ATO Administration Guide

Version 2.0.X

July, 2010

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Overview

ATO is a utility providing tape-out capability from an Avamar system. It's based on a re-hydrated approach where data is first recovered to a staging file system then subsequently backed up to tape using standard tape backup applications. It entails a three step process the first a client/backup selection phase followed by an optional view or confirmation of the selection and finally the staging and tape backup phase. ATO Batch Manager automates this process eliminating any need for operator intervention or each phase can be executed interactively.

All Avamar system types are supported including single and multi node, source and replication target and Avamar used as a Networker de-dupe node. All popular tape backup applications are supported with their corresponding tape backup scripts being generated and initiated automatically. Performance may vary depending on the infrastructure involved and the tape out strategy used incremental versus non-incremental. Non-incremental averages ~100-150 GB/Hr during the staging phase but can often peak over 200 GB/Hr when low file counts or larger files are involved. Incremental is most effective with file system and NDMP backups providing effective throughput staging rates in the range of ~600 GB/Hr to 1+ TB/Hr using a single staging server. By increasing the number of available staging servers aggregate throughputs will improve considerably as ATO can utilize them concurrently. Incremental also provides the ability to leverage incremental tape backups reducing their run times and media usage by as much as ~80%.

The minimum staging disk capacity required must be large enough to hold the largest individual backup involved. With incremental, disk capacity must be large enough to retain a single copy of each client's data involved. Any type of staging disks may be used arrays, JBOD or standalone USB disks. When staging disk capacity is too small the entire TO process becomes less efficient with valuable time being spent on deleting previously staged data resulting in delays on the tape application related with mounting, dismounting and positioning time of tapes.

ATO Features

- **Single point of management**
- **Seamless support for various staging platform types**
- **Seamless support of up to 20 concurrent tape out sessions per ATO instance**
- **All Avamar system types supported + Networker De-Dup node**
- **Easy to use menu driven user interface**
- **Automated tape backup initiation and monitoring using popular tape backup applications Networker, NetBackup, Backup Exec, Arcserv, HP Data Protector, TSM**
- **Structured event and batch logs capture status of all significant tape out activity**
- **Supports incremental and non-incremental tape out strategies**
- **Supports several Avamar Plug-In types**
- **Checkpoint recovery mechanism**
- **Powerful filters to limit and control backups selected for tape**
- **Audit mechanism tracks critical path components to tape ensuring accurate location of files on tape**

Architectural Overview

The following illustration depicts the basic ATO architecture beginning with the data flow as it travels from the Avamar server under the control of the ATO client configuration and environment files to the staging server disk(s). Once staging completes an auto-generated tape script is optionally invoked to perform a tape backup using the appropriate tape server and tape policy definition. When multiple staging or tape backup servers are available ATO can utilize these concurrently improving aggregate throughputs considerably.

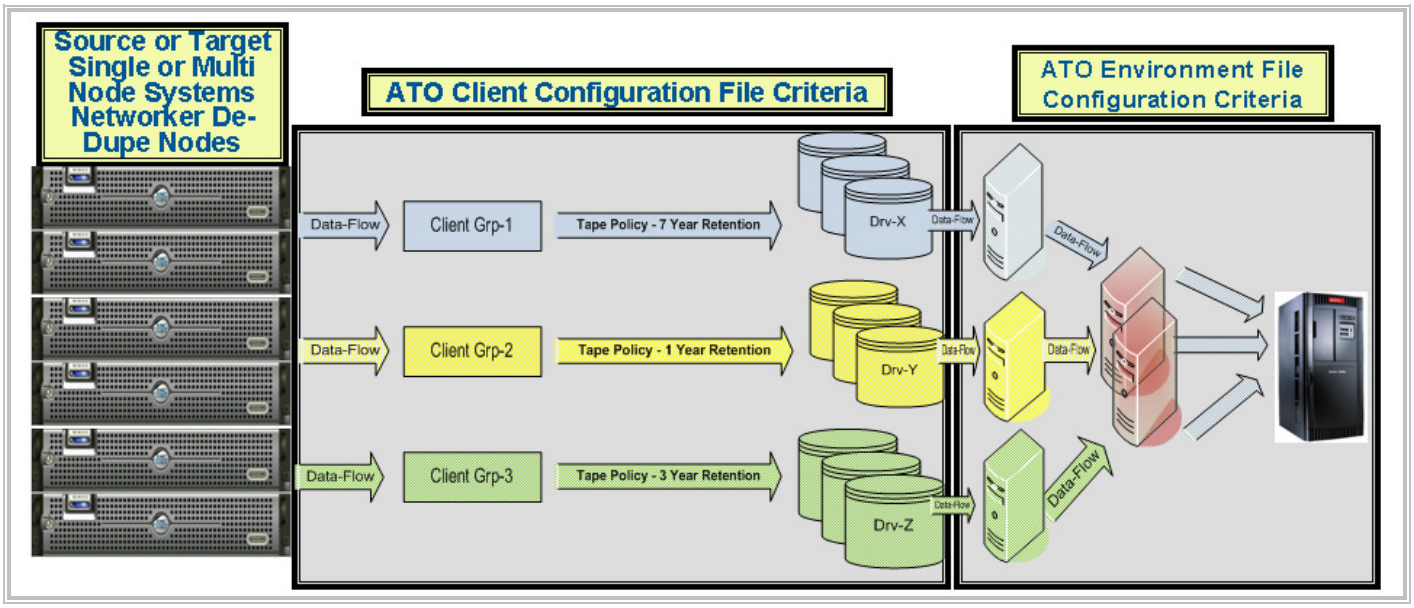

Figure 1

Control & Data Flow

Figure 2 highlights the control and data paths ATO uses. A key advantage is its ability to manage the tape out process and infrastructure from a single point simplifying operational tasks. This is also applicable when multiple staging servers are used regardless of the OS platforms involved. In addition, heterogeneous tape backup servers and application software can be used concurrently in a transparent manner.

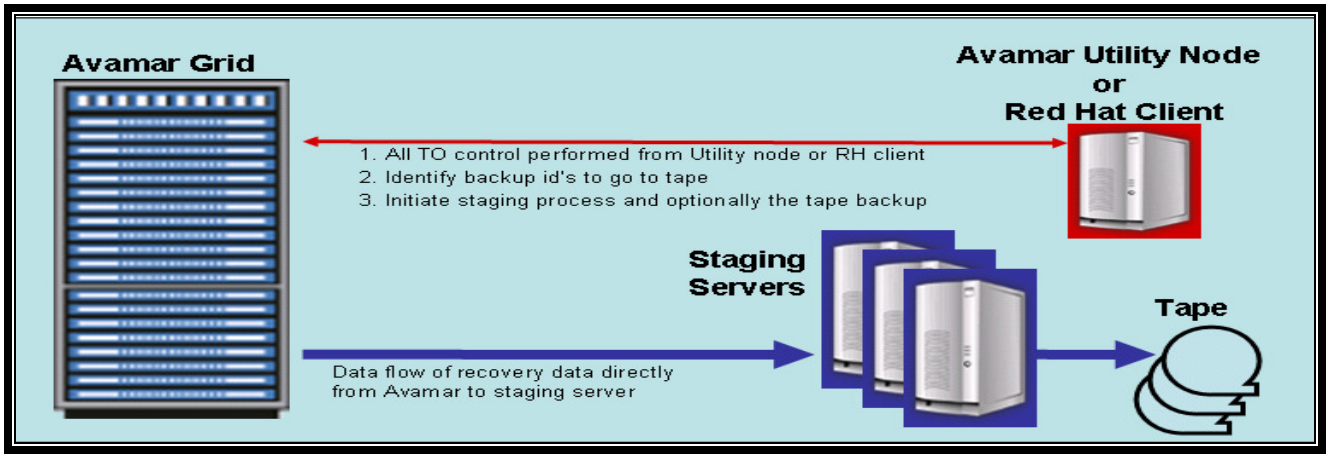

Figure 2

Installation

ATO is distributed and installed from a tar file on a Utility node or a supported Red Hat client. Different prerequisites exist for each so perform only those steps pertaining to your specific environment. To obtain a copy of the latest ATO tar file go to http://ca-center.lss.emc.com/imsg/ProductPages/ATO.html which is accessible on EMC internal network only. For those without access to this site please contact EMC Support for guidance.

