowledging System Events* (page 276) for additional information.

**80% — Capacity Warning Issued.** When server utilization reaches 80%, a pop-up notification will inform you that the server has consumed 80% of its available storage capacity. Avamar Enterprise Manager capacity state icons are yellow.

## Obtaining Basic Utilization Information

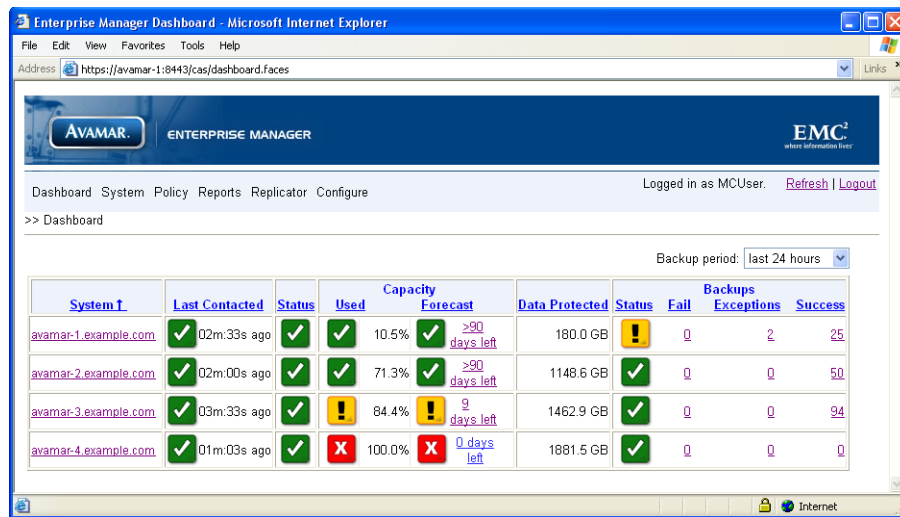
Both Avamar Administrator and Avamar Enterprise Manager provide real-time basic capacity utilization information.

**Avamar Administrator.** If administering a server using Avamar Administrator, basic capacity utilization information for that server is shown in the Server window Server Management tab (page 242).






The Server Information table shows total amount of server storage capacity and percentage of total available server storage capacity currently used. Refer to *Monitoring the Server* (page 242) for additional information about the Server window.

**Avamar Enterprise Manager.** If administering one or more servers with Avamar Enterprise Manager, consolidated capacity utilization information for all servers being monitored is shown in the Dashboard (page 296).



The Capacity Used column shows summary status of how storage capacity is being utilized on that Avamar server.

Capacity Used state icons communicate the following

-  Avamar server has used less than 80% of total storage capacity.
-  Avamar server has used more than 80% but less than 95% of total storage capacity.  
 Consider adding additional capacity or deleting old backups.
-  Avamar server has used more than 95% of total storage capacity.  
**IMPORTANT:** No new backups will be allowed until additional capacity is added or old backups are deleted. Contact EMC Technical Support.




Capacity utilization information is also shown on each server's information page (page 300). Refer to *Individual System Information Page* (page 300) for additional information about the Avamar Enterprise Manager Server information page.





## Capacity Forecasting

In order to help you understand how quickly storage capacity is being consumed, each server continuously tracks and analyzes at what rate storage capacity is being consumed and projects how long you can continue consuming storage capacity at that rate. This forecasting occurs continuously in the background.

The Avamar Enterprise Manager Dashboard (page 296) shows capacity forecasting results in the Capacity Forecast column (shown right).

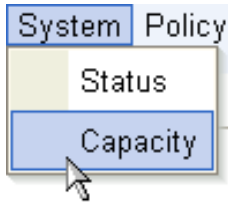
Capacity Forecast state icons communicate the following:

-  Avamar server is forecast to have 90 days or more storage capacity.
-  Avamar server is forecast to have less than 90 days of storage capacity.
-  Avamar server is forecast to have less than 30 days of storage capacity.

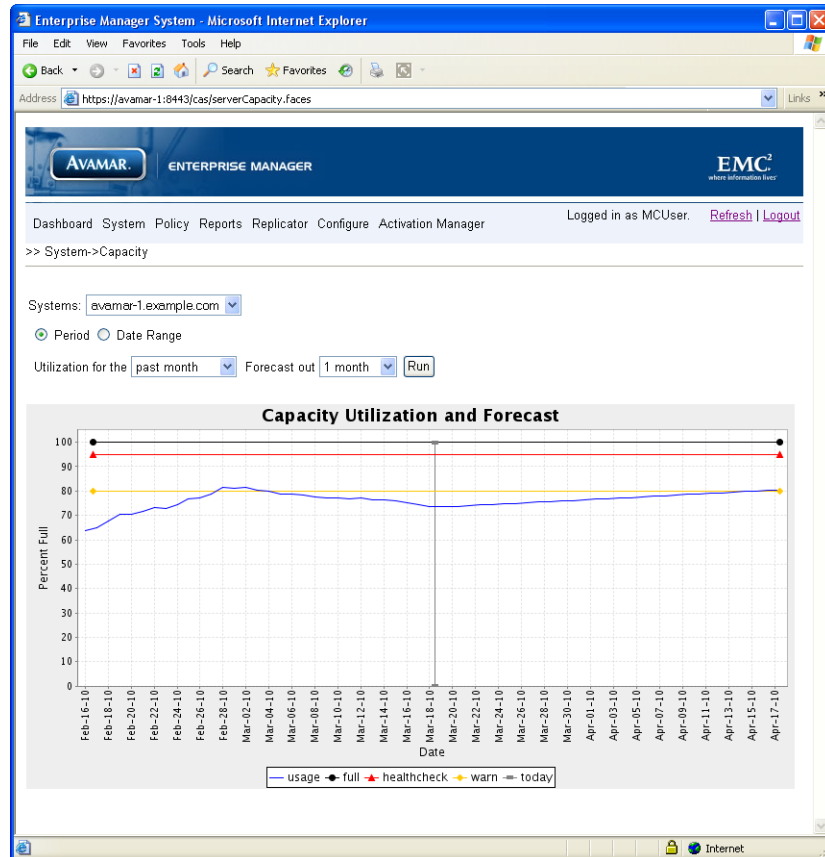
Forecast	
10.5%	 <u>&gt;90</u> days left
71.3%	 <u>&gt;90</u> days left
84.4%	 <u>9</u> days left
100.0%	 <u>0</u> days left

## Detailed Utilization and Forecasting

Avamar Enterprise Manager also provides graphing capabilities for both capacity utilization (that is, server storage capacity that has already been consumed) and capacity forecasting (that is, server storage capacity that is projected to be used in the future).



Placing your mouse cursor over the **System** menu until a sub-menu appears and selecting **Capacity** displays the Capacity Utilization and Forecast page (shown next).



You can customize this page as follows:

**Period or Date Range**

If **Period** is selected, menus provide control over how much past utilization information is shown. Available time periods are past month, 3 months, 6 months and 9 months.

If **Date Range** is selected, you can type a custom range of dates for which to show capacity utilization.

**Forecast out**

Capacity forecasting selections in are 1 month, 3 month, 6 months and 9 months in the future.

## Customizing Capacity Limits and Behavior

Many of the settings that control capacity limits and behavior can be customized to meet your specific site requirements. These site-specific customizations are accomplished by manually modifying one or more application preference files.

### Avamar Administrator Settings

In order to customize Avamar Administrator capacity management settings, you can change one or more of the following preferences in the `com.avamar.mc.mcs` section of the `/usr/local/avamar/var/mc/server_data/prefs/mcserver.xml` preferences file.

PREFERENCE	DESCRIPTION	DEFAULT SETTING
<code>capForecastDataDays</code>	Actual amount of historical capacity usage data used for forecasting.	30 days
<code>capForecastDataMinDays</code>	Minimum amount of historical capacity usage data that is required to perform forecasting.	14 days
<code>capForecastReachedDays</code>	When forecasted capacity falls below this number of days, Avamar Administrator begins generating events (that must be acknowledged) and displaying pop-up alerts at login.	30 days
<code>capMonitorIntervalMin</code>	This setting controls how often the Avamar Administrator checks forecasted capacity.	1 day (daily)
<code>capReachedPercentage</code>	When total capacity utilization reaches this percentage threshold, Avamar Administrator generates an event notifying administrators that the system is full.	95%
<code>hcMonitorIntervalMin</code>	This setting controls how often the Avamar Administrator performs a health check (that is, verifies whether or not consumed capacity has reached the health check limit).	1 day (daily)
<code>hcOffsetROPercentage</code>	Percentage, that when subtracted from the server read-only limit (100%), produces the health check limit.	5%
<code>hcReminderIntervalMin</code>	This setting controls how often the Avamar Administrator issues events and pop-up alerts once the health check limit has been reached.	60 minutes (hourly)

## Avamar Enterprise Manager Settings

In order to customize Avamar Enterprise Manager capacity management settings, you can change one or more of the following preferences in the `com.avamar.mc.dashboard` section of the `/usr/local/avamar/var/em/server_data/prefs/emserver.xml` preferences file.

PREFERENCE	DESCRIPTION	DEFAULT SETTING
<code>capWarnPercent</code>	When capacity usage reaches this percentage, capacity state icon is yellow.	80%
<code>capErrPercent</code>	When capacity usage reaches this percentage, capacity state icon is red.	95%
<code>capForecastWarnDays</code>	When forecasted capacity falls below this number of days, capacity forecast icon is yellow.	90 days
<code>capForecastErrDays</code>	When forecasted capacity falls below this number of days, capacity forecast icon is red.	30 days



## Updating Avamar Application Preference Files

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Shutdown the correct system component by doing one of the following:

IF	DO THIS
Changing Avamar Administrator settings.	Type: <b>dpnctl stop mcs</b>
Changing Avamar Enterprise Manager settings.	Type: <b>dpnctl stop ems</b>

4. Do one of the following:
  - (a) If changing Avamar Administrator settings (page 327), type:  
**cd /usr/local/avamar/var/mc/server\_data/prefs**  
Open `mcservers.xml` in a Unix text editor.
  - (b) If changing Avamar Enterprise Manager settings (page 328), type:  
**cd /usr/local/avamar/var/em/server\_data/prefs**  
Open `emservers.xml` in a Unix text editor.
5. Change one or more preference settings.
6. Save your changes.
7. Restart the correct system component by doing one of the following:

IF	DO THIS
Changing Avamar Administrator settings.	Type: <b>dpnctl start mcs</b>
Changing Avamar Enterprise Manager settings.	Type: <b>dpnctl start ems</b>

## Server and Client Average Daily Change Rates

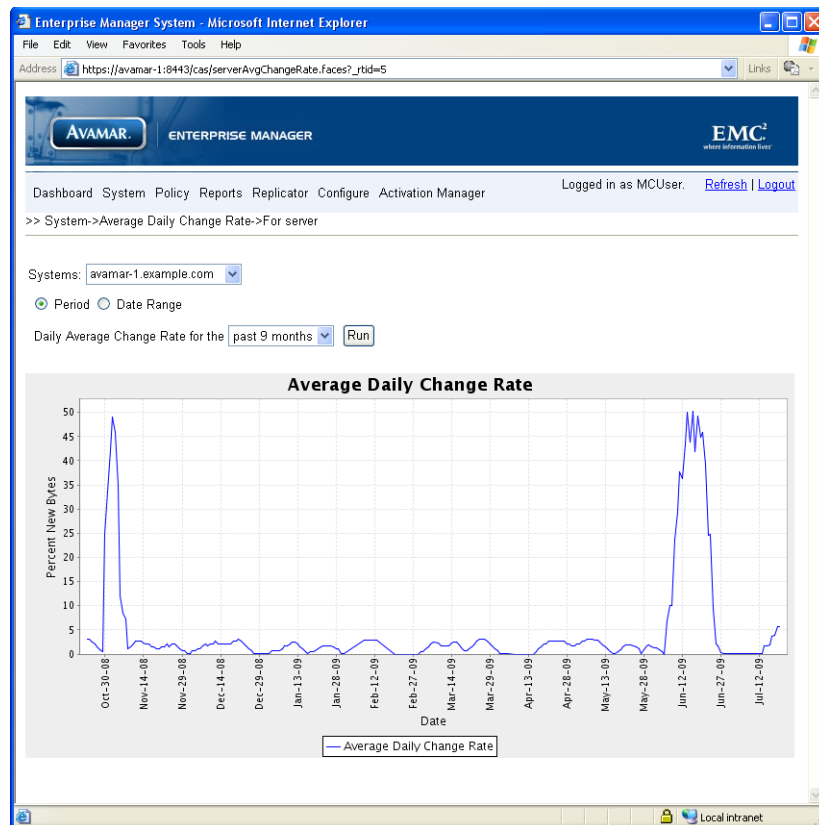
When managing your server capacity, it is useful to know the average daily change rate for both the server and for individual clients.

For example, the server average daily change rate can spike upward for a few days immediately after adding several new clients (particularly database clients). This is to be expected. After a few days, data deduplication optimizes server storage efficiency and the server daily change rate typically returns to normal.

However, if the server average daily change rate remains high for an extended period of time, it might be necessary to determine if this is due to one or more individual clients that might be experiencing less than expected data deduplication efficiencies.

### Server Data

Placing your mouse cursor over the **System** menu until a sub-menu appears and selecting **Average Daily Change Rate > For Server** displays the Average Daily Change Rate For Server page (shown next).

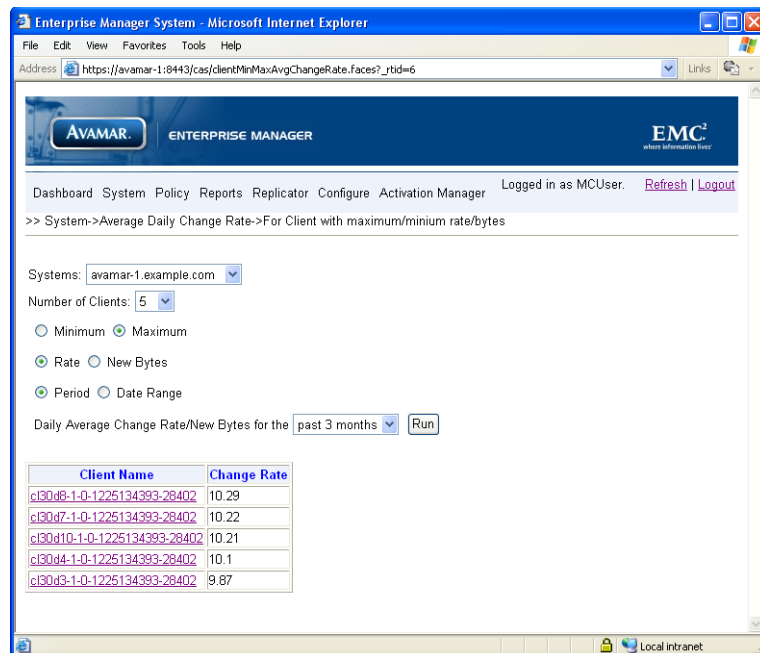


You can customize this page as follows:

- Period or Date Range** If **Period** is selected, menus provide control over how much past daily change rate information is shown. Available time periods are past month, 3 months, 6 months and 9 months. If **Date Range** is selected, you can select a custom range of dates for which to show server daily change rate data.

## Client Data

Placing your mouse cursor over the **System** menu until a sub-menu appears and selecting **Average Daily Change Rate > For Clients with Maximum/Minimum rate/bytes** displays the average daily change rate for client with maximum/minimum rate/bytes page (shown next).



You can customize this page as follows:

- Number of Clients** Select 5, 10, 20 or 50 clients for which to show daily change rate data.
- Minimum or Maximum** Select whether to show clients with the most (**Maximum**) or least (**Minimum**) daily change rate.
- Rate or New Bytes** Select whether to customize display based on percentage of new data (**Rate**) or absolute capacity used (**New Bytes**).

**Period or  
Date Range**

If **Period** is selected, menus provide control over how much past daily change rate information is shown. Available time periods are past month, 3 months, 6 months and 9 months.

If **Date Range** is selected, you can select a custom range of dates for which to show daily change rate data.

Clicking a client name displays an average daily change rate graph for that client.

# REPLICATION

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Replication is a feature that transfers data from a “source” Avamar server to a “destination” Avamar server. All data in the destination server can be directly restored back to primary storage without having to be staged through the source Avamar server.

You can use either Avamar Administrator or Avamar Enterprise Manager to manage your replication settings.

**Efficient Data Transfers.** Replication is accomplished by way of highly efficient, asynchronous Internet Protocol (IP) data transfers, which can be scheduled during off-peak hours to make optimum use of network bandwidth. Additionally, like other members of the Avamar product family, replication uses sophisticated data deduplication technology that finds and eliminates redundant sequences of data before it is sent to the destination server, thereby reducing network traffic and promoting efficient use of hard disk storage.

**Remote Branch Disaster Recovery.** Replication enables the efficient replication of data stored in a single-node server to a multi-node server. Using replication, a distributed enterprise can centrally protect and manage multiple remote branch offices that are using individual single-node servers for local backup and restore. The centralized multi-node server can then be used for disaster recovery, in the event of catastrophic data loss at any remote branch office.

**Enterprise Data Center Disaster Recovery.** Replication can also be used to replicate data stored in a multi-node server to any other multi-node server in your enterprise. In this manner, multi-node servers can provide peer-to-peer disaster recovery for each other.

## Important Terms and Concepts

This topic discusses the basic concepts and fundamental principles of Avamar server replication.

There are two basic kinds of replication:

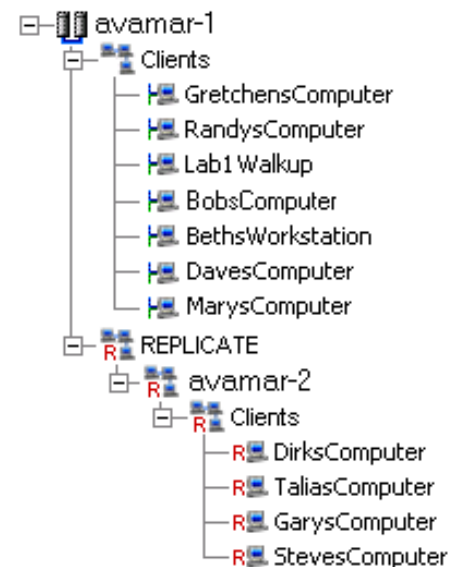
- Normal replication
- Full “root-to-root” replication

**Normal Replication.** During normal replication, user data on the source Avamar server is replicated to a destination Avamar server.

**The “REPLICATE” Domain.** Replication automatically creates a special “REPLICATE” domain on the destination server during the first replication operation. This domain contains a mirrored representation of the entire source server client tree on the destination server.

All data within the REPLICATE domain is read-only. The only operations allowed on these backups are:

- Redirected restores to other clients not within the REPLICATE domain (page 84)
- Changing a backup expiration date (page 88)
- Validating backups on other clients not within the REPLICATE domain (page 92)
- Viewing backup statistics (page 94)
- Deleting a backup (page 98)



The example (right) shows a destination server “avamar-1” that contains both local clients and clients replicated from source server “avamar-2.”

**Full “Root-to-Root” Replication.** Full “root-to-root” replication is a kind of replication that creates a complete logical copy of an entire source server on the destination server. Furthermore, the replicated data is not copied to the REPLICATE domain, it is added directly to the root domain just as if source clients had registered with the destination server. Also, source server data replicated in this manner is fully modifiable on the destination server.

---

**NOTE:** The remainder of this chapter deals exclusively with normal replication. Refer to *Avamar System Migration* (page 393) for additional information about using full “root-to-root” replication.

---

**“Source” and “Destination” Servers.** Replication always transfers data from a “source” Avamar server to a “destination” Avamar server. Furthermore, in order to maintain referential integrity on the original “source” server, replicated data cannot be directly modified on the destination server. Replicated data is simply stored on the destination server in the event that it is needed for future recovery.

**Normal Replication Is a Scheduled Event.** Once replication is set up and configured on the source server, normal replication occurs automatically at predetermined scheduled intervals.

**What Data Is Replicated?** In order to fully replicate an Avamar server, all of the following data must be copied from the source server to the destination server during each replication operation:

- Client backups
- Domains, clients and users
- Groups, datasets, schedules and retention policies
- State of the server (for example, contents of the activity monitor and server monitor databases at the time of the last MCS backup or “flush”)

## Capabilities and Limitations

**Only “Static” Data Is Replicated.** Each replication operation transfers all static data resident on the source Avamar server. The concept of “static” data is especially important. It must be understood that at the time a replication operation is initiated, the replication operation can only process quiescent (“static”) data resident on the source server. Therefore, any operation that writes data to the source server and has not fully completed (for example, an in-process backup, adding a new user, editing a dataset and so forth) will in most cases not be part of that particular replication operation. However, that data will be replicated during the next replication operation.

**You Can Replicate Backups by Retention Type.** In order to enhance the flexibility of the retention feature, you can configure your replication operations to replicate all backups from the source Avamar server to the destination Avamar server, or only replicate daily, weekly, monthly or yearly backups.

**Avamar Administrator Can Only Manage One Server at a Time.** An important limitation of using Avamar Administrator to manage your replication settings is that you are limited to managing one server at a time. If you have more than one Avamar system in your environment, you may prefer to use the Avamar Enterprise Manager multi-system management console instead.

**Timezones.** Be advised that when you schedule replication activities, the start time is displayed in your local timezone, not the source or target server timezone. For example, consider a situation in which you are in the Pacific timezone and the replication source server is in the Eastern timezone. If you (in Pacific timezone) set replication to begin at 8:00 P.M., the server (which resides in the Eastern timezone) will compensate for the 3 hour difference between timezones and start the replication job at 11:00 P.M.

---

## Best Practices

**If Possible, Avoid Source/Target Server Incompatibilities.** Although replication between different version servers is supported, for best results, try to ensure that the target server is running same or later version of the Avamar software than the source Avamar server.

**Use a Large Time-Out Setting Initially.** If you specified an optional time-out value during installation and configuration, recent backups might not get replicated as the replication process can time out before all backups in the system are successfully replicated. This is because replication always replicates backups alphabetically by client name and earliest backups before later backups.

Whenever possible, you should examine a sampling of recent replicated backups on the destination server to ensure that all are being replicated. It is often necessary to increase the optional time-out value during the first few weeks of replication sessions. Eventually the replication process should normalize. As more data is replicated to the destination server, greater levels of data deduplication and decreased transfer times can be expected. At that time, you can decrease the optional time-out value if so desired.

---

**IMPORTANT:** Normal source server background maintenance tasks such as hfscheck and garbage collection should not be performed while a replication session is in progress. Therefore, once you have determined that your nightly replication window has normalized, you should optimize the length of your replication window accordingly.

---

The default time-out setting is 20 hours (72000 seconds).

**Schedule Replication During Periods of Low Backup Activity.** Because only completed client backups are replicated, you should make every effort to schedule replications during periods of low backup activity. This ensures that the greatest number of client backups get replicated during each replication session.



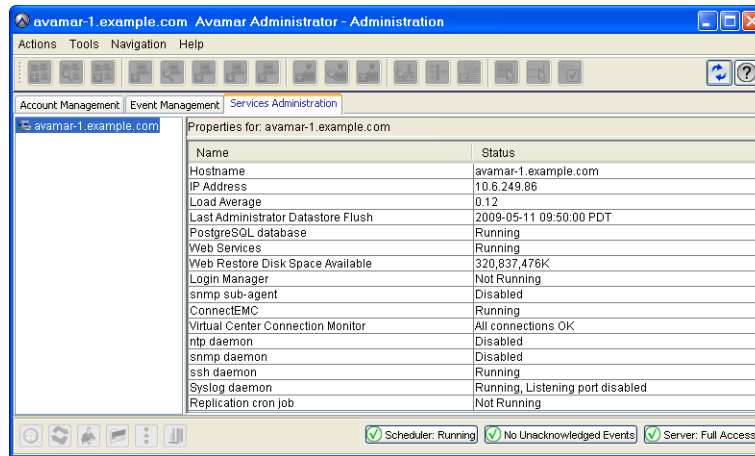
# Managing Replication with Avamar Administrator

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Administration** or click the **Administration** launcher button.



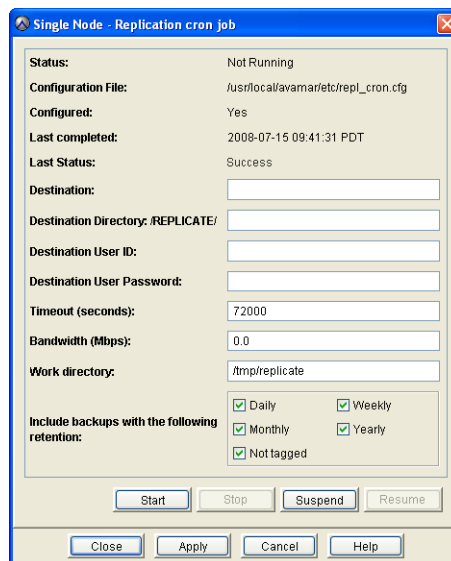
The Administration window appears.

3. Click the Services Administration tab.



4. Double-click the Replication cron job entry in the properties table.

The Replication cron job dialog box appears.



The Replication cron job dialog box displays the following information:

FIELD	DESCRIPTION
Status	<p>Current replication status. One of the following:</p> <p>Running      Scheduled replication operations are occurring normally.</p> <p>Not Running      Scheduled replication operations are not occurring normally.</p> <p>Not Running and Suspended      Scheduled replication operations are not occurring normally and no future replication operations will occur until replication is resumed on this Avamar server.</p>
Suspended	Indicates whether or not scheduled replication operations have been started (No) or stopped (Yes).
Configuration File	Location of the repl_cron.cfg configuration file, which stores replication settings for this Avamar system.
Enabled	Indicates whether or not scheduled replication is enabled (Yes) or disabled (No) on this source Avamar server.
Last Completed	Elapsed time since last replication operation completed.
Last Status	<p>Status of last completed replication operation. One of the following:</p> <p>None      Status for last replication operation is not available.</p> <p>Success      Last replication operation successfully completed.</p> <p>Failed      One or more errors were encountered during the last replication operation.</p> <p><b>TIP:</b> In addition to viewing overall replication job status, you can also view replication status on a client-by-client basis in the Activity window. Refer to <i>Monitoring Backup, Restore and Validation Activities</i> (page 76) for additional information.</p>

5. Type or select the following:

FIELD/OPTION	DESCRIPTION
Destination	Destination Avamar server hostname (as defined in corporate DNS).
Destination Directory: /REPLICATE	Shows destination directory on destination Avamar server. The default location is /REPLICATE/SOURCE, where SOURCE is the source Avamar server hostname you clicked in the systems list. This destination is modifiable, but must always exist under the /REPLICATE domain.
Destination User Id	Avamar administrative user account ID (repluser) that will be used to log into the destination Avamar server.
Destination User Password	The password for the Avamar administrative user account ID (repluser) entered in the Destination User Id field. <b>NOTE:</b> If you change the password for the repluser account on the target server, then remember to update the Destination User Password value in the replication configuration on the source server with the new password.
Timeout (seconds)	This is the maximum length of time that each replication operation should run.
Bandwidth (Mbps)	This is a network utilization throttling setting that specifies the maximum average network utilization allowed in Mega Bits Per Second (Mbps). If the replication operation exceeds this setting, it will be "throttled back" by introducing delays until the average network utilization falls below the specified threshold.
Work directory	This is the full path to the temporary folder or directory that will be used to store replication log files.
Include backups with the following retention:	This setting allows you limit your replication operation to only backups that have been assigned a specific retention type (page 73). Select one or more of the following:  <b>Daily</b> Replicate daily backups. <b>Weekly</b> Replicate weekly backups. <b>Monthly</b> Replicate monthly backups. <b>Yearly</b> Replicate yearly backups. <b>Not tagged</b> Replicate backups that are not explicitly tagged as daily, weekly, monthly or yearly.

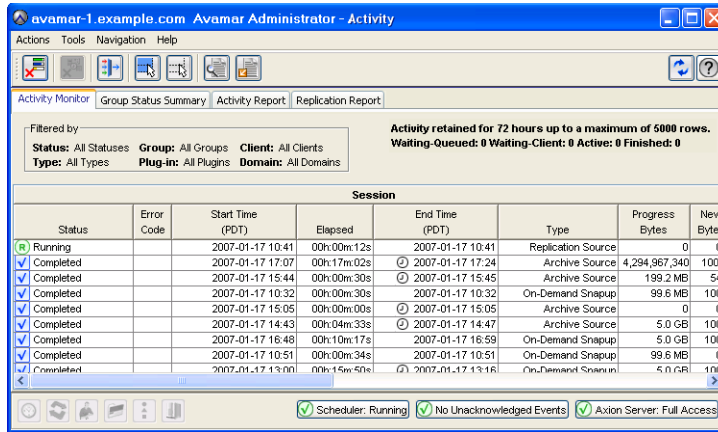
FIELD/OPTION	DESCRIPTION
Schedule	Select the time of day at which you want to initiate replication for this server, or Don't Run if you want to temporarily suspend replication of this Avamar system.

6. Click **OK**.

The Replication cron job dialog box closes.

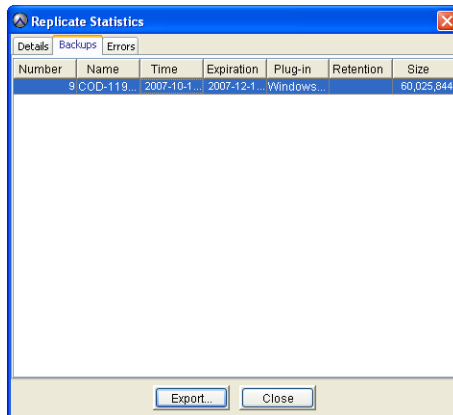
# Viewing Replication Statistics with Avamar Administrator

1. Start Avamar Administrator (page 21).
  2. Select **Navigation > Activity** or click the **Activity** launcher button.
- The Activity window appears.



3. Click the Activity Monitor tab.
4. Select a Replication Source or Replication Destination activity and select **Actions > View Statistics**.

The Replicate Statistics dialog box appears.



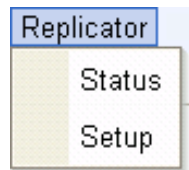
TAB	DESCRIPTION
Details	Shows detailed information obtained from the <code>v_repl_activities</code> database view. Refer to <code>v_repl_activities</code> (page 596) for additional information.
Backups	Shows a list of backups included in this replication operation.
Errors	Shows any errors that occurred during this replication operation.

5. Click **Close**.
- The Replicate Statistics dialog box closes.

## Managing Replication with Avamar Enterprise Manager

Unlike Avamar Administrator's replication management feature (page 337), which is inherently constrained to only managing replication settings for one Avamar system at a time, Avamar Enterprise Manager's replication management feature is capable of managing replication for all Avamar systems you are currently monitoring.

Avamar Enterprise Manager provides two different replication management pages: a status page, which shows status for various replication operations; and a setup page, which is used to set up and configure various replication operations for various Avamar systems you are currently monitoring.

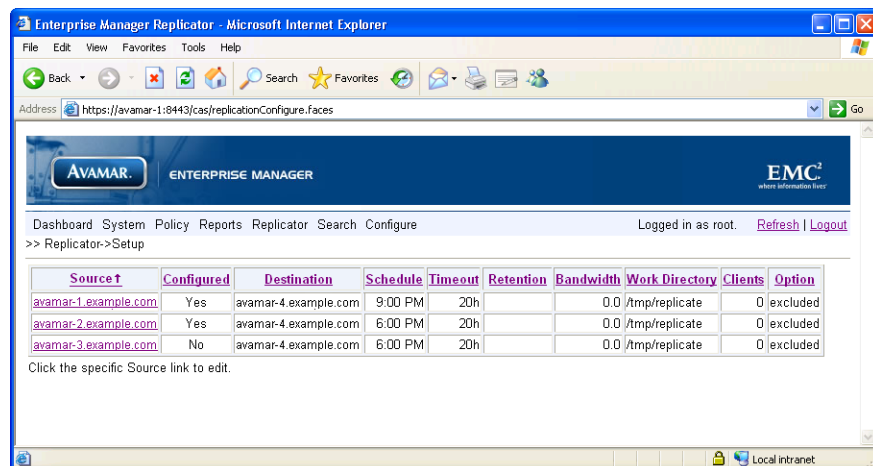


Placing your mouse cursor over the **Replicator** menu until a sub-menu appears and selecting **Status** displays the Replicator Status page (page 344).

Placing your mouse cursor over the **Replicator** menu until a sub-menu appears and selecting **Setup** displays the Replicator Setup page (page 342).

### Replicator Setup Page

The Replicator Setup page is used to set up and configure various replication settings for various Avamar systems you are currently monitoring.



The Replicator Setup page displays the following information for each Avamar system you have added to your Avamar Enterprise Manager configuration:

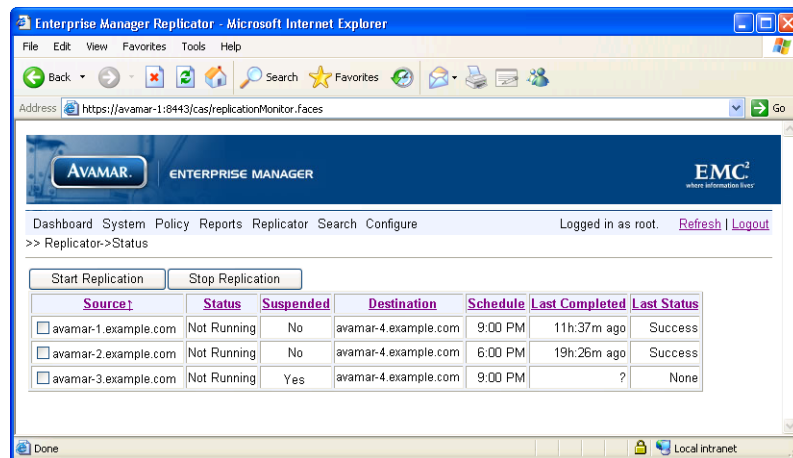
COLUMN	DESCRIPTION
Source	Source Avamar server hostname (as defined in corporate DNS).

COLUMN	DESCRIPTION
Configured	<p>Indicates whether or not source Avamar server has been configured and enabled for replication. One of the following:</p> <p>Not Monitored      This Avamar system is currently not being monitored by Avamar Enterprise Manager. In order to use Avamar Enterprise Manager's replication management feature on this system, you must enable or resume monitoring. Refer to <i>Suspending and Resuming System Monitoring</i> (page 318) for additional information.</p> <p>No                      This Avamar system is not currently configured and enabled for replication operations. Refer to <i>Configuring or Modifying Replication Settings</i> (page 346) for additional information.</p> <p>Yes                     This Avamar system is configured and enabled for replication operations.</p>
Destination	Destination Avamar server hostname (as defined in corporate DNS).
Schedule	Hour of the day that replication is scheduled to occur, or Don't Run if replication is temporarily suspended.
Timeout	Maximum length of time that replication activity is allowed to run.
Retention	<p>Shows which types of backups are being replicated. One or more of the following:</p> <p>Daily                  Daily backups are being replicated.</p> <p>Weekly                Weekly backups are being replicated.</p> <p>Monthly               Monthly backups are being replicated.</p> <p>Yearly                 Yearly backups are being replicated.</p> <p>Not tagged          Backups that have not explicitly tagged as daily, weekly, monthly or yearly are being replicated.</p>
Bandwidth	<p>Network utilization throttling setting. This setting specifies the maximum average network utilization allowed in Mega Bits Per Second (Mbps).</p> <p>If the replication operation exceeds this setting, it will be "throttled back" by introducing delays until the average network utilization falls below the specified threshold.</p>
Work Directory	Temporary folder or directory used to store replication log files.

COLUMN	DESCRIPTION
Clients	Shows number of clients that have been explicitly included or excluded.
Option	True if clients are included. Otherwise, clients are excluded.

## Replicator Status Page

The Replicator Status page shows consolidated daily replication status for each Avamar system you are currently monitoring.



The Replicator Status page displays the following information for each Avamar system you are currently monitoring:

COLUMN	DESCRIPTION
Source	Source Avamar server hostname (as defined in corporate DNS).
Status	Current replication status. One of the following:  Running            Scheduled replication operations are occurring normally.  Not Running        Scheduled replication operations are not occurring normally.  Not Running and Suspended    Scheduled replication operations are occurring normally and no future replication operations will occur until replication is resumed on this Avamar server.
Suspended	Indicates whether or not scheduled replication operations have been started (No) or stopped (Yes).
Destination	Destination Avamar server hostname (as defined in corporate DNS).
Schedule	Hour of the day that replication is scheduled to occur, or Don't Run if replication is temporarily suspended.



COLUMN	DESCRIPTION
Last Completed	Elapsed time since last replication operation completed.
Last Status	<p>Status of last completed replication operation. One of the following:</p> <p>None                      Status for last replication operation is not available.</p> <p>Success                    Last replication operation successfully completed.</p> <p>Failed                      One or more errors were encountered during the last replication operation.</p>

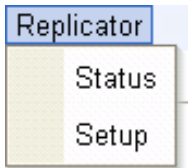
## Configuring or Modifying Replication Settings

This topic describes how to configure an Avamar system you are currently monitoring to begin daily replications, or modify existing replication settings.

1. Open your web browser and log into Avamar Enterprise Manager (page 295).

The Dashboard page (page 296) appears.

2. Place your mouse cursor over the **Replicator** menu until a sub-menu appears (shown right), then select **Setup**.



The Replicator Setup page (page 342) appears.

3. Click the desired Avamar system link in the Source column.

An Edit block appears below the systems list, which lists the replication settings for that Avamar system.

The screenshot shows the Avamar Enterprise Manager web interface in Microsoft Internet Explorer. The browser address bar shows the URL: `https://avamar-1:8443/cas/replicationConfigure.faces`. The page title is "Enterprise Manager Replicator - Microsoft Internet Explorer".

The main content area displays a table of replication configurations:

Source	Configured	Destination	Schedule	Timeout	Bandwidth	Work Directory	Clients	Option
<a href="#">avamar-1.example.com</a>	Yes	avamar-4.example.com	9:00 PM	20h	0.0	/tmp/replicate	0	excluded
<a href="#">avamar-2.example.com</a>	Yes	avamar-4.example.com	6:00 PM	20h	0.0	/tmp/replicate	0	excluded
<a href="#">avamar-3.example.com</a>	No	avamar-4.example.com	6:00 PM	20h	0.0	/tmp/replicate	0	excluded

Below the table, there is a section titled "Edit Replication Options: avamar-1.example.com". This section contains several configuration fields:

- Destination:** External: avamar-4.example.com
- Destination Directory:** /REPLICATE/ avamar-1.example.com
- Destination User ID:** root
- Destination User Password:** [masked]
- Schedule:** Don't Run
- Timeout:** 20 hours
- Work directory:** /tmp/replicate
- Bandwidth (Mbps):** 0.0

There are also checkboxes for "Include backups with the following retention:" (Daily, Weekly, Monthly, Yearly, Not tagged) and "Replication type:" (Full, Selective). At the bottom right of the form are "Save", "Cancel", and "Reset" buttons.

4. Type or select the following:

FIELD/OPTION	DESCRIPTION
Destination	Select the desired destination Avamar server from the list.
Destination Directory: /REPLICATE	Shows destination directory on destination Avamar server. The default location is /REPLICATE/SOURCE, where SOURCE is the source Avamar server hostname you clicked in the systems list. This destination is modifiable, but must always exist under the /REPLICATE domain.
Destination User ID	Type the a valid Avamar administrative user account ID that will be used to log into the destination Avamar server in order to perform replication. The default is the repluser account.
Destination User Password	Type the password for the Avamar administrative user account ID (repluser) entered in the Destination User ID field. <b>NOTE:</b> The password for the repluser account must be the same on both the source and destination server. If you change the password on one server, then remember to change it on the other server.
Schedule	Select the time of day at which you want to initiate replication for this server, or Don't Run if you want to temporarily suspend replication of this Avamar system.
Timeout	Select the maximum length of time that each replication operation should run.
Work Directory	Type the full path to the temporary folder or directory that will be used to store replication log files.
Bandwidth (Mbps)	Type a network utilization throttling setting in Mega Bits Per Second (Mbps). Refer to <i>Replicator Setup Page</i> (page 342) for additional information about this setting.

FIELD/OPTION	DESCRIPTION
<p>Include backups with the following retention:</p>	<p>This setting allows you limit your replication operation to only backups that have been assigned a specific retention type (page 73). Select one or more of the following:</p> <p>Daily            Replicate daily backups.</p> <p>Weekly            Replicate weekly backups.</p> <p>Monthly            Replicate monthly backups.</p> <p>Yearly            Replicate yearly backups.</p> <p>Not tagged        Replicate backups that are not explicitly tagged as daily, weekly, monthly or yearly.</p>
<p>Replication Type</p>	<p>One of the following:</p> <p>Full                Replicate data for all clients residing on the source Avamar server.</p> <p>Selective            Include or exclude certain clients from replication operations.</p>
<p>Select Clients</p>	<p>If Replication Type is set to Selective, use this section to include all clients, or include or exclude only those clients that match a pattern matching expression.</p>

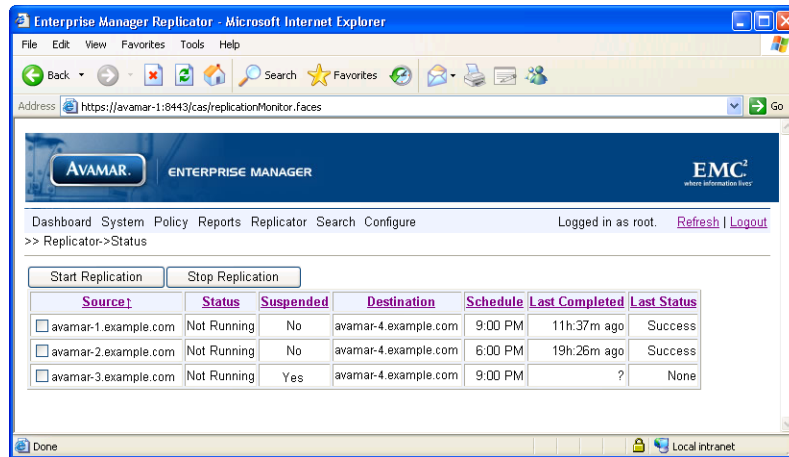
## Getting Replication Status

1. Open your web browser and log into Avamar Enterprise Manager (page 295).

The Dashboard page (page 296) appears.

2. Place your mouse cursor over the **Replicator** menu until a sub-menu appears (shown right), then select **Status**.

The Replicator Status page (page 344) appears.



The Replicator Status page shows consolidated daily replication status for each Avamar system you are currently monitoring.

Refer to *Replicator Status Page* (page 344) for descriptions and explanations of the information shown on this page.

## Starting and Stopping Daily Replications

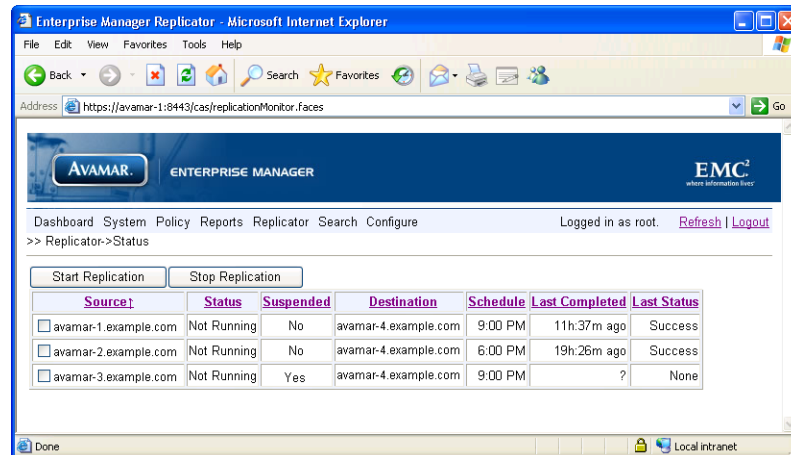
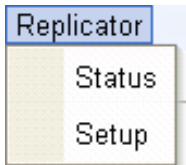
**IMPORTANT:** Stopping replication will cause any currently-running replication operation to be immediately canceled if that replication operation was initiated using Avamar Enterprise Manager. However, if a currently-running replication operation was initiated by way of a cron mechanism and you stop replication on that server, that replication operation will run to completion.

1. Open your web browser and log into Avamar Enterprise Manager (page 295).

The Dashboard page (page 296) appears.

2. Place your mouse cursor over the **Replicator** menu until a sub-menu appears (shown right), then select **Status**.

The Replicator Status page (page 344) appears.



3. Do one of the following:

IF	DO THIS
You want to start daily replications for one or more Avamar system you are currently monitoring.	Select the option (checkbox) next to the servers for which you want to start daily replications and click <b>Start Replication</b> .
You want to stop daily replications for one or more Avamar system you are currently monitoring.	Select the option (checkbox) next to the servers for which you want to stop daily replications and click <b>Stop Replication</b> .

# ADVANCED SERVER ADMINISTRATION AND MAINTENANCE

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**IMPORTANT:** Avamar server maintenance commands should only be used by authorized personnel thoroughly familiar with their intended use. Contact EMC Technical Support for additional information.

## Checkpoints





“Checkpoints” are system-wide backups taken for the express purpose of assisting with disaster recovery. Checkpoints are typically scheduled during the blackout window (page 274).

In addition to the regularly scheduled twice daily checkpoints, you can create and validate additional server checkpoints any time you need to.

Checkpoint validation might take several hours depending on the amount of data in your Avamar server. For this reason, each validation operation can be individually configured to perform all checks (full validation) or perform a partial “rolling” check which fully validates all new and modified stripes, then partially checks a subset of unmodified stripes.

You can also delete checkpoints in order to reclaim additional server storage capacity.

Individual checkpoints shown in the Avamar Server window Checkpoint Management tab are always in one of the following states:

STATE	DESCRIPTION
	Checkpoint failed validation or was cancelled before it could complete.
	Checkpoint has not yet been validated.
	Validation is currently being performed on this checkpoint.
	Checkpoint passed validation.

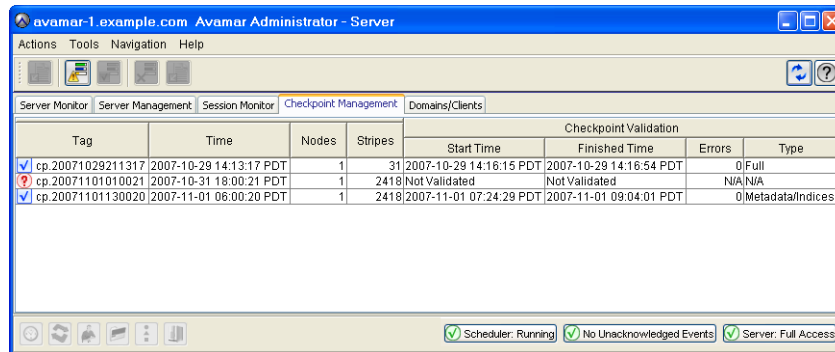
## Creating a Checkpoint



1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.

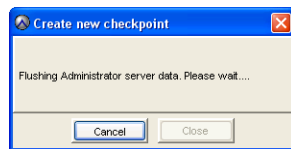
The Avamar Server window appears.

3. Click the Checkpoint Management tab.



4. Select **Actions > Create Checkpoint**.

The Create New Checkpoint dialog box appears.



This dialog box shows the progress of this operation. You can cancel the operation at any time by clicking **Cancel**.

5. When the Create New Checkpoint dialog box shows that the checkpoint is complete, click **Close**.

The Create New Checkpoint dialog box closes.



## Validating a Checkpoint

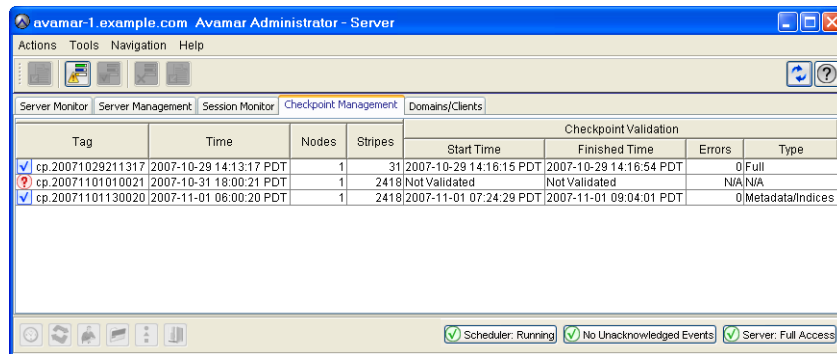
Checkpoint validations can take several hours to perform and only one checkpoint can be validated at a time.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.



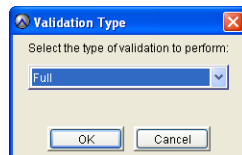
The Avamar Server window appears.

3. Click the Checkpoint Management tab.



4. Select an existing unvalidated checkpoint and select **Actions > Validate Checkpoint**.

The Validation Type dialog box appears.



5. Select one of the following validation types:

TYPE	DESCRIPTION
Full	Validation performs all checks.
Rolling	A partial "rolling" check which fully validates all new and modified stripes, then partially checks a subset of unmodified stripes.

6. Click **OK**.

The Validation Type dialog box closes.

The Start Time, Finished Time changes and status indicator all change state to indicate that the validation operation is being performed.

When the validation operation is complete, the Start Time, Finished Time changes and status indicator will change states to indicate either a successful validation or that this checkpoint could not be validated.

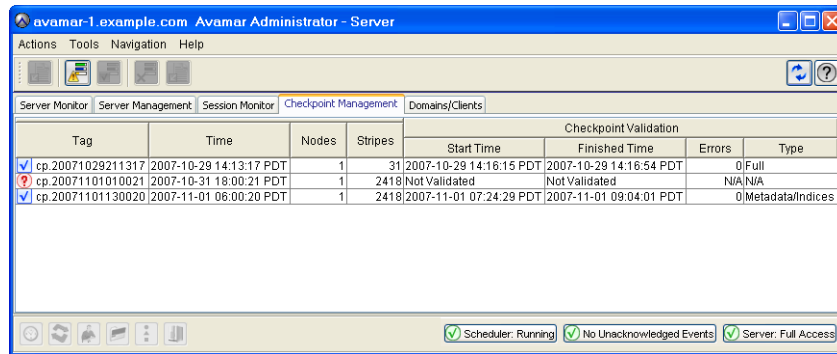
## Deleting a Checkpoint

Deleting checkpoints is typically done in order to reclaim additional server storage capacity. Generally, it is best to delete unvalidated checkpoints before deleting validated checkpoints.

1. Start Avamar Administrator (page 21).
2. Select **Navigation > Avamar Server** or click the **Avamar Server** launcher button.



The Avamar Server window appears.  
 Click the Checkpoint Management tab.



3. Select the checkpoint you want to delete and select **Actions > Delete Checkpoint**.

A message appears asking you to confirm this action.

4. Click **Yes** to permanently delete this checkpoint.

## Rolling Back to a Checkpoint

“Rollback” is the process of restoring the Avamar server to a known good state using data stored in a validated checkpoint.

If nodes have been added to the Avamar server since the checkpoint was taken, entries for them should be removed from the probe.out file before this procedure is performed.

- User=admin
1. Open a command shell (page 477).
  2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

Shut Down the Server

Find Latest Validated Checkpoint

3. Type:
 

```
dpnctl stop
```
4. In order to perform a rollback, you need a valid checkpoint ID. To display a list of checkpoints, type the following:

**cplist**

The following information appears in your command shell:

```
cp.20080106170113 Fri Jan 6 17:01:13 2008 valid hfs del nodes 4 stripes 396
cp.20080107170042 Sat Jan 7 17:00:42 2008 valid hfs del nodes 4 stripes 396
cp.20080108170040 Sun Jan 8 17:00:40 2008 valid hfs ... nodes 4 stripes 396
cp.20080109170043 Mon Jan 9 17:00:43 2008 valid hfs ... nodes 4 stripes 396
```

Where each “cp.YYYYMMDDHHMMSS” entry is a checkpoint ID and “valid hfs” indicates a validated checkpoint.

valid hfs indicates a fully validated checkpoint; valid par indicates a partially validated checkpoint.

Generally, you should roll the system back to the latest fully validated checkpoint unless you have a good reason to roll back to an earlier checkpoint.

5. Use the date/time stamps to find the latest validated checkpoint and note the checkpoint ID.

Initiate the  
Rollback

6. Type:

```
rollback.dpn --cptag=cp.YYYYMMDDHHMMSS >& FILE
```

Where cp.YYYYMMDDHHMMSS is the checkpoint ID from step 6 and FILE is a user-defined temporary file.

7. Wait for the rollback to complete.

The rollback might take up to one hour, depending on the amount of data present in your Avamar server. When the rollback is complete, the command prompt will return.

8. Open the user-defined temporary file (FILE) created in step 8 and verify that the rollback successfully completed without errors.

The server will automatically restart following a successful rollback.

## MCS Configuration Settings

**Server and Client Preferences Files.** Avamar Administrator consists of both client and server software applications. Each application can be independently configured by modifying the appropriate preferences file.

Changes made to the server preferences file affect all Avamar Administrator sessions; changes made to a client preferences file only affect Avamar Administrator sessions on that client.

**Filenames.** The Avamar Administrator preferences files are:

- mcserver.xml (server preferences file)
- mcclient.xml (client preferences file)

Both files conform to the preferences.dtd XML Document Type Description (DTD) referenced by the JSDK 1.4 API.

**“Default” and “Live” Copies.** Two copies of each of these files are present on the system: an initial “default” copy that is used to initialize each application following installation and a “live” copy that contains the current settings used by the application.

**Locations.** The default copies are located in each application’s /lib directory. The “live” copies are located in a “live file” directory. The default live file directory for each application is:

- /usr/local/avamar/var/mc/server\_data/prefs (server live file directory)
- INSTALL-DIR/var/mc/gui\_data/prefs (client live file directory)

Where INSTALL-DIR is typically C:\Program Files\avs\administrator on Microsoft Windows computers, /usr/local/avamar on Linux computers or /opt/AVMRconsl on Solaris computers.

**Initialization Behavior.** When either the server or client application is initialized, the respective default preferences file in the lib directory is loaded into memory and replicated to the live file directory.

---

**IMPORTANT:** Reinitializing a running MCS is highly destructive — it will completely overwrite any custom preference settings stored in the live /usr/local/avamar/var/mc/server\_data/prefs/mcserver.xml file and revert the system configuration back to default settings.

If this occurs, you will need to recover custom preference settings from a previous flush (backup) if they are overwritten.

---

**Upgrade Behavior.** During server upgrades, any mcserver.xml entry that is marked with the merge="delete" attribute in the new “default” mcserver.xml file will not be merged into the new “live” copy. These entries are obsolete. They are retained in the “default” mcserver.xml file so that the MCS will know to delete the preferences on an upgraded customer system.

## Backing Up MCS Data

In order to protect itself from hardware failures, the MCS backs up or “flushes” its persistent data to the Avamar server that it manages. Flushes (backups) are done by way of an **avtar** client session.

**Automatic Flushes.** Automatic flushes are normally performed hourly and as part of system checkpoints.

**flush.timestamp File.** Before every flush, a special timestamp file (flush.timestamp) is created in the server\_data directory. This file includes the time and date of the flush. On a server rollback, this file is restored and can be used to verify the rollback was successful to the time and date desired. The contents of flush.timestamp is also accessible by way of the **mcsserver.sh --status** command. Refer to *Getting MCS Status* (page 291) for additional information.

**init.timestamp File.** During system initialization the init.timestamp file is created or overwritten in the server\_data directory. This file includes the time and date of the system initialization and can be used to verify that initialization was successful on the time and date desired.

## Performing an On-Demand MCS Flush

Automatic flushes (page 358) are normally performed hourly and as part of system checkpoints. You can also force an on-demand “flush” by performing the following:

- User=admin
1. Open a command shell (page 477).
  2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Type:  
**mcsserver.sh --flush**

## Finding MCS Backups in the System

MCS flushes (backups) are stored under the /MC\_BACKUPS account. You can get a list of MCS backups by browsing this account in the Avamar Administrator Backup & Restore window or by typing the following `avtar` command on a single command line:

```
avtar --backups --id=root --ap=PASSWORD --path=/MC_BACKUPS  
--hfsaddr=mydgn.Example.com --count=NUM
```

Where `PASSWORD` is the Avamar root user account password (not the operating system root password) and `NUM` is the number of backups you want listed by this command.

---

**IMPORTANT:** Space limitations in this publication cause the previous command example to continue (wrap) to more than one line. Your command must be typed on a single command line (no line feeds or returns allowed).

---

**--count=NUM Option.** A typical Avamar server takes 26 MCS flushes (backups) per day (one per hour and one each during the morning and evening system checkpoints). Therefore, specifying `--count=NUM` in increments of 26 will in most cases list all MCS flushes (backups) stored in the system for a predictable past number of days (for example, `--count=26` should list all backups stored in the system during the past day, `--count=52` should list all backups stored in the system during the past two days and so forth).

## Restoring MCS Data

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Stop the MCS by typing:  
**dpnctl stop mcs**
4. Restore the MCS to the latest flush (backup) by typing:  
**mcservice.sh --restore**

---

**TIP:** You can also restore the MCS to a specific backup by including the **--labelnum=NUM** option. Refer to *Finding MCS Backups in the System* (page 359) for additional information.

---

5. Open `/usr/local/avamar/var/mc/server_log/restore.log` to verify the success of the restore.
6. Restart the MCS by typing:  
**dpnctl start mcs**
7. Resume scheduled operations (page 279).



## Reverting to Default MCS Preference Settings

You can safely revert back to the initial default preference settings (page 357) by performing the following:

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Stop the MCS by typing:

```
dpnctl stop mcs
```

4. Rename /usr/local/avamar/var/mc/server\_data/prefs/mcserver.xml to old.mcserver.xml.

Next, you must copy the default server preferences file into the /usr/local/avamar/var/mc/server\_data/prefs directory.

5. Type:

```
cp /usr/local/avamar/lib/mcserver.xml  
/usr/local/avamar/var/mc/server_data/prefs/mcserver.xml
```

---

**NOTE:** Space limitations in this publication cause the previous **cp** command to continue (wrap) to more than one line. Your **cp** command must be typed on a single command line (no line feeds or returns allowed).

---

6. Restart the MCS by typing:

```
dpnctl start mcs
```

7. Resume scheduled operations (page 279).

## Manually Changing Your Avamar Administrator Client Preferences

Some Avamar Administrator client preferences can be changed directly from Avamar Administrator. However, a number of preferences can only be changed by modifying `mcclient.xml`.

1. Close Avamar Administrator.
2. Open `var/mc/gui_data/prefs/mcclient.xml` in a text editor.
3. Modify the preference elements you want to change.
4. Save your changes.
5. Your changes will take effect the next time you start Avamar Administrator.

## Updating Your Server Licensing

Each Avamar server is individually licensed when that server is initially deployed at a customer site.

Avamar servers are licensed in units of decimal TB capacity. For example, 1 TB of licensable capacity equals 1,000,000,000,000 bytes. Licensable capacity includes deduplicated customer data and system overhead, including RAIN parity data (for RAIN-based systems).

If that server experiences a hardware failure that causes the primary MAC address of the utility node to change, or if additional storage capacity is purchased, a new license key file must be generated.

---

**IMPORTANT:** In order to generate a license key file, you must be able to log into the AvaSphere Extranet Portal with a browser that supports cookies.

If you do not have an AvaSphere Extranet Portal user account, contact EMC Technical Support to assist you with updating your server licensing.

---

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Type:

**gathergsankeydata**

Enter your customer account number (as found on your EMC Purchase Order Confirmation):

4. Type your EMC Customer Number and press **ENTER**.

Your EMC Customer Number can be found on your EMC Purchase Order Confirmation.

Valid Customer Numbers conform to the following format:

CN-YYMMDDNNNNN

Where YY is a two-digit year, MM is a two-digit month, DD is a two-digit day of the month and NNNNN is a five-digit numerical sequence.

The following information appears in your command shell:

```
Enter your Avamar system asset ID number (as found on your EMC Purchase Order Confirmation):
```

5. Type your system Reference ID and press **ENTER**.

The system Reference ID is found on your EMC Purchase Order Confirmation.

Valid system Reference IDs conform to the following format:

A-YYYYNNNNNN

Where YYYY is a four-digit year and NNNNNN is a six-digit numerical sequence.

The following information appears in your command shell:

```
Your answers were:
```

```
Customer account ID: [CN-*****]
```

```
Customer asset ID: [A-*****]
```

```
Is this correct? [y(es), n(o), e(xit)]:
```

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

At this point, the `gsankeydata.xml` license key information file should be present in the local directory, from which `gathergsankeydata` was run in step 5.

7. Open your web browser and log into your AvaSphere Extranet Portal user account by typing:

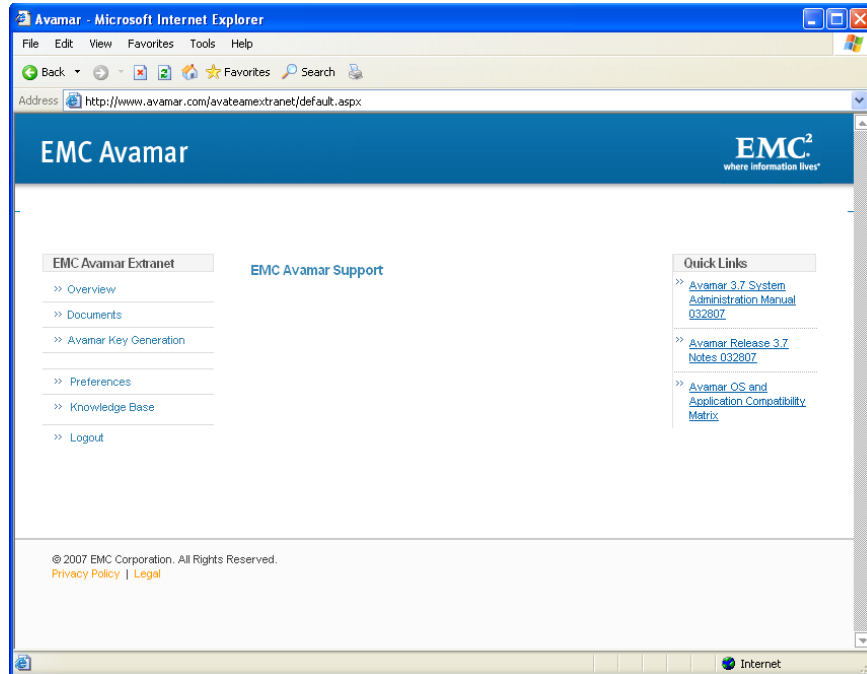
**`http://www.avamar.com/avateamextranet`**

The EMC Avamar Extranet Login page appears.

[Log Into  
AvaSphere  
Extranet Portal](#)

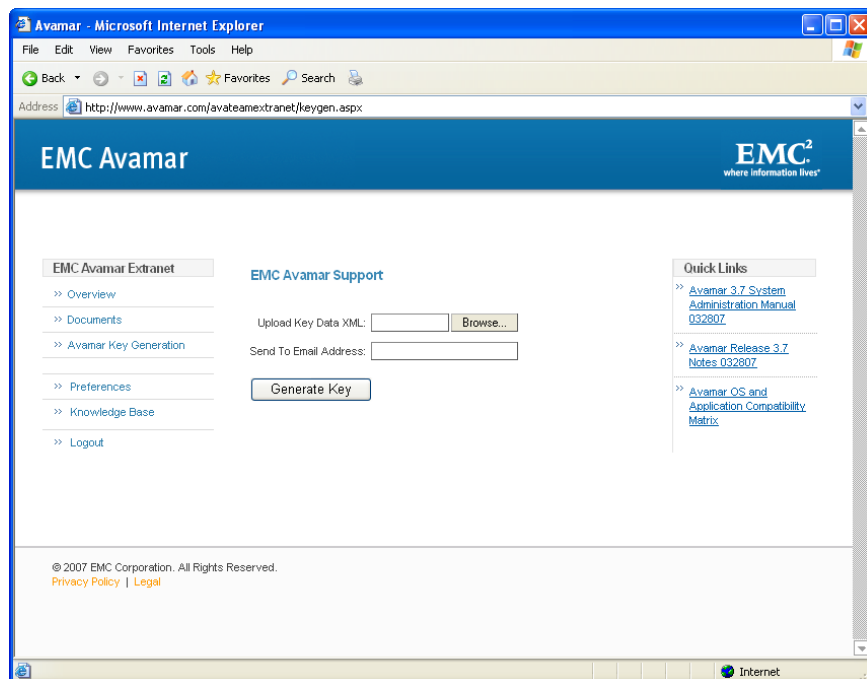
8. Log into your AvaSphere Extranet Portal user account by typing your username and password in the Username and Password fields, then clicking **Submit**.

The EMC Avamar Support main page appears.



9. Click **Avamar Key Generation**.

The EMC Avamar Support key generation page appears.



10. Click **Browse...**

The Choose File dialog box appears.

11. Locate the license key information file created in steps 5 through 6.

12. Double-click the license key information file or select the license key information file and click **Open**.

The Choose File dialog box closes.

13. Switch to EMC Avamar Support key generation page and type the email address to which you want the license key file sent.

---

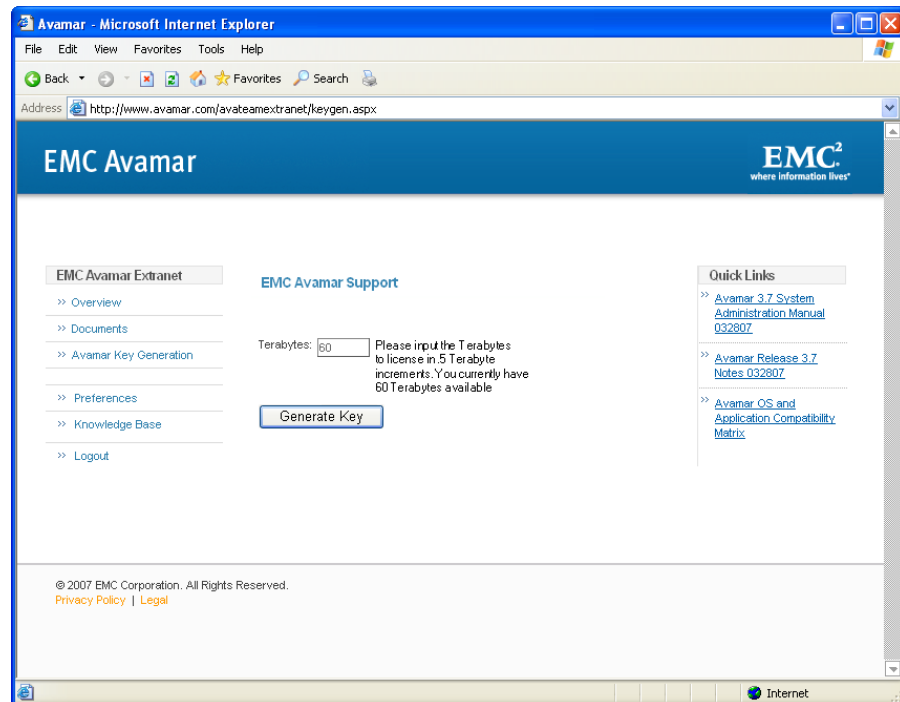
**IMPORTANT:** This must be an email account from which you can save the attached license key file and copy it to the Avamar server.

---

14. Click **Generate Key**.

The EMC Avamar Support enter terabytes page appears.

This page allows you to specify the number of Capacity Terabyte Licenses you want to allocate to this Avamar server.



15. Type the number of Capacity Terabyte Licenses you want to allocate to this Avamar server in the Terabyte field.

16. Click **Generate Key**.

The EMC Avamar Support final key generation page appears, confirming that your license key has been emailed to the address you entered in step 13.

17. Open your email program and access the email account you entered in step 13.

The license key file is an email attachment with the following naming convention:

ASSET-NAME.xml

Where ASSET-NAME is typically the Avamar server hostname as defined in corporate DNS.

18. Open the Avamar Key Information email message and save the ASSET-NAME.xml email attachment to a convenient temporary directory or folder.
19. Do one of the following:

IF	DO THIS
Administering a single-node server.	Use WinSCP or an equivalent program to copy the ASSET-NAME.xml license key file from the temporary directory or folder to the Avamar server /tmp directory.
Administering a multi-node server.	Use WinSCP or an equivalent program to copy the ASSET-NAME.xml license key file from the temporary directory or folder to the Avamar server utility node /tmp directory.

---

**IMPORTANT:** In order to activate your license using the **avmaint license** command, the Avamar server data server subsystem (also known as GSAN) must be running.

---

User=admin

20. Switch to your command shell session and ensure that you are still logged in as user admin and that the admin OpenSSH key is still loaded.
21. Verify that the data server subsystem (also known as GSAN) is running by typing:

**dpnctl status gsan**

The following information appears in your command shell:

```
dpnctl: INFO: gsan status: ready
```

22. Do one of the following:

IF	DO THIS
Your Avamar server is running	Change file permissions on the ASSET-NAME.xml license key file and activate the license by typing: <pre>chmod 644 /tmp/ASSET-NAME.xml</pre> <pre>avmaint license /tmp/ASSET-NAME.xml</pre> <pre>--avamaronly</pre> Where ASSET-NAME.xml is the license key file you previously downloaded.

IF	DO THIS
Your Avamar server is not running	Change file permissions on the ASSET-NAME.xml license key file and activate the license by typing: <pre>cd /usr/local/avamar/etc mv license.xml license.xml.old cp /tmp/ASSET-NAME.xml license.xml chmod 644 license.xml</pre> Where ASSET-NAME.xml is the license key file you previously downloaded.

23. Verify that the server license is correctly installed by typing:

```
avmaint license --avamaronly
```

License information appears in your command shell:



## Changing Avamar Passwords

This procedure describes how to use the **change-passwords** interactive utility to change various operating user account and Avamar server user account passwords, as well as creating new OpenSSH keys.

**change-passwords** will interactively prompt and guide you through any or all of the following operations:

- Changing operating system login passwords for the admin, dpn and root accounts
- Creating new admin and dpnid OpenSSH keys
- Changing internal Avamar server passwords for the root and MCUser accounts

After running the **change-passwords** interactive utility (page 369), you must also manually update EMS settings (page 377).

### Run change-passwords

To change any operating user account passwords, Avamar server user account passwords or create new OpenSSH keys, perform the following:

User=dpn

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user dpn.
Administering a multi-node server.	Log into the utility node as user dpn.

3. Type:

**change-passwords**

If you run **change-passwords** on a multi-node server, the following information appears in your command shell:

```
Do you wish to change passwords and/or passphrases on all nodes?
Answering y(es) changes this set of nodes:
    #.s  -- all utility/services nodes
    #.#  -- all data nodes.
Answering n(o) will afford you the opportunity to install
existing SSH keys onto other nodes.
```

```
y(es), n(o), h(elp), q(uit/exit):
```

---

**NOTE:** The previous information will not appear if you run **change-passwords** on a single-node server.

---

4. Do one of the following:

IF	DO THIS
You want to change passwords on all nodes.	Type <b>y</b> and press <b>ENTER</b> .
You want to change passwords on selected nodes.	Type <b>n</b> and press <b>ENTER</b> .

The following information appears in your command shell:

```
Identity added: /home/dpn/.ssh/dpnid (/home/dpn/.ssh/dpnid) Identity
added: /home/dpn/.ssh/dpnid.prev (/home/dpn/.ssh/dpnid.prev) Identity
added: /home/dpn/.ssh/dpnid.orig (/home/dpn/.ssh/dpnid.orig)
```

```
Do you wish to specify one or more additional SSH passphrase-less
private keys that are authorized for root operations?
Answer n(o) here unless there are known inconsistencies in
~root/.ssh/authorized_keys2 files among the various nodes (as might
be evident if you had been prompted for a root password in a previous
run of this program).
```

```
Note that the following keys will be used automatically (there is
no need to re-specify them here):
/home/dpn/.ssh/dpnid
/home/dpn/.ssh/dpnid.prev
/home/dpn/.ssh/dpnid.orig
```

```
y(es), n(o), h(elp), q(uit/exit):
```

5. Type **n** and press **ENTER**.

The following information appears in your command shell:

```
The following is a test of root authorization with the currently
loaded SSH key(s).
```

```
If during this test you are prompted for an OS root password,
then you might be missing an appropriate "dpnid" key for one
or more nodes.
```

```
-> In that event, re-run this program and, when prompted,
specify as many SSH private key files as are necessary
in order to complete root operations on all nodes.
```

```
Starting root authorization test with 15 second timeout...
End of root authorization test.
```

Change Operating  
System User  
Account  
Passwords?

The following information appears in your command shell:

```
-----
Change OS (login) passwords?
y(es), n(o), q(uit/exit):
```

6. Do one of the following:

IF	DO THIS
You want to change admin, dpn or root operating system user account passwords.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change admin, dpn or root operating system user account passwords.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 16.

The following information appears in your command shell:

```
-----
Change OS password for "admin"?
y(es), n(o), q(uit/exit):
```

Change admin  
Login Password?

7. Do one of the following:

IF	DO THIS
You want to change the admin operating system user account password.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change the admin operating system user account password.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 10.

The following information appears in your command shell:

```
Please enter a new OS (login) password for user "admin".
(Entering an empty (blank) line twice quits/exits.)
```

8. Type the new admin operating system user account password and press **ENTER**.

The following information appears in your command shell:

```
Please enter the same OS password again.
(Entering an empty (blank) line twice quits/exits.)
```

9. Retype the new admin operating system user account password and press **ENTER**.

The following information appears in your command shell:

```
Accepted OS password for "admin".
-----
Change OS password for "dpn"?
y(es), n(o), q(uit/exit):
```

Change dpn Login Password?

10. Do one of the following:

IF	DO THIS
You want to change the dpn operating system user account password.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change the dpn operating system user account password.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 13.

The following information appears in your command shell:

```
Please enter a new OS (login) password for user "dpn".
(Entering an empty (blank) line twice quits/exits.)
```

11. Type the new dpn operating system user account password and press **ENTER**.

The following information appears in your command shell:

```
Please enter the same OS password again.
(Entering an empty (blank) line twice quits/exits.)
```

12. Retype the new dpn operating system user account password and press **ENTER**.

The following information appears in your command shell:

```
Accepted OS password for "dpn".
-----
Change OS password for "root"?
y(es), n(o), q(uit/exit): y
```

Change root Login Password?

13. Do one of the following:

IF	DO THIS
You want to change the root operating system user account password.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change the root operating system user account password.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 16.

The following information appears in your command shell:

```
Please enter a new OS (login) password for user "root".
(Entering an empty (blank) line twice quits/exits.)
```

14. Type the new root operating system user account password and press **ENTER**.

The following information appears in your command shell:

```
Please enter the same OS password again.
(Entering an empty (blank) line twice quits/exits.)
```

15. Retype the new root operating system user account password and press **ENTER**.

The following information appears in your command shell:

```
Accepted OS password for "root".
=====
Change SSH keys?
y(es), n(o), q(uit/exit): y
```

Change OpenSSH Keys?

The following information appears in your command SHELL:

```
=====
Change SSH keys?
y(es), n(o), q(uit/exit):
```

16. Do one of the following:

IF	DO THIS
You want to change admin or dpnid OpenSSH keys.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change admin or dpnid OpenSSH keys.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 22.

17. Do one of the following:

IF	DO THIS
You want to create new admin or dpnid OpenSSH keys.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to create new admin or dpnid OpenSSH keys.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 18.

The following information appears in your command shell:

```
-----
Change SSH key for "admin"?
y(es), n(o), q(uit/exit):
```

18. Do one of the following:

Create New admin OpenSSH Key?

IF	DO THIS
You want to create a new admin OpenSSH key.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to create a new admin OpenSSH key.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 21.

The following information appears in your command shell:

```
Please enter a new SSH key passphrase for user "admin".
(Entering an empty (blank) line twice quits/exits.)
```

19. Type the new admin OpenSSH passphrase and press **ENTER**.

The following information appears in your command shell:

```
Please enter the same SSH key again.
(Entering an empty (blank) line twice quits/exits.)
```

20. Retype the new admin OpenSSH passphrase and press **ENTER**.

The following information appears in your command shell:

```
Accepted SSH key for "admin".
-----
Redo passphrase-less elevated-privilege SSH key "dpnid"?
y(es), n(o), h(elp), q(uit/exit):
```

Create New dpnid  
OpenSSH Key?

21. Do one of the following:

IF	DO THIS
You want to create a new dpnid OpenSSH key.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to create a new dpnid OpenSSH key.	Type <b>n</b> and press <b>ENTER</b> .

**IMPORTANT:** This task requires knowledge of the internal Avamar server root user account password.

Change Internal  
Avamar Server  
User Account  
Passwords?

The following information appears in your command shell:

```
=====
Change Avamar Server passwords?
y(es), n(o), q(uit/exit):
```

22. Do one of the following:

IF	DO THIS
You want to change the MCUser or internal root Avamar server user account passwords.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change the MCUser or internal root Avamar server user account passwords.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 30.

The following information appears in your command shell:

```
Please enter the CURRENT Avamar Server password for "root"
(Entering an empty (blank) line twice quits/exits.)
```

23. Type the current internal Avamar server root user account password (not the operating system root password) and press **ENTER**.

The following information appears in your command shell:

```
Checking Avamar Server root password (300 second timeout)...
Avamar Server current root password accepted.
-----
Change Avamar Server password for "MCUser"?
y(es), n(o), q(uit/exit): y
```

Change Internal  
 Avamar Server  
 MCUser  
 Password?

24. Do one of the following:

IF	DO THIS
You want to change the internal Avamar server MCUser password.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change the internal Avamar server MCUser password.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 27.

The following information appears in your command shell:

```
Please enter a new Avamar Server password for user "MCUser".
(Entering an empty (blank) line twice quits/exits.)
```

25. Type the new internal Avamar server MCUser password and press **ENTER**.

The following information appears in your command shell:

```
Please enter the same Avamar Server password again.
(Entering an empty (blank) line twice quits/exits.)
```

26. Retype the new internal Avamar server MCUser password and press **ENTER**.

The following information appears in your command shell:

```
Accepted Avamar Server password for "MCUser".
-----
Change Avamar Server password for "root"?
y(es), n(o), q(uit/exit):
```

Change Internal  
 Avamar Server  
 root Password?

27. Do one of the following:

IF	DO THIS
You want to change the internal Avamar server root password.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change the internal Avamar server root password.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 30.

The following information appears in your command shell:

```
Please enter a new Avamar Server password for user "root".
(Entering an empty (blank) line twice quits/exits.)
```

28. Type the new internal Avamar server root password and press **ENTER**.

The following information appears in your command shell:

```
Please enter the same Avamar Server password again.
(Entering an empty (blank) line twice quits/exits.)
```

29. Retype the new internal Avamar server root password and press **ENTER**.

The following information appears in your command shell:

```
Accepted Avamar Server password for "root".
-----
Do you wish to proceed with your password changes on the selected node?
  Answering y(es) will proceed with password updates.
  Answering n(o) or q(uit) will not proceed.

y(es), n(o), q(uit/exit): y
```

Change Server  
 Lockbox  
 Administrative  
 Passphrase?

The following information appears in your command shell:

```
=====
Change the server lockbox administrative passphrase?
y(es), n(o), h(elp), q(uit/exit): y
```

30. Do one of the following:

IF	DO THIS
You want to change the server lockbox passphrase.	Type <b>y</b> and press <b>ENTER</b> .
You do not want to change the server lockbox passphrase.	Type <b>n</b> and press <b>ENTER</b> . Proceed to step 33.

The following information appears in your command shell:

```
-----
Change the server lockbox administrative passphrase?
y(es), n(o), h(elp), q(uit/exit): y

Please enter the CURRENT server lockbox administrative passphrase.
Enter ? or help for help.

(Entering an empty (blank) line twice quits/exits.)
```

31. Type the old server lockbox passphrase and press **ENTER**.

The following information appears in your command shell:

```
Please enter the NEW server lockbox administrative passphrase.
Enter ? or help for help.

(Entering an empty (blank) line twice quits/exits.)
```

32. Type the new server lockbox passphrase and press **ENTER**.

Accept Changes?