Installation – Using a Utility Node

1. Transfer the ATO tar file to the Utility Node and execute the following command. **Note:** the ***Pxf*** is an upper case P.

   a. ***scp <ato-tar-file> to /usr/local/avamar/src***
   b. ***tar Pxf ato_<ato-tar-file-version>.tar***

Installation – Using a Red Hat Client

1. When using a RH client for ATO control additional steps and files are required to establish a working environment. You must install the ***mccli*** and ***java*** rpm's as well as the ***avmgr*** binary all of which are available from the Avamar Utility node.

2. Install the Red Hat system as a regular file system client to the Avamar system ATO will be referencing.

3. Obtain a copy of file ***avmgr*** from the Utility Node located in ***/usr/local/avamar/bin*** copying it to this same location on the RH system.

   a. ***chmod 755 /usr/local/avamar/bin/avmgr***

4. Install ***mccli*** and ***Java*** rpm's as follows.

   c. Obtain a copy of the appropriate ***java*** and ***mccli*** rpm's from the Utility node located in ***/usr/local/avamar/src/RHEL4_64*** and save them to a temporary folder.

JAVA**:**	**jre-6u12-linux-amd64.rpm**	(Avamar Ver-5.x)
	jre-1_5_0_12-linux-amd64.rpm	(Avamar Ver 4.x)
MCCLI**:**	**dpnmccli-5.0.1-32.rhel4_64.x86_64.rpm**	(Avamar Ver-5.x)

   Note: exact rpm file names will vary depending on the Avamar version

5. Change to the temporary folder where the rpm's were saved and run the following commands. If required refer to the MCCLI Programmer Guide for additional details.

   a. ***rpm –ivh jre-6u12-linux-amd64.rpm***
   b. ***rpm –ivh dpnmccli-5.0.1-32.rhel4_64.x86_64.rpm***

6. Create a soft link pointing to the appropriate location where the newly installed ***mccli*** binaries reside. The ***mccli*** version shown in red will vary. Refer to the MCCLI Programmer Reference Guide which documents the installation procedure.

   d. ***cd /usr/local/avamar/bin***
   e. ***ln –s /usr/local/avamar/5.0.1-32/bin/mccli mccli***
   f. ***ls -l mccli lrwxrwxrwx <???> mccli -> /usr/local/avamar/5.0.1-32/bin/mccli*** (verification of link)

7. At the end of the the ***mccli*** rpm install you'll be prompted to run: ***/usr/local/avamar/5.0.1-32/bin/avsetup_mccli*** a sample execution is shown here;

   setting linux default
   Enter the location of your JRE 1.6 installation [/usr/java/jre1.6.0_12]:
   Enter the root directory of your Avamar installation [/usr/local/avamar/5.0.1-32]:
   Enter the user data directory of your Avamar installation [~/.avamardata/5.0.1-32/var]:
   INFO: /root/.avamardata/5.0.1-32/var does not exist
   Configuring default local mcsprofile in /usr/local/avamar/5.0.1-32/lib/mcclimcs.xml
   Enter default mcs host name (mcsaddr) [avamar98]:
   Enter default mcs port number on avamar98 (mcsport) [7778]:
   Enter default userid on avamar98 (mcsuserid) [MCUser]:
   Enter password for MCUser (mcspasswd) [MCUser1]:

   If during the above process you did not update the values with correct values you can copy the ***mcs*** profile from the location named above ***/usr/local/avamar/5.0.1-32/lib/mcclimcs.xm***l to the default location where ATO looks in ***/root/.avamardata/var/mc/cli_data/prefs/mcclimcs.xml*** , if this path doesn't exist create it manually. Update the fie ensuring fields ***mcsaddr, mcsuserid*** and ***mcspasswd*** are updated correctly with appropriate values. ***Mcsaddr*** must equal the hostname of the Utility node and ***mcsuserid*** & ***mcspasswd*** must equal a valid root level ID such as ***MCUser / MCUser1*** but this may vary.

   Verify you can successfully execute basic ***mccli*** commands such as: ***mccli version show***
   Note: If you are unable to successfully execute ***mccli*** commands you must be resolve the issue before using ATO

8. When you establish ATO environment files on a RH client you must always edit the Utility node name field as it will by default equal the RH hostname. It must contain the name of the Avamar Utility node.

Installation – Using a Networker Dedup Node

1. Install the Networker server as a native file system client to the Avamar dedup node using the native Avamar procedure.

2. When the Networker client software is installed on Unix or Linux the paths to commands required by ATO ***savefs, save*** and ***recover*** differ but the ATO environment file provides only one variable to specify a path to these. ***Save*** and ***recover*** are normally located in ***/usr/bin*** while ***savefs*** is in ***/usr/sbin***. To overcome this issue establish a soft link in path ***/usr/bin*** to ***savefs*** then define ***/usr/bin*** as the path name in the ATO environment file.

   Note: This may differ between OS platforms as to where Networker keeps these commands.

   The following is the suggested procedure;

   a. ***login as root to the staging server***
   b. ***cd /usr/bin***
   c. ***ln –s /usr/sbin/savefs savefs***
   d. ***assign to environment file variable BACKUPPRODUCTHOMEUNIX: /usr/bin***

Installation – Common to All Modes

1. The staging server(s) used by ATO must be a regularly installed file system client to Avamar and the tape backup application involved. Follow normal documented procedures to install on each operating system the appropriate file system plug-in.

2. The tape backup servers used by ATO must be a regularly installed file system client to Avamar. Follow normal documented procedures to install on each server the appropriate file system plug-in..

3. Prior to configuring the ATO environment files you will need the following information to populate the named variables;

   a. ***BUSERVER_NAME*** - Tape backup server host name as it is known to Avamar
   b. ***UNIXSS & WINDOWSS*** – A Unix/Linux and Windows staging server name as they are known to Avamar and include the Avamar domain name they resides in
   c. ***TUNIXSS*** - For a Unix or Linux staging server identify the base platform type using values LINUX, HPUX, AIX, SOLARIS or FREEBSD
   d. ***UNIXINSTALLPATH & WININSTALLPATH*** – Base install path where the Avamar FS agent is installed on the staging servers
   e. ***BACKUPPRODUCTHOMEUNIX & BACKUPPRODUCTHOMEWIN*** - Install path to where the tape application's binaries exist on the staging server for CLI access
   f. ***BACKUPPRODUCT*** - Tape backup application to be used***: networker, netbackup, tsm, arcserv, backupexec*** or ***hpdp***
   g. ***TAVAINSTALLPATH*** – Base install path of Avamar FS plug-in on the tape backup server
   h. ***TAVADOMAINNAME*** – Avamar domain name where tape backup server resides

4. Establish a base ATO environment configuration file with the following command sequence. This will also establish an appropriately named pseudo client in the /clients domain and used by ATO to communicate with the staging servers. Environment file(s) and their contents are crucial to successful ATO operation therefore accuracy is important. Refer to section below on variable definitions and appropriate values.

   a. ***ato –env*** (establish base environment if it doesn't exist or view an already established one)
   b. ***ato –env update*** (edit environment file contents as required)
   c. ***ato –env parse*** (perform a parse check against environment file contents)
   d. Repeat this process if required for each additional file 2 through 20 using syntax "**ato *2 –env etc..*"** where **2** represents the environment file# to access. By default environment file #1 is used and does not need to be specified in any ATO command syntax.
   e. Refer to ***Environment File Definition*** section below on how to establish additional environments and variable definitions

5. Setup the ATO client configuration file by grouping and organizing the clients for tape out into manageable workloads. It is best to update this file using the ATO Configuration Manager (CM) available from the ATO Menu. Please refer to section below on using the CM

6. Define appropriate tape policy save set definition(s) to capture the staging locations involved. The following illustrates how the staging server client resource may look in Networker for both non-incremental and incremental. Any number of mount points and/or folders can be used for staging destination therefore save set definitions will vary depending on requirements of what to include or not in a given tape backup.