33. Do one of the following:

IF	DO THIS
You want to accept changes made to passwords or OpenSSH keys during this utility session.	Type <b>y</b> and press <b>ENTER</b> .
You want to exit this utility session without making changes to passwords or OpenSSH keys.	Type <b>n</b> and press <b>ENTER</b> .

The following information appears in your command shell:

```
Changing OS passwords...
[Logging to /usr/local/avamar/var/change-passwords.log...]
Done changing OS passwords...
Changing Avamar Server passwords...
Checking MCS Status...
Stopping MCS...
Starting process of updating Administrator configuration...
Running script to update Administrator configuration on node 0.s...
[Logging to /usr/local/avamar/var/change-passwords.log...]
Done with updating Administrator configuration on node 0.s...
Starting process of updating client configurations...
Running script to update client configuration on 0.s...
[Logging to /usr/local/avamar/var/change-passwords.log...]
Updating client configuration on node 0.0...
```



```

Done updating client configuration on 0.0...
Checking MCS Status...
Starting MCS...
Starting process of changing SSH keys...
Running script to update SSH keys on node 0.s...
[Logging to /usr/local/avamar/var/change-passwords.log...]
Done with updating SSH keys on node 0.s...
-----
Done.
NOTES:
- If you had custom public keys present in the
  authorized_keys2 files of any Avamar OS users
  (admin, dpn, root) be aware that
  you may need to re-add your custom keys.
- Please be sure to resume schedules via the
  Administrator GUI.

```

## Manually Update EMS Settings

After the **change-passwords** interactive utility has finished modifying various passwords, you must update the EMS by performing the following:

1. Open your web browser and log into Avamar Enterprise Manager (page 295).

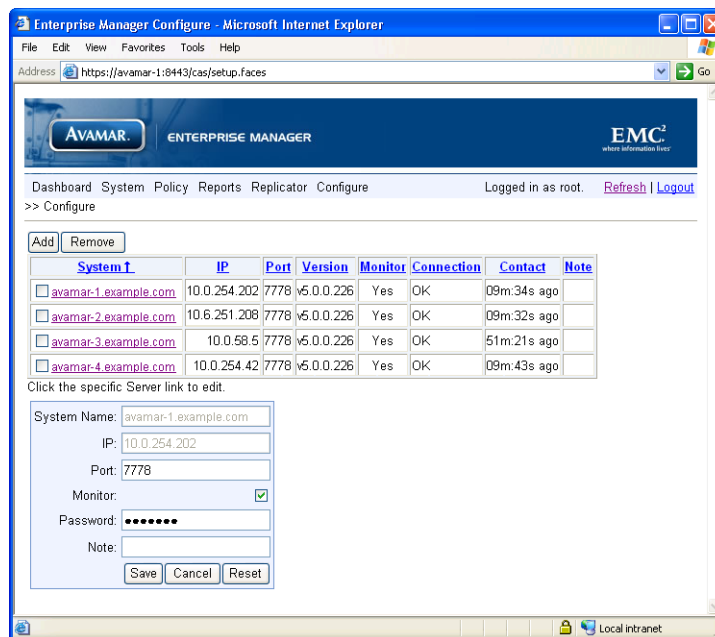
The Dashboard page (page 296) appears.

2. Select **Configure**.

The Configure page (page 315) appears.

3. Click the server name you want to edit.

An Edit block appears below the systems list.



4. Type the new MCUser password in the Password field and click **Save**.

User=admin

5. Open a command shell (page 477).

6. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

7. Type:

```
dpnctl stop ems
emserver.sh --renameserver --uselocalmcs
dpnctl start ems
```

## Changing Single-Node Server Network Settings

This topic describes how to properly use the `dpnnetutil` utility to change the following single-node server network settings:

- IP address
- Domain name
- DNS settings
- Network gateway
- NAT settings
- Multi-NICs settings

Do not use `dpnnetutil` to change the node type.

---

**IMPORTANT:** This procedure cannot under any circumstances be used to change network settings for multi-node servers. If `dpnnetutil` is run against a multi-node server, operational readiness might be adversely affected.

Contact EMC Technical Support for additional information.

---

### User=root

1. Open a command shell (page 477).
2. Log into the server as root.
3. When prompted for a password, type the root password and press **ENTER**.
4. Type:

```
dpnnetutil
```

The following information appears in your command shell:

```
Do you want to configure AVAMARSERVER?
```

Where AVAMARSERVER is your server's hostname.

5. Use **TAB** or cursor keys to select **Yes** and press **ENTER**.

### Time Zone

The following information appears in your command shell:

```
The current default time zone is "TIMEZONE".
```

```
Do you want to select a different time zone?
```

Where TIMEZONE is your current default time zone.

6. Do one of the following:

IF	DO THIS
You want to change the default server time zone.	<ol style="list-style-type: none"> <li>1. Use <b>TAB</b> or cursor keys to select <b>Yes</b>.</li> <li>2. Press <b>ENTER</b>.</li> <li>3. Use cursor keys to select a time zone from the list.</li> <li>4. Use <b>TAB</b> or cursor keys to select <b>OK</b>.</li> <li>5. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing default server time zone.	<ol style="list-style-type: none"> <li>1. Use <b>TAB</b> or cursor keys to select <b>No</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

SMTP Server

The following information appears in your command shell:

Please enter the name or address of an SMTP server that will accept and relay e-mail submissions from this host.

7. Do one of the following:

IF	DO THIS
You want to change the SMTP server name.	<ol style="list-style-type: none"> <li>1. Type the new SMTP server name.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing SMTP server name.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the existing SMTP server name and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

Server IP Address

The following information appears in your command shell:

Do you want to create a bonded interface bond0 for this node?

8. Select **No**.

The following information appears in your command shell:

Please enter the new IP address for the system single-node server interface eth0:

9. Do one of the following:

IF	DO THIS
You want to change the server IP address.	<ol style="list-style-type: none"> <li>1. Type the new server IP address.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing server IP address.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the existing server IP address and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

**Network Mask**

The following information appears in your command shell:

Please enter the network mask for the system single-node server interface eth0.

10. Do one of the following:

IF	DO THIS
You want to change the network mask.	<ol style="list-style-type: none"> <li>1. Type the new network mask.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing network mask.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the current network mask and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

**Server Hostname**

The following information appears in your command shell:

Please enter the new hostname (without domain name) for the system single-node server.

11. Do one of the following:

IF	DO THIS
You want to change the server hostname.	<ol style="list-style-type: none"> <li>1. Type the new server hostname. Do not use a fully qualified hostname. The server domain name will be specified in the next step.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing server hostname.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the existing server hostname and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

**Server Domain**

The following information appears in your command shell:

Please enter the domain name for the system single-node server.

12. Do one of the following:

IF	DO THIS
You want to change the server domain name.	<ol style="list-style-type: none"> <li>1. Type the new server domain name.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing server domain name.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the existing server domain name and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

Network Gateway Address

The following information appears in your command shell:

Please enter the network gateway address for the system single-node server.

13. Do one of the following:

IF	DO THIS
You want to change the network gateway address.	<ol style="list-style-type: none"> <li>1. Type the new network gateway address.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing network gateway address.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the network gateway address and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

Primary DNS Resolver

The following information appears in your command shell:

Please enter the IP address of the primary DNS resolver for the system single-node server.

14. Do one of the following:

IF	DO THIS
You want to change the primary DNS resolver IP address.	<ol style="list-style-type: none"> <li>1. Type the new primary DNS resolver IP address.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing primary DNS resolver IP address.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the primary DNS resolver IP address and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

Secondary DNS Resolver

The following information appears in your command shell:

Please enter the IP address of the secondary DNS resolver for the system single-node server.

15. Do one of the following:

IF	DO THIS
You want to change the secondary DNS resolver IP address.	<ol style="list-style-type: none"> <li>1. Type the new secondary DNS resolver IP address.</li> <li>2. Press <b>TAB</b> to select <b>OK</b>.</li> <li>3. Press <b>ENTER</b>.</li> </ol>
You want to keep the existing secondary DNS resolver IP address.	<ol style="list-style-type: none"> <li>1. Press <b>TAB</b> to accept the secondary DNS resolver IP address and select <b>OK</b>.</li> <li>2. Press <b>ENTER</b>.</li> </ol>

Review/Confirm  
Changes

The following information appears in your command shell:

```
Accept settings and proceed to fix up the network configurations?  
Select Yes to proceed. No to quit. You may re-run "dpnnetutil".
```

16. Examine the settings shown.

17. Do one of the following:

IF	DO THIS
You want to accept these settings and make these changes.	1. Use <b>TAB</b> or cursor keys to select <b>Yes</b> . 2. Press <b>ENTER</b> .
You want to exit <b>dpnnetutil</b> without making any changes.	1. Use <b>TAB</b> or cursor keys to select <b>No</b> . 2. Press <b>ENTER</b> .

The **dpnnetutil** program writes the configuration changes to the `/usr/local/avamar/probe.xml` directory.

---

**NOTE:** Use the **nodedb print** command to view the contents of `probe.xml`.

---

The Avamar server software automatically restarts upon completion of the reconfiguration.

18. Check and update as necessary the configurations of the external network infrastructure elements (switches and firewalls) to ensure that the single-node server will remain reachable after it have been assigned new IP address or new default network gateway. In particular, VLANs and ACLs might need to be updated.

## Adding a Custom Security Notification to Web Login Pages

Avamar Enterprise Manager and the Avamar Web Access features allow you to include a custom security notification to users on their respective login pages. These notifications typically notify visitors to these login pages that only authorized users of that system are permitted access and explains the penalties of unauthorized access.

The actual mechanism for implementing these notifications involves adding the following plain-text files to the `/usr/local/avamar/var/em/server_data/` directory:

- `disclaimer_EM.txt`
- `disclaimer_Web_Restore.txt`

`disclaimer_EM.txt` stores the custom security notification for the Avamar Enterprise Manager login page; `disclaimer_Web_Restore.txt` stores the custom security notification for the Avamar Web Access login page.

To customize security notification language for your site, simply create these files in a text editor, add your content and save them to the `/usr/local/avamar/var/em/server_data/` directory. Either file can contain plain text or HTML content.

If you later decide not to display additional security notifications at your site, simply remove these files and no security notifications will appear. It is also permissible for these files to be empty.



## Manually Updating the Plugin Catalog

Beginning with Avamar 4.1, new clients can be added to an operational Avamar system without having to perform a system upgrade. When new clients are added, Avamar 4.1 systems automatically update the consolidated plugin catalog.

However, if you add new clients to an Avamar 4.0.x or earlier system, you must manually update the consolidated plugin catalog in order for those clients to be recognized by the system.

User=admin

1. Open a command shell (page 477).
2. Do one of the following:

IF	DO THIS
Administering a single-node server.	Log into the server as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> .
Administering a multi-node server.	Log into the utility node as user admin. When prompted for a password, type the admin password and press <b>ENTER</b> . Load the admin OpenSSH key by typing: <b>ssh-agent bash</b> <b>ssh-add ~admin/.ssh/admin_key</b> You are prompted to type a passphrase. Type the admin user account passphrase and press <b>ENTER</b> .

3. Go to the directory that contains the existing plugin\_catalog.xml and rename it by typing:

```
cd /usr/local/avamar/lib
mv plugin_catalog.xml plugin_catalog.xml.old
```

4. Obtain the updated consolidated plugin catalog.

In most cases, EMC Technical Support will provide this for you.

5. Copy the updated consolidated plugin catalog to the /usr/local/avamar/lib directory.

6. Ensure that updated plugin\_catalog.xml has the correct ownership and permissions by typing:

```
ls -l plugin_catalog.xml
```

Correct ownership and permissions are:

```
304 -rw-r--r-- 1 root admin 305578 Jun 3 14:21 plugin_catalog.xml
```

7. If ownership and permissions are not correct, set them typing:

```
chmod 644 plugin_catalog.xml
```

```
chown root:admin plugin_catalog.xml
```

8. Stop, then restart the MCS so it reads the updated plugin\_catalog.xml by typing:

```
dpnctl stop mcs
```

```
dpnctl start mcs
```

# CLIENT SYSTEM RECOVERY

---

This chapter describes how to completely restore a supported Red Hat Linux or Sun Solaris client system back to the original system state.

This publication assumes that a full system recovery is only ever required as part of a disaster recovery because the boot hard disk drive or RAID LUN failed. If performing a complete system recovery for any other reason, contact EMC Technical Support before proceeding.

## Windows Client System Recovery

Windows client system recovery is discussed in other publications:

TOPIC	PUBLICATION
Windows Server 2008 and Windows 7 disaster recovery	<i>Avamar for Windows Servers Guide</i>
Windows Server 2003 disaster recovery	<i>Avamar for Windows Servers Guide</i>
Windows Server 2003 System Recovery using NT Backup	<i>Restoring Windows Server 2003 System State Using NTBackup and Avamar Technical Note</i>
Windows XP and 2000 System Recovery using NT Backup	<i>Avamar for Windows Servers Guide</i>

---

**NOTE:** The Avamar 5.0 Windows Client does not support backup and recovery of Windows 2000. For Windows 2000, use the Avamar 4.1 Windows Client.

---

# Red Hat Linux System Recovery

This procedure describes how to completely restore a Red Hat Linux client system back to the original system state.

## Prerequisites

A complete and recent Avamar backup of the original client local filesystem must exist on the Avamar server.

The recovery destination disk must be connected to the recovery target client and a minimal installation of a compatible operating system must have been performed. For purposes of this procedure, “compatible” means that if the original client backup on the Avamar server was performed against an RHEL3 client, then RHEL3 should be installed on the recovery target client.

Finally, Avamar Linux Client must be installed on the recovery target client.

## Procedure

1. Boot the recovery target client from the install media (first CD) and type:

```
linux rescue
```

An RHEL install prompt appears in your command shell:

2. Follow the on-screen instructions.

Be sure to enable networking by providing IP address, network mask, default gateway and DNS server when prompted.

3. Allow the installer to search for existing installations and mount the /mnt/sysimage filesystem as read-write.

This will be the target of the restore. This is also referred to as the “recovery destination disk.”

---

**NOTE:** The root filesystem cannot be restored directly to /mnt/sysimage because there is currently no method that will restrict the restore operation to only the local partition without traversing network mount points. Therefore, a restore done directly to /mnt/sysimage might copy files from all the partitions and /mnt/sysimage could fill up before all required files were restored.

---

4. Verify that /lib64, /usr/lib64, /mnt/sysimage/lib64 are all present in the LD\_LIBRARY\_PATH system variable. If any directories are missing from LD\_LIBRARY\_PATH, add them to the LD\_LIBRARY\_PATH variable.

5. Create a temporary /temp/avamar.cmd flag file with a Unix text editor.

For example:

```
cd /tmp

vi avamar.cmd

--bindir=/mnt/sysimage/usr/local/avamar/bin
--vardir=/mnt/sysimage/usr/local/avamar/var
--sysdir=/mnt/sysimage/usr/local/avamar/etc
--server=AVAMARSERVER
--account=/DOMAIN/MyClient
--id=USERNAME
--ap=PASSWORD
--overwrite=always
--target=.
```

Where AVAMARSERVER is your Avamar server IP address or fully qualified hostname (as defined in DNS), /DOMAIN/MyClient is the full location of the original Linux client on the Avamar server and USERNAME and PASSWORD are the login credentials for a user account with sufficient role and privileges to perform the restore operation.

6. Start Avamar Administrator (page 21).
7. Select **Navigation > Backup and Restore** or click the **Backup & Restore** launcher button.



The Backup and Restore window appears.

8. Click the Select for Restore tab.
9. In the Clients tree, select the original Linux client.
10. Find and select the backup you want to use for this restore operation.

#### Restore Most Directories

Next, step 11 describes how to restore most of the subdirectories that originally existed under root (/). Certain special directories such as /boot, /dev and /proc should not be restored in this manner. Also, special instructions will be provided later for restoring /usr and /lib, as well as individual files in the root (/) directory.

---

**IMPORTANT:** Do not restore /boot, /dev and /proc at this time. You will be provided special instructions for restoring these directories later in this procedure.

---

11. For most of the directories that originally existed under root (/) as follows:
  - (a) Create an identical directory under the client /mnt/sysimage directory.

For example:

```
mkdir /mnt/sysimage/data-1
```

- (b) Change directory into that directory.

For example:

```
cd /mnt/sysimage/data-1
```

Where data-1 is an example directory you want to restore.

- (c) Restore this directory's contents from the backup by typing the following on a single command line:

```
/mnt/sysimage/usr/local/avamar/bin/avtar.bin -x
--flagfile=/tmp/avamar.cmd /data
```

---

**NOTE:** Space limitations in this publication cause the previous command example to continue (wrap) to more than one line. Your command must be typed on a single command line (no line feeds or returns allowed).

---

12. Repeat step 11 for each directory under root (/) you want to restore.

#### Restore /usr Directory

Step 13 provides instructions for restoring the /usr directory. Because /usr contains files that are actively used by the Avamar Linux Client during this procedure, you must manually exclude the /mnt/sysimage/usr/local/avamar directory from the command used to restore /usr.

13. Restore the /usr directory as follows:

- (a) Change directory to /mnt/sysimage/usr by typing.

```
cd /mnt/sysimage/usr
```

- (b) Restore the contents of /usr, except for /local/avamar, by typing the following on a single command line:

```
/mnt/sysimage/usr/local/avamar/bin/avtar.bin -x
--flagfile=/tmp/avamar.cmd --exclude='./local/avamar/*'
/usr
```

---

**NOTE:** Space limitations in this publication cause the previous command example to continue (wrap) to more than one line. Your command must be typed on a single command line (no line feeds or returns allowed).

---

#### Restore Individual Files in the Root (/) Directory

Step 14 provides instructions for restoring individual files in the root (/) directory. In order to do this, the `--no-recursion` option must be supplied on the command line.

14. Restore individual files in the root (/) directory as follows:

- (a) Change directory to /mnt/sysimage by typing.

```
cd /mnt/sysimage
```

- (b) Restore the individual files in the root (/) directory by typing the following on a single command line:

```
/mnt/sysimage/usr/local/avamar/bin/avtar.bin -x
--flagfile=/tmp/avamar.cmd --no-recursion /
```

---

**NOTE:** Space limitations in this publication cause the previous command example to continue (wrap) to more than one line. Your command must be typed on a single command line (no line feeds or returns allowed).

---

Restore /lib  
Directory

Step 15 provides instructions for restoring the /lib directory. Because /lib contains files that are actively used by the Avamar Linux Client during this procedure, you must create another director (for example, /mnt/sysimage/libcopy) and restore files there. After the files are restored, you can delete /mnt/sysimage/lib and rename /mnt/sysimage/libcopy to /mnt/sysimage/lib.

15. Restore the /lib directory as follows:

(a) Change directory to /mnt/sysimage by typing.

```
cd /mnt/sysimage
```

(b) Create the libcopy directory by typing:

```
mkdir libcopy
```

(c) Change directory to /mnt/sysimage/libcopy by typing.

```
cd libcopy
```

(d) Restore the contents of /lib to /mnt/sysimage/libcopy by typing the following on a single command line:

```
/mnt/sysimage/usr/local/avamar/bin/avtar.bin -x  
--flagfile=/tmp/avamar.cmd /lib
```

---

**NOTE:** Space limitations in this publication cause the previous command example to continue (wrap) to more than one line. Your command must be typed on a single command line (no line feeds or returns allowed).

---

(e) Change directory to /mnt/sysimage by typing.

```
cd /mnt/sysimage
```

(f) Delete /mnt/sysimage/lib by typing:

```
rm -rf ./lib
```

(g) Rename /mnt/sysimage/libcopy to /mnt/sysimage/lib by typing:

```
mv ./libcopy ./lib
```

16. Inspect /mnt/sysimage/etc/fstab and verify that there are valid statements for each filesystem to be mounted on the new system.

17. Exit out the shell.

The system will reboot itself. Eject the CD and boot normally.

18. Confirm correct client operation.

# Sun Solaris System Recovery

This procedure describes how to completely restore a Sun Solaris client system back to the original system state.

## Prerequisites

A complete Avamar backup of the local filesystems exists on the Avamar server.

The destination disk for the restore is connected to the Solaris system and a mountable root partition filesystem has been created.

The old /var and /opt filesystems exist and can be mounted. If /var or /opt are not already available, use the CDROM to install a minimal version of Solaris on the disk.

## Procedure

1. Boot from CDROM by typing:  
`reboot -- cdrom`
2. Proceed through the various prompts; provide hostname, IP address, default gateway and DNS server when prompted.
3. At the Solaris Web Start will assist you in installing software for Solaris (! to quit) prompt, press ! to go to a shell prompt.
4. Do one of the following:

IF	DO THIS
Restoring a Solaris 8 system.	Skip this step and go directly to step 5.
Restoring a Solaris 10 system.	After entering your DNS entries, select either option 3 <b>Solaris Interactive Text (Desktop session)</b> or option 4 <b>Solaris Interactive Text (Console session)</b> . Press <b>F5</b> to exit. When prompted, press <b>F2</b> to confirm exit and return to a shell prompt.

5. Mount the old / partition under /a by typing:  
`mount /dev/dsk/c1t0d0s0 /a`  
Use the correct site-specific disk partition and mount parameters for the root volume.  
This will be the target of the restore.
6. Mount the old /opt partition under /opt by typing:  
`mount /dev/dsk/c1t0d0s5 /opt`  
Use the correct site-specific disk partition and mount parameters for the /opt volume.

7. Mount the old /var partition should be mounted under /var by typing:

```
mount /dev/dsk/c1t0d0s4 /var
```

Use the correct site-specific disk partition and mount parameters for the /var volume.

This is so that pkgadd and pkgm will not quit with errors such as nonexistent admin file or bad device (/var/sadm/pkg) specified.

8. If Avamar client software exists in /opt/AVMRclnt, you must install it.

Refer to your *Avamar Backup Clients User Guide* for specific instructions about how to install the Avamar Solaris Client.

---

**NOTE:** The installation program will display a warning about root (/) having 0 free bytes, as well as errors related to read-only filesystems when trying to create /etc/init.d/ava-gent and various links in /usr/bin and /etc/rc.d/rcX.d. However, despite these warnings, all the binaries are correctly installed in /opt/AVMRclnt/bin.

---

The root filesystem cannot be restored directly to /a, because there is currently no option that will restrict the restore operation to only the local partition without traversing network mount points. A restore done directly to /a might copy files from all the partitions and /a could fill up before all required files were restored.

9. Restore /etc to /a/etc by typing:

```
mkdir /a/etc; cd /a/etc
```

```
/opt/AVMRclnt/bin/avtar -x --server=dpn61 --id=root  
--password=*** --account=/clients/soldev1 --target=. /etc
```

10. Inspect /a/etc/vfstab to verify the original mount points for the local filesystem; eliminate these mount points from the list of directories that will be restored.

11. Run Avamar Administrator and connect to the Avamar server; browse the backup of the Solaris server to see the directories and files that originally existed under /.

For each directory that originally existed under / and needs to be restored, create the directory (if needed) under /a, then cd into that directory and restore its contents from the backup. Example for /dev:

```
mkdir /a/dev; cd /a/dev
```

```
/opt/AVMRclnt/bin/avtar -x --server=dpn61 --id=root  
--password=*** --account=/clients/soldev1 --restoresystem  
--target=. /dev
```

Use correct values for the **--server**, **--password** and **--account** options in order to log into the server.

The **--overwrite=always** option forces existing files to be overwritten and the **--restoresystem** option causes system files, such as devices and named-pipes, to be restored.

12. Reboot the system normally and confirm correct operation.



# AVAMAR SYSTEM MIGRATION

---

This chapter discusses how to use replication to completely migrate all data residing on a source Avamar server to a new destination server, as well as how to migrate backup clients to the new (destination) server.

## Important Terms and Concepts

**System Migration.** System migrations are planned operations that permanently move (migrate) all backup clients and all backup data from one system to another. This is accomplished by performing a full “root-to-root” replication of all data residing on a source Avamar server to a new destination server. Full “root-to-root” replications preserve the domain structure, policy objects (for example, datasets, schedules, retention policies), as well as backup activity and system event databases.

**Global Client IDs.** In order to facilitate seamless client migration from one Avamar server to another, Avamar 3.5.0 and later servers implement a feature called a global client ID (global CID). Global CIDs are completely unique Avamar backup client identifiers across all Avamar servers.

On Avamar 3.5.0 through 3.6 systems, global CIDs are an optional feature that is only enabled if `--failover` is supplied on the `replicate` command line. On Avamar 3.7 and later systems, global CIDs are the default.

While it is possible to perform server migrations on pre-3.5.0 servers, the procedure is more involved because all clients must reregister with the destination server.

During system migrations, if global client IDs (global CIDs) are used at your site and if the destination server can assume the same DNS name or IP address as the original source server, clients that formerly backed up to the source server can continue to operate transparently without reregistering with the new destination server.

**Client Migrations.** Client migrations are typically un-planned operations, usually performed when a source server experiences a serious problem that compromises its operational effectiveness. A client migration simply forces a reregistration and activation of any source server backup client with a new (destination) server. This will allow them to continue protecting their data.

Furthermore, if regular normal replications had been occurring between the source and destination servers, old backups will be present in the special REPLICATE domain.

However, it must be understood, that as far as the Avamar server is concerned, there is no correlation whatsoever between a client account within the REPLICATE domain and any new account that might be created as the result of registering and activating with the new (destination) server.

## Capabilities and Limitations

---

**IMPORTANT:** If you successfully replicate data from a source Avamar server to a destination server and you subsequently roll the destination server back to a point in time before that replication, all replicated data will be permanently lost.

Therefore, EMC Corporation strongly recommends that, immediately following any successful replication, you create (page 352) and validate (page 353) a destination server checkpoint so that you will have a reliable server rollback point that includes all replicated data.

---

**Source and Destination Servers Should Be Comparable Sizes.** For best results, the destination Avamar server should be the same size or larger than the source server.

**Server Software Compatibility.** When migrating systems, you must migrate the source server to the same or later Avamar software version.

---

**IMPORTANT:** Do not migrate a source server to an older destination server because this might cause an unexpected loss of data due to server software incompatibilities.

---

Migrating a source server to the same or later Avamar software version also ensures that backup clients will function properly due to backward compatibility.

**If Possible, Register Backup Clients Via Avamar Server DNS Name, Not IP Address.** The typical practice at most sites is for all Avamar backup clients to register with the Avamar server by resolving a DNS name to the server IP address. This is usually done to simplify the registration process so that backup users do not have to know an actual IP address in order to register their clients.

However, the practice of allowing client communication with an Avamar server by resolving the server DNS name provides an additional benefit: should it ever become necessary to migrate data on that source server to a new destination server, you simply have to take the old source server off the network, change the new destination server DNS name to the old source server DNS name and backup clients will be able to seamlessly transition to the new destination server. Otherwise, if backup clients communicate with the Avamar server by way of an IP address, clients must manually reregister with the new destination server once it is deployed on the network.

# Migrating Avamar Servers

This procedure describes how to migrate an Avamar source server to a new destination server.

This procedure supports any version source server as long as the following functional differences are understood:

If migrating an Avamar 3.7 or later source server, global CIDs are enabled by default. Once the new destination server is online and has assumed the DNS name or IP address of the source server, clients that were formerly registered with the source server will be able to communicate with the new destination server.

If migrating an Avamar 3.5.0 through 3.6 source server, you should include the `--failover` option on your `replicate` command line. If you do not, you must manually migrate your backup clients to the new server (page 400).

If migrating an Avamar 3.0.1 or older system, global CIDs are not available. Therefore, you must manually migrate your backup clients to the new server (page 400).

This procedure assumes the following conditions:

- Both source and destination servers are fully operational and will be online at the beginning of the server migration operation
- All source server clients were registered using the server hostname (not the source server IP address)
- Source and destination servers have different hostnames at the beginning of the operation; the destination server hostname will be changed to match the source server near the end of the operation

## Replicate Source Server

User=admin

1. Open a command shell (page 477) on the source server.
2. Do one of the following:

IF	DO THIS
Source server is a single-node server.	Log into the server as user admin.
Source server is a multi-node server.	Log into the utility node as user admin.

3. Load the admin OpenSSH key by typing:

```
ssh-agent bash
```

```
ssh-add ~admin/.ssh/admin_key
```

You are prompted to type a passphrase.

4. Type the admin user account passphrase and press **ENTER**.

Flush Source MCS

5. On the source server, flush the MCS by typing:

```
mcsserver.sh --flush
```

This ensures that all cached MCS data (for example, account information, logs and so forth) is saved to the MCS database.

Initiate Full "Root-To-Root" Replication

6. On the source server, initiate a full "root-to-root" replication to the destination server by doing one of the following:

IF	DO THIS
Your server is running Avamar 3.7 or later software	Type: <pre><b>replicate --dstaddr=DST --dstid=root --dstpassword=DST-ROOT-PASSWORD --id=root --ap=SRC-ROOT-PASSWORD --fullcopy</b></pre>
Your server is running Avamar 3.5.0 through 3.6 software	Type: <pre><b>replicate --dstaddr=DST --dstid=root --dstpassword=DST-ROOT-PASSWORD --id=root --ap=SRC-ROOT-PASSWORD --fullcopy --failover</b></pre>
Your server is running Avamar 3.0.1 or older software	Type: <pre><b>replicate --dstaddr=DST --dstid=root --dstpassword=DST-ROOT-PASSWORD --id=root --ap=SRC-ROOT-PASSWORD --fullcopy</b></pre>

Where SRC-ROOT-PASSWORD and DST-ROOT-PASSWORD are the source and destination Avamar root passwords, respectively.

---

**NOTE:** The only difference between the two previous commands is supplying the **--failover** option on Avamar 3.5.0 through 3.6 servers in order to force use of optional global CIDs.

---

7. Wait for this replication operation to complete before proceeding any further.

8. Perform a full system shutdown of the source server (page 287).

### Restore Data on Destination Server

User=admin

1. Open a command shell (page 477) on the destination server.

2. Do one of the following:

IF	DO THIS
Destination server is a single-node server.	Log into the server as user admin.
Destination server is a multi-node server.	Log into the utility node as user admin.

Stop Destination  
MCS

3. Load the admin OpenSSH key by typing:

```
ssh-agent bash
ssh-add ~admin/.ssh/admin_key
```

You are prompted to type a passphrase.

4. Type the admin user account passphrase and press **ENTER**.
5. On the destination server, stop the MCS by typing:

```
dpnctl stop mcs
```

The following information appears in your command shell:

```
Do you want to proceed with the stop Y/N? [Y]: y
```

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

The following information appears in your command shell:

```
MCS shutdown initiated.
Stopping MCS...
MCS stopped.
Stopping the database server.
Database server stopped.
```

Perform New-  
System Restore

7. On the destination server, perform a new-system restore by typing:

```
mcservers.sh --restore --restoretype=new-system
```

The following information appears in your command shell:

```
=== BEGIN === check.mcs (prerestore)
check.mcs passed
=== PASS === check.mcs PASSED OVERALL (preavsetup)
--restore will modify your MCS database and preferences.
Do you want to proceed with the restore Y/N? [Y]:
```

8. Type **y** and press **ENTER**.

The following appears in the command shell:

```
Database server stopped.
removing data dir /usr/local/avamar/var/mc/server_data
creating /usr/local/avamar/var/mc/server_data with permissions 0755
creating /usr/local/avamar/var/mc/server_data/prefs with permissions 0755
creating /usr/local/avamar/var/mc/server_data/postgres with permissions 0700
creating /usr/local/avamar/var/mc/server_data/postgres/data with permissions
0755
Enter the Avamar Server IP address or fully-qualified domain name to restore
from (i.e. dpn.your_company.com):
```

9. Type your fully qualified Avamar destination server name or IP address and press **ENTER**.

avamar-2.example.com is used as an example fully qualified Avamar destination server name for the remainder of this procedure.

10. Press **ENTER**.

The following appears in the command shell:

```
Enter the Avamar Server IP port to restore from [27000]:
```

11. Press **ENTER** to accept the default port.

The following appears in the command shell:

```
Using port '27000'.
Enter password for MCUser:
```

12. Type the password for the MCUser administrative user account and press **ENTER**.

The following appears in the command shell:

```
Select the Avamar server IP address or fully-qualified hostname to be used by
backup clients:
```

- ```
1) DESTINATION_SERVER.avamar.com
2) SOURCE_SERVER.avamar.com
3) Enter another address
```

```
Enter your selection(1-3):
```

13. Type **1** and press **ENTER**.

The following appears in the command shell:

```
Enter the Avamar server accounting system root user password for Avamar server:
```

14. Type your Avamar server software root user password and press **ENTER**.

The following appears in the command shell:

```
Performing restore administrative tasks...
Restore administrative tasks complete.
```

Start Destination  
MCS

15. On the destination server, start the MCS by typing:

```
dpnctl start mcs
```

## Update DNS

Update your DNS server to redirect the original source hostname to the new destination server IP address.

All data replicated from the source server has been moved and restored to the new destination server.

If the new destination server is running Avamar 3.5 or later software, all clients that were formerly registered with the source server now communicate with the new destination server.

If the new destination server running Avamar 3.0.1 or older software, you must manually migrate your backup clients to the new server (page 400).

## Manually Migrating Backup Clients to a New Server

When a source server experiences a serious problem that compromises its operational effectiveness, you can force a registration and activation of any source server backup clients with new (destination) server. This will allow them to continue protecting their data.

Furthermore, if regular normal replications had been occurring between the source and destination servers, old backups will be present in the special REPLICATE domain.

However, it must be understood, that as far as the Avamar server is concerned, there is no correlation whatsoever between a client account within the REPLICATE domain and any new account that might be created as the result of registering and activating with the new (destination) server.

### Migrating Pageable Clients

A client is “pageable” when it is persistently connected to the same network as the Avamar server. A pageable client can be registered and activated using any other methods described earlier in this publication. Refer to *Domains, Clients and Users* (page 33) for additional information.

### Migrating Non-Pageable Clients

A client is considered “non-pageable” when it is disconnected the same network as the Avamar server or using Network Address Translation (NAT).

If you want to migrate a non-pageable client to the new server, perform the following while it is disconnected from the network:

1. Erase the contents of the client CID.bin file.
2. Edit avagent.cfg to change `mcsaddr=SOURCE-SERVER` to `mcsaddr=DESTINATION-SERVER`.
3. Restart the Avamar client and agent applications to initiate registration with the new destination server.



# 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.

## Workflow Overview

The flow of tasks for using Avamar Activation Manager can be separated into two divisions:

- *Preparing to use Avamar Activation Manager* (page 402)
- *Using Avamar Activation Manager* (page 402)

### Preparing to use Avamar Activation Manager

Complete the following tasks before using Avamar Activation Manager:

- Meet the environment requirements listed in *Environment* (page 403).
- Configure Avamar Activation Manager to use your company's directory service as described in *Configure Kerberos Realms Information* (page 407). This step is not required if you plan to import a list of clients as described in *Import Client List* (page 415).
- Add all Avamar servers that you will use with Avamar Activation Manager to the Avamar Enterprise Manager database. This process is described in *Configure* (page 315).
- Determine the Avamar domains you will use and decide which clients will be assigned to each domain.
- Decide on the groups you will need in each of your Avamar domains, and create them. This process is described in *Groups and Group Policies* (page 128). Groups can also be created as you need them as described in *Creating New Groups* (page 437).
- Install the Avamar client software on the client computers. *Remote Push Install of the Client Software* (page 408) provides information about this task.

### Using Avamar Activation Manager

The workflow for using Avamar Activation Manager to register and activate Avamar client on your enterprise's computers is:

- Familiarize yourself with the Avamar Activation Manager UI using the description in *The Avamar Activation Manager UI* (page 418).
- Select a client data source using the steps in *Client Data Source* (page 413).
- Activate clients following the procedures in *Activating Clients* (page 424).

Other tasks you can perform using Avamar Activation Manager:

- Create new groups of clients using the techniques described in *Creating New Groups* (page 437).
- Move clients between Avamar servers using the procedure in *Moving Clients to a Different Avamar server* (page 439).
- Check Avamar Activation Manager activity status by reviewing the log, as described in *Avamar Activation Manager Log* (page 443).

## Environment

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. |

### Directory Service Domain

Directory service domains that meet the following requirements are supported by this solution:

| CATEGORY          | REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Directory Service | <p>LDAP-compliant services, such as: Microsoft's Active Directory.</p> <p><b>NOTE:</b> A directory service is only required when using Avamar Activation Manager without an imported client list.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Naming Scheme     | <p>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.</p> <p>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.</p> <p><b>NOTE:</b> 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.</p> |

| CATEGORY           | REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Systems Management | <ul style="list-style-type: none"> <li>Microsoft System Center Configuration Manager</li> <li>IBM Tivoli Management Framework</li> <li>HP OpenView ServiceCenter</li> </ul> <p><b>NOTE:</b> 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.</p> |

## Avamar System

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

| CATEGORY                  | REQUIREMENT                                               |
|---------------------------|-----------------------------------------------------------|
| Avamar servers            | Must be listed in the Avamar Enterprise Manager database. |
| Avamar server software    | Version 5.0                                               |
| Avamar Enterprise Manager | Version 5.0                                               |
| Avamar client             | Version 5.0 and later                                     |
| Avamar Desktop/Laptop     | Version 5.0.105                                           |

## 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                                                                                                                                                                                                                                                                                                                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OS                   | Windows.                                                                                                                                                                                                                                                                                                                    |
| Web Browser          | <ul style="list-style-type: none"> <li>• Windows Internet Explorer versions 7.x.x and 8.x.x</li> <li>• Mozilla Firefox 3.x.x</li> </ul> <p><b>NOTE:</b> To avoid long-running JavaScript warnings following the instructions specific to your browser in <i>Preventing Long-Running JavaScript Warnings</i> (page 406).</p> |
| Adobe Acrobat Reader | 7.0 or later. Available from <a href="http://www.adobe.com">www.adobe.com</a> .<br>Optional. Required in order to view documentation.                                                                                                                                                                                       |

## 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\Internet Explorer\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.

## Configure Kerberos Realms Information

Before using Query Directory Service, configure Avamar Activation Manager with the Kerberos realms of your organization. This permits Avamar Activation Manager to work with your organization's directory service. To configure Kerberos realm information for your organization, complete the steps described for configuring the Avamar Desktop/Laptop server in *Configure Kerberos Realms Information* (page 456).

---

**NOTE:** Avamar Activation Manager and Avamar Desktop/Laptop use the same LDAP configuration information.

---

The values set in `ldap.properties` during this configuration process are used on the Query Directory Service screen in the User Domain and Directory Domain field list boxes, as described in *Query Directory Service* (page 413).

## Remote Push Install of the Client Software

This section 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 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 *Activating Clients* (page 424).

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 the following sections.

Examples of other Systems management tools that might work to install the Avamar client 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.



## Push Install on Windows Computers

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

To push install Avamar client on supported Windows computers:

1. Copy the Avamar client for Windows installer package to a location that is accessible to your Systems management tool.
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, selecting the appropriate command from the choices in *Installer Package Commands for Windows Computers* (page 409).
5. Launch the Systems management tool's installation process.

### Installer Package Commands for Windows Computers

The installer package accepts the following commands, 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:

- `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.
- `msiexec /qn /I "path_to_MSI_pkg" UICOMPONENT=0`  
This command enables Avamar as an agent process with no user interface.

## Push Install on Mac Computers

The Avamar client software can be push installed on supported Mac computers. The installation process requires the file `dtlt.xml` only when the Avamar Desktop/Laptop features are being installed.

### 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 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.
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 `dtlt.xml` to each computer. The copy location of these files is the value of the `path_to_install_package` variable described in step 5.

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  
"path_to_MSI_pkg" -target install_location
```

---

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

---

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 and `install_location` is where you want the software installed.

Normally, `install_location` is the root (`/`) but any local volume is allowed.

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

## Avamar Client without Avamar Desktop/Laptop

In general, to 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.
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 copy location of this file is the value of the *path\_to\_MSI\_pkg* variable described 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_MSI_pkg" -target  
install_location
```

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 and *install\_location* is where you want the software installed. Normally, *install\_location* is the root (/) but any local volume is allowed.