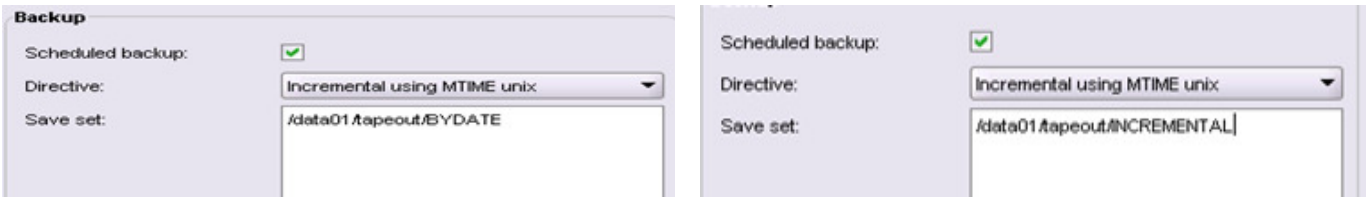

Figure 3

7. To start ATO interactive menu type ***ato***.

Environment File

ATO environment files define key control variables reflecting a given user environment. Each file can be thought of as an independent ATO configuration used to control an ATO tape out session. Because environment files are referenced separately they can be used to perform multiple tape-out sessions concurrently providing they reference unique staging server resources.

Establishing the base or first environment file by running "***ato –env***" and additional files 2 through 20 can be established using syntax ***ato [env#] –env*** where ***env#*** represents the environment file number. Environment file names remain consistent with the exception of their appropriate numeric value being appended to it. Critical variable contents are established automatically ensuring no conflicts with other environment files but site specific information such as staging server specifications and tape backup server names must be manually edited as required. To update an environment file enter ***ato [env#] –env update***

Note: All functions related with environment files can be accessed directly from the ATO menu by entering ***ato***

========< Environment Configuration >==========
Environment Filename: /usr/local/avamar/etc/atoenv.cfg
==========

AVAMAR_UTILNODE_NAME=lablnx01	Avamar Utility node name
HOMEPATH==/usr/local/avamar/bin	home path of ***ato*** binaries
# >>> TAPE BACKUP PARAMETERS	
BUSERVER_NAME=n/a	Tape backup server name
BACKUPPRODUCT=networker	arcserv, brightstore, hpdp, networker, netbackup, tsm, backupexec
BACKUPPRODUCTHOMEUNIX=n/a	tape backup software install path to binaries on UNIX SS
BACKUPPRODUCTHOMEWIN=n/a	tape backup software install path to binaries on Windows SS
TAVAINSTALLPATH:=n/a	Avamar agent install path on tape backup server (used for –server option)
TAVADOMAINNAME:=n/a	Avamar domain name where tape backup server resides, (used by –server option)
ENDOFYEAR=01	used to determine which month EOY backups take place
# >>> STAGING SERVER PARAMETERS	
UNIXSS=/clients/lablnx02.mexlab.emc	UNIX staging server host name include Avamar domain path
UNIXINSTALLPATH=/usr/local/avamar	UNIX staging server Avamar client installation home path
TUNIXSS=LINUX	UNIX staging server type, HPUX, AIX, SOLARIS, FREEBSD,LINUX
WINDOWSS=n/a	Windows staging server name include Avamar domain path
WININSTALLPATH=C:/progra~1/avs	Windows staging server Avamar client installation home path
LINUXSS=n/a	LINUX staging server used for Avamar AST TO mode only
# >>> ATO CONTROL FILES	
CFG=/usr/local/avamar/etc/atoclient.cfg	client configuration file
LOG=/usr/local/avamar/var/atoevent.log	event log file#
TMP_PATH=/tmp/atocfg	Temp path used by this environment#
PSEUDOCLIENT=/clients/tapeoutato	Avamar pseudo client used by ATO process's
# >>> ATO OPERATIONAL PARAMETERS	
CMD_mail=/bin/mail	email program to be used for email notifications
MAIL_TO=""	email address list in a single double quoted, space separated string
LOG_SIZE=30000	event log file max size in number of lines
TIMEDELAYSTAGE=300	delay between staging progress messages
TIMEDELAYTAPE=600	delay between tape backup progress messages
USE_ALLNODES=Y	set to Y to optimize staging performance in a GRID environment
MAX_RECOVERY_SESSIONS=5	Used by Recovery Manager interface
COLORSCHEME=1	screen color: 1=black/multi-color, 2=white/some color, 3=no color
SCRIPT_TIMEOUT=36000	automated tape script run timeout in seconds

Notes:

1. Staging server name definitions must include the Avamar domain path
2. Always perform a parse check against an environment file after updating with ***ato [env#] -env parse***

3. Windows path name definitions must be in entered in DOS 8.3 name format and you must substitute forward slashes / for the standard Windows backward slash \.
4. When using multiple environment files the staging server names used in each normally must be unique. However, a given environment contains both a Unix and Windows SS definition of which only one can be used at a time. To enable these to be used concurrently establish another environment file containing the same SS names. One environment file can now be used for a Unix TO session while the second is used for a Windows TO session but both environments have access to both SS's.
5. Never modify the ATO Control file section
6. When using multiple environment files ATO command syntax remains consistent with the exception of the first argument used to identify the environment number to use. By default, environment 1 is assumed therefore is not necessary to specify but for environments 2 through 20 requires it be specified. For example, ***ato 2 -siteid test –tapeout –inc*** will initiate a tape out operation using environment 2, ***ato -siteid test –tapeout –inc*** will initiate a tape out operation using the base or environment one.