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 **EMC Avamar 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.

## Starting Avamar Activation Manager

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

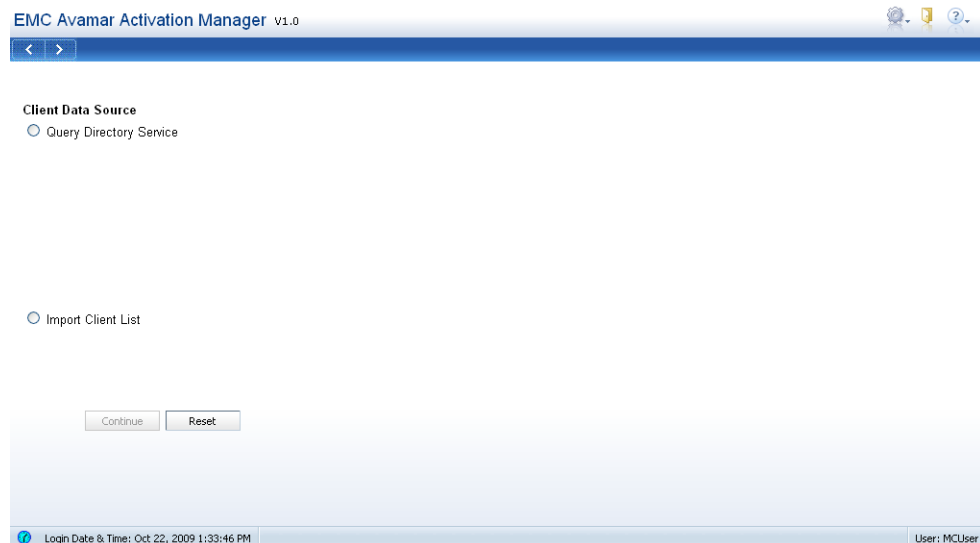


The Client Data Source screen appears. *Client Data Source* (page 413) describes this screen in detail.

## 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* (page 413)
- *Import Client List* (page 415)



## Query Directory Service

When you use **Query Directory Service**, your enterprise's directory service is queried to obtain information about clients and, if available, directory service organizational units, such as domains, sub-domains, and groups.

**IMPORTANT:** Before using Query Directory Service, complete the steps in *Configure Kerberos Realms Information* (page 407).

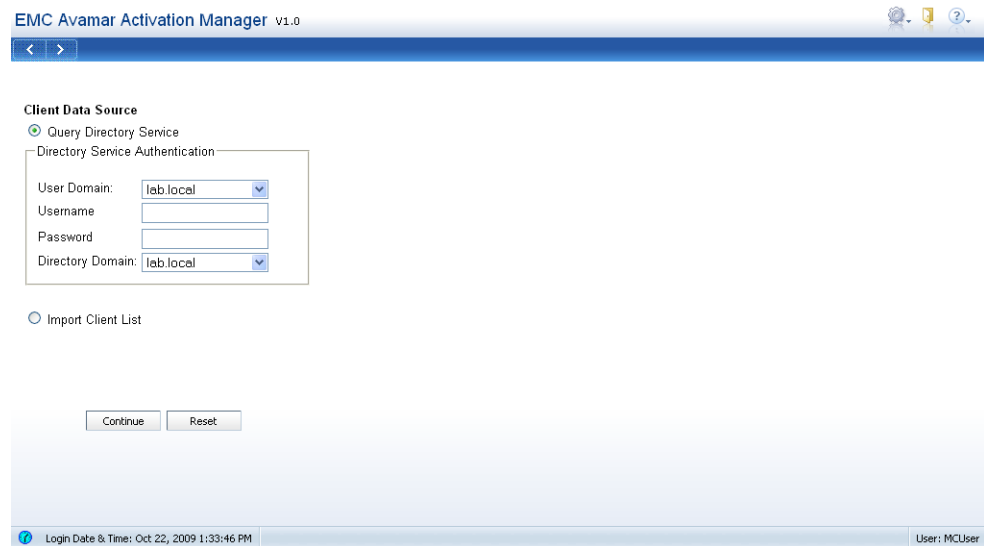
To use Query Directory Service:

1. Start Avamar Activation Manager.

This is described in *Starting Avamar Activation Manager* (page 413).

2. On the Client Data Source screen, select **Query Directory Service**.

The Directory Service Authentication section appears.



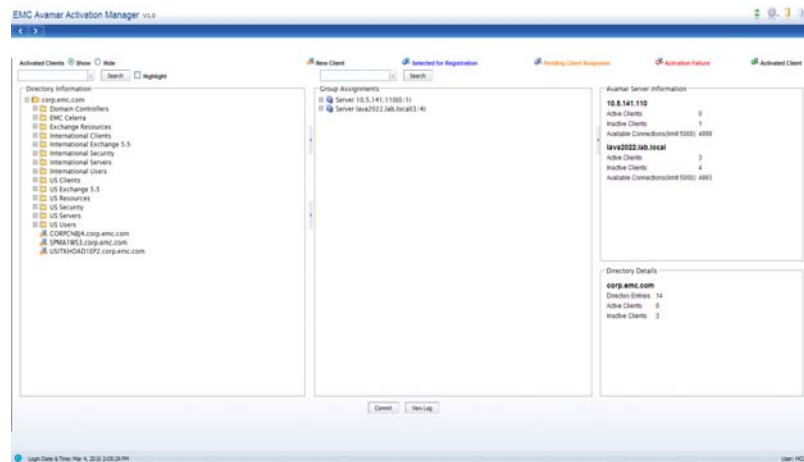
The Directory Service Authentication section has four fields.

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.

3. In **User Domain**, select the Kerberos realm to use for authentication of your user account information.
4. In **Username**, type the username for the account to use to query the directory service.

5. In **Password**, type the password for the account.
6. In **Directory Domain**, select the Kerberos realm to query for client and organizational unit information.
7. 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 at least one and at most 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)

**NOTE:** Use UTF-8 encoding when importing a client list file that includes non-ASCII characters in the names of organizational units. This ensures correct display of those elements in the Avamar Activation Manager UI.

The client list file method is particularly useful when you combine it with output from a Systems management tool's installation of the Avamar client 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 will already have the Avamar client software installed.

The second value, the directory service logical group name, 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.

In the following example numbers have been added to the previous client list for reference purposes.

```
1 Hostname,Group
2 User1-desktop.Acme.corp.com,acme.corp/USA/MA
3 User1-laptop.Acme.corp.com,acme.corp/USA/CA/SFO
4 User2-desktop.Acme.corp.com,acme.corp/Engineering
5 User3-desktop.Acme.corp.com,
6 User4-desktop.Acme.corp.com,
```

Line 1 lists the header names for each value. The first header value is "Hostname", the second is "Group". The values are separated by a comma. Line 1 can be left blank, but to make the file more accessible to others it is recommended that the headers be provided as shown.

---

**IMPORTANT:** Line 1 must contain the header names as shown, or a blank line; otherwise import will fail with the following message: "Invalid file or invalid format".

---

Line 2 contains the hostname "User1-desktop.Acme.corp.com", the separating comma, and the group "acme.corp/USA/MA".

Line 3 contains the hostname "User1-laptop.Acme.corp.com", the separating comma, and the group "acme.corp/USA/CA/SFO".

Line 4 contains the hostname "User2-desktop.Acme.corp.com", the separating comma, and the group "acme.corp/Engineering".

Line 5 and 6 contain only the hostnames "User3-desktop.Acme.corp.com" and "User4-desktop.Acme.corp.com", each followed by a comma. The comma is required, even when a group is not listed. Since a group is not listed, both hostnames will be displayed at the root level of the hierarchical display.



**NOTE:** If you use spreadsheet software such as Microsoft Excel to create or edit the client list, do not add a comma to the end of the first cell or the beginning of the second cell to create comma separated values. Adding a comma is not necessary because when you save the client list as a CSV file-type, the software adds the comma separators as part of the file conversion process. To double-check that the client list is correctly formatted, open it in a plain text editor.

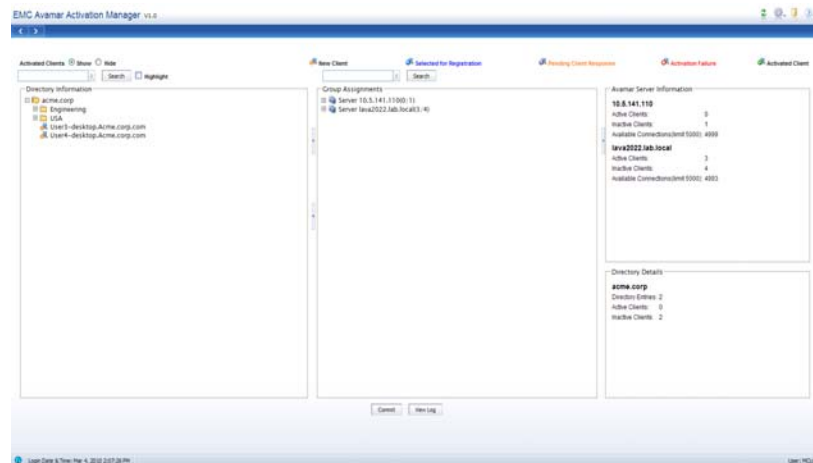
To use a client list file as the data source:

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

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.

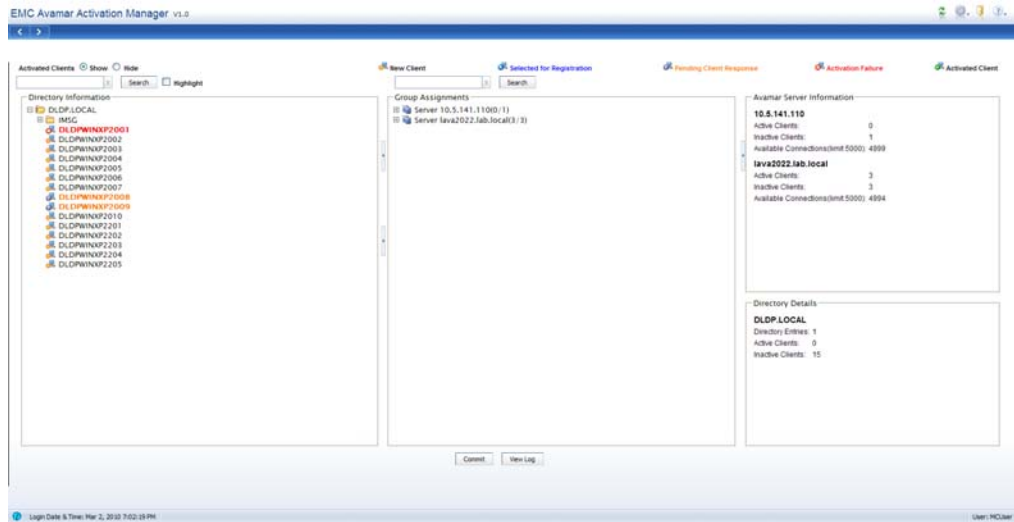


The UI pictured shows the result of importing the client list from the previous example.

## The Avamar Activation Manager UI

The elements of the Avamar Activation Manager UI are described in:






- *Directory Information* (page 419)
- *Group Assignments* (page 420)
- *Avamar Server Information* (page 421)
- *Directory Details* (page 421)
- *Controls* (page 422)
- *Session Timeout* (page 423)



## Directory Information

The Directory Information section uses a familiar hierarchical tree view to display clients within their directory service groups.

A folder icon represents each level of the directory hierarchy and 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 selected for registration
-  Invited client that has not responded
-  Client that is fully registered and activated
-  Client that failed activation

---

**NOTE:** Clients in the Default Proxy Group are not displayed in Avamar Activation Manager.

---

**Directory Information Search.** The Directory Information section has an integrated search tool. Located above the Directory Information section, this tool can be used to search the Directory Information section for a computer with a specific name or several computers with similar names.

*Searching for Clients to Activate* (page 425) describes how to use Directory Information search.

## 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.








---

**NOTE:** The Group Assignments section does not display the following Avamar domains: MC\_DELETE, MC\_RETIRED, and REPLICATE.

---

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 selected for registration
-  Invited client that has not responded
-  Client that is fully registered and activated
-  Client that failed activation

The Group Assignments section has an integrated search tool. Located above the Group Assignments section, this tool can be used to search the Group Assignments section for a computer with a specific name or several computers with similar names.

*Finding Clients* (page 433) describes how to use Group Assignments search.

## Avamar Server Information

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

FIELD	DESCRIPTION
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 5000 client limit.



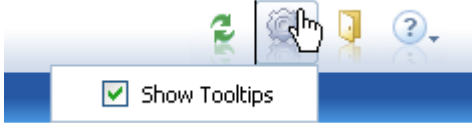
## Directory Details

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

FIELD	DESCRIPTION
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.

CONTROL	FUNCTION
Activated Clients	<p>Located at the top of the window, Activated Clients provides a toggle for showing or hiding clients that have successfully been activated.</p> <p>Select <b>Show</b> (the default) to display fully activated clients in the Directory Information and Group Assignments sections; select <b>Hide</b> to hide them.</p>
Commit button	<p>Click <b>Commit</b> to do the following:</p> <ul style="list-style-type: none"> <li>• Push registration information to the Avamar server based on the current state of the Group Assignments section.</li> <li>• Generate and send a client ID to each client shown in the Registered state in that section.</li> </ul>
View Log button	<p>Click <b>View Log</b> to display the Avamar Activation Manager log.</p>
Refresh button	<p>To refresh the view, click </p>
Configuration button	<p>To view the configuration menu, click </p> <p>The menu choices are:</p> <ul style="list-style-type: none"> <li>• Show Tooltips</li> <li>• Open Process Viewer</li> </ul>
Show Tooltips	<p>Select <b>Show Tooltips</b> to view Tooltips, clear the checkbox to hide them.</p> 
Open Process Viewer	<p>Click Open Process Viewer to display the Process Viewer. Refer to <i>Process Viewer</i> (page 441) for more information.</p>

## 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* (page 413).

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 the following file for editing:

```
/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.

## Activating Clients

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

- *Searching for Clients to Activate* (page 425)
- *Using Directory Information Search* (page 429)
- *Register and Activate Clients* (page 431)
- *Removing Clients* (page 435)
- *Re-inviting Clients* (page 436)

---

**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.

---

## Understanding Client Activation

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.

Avamar Activation Manager improves on each of these methods by providing a user interface that simplifies the registration (and activation) of large numbers of clients.



## 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.

Avamar Activation Manager improves on both of these methods by providing a user interface that simplifies the activation of large numbers of clients.

## Searching for Clients to Activate

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.

The search string is compared to the local hostname of each computer; not the fully qualified domain name.

For example, the search string "\*abc\*" would match the computer "abc123.dfg.example.com". However, it would not match the computer dfg456.abc.example.com because its local name, "dfg456", is not matched by the search string.

### Search String

The search string is one or more characters that you type into the search field. You can also use an asterisk (\*) as a wildcard in the search string. The asterisk (\*) represents zero or more characters.

The search string you create 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

CHARACTER	NAME	UNICODE
>	Greater-than Sign	003E
\	Reverse Solidus	005C
,	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	Matches: <ul style="list-style-type: none"> <li>• 123abc-example</li> <li>• 123aBc-example</li> <li>• 123abC-example</li> </ul> Does not match: <ul style="list-style-type: none"> <li>• abcexample</li> <li>• labcode.example.com</li> <li>• Abc.corp.example.com</li> <li>• bca.example.com</li> <li>• ab_c.example.com</li> <li>• AB-C.example.com</li> </ul>
An asterisk represents any zero or more characters in a computer's name.	*ab*	Matches: <ul style="list-style-type: none"> <li>• abc.example</li> <li>• cabc.124.net</li> <li>• labcode.example.com</li> <li>• ab_c.example</li> <li>• cab</li> <li>• AB- C.corp.example.com</li> </ul> Does not match: <ul style="list-style-type: none"> <li>• bca.example</li> <li>• a_c.example.com</li> <li>• A-B123</li> </ul>
Special characters in a computer's name are not ignored.	*ab.c*	Matches: <ul style="list-style-type: none"> <li>• cab.com</li> <li>• 123ab.corp</li> <li>• terAB.c</li> </ul> Does not match: <ul style="list-style-type: none"> <li>• abc</li> <li>• ABC</li> <li>• abc.corp</li> </ul>

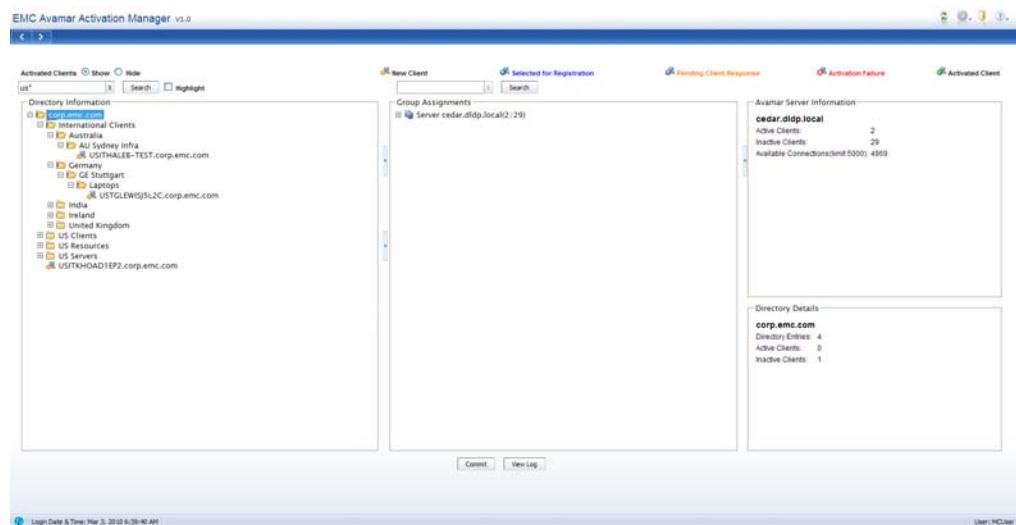
## Search Results Views

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.

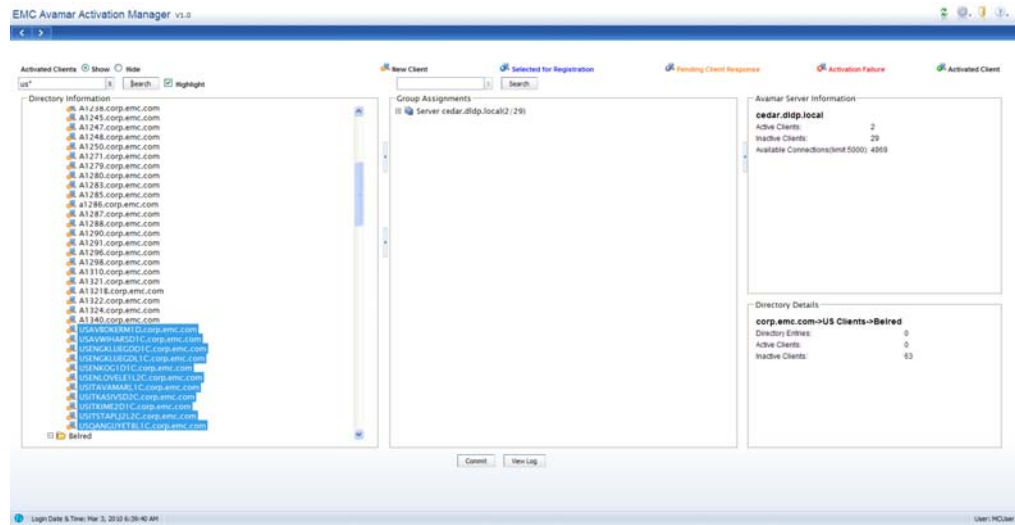
Computers that are not currently visible but are on a branch that was expanded and then collapsed during the current session are also searched.

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. 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* (page 413) and *Import Client List* (page 415), and click **Continue**.  
 The Avamar Activation Manager web browser UI appears.
4. Type your search string in the search field.
5. Clear **Highlight**.
6. Click **Search**.

7. From the search results select computers for activation:
  - (a) 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.
  - (b) 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.
8. In Group Assignments, select the checkbox next to each client you want to register and activate.
9. Click **Commit**.

*Register and Activate Clients* (page 431) describes the activation process in more detail.

### Search and Activate Using the Highlight View

To search and activate computers using the Highlight view:

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

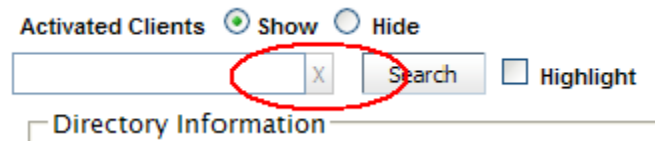
The Avamar Activation Manager Client Data Source screen appears.
3. Complete the steps to use one of the data sources as described in *Query Directory Service* (page 413) and *Import Client List* (page 415), and click **Continue**.

The Avamar Activation Manager web browser UI appears.
4. Expand all branches of the Directory Information tree that you want searched.
5. Type your search string in the search field.
6. Select **Highlight**.
7. Click **Search**.
8. From the search results select computers for activation:
  - (a) Activate all computers in the results by dragging any one of the selected computers to a group in Group Assignments.
  - (b) Browse the results, select one or more computers, and drag the selection to a group in Group Assignments.
9. In Group Assignments, select the checkbox next to each client you want to register and activate.
10. Click **Commit**.

*Register and Activate Clients* (page 431) 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.



## Register and Activate 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* (page 413) and *Import Client List* (page 415), 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* (page 429).

---

**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 name changes to green and its 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 .

## Activation Failure

The failure of a client to activate is indicated by changing the client's name to red and its icon to . These indicators appear during the session in which activation is attempted. The failure is also written to the log as described in *Avamar Activation Manager Log* (page 443).

If activation of a client fails, it is usually because the client is unavailable or because the Avamar client software is not properly installed. Review the log as described in *Avamar Activation Manager Log* (page 443) to determine the status of each client's activation invitation.

Activation invitations that fail when **Commit** is clicked are added to a queue and automatically tried again. *Queued Activation Invitations* (page 444) describes this mechanism.

## Clients Activated in Multiple Groups

Clients can be activated with more than one group on a server. This provides flexibility for the backup schedules and datasets assigned to the computer.

Clients that are activated in more than one group appear in each group branch in the Group Assignments section. In the Avamar Server Information section the number of Active Clients counts an activated computer one time, even if it is activated in multiple groups.



## Finding Clients

Occasionally you will want to find one or more clients listed in Group Assignments. You may want to complete the activation of a client, or remove it from Group Assignments before it is activated. Or you might want to move clients as described in *Moving Clients to a Different Avamar server* (page 439). To quickly find clients in Group Assignments use the search tool.

The search tool results appear in Group Assignments. Only computers that match your search term are shown with their associated hierarchy. Computers and hierarchical elements that do not match your search are hidden.

While your search term is active, you can drag and drop from Directory Information to Group Assignments. Computers that match the active search term are display, all others are hidden. To return to the full Group Assignments view, click **X** next to the search field. This clears the active search term.

To find clients in Group Assignments:

1. Log in to Avamar Enterprise Manager using an Avamar administrator account.

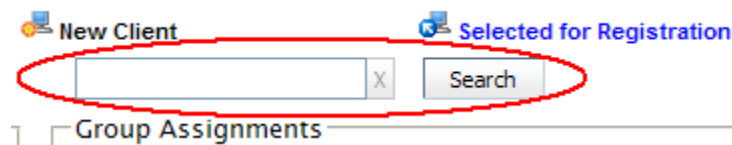
2. Click **Activation Manager**.

The Avamar Activation Manager Datasource Selection screen appears.

3. Complete the steps for one of the data sources as described in *Query Directory Service* (page 413) and *Import Client List* (page 415), and click **Continue**.

The Avamar Activation Manager web browser UI appears.

4. Enter a search string in the search field above Group Assignments.



The search string cannot contain any special characters, except the asterisk. Other search string rules are described in the following table.

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"> <li>123abc-example</li> <li>123aBc-example</li> <li>123abC-example</li> </ul> <p>Does not match:</p> <ul style="list-style-type: none"> <li>abcexample</li> <li>labcode.example.com</li> <li>Abc.corp.example.com</li> <li>bca.example.com</li> <li>ab_c.example.com</li> <li>AB-C.example.com</li> </ul>

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"> <li>• abc.example</li> <li>• cabc.124.net</li> <li>• labcode.example.com</li> <li>• ab_c.example</li> <li>• cab</li> <li>• AB-C.corp.example.com</li> </ul> Does not match: <ul style="list-style-type: none"> <li>• bca.example</li> <li>• a_c.example.com</li> <li>• A-B123</li> </ul>

5. Click **Search**.

Matching computers, and their associated hierarchical elements appear. Computers and hierarchical elements that do not match your search are hidden.

To return to the full Group Assignments view, click **X** next to the search field. This clears the active search term.

## Client Selected for Activation with Multiple Servers

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. 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* (page 413) and *Import Client List* (page 415), and click **Continue**.

The Avamar Activation Manager web browser UI appears.


4. Find the client in Group Assignments.

The client's icon will be . *Finding Clients* (page 433) describes how to search for a client.

5. Select the checkbox next to the client.

6. Repeat this for each client you want to remove.

7. 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 activation to fail, you can re-invite the client. Activation failures are also queued to be automatically attempted as described in *Queued Activation Invitations* (page 444).

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* (page 413) and *Import Client List* (page 415), and click **Continue**.


The Avamar Activation Manager web browser UI appears.

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

5. Click **Commit**.

A unique client ID is pushed to each 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 .

## Creating New Groups

New groups can be created, configured, and enabled as needed from within Avamar Activation Manager. You can populate the new group with clients as you create it or create the new group and add clients later.

There are two methods for creating a new group:

- Drag and drop
- Right-click

### Creating a New Group using Drag and Drop

To create a new group using drag and drop:

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* (page 413) and *Import Client List* (page 415), and click **Continue**.  
The Avamar Activation Manager web browser UI appears.
4. Select an organizational unit in Directory Information.  
Do not select any clients or other organizational units.
5. Drag the organizational unit to Group Assignments and drop it on an Avamar server, domain, or sub-domain.  
The Create Group dialog opens. The name of the organizational unit is listed as the new group's name.
6. In **Group Name**, accept the new group name or change it.
7. Select **Enabled** to enable the group as it is created or clear it to enable the group at a later time.
8. In **Dataset**, select the dataset to assign to the new group.  
The list contains the datasets configured for the selected domain.
9. In **Retention Policy**, select the retention policy to assign to the new group.  
The list contains the policies configured for the selected domain.
10. In **Schedule**, select the schedule to assign to the new group.  
The list contains the schedules configured for the selected domain.
11. Click **OK**.

The new group is created and all new clients within the organizational unit, and sub-units, are added to the group. Previously activated clients are not added to the new group.

## Creating a New Group using Right-Click

To create a new group using right-click:

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* (page 413) and *Import Client List* (page 415), and click **Continue**.  
The Avamar Activation Manager web browser UI appears.
4. In Group Assignments, select an Avamar server, domain, or sub-domain.
5. Right-click anywhere in Group Assignments.  
A menu appears, with Create New Group as a choice.
6. Select **Create New Group**.  
The Create Group dialog opens.
7. In **Group Name**, enter a name for the new group.
8. Select **Enabled** to enable the group as it is created or clear it to enable the group at a later time.
9. In **Dataset**, select the dataset to assign to the new group.  
The list contains the datasets configured for the selected domain.
10. In **Retention Policy**, select the retention policy to assign to the new group.  
The list contains the policies configured for the selected domain.
11. In **Schedule**, select the schedule to assign to the new group.  
The list contains the schedules configured for the selected domain.
12. Click **OK**.

The new group is created and is ready for you to add clients.

## Moving Clients to a Different Avamar server

Avamar Activation Manager provides the ability to move an activated client from one Avamar server to another. This is useful to help manage server load when new clients are added, and to help reduce network latency when an Avamar server or an Avamar client is moved to a new geographical location.

For the purposes of this topic, the source server is the Avamar server that the clients are activated on *before* moving and the target server is the Avamar server that the clients are activated on *after* moving.

The following choices are available for a client that is moved:

- Delete it from, or retire it on, the source server
- Replicate all, none, or the last of its backups to the target server

---

**IMPORTANT:** Each condition listed in *Preconditions for Moving Clients* (page 439) must be met before using Avamar Activation Manager to move clients from one Avamar server to another.

---

### Preconditions for Moving Clients

Before initiating a client move, ensure that each of the following conditions is true:

- Source and target servers are running the same Avamar software version.
- Source and target servers are in the Avamar Enterprise Manager database, as described in *Configure* (page 315).
- Source server can communicate with target server.
- Each client to be moved can communicate with the target server.
- Target server has sufficient storage available to accept the replicated backups of all clients being moved.
- Target server is not running any maintenance tasks.
- Client-side activations are enabled on the target server.
- Clients being moved are not already registered with the target server.
- Clients being moved do not have any active backup or restore tasks running.

## How to Move Activated Clients

To move a single activated client, or multiple activated clients on the same Avamar server, to a different Avamar server:

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* (page 413) and *Import Client List* (page 415), and click **Continue**.

The Avamar Activation Manager web browser UI appears.

4. In **Activated Clients**, select **Show**.

5. Select the checkbox next to each client you want to move.

The clients you select must be activated on the same source server. A client move task can only move clients activated on the same source server.

6. Select the source server.

7. Right-click the source server.

A context menu appears.

8. Select **Move Activated Clients**.

The Source clients screen of the Move Activated Clients wizard appears.

9. Click **Next**.

The Target domain screen appears.

10. Select the target domain and click **Next**.

The Target groups screen appears.

11. In **Replicate Existing Backups**, select **All**, **Last**, or **None**.

CHOICE	DESCRIPTION
All	For each selected client, replicate all existing backups onto the target server.
Last	For each selected client, replicate only the last backup onto the target server.
None	Do not replicate any backups onto the target server.

If **All** is selected, **Delete from source** appears; complete the next step. Otherwise, skip to step 13.

12. In **Delete from source**, select or clear the checkbox based on the following:

- Select **Delete from source** to delete each client from the source server after it is successfully moved to the target server.
- Clear **Delete from source** to retire each client on the source server when the move to the target server has succeeded.



13. Select one or more of the target groups.

Clients will be moved into each selected target group.

14. Click **OK**.

Background process message appears.

15. Click **OK**.

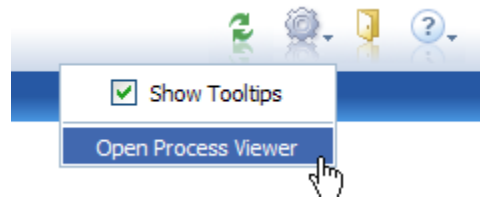
The move starts. The processes started by the move task run in the background.

To track the client move task processes, use Process Viewer, as described in *Process Viewer* (page 441). To determine the final status of the task, review the log, as described in *Avamar Activation Manager Log* (page 443).

## Process Viewer

Process Viewer displays the status of the active processes associated with your client move tasks.

To open Process Viewer, click , and click **Open Process Viewer**.



### Refreshing Process Viewer

Each time Process Viewer is opened it retrieves the most current information. To refresh Process Viewer while it is open, click **Refresh**.

### Clearing Process Viewer

To clear all entries from Process Viewer, except Active entries, click **Clear**.

### Process Viewer Information

Process Viewer provides the following columns of information for active processes.

COLUMN	DESCRIPTION
Description	The type of task that started the process
User	The login ID for the user that started the process

COLUMN	DESCRIPTION
Status	The current state of the process. Status is one of the following:  Active     The move task is in progress. Success    The entire move task succeeded. Partial     Not all selected clients were moved successfully. Failed      The entire move task failed. Queued     At least one of the client activations for the move task is in the retry queue.
Start Time	The date and time the process started
End Time	The date and time the process ended

## 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 activated and which require follow-up work in order to be sure that they are protected.

### Opening the Log

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

The log has a line-by-line record of each Avamar Activation Manager task.

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

COLUMN NAME	DESCRIPTION	SORT BEHAVIOR
Hostname	Hostname of the client involved in the task	Sorts in ascending and descending alphanumeric order.
Operation	Differentiates between two types of operations: <ul style="list-style-type: none"> <li>Registration/Activation</li> <li>Client Move</li> </ul>	Sorts in ascending and descending alphanumeric order.
Status	Displays the result of an Avamar Activation Manager task	Sorts in ascending and descending alphanumeric order.
Status Code	Displays numeric status codes	Sorts in ascending and descending numeric order.
Description	Displays a brief description of the task result	Sorts in ascending and descending alphanumeric order.
Time	Displays the task's start time relative to the Avamar server's time zone	Sorts as newest to oldest or oldest to newest.

Possible log messages and their descriptions are listed in *Log Messages* (page 447).

### Show and Hide Successful Activations

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

### Log Status Colors

To permit a quick visual status assessment, the log uses colors to indicate an entry's status.

STATUS	DESCRIPTION	COLOR
Pending	Initial activation invitation failed and the task is on the queue to be retried.	Dark orange

STATUS	DESCRIPTION	COLOR
Success	Activation or move task succeeded.	Green
Failure	Activation or move task failed. This includes invitations that did not succeed while on the queue and have reached the queue limit on attempts.	Red

## Queued Activation Invitations

An activation invitation that does not immediately succeed due to certain errors is added to a queue. The invitation is tried again every 2 hours until it succeeds or until the limit of 24 attempts is reached.

The following table lists the errors that will cause an initial activation invitation to be added to the queue.

STATUS CODE	DESCRIPTION
22271	Invitation failed — Client software could not be contacted.
22237	Activation failed — Client previously activated or cannot communicate with Avamar server.
22280	Client reconnect error — Hostname mismatch.
22282	Client reconnect error — Unknown ID.
22295	Client registration error — Server not available.

## Removing a Queued Invitation

An invitation is removed from the queue if a second invitation command issued through Avamar Activation Manager succeeds or if the client is removed from the pending activation state through Avamar Activation Manager.

## Log Descriptions for Queued Invitations

The possible log entries for queued invitations are described in the following table.

ENTRY FORMAT	DESCRIPTION
Activation at commit failed. Client scheduled for 24 retries. <i>description</i>	First entry after an activation invitation fails when <b>Commit</b> is clicked; where <i>description</i> is a message describing the cause of the failure.
( <i>n</i> /24) - Activation failed - <i>description</i>	Entry after <i>n</i> attempts fail; where <i>n</i> is an integer starting with 1 and increased by 1 after each attempt, and <i>description</i> is a message describing the cause of the failure.

ENTRY FORMAT	DESCRIPTION
Invitation failed. - <i>description</i>	Entry after 24 attempts fail; where <i>description</i> is a message describing the cause of the failure.

Refer to *Log Messages* (page 447), for more information about the messages that describe the cause of invitation failures.

## Refreshing the View

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

## Clearing the Log

To clear the log, click **Clear**.

The current log is written to a file and the log viewer is cleared. Avamar Activation Manager keeps the five most recent log files in the logs directory at:

`/usr/local/jakarta-tomcat-5.5.9/logs`

## Maximum Size of Log

The maximum size of the log is 100 KB. When the log reaches that size it is automatically written to a file in the logs directory and the log viewer is cleared.

## 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.  
 The text string cannot contain special characters, except an asterisk to represent one or more characters.
3. Click **Search**.

The search categories are described in the following table.

SEARCH CATEGORY	DESCRIPTION
Hostname	Hostname of the client involved in the task.
Operation	Type of task associated with the entry, either Registration/Activation or Move Client.
Status	Result of an Avamar Activation Manager task.
Status Code	Numeric event codes.
Description	Brief descriptions of event result.

SEARCH CATEGORY	DESCRIPTION
Time	The task's start time 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.

The exported data consists of all of the data in the current log view, as filtered by your most recent search. It includes the data visible on the current page and all data in any other pages of the current view.

To export and view the log immediately:

1. Perform a search to obtain the data you want to export.

*Searching the Log* (page 445) describes how to search the log. To export the entire log, use a single asterisk as the only character in the text field.

2. On the log window, click  .

A dialog box opens.

3. Select **Open**.
4. Select the application.

This should be an application that can open and display CSV files.

5. Click **OK**.

To export and save the log:

1. Perform a search to obtain the data you want to export.

*Searching the Log* (page 445) describes how to search the log. To export the entire log, use a single asterisk as the only character in the text field.

2. On the log window, click **Export**.

A dialog box opens.

3. Select **Save**.
4. Click **OK**.

A save dialog box opens.

5. Select a name and save location for the file.
6. Click **Save**.

## Printing the Current Log View


The log can be printed through any properly configured printer available to your local computer.

The data sent to the printer consists of all of the data in the current log view, as filtered by your most recent search. It includes the data visible on the current page and all data in any other pages of the current view.

To print the log:

1. Perform a search to obtain the data you want to export.

*Searching the Log* (page 445) describes how to search the log. To print the entire log, use a single asterisk as the only character in the text field.

2. On the log window, click  .

The Print dialog box opens.

3. Configure the print settings.
4. Click **OK**.

## Log Messages

The following table describes many of the log messages associated with Registration/Activation.

STATUS CODE	MESSAGE	DESCRIPTION
22236	Activation failed - Client does not exist.	The client was disconnected from the network or powered down before the invitations was sent.
22237	Activation succeeded - Client is registered and activated.	Successful activation of client.
22237	Activation failed - Client previously activated or cannot communicate with Avamar server.	Possible causes: <ul style="list-style-type: none"> <li>• The client software is already activated with another Avamar server</li> <li>• Client and server cannot communicate because client is off-line</li> <li>• Client's hostname cannot be resolved</li> </ul>
22263	Registration failed - Client registration error.	Either the Avamar server or MCS is not available.

STATUS CODE	MESSAGE	DESCRIPTION
22271	Invitation failed - Client software could not be contacted.	Possible causes: <ul style="list-style-type: none"> <li>• The hostname does not exist on the network</li> <li>• Avamar server cannot communicate with the invited computer</li> <li>• Avamar client software is not installed on the invited computer</li> </ul>
22295	Client registration error - Server not available.	The Avamar server is not available.
23006	Activation failed - Hostname is more than 63 characters.	The client hostname must be 63 characters or less in length.
23009	Activation failed - Hostname contains invalid characters.	The client hostname cannot contain special characters. Only the following characters are allowed: <ul style="list-style-type: none"> <li>• A-Z (Uppercase letters A through Z)</li> <li>• a-z (Lowercase letters a through z)</li> <li>• 0-9 (Integers 0 through 9)</li> <li>• . (Period)</li> <li>• _ (Low line)</li> <li>• - (Hyphen)</li> </ul>



The following table describes many of the log messages associated with Client Moves.

STATUS CODE	MESSAGE	DESCRIPTION
22236	Move failed - Client does not exist.	Possible causes: <ul style="list-style-type: none"> <li>• The hostname does not exist on the network</li> <li>• Avamar server cannot communicate with the invited computer</li> <li>• Client was externally deleted from the source server</li> </ul>
22240	Move/Client Delete failed - Failed to delete the client.	Client is active and cannot be deleted from the source server.
22241	Move/Remove client from Group failed – Client is not a member of this group.	Client not found in selected group.
22270	Move/Remove client from Group failed - Unable to remove a client from a group.	Client is active and cannot be deleted from a group on the source server.
22506	Move/Client Retire failed - Failed to retire client from source server.	Client is active and cannot be retired from the source server.
30002	Move failed - Client is already under move process.	Client is being moved by another process.
30003	Move failed - Client already exists on the target server.	Client could not be moved because a computer with the same name is registered with the target server.
30004	Move succeeded - Client successfully moved to target server.	The client move and the tasks associated with it were successfully completed.
30005	Move/Replication failed - Failed to replicate the Client data.	The client's data could not be replicated because of one of the following: <ul style="list-style-type: none"> <li>• Source server is down</li> <li>• MCS is down</li> </ul>

## AVAMAR DESKTOP/LAPTOP

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Avamar Desktop/Laptop is based on the Avamar client software. It adds enhanced features for an enterprise's desktop and laptop computers.

The Avamar Desktop/Laptop features are designed to enhance the functionality of Avamar client for Windows and Mac desktops and laptops.

These features include:

- Web browser UI  
Restore by search, restore by browse, manual backup, and activity history are all available through a convenient web browser user interface.
- Domain-oriented data security  
Users are authenticated through your enterprise's Active Directory or OpenLDAP-compliant directory service. Alternatively, you can configure Avamar server to authenticate users using Avamar authentication.
- User-initiated backups  
Users can manually initiate a backup from the client. These backups are limited to the datasets assigned to the client's groups and are prevented from running during server maintenance windows.
- User selectable backup schedules  
Optionally, a domain can be configured to allow users to select from a list of available backup schedules. This feature permits a user to configure automatic backups to run at the most convenient time.
- Restore of folders and files directly to the original location  
Users can restore folders and files to the original location. The same name can be used or, to avoid overwriting an existing file, a new name can be generated.
- Restore of files to an alternate location  
Users can restore files to an alternate location on their computer.
- Creation of a restore set by search or directory-tree browse  
Users can use search or can browse a backup directory-tree to create a set of folders and files to restore. Files can be restored to their original location or to a new location.

- Activity history  
 Users can view a 14 day history of the status of restore and backup tasks, and listings of the folders and files backed up during that period.
- Deploy Avamar clients using common Systems management tools  
 In a corporate environment, Avamar Desktop/Laptop can be push installed on Windows and Mac desktop and laptop computers using Systems management tools, such as Microsoft's Systems Management Server 2003 (SMS).

## Environment Requirements

Avamar Desktop/Laptop has specific environment requirements. Those requirements are listed in the following sections:

- *Computers* (page 451)
- *Network* (page 452)
- *LDAP Authentication* (page 453)
- *Avamar System* (page 454)

### Computers

The following minimum requirements must be met by computers using Avamar Desktop/Laptop:

CATEGORY	REQUIREMENT
Operating System	<ul style="list-style-type: none"> <li>• Windows 7 Home Premium</li> <li>• Windows 7 Professional</li> <li>• Windows 7 Ultimate</li> <li>• Windows Vista Home basic</li> <li>• Windows Vista Premium</li> <li>• Windows Vista Enterprise (32- and 64-bit)</li> <li>• Microsoft Windows XP Professional (32- and 64-bit)</li> <li>• Microsoft Windows XP Home</li> <li>• Apple Mac OS X v10.6 Snow Leopard</li> <li>• Apple Mac OS X v10.5 Leopard</li> <li>• Apple Mac OS X v10.4 Tiger</li> </ul>
CPU	1 GHz
RAM	1 GB
Hard Drive Space	Microsoft Windows and Apple OS X clients: <ul style="list-style-type: none"> <li>• 250 MB permanent hard drive space minimum for software installation</li> <li>• Additional space may be required by your snapshot technology and to back up system state</li> </ul>

CATEGORY	REQUIREMENT
Network Interface	Either of the following: <ul style="list-style-type: none"> <li>• 10baseT or higher, configured with latest drivers for your platform</li> <li>• IEEE 802.11a/b/g, configured with latest drivers for your platform</li> </ul>
Ports	TCP data ports 7778, 8080, 8105, 8181, 8444, 27000, 28001, 28002, and 29000 must allow bidirectional communication with the Avamar server.
Web Browser	On Windows: <ul style="list-style-type: none"> <li>• Windows Internet Explorer versions 6.x.x, 7.x.x and 8.x.x</li> <li>• Mozilla Firefox 3.x.x</li> </ul> On Mac: <ul style="list-style-type: none"> <li>• Apple Safari 3.x.x and 4.0.x</li> </ul>
Java	J2SE 5.0 Update 18 and later
Adobe Acrobat Reader	7.0 or later. Available from <a href="http://www.adobe.com">www.adobe.com</a> . Optional. Required in order to view documentation.

## 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, 8080, 8105, 8181, 8444, 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.

## LDAP Authentication

The following minimum requirements must be met to use LDAP authentication:

CATEGORY	REQUIREMENT
Directory Service	LDAP v.3 compliant systems, such as Microsoft Active Directory and OpenLDAP.
Naming system	Client computers must have a static, resolvable, fully qualified domain name.
Domain components	The configuration of the Avamar Desktop/Laptop server must correctly describe any domain components used to segregate authentication.  Also, the Kerberos realm used for LDAP user authentication from Mac computers must be the default Kerberos realm listed in <code>ldap.properties</code> .  Refer to <i>Configure Kerberos Realms Information</i> (page 456) for more information about these requirements.
User accounts	Users must log in to the client computer using a domain account authenticated through the directory service. The account cannot be a generic local or domain administrator account, but can be an account with those privileges, that is, the account "Administrator" will not work but the account "smithb" that has domain administrator rights will.

## Avamar Authentication

The following minimum requirements must be met to use Avamar authentication:

CATEGORY	REQUIREMENT
Naming system	Client computers must have a static, resolvable, fully qualified domain name.
User accounts	Users must have a local or domain log in account for the client computer. Users must also have an account on the Avamar server domain associated with the client computer.

## Avamar System

You should work with your EMC field sales representatives when deciding on the characteristics of the Avamar system deployment that will work best to support your enterprise's desktop and laptop clients.

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**IMPORTANT:** Due to the wide range of differences in each enterprise's desktop and laptop topology a description of the requirements for an Avamar system to support desktops and laptops at any one enterprise is beyond the scope of this guide. However, certain basic requirements are common for all desktop and laptop deployments.

---

The following requirements are common to all Avamar systems supporting Avamar Desktop/Laptop:

CATEGORY	REQUIREMENT
Maximum number of clients per Avamar server	5,000 desktops and laptops.
Avamar server software version	Version 5.0 or above.
Avamar client version	Version 5.0 or above.
Avamar Desktop/Laptop version	Version 5.0 or above.

## Avamar Desktop/Laptop Server Configuration

Avamar Desktop/Laptop features utilize a separate server process running on the Avamar system. This Avamar Desktop/Laptop server is installed as part of every Avamar server installation.

Avamar Desktop/Laptop server configuration tasks should be performed in the following order:

- *Starting Avamar Desktop/Laptop* (page 455)
- *Choosing an Authentication Mechanism* (page 455)
- *Public Key Infrastructure Configuration* (page 462)
- *Rebranding the Web UI* (page 469)

### Starting Avamar Desktop/Laptop

The Avamar Desktop/Laptop server automatically starts when the Avamar server starts. However, to manually start the Avamar Desktop/Laptop server:

1. Log in to the Avamar utility node as root.
2. Use **dpnctl** to start the Avamar Desktop/Laptop server:

```
dpnctl start dtlt
```

### Choosing an Authentication Mechanism

Avamar Desktop/Laptop can use either LDAP authentication or Avamar authentication.

---

**IMPORTANT:** After configuring authentication, restart Avamar Desktop/Laptop to apply the new settings. The **avldap** tool does this for you automatically. *Stopping and Starting Avamar Desktop/Laptop Server* (page 470) describes how to do this manually.

---

#### LDAP Authentication

The LDAP implementation uses Kerberos to securely communicate with LDAP-type authentication systems such as Active Directory and OpenLDAP. When this authentication mechanism is used, the username of the account that is currently logged in to the computer is automatically entered on the Avamar Desktop/Laptop login screen and the Username field is not editable. This adds additional protection for the backed up data. *Configure Kerberos Realms Information* (page 456) describes how to use this form of authentication.

To enable user authentication from Mac computers, the default Kerberos realm must specify the Kerberos realm of the Mac users. Refer to *Configure Kerberos Realms Information* (page 456) for more information.

## Avamar Authentication

The Avamar authentication implementation compares username/password combinations with user records that have been entered into Avamar server. When this form of authentication is used, the Avamar Desktop/Laptop login screen allows you to type both a username and a password. *Configuring Avamar Authentication* (page 461) describes how to use this form of authentication with Avamar Desktop/Laptop. Refer to *Users and Roles* (page 59) for more information about the Avamar authentication implementation.

Avamar authentication works with users who authenticate at the Avamar root level, Avamar domain levels, or Avamar sub-domain levels. The mechanism first looks in the domain with which the login computer is activated. If the username is found at that level authentication proceeds. If the username is not found, the next level up is checked. This continues until the username is found, or the Avamar root is reached without finding the username.

For example, if the login computer is activated with the /clients/mountain Avamar domain, the mechanism will make checks in the following order until the username is found:

- /clients/mountain (login computer's Avamar domain)
- /clients (next level up)
- / (root)

## Configure Kerberos Realms Information

Avamar Desktop/Laptop server uses Kerberos as part of its secure user authentication system. The schema permits the configuration of multiple Kerberos realms through modifications made to two files:

- krb5.conf
- ldap.properties

Kerberos realm configuration is simplified by using **avldap**, the Kerberos realm configuration tool provided with Avamar Desktop/Laptop.

### Kerberos Realm Configuration Tool

The Kerberos realm configuration tool, **avldap**, configures, tests, and shows the values of krb5.conf and ldap.properties.

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

ARGUMENT	VALUE	DESCRIPTION
<b>--configure</b>	FQDN of a Kerberos realm	Queries for information and configures krb5.conf and ldap.properties for the Kerberos realm.



ARGUMENT	VALUE	DESCRIPTION
<b>--test</b>	No value, or provide the following values in response to prompts: <ul style="list-style-type: none"> <li>• FQDN</li> <li>• username</li> <li>• password</li> </ul>	Parses ldap.properties, verifies Kerberos authentication and LDAP queries for realm. If no value is provided, the values for the default realm are used. Otherwise the realm and account information you provide is tested.
<b>--show</b>	No value	Displays: <ul style="list-style-type: none"> <li>• Default encryption types set by krb5.conf</li> <li>• Short name of default domain</li> <li>• Each domain configured in krb5.conf, along with its short name and URL</li> <li>• Errors in ldap.properties</li> </ul>
<b>--help</b>	No value, or one of the following: <ul style="list-style-type: none"> <li>• <b>--configure</b></li> <li>• <b>--test</b></li> <li>• <b>--show</b></li> </ul>	When no value is provided, general help is displayed. When one of the other arguments is provided, help specific to that argument is displayed.

If an error is encountered, one of the following messages appears.

MESSAGE	DESCRIPTION
Client not found in Kerberos database	This message appears when: <ul style="list-style-type: none"> <li>• The value of Domain Short Name does not match an existing Kerberos realm.</li> <li>• The value of Domain Short Name does not match any of the Kerberos realms specified in ldap.properties.</li> <li>• The value of User Name does not match a valid account in the authentication realm specified by the value of Domain Short Name.</li> </ul>
Clock skew too great	Testing and configuration cannot be completed because the difference between UTC on the KDC host and UTC on the Avamar server is greater than 5 minutes.
Duplicate url identifier entries are present for domain <i>domainname</i> in ldap.properties.	URL identifiers with the same domain name are present in ldap.properties. Example of this error: <pre>ldap.url.test.local=ldap:// new.test.local:389 ldap.url.test.local=ldap:// abcd.test.local:389</pre>

MESSAGE	DESCRIPTION
Invalid options provided	<b>avldap</b> was invoked with an argument other than: <ul style="list-style-type: none"> <li>• <b>--configure</b></li> <li>• <b>--test</b></li> <li>• <b>--show</b></li> <li>• <b>--help</b></li> </ul>
KDC has no support for encryption type	The default encryption type specified in <code>krb5.conf</code> is not supported by your company's Active Directory configuration. <i>Changing the Default Encryption Type</i> (page 460) describes a method to work around this problem.
Multiple default domain entries are present in <code>ldap.properties</code>	In <code>ldap.properties</code> , more than one domain has been labeled as the default domain.
No KDC discovered for domain <i>domainname</i> .	The search techniques used by <b>avldap</b> could not find a Key Distribution Center (KDC).
No url is present in <code>ldap.properties</code> for domain <i>domainname</i> .	The URL for a domain being tested is not specified in <code>ldap.properties</code> . This message appears when <b>avldap</b> is run with <b>--test</b> and either: <ul style="list-style-type: none"> <li>• There is no <code>ldap.url</code> value for the default domain</li> <li>• There is no <code>ldap.url</code> value for the domain that you specify</li> </ul> For example if the FQDN of the default domain is <code>test.local</code> and you do not have an <code>ldap.url</code> value for <code>test.local</code> , this message will appear. In this example ,add the following value to correct the error: <pre>ldap.url.test.local=ldap:// abcd.test.local:389</pre>
Pre-authentication information was invalid	The value of Password is not correct for the specified account.

### General Requirements for `ldap.properties`

The **avldap** tool creates properly formatted `ldap.properties` and `krb5.conf` files based on your input. A properly formatted `ldap.properties` complies with the following key/value rules:

- One LDAP URL key/value for each Kerberos realm

The LDAP URL key/value maps a Kerberos realm to a specific domain controller.

The LDAP URL key/value format is:

**ldap.url.r1.example.abc.com=ldap://dchost.r1.example.abc.com:389**

Where *r1.example.abc.com* is the FQDN of a Kerberos realm, *dchost.example.abc.com* is the FQDN of the domain controller for that realm, and *389* is the port used by the LDAP service.

- Exactly one default server key/value

The default server key/value is used during authentication of users on clients that are not mapped to a specific domain, such as users logging in from a Mac computer. The format is:

**ldap.qualified-name-default**=*dchost.example.abc.com*

Where *dchost.example.abc.com* is the FQDN of the default Kerberos realm.

## Configuring Kerberos Realms for Avamar Desktop/Laptop

Avamar Desktop/Laptop is installed with template versions of the Kerberos realm configuration files: `krb5.conf` and `ldap.properties`. You can use these templates to manually create your own files. However, the recommended approach is to use **avldap** to create files that are properly configured for your company.

---

**IMPORTANT:** When configuring your organization's Kerberos realm information, keep in mind that Kerberos realm names are usually assigned using all uppercase letters, and that these values are case-sensitive.

---

To configure the Kerberos realms information for Avamar Desktop/Laptop:

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

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

3. Rename the two template files:

```
mv krb5.conf krb5.conf.template
```

```
mv ldap.properties ldap.properties.template
```

4. Run **avldap** with the `configure` option:

```
/usr/local/avamar/bin/avldap --configure
```

The following prompt appears:

```
Enter the Fully Qualified Domain Name and press <ENTER>
```

5. Type the fully qualified domain name of a Kerberos realm.

The following prompt appears:

```
Enter the User Name and press <ENTER>
```

6. Type the username for an account that is authorized to read the directory service's database.

The following prompt appears:

```
Enter the password <ENTER>
```

7. Type the password associated with the username.

The following prompt appears:

```
Do you wish to configure domain domainname as default domain (y/n)?
```

8. Type **y** if you want the domain to be the default domain; type **n** if you do not.

The default domain is the default Kerberos realm server for clients that do not publish a Kerberos realm server during authentication. This behavior is sometimes seen with mixed OS environments, for example, an Active Directory domain and a Mac client.

The following prompt appears:

```
INFO: The configuration file changes need a restart of dtlt and ems services.  
Do you wish to restart dtlt and ems services?
```

9. Do one of the following:

- To configure additional Kerberos realms, type **n** for no.

The following reminder appears:

```
INFO: The dtlt and ems services need to be restarted manually for the  
configurations to take effect.
```

Do not restart. Instead, repeat steps 4 through 9.

- To finish the configuration, type **y** for yes.

When you type **y** the DTLT and EMS processes are restarted with the new Kerberos values, the new values are tested, and the following success message appears:

```
SUCCESS: Configuration of krb5.conf and ldap.properties is successful.
```

Kerberos realm configuration is complete.

## Changing the Default Encryption Type

The default configuration of `krb5.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 `krb5.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 = des3-cbc-sha1-kd des-cbc-crc des-cbc-md5  
default_tkt_enctypes = des3-cbc-sha1-kd des-cbc-crc des-cbc-md5
```

4. Comment out the specification.

The finished section looks like this:

```
#[libdefaults]
# default_tgs_enctypes = des3-cbc-sha1-kd des-cbc-crc des-cbc-md5
# default_tkt_enctypes = des3-cbc-sha1-kd des-cbc-crc des-cbc-md5
```

## Configuring Avamar Authentication

To configure Avamar Desktop/Laptop to use Avamar authentication:

1. Log in to the Avamar utility node as root.
2. Change the working directory to:  
`/usr/local/avamar/etc`
3. Open `ldap.properties` in a plain text editor.
4. Add the following line:  
`user-login-module=avamar`
5. Save and close `ldap.properties`.
6. Restart the Avamar Desktop/Laptop server:  
`dpnctl stop dtlt`  
`dpnctl start dtlt`

## Public Key Infrastructure Configuration

To protect user security web browsers display an authentication warning when accessing a secure web page, unless the web server provides a trusted public key certificate with the page. The Avamar Desktop/Laptop UI uses only secure web pages and this warning will be seen in browsers that access those pages. To avoid the warning, install a trusted public key certificate on the Avamar Desktop/Laptop Tomcat web server.

A public key certificate is trusted by a web browser if its signature matches the signature of a trusted root certification authority that is part of the web browser's installation files, or if it matches the signature of an in-house root certification authority that is installed on your organization's desktops and laptops.

**Background.** Avamar Desktop/Laptop UI uses secure socket layer/transport layer security (SSL/TLS) connections between clients and the Avamar Desktop/Laptop server to provide authentication and data security. The SSL/TLS connections are made using the hypertext transfer protocol secure (HTTPS) channel between a web browser on a client and the Avamar Desktop/Laptop Tomcat web server.

In the initial stage of establishing an SSL/TLS connection, supported web browsers request the server's public key certificate so the server can be authenticated. When the certificate is received, the digital signature of the certification authority (CA) that signed it is compared to the CA signatures contained within the trusted root certification authorities installed on the client computer. This authentication/encryption mechanism is called the Public Key Infrastructure (PKI).

If an exact match of the digital signature is found, the information on the public key certificate is trusted and an authenticated and secure connection between the web browser and the UI is established.

If an exact match is not found, the web browser prominently displays an authentication warning. The authentication warning differs depending on the web browser but, in all cases, the user is provided with a choice of terminating or allowing the secure connection. If the user chooses to allow it, an unauthenticated secure connection is established.

**Default Key Entry.** When the Avamar server software is first installed a "tomcat" key entry is added to the default keystore located at: /root/.keystore. This key is self-signed and specific to the server. However, because other identifying information is not available at the time of installation, generic identifying information is used.

This default key is used by the Avamar Desktop/Laptop Tomcat server and the Avamar Enterprise Manager Tomcat server. It is sufficient to allow SSL/TLS connections, but it does not contain a digital signature that is trusted by web browsers.

---

**NOTE:** Any changes made to the "tomcat" key entry in the default keystore affect both the Avamar Desktop/Laptop Tomcat server and the Avamar Enterprise Manager Tomcat server.

---

## Installing a Trusted Public Key Certificate

Installing a trusted public key certificate for the Avamar Desktop/Laptop Tomcat server prevents your Avamar Desktop/Laptop users from seeing a web browser warning when accessing the Avamar Desktop/Laptop web UI.

The tasks involved in installing a trusted public key certificate are:

- *Delete the Default Key Entry* (page 463)
- *Create a New Key Entry* (page 464)
- *Generate a Certificate Signing Request* (page 465)
- *Obtain a Public Key Certificate* (page 465)
- *Import the Chained or Root Certificates* (page 466)
- *Import the Public Key Certificate* (page 468)

The following variables are used in this section's instructions.

VARIABLE	DESCRIPTION
changeit	Password for the keystore. The default is <b>changeit</b> .
FQDN	Fully qualified domain name of the Avamar utility node.
OU	Organizational unit within your company that has authority over the host.
Company	Name of your company.
City	City in which the host is located.
State	State in which the host is located.
Country	Country in which the host is located.
chained_certN	Certificate file saved from the chained or root certificate received from the CA. <i>N</i> represents an integer identifier when more than one certificate file is saved from the chained or root certificate.

### Delete the Default Key Entry

The default "tomcat" key entry must be deleted from the keystore before you can create a new key entry containing your company's information.

1. Log into the Avamar utility node as root.
2. Change your working directory to the Java bin directory:

```
cd $JAVA_HOME/bin
```

3. Run the keytool -delete command:

```
keytool -delete -alias tomcat
```

4. At the password prompt, enter the keystore password:

```
Enter keystore password: changeit
```

---

## Create a New Key Entry

After deleting the default "tomcat" key entry, create a new one that contains your company's information.

1. Log into the Avamar utility node as root.
2. Change your working directory to the Java bin directory:  

```
cd $JAVA_HOME/bin
```
3. Run the keytool -genkeypair command:  

```
keytool -genkeypair -keysize 2048 -alias tomcat -keyalg RSA
```
4. At each prompt, enter the correct information as shown:

```
Enter keystore password: changeit
```

```
What is your first and last name?
```

```
[Unknown]: FQDN
```

---

**NOTE:** To accommodate individuals the keytool -genkeypair command prompt's for first and last name. However, in a corporate environment this prompt must be answered with the fully qualified domain name (FQDN) of the Avamar utility node.

---

```
What is the name of your organizational unit?
```

```
[Unknown]: OU
```

```
What is the name of your organization?
```

```
[Unknown]: Company
```

```
What is the name of your City or Locality?
```

```
[Unknown]: City
```

```
What is the name of your State or Province?
```

```
[Unknown]: State
```

```
What is the two-letter country code for this unit?
```

```
[Unknown]: Country
```

```
Is CN=FQDN, OU=OU, O=Company, L=City, ST=State, C=Country correct?
```

```
[no]: y
```

For example, if the following information applied to your company:

- FQDN of the Avamar utility node is avnode.widgets.com
- Organizational unit is Accounting
- Company name is Widgets
- Company is located in Pleasanton, California, USA

The summary prompt for keystore -genkeypair should read:

```
Is CN=avnode.widgets.com, OU=Accounting, O=Widgets, L=Pleasanton, ST=California, C=USA correct?
```





```
DwYDVQIQIEwhDb2xvcmFkbzETMBEGA1UEBxMKTG91aXN2aWxsZTEYMBYGA1UEChMP
RU1DIENvcnBvcnF0aW9uMQ8wDQYDVQQLExZBdmFtYXIXHTAbBgNVBAMTFGxhdmEY
MDIyLmXzcy5lbWMuY29tMIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCCvAfC
D39UeAmNLoUx6IqjCXoNIticPQOftlwjgohYIvXKE6eWDF1S3HfWtkoexXMt/1hF
xcREXqQOMcmi9ZHcFRCs1wti6jNh6Qc9O+E/cWKTneEgOWPigbTrB41mWkKofKz/
thC1p01ueQwUHMIST6opIRsXHicsvsbj+Bj70QIDAQABo4IBkDCCAYwwDgYDVR0P
AQH/BAQDAgO4MBEGCWSAGG+EIBAQQEAWIGQDAfBgNVHREEGDAWghRsYXZhMjAy
Mi5sc3MuZW1jLmNvbTAFBgNVHSMEGDAWgBSJz061oIdefkN40Z1JaAd8hAczVjCB
kgYDVR0gBIGKMIGHMIGEBgkqhkiG9w0FBzUwdzAuBggrBgEFBQcCARYiaHR0cDov
L2NhLnJzYXNlY3VyaXR5LmNvxs9DUFMuaHRtbDBFBggrBgEFBQcCAjA5MBGWEVJT
QSBTZWN1cm10eSBJbmMuMAMCAQEaHUNQUyBjbmNvcnBvcnF0ZWQgYnkgcmlvMjZl
bmNlM0GA1UdJQQWMBQGCCsGAQUFBwMBBggrBgEFBQcDAjAdBgNVHQ4EFgQUXGqU
d5if2l0PyMxNL9errGa+vEQwUgYDVR0fBEswSTBHoEWgQ4ZBaHR0cDovL2Nybc5y
c2FzZWN1cm10eS5jb206ODAvO1NBjTIwQ29ycG9yYXR1JTJwU2VydMvYjTIwQ0Et
Mi5jcmwwDQYJKoZIhvcNAQEFBQADgYEAFFBQjw2l2H4Vnvahbas2rdFSN80Fnbh
VcYBnWAuiA1aOgclu9ZtmMX1JrGVrS8qCThrUZoGHsLsbDF8wuyFeloelHcdZSY1
GorkhdbcBR5NVGq5UHB7sbKiDvbMuEf6Gwbier0mps7oEOMU8uh8v2rMTsXEuhtK
csWTe/IxkOk=
-----END CERTIFICATE-----
```

2. After receiving the public key certificate, log into the Avamar utility node as root.
3. Save the public key certificate in root's home directory as tomcat.cert.

### Import the Chained or Root Certificates

Normally you receive a chained or root certificate file along with the public key certificate.

---

**NOTE:** When you do not receive a chained or root certificate file along with the public key certificate, skip this section and instead follow the steps in *Import the Public Key Certificate* (page 468).

---

1. Log in to the Avamar utility node as root.
2. Change your working directory to the Java bin directory:  
`cd $JAVA_HOME/bin`
3. Open the chained or root certificate file in a plain text editor.

The file's contents will be similar to the following:

```
-----BEGIN CERTIFICATE-----
MIIDdCCAt2gAwIBAgIQJyzRkL6Balz4Y8X3iFwiFjANBgkqhkiG9w0BAQUFADCB
uzEkMCIGA1UEBxMbVmfSaUN1cnQgVmFsaWRhdGlvbiBOZXR3b3JrMRcwFQYDVQQK
Ew5WYWxpQ2VydCwgSW5jLjE1MDMGA1UECxMsVmFsaUN1cnQgQ2xhc3MgMyBQb2xpc
Y3kgVmFsaWRhdGlvbiBBdXR0b3JpdHkxITAFBgNVBAMTFGh0dHA6Ly93d3cudmFs
aWN1cnQuY29tLzEgMB4GCSqGSIb3DQEJARYRaW5mb0B2YWxpY2VydC5jb20wHhcN
MDUwNTAyMTczNDQ0WhcNMjkwNDMwMDkyNDAwWjBsMR0wGAYDVQQKEExFSU0EgU2Vj
dXJpdHkgSW5jLjE1MDMGA1UEAxMVU1NBIFB1YmXpYyBSb290IENBIHYxMS4wLmYy
-----
```

```

KoZlHvcNAQkBFh9yc2FrZW9ucm9vdHNpZ25AcnNhc2VjdXJpdHkuY29tMIGfMA0G
CSqGSIb3DQEBAQUAA4GNADCBiQKBgQC0dSva2EQ740GxqiIKSHATT4f8XYwUU23p
zRe5W6IVpt4jkwDwkgvTcP6M8PD4OfK6Imal4hAH/c3K/dUIH7YyQZRGAE5Y27G
5klZYKIdcFlrfautgVES170MLKfMjqym2FWafVOibXatRcw7B0S+mP9404jID/Ma
IprXkH5JjwIDAQABo4HGMIHDMBOGA1UdDgQWBbT1TDF6UQM/LNeL15lvqHGQq3g9
mzBsBgNVHR8EZTBjMGGgX6BdhltodHRwOi8vd3d3LnJzYXNlY3VyaXR5LmNvbS9w
cm9kdWN0cy9rZW9uL3JlcG9zaXRvcnkY2VydGlmawNhdGVfc3RhdhVzL1ZhbGlj
ZXJ0X1Jvb3RfQ0EuY3JsmAwGA1UdEwQFMAMBAf8wDgYDVR0PAQH/BAQDAGGMBYg
A1UdIAQPMA0wCwYJKoZIhvcNBQYBMA0GCSqGSIb3DQEBBQUAA4GBAJsZWGbpVgmc
xmW5vM9xqt6r1jjQE44zOFNgwLXp0YR605ss5SjkVlyx4WtjKzSrI4hPLhVJN5f
69F7NxNQmf658Mkkx3Vv6+orEvHFqIw/Hx4uqmdBRpHy/cckaBcEqhJfew7IUFs+
4KRrACEZFnBeaZQlTH8J7UqTThT7By2x
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIC5zCCALACAQEwDQYJKoZIhvcNAQEFBQAwgbsxJDAiBgNVBACtG1ZhbG1DZXJ0
IFZhbGlkYXRpb24gTmV0d29yazEXMBUGA1UEChMOVmFsaUNlcnQsIEluYy4xNTAz
BgNVBAsTLFZhbG1DZXJ0IENsYXNzIDMgUG9saWN5IFZhbGlkYXRpb24gQXV0aG9y
aXR5MSEwHwYDVQQDEXhodHRwOi8vd3d3LnZhbGljZXJ0LmNvbS8xIDAeBgkqhkiG
9w0BCQEWEWluZm9AdmFsaWNlcnQuY29tMB4XDk5MDYyNjAwMjIzMDUxOTU5MDYy
NjAwMjIzMDUxOTU5MDYyNjAwMjIzMDUxOTU5MDYyNjAwMjIzMDUxOTU5MDYy
azEXMBUGA1UEChMOVmFsaUNlcnQsIEluYy4xNTAzBgNVBAsTLFZhbG1DZXJ0IENs
YXNzIDMgUG9saWN5IFZhbGlkYXRpb24gQXV0aG9yaXR5MSEwHwYDVQQDEXhodHRw
Oi8vd3d3LnZhbGljZXJ0LmNvbS8xIDAeBgkqhkiG9w0BCQEWEWluZm9AdmFsaWNl
cnQuY29tMIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQDjmFGWH0jVsQaBa1fD
cnWTq8+epvzzF1LWLU2fNUSoLgRNB0mKOCn1dzfnt6td3zZxFJmP3MKs8edgkpfS
2Ejcv8ECIMYkpChMMFp2bbF893enhBxoYjHW5tBbcqwuI4V7q0zK89HBFx1cQqY
JJgpp0lZpd34t0NiYfPT4tBVPwIDAQABMA0GCSqGSIb3DQEBBQUAA4GBAFa7AliE
Zwgs3x/be0kz9dNnnfS0ChCzycUs4pJqcXgn8nCDQtM+z61U9PHYkhaM0QTLs6vJ
n0WuPIqpsHEzXc jFV9+vqDwzf4mH6eg1krh/hXqulrweN1gqz8mRzyqBPu3G0d/A
PhmcGcwTTYJBtYze4D1gCCAPRX5ron+jjBXu
-----END CERTIFICATE-----

```

This chained certificate example contains two certificates.

4. Separate the chained or root certificate into individual certificate files using the BEGIN CERTIFICATE and END CERTIFICATE designations as the boundaries of each certificate. Save each with a distinguishing filename in root's home directory.

For example the chained certificate shown in step 3 is split into two files: tomcat\_chain1 and tomcat\_chain2 and each file is saved in root's home directory.

5. Import the certificate by typing the following on a single command line:

```
keytool -importcert -trustcacerts -noprompt -file ~/
chained_certN -alias chained_certN
```

6. At the password prompt, enter the keystore password:

**Enter keystore password:** *changeit*

A message appears:

**Certificate was added to keystore**

7. Repeat steps 5 and 6 for each individual certificate file derived from the chained or root certificate file.

### Import the Public Key Certificate

The final step is to import the public key certificate you saved as tomcat.cert.

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

```
cd $JAVA_HOME/bin
```

3. Import the certificate by typing the following on a single command line:

```
keytool -importcert -trustcacerts -noprompt -file ~/tomcat.cert  
-alias tomcat
```

4. At the password prompt, enter the keystore password:

```
Enter keystore password: changeit
```

A message appears:

```
Certificate reply was installed in keystore
```

5. Use **dpnctl** to restart Avamar Desktop/Laptop:

```
dpnctl stop dtlt
```

```
dpnctl start dtlt
```

Public key certificate installation is complete.

## Rebranding the Web UI

The Avamar Desktop/Laptop web UI can be modified by replacing the graphic located at the top-left of the UI with your company's logo.



To replace the logo graphic:

1. Create a transparent graphic and save it as "ProductName.png".

A transparent graphic permits the background gradient to be seen behind the graphic's rectangle. The graphic's dimensions must be: width=222 px and height=18 px.

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

```
cd /usr/local/apache-tomcat-5.5.27/webapps/dtlt/images
```

4. Make a backup copy of the original graphic:

```
cp ProductName.png ProductName.png_orig
```

5. Move your logo into the current working directory as ProductName.png.

The new graphic is immediately available.

## Deleting a Browser's Cache

In some web browsers, with certain cache settings, the new graphic may not appear right away. To view the new graphic on those browsers, delete cached copies of previously viewed files:

- IE6:  
**Tools > Internet Options > General (tab) > Delete Files**  
Click **OK** and click **OK** again.
- IE 7:  
**Tools > Delete Browsing History > Temporary Internet Files > Delete Files**  
Click **Close**, and click **OK**.
- IE 8:  
**Tools > Delete Browsing History > Temporary Internet Files > Delete**
- Firefox 3.x:  
**Tools > Clear Private Data > Cache (checkbox) > Clear Private Data Now**

- Firefox 3.5.x:  
**Tools > Clear Recent History > Time range to clear** (drop down list; choose: **Everything**) > **Details** (drop down list; choose: **Cache**) > **Clear Now**
- Safari 3 and 4 for Mac:  
**Safari** (menu) > **Empty Cache > Empty**

## Checking the Status of Avamar Desktop/Laptop Server

To check the status of Avamar Desktop/Laptop server:

1. Log in to the Avamar utility node as root.
2. Use **dpnctl** to obtain status information about the Avamar Desktop/Laptop server:

```
dpnctl status dtlt
```

## Stopping and Starting Avamar Desktop/Laptop Server

If the Avamar Utility node must be restarted, the Avamar Desktop/Laptop server restarts automatically. However, the Avamar Desktop/Laptop server can be stopped and started manually.

To stop Avamar Desktop/Laptop:

1. Log in to the Avamar utility node as root.
2. Use **dpnctl** to stop Avamar Desktop/Laptop:

```
dpnctl stop dtlt
```

To start Avamar Desktop/Laptop:

1. Log in to the Avamar utility node as root.
2. Use **dpnctl** to start Avamar Desktop/Laptop:

```
dpnctl start dtlt
```

## User Selectable Backup Schedules

Avamar Desktop/Laptop provides the ability to permit your enterprise's users to select a backup schedule. Users can choose a schedule from any of the weekly recurrence schedules in their domain.

When a user chooses a new backup schedule, the user's client is moved to the group associated with the schedule and the schedule is applied. Access to previous backup data is not affected by the change.

When the selectable backup schedules feature is enabled for an Avamar server, it applies to clients and groups in all domains and sub-domains on the server. Clients and groups that meet the following requirements will have access to the feature.

REQUIREMENT	DESCRIPTION
Feature enabled by administrator	The feature is, by default, disabled. It must be enabled and the Avamar Desktop/Laptop server process must be restarted before it can be used.
Single domain	Only groups within the same domain as a client are displayed. A sub-domain is considered to be a separate domain.
No multiple group memberships	Clients that are a member of more than one group cannot access this feature.
Groups must be enabled	Only the schedules for enabled groups are listed.
"Weekly" recurrence schedules only	Only weekly recurrence group schedules are listed, and only clients that currently have a weekly recurrence schedule can access this feature.
At least two different schedules	This feature will only be visible to qualified clients if there are at least two different weekly recurrence schedules in the domain.
Duplicate schedules only shown once	If two or more groups in a domain share the same weekly recurrence schedule, only the schedule for the first group will be included in the selection list.

Two configuration tasks must be completed in order to use this feature:

- *Enable Selectable Backup Schedules* (page 472)
- *Configure Selectable Backup Schedules* (page 472)

## Enable Selectable Backup Schedules

To enable selectable backup schedules:

1. Log in to the Avamar utility node as root.

2. Change your current working directory:

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

3. Open the Avamar Desktop/Laptop properties file in a plain text editor, such as **vi**:

```
vi dtlt.properties
```

4. Edit the value of the selectable backup schedules key:

Change:

```
userSelectableBackupTime=false
```

To:

```
userSelectableBackupTime=true
```

5. Save and close the file.

6. Restart the Avamar Desktop/Laptop server:

```
dpnctl stop dtlt
```

```
dpnctl start dtlt
```

## Configure Selectable Backup Schedules

Once enabled, the selectable backup schedules feature will display a button that gives access to a schedule list. This feature is enabled in each domain on the server, if the domain has groups that meet the requirements listed in the table in *User Selectable Backup Schedules* (page 471). Any client in an enabled domain that meets the listed requirements will have access to the selection list.

To simplify administration of this feature, and to decrease user problems due to changed datasets, the following best practices are recommended:

- Place clients that should not have access to this feature in a group that does not use a weekly recurrence schedule.

Only clients in a group that has a weekly recurrence schedule are able to view a domain's selection list. To prevent clients from accessing this feature, place them in a group with a schedule that uses one of the other recurrence types: Daily, Monthly, On-Demand.

- Create a special domain or sub-domain to use this feature and limit it to clients with the same dataset and retention policy.

A domain's selection list includes the schedules for all qualified groups in the domain. If the domain contains groups with various datasets and retention policies, the list could include the schedule for a group that has a different dataset or retention policy than a user's current group. By selecting this schedule the users could unintentionally change their client's dataset and retention policy.



To create a domain and enable groups to effectively use the selectable backup schedules feature:

1. Start Avamar Administrator, as described in *Starting Avamar Administrator* (page 27).
2. Create a domain or sub-domain, as described in *Adding a New Domain* (page 34)
3. Create a weekly schedule, as described in *Creating a New Schedule* (page 114).

To create a schedule with a weekly recurrence, in **Repeat this schedule**, select **Weekly**.

4. Copy the schedule, as described in *Copying a Schedule* (page 117).  
Create a copy for each schedule time that should be on the schedule list.
5. Edit each schedule copy to change the start time to one of the start times that should be on the schedule list.

Editing a schedule is described in *Editing a Schedule* (page 116).

6. Create a common dataset for all clients in the domain.

Creating a dataset is described in *Creating a New Dataset* (page 104). Only one dataset should be created. All clients will use this common dataset.

7. Create a common retention policy for all clients in the domain.

Creating a retention policy is described in *Creating a New Retention Policy* (page 122). Only one retention policy should be created. All clients will use this common retention policy.

8. For each schedule you created, create a new group.

Creating a group is described in *Adding a New Group* (page 133). While creating each group, do the following:

- (a) On the first screen of the New Group wizard, clear **Disabled**.
- (b) On the second screen of the New Group wizard, select the common dataset you created.
- (c) On the third screen of the New Group wizard, select one of the schedules you created.

Do not assign a schedule to more than one group.

- (d) On the fourth screen of the New Group wizard, select the common retention policy you created.
- (e) On the fifth screen of the New Group wizard, assign clients to the group.

Assigning clients to every group is not required. However, all clients that will use the selectable backup schedules feature should be assigned to a group in the domain. Users will be able to use the feature to move their client to the group with the backup schedule they want.

- (f) Click Finish.

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

The selectable backup schedules domain is ready. When a user with a client in that domain navigates to the Backup page of the Avamar Desktop/Laptop web UI, the **Change Backup Time** button appears. Use of the feature is described in the web UI help.

## Client Installation using Systems Management Tools

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

Remote installation is described in *Remote Push Install of the Client Software* (page 408).

## Local Installation of the Client

The Avamar Desktop/Laptop software can also be installed on desktops and laptops by running the installer locally. This method launches a graphical installation interface that walks you through the installation. At the conclusion of the installation the computer will be ready to register and activate with an Avamar server.

The disadvantages of using local installation instead of installing the software using a Systems management tool are:

- Individual, local installs can be very time consuming when performed on thousands of desktops and laptops.
- Unlike many Systems management tools, local installs do not provide a list which can be used when you assign computers to groups as described in the Avamar Activation Manager administrator's guide.

Local installation, upgrading, and uninstalling of Avamar Desktop/Laptop is described in the *Avamar Backup Clients User Guide*.

## Client Log Location

The local client log provides information about backup and restore operations on that client.

### Windows Computers

On Windows computers, the Avamar client log is located at:

```
%APPDATA%\avscc.log
```

### Mac Computers

On Mac computers, the client log is located at:

```
$HOME/avscc.log
```

## Mac Clients with Entourage

Microsoft Entourage is a Mac email client that uses Microsoft Database Daemon to manage its database. In order to protect the Entourage data, both Entourage and the Microsoft Database Daemon must be shut down during backups. The Avamar client software provides scripts to shut down Entourage and the Microsoft Database Daemon before running a backup and restarting the Microsoft Database Daemon when the backup is complete. Entourage must be started manually.