Environment File Display:

```
==============< Environment Configuration >==============
 Environment Filename: /usr/local/avamar/etc/atoenv.cfg2
=========================================================

AVAMAR_UTILNODE_NAME:   lablnx01
HOMEPATH:               /usr/local/avamar/bin
# >>> TAPE BACKUP PARAMETERS
BUSERVER_NAME:          lablnx02.mexlab.emc
BACKUPPRODUCT:          networker
BACKUPPRODUCTHOMEUNIX: /usr/sbin
BACKUPPRODUCTHOMEWIN:   n/a
TAVAUNIXINSTALLPATH:    /usr/local/avamar
TAVAWININSTALLPATH:     C:/progra~1/avs
TAVADOMAINNAME:         /Mexico
ENDOFYEAR:              01
# >>> STAGING SERVER PARAMETERS
UNIXSS:                 /Mexico/lablnx02.mexlab.emc
UNIXINSTALLPATH:        /usr/local/avamar
TUNIXSS:                LINUX
WINDOWSS:               n/a
WININSTALLPATH:         C:/progra~1/avs
LINUXSS:                n/a
# >>> ATO CONTROL FILES
CFG:                    /usr/local/avamar/etc/atoclient.cfg
LOG:                    /usr/local/avamar/var/atoevent.log2
TMP_PATH:               /tmp/atocfg2
PSEUDOCLIENT:           /clients/tapeoutato2
# >>> ATO OPERATIONAL PARAMETERS
CMD_mail:               /usr/sbin/sendmail
MAIL_TO:                ""
LOG_SIZE:               30000
TIMEDELAYSTAGE:         300
TIMEDELAYTAPE:          600
USE_ALLNODES:           Y
MAX_RECOVERY_SESSIONS: 5
COLORSCHEME:            1
SCRIPT_TIMEOUT:         36000

=========================================================
```

Figure 4

Environment File Update

```
1) Utility Node Info
2) Tape Backup Server Parameters
3) Staging Server Parameters
4) ATO Control Files
5) ATO Operational Parameters

0) Manual Edit Session

 Enter #=View/Modify or [ Def=Quit ]: >
```

Figure 5

Email Setup Information

An email list can be specified in the environment file to provide email alerts containing the related event details associated with either a –***select*** or –***tapeout*** action. The following steps may be required for Email to work using the ***sendmail*** command.

1. ***vi /etc/sendmail.mc*** (*save a copy of this file first*)

2. Search for **SMART** and edit the domain name of customers relay host by changing the text shown in red to the required relay hostname

   dnl # Uncomment and edit the following line if your outgoing mail needs to
   dnl # be sent out through an external mail server:
   dnl #
   dnl define(`SMART_HOST',`smtp.your.provider')dnl

3. ***vi /etc/mail/sendmail.cf*** (*save a copy of this file first*)

4. Search using "**^DS"** which should bring you to the following line

   # "Smart" relay host (may be null)
   DS

5. Update the line with DS by replacing the red text with your relay host name.

   DS ***your-relay-host-name***

6. Restart mail services

   service sendmail restart

7. Test **sendmail** using the following command. Using outside address's will work only if customer permits these to be relayed from the Avamar system, internal address's however should work.

   sendmail ***your-address***

Client File Field Definitions

The client configuration file located in ***/usr/local/avamar/etc/atoclient.cfg*** is vital to ATO operation and must be modified to reflect your tape-out client environment using its field definitions as documented below. Be careful when updating manually and always run a parse check to verify the contents after any modification.

Prerequisites and Considerations:

1. Clients sharing a group-id must share a common tape-out script name and staging server type. In situations where these parameters must differ for a group of clients then you must configure them in separate groups.
2. Date fields are normally calculated automatically indicated by the keyword AUTO and is relative to the current date of execution. The search range will be from the first of the current month to the current date.
3. A "#" character in column-1 represents a comment. Comments are useful for documentation purposes. Use a double comment "##" if you prefer the comments not be displayed by the ***–cfg*** display option.
4. Any clients to be taped out must have at least one entry in this file.
5. Tape policy Field's 12, 13 and 14 are referenced when building an appropriate tape backup script therefore you must ensure these policies are configured correctly within the tape backup application software.
6. Always perform a parse check against the client configuration file after any modifications ***ato –cfg parse or from CM.***
7. To add/modify/display/enable or disable clients from the tape-out process you can use ***ato –cfg manager*** or Opt-2 in Menu to modify the configuration file. Using the provided interface provides better accuracy especially for domain and client names.

Table 1

=not applicable on Networker de-dupe node *=applicable only to Networker de-dupe node**

Group-ID Fld-1	A free form text string used to identify and group clients together for tape-out purposes. It can also be used to facilitate multiple entries of a given client useful when varying criteria may be required such as different retention times on tape.
Start-Date Fld-2	Starting date to begin backup search from. Keyword **AUTO** defaults to the first of the current month or you can enter a specific date using format ***yyyy-mm-dd*** or you can specify on the call line **–sdate** ***yyyy-mm-dd***
End-Date Fld-3	Ending date to limit the backup search to. Keyword **AUTO** defaults to the current date or you can enter a specific date using format ***yyyy-mm-dd*** or you can specify on the call line **–edate** ***yyyy-mm-dd***
Domain Fld-4	Must be set to the Avamar domain name where the specified client name resides. **To be considered a Networker client the first level domain must be ***/NetWorker***
Client Name Fld-5	Client name to select and stage backups from, enter the client name as it is known to Avamar
Avamar Policy Group Name Fld-6	Filter backups using a specific Avamar group name only. Value may vary between clients within an ATO group. Set to n/a if not used. Command line parameter ***–gname*** is also available for this purpose and if specified takes precedence and will pertain to all clients in the group.
Retention Type Fld-7	Filter backups to a specific retention type only. Valid values are ***none, daily, weekly, monthly, yearly*** or n/a if not used. Value may vary between clients within an ATO group. Command line parameter ***–rtype*** is also available for this purpose and if specified takes precedence and will pertain to all clients in the group

Exclude Folder or File name Fld-8	Filter staged data by excluding specified folders from the staging process, set to ***n/a*** if not used. Multiple file names may be specified by separating each using the "|" pipe character. Command line ***–xdata*** is also available for this purpose taking precedence and will pertain to all clients in the group. Using command line multiple ***–xdata*** arguments are permitted and can be used for one file spec **Note**: When using command line any file names containing spaces must be enclosed in quotes. * For Avamar native mode filter is applied during the ***–tapeout*** process ** For Networker de-dupe node filter is applied during the ***–select*** process where the defined names a maximum of 6, represent a Networker save set name.
O/P File Fld-9	Set to keyword of **DEFAULT** in native mode or **AVAMAR** in Avamar or AST mode. The file name used in both cases will be ***snapup2tape.txt***. Please contact support before using Avamar mode.
Destination-Dir Fld-10	Destination directory where backup data will be recovered to. Each client within the group can have different destination FS or directories specified.
Tape-backup-Script Fld-11	The keyword of **AUTO** will generate a suitable tape backup script automatically. To specify your own tape script it must reside on the Utility node its complete path must be specified. A prerequisite is for all clients within a group to share a common script name. Keyword of **MANUAL** pertains to AST mode only and indicates no tape backup script will be called and you will be required to answer a prompt after the staging restore is complete. Refer to command line option ***–s*** for a better alternative to provide staging only.
Monthly or Daily-Group Fld-12	With Networker, represents the group name to be referenced during the regular tape backup. It will be initiated from the staging client therefore is considered a client initiated backup. For other tape applications this field represents a policy name used in a similar fashion. Additional tape command line syntax can be included here as well.
Yearly Group Fld-13	With Networker, represents the Group name to be referenced during a yearly tape backup. It will be initiated from the staging client therefore considered a client initiated backup For other tape applications it represents a policy name used in a similar fashion. Works in conjunction with **ENDOFYEAR** variable defined in environment file. 0=not used, 01=January 12=December which determines which month is considered end of year and when applicable will sue this policy. Additional tape command line syntax can be included here as well.
Networker-Group Fld-14	This variable is similar to Fld-12 however is used only when the tape script is initiated from the tape backup server versus client initiated from a staging client. This is determined by using the ***–server*** option during a ***–tapeout*** operation. Initiating a tape backup from a Networker server will invoke different syntax and it can be monitored from NMC using its group name. It also facilitates the use of multiplexing and automatic cloning. Enter **n/a** in this field if not used. Two additional parameters located in the environment file ***TAVAINSTALLPATH*** and ***TAVADOMAINNAME*** must also be updated accordingly in order to support the ***–server*** option. Additional tape command line syntax can be included here as well.
Staging Server Type Fld-15	Used to define the ATO staging server type, valid values are ***UNIX, WINDOWS*** or ***LINUX*** which is only applicable when used in conjunction with AST scripts. Normal use requires this be set to either **UNIX** or **WINDOWS** based on the desired staging server type to stage to. **Note**: ***UNIX*** accommodates all flavors of supported UNIX and LINUX platforms not to be confused with the ***LINUX*** definition above. **Note**: all clients within an ATO group must share the a common destination server type. The actual SS name is taken from the environment file you choose to perform the TO session with.
Destination Path Suffix Fld-16	When specified its value is appended to the final destination path name, set to ***n/a*** if not used. When used on a per client basis its value may vary between clients. Command line parameter ***–path*** is also available for this purpose and when specified takes precedence and it will pertain to all clients in the group. Only one ***–path*** statement can be specified on the command line. **Note**: Specify a Windows path ***C:\Program Files*** as ***/C/Program Files***. Also, if using the command line the entire string must be in quotes if spaces are present within the name.

Include Folder or File Name Fld-17	When specified only the selected folder(s) or file(s) will be staged, set to ***n/a*** if not used. Multiple file names can be specified by separating them using the "|" pipe character. Command line ***–data*** is also available for this purpose and takes precedence over the configuration file value. With command line multiple ***–data*** arguments are allowed and will pertain to all clients in selected group. **Note**: When using command line each file name must be in quotes if they contain spaces. * Usage with Avamar native mode is applied during the ***–tapeout*** process ** Usage with Networker de-dupe node is applied during the ***–select*** process and the name represents a save set name
Incremental-Delete Fld-18	This flag when set to ***INCDEL*** deletes the specified clients staging data after exporting to tape. The next incremental tape-out operation will need to restage 100% of the data. However, the tape backup phase may still be able to leverage an incremental although this varies between application and platform type. Set this field to ***n/a*** if not used. Command line option ***–incdel*** overrides this parameter forcing all clients involved to use this policy. In order to continue leveraging an incremental tape backup, you must ensure its incremental reference point is based on file modification time MTIME rather than the usual CTIME value. In Networker this is accomplished by using the following directive on the server or for client initiated backups in a *nsr.dir* file on the staging FS's involved. **Note**: Networker does not leverage the incremental after deletion on Windows but does on Red-Hat and perhaps other Unix platforms. Modify path as required to point to your staging destination UNIX: **<</>> + mtimeasm: *.*** Windows**: << "F:\" >> +mtimeasm: *.***

Client Configuration File Layout

```
 1. Group-ID        6. Policy-Group-Name  11. TapeBU-Script     16. Dest-Path Suffix
 2. Start-Date      7. Retention-Type     12. Monthly-Group     17. Select-Folder(s)
 3. End-Date        8. Exclude-Files      13. Yearly-Group      18. Incremental Delete
 4. Domain          9. O/P File           14. NwkSrv-Group
 5. Client          10. Destination-Dir   15. SS-Type


=============================================================================================================
# ########
# Group-ID: ak Created 17/09/09 06:10
# ########
ak2,AUTO,AUTO,/Mexico,lablnx02.mexlab.emc,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout/fs,AUTO,tapeout_grp,n/a,n/a,UNIX,n/a,n/a,n/a,n/a
ak3,AUTO,AUTO,/Mexico,lablnx02.mexlab.emc,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout,AUTO,tapeout_grp,n/a,n/a,UNIX,n/a,n/a,n/a,n/a
ak4,AUTO,AUTO,/Mexico,lablnx02.mexlab.emc,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout,AUTO,tapeout_grp,n/a,n/a,UNIX,n/a,n/a,n/a,n/a
# ########
# Group-ID: ak Created 18/09/09 21:47
# ########
ak,AUTO,AUTO,/Mexico,emcsql,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout,AUTO,tapeout_grp,n/a,n/a,n/a,UNIX,n/a,n/a,n/a,n/a
ak,AUTO,AUTO,/Mexico,mxtgzarazml1c.corp.emc.com,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout,AUTO,tapeout_grp,n/a,n/a,n/a,UNIX,n/a,n/a,n/a,n/a
ak,AUTO,AUTO,/Mexico,lablnx02.mexlab.emc,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout,AUTO,tapeout_grp,n/a,n/a,n/a,UNIX,n/a,n/a,n/a,n/a
# ########
# Group-ID: ak5 Created 25/09/09 09:55
# ########
ak6,AUTO,AUTO,/clients,cdtgkirkpal1c.corp.emc.com,n/a,n/a,/n/a,DEFAULT,/data01/tapeout,AUTO,tape_daily_grp,tape_eoy_grp,tape_server_grp,UNIX,n/a,n/a,n/a
ak6,AUTO,AUTO,/clients,mxenbedoljl2c.corp.emc.com,n/a,n/a,/n/a,DEFAULT,/data01/tapeout,AUTO,tape_daily_grp,tape_eoy_grp,tape_server_grp,UNIX,n/a,n/a,n/a
repl,AUTO,AUTO,/Mexico,lablnx02.mexlab.emc,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout,AUTO,tapeout_grp,n/a,n/a,n/a,REPLICATE,n/a,n/a,n/a
# ########
# Group-ID: aknew Created 31/10/09 12:58
# ########
aknew,AUTO,AUTO,/clients,artgbrunfjl1c.corp.emc.com,n/a,n/a,n/a,n/a,DEFAULT,/data01/tapeout,AUTO,tapeout_grp,n/a,n/a,n/a,UNIX,n/a,n/a,n/a,n/a

CONFIGURATION SUMMARY: Clients=9 Unique-Clients=5 Disabled-Clients=1 Groups=7 Staging-Paths=2 Select-Files-Only=3 Inc-Delete=0
```

Operator Menu

The ATO Operator Menu provides an intuitive and interactive interface for all major ATO functions. It can be used to determine TO status, interactively modify or view configuration files, access Event Log, view selected backup metrics, interface with Recovery and Batch Managers etc.. Most functions available in the Menu are also available directly at the command line described later in this document. To start the ATO menu enter ***ato*** with no arguments.

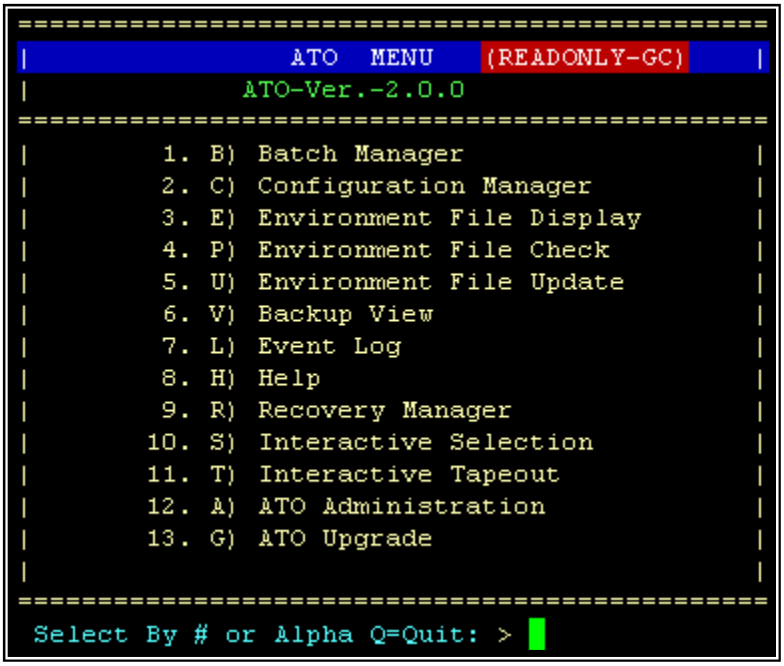

Figure 6

The status area highlighted in red is displayed only when a Avamar maintenance task is active. Menu selections are made by entering its numeric ID or corresponding alpha character which is not case sensitive. A summary of each selection is given here but detailed information is provided later in this document.