The scripts are configured to run through dataset policies. Mac clients running Entourage should be assigned to groups using a dataset with these policies. Other clients should be assigned to groups using a dataset without these policies.

---

**IMPORTANT:** Assigning Mac clients running Entourage to groups without these policies causes the Entourage database to be skipped during backups and errors to appear in the client logs.

---

## Creating the Dataset

All groups for Mac clients running Entourage should use a dataset that provides the necessary policies.

To create a dataset with the required policies:

1. Create a new dataset as described in *Creating a New Dataset* (page 104).  
The plug-in type must be Macintosh Desktop/Laptop.
2. Select the dataset **Options** tab.
3. Select **Show Advanced Options**.
4. In the Pre-Script section of that tab, in **Run user-defined script at beginning of backup**, type:

```
shutdown.sh
```

5. In the Pre-Script section of that tab, select **Abort backup if script fails**.
6. In the Post-Script section of that tab, in **Run user-defined script at end of backup**, type:  
`startup.sh`
7. In the Post-Script section of that tab, select **Exit process with script failure exitcode**.
8. When all other configuration for the dataset is complete, click **OK**.

Assign this dataset, or one with the same changes on the Options tab, to each group for Mac clients with Entourage.

## Client Backup Message

Mac clients that are assigned to a group that uses a dataset configured for Mac clients with Entourage will see a message whenever a scheduled or manual backup task is initiated.



The options with this message are in the following table.

OPTION	RESULT
Cancel	The Microsoft Database Daemon is not shutdown and the backup task is cancelled.
OK	The Microsoft Database Daemon is immediately terminated, Entourage is shutdown, and the backup task is started. At the conclusion of the backup the Microsoft Database Daemon is restarted. Manual startup of Entourage is required.
No Action	The message is displayed for 30 seconds, after which the Microsoft Database Daemon is terminated, Entourage is shutdown, and the backup task is started. At the conclusion of the backup the Microsoft Database Daemon is restarted. Manual startup of Entourage is required.

## APPENDIX A — COMMAND SHELL SESSIONS

---

**User Accounts.** Additionally, the following user accounts are commonly used for various system administration and maintenance tasks:

- root
- admin
- dpn

The admin and dpn user accounts require authentication by way of Secure Shell (SSH).

### Starting the Command Shell Sessions

This example procedure describes how to log into an Avamar node as user admin via SSH.

1. Open a command shell.
2. Log into the desired node as user admin.
3. Load the admin OpenSSH key by typing:  

```
ssh-agent bash
```

```
ssh-add ~admin/.ssh/admin_key
```

You are prompted to type a passphrase.
4. Type the admin user account passphrase.

## Switching User IDs

**Switch User to root** You can easily switch to user root using the `su` command and switch back to the previous login ID with the `exit` command.

**Switch User to dpn** When asked to switch to the dpn user account, you will need to perform the following:

1. Switch user to the dpn user account by typing:

```
su - dpn
```

2. When prompted for a password, type the dpn password and press **ENTER**.
3. Load the dpn OpenSSH key by typing:

```
ssh-agent bash
```

```
ssh-add ~dpn/.ssh/dpnid
```

---

**TIP:** Type `whoami` in any command shell to return your current user account (login ID).

---

## APPENDIX B — PLUGIN OPTIONS

---

### Important Terms and Concepts

Plug-in options provide additional control of backups and restores. These options are context-sensitive to both the operation being performed and the specific plug-in selected for that operation.

These options can be specified during on-demand backup and restore operations, or persistently set within datasets for all future scheduled backups.

Backup or restore option dialog boxes automatically appear when initiating on-demand backups or restores, respectively.

When creating a new dataset, the new dataset wizard offers an opportunity to configure persistent backup plug-in option settings for that dataset.

To view or set plug-in options for an existing dataset:

1. Start Avamar Administrator.
2. Select **Tools > Manage Datasets...**  
The Manage All Datasets window appears.
3. Select a dataset from the list and click **Edit**.  
The Edit Dataset dialog box appears.
4. Click the **Options** tab.

Plug-in options can be set two ways:

- By using the graphical controls
- By typing option names and values as free text

**Setting Plug-in Options by Using Graphical Controls.** By clicking the Options tab and selecting a plug-in you can display all current options for that specific plug-in.

These settings are represented by graphical controls (for example, options, radio buttons, list boxes, and so forth).

The advantage to setting plug-in options by using graphical controls is that you cannot type an option name or value incorrectly. Only valid states are shown.

Setting **Show Advanced Options** expands this list even further by displaying options that are normally only of interest to persons debugging an Avamar system. These advanced options are shown in red.

**Typing Option Names and Values as Free Text.** You can also set plug-in options by typing option names and values as free text.

Clicking **More** expands the dialog box to include Enter Attribute and Attribute Value fields, which can be used to input plug-in options and values as free text.

However, it must be understood that no error checking or validation is performed on these free text entries and that free text entries override settings made by way of the graphical controls.



## AIX File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar AIX File System plugin.

### Backup Options

FIELD/OPTION	DESCRIPTION	
Backup label	Assigns this descriptive label to backup.	
<b>LOGGING</b>	List backup contents Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates	
	Informational message level Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.	
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.

	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b> Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.

## Restore Options

FIELD/OPTION	DESCRIPTION								
Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:  Never  Always  Generate New Name  If Modified  If Newer								
List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates								
Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  <table border="0"> <tr> <td>No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.								

LOGGING

	FIELD/OPTION	DESCRIPTION
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
<b>ADVANCED OPTIONS</b>	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring /usr/MyDir/MyFile to /tmp and you selected this option, the full path to the restored file will be /tmp/usr/MyDir/MyFile.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

# Avamar FreeBSD File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar FreeBSD File System plugin.

## Backup Options

FIELD/OPTION	DESCRIPTION	
Backup label	Assigns this descriptive label to backup.	
<b>LOGGING</b>	List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates
	Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.

	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

	FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b>	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.



## Restore Options

FIELD/OPTION	DESCRIPTION								
Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:  Never  Always  Generate New Name  If Modified  If Newer								
List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates								
Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  <table border="0"> <tr> <td>No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.								

LOGGING

	FIELD/OPTION	DESCRIPTION
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
<b>ADVANCED OPTIONS</b>	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring /usr/MyDir/MyFile to /tmp and you selected this option, the full path to the restored file will be /tmp/usr/MyDir/MyFile.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

# HP-UX File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar HP-UX File System plugin.

## Backup Options

FIELD/OPTION	DESCRIPTION	
Backup label	Assigns this descriptive label to backup.	
<b>LOGGING</b>	List backup contents Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates	
	Informational message level Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.	
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.

	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in /opt/AVMRclnt/etc/scripts.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in /opt/AVMRclnt/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

	FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b>	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.

### Restore Options

FIELD/OPTION	DESCRIPTION
Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:  Never  Always  Generate New Name  If Modified  If Newer

FIELD/OPTION		DESCRIPTION
LOGGING	List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates
	Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.
	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session.  <b>IMPORTANT:</b> Script must be located in /opt/AVMRcInt/etc/scripts.
PRE-SCRIPT	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
POST-SCRIPT	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session.  <b>IMPORTANT:</b> Script must be located in /opt/AVMRcInt/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.

	FIELD/OPTION	DESCRIPTION
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
<b>ADVANCED OPTIONS</b>	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring /usr/MyDir/MyFile to /tmp and you selected this option, the full path to the restored file will be /tmp/usr/MyDir/MyFile.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

# Linux File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar Linux File System plugin.

## Backup Options

FIELD/OPTION	DESCRIPTION								
Backup label	Assigns this descriptive label to backup.								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> <b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> <b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.								



	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

	FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b>	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.

## Restore Options

FIELD/OPTION	DESCRIPTION								
Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:  Never  Always  Generate New Name  If Modified  If Newer								
List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates								
Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  <table border="0"> <tr> <td>No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.								

LOGGING

FIELD/OPTION		DESCRIPTION
PRE-SCRIPT	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
POST-SCRIPT	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
CLIENT CACHE OPTIONS	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
ADVANCED OPTIONS	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring /usr/MyDir/MyFile to /tmp and you selected this option, the full path to the restored file will be /tmp/usr/MyDir/MyFile.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

# Macintosh File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar Macintosh File System plugin.

## Backup Options

FIELD/OPTION	DESCRIPTION	
Backup label	Assigns this descriptive label to backup.	
<b>LOGGING</b>	List backup contents Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates	
	Informational message level Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.	
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.

	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

	FIELD/OPTION	DESCRIPTION
ADVANCED OPTIONS	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.

Restore Options

FIELD/OPTION	DESCRIPTION								
Overwrite existing files	<p>Controls behavior when file to be restored already exists. One of the following:</p> <ul style="list-style-type: none"> <li>Never</li> <li>Always</li> <li>Generate New Name</li> <li>If Modified</li> <li>If Newer</li> </ul>								
List backup contents	<p>Specifies how much information about backup contents should be included in the log files. One of the following:</p> <ul style="list-style-type: none"> <li>No file listing</li> <li>List file names</li> <li>List files and dates</li> </ul>								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> Informational message level	<p>Specifies how many informational messages should be included in the log files. One of the following:</p> <table border="0"> <tr> <td>No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<b>Enable debugging messages</b>	<p>If selected, maximum information is written to log files.</p> <p><b>IMPORTANT:</b> If selected, very large log files are created.</p>								



	FIELD/OPTION	DESCRIPTION
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
<b>ADVANCED OPTIONS</b>	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring /usr/MyDir/MyFile to /tmp and you selected this option, the full path to the restored file will be /tmp/usr/MyDir/MyFile.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

## NetWare File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar NetWare File System plugin.

### Backup Options

	FIELD/OPTION	DESCRIPTION
<b>SMS AUTHENTICATION</b>	Server login ID	SMS login username. For example, CN=admin.O=HOSTNAME_CTX.
	Server password	Server login ID password.
	Snapshot stored-on pool	Specifies snapshot stored-on pool name.
	Backup label	Assigns this descriptive label to backup.

FIELD/OPTION		DESCRIPTION
<b>LOGGING</b>	List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates
	Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.
	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
<b>FILESYSTEM TRAVERSAL</b>	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.

	FIELD/OPTION	DESCRIPTION
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in SYS:AVAMAR\etc\scripts.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in SYS:AVAMAR\etc\scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).
<b>ADVANCED OPTIONS</b>	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.
	Suspend NSS Compression	If selected, NSS compression is suspended during backups and automatically resumed following backups.

Restore Options

FIELD/OPTION		DESCRIPTION
<b>SMS AUTHENTICATION</b>	Server login ID	SMS login username. For example, CN=admin.O=HOSTNAME_CTX.
	Server password	Server login ID password.
	Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:  Never Always Generate New Name If Modified If Newer

FIELD/OPTION		DESCRIPTION
LOGGING	List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates
	Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals    Some informational messages are included in the log files.  Many informationals    Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.
	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session.  <b>IMPORTANT:</b> Script must be located in SYS:AVAMAR\etc\scripts.
PRE-SCRIPT	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
POST-SCRIPT	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session.  <b>IMPORTANT:</b> Script must be located in SYS:AVAMAR\etc\scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.

	FIELD/OPTION	DESCRIPTION
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
<b>ADVANCED OPTIONS</b>	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring F:\Temp\MyFile.txt to C:\Temp and you selected this option, the full path to the restored file will be C:\Temp\F\Temp\MyFile.txt.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

# SCO OpenServer File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar SCO OpenServer File System plugin.

## Backup Options

FIELD/OPTION	DESCRIPTION								
Backup label	Assigns this descriptive label to backup.								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> <b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: #000080; color: white; padding: 5px; text-align: center;">LOGGING</div> <b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.								



	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

	FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b>	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.

Restore Options

FIELD/OPTION	DESCRIPTION								
Overwrite existing files	<p>Controls behavior when file to be restored already exists. One of the following:</p> <p>Never</p> <p>Always</p> <p>Generate New Name</p> <p>If Modified</p> <p>If Newer</p>								
List backup contents	<p>Specifies how much information about backup contents should be included in the log files. One of the following:</p> <p>No file listing</p> <p>List file names</p> <p>List files and dates</p>								
<p>Informational message level</p>	<p>Specifies how many informational messages should be included in the log files. One of the following:</p> <table border="0"> <tr> <td>No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<b>Enable debugging messages</b>	<p>If selected, maximum information is written to log files.</p> <p><b>IMPORTANT:</b> If selected, very large log files are created.</p>								

LOGGING

FIELD/OPTION		DESCRIPTION
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session. <b>IMPORTANT:</b> Script must be located in /usr/local/avamar/etc/scripts.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
<b>ADVANCED OPTIONS</b>	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring /usr/MyDir/MyFile to /tmp and you selected this option, the full path to the restored file will be /tmp/usr/MyDir/MyFile.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

# Solaris File System Plugin Options

This topic lists and describes the plugin options available for use with the Avamar Solaris File System plugin.

## Backup Options

FIELD/OPTION	DESCRIPTION	
Backup label	Assigns this descriptive label to backup.	
<b>LOGGING</b>	List backup contents Specifies how much information about backup contents should be included in the log files. One of the following: No file listing List file names List files and dates	
	Informational message level Specifies how many informational messages should be included in the log files. One of the following: No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files. Some informationals    Some informational messages are included in the log files. Many informationals    Additional status information is included in the log files. All informationals        Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.	
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in /opt/AVMRcInt/etc/scripts on HP-UX and Solaris.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in /opt/AVMRcInt/etc/scripts on HP-UX and Solaris.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b> Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.

## Restore Options

FIELD/OPTION	DESCRIPTION								
Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:  Never  Always  Generate New Name  If Modified  If Newer								
List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates								
Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  <table border="0"> <tr> <td>No informationals</td> <td>All informational messages are suppressed. However, errors and warnings are included in the log files.</td> </tr> <tr> <td>Some informationals</td> <td>Some informational messages are included in the log files.</td> </tr> <tr> <td>Many informationals</td> <td>Additional status information is included in the log files.</td> </tr> <tr> <td>All informationals</td> <td>Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.</td> </tr> </table>	No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.	Some informationals	Some informational messages are included in the log files.	Many informationals	Additional status information is included in the log files.	All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
No informationals	All informational messages are suppressed. However, errors and warnings are included in the log files.								
Some informationals	Some informational messages are included in the log files.								
Many informationals	Additional status information is included in the log files.								
All informationals	Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.								
<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.								
<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.								

LOGGING



FIELD/OPTION		DESCRIPTION
PRE-SCRIPT	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session. <b>IMPORTANT:</b> Script must be located in /opt/AVMRcInt/etc/scripts on HP-UX and Solaris.
	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.
POST-SCRIPT	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session. <b>IMPORTANT:</b> Script must be located in /opt/AVMRcInt/etc/scripts on HP-UX and Solaris.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
CLIENT CACHE OPTIONS	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
ADVANCED OPTIONS	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring /usr/MyDir/MyFile to /tmp and you selected this option, the full path to the restored file will be /tmp/usr/MyDir/MyFile.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.

# Windows File System Plug-in Options

This topic lists and describes the plug-in options available for use with the Avamar Windows File System plug-in.

## Backup Options

FIELD/OPTION	DESCRIPTION	
Backup label	Assigns this descriptive label to backup.	
<b>LOGGING</b>	List backup contents Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates	
	Informational message level Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.	
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.
	<b>Backup Windows System State</b>	If selected, include Windows system state information so that this backup can be used for future disaster recovery.

	FIELD/OPTION	DESCRIPTION
<b>FILESYSTEM TRAVERSAL</b>	<b>Do not traverse any mounts</b>	If selected, no mount points are traversed during this backup.
	<b>Traverse fixed-disk mounts</b>	If selected, only fixed-disk filesystem mount points are traversed during this backup.
	<b>Traverse fixed-disk and remote network mounts</b>	If selected, both fixed-disk and NFS network mount points are traversed during this backup.
	Force traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should be traversed during this backup.
	Force non-traversal of specified file system type(s)	Accepts a comma-separated list of one or more filesystem types (for example, nfs, ext2, jfs, xfs) that should not be traversed during this backup.
<b>PRE-SCRIPT</b>	<b>Run user-defined script at beginning of backup</b>	Runs user-defined script at beginning of backup session. <b>IMPORTANT:</b> Script must be located in C:\Program Files\avs\etc\scripts on Windows and must have a .bat, .js or .vbs extension.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>-SCRIPT AFTER FREEZE</b>	<b>Run user-defined script after volumes have been frozen</b>	Runs user-defined script after volumes have been frozen. <b>IMPORTANT:</b> Script must be located in C:\Program Files\avs\etc\scripts on Windows and must have a .bat, .js or .vbs extension.
	<b>Abort backup if script fails</b>	If selected, stop backup if script returns a non-zero status code.
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of backup</b>	Runs user-defined script at end of backup session. <b>IMPORTANT:</b> Script must be located in C:\Program Files\avs\etc\scripts on Windows and must have a .bat, .js or .vbs extension.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.

	FIELD/OPTION	DESCRIPTION
<b>VOLUME FREEZING</b>	Method to freeze volumes	One of the following: Best Microsoft VSS OTM None
	OTM freezewart: File activity quiescent time	OTM only: Number of seconds that volume(s) must be quiescent to establish a freeze.
	OTM freezetimeout: Maximum time to wait when trying to freeze volume(s)"	OTM only: Maximum number of seconds to wait for volumes to freeze.
	OTM freezecachesize: Size in MBs of OTM transaction cache	OTM only: Size of disk transaction cache. Negative value is fraction of used disk space (for example, -50 is 1/50th or 2%).
	OTM freezecachedir: Folder to use for the OTM transaction cache	OTM only: Path of a folder to store the OTM transaction cache. Default location is the Avamar VAR folder.
	Freeze exclude devices	Comma separated list of devices (for example, \Device\mydevice\*) to exclude from volume freezing.
	Freeze exclude volumes	Comma separated list of volume names (for example, C:) to exclude from freezing.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a backup is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Maximum client file cache size (MBs)	Specifies maximum client file cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client file cache).
	Maximum client hash cache size (MBs)	Specifies maximum client hash cache size in MBs. A negative value indicates a fraction of RAM (for example, -8 specifies that no more than 1/8th of physical RAM be allocated to the client hash cache).

	FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b>	Client-side flag file	Specifies path to a flag file on the client, which contains additional option settings.
	Network usage throttle (Mbps)	Specifies a setting that reduces network usage to specified rate, expressed as megabits/second (for example, 0 = unrestricted, 50% of a T1 = 0.772).
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve backup performance under certain circumstances.
	Use Last Access Time to detect ACL-only changes	If selected, forces a rescan of any files in which the Access Time has changed since the previous backup.

## Restore Options

FIELD/OPTION	DESCRIPTION
Overwrite existing files	Controls behavior when file to be restored already exists. One of the following:  Never  Always  Generate New Name  If Modified  If Newer
Restoration of open files	One of the following:  Never                      Do not restore.  Defer until reboot        Defer restore until system is rebooted.  Generate new name        Restore file with a different name.  If newer defer until reboot

FIELD/OPTION		DESCRIPTION
<b>LOGGING</b>	List backup contents	Specifies how much information about backup contents should be included in the log files. One of the following:  No file listing  List file names  List files and dates
	Informational message level	Specifies how many informational messages should be included in the log files. One of the following:  No informationals      All informational messages are suppressed. However, errors and warnings are included in the log files.  Some informationals      Some informational messages are included in the log files.  Many informationals      Additional status information is included in the log files.  All informationals      Provides maximum information. In addition to errors and warnings, all informational messages are included in the log files.
	<b>Report advanced statistics</b>	If selected, advanced timing and deduplication statistics are written to log files.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.
	<b>Run user-defined script at beginning of restore</b>	Runs user-defined script at beginning of restore session.  <b>IMPORTANT:</b> Script must be located in C:\Program Files\avs\etc\scripts on Windows and must have a .bat, .js or .vbs extension.
<b>PRE-SCRIPT</b>	<b>Abort restore if script fails</b>	If selected, stop restore if script returns a non-zero status code.

	FIELD/OPTION	DESCRIPTION
<b>POST-SCRIPT</b>	<b>Run user-defined script at end of restore</b>	Runs user-defined script at end of restore session. <b>IMPORTANT:</b> Script must be located in C:\Program Files\avs\etc\scripts on Windows and must have a .bat, .js or .vbs extension.
	<b>Exit process with script failure exitcode</b>	If selected, <b>avtar</b> exits with the exit code of the script instead of a standard <b>avtar</b> exit code.
<b>CLIENT CACHE OPTIONS</b>	<b>Check client-side caches and report inconsistencies</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server.
	<b>Check and repair client-side caches</b>	If selected, a restore is not performed. Instead, forces a validation check of client-side cache with the Avamar server, and repairs inconsistencies.
	Rebuild client-side caches from most recent backup	Does not restore data. If selected, the contents of last backup are used to re-create client-side file cache.
<b>ADVANCED OPTIONS</b>	<b>Do not descend into subdirectories</b>	If selected, restore only the specified top-level directory; do not restore any subdirectories.
	<b>Recreate original path beneath target directory</b>	If selected, re-create the original path to files and directories beneath the specified target directory. For example, if restoring F:\Temp\MyFile.txt to C:\Temp and you selected this option, the full path to the restored file will be C:\Temp\F\Temp\MyFile.txt.
	Restore hidden folders and files	If selected, also restore folders and files that have the HIDDEN attribute set in the backup.
	Restore folders and files with SYSTEM attribute	If selected, also restore folders and files that have the SYSTEM attribute set in the backup.
	<b>Directly connect to all server nodes</b>	If selected, establish multiple connections to the server. This can improve restore performance under certain circumstances.



## DB2 Plug-in Options

This topic lists and describes the plug-in options available for use with any of the following Avamar AIX DB2 plug-ins:

- AIX DB2
- Windows DB2
- Linux DB2

### Backup Options

	FIELD/OPTION	DESCRIPTION
	<b>Create an ONLINE backup</b>	If selected, database can be backed up while it is operational (also known as “hot backup”). <b>IMPORTANT:</b> DB2 Archive Logging must already be enabled to successfully perform online backups.
	<b>Exclude archive logs in ONLINE backup</b>	<b>IMPORTANT:</b> By default, the archive logs are included in the backup. If you decide not to include the archive logs in the backup, select <b>Exclude archive logs in ONLINE backup</b> . However, if you do not include archive logs in the database backup, ensure that archive logs are included in filesystem backups. Failure to do so might result in loss of data.
	Instance Admin Username	
	Instance Admin Password	Password for the Instance Admin Username.
<b>ADVANCED OPTIONS</b>	<b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

## Restore Options

FIELD/OPTION		DESCRIPTION
<b>RECOVER OR RESTORE</b>	Restore and Recover	For online backups that have archive logs, restores both the database and the archive logs, and rolls the database forward (recovers it). If this option is selected, you must select one of the options from the Type of Recovery list and specify a value in the Directory path to restore archive logs field.
	Restore Only	Performs only a restore of the backups (no recovery). Select this option to restore a backup without recovery, to restore offline backups, or to restore online backups that do not have archive logs.
	<b>Restore only archive logs from ONLINE backup</b>	Restores only the archive logs from the backup image. It does not restore the database.
<b>RECOVERY TYPE</b>	Type of Recovery	When the Restore and Recover option is selected, choose a recovery option from the list: <ul style="list-style-type: none"> <li>End of Logs      Database is rolled forward until the end of the archive logs.</li> <li>Point In Time    Database is rolled forward until a certain point in time, which should be specified in the Date and Time field.</li> <li>End of Backup    Database is rolled forward until the end of the backup. This option is available only for DB2 v9.5 and later.</li> </ul>
	Date and Time	When Point In Time is selected from the Type of Recovery list, specify the recovery date and time in yyyy-mm-dd hh:mm:ss format in this field. The time should be in the time zone of the client system. The entry can be truncated to the desired precision level. For example, minutes and seconds can be omitted for convenience.
<b>GENERAL</b>	Instance Admin Username	
	Instance Admin Password	Password for the Instance Admin Username.
	Database Name	If Restore everything to a different location is selected (redirected restore), then specify the new name for the database in this field.
	Directory path to restore archive logs	Full path to the location on the target filesystem to which archive logs are written.

FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b> <b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

## Lotus Domino Plug-in Options

This topic lists and describes the plug-in options available for use with the AIX Lotus Domino and Windows Lotus Domino plug-ins.

### Backup Options

FIELD/OPTION	DESCRIPTION
Backup label	Assign this descriptive label to backup.
<b>Follow links</b>	If selected, back up databases and directories pointed to by links.
Backup Type	One of the following:  Full                Back up all databases and files required for a complete recovery.  Incremental      Back up transaction logs and new database files that were created since the last full or incremental backup.  Subset              Back up selected database files.
Full path of the Domino server's notes.ini file	Type the full pathname of Domino server's notes.ini file.  <ul style="list-style-type: none"> <li>• On Windows, the default folder is C:\Program Files\IBM\Lotus\Domino\data\.</li> <li>• On AIX, the default directory is /data/notesdata/.</li> </ul>
Full path of the Domino directory	Type the full path of the Domino directory.  <ul style="list-style-type: none"> <li>• On Windows, the default folder is C:\Program Files\IBM\Lotus\Domino\.</li> <li>• On AIX, the default directory path is /opt/ibm/lotus/notes/80010/ibmpow/.</li> </ul>
Domino user name	Type the Domino username.  This is the OS user, which has permissions to start and stop the Domino server on the IBM AIX machine.  The default username is notes.  <b>NOTE:</b> This field is specific to the AIX Lotus Domino plug-in.
<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.

FIELD/OPTION		DESCRIPTION
<b>TRANSACTION LOGS</b>	Back up transaction logs with full backup	If selected, include transaction logs with the backup. By default, this option is selected.
	Archive transaction logs	If selected, archive transaction logs following the backup. By default, this option is selected.
	Terminate backup on error	If selected, terminate the backup if an error occurs.

## Restore Options

FIELD/OPTION	DESCRIPTION
<b>Bring all databases online after restore</b>	If selected, all databases are automatically brought online following a successful restore. By default, this option is selected.
<b>Overwrite files</b>	If selected, the restore operation overwrites existing databases or files with the restored data. Clear this option to prevent the restore operation from overwriting existing database or files (that is, no data is restored to these databases or files). Any skipped databases or files will be noted in log entries. By default, this option is not set.
Domino user name	Type Domino username. This is the OS user, which has permissions to start and stop the Domino server on the IBM AIX machine. The default username is notes. <b>NOTE:</b> This field is specific to the AIX Lotus Domino plug-in.
Enable debugging messages	If selected, write maximum information to log files. <b>IMPORTANT:</b> If set, large files are created.
Restore system databases	If selected, system databases are restored. You must stop the Domino server to restore system databases. <b>NOTE:</b> System databases include: busytime.nsf, ddm.nsf, events4.nsf, log.nsf, mail.box, names.nsf and mailjrn.nsf.
Specifies full paths for the Domino configuration file and directory	If selected, the restore operation uses the pathnames specified by the Full path of the Domino server's notes.ini file and Full path of the Domino directory fields. <b>IMPORTANT:</b> The use of this option is usually necessary only if the Lotus Domino configuration has changed or the Domino server has been reinstalled in a new location. In these types of situations, you must provide the current pathnames to restore database files. <b>NOTE:</b> A restore operation, by default, uses the same pathnames for the notes.ini file and Domino directory as the ones that were used for the backup.

FIELD/OPTION	DESCRIPTION	
Full path of the Domino server's notes.ini file	<p>If <b>Specify full paths for the Domino configuration file and directory</b> is selected, type the full pathname to the Domino server's notes.ini file.</p> <p>On Windows, the default folder is C:\Program Files\IBM\Lotus\Domino\data\.</p> <p>On AIX, the default directory is /data/notesdata/.</p>	
Full path of the Domino directory	<p>If <b>Specify full paths for the Domino configuration file and directory</b> is selected, type the full pathname of the Domino directory.</p> <p>On Windows, the default folder is C:\Program Files\IBM\Lotus\Domino\.</p> <p>On AIX, the default directory path is /opt/ibm/lotus/notes/80010/ibmpow/.</p>	
<b>RECOVER</b>	<p><b>Recover the databases by using transaction logs</b></p>	<p>If selected, the restore operation uses transaction logs to recover database files to a specific date and time.</p> <p>By default, this option is selected.</p>
	<p>Recover the databases in batch</p>	<p>If selected, restore databases in a batch process.</p> <p>If any one database encounters a problem during a batch recovery, the recovery fails for all databases that were selected.</p> <p><b>IMPORTANT:</b> The use of this option is intended for advanced users, who are familiar with the recovery of Domino databases.</p>
	<p><b>Create new DBIID during recovery</b></p>	<p>If selected, the Domino server assigns new DBIIDs to recovered databases.</p> <p>By default, this option is not selected.</p> <p><b>IMPORTANT:</b> Because database transactions are specific to the DBIID, transaction logs prior to the recovery cannot be applied. Avamar recognizes a database with a new DBIID as an entirely new database.</p>
	<p>Create new DBIID and ReplicaID during recovery</p>	<p>If selected, the Domino server assigns new ReplicaIDs and DBIIDs to recovered databases.</p> <p>By default, this option is not selected.</p> <p><b>IMPORTANT:</b> Because transactions are specific to the DBIID, transaction logs prior to the recovery cannot be applied. Avamar recognizes a database with a new DBIID as an entirely new database.</p>

	FIELD/OPTION	DESCRIPTION
<b>RECOVER TIME</b>	<b>Now</b>	If selected, restore each database to its original state at the time of the backup. Then, transaction logs are used to recover all data until now.  By default, this option is selected.
	<b>Other date/time</b>	If selected, restore each database to its original state at the time of the backup. Then, transaction logs are used to recover all data up to the date and time specified in the Recover date/time (yyyy-mm-dd hh:mm:ss) field.
	<b>Backup date/time</b>	If selected, restore each database to its original state at the time of its backup.
	Recover date/time (yyyy-mm-dd hh:mm:ss)	If Other date/time is selected, type the calendar date to which you want to recover data. Entry must be in the following format: <b>YYYY-MM-DD hh:mm:ss:mmm</b> where <ul style="list-style-type: none"> <li>• YYYY is a four-digit year.</li> <li>• MM is a two-digit month of the year.</li> <li>• DD is a two-digit day of the month (date).</li> <li>• hh is a two-digit hour of the day.</li> <li>• mm is the two-digit number of minutes past the hour.</li> <li>• ss is the two-digit number of seconds past the minute.</li> </ul> Dashes (-) must separate year, month, and dates. Colons (:) must separate hours, minutes, and seconds. It is permissible to truncate this entry to the desired precision. For example, if no minutes are supplied, top of the hour is assumed.
<b>DAOS OPTIONS</b>	Restore missing NLO files	If selected, restores missing NLO files referenced by the databases that are successfully restored. By default, this option is selected. <b>NOTE:</b> The process of finding NLO files might take a long time.
	Synchronize DAOS catalog files	If selected, synchronizes the DAOS catalog file. <b>NOTE:</b> The process of synchronizing the DAOS catalog file might take a long time.



FIELD/OPTION	DESCRIPTION	
<b>NUMBER OF DATABASES TO RESTORE PER BATCH</b>	Controls the number of databases that are restored in a single restore pass (iteration). Smaller settings (fewer databases per batch) allow you to bring those databases online sooner to reduce downtime, but require more iterations. Select one of the following:	
	<b>Default</b>	If selected, each restore pass (iteration) processes 10 databases. By default, this option is selected.
	<b>All</b>	If selected, restore all databases in a single pass (iteration).
	<b>User Defined</b>	If selected, the number of database you specify in the Number of databases to restore per batch field are restored in a single pass (iteration).
	Number of databases to restore per batch	If User Defined is selected, type the desired number of databases to restore for each pass (iteration).

## NDMP Plugin Options

This topic lists and describes the plugin options available for use with any of the following Avamar NDMP plugins:

- NDMP
- EMC Celerra via NDMP
- Netapp Filer via NDMP

### Backup Options

FIELD/OPTION	DESCRIPTION
Filer Dump Mode	One of the following:  Prefer Incremental, but do a Full if required  Prefer Incremental, but do a Full if required  Force an incremental (level 1) dump
<b>Save file/directory permissions(ACL's) with the backup</b>	If selected, extended file and directory Access Control Lists (ACLs) are saved during the backup. This is the default setting.  <b>NOTE:</b> This option is not available for use with the EMC Celerra via NDMP plugin.  <b>IMPORTANT:</b> Unsetting this option prevents the Avamar server from saving ACLs during your backup. You will therefore not be able to restore ACLs at any future time.

### Restore Options

FIELD/OPTION	DESCRIPTION
<b>Restore file/directory permissions(ACL's) that were saved with the backup</b>	If selected, ACLs saved during NDMP backups are restored.  <b>NOTE:</b> This option is not available for use with the EMC Celerra via NDMP plugin.  <b>IMPORTANT:</b> If ACLs were not saved during the NDMP backup, they cannot be restored.

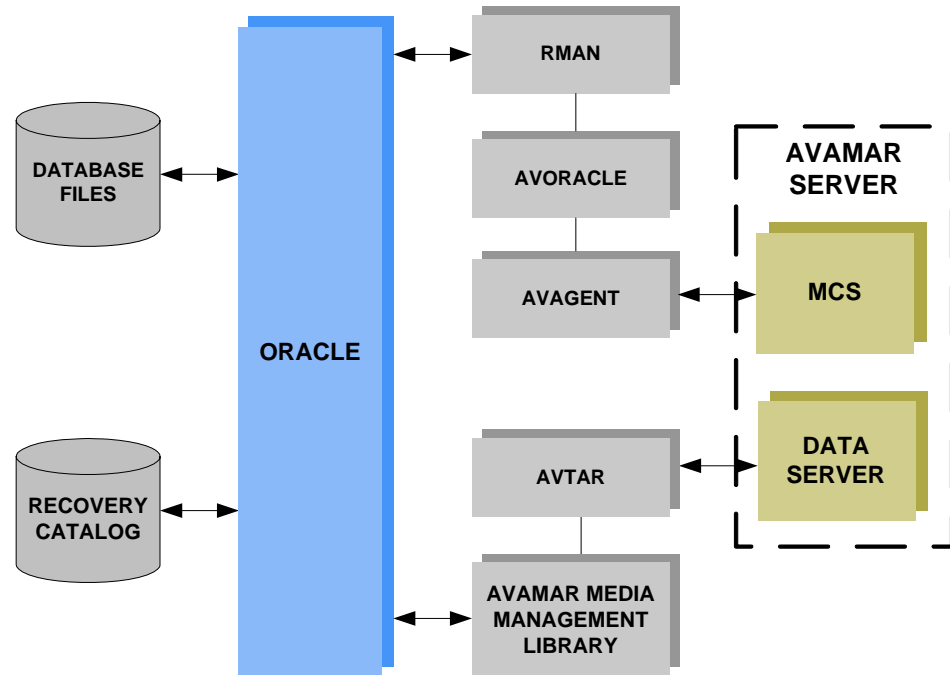
## Oracle RMAN Plug-in Options

This topic describes the plug-in options available for use with any of the following Oracle RMAN plug-ins:

- AIX Oracle RMAN
- Linux Oracle RMAN
- Solaris Oracle RMAN
- Windows Oracle RMAN

### Theory of Operation

During backups and restores, the Avamar Oracle database plug-in generates an RMAN script that performs the actual backup and restore of the specified database. The Avamar client agent runs RMAN with this generated script, which directs Oracle to open a connection with an RMAN module from EMC, which in turn invokes an **avtar** session to connect to the Avamar server.



The following is an example RMAN script, which typically might be generated as part of an Oracle database backup:

```
configure controlfile autobackup on;
run {
allocate channel c1 type sbt;
send 'connect information for avtar to connect to the Avamar server';
backup database; }
```

During the backup or restore operation, RMAN produces a log file which is captured and readable from within Avamar Administrator. For example:

```
Recovery Manager: Release 10.1.0.2.0 - Production

Copyright (c) 1995, 2004, Oracle. All rights reserved.
```

```

connected to target database: ORACLE (DBID=1420649215)
using target database controlfile instead of recovery catalog

RMAN> configure controlfile autobackup on;
2> run {
3> allocate channel c1 type sbt;
4> send '... ';
6> backup database;
7> }
8>
old RMAN configuration parameters:
CONFIGURE CONTROLFILE AUTOBACKUP OFF;
new RMAN configuration parameters:
CONFIGURE CONTROLFILE AUTOBACKUP OFF;
new RMAN configuration parameters are successfully stored

allocated channel: c1
channel c1: sid=142 devtype=SBT_TAPE
channel c1: AVTAR/Avamar backup (EMC)

sent command to channel: c1

Starting backup at 21-MAR-05
channel c1: starting full datafile backupset
channel c1: specifying datafile(s) in backupset
input datafile fno=00001
name=D:\ORACLE\PRODUCT\10.1.0\ORADATA\ORACLE\ORACLE\SYSTEM01.DBF
input datafile fno=00003
name=D:\ORACLE\PRODUCT\10.1.0\ORADATA\ORACLE\ORACLE\SYSAUX01.DBF
input datafile fno=00002
name=D:\ORACLE\PRODUCT\10.1.0\ORADATA\ORACLE\ORACLE\UNDOTBS01.DBF
input datafile fno=00004
name=D:\ORACLE\PRODUCT\10.1.0\ORADATA\ORACLE\ORACLE\USERS01.DBF
channel c1: starting piece 1 at 21-MAR-05
channel c1: finished piece 1 at 21-MAR-05
piece handle=15gfs32k_1_1 comment=API Version 2.0,MMS Version 2.2.0.108 channel c1:
backup set complete, elapsed time: 00:00:45 channel c1: starting full datafile
backupset channel c1: specifying datafile(s) in backupset including current controlfile
in backupset including current SPFILE in backupset channel c1: starting piece 1 at 21-
MAR-05 channel c1: finished piece 1 at 21-MAR-05 piece handle=16gfs34l_1_1 comment=API
Version 2.0,MMS Version 2.2.0.108 channel c1: backup set complete, elapsed time:
00:00:17 Finished backup at 21-MAR-05 released channel: c1

Recovery Manager complete.

```

## Backup Options

FIELD/OPTION	DESCRIPTION
Oracle instance name	<p>Specifies Oracle server name.</p> <p>This field can normally be left blank because the Oracle instance name is automatically stored when the target client is browsed during on-demand backup or when a dataset is applied to a member of a group during a scheduled backup.</p>

FIELD/OPTION	DESCRIPTION
User name	<p>Specifies username that is used to authenticate with the Oracle database.</p> <p>If left blank, RMAN tries to log in with the same username and password that the Avamar client agent uses and attempts to assume SYSDBA privileges.</p> <p>Typically, this field should contain the special account name (backupuser) that was created manually as part of database preparation.</p> <p>Username and password comprise a connection string to Oracle. The connection string must specify a user that has backup privileges for the database.</p>
Password	Type the backupuser account password.
Number of RMAN channels	<p>Specifies the number of channels to allocate during a backup or restore. The maximum number is 6. Default is one.</p> <p><b>NOTE:</b> Allocating multiple channels for backups and restores may improve performance. Performance improvements for backups and restores, however, depend on the Oracle server configuration.</p> <p><b>IMPORTANT:</b> In some instances allocating too many channels may lock out processes, which can result in a timeout error. This problem does not occur when using RMAN scripts.</p>
<b>Backup archive logs with database</b>	If selected, Oracle archive logs are automatically backed up during the database backup.
<b>Delete archive logs after backup</b>	If selected, Oracle archive logs are automatically deleted immediately following a successful database backup.
<b>Enhanced data deduplication</b>	<p>Enables or disables enhanced data deduplication. During backups, enhanced data deduplication typically reduces the amount of client data that must be sent to the server, but, requires additional client CPU resources. Choices are:</p> <p>Default      Use the global enhanced data deduplication setting already set on the server. This is the default setting.</p> <p>Disabled      Do not use enhanced data deduplication for backups.</p> <p>Enabled      Use enhanced data deduplication for backups.</p>


FIELD/OPTION	DESCRIPTION	
Media Management Library bitwidth	<p>Specifies Media Management Library (MML) bitwidth. Choices are:</p> <ul style="list-style-type: none"> <li>• automatic (default)</li> <li>• 32-bit</li> <li>• 64-bit</li> </ul> <p><b>NOTE:</b> The Media Management Library bitwidth option is available for Linux and Unix Oracle RMAN plug-ins. This option does not apply to Windows platforms.</p>	
<b>BACKUP TYPE</b>	Full backup	<p>If selected, back up all datafiles, redo logs, and archive logs.</p> <p>Full backups do not use Block Change Tracking. This option is the default.</p>
	Level 0 backup	<p>If selected, perform a level 0 backup.</p> <p>Level 0 backups save all datafiles, redo logs, and archive logs.</p> <p>A level 0 backup is required before performing level 1 backups.</p> <p>You must enable the RMAN Change Block Tracking feature before performing a level 0 backup. <i>Enabling Block Change Tracking</i> (page 68) provides more information.</p>
	Level 1 backup	<p>If selected, perform a level 1 backup.</p> <p>Level 1 backups save only changed blocks of the database.</p> <p>A level 0 backup is required before you perform a level 1 backup. Selecting the Level 1 backup option before creating a level 0 backup, results in a level 0 backup.</p> <p>You must enable the RMAN Change Block Tracking feature before performing a level 1 backup. <i>Enabling Block Change Tracking</i> (page 68) provides more information.</p>
	<p><b>NOTE:</b> The AIX Oracle RMAN plug-in does not include level 0 or level 1 backup options. Level 0 and 1 backups of Oracle databases are not supported on IBM AIX platforms.</p>	

	FIELD/OPTION	DESCRIPTION
<b>RECOVERY CATALOG</b>	<b>Use recovery catalog</b>	If selected, Recovery catalog server name, Recovery catalog username, and Recovery catalog password settings are used to specify a recovery catalog server connection string for RMAN.  By using a recovery catalog server, many specialized features of RMAN may be used. A thorough discussion of these features is beyond the scope of this publication. Refer to your Oracle documentation for additional information.
	Recovery catalog server name	Specifies recovery catalog server name.
	Recovery catalog user name	Specifies recovery catalog username.
	Recovery catalog password	Specifies recovery catalog password.
<b>ADVANCED OPTIONS</b>	<b>Enable debugging messages</b>	If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.
	NLS_DATE_FORMAT	Specifies a valid timestamp format for the target machine. For example: MM/DD/YYYY

## Restore Options

FIELD/OPTION	DESCRIPTION
Oracle instance name	<p>Specifies Oracle server name.</p> <p>This field can normally be left blank because the Oracle instance name is automatically stored when the target client is browsed during on-demand backup or when a dataset is applied to a member of a group during a scheduled backup.</p>
User name	<p>Specifies username that is used to authenticate with the Oracle database.</p> <p>If left blank, RMAN tries to log into with the same username and password the Avamar client agent is running under, and attempts to assume SYSDBA privileges.</p> <p>Typically, this field should contain the special account name (backupuser) that was created manually as part of database preparation.</p> <p>Username and password comprise a connection string to Oracle. The connection string must specify a user that has backup privileges for the database.</p>
Password	<p>Specifies password for the Username account.</p>
Media Management Library bitwidth	<p>Specifies Media Management Library (MML) bitwidth. Choices are:</p> <ul style="list-style-type: none"> <li>• Automatic (default)</li> <li>• 32-bit</li> <li>• 64-bit</li> </ul> <p><b>NOTE:</b> The Media Management Library bitwidth option is available for Linux and Unix Oracle RMAN plug-ins. This option does not apply to Windows platforms.</p>
Number of RMAN channels	<p>Specifies the number of channels to allocate for the restore operation. The maximum number is six.</p> <p>Default is one.</p> <p><b>NOTE:</b> Allocating more channels may not always improve performance. Performance improvement depends on the Oracle server configuration.</p> <p><b>IMPORTANT:</b> In some instances allocating too many channels may lock out processes, which can result in a timeout error. This problem does not occur when using RMAN scripts.</p>



FIELD/OPTION	DESCRIPTION
Point-in-time recovery mode	<p>Specifies the type of recovery.</p> <p>Do not specify a point-in-time option if you selected multiple databases for the restore.</p> <p><b>IMPORTANT:</b> Before using a point-in-time recovery option other than Default, ensure that relevant backups are available on the Avamar server. The recovery operation will fail if a backup has expired or has been deleted from the Avamar server. Choices are:</p> <p>Default      Recovers the database to the most recent SCN. Avamar Oracle Client automatically determines the SCN from the control file.</p> <p>SCN            Recovers the database to the specified SCN.</p> <p>                  Specify the SCN in the Point-in-time recovery value text box.</p> <p>Log sequence   Recovers the database to the specified log sequence number.</p> <p>                  Specify the log sequence number in the Point-in-time recovery value text box.</p> <p>By default, Avamar Oracle Client uses thread 1. To specify a different thread number:</p> <ol style="list-style-type: none"> <li>1. Click <b>More</b>.</li> <li>2. Type <b>THREAD</b> in the Enter Attribute text box.</li> <li>3. Type the specific thread number in the Enter Attribute Value text box.</li> <li>4. Click .</li> </ol>

FIELD/OPTION	DESCRIPTION
Point-in-time recovery mode (continued)	<p>Time stamp</p> <p>Recovers the database to the specified timestamp.</p> <p>Specify the timestamp in the <b>Point-in-time recovery value</b> text box. The timestamp format must conform to the localization settings on the target machine and locale configuration setting for the Oracle server.</p> <p>The timestamp order of precedence rules from highest to lowest are as follows:</p> <p>Highest — A timestamp format specified by the NLS_DATE_FORMAT text box (advanced option).</p> <p>Lower — A timestamp format specified by the NLS_DATE_FORMAT variable in environment settings.</p> <p>Lowest — The built-in default timestamp format uses american_america.us7ascii.</p> <p>The format is:  MM DD YYYY HH24:MI:SS</p> <p>where:</p> <ul style="list-style-type: none"> <li>• MM is a two-digit month.</li> <li>• DD is a two-digit day of the month.</li> <li>• YYYY is a four-digit year.</li> <li>• HH24 is the hour using a 24-hour format.</li> <li>• MI is minutes.</li> <li>• SS is seconds.</li> </ul> <p>Avamar Oracle Client generates a script by using the timestamp specification and the format (determined by the precedence rules) and sends the script to RMAN. The timestamp format specified in the NLS_DATE_FORMAT text box is also added to the ENV setting before RMAN is called.</p> <p>For more information about Oracle and RMAN localization, refer to Oracle documentation.</p>
Point-in-time recovery value	<p>Specifies the SCN, log sequence number, or timestamp depending on which point-in-time recovery mode is selected.</p>

FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b> <b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.
NLS_DATE_FORMAT	Specifies a valid timestamp format for the target machine. For example: MM/DD/YYYY

## Microsoft Office SharePoint Server Plug-in Options

This topic lists and describes the plug-in options available for use with the Avamar Microsoft Office SharePoint Server plug-in.

### Backup Options

FIELD/OPTION	DESCRIPTION
Temporary backup directory	Temporary backup directory
Backup Type	Sets backup level: either Full or Differential
<b>Remove temporary backup files after backup completes</b>	
<b>ADVANCED OPTIONS</b> Enable debugging messages	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

### Restore Options

FIELD/OPTION	DESCRIPTION
Username	Username with admin rights on farm.
Password	
Restore Type	Restore by overwriting existing data (Overwrite) or restore just the new data (New).
<b>ADVANCED OPTIONS</b> Enable debugging messages	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

## Windows Exchange Database Plugin Options

This topic lists and describes the plugin options available for use with the Avamar Windows Exchange Database plugin. This plugin supports both Exchange 2007 and 2003 database backup and restore.

### Backup Options

FIELD/OPTION	DESCRIPTION
<b>Set when backup occurs on clustered systems</b>	<p>Choices are:</p> <p>Always                      Backs up all nodes in the cluster. This is the default setting.</p> <p>Active node only            Only the active node in the cluster is backed up.</p> <p>Passive node only            Only passive nodes in the cluster are backed up.</p> <p>Refer to your <i>Avamar Backup Clients User Guide</i> for additional information about Avamar support for Microsoft Windows Clusters.</p>
<b>Delete log files after snapup</b>	<p><b>IMPORTANT:</b> Do not select this option if you are performing concurrent incremental backups.</p>
<b>Enhanced Commonality Factoring</b>	<p>Enables or disables enhanced data deduplication. During backups, enhanced data deduplication typically reduces the amount of client data that must be sent to the server but requires additional client CPU resources. Choices are:</p> <p>Default                      Use the global enhanced data deduplication setting already set on the server. This is the default setting.</p> <p>Disabled                      Do not use enhanced data deduplication for backups.</p> <p>Enabled                      Use enhanced data deduplication for backups.</p>

FIELD/OPTION	DESCRIPTION						
<b>ADVANCED OPTIONS</b>	<p>Server Name</p> <p>This field can normally be left blank because the Exchange server name is automatically stored when the target client is browsed during on-demand backups or when a dataset is applied to a member of a group during a scheduled backup.</p>						
	<p>Annotation (Microsoft Information Store)</p> <p>This field names the portion of (Extensible Storage Engine (ESE) backup to perform. Choices are:</p> <table border="0"> <tr> <td>Microsoft Information Store</td> <td>This is the default setting.</td> </tr> <tr> <td>Microsoft Site Replication Service</td> <td>Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.</td> </tr> <tr> <td>Microsoft Key Management Service</td> <td>This is the local activation service that provides Windows activation, instead of using Microsoft's external product activation.</td> </tr> </table>	Microsoft Information Store	This is the default setting.	Microsoft Site Replication Service	Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.	Microsoft Key Management Service	This is the local activation service that provides Windows activation, instead of using Microsoft's external product activation.
	Microsoft Information Store	This is the default setting.					
	Microsoft Site Replication Service	Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.					
	Microsoft Key Management Service	This is the local activation service that provides Windows activation, instead of using Microsoft's external product activation.					
<p>Storage Group Name</p> <p>This field can normally be left blank because the Exchange storage group name is automatically stored when the target client is browsed during on-demand backups or when a dataset is applied to a member of a group during a scheduled backup.</p>							
<p><b>Pipe input/output to avtar</b></p> <p>If selected, backups and restores are performed directly by the Avamar backup process (<b>avtar</b>).            If cleared, an intermediate local backup file can be used.</p>							
<p><b>Enable debugging messages</b></p> <p>If selected, maximum information is written to log files.  <b>IMPORTANT:</b> If selected, very large log files are created.</p>							

## Restore Options

FIELD/OPTION	DESCRIPTION
<b>Perform Database Recovery after restore making Exchange consistent</b>	Performs soft recovery (performs a consistency check and prepares to put the database online) after database is restored. This is the default setting.
Wait for Database Recovery to Complete	If <b>Perform Database Recovery after restore making Exchange consistent</b> is selected, specifies whether to wait for the recovery process to complete or complete the restore session asynchronously with the recovery process. Dependent on the previous option. This is the default setting.
Mount the database(s) after successful restore	If selected, databases will be mounted following a successful restore. This is not the default setting.
Keep logs after Restore	If selected, restore log files are written to the location specified in the Restore logs path field.
Restore logs path	Specifies location for restore log files. Specify this alternative location C:\TMP if drive is low on disk space.
<b>Adjust for gaps when existing log files are not contiguous</b>	If selected, restore operation will include a check for contiguous log files error and will correct the error. This is the default setting.
Move logs path	Specifies location for keeping old restore log files. Existing log files are moved to this location prior to the restore operation. This prevents log file conflicts during restore.
<b>Recovery Storage Group Name</b>	Specifies Recovery Storage Group that will be created during the restore operation. Default name is RSG.
Redirected storage group path	Specifies location for redirect restores that include a Recovery Storage Group. The Recovery Storage Group name specified in the <b>Recovery Storage Group Name</b> field is created under this location.

FIELD/OPTION	DESCRIPTION						
<b>ADVANCED OPTIONS</b>	<p>Server Name</p> <p>This field can normally be left blank because the Exchange server name is automatically stored when the target client is browsed during restore operations. However, this field can be used to type another server hostname when performing directed restores to another network host.</p>						
	<p>Annotation (Microsoft Information Store)</p> <p>This field names the portion of (Extensible Storage Engine (ESE) backup to perform. Choices are:</p> <table border="0"> <tr> <td>Microsoft Information Store</td> <td>This is the default setting.</td> </tr> <tr> <td>Microsoft Site Replication Service</td> <td>Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.</td> </tr> <tr> <td>Microsoft Key Management Service</td> <td>This is the local activation service that provides Windows product activation in place of product activation over the Internet through Microsoft's servers.</td> </tr> </table>	Microsoft Information Store	This is the default setting.	Microsoft Site Replication Service	Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.	Microsoft Key Management Service	This is the local activation service that provides Windows product activation in place of product activation over the Internet through Microsoft's servers.
	Microsoft Information Store	This is the default setting.					
	Microsoft Site Replication Service	Site replication service used for mixed Exchange 5.5 and 2000/2003 environments.					
	Microsoft Key Management Service	This is the local activation service that provides Windows product activation in place of product activation over the Internet through Microsoft's servers.					
	<p>Storage Group Name</p> <p>This field can normally be left blank because the Exchange storage group name is automatically stored when the target client is browsed during restore operations.</p>						
	<p>Local Backup File Name</p> <p>If Pipe input/output to <b>avtar</b> is cleared, this field defines the filename used to send/receive data.</p> <p>This can be used to restore the exchstream file in one step to a local file, then perform a Exchange restore using that file.</p>						
<p><b>Pipe input/output to avtar</b></p> <p>If selected, backups and restores are performed directly by the Avamar backup process (<b>avtar</b>). If cleared, an intermediate local backup file can be used.</p>							
<p><b>Enable debugging messages</b></p> <p>If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.</p>							



## Windows Exchange Message Plugin Options

This topic lists and describes the plugin options available for use with the Avamar Windows Exchange Message plugin.

### Backup Options

	FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b>	<b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

### Restore Options

	FIELD/OPTION	DESCRIPTION
	Overwrite existing messages	Controls behavior when message to be restored already exists. One of the following:  Never  Always  If Modified  If Newer
	Checking for already restored items	Checks if the items or messages have been restored earlier in order to prevent creation of duplicate items.
<b>ADVANCED OPTIONS</b>	<b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

## Windows SQL Server Plugin Options

This topic lists and describes the plugin options available for use with the Avamar Windows SQL Server plugin.

### Backup Options

FIELD/OPTION	DESCRIPTION
<b>Enhanced Data Deduplication</b>	<p>Enables or disables enhanced data deduplication. During backups, enhanced data deduplication typically reduces the amount of client data that must be sent to the server but requires additional client CPU resources. Choices are:</p> <p>Default      Use the global enhanced data deduplication setting already set on the server. This is the default setting.</p> <p>Disabled      Do not use enhanced data deduplication for backups.</p> <p>Enabled      Use enhanced data deduplication for backups.</p>
Backup Type	<p>Sets the backup level. One of the following:</p> <p>Full      Backs up the entire database, including all objects, system tables, and data.</p> <p>Differential      Backs up any data that has changed since the last complete backup.</p> <p>Incremental      Backs up only the transaction logs.</p>
Force Incremental backup	<p>If a full backup exists, creates an incremental backup that contains transactions that occur from the end of the first full backup until the beginning of the second full backup. This ensures that a point-in-time recovery to a point in time between the two full backups can occur, if necessary.</p>
Backup label	<p>Assigns this descriptive label to the backup.</p>



## Restore Options

FIELD/OPTION	DESCRIPTION
<b>Use SQL replace option</b>	<p>If selected, an SQL WITH REPLACE clause statement is added to the restore Transact-SQL command. This specifies that SQL Server should create any necessary database and related files even if another database or file already exists with the same name.</p> <p><b>IMPORTANT:</b> This option overrides a SQL Server safety check that is intended to prevent you from accidentally overwriting a different database or file. This safety check is described in the Microsoft Transact-SQL Reference Manual under the RESTORE command section.</p> <p>This option might be required if a previous database restore exited with the following SQL Server error, which is visible in the Avamar SQL restore log:</p> <p>One or more devices or files already exist. Reissue the statement using the WITH REPLACE option to overwrite these files and devices.</p>
<b>Restore system databases</b>	<p>If selected, the plugin creates an expanded list of databases to restore that includes system databases and non-system databases. By default, this option is cleared, and only non-system databases are expanded from the restore targets.</p>
<b>Log Tail backup</b>	<p>Backs up the tail of the transaction log to capture the log records that have not been backed up. The log tail backup is then used after the database restore to recover the transactions that were not included in the backup.</p> <p>Log tail backup is available only for databases that use the full and bulk-logged recovery models. It should only be used for a direct restore without the SQL replace option.</p> <p>Clear the checkbox if you are performing a redirected restore or a direct restore with replace.</p>

FIELD/OPTION	DESCRIPTION
<b>ADVANCED OPTIONS</b>	<b>Use NT Authentication</b> If selected, use NT authentication for connecting to SQL server. If cleared, use SQL Server authentication.
	SQL server address Connect to this SQL server hostname or IP address.
	SQL login ID If <b>Use NT Authentication</b> option is cleared, connect to the SQL server using this login ID.
	SQL password If <b>Use NT Authentication</b> option is cleared, type the password for the SQL login account.
	<b>Enable debugging messages</b> If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.
	New database name To rename this database, type the new name here.
	Alternate database /log location If relocating the database, type the full path of the new database file (*.mdf) location. If the Alternate database/log location field contains an entry and the Alternate database log location field is empty, then both the database and the log files are restored to this new location. If both the Alternate database/log location and Alternate database log location field contain entries, then database files and log files are restored to their respective (and likely different) locations.
	Alternate database log location If relocating the database, type the full path of the new database log file (*.ldf) location.
	<b>Point-in-Time</b> A specific date and time to which to recover the database. Available only if the database uses the full recovery model. Specify the date and time in yyyy-mm-ddThh:mm:ss format. For example, 2009-10-25T14:15:45 is October 25, 2009 at 2:15:45 P.M.

FIELD/OPTION	DESCRIPTION
ADVANCED OPTIONS	Mark name  If named marks are inserted in the transaction log for recovery purposes, then you can recover to a specific mark. Available only if the database uses the full recovery model.  Specify the mark name.  <b>NOTE:</b> If you specify both a point in time and a mark name, then the recovery rolls forward to the mark name, even if the mark is after the specified point in time.
	After date/time  If named marks are not unique in the transaction log, then you can specify the date and timestamp of the mark to recover to. Specify the date and time in yyyy-mm-ddThh:mm:ss format. For example, 2009-10-25T14:15:45 is October 25, 2009 at 2:15:45 P.M.
	STOPBEFOREMARK  Specifies that the transaction at the named mark is the recovery point. In other words, the recovery rolls forward to the mark and includes the transaction at the mark.
	STOPATMARK  Specifies that the transaction immediately before the named mark is the recovery point. In other words, the recovery rolls forward to the mark but <i>does not</i> include the transaction at the mark.

## Windows VSS Plug-in Options

This topic lists and describes the plug-in options available for use with the Avamar Windows VSS plug-in.

### Backup Options

FIELD/OPTION	DESCRIPTION	
Backup Type	Sets backup level. <b>IMPORTANT:</b> Full is the only backup level supported by the Avamar Windows VSS plugin.	
Create Disaster Recovery Backup	Selected by default. If checkbox is cleared, a disaster recovery backup will not be performed when the system state backup is processed. <b>IMPORTANT:</b> Turning this off makes the backups go much quicker, but then the backup will not be valid for performing a disaster recovery. Avoid turning this option off. One exception is when performing a backup of Active Directory, clear this check box.	
Backup label	Assigns this descriptive label to the backup.	
<b>ADVANCED OPTIONS</b>	Temporary directory for the plugin.	User-defined temporary directory.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

### Restore Options

FIELD/OPTION	DESCRIPTION	
<b>ADVANCED OPTIONS</b>	Temporary directory for the plugin.	User-defined temporary directory.
	<b>Enable debugging messages</b>	If selected, maximum information is written to log files. <b>IMPORTANT:</b> If selected, very large log files are created.

## Replicate Plugin Options

This topic lists and describes the plugin options available for use with the Avamar Replicate plugin.

### Backup Options

FIELD/OPTION	DESCRIPTION
Domain name on the target server	Specifies where backups will be stored on the target server. Your replicated backups will appear in the specified domain (directory) under REPLICATE on the target server
Destination server	Specifies target (destination) server that will receive replicated backups.
User ID on destination server	Specifies Avamar administrative user account on the target (destination) server with sufficient privileges to allow the replication operation.
Password on destination server	Specifies password for the Avamar administrative user account on the target (destination) server.

---

**IMPORTANT:** Restore operations are not supported by the Avamar Replicate plugin.

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## APPENDIX C — MCS AND EMS DATABASE VIEWS

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This appendix lists each MCS and EMS database view and describes the individual columns storing data within each view. This information is intended to support using these views to create various reports.

### Data Types

Each column in a database view stores one of the following data types:

TYPE	DESCRIPTION
bool	Logical Boolean value (true or false).
date	Specific calendar date (year, month, day).
float8	8-byte floating-point number.
int2	Signed 2-byte integer (whole number).
int4	Signed 4-byte integer (whole number).
int8	Signed 8-byte integer (whole number).
numeric	Exact numeric value with selectable precision.
text	Variable-length character string.
time	Specific time of day.
timestamp	Specific calendar date and time of day.
varchar	Variable-length character string.

## MCS Database Views

The following topics list each MCS database view and describes the individual columns storing data within each view.

### v\_activities

This view contains a record (row) for each backup, restore or validation activity that has taken place.

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**IMPORTANT:** Beginning with version 4.0, use of this database view is deprecated in favor of *v\_activities\_2* (page 565). All official support for this database view is likely to be discontinued in a future release.

---

COLUMN	TYPE	DESCRIPTION
axionsystemid	varchar	Avamar system ID.
bytes_excluded	float8	Number of bytes intentionally excluded. Not relevant for replication activities.
bytes_modified_sent	float8	Not relevant for replication activities.
bytes_modified_not_sent	float8	Not relevant for replication activities.
bytes_new	float8	Number of bytes processed after data deduplication.
bytes_overhead	float8	Number of bytes of overhead. Not relevant for replication activities.
bytes_scanned	float8	Number of bytes processed. Not relevant for replication activities.
bytes_skipped	float8	Number of bytes unintentionally skipped (errors, and so forth).
cid	varchar	Client ID (subject to change - avoid storing externally).
client_name	varchar	Client name.
client_os	varchar	Client operation system.
client_ver	varchar	Avamar client software version.
completed_date	date	Completed or terminated date.
completed_time	time	Completed or terminated time.
completed_ts	timestamp	Completed or terminated date and time.

COLUMN	TYPE	DESCRIPTION
createtime	numeric	Avamar server timestamp for when backup was created.
dataset	varchar	Dataset used to perform this backup (applies to group-based backups only).
dataset_override	bool	True if client dataset was used instead of group dataset to perform this backup.
display_name	varchar	VMware client display name.
domain	varchar	Client domain.
effective_expiration	varchar	Expiration of backup as calculated at time of backup.
effective_expiration_ts	timestamp	Expiration of backup as calculated at time of backup.
effective_path	varchar	Actual dataset used in backup (applies to group-based backups only).
encryption_method	varchar	Encryption method used. Valid values are: <ul style="list-style-type: none"> <li>• proprietary</li> <li>• ssl</li> </ul>
error_code	int4	Numeric activity status completion code.
error_code_summary	varchar	If activity did not successfully complete, a short summary of this error code.
expiration	text	Current expiration date.
expiration_ts	timestamp	Current expiration timestamp.
group_name	varchar	Group name (applies to group-based backups only).
initiated_by	varchar	Activity initiated by (applies to on-demand backup only).
num_files_skipped	float8	Number of file unintentionally skipped (errors, and so forth). Not relevant for replication activities.
num_of_files	float8	Number of files processed. Can be zero for replication activities. Not relevant for replication activities.
plugin_name	varchar	Name of the plugin used to perform this activity.

COLUMN	TYPE	DESCRIPTION
plugin_number	int4	Numeric plugin ID.
recorded_date	date	Date activity was recorded.
recorded_date_time	timestamp	Date and time activity was recorded.
recorded_time	time	Time activity was recorded.
retention_policy	varchar	Retention policy used to perform this backup (applies to group-based backups only).
retention_policy_override	bool	True if client retention policy was used instead of group retention policy to perform this backup.
schedule	varchar	Schedule used for scheduled backups.
schedule_recurrence	varchar	Recurrence interval. One of daily, weekly, yearly or monthly.
scheduled_end_date	date	Expected end date of activity.
scheduled_end_time	time	Expected end time of activity.
scheduled_end_ts	timestamp	Expected end date and time of activity.
scheduled_start_date	date	Scheduled start date.
scheduled_start_time	time	Scheduled start time.
scheduled_start_ts	timestamp	Scheduled start date and time.
session_id	varchar	Unique identifier for this activity.
snapup_label	varchar	Backup label. Is blank for replication activities.
snapup_number	varchar	Backup number. Is blank for replication activities.
started_date	date	Actual start date of activity.
started_time	time	Actual start time of activity.
started_ts	timestamp	Actual start date and time of activity.
status_code	int4	Last known status code of activity.
status_code_summary	varchar	Short summary of this status code.

COLUMN	TYPE	DESCRIPTION
type	varchar	Type of activity. Valid values are: <ul style="list-style-type: none"> <li>• On-Demand Snapup</li> <li>• Scheduled Snapup</li> <li>• Restore</li> <li>• Validate</li> </ul> <b>NOTE:</b> Value "Archive Source" deprecated in version 3.7;

### v\_activities\_2

This view contains a record (row) for each non-replication activity (that is, backup, restore or validation) that has taken place. Replication activities are stored in v\_repl\_activities (page 596).

COLUMN	TYPE	DESCRIPTION
axionsystemid	varchar	Avamar system ID.
bytes_excluded	float8	Number of bytes intentionally excluded.
bytes_modified_sent	float8	Number of bytes modified and sent.
bytes_modified_not_sent	float8	Number of bytes modified but not sent.
bytes_new	float8	Number of bytes processed after data deduplication.
bytes_overhead	float8	Number of bytes of overhead.
bytes_scanned	float8	Number of bytes processed.
bytes_skipped	float8	Number of bytes unintentionally skipped (errors, and so forth).
cid	varchar	Client ID (subject to change - avoid storing externally).
client_name	varchar	Client name.
client_os	varchar	Client operation system.
client_ver	varchar	Avamar client software version. <b>NOTE:</b> If this activity is a VMware image backup or restore, this is Avamar client software version running on the proxy server.
completed_date	date	Completed or terminated date.
completed_time	time	Completed or terminated time.
completed_ts	timestamp	Completed or terminated date and time.

COLUMN	TYPE	DESCRIPTION
createtime	numeric	Avamar server timestamp for when backup was created.
dataset	varchar	Dataset used to perform this backup (applies to group-based backups only).
dataset_override	bool	True if client dataset was used instead of group dataset to perform this backup.
display_name	varchar	VMware client display name.
domain	varchar	Client domain.
effective_expiration	varchar	Expiration of backup as calculated at time of backup.
effective_expiration_ts	timestamp	Expiration of backup as calculated at time of backup.
effective_path	varchar	Actual dataset used in backup (applies to group-based backups only).
encryption_method	varchar	Encryption method used for client/server data transfer. Choices are: <ul style="list-style-type: none"> <li>proprietary</li> <li>ssl</li> </ul>
encryption_method2	varchar	Encryption method used for client/server data transfer. Choices are: <p>Medium Medium strength encryption.</p> <p>High Strongest available encryption setting for that specific client platform.</p> <p>None No encryption.</p> <p><b>NOTE:</b> The exact encryption technology and bit strength used for any given client-server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.</p>
encrypt_method2_sa	bool	True if mcserver.xml encrypt_server_authenticate preference is set true. Otherwise, false.

COLUMN	TYPE	DESCRIPTION
error_code	int4	Numeric activity status completion code.
error_code_summary	varchar	If activity did not successfully complete, a short summary of this error code.
expiration	text	Current expiration date.
expiration_ts	timestamp	Current expiration timestamp.
group_name	varchar	Group name (applies to group-based backups only).
initiated_by	varchar	Activity initiated by (applies to On-Demand Backup only).
num_files_skipped	float8	Number of files unintentionally skipped (errors, and so forth).
num_of_files	float8	Number of files processed.
plugin_name	varchar	Name of the plugin used to perform this activity.
plugin_number	int4	Numeric plugin ID.
proxy_cid	varchar	VMware proxy client unique ID.
recorded_date	date	Date activity was recorded.
recorded_date_time	timestamp	Date and time activity was recorded.
recorded_time	time	Time activity was recorded.
retention_policy	varchar	Retention policy used to perform this backup (applies to group-based backups only).
retention_policy_override	bool	True if client retention policy was used instead of group retention policy to perform this backup.
schedule	varchar	Schedule used for scheduled backups.
schedule_recurrence	varchar	Recurrence interval. One of daily, weekly, yearly or monthly.
scheduled_end_date	date	Expected end date of activity.
scheduled_end_time	time	Expected end time of activity.
scheduled_end_ts	timestamp	Expected end date and time of activity.
scheduled_start_date	date	Scheduled start date.
scheduled_start_time	time	Scheduled start time.

COLUMN	TYPE	DESCRIPTION
scheduled_start_ts	timestamp	Scheduled start date and time.
session_id	varchar	Unique identifier for this activity.
snapup_label	varchar	Backup label. Is blank for replication activities.
snapup_number	varchar	Backup number. Is blank for replication activities.
started_date	date	Actual start date of activity.
started_time	time	Actual start time of activity.
started_ts	timestamp	Actual start date and time of activity.
status_code	int4	Last known status code of activity.
status_code_summary	varchar	Short summary of this status code.
type	varchar	Type of activity. Valid values are: <ul style="list-style-type: none"> <li>• On-Demand Backup</li> <li>• Scheduled Backup</li> <li>• Restore</li> <li>• Validate</li> </ul> <b>NOTE:</b> Value "Archive Source" deprecated in version 3.7.
wid	varchar	Unique workorder identifier for this activity.

### **v\_activity\_errors**

This view contains a record (row) that stores the total number of times a specific event code is encountered during a specific activity.

COLUMN	TYPE	DESCRIPTION
cid	varchar	Client ID.
cnt	int4	Count of the number of this event code encountered.
code	int4	Event code.
pid_number	int4	Plugin number.
session_id	varchar	Session ID.



## v\_audits

This view contains a record (row) for each audit log entry.

COLUMN	TYPE	DESCRIPTION
audit_id	int4	Internally generated unique ID for this audit entry.
date_time	timestamp	Date and time of event.
domain	varchar	Domain associated with this event.
ecode	int4	Event code.
product	varchar	Values include: <ul style="list-style-type: none"> <li>• EM</li> <li>• EMS</li> <li>• END_USER</li> <li>• MCCLI</li> <li>• MCGUI</li> <li>• MCS</li> <li>• SNMP_SUB_AGENT</li> <li>• WEB_RESTORE</li> </ul>
role	varchar	Values include: <ul style="list-style-type: none"> <li>• Administrator</li> <li>• Activity Operator</li> <li>• Restore Only Operator</li> </ul>
object	varchar	Values include: <ul style="list-style-type: none"> <li>• ACTIVITY</li> <li>• AGENT</li> <li>• BACKUP</li> <li>• CLIENT</li> <li>• CP</li> <li>• CPV</li> <li>• CRG</li> <li>• CRON</li> <li>• DATASET</li> <li>• DOMAIN</li> <li>• EMS</li> <li>• EVENT</li> <li>• GC</li> <li>• GROUP</li> <li>• HFSCHECK</li> <li>• MCS</li> <li>• PLUGIN</li> <li>• PROFILE</li> <li>• REPL</li> <li>• REPORT</li> <li>• RETENTION</li> <li>• SCHEDULE</li> <li>• SNMP_SUB_AGENT</li> <li>• SNMPD</li> <li>• SYSLOGD</li> <li>• USER</li> </ul>

COLUMN	TYPE	DESCRIPTION
operation	varchar	Values include: <ul style="list-style-type: none"> <li>• ACK</li> <li>• ACTIVATE</li> <li>• ADD</li> <li>• AUTH</li> <li>• BACKUP</li> <li>• BROWSE</li> <li>• CANCEL</li> <li>• COPY</li> <li>• DELETE</li> <li>• DISABLE</li> <li>• EDIT</li> <li>• ENABLE</li> <li>• EXPORT</li> <li>• LOGON</li> <li>• RESTART</li> <li>• RESUME</li> <li>• RETIRE</li> <li>• RUN</li> <li>• START</li> <li>• STOP</li> <li>• SUSPEND</li> <li>• VALIDATE</li> </ul>
user_name	varchar	User ID that initiated this action.

## v\_clients

This view contains a record (row) for each client known to the MCS.

---

**IMPORTANT:** Beginning with version 4.0, use of this database view is deprecated in favor of *v\_clients\_2* (page 573). All official support for this database view is likely to be discontinued in a future release.

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COLUMN	TYPE	DESCRIPTION
agent_version	varchar	Version of agent installed.
allow_overtime	bool	True if client can ignore scheduling window end time. See also <i>overtime_option</i> (page 572).
allow_userinit_snapup_file_sel	varchar	Allow file selection on user initiated backups.
allow_userinit_snapups	varchar	Allow user initiated backups.
backed_up_ts	timestamp	Last backup date/time.

COLUMN	TYPE	DESCRIPTION
can_page	bool	True if MCS can call out to client.
checkin_ts	timestamp	Last checkin date/time.
cid	varchar	Client ID (subject to change - avoid storing externally).
client_addr	varchar	Client IP address.
client_name	varchar	Client name.
client_type	varchar	Client type. One of the following: <ul style="list-style-type: none"> <li>• REGULAR</li> <li>• VCENTER</li> <li>• VMACHINE</li> <li>• VPROXY</li> <li>• VREGULAR</li> </ul>
contact_email	varchar	Contact email address.
contact_location	varchar	Contact location.
contact_name	varchar	Person to contact regarding issues with this client.
contact_notes	varchar	Contact notes.
contact_phone	varchar	Contact phone number.
created	date	Creation date.
ds_override	bool	True if client can override group dataset
enabled	bool	True if client can generate activities.
full_domain_name	varchar	Fully qualified client location.
has_snapups	bool	True if the client has backups.
modified	date	Date that client information was last modified.
os_type	varchar	Client OS type.
override_userinit_retpol	varchar	Override standard retention policy on user initiated backups.

COLUMN	TYPE	DESCRIPTION
overtime_option	varchar	<p>One of the following:</p> <p><b>ALWAYS</b> Scheduled group backups are always allowed to run past the schedule duration setting.</p> <p><b>NEXT</b> Only the next scheduled group backup is allowed to run past the schedule duration setting.</p> <p><b>NEXT_SUCCESS</b> Scheduled group backups are allowed to run past the schedule duration setting until a successful backup is completed.</p> <p><b>NEVER</b> Scheduled group backups are never allowed to run past the schedule duration setting.</p> <p>This value is automatically set to NEXT_SUCCESS when client initially registers and is cleared after one backup successfully completes.</p>
page_addr	varchar	IP address used to contact this client.

COLUMN	TYPE	DESCRIPTION
page_port	varchar	Data port used to contact this client.
pageadr_locked	bool	True if address cannot be updated automatically by MCS.
plugin_for_last_backup	varchar	Plugin used for the last backup.
rc_override	bool	True if client can override group retry count setting.
registered	bool	True if client has checked into MCS.
registered_ts	timestamp	Registered date/time.
restore_only	bool	True if client can only do restores.
retry_cnt	int4	Connection retry count.
rp_override	bool	True if client can override group retention policy.
timeout	int4	Connection timeout value.
tp_override	bool	True if client can override group timeout period setting.

## v\_clients\_2

This view contains a record (row) for each client known to the MCS.

COLUMN	TYPE	DESCRIPTION
agent_version	varchar	Version of agent installed.
allow_overtime	bool	True if client can ignore scheduling window end time. See also overtime_option (page 575).
allow_userinit_snapup_file_sel	varchar	Allow file selection on user initiated backups.
allow_userinit_snapups	varchar	Allow user initiated backups.
backed_up_ts	timestamp	Last backup date/time.
can_page	bool	True if MCS can call out to client.
checkin_ts	timestamp	Last checkin date/time.
cid	varchar	Client ID (subject to change - avoid storing externally).
client_addr	varchar	Client IP address.

COLUMN	TYPE	DESCRIPTION
client_name	varchar	Client name.
client_type	varchar	Client type. One of the following: <ul style="list-style-type: none"> <li>• REGULAR</li> <li>• VCENTER</li> <li>• VMACHINE</li> <li>• VPROXY</li> <li>• VREGULAR</li> </ul>
contact_email	varchar	Contact email address.
contact_location	varchar	Contact location.
contact_name	varchar	Person to contact regarding issues with this client.
contact_notes	varchar	Contact notes.
contact_phone	varchar	Contact phone number.
created	date	Creation date.
display_client_name	varchar	Virtual machine displayable node name.
display_full_domain	varchar	Fully qualified domain and client display name.
ds_override	bool	True if client can override group dataset
enabled	bool	True if client can generate activities.
full_domain_name	varchar	Fully qualified client location.
has_snapups	bool	True if the client has backups.
modified	date	Date that client information was last modified.
os_type	varchar	Client OS type.
override_userinit_retpol	varchar	Override standard retention policy on user initiated backups.

COLUMN	TYPE	DESCRIPTION
overtime_option	varchar	<p>One of the following:</p> <p><b>ALWAYS</b> Scheduled group backups are always allowed to run past the schedule duration setting.</p> <p><b>NEXT</b> Only the next scheduled group backup is allowed to run past the schedule duration setting.</p> <p><b>NEXT_SUCCESS</b> Scheduled group backups are allowed to run past the schedule duration setting until a successful backup is completed.</p> <p><b>NEVER</b> Scheduled group backups are never allowed to run past the schedule duration setting.</p> <p>This value is automatically set to NEXT_SUCCESS when client initially registers and is cleared after one backup successfully completes.</p>
page_addr	varchar	IP address used to contact this client.

COLUMN	TYPE	DESCRIPTION
page_port	varchar	Data port used to contact this client.
pageadr_locked	bool	True if address cannot be updated automatically by MCS.
plugin_for_last_backup	varchar	Plugin used for the last backup.
rc_override	bool	True if client can override group retry count setting.
registered	bool	True if client has checked into MCS.
registered_ts	timestamp	Registered date/time.
restore_only	bool	True if client can only do restores.
retry_cnt	int4	Connection retry count.
rp_override	bool	True if client can override group retention policy.
timeout	int4	Connection timeout value.
tp_override	bool	True if client can override group timeout period setting.

### **v\_compatibility**

This view stores MCS database compatibility information.

COLUMN	TYPE	DESCRIPTION
component	varchar	Subsystem component. One of the following: <ul style="list-style-type: none"> <li>• db_schema_version_init</li> <li>• db_schema_version</li> <li>• db_views_schema_version</li> </ul>
version	varchar	Specific version number of the component.



## v\_datasets

This view contains a record (row) for each dataset known to the MCS.

COLUMN	TYPE	DESCRIPTION
all_data	bool	True if dataset will save all data.
domain	varchar	Avamar domain associated with dataset.
is_link	bool	True if dataset is pointer to another dataset.
is_read_only	bool	True if dataset cannot be modified.
link_name	varchar	Name of dataset if is_link is true.
name	varchar	Name of dataset.

## v\_dpnsuammary

This view contains a record (row) for each backup, restore or validation activity on a client-by-client basis.

COLUMN	TYPE	DESCRIPTION
clientver	varchar	Version of agent software running on client.
host	varchar	Client name.
mod_sent	float8	Bytes modified and sent.
modnotsent	float8	Bytes modified but not sent.
numfiles	float8	Number of files processed.
nummodfiles	float8	Number of files modified.
operation	varchar	Type of activity reported by this entry.
os	varchar	Client operating system.
overhead	float8	Number of bytes of overhead sent and stored on storage subsystem.
pcntcommon	int4	Percent data deduplication.
reduced	float8	Bytes reduced by compression.
root	varchar	Dataset used in backup applies to group-based backups only.
seconds	float8	Completed or terminated date and time.
sessionid	varchar	Unique identifier for client to storage subsystem session for this activity.