1-B: Batch Manager BM has two modes of operation Monitor and Configuration. Configuration mode is used to establish ATO batch profiles which can be executed interactively in BM, from the command line directly or with the ATO CRON interface. Monitor mode provides a dashboard view used for monitoring progress and completion status of all batch profiles. The display is color coded reflecting the current and/or last completion status of all ATO batch jobs from all environments.

2-C: Configuration Manager CM is used to manage all aspects of client and group configuration within ATO. It provides an interactive interface to ensure accuracy of entered information and is color coded to reflect client status relative to performing TO activities. CM is relative to all environments therefore no environment number is prompted for.

3-E: Displays the contents of an ATO environment file. You will be prompted for the environment number to use.

4-P: Performs a parse check against an ATO environment file displaying the results. You will be prompted for the environment number to use.

5-U: Enter an update session of an ATO environment file using one of two methods, an interactive one where each section of the file can be selected and modified or the other invokes a vi edit session of the file. You will be prompted for the environment number to use.

6-V: Used to view the previously selected backups and their metrics and reflects the clients and backups which will be acted on if a -tapeout session was initiated. Display views vary slightly between Avamar native versus Networker de-dupe mode due to architectural differences. Views are relative to a given environment therefore you will be prompted for the environment number to use.

7-L: Browse the Event Log containing a summary of every ***–select*** and ***–tapeout*** action performed against a given environment. Each event is displayed as an event allowing you to view information relevant to a given operation. Events can contain detailed information on failed staging or tape backup phases. You will be prompted for the environment number to use.

8-H: Display ATO help information

9-R: Recovery Manager provides the ability to identify and re-execute failed sessions containing only the failed portion. The number of checkpoints maintained is determined from variable MAX_RECOVERY_SESSIONS in the environment file. Contents of a given checkpoint are displayed similar to that of a regular view. Two checkpoint types exist, retry and rerun described in detail later in this document. Checkpoints are relative to an environment number therefore you will be prompted for the environment number to use.

10-S: The interactive selection is used to perform a selection process with relevant questions and information being provided and based on your responses an appropriate ***–select*** command is built and optionally executed. The select process is relative to the environment used therefore you will be prompted for the environment numbed to use.

11-T: Perform an interactive ***-tapeout*** sessions where relevant questions and information is requested and based on your responses an appropriate ***–tapeout*** command is built which can be executed either inline or as a batch job. The process is relative to an environment number therefore you will be prompted for the environment numbed to use.

12-A: Provides ATO administration functions including backing up your ATO environment, performing a ATO grab capturing required files for problem diagnosis, perform a health check to verify contents of environment files and the client configuration file, a file locator function to display the location of every ATO file. A rollback function enabling you to roll back various files individually or as a group from a backup

13:-G Provide a method to quickly update ATO to a new version. Performing an upgrade will automatically invoke a backup of the current ATO version which can be used to roll back to if necessary.

Configuration Manager CM

Configuration Manager is an interactive tool for viewing and modifying the client configuration file. The file is a CSV formatted file therefore must be edited accurately otherwise it could adversely impact ATO operation. To help ensure accuracy two interactive methods are available the first better suited for adding clients interactively and configuring individual clients and the second a more bulk oriented approach with less control and granularity.

The interactive method is preferred and uses a menu interface where different client views can be accessed with options to add, modify, enable and disable a client to ATO. It also provides a text report based on a displayed view. Clients are displayed color coded to highlight whether a client is configured for TO or not – ***blue= not configured, green=configured*** and ***red=disabled***. You can disable a client from the tape out process and re-enable later as required. Several configuration file functions are available including viewing the client file in a formatted display, parsing the file to confirm its contents and updating it directly using a vi session. The first time the CM is accessed a discovery process is performed however as new clients or domains are established they will need to be rediscovered using the '***F=Refresh***" option. Many CM operations are also available directly from the command line. The following screen shots show samples of various CM views.

Usage Syntax: ***ato –cfg manager*** or ***select Opt-2 in Menu***

Domain & Client Group View

```
Using Previous Avamar Domain/Client History, to refresh use F option below.


================================================================================================================================================
 CLIENT Configuration Manager [DOMAIN-VIEW]: <domain-name> [client-count]
================================================================================================================================================
 1)   /clients [4]                                2)  /NetWorker/fsc01srv4 [2]                  3)  /REPLICATE/avamards1-france [21]
 4)   /REPLICATE/avamards1-germany [1]            5)  /REPLICATE/avamards1-germany/clients [5]  6)  /REPLICATE/avamards1-Sweden [2]
 7)   /REPLICATE/ave-1-5/clients [2]              8)  /REPLICATE/ave-1-5/Win2K3 [9]             9)  /REPLICATE/ave-1-5/Win2K3ClusEXCH [1]
 10)  /REPLICATE/ave-1-5/Win2K3ClusSQL [1]        11) /REPLICATE/ave-1-5/Win2K3SQL [2]          12) /REPLICATE/ave-1-5/Win2K3/Win2K3Clus [2]
 13)  /REPLICATE/ave-1-5/Win2K3/Win2K3ClusExch    14) /REPLICATE/rodney/clients [3]             15) /REPLICATE/rodney/FemmiA_domain [1]
 16)  /REPLICATE/rodney/Keith_domain [1]          17) /REPLICATE/rodney/SEMEA_Domain [1]        18) /REPLICATE/rodney/Thellbergs_domain [1]
 19)  /REPLICATE/rodney/Toby [1]                  20) /VMESX [1]                                21) /Win2K3 [4]

================================================================================================================================================


 Client Manager: [#=Domain G=Group F=Refresh S=Status-All C=Cfg-View P=Cfg-Parse U=Cfg-Update V=Quick-View Q=Quit] > g


================================================================================================================================================
 CLIENT Configuration Manager [GROUP-VIEW]: <client-name> [#Entries] Blue=Not-Configured Green=Enabled Red=Disabled
================================================================================================================================================
 1)   adam2 [1]                                   2)  adam4 [2]                                 3)  ak [8]
 4)   ak2 [2]                                     5)  ak98 [1]                                  6)  ak99 [2]
 7)   aknew [2]                                   8)  demo [1]                                  9)  exchange [1]
 10)  fs [4]                                      11) fsc01srv1 [1]                             12) fsc01srv4 [3]
 13)  nwk [1]                                     14) reptest [1]                               15) sqldb [1]
 16)  training [3]

================================================================================================================================================


 Client Manager: [#=Group C=View-Cfg P=Cfg-Parse U=Cfg-Update V=Quick-View S=Status-All Def=Domain-View>] >
```

Figure 7

Domain & Client Group view – Networker

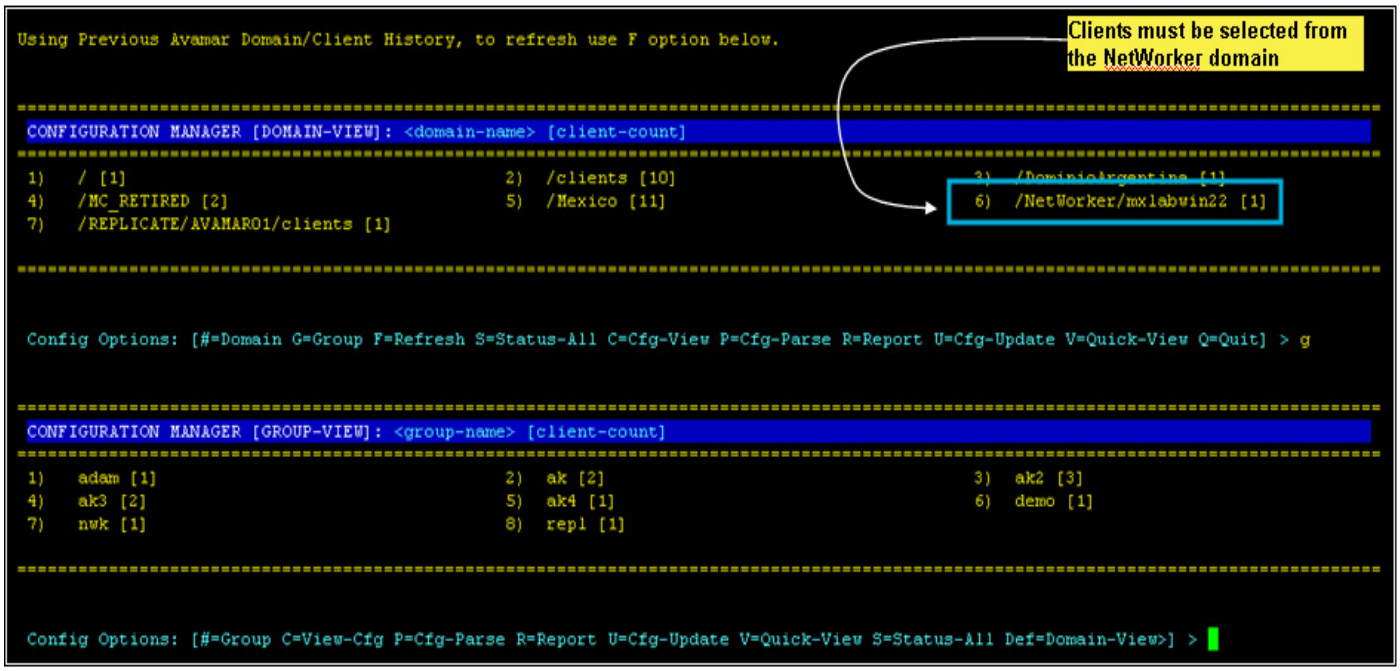

Figure 8

Client Disable and Re-Enable Sequence

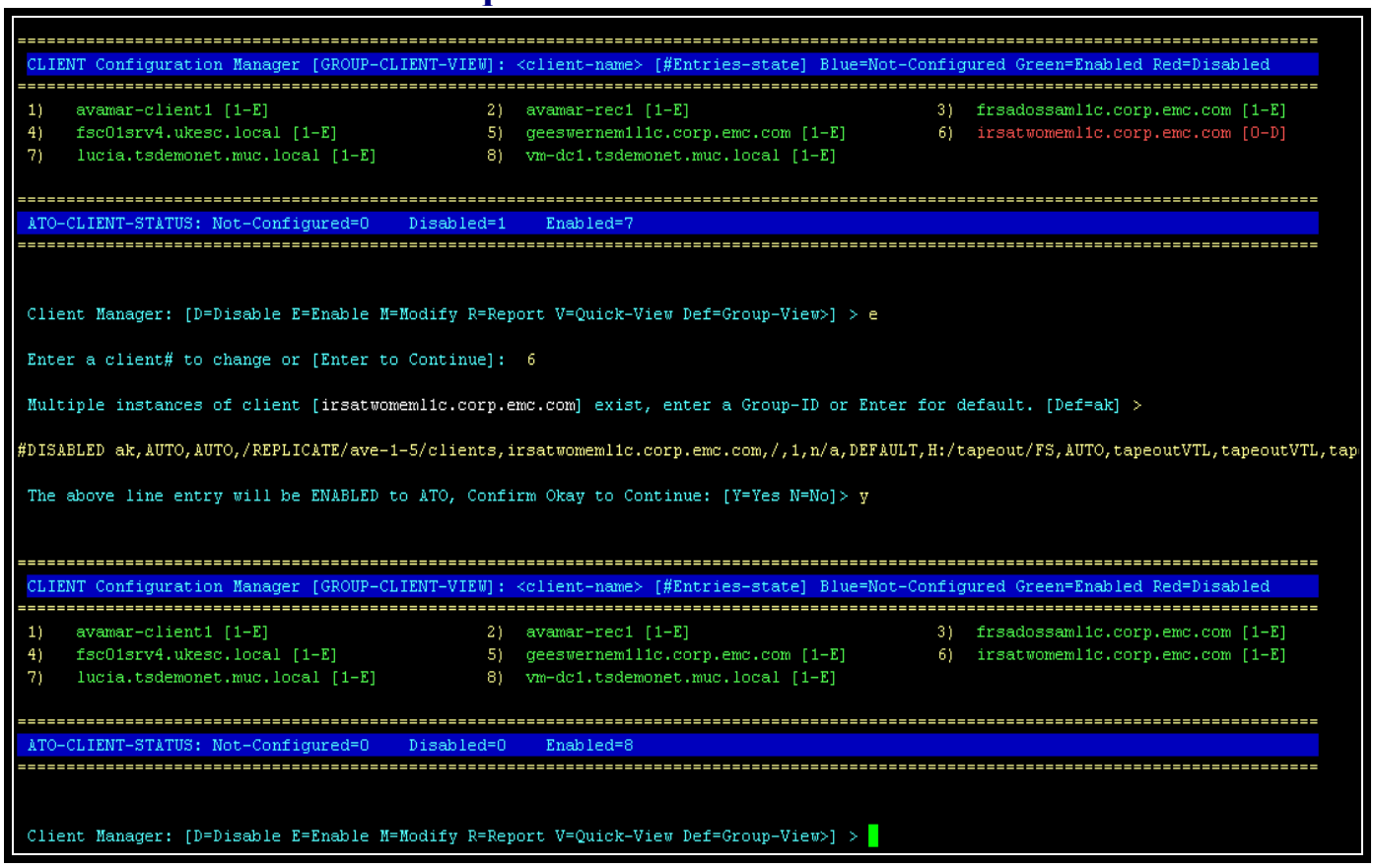

Figure 9

Client File Group Display

```
Client Manager: [#=Domain G=Group F=Refresh S=Status-All C=Cfg-View P=Cfg-Parse U=Cfg-Update V=Quick-View Q=Quit] > c

Available Client Group-ID's:

adam2 adam4 ak ak2 ak98 ak99 aknew demo exchange fs fsc01srv1 fsc01srv4 nwk reptest sqldb training

View by Group-ID or ALL, Enter [<Group-ID> or Enter=ALL]:> ak
==============< Active Client Configuration >==============
 To modify, edit file /usr/local/avamar/etc/atoclient.cfg
============================================================

 1. Group-ID      6. Exclude-Dom        11. TapeBU-Script    16. Dest-Path Suffix
 2. Start-Date    7. Min-Retention      12. Monthly-Group    17. Selected-Folder(s)
 3. End-Date      8. not-used           13. Yearly-Group     18. Incremental Delete
 4. Domain        9. O/P File           14. NwkSrv-Group
 5. Client        10. Destination-Dir   15. SS-Type


================================================================================================================================
ak,AUTO,AUTO,/REPLICATE/ave-1-5/clients,irsatwomeml1c.corp.emc.com,/,1,n/a,DEFAULT,H:/tapeout/FS,AUTO,tapeoutVTL,tapeoutVTL,tapeoutVTL,WINDOWS,n/a,n
ak,AUTO,AUTO,/REPLICATE/ave-1-5/Win2K3,avamar-client1,/,1,n/a,DEFAULT,H:/tapeout/FS,AUTO,tapeoutVTL,tapeoutVTL,tapeoutVTL,WINDOWS,n/a,n/a,n/a
ak,AUTO,AUTO,/REPLICATE/rodney/SEMEA_Domain,frsadossaml1c.corp.emc.com,/,1,n/a,DEFAULT,H:/tapeout/FS,AUTO,tapeoutVTL,tapeoutVTL,tapeoutVTL,WINDOWS,n
ak,AUTO,AUTO,/REPLICATE/ave-1-5/Win2K3,avamar-rec1,/,1,n/a,DEFAULT,H:/tapeout/FS,AUTO,tapeoutVTL,tapeoutVTL,tapeoutVTL,WINDOWS,n/a,n/a,n/a
ak,AUTO,AUTO,/Win2K3,fsc01srv4.ukesc.local,/,1,n/a,DEFAULT,H:/tapeout/FS,AUTO,tapeoutVTL,tapeoutVTL,tapeoutVTL,WINDOWS,n/a,n/a,n/a
ak,AUTO,AUTO,/REPLICATE/avamards1-germany/clients,geeswernem11c.corp.emc.com,/,1,n/a,DEFAULT,H:/tapeout/replicate,AUTO,tapeoutVTL,tapeoutVTL,tapeou
ak,AUTO,AUTO,/REPLICATE/avamards1-germany/clients,lucia.tsdemonet.muc.local,/,1,n/a,DEFAULT,H:/tapeout/replicate,AUTO,tapeoutVTL,tapeoutVTL,tapeoutV
ak,AUTO,AUTO,/REPLICATE/avamards1-germany/clients,vm-dc1.tsdemonet.muc.local,/,1,n/a,DEFAULT,H:/tapeout/replicate,AUTO,tapeoutVTL,tapeoutVTL,tapeout

 CONFIGURATION SUMMARY: Clients=8 Unique-Clients=8 Disabled-Clients=0 Groups=1 Staging-Paths=2 Select-Files-Only=0 Inc-Delete=0
```

Figure 10

Client Status Display All Clients

```
Client Manager: [#=Domain G=Group F=Refresh S=Status-All C=Cfg-View P=Cfg-Parse U=Cfg-Update V=Quick-View Q=Quit] > s


================================================================================================================================
 CLIENT Configuration Manager [ALL-CLIENT-VIEW]: <client-name> [#Entries-state] Blue=Not-Configured Green=Enabled Red=Disabled
================================================================================================================================
 1)   a1277.corp.emc.com [1-E]                2)  avamar-admin.ukesc.local [1-E]          3)  avamar-client1 [4-E]
 4)   avamarclient5.sc.sweden.emc.com [0-N]   5)  avamar-rec1 [1-E]                       6)  avamar-rec1 [1-E]