COLUMN	TYPE	DESCRIPTION
starttime	timestamp	Date and time job was actually dispatched to client by Avamar Administrator. <b>NOTE:</b> Start time in client log might be slightly later due to communication and job setup latency.
startvalue	float8	Scheduled start date and time, expressed as elapsed time (in seconds) since beginning of the Unix epoch.
status	varchar	Success/fail result of this activity.
totalbytes	float8	Number of bytes processed.
workorderid	varchar	Unique workorder identifier for this activity.

### v\_dpn\_stats

This view contains a record (row) for Avamar server statistics.

COLUMN	TYPE	DESCRIPTION
data_protected_mb	float8	Megabytes protected.
date	date	Date.
date_time	timestamp	Date and time.
dpn_name	varchar	Avamar server name.
time	time	Time.

### v\_ds\_commands

This view contains a record (row) for each optional plugin command defined for each dataset.

COLUMN	TYPE	DESCRIPTION
command_name	varchar	Name of command.
dataset_name	varchar	Name of dataset.
domain	varchar	Domain.
plugin_name	varchar	Name of plugin.
type	varchar	Type of optional plugin command.
value	varchar	Value associated with command name.

### **v\_ds\_excludes**

This view contains a record (row) for each exclude definition defined for each dataset.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
dataset_name	varchar	Name of dataset.
domain	varchar	Domain.
plugin_name	varchar	Name of plugin.
value	varchar	Exclude value for dataset/plugin.

### **v\_ds\_includes**

This view contains a record (row) for each include definition defined for each dataset.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
dataset_name	varchar	Name of dataset.
domain	varchar	Domain.
plugin_name	varchar	Name of plugin.
value	varchar	Include value for dataset/plugin.

### **v\_ds\_targets**

This view contains a record (row) for each source target defined for each dataset.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
dataset_name	varchar	Name of dataset.
domain	varchar	Domain.
plugin_name	varchar	Name of plugin.
value	varchar	Target value for dataset/plugin.

### **v\_ev\_catalog**

This view contains a record (row) for each event code in the events catalog.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
category	varchar	Event category.
code	int4	Event code.
name	varchar	Event name.

COLUMN	TYPE	DESCRIPTION
object	varchar	Values include: <ul style="list-style-type: none"> <li>• ACTIVITY</li> <li>• AGENT</li> <li>• BACKUP</li> <li>• CLIENT</li> <li>• CP</li> <li>• CPV</li> <li>• CRG</li> <li>• CRON</li> <li>• DATASET</li> <li>• DOMAIN</li> <li>• EMS</li> <li>• EVENT</li> <li>• GC</li> <li>• GROUP</li> <li>• HFSCHECK</li> <li>• MCS</li> <li>• PLUGIN</li> <li>• PROFILE</li> <li>• REPL</li> <li>• REPORT</li> <li>• RETENTION</li> <li>• SCHEDULE</li> <li>• SNMP_SUB_AGENT</li> <li>• SNMPD</li> <li>• SYSLOGD</li> <li>• USER</li> </ul>
operation	varchar	Values include: <ul style="list-style-type: none"> <li>• ACK</li> <li>• ACTIVATE</li> <li>• ADD</li> <li>• AUTH</li> <li>• BACKUP</li> <li>• BROWSE</li> <li>• CANCEL</li> <li>• COPY,</li> <li>• DELETE</li> <li>• DISABLE</li> <li>• EDIT</li> <li>• ENABLE</li> <li>• EXPORT</li> <li>• LOGON</li> <li>• RESTART</li> <li>• RESUME</li> <li>• RETIRE</li> <li>• RUN</li> <li>• START</li> <li>• STOP</li> <li>• SUSPEND</li> <li>• VALIDATE</li> </ul>
severity	varchar	Event severity.

COLUMN	TYPE	DESCRIPTION
summary	varchar	Single-line event description.
swSource	varchar	Software modules generating event.
type	varchar	Event type.

### **v\_ev\_cus\_body**

This view contains a record (row) listing the attachments for each custom events profile.

COLUMN	TYPE	DESCRIPTION
attachments	varchar	String of attachment data.
epid	varchar	Unique ID for this events profile.

### **v\_ev\_cus\_cc\_list**

This view contains a record (row) listing the email cc recipients for each custom events profile.

COLUMN	TYPE	DESCRIPTION
cc_list	varchar	List of email cc recipients.
epid	varchar	Unique ID for this events profile.

### **v\_ev\_cus\_codes**

This view contains a record (row) for each event code that should be included in a custom events profile.

COLUMN	TYPE	DESCRIPTION
code	int4	Event code to monitor.
cur_value	bool	True if code triggers email and syslog notification.
default_value	bool	Original default setting for email and syslog notification.
epid	varchar	Unique ID for this events profile.

## v\_ev\_cus\_prof

This view contains a record (row) for each custom events profile.

COLUMN	TYPE	DESCRIPTION
active	bool	True if profile is enabled.
connectemc_channel	varchar	ConnectEMC configuration channel used for this profile.
connectemc_notify_enabled	bool	True if ConnectEMC Notification is enabled for this profile.
domain	varchar	Profile domain.
email_notify_enabled	bool	True if email notification should occur.
epid	varchar	Unique ID for this events profile.
include_logs	bool	True if logs are included in email.
include_nodelist	bool	True if nodelist is included in email.
inline_email_attachments	bool	True if email attachments are included in the body of the email.
log_dir	varchar	Directory location of log files.
name	varchar	Name of custom profile.
read_only	bool	True if not modifiable.
sched_id	varchar	Email schedule.
snmp_notify_enabled	bool	True if snmp notification should.
subject	varchar	Email subject header string.
syslog_notify_enabled	bool	True if syslog notification should occur.
timestamp	numeric	Date and time of last email check, expressed as elapsed time (in seconds) since beginning of the Unix epoch.

## v\_ev\_cus\_prof\_params

This view contains event code-specific parameters for custom event profiles.

COLUMN	TYPE	DESCRIPTION
ecode	int4	Event code.
epid	varchar	Profile ID.
param	varchar	Parameter.
value	varchar	Value.

### **v\_ev\_cus\_rpt**

This view contains a record (row) for each report emailed with an event profile.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
enabled	bool	True if option to email report was set.
epid	varchar	Profile ID.
output_csv	bool	True if report was emailed in Comma-Separated Values (CSV) format.
output_txt	bool	True if report was emailed in plain text format.
output_xml	bool	True if report was emailed in XML format.
rptid	varchar	Report ID.
since_count	int4	Number of days, weeks or months since last email was sent, or 0 if since_option is last_notified.
since_option	varchar	Unit of measure for since_count. Values include: <ul style="list-style-type: none"> <li>• day</li> <li>• week</li> <li>• month</li> <li>• last_notified</li> </ul>

### **v\_ev\_cus\_snmp\_contact**

This view contains a record (row) for each profile's snmp trap configuration.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
community	varchar	Name of the snmp community to send traps as.
epid	varchar	Profile ID.
snmp_host	varchar	Host to send snmp traps to.
snmp_port	varchar	Data port to send snmp traps to (default: 162).

## **v\_ev\_cus\_syslog\_contact**

This view contains a record (row) for each custom event profile that uses syslog as the notification mechanism.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
epid	varchar	Unique ID for this events profile.
facility	int4	Syslog facility. Valid values are: 1 user. 16 local0. 17 local1. 18 local2. 19 local3. 20 local4. 21 local5. 22 local6. 23 local7.
format	int4	Output format. Valid values are: 1 XML. 2 Plain text.
syslog_host	varchar	Default value is localhost.
syslog_port	int4	Default value is port 514.

## **v\_ev\_cus\_to\_list**

This view contains a record (row) listing the email recipients for each custom events profile.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
epid	varchar	Unique ID for this events profile.
to_list	varchar	List of email recipients.



## v\_ev\_unack

This view contains a record (row) for each unacknowledged event logged by the MCS.

COLUMN	TYPE	DESCRIPTION
audience	vvarchar	Intended audience of event.
category	vvarchar	Event category. Valid values are: <ul style="list-style-type: none"> <li>• APPLICATION</li> <li>• SECURITY</li> <li>• SYSTEM</li> <li>• USER</li> </ul>
code	int4	Event code.
data	vvarchar	Event data.
date	date	Date of event.
description	vvarchar	Long event description.
domain	vvarchar	Domain associated with the event.
event_id	int4	Internally-generated event ID.
notes	vvarchar	Event notes text.
remedy	vvarchar	Event remedy text.
severity	vvarchar	Event severity. Valid values are: <ul style="list-style-type: none"> <li>• NODE</li> <li>• NODE_FATAL</li> <li>• OK</li> <li>• PROCESS</li> <li>• PROCESS_FATAL</li> <li>• SYSTEM_FATAL</li> <li>• USER</li> <li>• USER_FATAL</li> </ul>
software_source	vvarchar	Software modules generating event.
source	vvarchar	Host generating event.
summary	vvarchar	Single-line event description.
time	time	Time of event.
timestamp	numeric	Date and time of event, expressed as elapsed time (in seconds) since beginning of the Unix epoch.
type	vvarchar	Event type. Valid values are: <ul style="list-style-type: none"> <li>• INTERNAL</li> <li>• ERROR</li> <li>• WARNING</li> <li>• INFORMATION</li> <li>• DEBUG</li> </ul>

## v\_events

This view contains a record (row) for each event logged by the MCS.

COLUMN	TYPE	DESCRIPTION
audience	varchar	Intended audience of event.
category	varchar	Event category. Valid values are: <ul style="list-style-type: none"> <li>• APPLICATION</li> <li>• SECURITY</li> <li>• SYSTEM</li> <li>• USER</li> </ul>
code	int4	Event code.
data	varchar	Event data.
date	date	Date of event.
description	varchar	Long event description.
domain	varchar	Domain associated with the event.
event_id	int4	Internally-generated event ID.
notes	varchar	Event notes text.
remedy	varchar	Event remedy text.
severity	varchar	Event severity. Valid values are: <ul style="list-style-type: none"> <li>• NODE</li> <li>• NODE_FATAL</li> <li>• OK</li> <li>• PROCESS</li> <li>• PROCESS_FATAL</li> <li>• SYSTEM_FATAL</li> <li>• USER</li> <li>• USER_FATAL</li> </ul>
software_source	varchar	Software modules generating event.
source	varchar	Host generating event.
summary	varchar	Single-line event description.
time	time	Time of event.
timestamp	numeric	Date and time of event, expressed as elapsed time (in seconds) since beginning of the Unix epoch.
type	varchar	Event type. Valid values are: <ul style="list-style-type: none"> <li>• INTERNAL</li> <li>• ERROR</li> <li>• WARNING</li> <li>• INFORMATION</li> <li>• DEBUG</li> </ul>

## v\_gcstatus

This view contains a record (row) for each garbage collect (GC) operation.

COLUMN	TYPE	DESCRIPTION
bytes_recovered	int8	Number of bytes recovered in this garbage collect operation.
chunks_deleted	int4	Number of chunks deleted in this garbage collect operation.
elapsed_time	int8	Total elapsed time in seconds for this garbage collect operation.
end_time	timestamp	Date and time this garbage collect operation ended.
gcstatusid	int8	Unique ID for this garbage collect operation.
indexstripes_processed	int4	Number of index stripes involved in this garbage collect operation.
indexstripes_total	int4	Number of index stripes.
node_count	int4	Number of nodes involved in this garbage collect operation.
result	varchar	String result code.
start_time	timestamp	Date and time this garbage collect operation started.

## v\_group\_members

This view contains a record (row) for each client organized by group assignment.

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**NOTE:** One client can be a member of more than one group.

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COLUMN	TYPE	DESCRIPTION
cid	varchar	Client ID (subject to change - avoid storing externally).
client_name	varchar	Client name.
dataset_name	varchar	Dataset name.
enabled	bool	True if client enabled in the group.
full_client_name	varchar	Client domain and hostname.
group_name	varchar	Group name.
restore_only	bool	True if client has been deleted and is available only for restore.
retention_name	varchar	Retention policy name.
use_client_ds	bool	True if client dataset should be used.
use_client_retry	bool	True if client retry should be used.
use_client_rp	bool	True if client retention policy should be used.
use_client_timeout	bool	True if client timeout should be used.

## v\_groups

This view contains a record (row) for each group known to the MCS.

COLUMN	TYPE	DESCRIPTION
created	date	Creation date.
dataset_name	varchar	Dataset name.
dataset_domain	varchar	Dataset domain.
domain	varchar	Domain.
enabled	bool	True if group is active/enabled.
failed_stop	bool	True if group backups should stop on failed backup.
group_type	varchar	One of the following: <ul style="list-style-type: none"> <li>REGULAR</li> <li>VCENTER</li> </ul>
modified	date	Last modified date.
name	varchar	Group name.
priority	int4	Group priority.
read_only	bool	True if group cannot be modified.
retention_name	varchar	Retention policy name.
retention_domain	varchar	Retention policy domain.
retry_cnt	int4	Retry count.
run_once	bool	True if running only one backup.
schedule_name	varchar	Schedule name.
schedule_domain	varchar	Schedule domain.
skip_next	bool	True if skipping next scheduled backup.
target_dpn	varchar	Avamar server to be used for this group.
timeout_min	int4	Timeout in minutes.

## v\_node\_space

This view contains a record (row) of disk capacity data retrieved or calculated per disk and per node.

COLUMN	TYPE	DESCRIPTION
capacity_mb	float8	Disk size.
date	date	Date.
date_time	timestamp	Date and time.
disk	int2	Disk number.
diskreadonly	int2	Value applied to normalize percent full.
node	varchar	Node number.
stripes_reserved_mb	float8	Bytes reserved for stripe usage.
stripes_used_mb	float8	Amount of reserved stripe bytes used.
time	time	Time.
used_mb	float8	Disk capacity used.
utilization	numeric	Percentage of storage space used.

## v\_node\_util

This view contains a record (row) of node statistics retrieved or calculated per node at a particular date and time.

COLUMN	TYPE	DESCRIPTION
cpu_sys_percentage	numeric	Percentage of node utilization by operating system.
cpu_user_percentage	numeric	Percentage of node utilization by user.
date	date	Date.
date_time	timestamp	Date and time.
disk_reads_per_sec	int4	Disk reads per second.
disk_writes_per_sec	int4	Disk writes per second.
diskreadonly	int2	Value applied to normalize percent full.
load_avg	numeric	Load average.
net_in_kbytes_per_sec	int4	Network received (KB/s).
net_out_kbytes_per_sec	int4	Network transmitted (KB/s).
net_ping	numeric	Node ping time.
node	varchar	Node ID.
state	varchar	Node state.
time	time	Time.
utilization	numeric	Percentage of storage space used.

## v\_plugin\_can\_restore

This view contains a record (row) of allowable plugin substitutions for restores. Each record is a one-to-one allowable substitution in which the original backup plugin (build, version) is matched with with an allowable substitute plugin ID (can\_restore\_pid).

COLUMN	TYPE	DESCRIPTION
build	varchar	An exception to the plugin version value if not ALL.
can_restore_pid	int4	PID of the plugin which this plugin can use to perform restores.
pid_number	int4	Numeric plugin ID.
version	varchar	Plugin version.

## v\_plugin\_catalog

This view contains a record (row) for each known plugin.

COLUMN	TYPE	DESCRIPTION
content	varchar	Content description of the plugin.
description	varchar	Descriptive name of the plugin.
encryption_mode	varchar	Encryption method used. Valid values are: <ul style="list-style-type: none"> <li>• proprietary</li> <li>• ssl</li> </ul>
explicit_target_supported	bool	True if targets for the plugin can be entered when creating/editing a dataset for the plugin.
implicit_target_supported	bool	True if the concept of all systems for the plugin is supported when creating/editing a dataset.
include_implicit_as_default	bool	True if implicit target included by default when creating/editing a dataset.
multiple_restore_targets_supported	bool	True if multiple restore targets can be entered when restoring a backup.
multiple_targets_supported	bool	True if multiple targets can be entered when creating/editing a dataset for the plugin.
pid	varchar	Name of the plugin.
pid_number	int4	Unique plugin identification.
version	varchar	Plugin version.



## v\_plugin\_depends\_upon

This view contains a record (row) for each known plugin dependency. Each record is a one-to-one match of an existing plugin ID (build, version) and the plugin ID on which it is dependent (dependence\_on\_pid).

COLUMN	TYPE	DESCRIPTION
build	varchar	An exception to the plugin version value if not ALL.
dependence_on_pid	int4	PID of the plugin that this plugin depends upon.
pid_number	int4	Numeric plugin ID.
version	varchar	Plugin version.

## v\_plugin\_flag\_groups

This view contains a record (row) for each grouping of plugin options (flags).

COLUMN	TYPE	DESCRIPTION
cgid	varchar	Control group ID.
description	varchar	
group_order	int4	Order of group.
tooltip	varchar	Text shown when cursor hovers over plugin.
type	varchar	One of the following: <ul style="list-style-type: none"> <li>• logical</li> <li>• radio</li> </ul>

## v\_plugin\_flag\_pulldown

This view contains a record (row) for each entry in a pulldown plugin option (flag).

COLUMN	TYPE	DESCRIPTION
build	varchar	An exception to the plugin version value if not ALL.
description	varchar	Displayable value of the entry.
entry	varchar	Entry in the pulldown menu.
fid	varchar	Flag ID.
flag_order	int4	Order of flag in pulldown.
plugin_number	int4	Numeric plugin ID.
version	varchar	Plugin version.

## v\_plugin\_flags

This view contains a record (row) for each plugin option (flag) available to be used for backups and restores for each plugin.

COLUMN	TYPE	DESCRIPTION
build	varchar	An exception to the plugin version value if not ALL.
cgid	varchar	Control grouping.
command	varchar	One of the following: <ul style="list-style-type: none"> <li>• restore</li> <li>• backup</li> </ul>
description	varchar	
fid	varchar	Flag ID.
flag_order	int4	Order of group.
max	int4	Maximum value of the flag, if applicable.
min	int4	Minimum value of the flag, if applicable.
name	varchar	
plugin_number	int4	Numeric plugin ID.
pidnum	int4	Plugin number that this flag should be directed too.
tooltip	varchar	Text shown when cursor hovers over plugin.
type	varchar	One of the following: <ul style="list-style-type: none"> <li>• boolean (checkbox)</li> <li>• integer (field)</li> <li>• string (field)</li> </ul>
value	varchar	Default value of the flag.
version	varchar	Plugin version.

## v\_plugin\_options

This view contains a record (row) of available options for a plugin; one option per record (row).

COLUMN	TYPE	DESCRIPTION
build	varchar	An exception to the version if not ALL.
can_modify	bool	For disable options only. True if the option value is preserved on upgrades.
option_name	varchar	Valid values are: <ul style="list-style-type: none"> <li>• browse_supported</li> <li>• disable_browse</li> <li>• disable_mc_adhoc_snapups</li> <li>• disable_restore disable_validate</li> <li>• disable_scc_adhoc_snapups</li> <li>• disable_scheduled_snapups</li> <li>• restore_supported</li> <li>• snapup_supported</li> <li>• snapup_supports_cl_options</li> <li>• snapup_supports_exclusion</li> <li>• snapup_supports_inclusion</li> <li>• validate_supports</li> </ul>
option_value	bool	True or false.
pid_number	int4	Numeric plugin ID.
version	varchar	Plugin version.

## v\_plugin\_state

This view contains a record (row) that stores the state of each plugin.

COLUMN	TYPE	DESCRIPTION
build	varchar	An exception to the plugin version values if not ALL.
obsolete	bool	True if the plugin is obsolete.
obsolete_comment	varchar	Comment as to why the plugin became obsolete.
pid_number	int4	Numeric plugin ID.
user_added	bool	True if the user added the build.
version	varchar	Plugin version.

## v\_plugins

This view contains a record (row) for each plugin installed on any client known to the MCS.

COLUMN	TYPE	DESCRIPTION
backed_up_ts	timestamp	Last backup date using this plugin.
build	varchar	Plugin build.
cid	varchar	Client ID (subject to change - avoid storing externally).
client_name	varchar	Name of client.
full_client_name	varchar	Client domain and hostname.
installed_ts	timestamp	Date this plugin type was first registered with MCS.
lastupdate_ts	timestamp	Date this current plugin version was first registered with MCS.
name	varchar	Description of plugin.
plugin_name	varchar	Name of plugin.
version	varchar	Plugin version.

## v\_repl\_activities

This view contains a record (row) for each replication activity that has taken place.

COLUMN	TYPE	DESCRIPTION
bytes_excluded	float8	Number of bytes intentionally excluded.
bytes_modified_sent	float8	Number of bytes modified and sent.
bytes_modified_not_sent	float8	Number of bytes modified but not sent.
bytes_new	float8	Number of bytes processed after data deduplication.
bytes_overhead	float8	Number of bytes of overhead.
bytes_reduced_comp	float8	Number of bytes reduced by compression.
bytes_scanned	float8	Number of bytes processed.
bytes_skipped	float8	Number of bytes unintentionally skipped (errors, and so forth).
cid	varchar	Client ID (subject to change — avoid storing externally).

COLUMN	TYPE	DESCRIPTION
client_name	varchar	Client name.
client_os	varchar	Client operation system.
client_ver	varchar	Avamar client software version.
completed_ts	timestamp	Date and time this replication operation actually ended.
dpn_domain	varchar	Client domain.
encrypt_method	text	Encryption method used for client/server data transfer. Choices are: <ul style="list-style-type: none"> <li>• proprietary</li> <li>• ssl</li> </ul> <p><b>NOTE:</b> This column is deprecated and exists for historical purposes only. Use encrypt_method2 instead.</p>
encrypt_method2	varchar	Encryption method used for client/server data transfer. Choices are: <p>High      Strongest available encryption setting for that specific client platform.</p> <p>Medium    Medium strength encryption.</p> <p>None      No encryption.</p> <p><b>NOTE:</b> The exact encryption technology and bit strength used for any given client-server connection is dependent on a number of factors, including the client platform and Avamar server version. Refer to your <i>Avamar Product Security Guide</i> for additional information.</p>
encrypt_method2_sa	bool	True if server authentication was enforced at the time of the backup (that is, mcserver.xml encrypt_server_authenticate preference is set true).
error_code	int4	Numeric activity status completion code.
error_code_summary	varchar	Last known error code summary.
initiated_by	varchar	Activity initiated by this user or MCS.
num_files_skipped	float8	Number of file unintentionally skipped (errors, and so forth).
num_mod_files	float8	Number of files modified.

COLUMN	TYPE	DESCRIPTION
num_of_files	float8	Number of files processed. Can be zero for replication activities.
plugin_name	varchar	Plugin name.
plugin_number	int4	Plugin number.
recorded_date	date	Date replication occurred.
retention_type	varchar	This replication activity included one or more of the following retention types:  D        Daily backups. W        Weekly backups. M        Monthly backups. Y        Yearly backups. N        Backups not tagged as having a specific retention type.
scheduled_end_ts	timestamp	Date and time this replication operation was scheduled to end.
scheduled_start_ts	timestamp	Date and time this replication operation was scheduled to occur.
session_id	varchar	Unique identifier for this activity.
started_ts	timestamp	Date and time this replication operation actually started.
status_code	int4	Numeric status code.
status_code_summary	varchar	Status code summary.
systemid	varchar	Avamar system ID.
type	varchar	Type of activity. Valid values are: <ul style="list-style-type: none"> <li>• Replication Destination</li> <li>• Replication Source</li> </ul>
wid	varchar	Unique workorder identifier for this activity.

## v\_report\_filter

This view contains a record (row) for each report identifying its filter options.

COLUMN	TYPE	DESCRIPTION
filter_name	varchar	Filter name.
filter_value	varchar	Filter value.
rptid	varchar	Report ID.

## v\_reports

This view contains a record (row) for each report.

COLUMN	TYPE	DESCRIPTION
adhoc_query	bool	True if a query statement is being used instead of filtering options.
domain	varchar	Report domain.
graphs_allowed	varchar	Not currently supported.
name	varchar	Report name.
readonly	bool	True if the report can not be edited or deleted. Used for 'canned' reports.
rptid	varchar	Report ID.
sql	varchar	SQL statement if adhoc_query is true.
view_name	varchar	Database view used by this report.

## v\_retention\_policies

This view contains a record (row) for each retention policy known to the MCS.

COLUMN	TYPE	DESCRIPTION
daily	int4	Advanced policy daily retention.
domain	varchar	Domain.
duration	numeric	Duration of retention.
enabled	bool	True if enabled.
expiration_date	numeric	Expiration date.
is_link	bool	True if this is a reference to another retention policy.
link_name	varchar	Name of retention policy if is_link is true.
monthly	int4	Advanced policy monthly retention.
name	varchar	Name of retention policy.
override	bool	True if advanced policy used for scheduled backups.
policy_no	int4	Policy number. Valid policy numbers are: 0 Undefined. 1 Compute expiration date. 2 Static expiration date. 3 No expiration date.
read_only	bool	True if retention policy cannot be modified.
unit	int4	Duration unit. Valid duration units are: 0 No expiration 1 Days 2 Weeks 3 Months 4 Years
weekly	int4	Advanced policy weekly retention.
yearly	int4	Advanced policy yearly retention.



## v\_sch\_recurrence

This view contains a record (row) for each recurring schedule known to the MCS.

COLUMN	TYPE	DESCRIPTION
domain	varchar	Schedule domain.
modifier	text	<p>Qualifies entries in the value column as follows:</p> <p>day        Indicates that this is a monthly schedule that runs on every numerical calendar day specified by the value column entry.</p> <p>hour       Indicates that this is a daily schedule that runs on every hour of the day specified by the value column entry.</p> <p>every      Indicates that this is a weekly schedule that runs on every day of the week specified by the value column entry.</p> <p>first      Indicates that this is a monthly schedule that runs during the first week of the month on the day of the week specified by the value column entry.</p> <p>second     Indicates that this is a monthly schedule that runs during the second week of the month on the day of the week specified by the value column entry.</p> <p>third      Indicates that this is a monthly schedule that runs during the third week of the month on the day of the week specified by the value column entry.</p> <p>fourth     Indicates that this is a monthly schedule that runs during the fourth week of the month on the day of the week specified by the value column entry.</p> <p>last       Indicates that this is a monthly schedule that runs during the last week of the month on the day of the week specified by the value column entry.</p>
name	varchar	Name of the schedule.

COLUMN	TYPE	DESCRIPTION
recur_interval	text	Recurrence interval. Valid recurrence intervals are: <ul style="list-style-type: none"> <li>• DAILY</li> <li>• HOURLY</li> <li>• WEEKLY</li> <li>• MONTHLY</li> <li>• YEARLY</li> </ul>
value	text	Recurrence value. For DAILY schedules, this value is the hour of the day. For WEEKLY schedules, this value is the day of week, such as Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday, and Friday. For MONTHLY schedules that repeat on a specific day of the month, this numerical value is the day of the month. For MONTHLY schedules that repeat on a specific day of a specific week, this value is the day of week, such as Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday, and Friday.

### v\_schedules

This view contains a record (row) for each schedule known to the MCS.

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**IMPORTANT:** Beginning with version 4.0, use of this database view is deprecated in favor of *v\_schedules\_2* (page 604). All official support for this database view is likely to be discontinued in a future release.

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COLUMN	TYPE	DESCRIPTION
description	varchar	Schedule description.
domain	varchar	Domain.
enabled	bool	True if schedule is enabled/active.
end_policy	int4	Type of schedule termination setting. Valid values are: <ul style="list-style-type: none"> <li>2 Never end.</li> <li>3 Run N number of times.</li> <li>4 End on a specific date.</li> </ul>

COLUMN	TYPE	DESCRIPTION
end_recur	numeric	End recurrence. This is a specific date or a count of the number of times the schedule should run or 0 if the schedule never ends. This value is related to the value of end_policy.
first_start	timestamp	First start.
is_link	bool	True if this is a reference to another schedule.
last_check	timestamp	Last check.
last_start	timestamp	Last started.
link_name	varchar	Schedule name if is_link is true.
min_interval	timestamp	Minimum interval.
name	varchar	Name of schedule.
overtime	bool	True if schedule end time can be overridden.
read_only	bool	True if cannot be modified.
recur_counter	numeric	Recurrence counter.
recur_interval	varchar	Recurrence interval. Valid recurrence intervals are: <ul style="list-style-type: none"> <li>• DAILY</li> <li>• HOURLY</li> <li>• WEEKLY</li> <li>• MONTHLY</li> <li>• YEARLY</li> </ul>
start_duration	timestamp	Duration of start scheduling window.
start_time	timestamp	Start time for scheduling window.
time_zone_id	varchar	Time zone of where the schedule was created or last modified.
total_duration	timestamp	Total duration of scheduling window.
type_enum	varchar	Type of schedule. The only valid schedule type is CALENDAR.

## v\_schedules\_2

This view contains a record (row) for each schedule known to the MCS.

COLUMN	TYPE	DESCRIPTION
description	varchar	Schedule description.
domain	varchar	Domain.
enabled	bool	True if schedule is enabled/active.
end_policy	int4	Type of schedule termination setting. Valid values are: 2 Never end. 3 Run N number of times. 4 End on a specific date.
end_recur	numeric	End recurrence. This is a specific date or a count of the number of times the schedule should run or 0 if the schedule never ends. This value is related to the value of end_policy.
first_start	timestamp	First start.
is_link	bool	True if this is a reference to another schedule.
last_check	timestamp	Last check.
last_start	timestamp	Last started.
link_name	varchar	Schedule name if is_link is true.
min_interval	timestamp	Minimum interval.
name	varchar	Name of schedule.
overtime	bool	True if schedule end time can be overridden.
read_only	bool	True if cannot be modified.
recur_counter	numeric	Recurrence counter.
recur_interval	varchar	Recurrence interval. Valid recurrence intervals are: <ul style="list-style-type: none"> <li>• DAILY</li> <li>• WEEKLY</li> <li>• MONTHLY</li> <li>• ADHOC</li> </ul>
start_duration	timestamp	Duration of start scheduling window.
start_time	timestamp	Start time for scheduling window.
time_zone_id	varchar	Time zone of where the schedule was created or last modified.
total_duration	timestamp	Total duration of scheduling window.

COLUMN	TYPE	DESCRIPTION
type_enum	varchar	Type of schedule. The only valid schedule type is CALENDAR.

### **v\_serial\_numbers**

This view stores a list of all Avamar server node serial numbers.

COLUMN	TYPE	DESCRIPTION
nodeid	varchar	Avamar logical node designation (for example, 0.0, 0.1, 0.s, and so forth).
serial_number	varchar	Avamar server node serial number.
serial_numbers_id	bigint	Unique Avamar server node ID.

### **v\_systems**

This view contains a record (row) for each Avamar system.

COLUMN	TYPE	DESCRIPTION
gsansystemid	varchar	Avamar server ID.
gsansystemname	varchar	User assigned name.
hfsaddr	varchar	IP address of server.
hfsport	int4	Port address of server.
lastupdate	timestamp	Last updated timestamp.
local_hfsaddr	varchar	Local IP address of server.
mcsport	int4	Port address of MCS for server from axion_systems.
systemid	int8	Numeric system ID (automatically assigned by MCS).

## EMS Database Views

The following topics list each EMS database view and describes the individual columns storing data within each view.

### v\_avamar\_server

This view contains a record (row) for each Avamar server monitored by Avamar Enterprise Manager.

COLUMN	TYPE	DESCRIPTION
adaurl	varchar	Universal Resource Locator (URL) for an optional Avamar Data Archive (ADA).
avamar_server_id	bigint	Unique Avamar server ID.
hfsport	integer	Avamar Hash File System (HFS) port number.
hostname	varchar	Avamar server hostname.
ip	varchar	Avamar server IP address.
lastcontact	timestamp	Time in UTC time the avamar system was last succesfully polled
local	boolean	True if this Avamar server is running on the same system as the Avamar Enterprise Manager server.
mcport	integer	Management Console Server (MCS) Remote Method Invocation (RMI) port number.
monitoring	boolean	True if monitoring this Avamar server.
note	varchar	Note about Avamar server entered by administrator.
rollbacktime	bigint	Unix time of last rollback.
status	varchar	Current polling status.
statusdetails	varchar	Detailed polling status.
systemid	varchar	Avamar system ID.
systemname	varchar	Avamar system name.
version	varchar	Avamar server version.

## **v\_compatibility**

This view stores Avamar Enterprise Manager server database compatibility information.

<b>COLUMN</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
component	varchar	
version	varchar	

# GLOSSARY

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**Activation.** See *Client Activation* (page 608).

**Authentication System.** A user name/password system that is used to grant user access to the Avamar server. Avamar supports its own internal authentication system (avs), as well as several external authentication systems (OpenLDAP, Windows Active Directory, NIS and SMB).

**Avamar Administrator.** Avamar Administrator is a graphical management console software application that is used to remotely administer an Avamar system from a supported Windows or client computer.

**Avamar Client.** A computer or workstation running Avamar software and accessing the Avamar server over a network connection. Avamar client software comprises a client agent and one or more plugins.

**Avamar Enterprise Manager.** Avamar Enterprise Manager is a multi-server management console application that provides centralized Avamar server administration capabilities for larger businesses and enterprises.

**Avamar Server.** The server component of the Avamar client/server system. Avamar server is a fault-tolerant, high-availability system that efficiently stores the backups from all protected clients. It also provides essential processes and services required for data restores, client access and remote system administration. Avamar server runs as a distributed application across multiple networked storage nodes.

**Avamar Web Access.** Browser-based user interface that allows access to the Avamar server for the express purpose of restoring files to a client.

**Backup.** A point-in-time copy of client data that can be restored as individual files, selected directories or as entire filesystems. Although more efficient than a conventional incremental backup, a backup is always a full, stand-alone copy of client data that can be restored immediately from an Avamar server.

**Client Activation.** The process of passing the client ID (CID) back to the client, where it is stored in an encrypted file on the client filesystem.

**Client Agent.** An Avamar client agent is a platform-specific software process running on the client that actually communicates with the MCS (page 169) and with any plugins installed on that client.



- Client Registration.** The process of establishing an identity with the Avamar server. When Avamar “knows” the client, it assigns a unique client ID (CID), which it will eventually pass back to the client during activation.
- Dataset.** A policy that defines a set of files, directories and filesystems for each supported platform that will be included or excluded in backups across a group of clients. A dataset is a persistent and reusable Avamar policy that can be named and attached to multiple groups.
- DNS .** Domain Name Server. A dynamic and distributed directory service for assigning domain names to specific IP addresses.
- Domain.** A feature in Avamar Administrator that is used to organize large numbers of clients into named areas of control and management.
- Email Home feature.** Optional feature that uses the High Priority Events profile and Notification schedule to regularly send server error and status messages directly to EMC Technical Support.
- Enterprise Manager Server (EMS).** The Avamar Enterprise Manager Server (EMS) provides essential services required to display Avamar system information and provides a mechanism for managing Avamar systems using a standard web browser. The Avamar Enterprise Manager server also communicates directly with existing MCSs, which are an integral part of the all Avamar systems in your enterprise.
- Full Replication.** A full “root-to-root” replication creates a complete logical copy of an entire source system on the destination system. The replicated data is not copied to the REPLICATE domain, it is added directly to the root domain just as if source clients had registered with the destination system. Also, source server data replicated in this manner is fully modifiable on the destination system. This is typically used for system migration (from a smaller Avamar configuration to a larger, possibly multi-node configuration) or system replacement (for instance, in a case of disaster recovery).
- Group.** A level of organization in Avamar Administrator for one or more Avamar clients. All clients in an Avamar group use the same group policies (dataset, backup schedule and retention policy).
- Group Policy.** The dataset, schedule and backup retention policy attached to a group that will be used by all clients in a group, unless these policies settings are overridden by an administrator at the client level.
- HFS.** Hash Filesystem. The content addressed storage area inside the Avamar server used to store client backups.
- HFS Check.** An Avamar Hash Filesystem check (HFS check) is an internal operation that validates the integrity of a specific checkpoint. Once a checkpoint has passed an HFS check, it can be considered reliable enough to be used for a server rollback.
- JRE.** Java Runtime Environment.
- LAN.** Local Area Network.
- LOFS.** Loopback Filesystem.
- MAC Address.** Media Access Control Address. A unique hardware address, typically embedded at the lowest level in a hardware assembly, that uniquely identifies each device on a network.
- Management Console Server (MCS).** The MCS provides centralized administration (scheduling, monitoring and management) for the Avamar server. The MCS also runs the server-side processes used by the Avamar Administrator graphical management console.
- Module.** Avamar 1.2.0 and earlier multi-node Avamar servers utilized a dual-module synchronous RAIN architecture in which nodes were equally distributed in two separate equipment cabinets on separate VLANs. The term “module” is a logical construct used to describe and support this architecture (older multi-node Avamar servers comprised a primary module and a secondary module). These legacy systems continue to be supported. However, newer multi-node Avamar servers utilize a single

module architecture and even though Avamar Administrator provides “module detail” information, a module is therefore logically equivalent to the entire server.

**NAT.** Network Address Translation.

**NDMP.** Network Data Management Protocol.

**NDMP Accelerator.** Avamar NDMP Accelerator (accelerator) is a dedicated single-node Avamar client, that when used as part of an Avamar system, provides a complete backup and recovery solution for Network Appliance™ filers (filers) by way of the Network Data Management Protocol (NDMP).

**NFS.** Network Filesystem.

**NIS.** Network Information Service. An external authentication system that can be used to log into an Avamar server.

**Node.** A networked storage subsystem consisting of both processing power and hard drive storage, running Avamar software.

**NTP.** Network Time Protocol. Controls time synchronization of a client or server computer to another reference time source.

**ODBC.** Open DataBase Connectivity. A standard database access method that makes it possible to access any data from any application, regardless of which database management system (DBMS) is handling the data.

**OpenLDAP.** Open Lightweight Directory Access Protocol. An external authentication system that can be used to log into an Avamar server.

**PAM.** Pluggable Authentication Module. A Linux library that allows a local system administrator to define how individual applications authenticate users.

**Plugin.** An Avamar plugin is a software process that recognizes a particular kind of data resident on that client.

**Policy.** A set of defined rules for client backups that can be named and applied to multiple groups. Groups have dataset, schedule and retention policies.

**RAIN.** Redundant Array of Independent Nodes. A flexible, fault-tolerant architecture that allows an Avamar server to maintain availability and preserve data storage if single nodes fail in an Avamar module.

**RDMS.** Relational Database Management System.

**Registration.** See *Client Registration* (page 609).

**Replication.** Replication is an optional feature that allows one Avamar server to store a read-only copy of its data on another Avamar server in order to support future disaster recovery of that server.

**Restore.** File or object restore. An operation that retrieves one or more filesystems, directories, files or data objects from an existing backup and writes it to a designated location.

**Retention.** The ability to control the length of time backups will be kept in an Avamar server before automated deletion. Retention can be set to permanent for backups that should not be deleted from an Avamar server. Retention is a persistent and reusable Avamar policy that can be named and attached to multiple groups.

**Roles.** A setting in Avamar Administrator that controls which operations each user can perform in the Avamar server. Roles are assigned on a user-by-user basis.

**Schedule.** The ability to control the frequency and the start/end time per day for backups of clients in a group. A schedule is a persistent and reusable Avamar policy that can be named and attached to multiple groups.

**System Migration.** System migrations are planned operations that use full “root-to-root” replications to copy all data residing on a source Avamar server to a new destination server. If global client IDs (global CIDs) are used, clients that formerly backed up to the source server can continue to operate transparently without reregistering with the new destination server.

**SSH.** Secure Shell. A remote login utility that authenticates by way of encrypted security keys instead of prompting for passwords. This prevents passwords from traveling across networks in an unprotected manner.

**Storage Node.** A node in the Avamar server providing storage of data.

**TFTP.** Trivial File Transfer Protocol. A version of the TCP/IP FTP protocol that has no directory or password capabilities.

**Utility Node.** In scalable multi-node Avamar servers, a single utility node provides essential internal services for the server (for example, MCS, cronjob, Domain Name Server (DNS), External authentication, Network Time Protocol (NTP) and Web access). Because utility nodes are dedicated to running these essential services, they cannot be used to store backups

**VLAN.** Virtual Local Area Network.