 7)   burafrad.burafr.emc.com [0-N]           8)  dell01srv6 [1-E]                        9)  fresmichojl1c.corp.emc.com [1-E]
 10)  fresquignel2c.corp.emc.com [0-N]        11) frsabayerl11c.corp.emc.com [0-N]        12) frsadossaml1c.corp.emc.com [1-E]
 13)  frsagronivl1c.corp.emc.com [0-N]        14) frsagrotzal2c.corp.emc.com [0-N]        15) frsagunenil2c.corp.emc.com [0-N]
 16)  frsalacapfl1c.corp.emc.com [0-N]        17) frsamalbor12c.corp.emc.com [0-N]        18) frsamichojl3c.corp.emc.com [0-N]
 19)  frsamoranal1c.corp.emc.com [0-N]        20) frsaquignel2c.corp.emc.com [0-N]        21) frtgbodecyl1c.corp.emc.com [0-N]
 22)  frtgdesaijl11c.corp.emc.com [0-N]       23) frtgdevijbl1c.corp.emc.com [0-N]        24) frtggardep11l1c.corp.emc.com [0-N]
 25)  frtggunenil1c.corp.emc.com [0-N]        26) frtghasnial2c.corp.emc.com [0-N]        27) frtsporetf-lp [0-N]
 28)  fsc01srv1.ukesc.local [4-E]             29) fsc01srv2.ukesc.local [3-D]             30) fsc01srv2.ukesc.local [3-D]
 31)  fsc01srv3.ukesc.local [1-E]             32) fsc01srv4 [3-E]                         33) fsc01srv4.ukesc.local [2-E]
 34)  fsc01srv4.ukesc.local [2-E]             35) GEENWEDEMJL1C.corp.emc.com [0-N]        36) GEESWEDEMJL1C [1-E]
 37)  geeswernem111c.corp.emc.com [1-E]       38) GEESWERNEM1L1C [0-N]                    39) GEESWERNEM1L1C [0-N]
 40)  irsatwomeml1c.corp.emc.com [3-E]        41) irsatwomeml1c.corp.emc.com [3-E]        42) ittgdeamil13c.corp.emc.com [0-N]
 43)  ittgfemmia112c.corp.emc.com [0-N]       44) lucia.tsdemonet.muc.local [1-E]         45) macbook-de-vg.local [0-N]
 46)  mscsiexchpr1.ukesc.local [0-N]          47) mscsisqlpr1.ukesc.local [0-N]           48) rm5iexchprn2.ukesc.local [0-N]
 49)  rm5iexchprn3.ukesc.local [0-N]          50) rm5iscsisqlprn2.ukesc.local [0-N]       51) rm5iscsisqlprn3.ukesc.local [0-N]
 52)  rm5iscsisrv1.ukesc.local [0-N]          53) rm5vmfsprox1.ukesc.local [0-N]          54) rm5vmfsprox2.ukesc.local [0-N]
 55)  swsathella12c.corp.emc.com [0-N]        56) swtgeriks1213c.corp.emc.com [0-N]       57) ukesc-admin.ukesc.local [0-N]
 58)  ukescroftd211c.corp.emc.com [1-E]       59) ukesc-vdm3.ukesc.local [0-N]            60) ukescvisualsrm.ukesc.local [0-N]
 61)  ukeslawrekl1c.corp.emc.com [1-E]        62) ukeslawrekl1c.corp.emc.com [1-E]        63) ukeslawrekl1c.corp.emc.com [1-E]
 64)  ukeslawrekl1c.corp.emc.com [1-E]        65) uksahildirl1c.corp.emc.com [0-N]        66) vdm-win2k3-1.ukesc.local [0-N]

================================================================================================================================
 ATO-CLIENT-STATUS: Not-Configured=41   Disabled=2    Enabled=23
================================================================================


Client Manager: [A=Add D=Disable E=Enable M=Modify R=Report V=Quick-View Def=Domain-View>] >
```

Figure 11

Client Text Report Files

```
Client Manager: [A=Add D=Disable E=Enable M=Modify R=Report V=Quick-View Def=Domain-View>] > r

Enter Client Report Filename [Q=Quit Def=ato-clientreport.txt]: >

Client report saved to [ ato-clientreport.txt ], <Press Enter to Continue>
```

```
root@avamards1:~/#: cat ato-clientreport.txt
CLIENT Configuration Manager [ALL-CLIENT-VIEW]: <client-name> [#Entries-state] Blue=Not-Configured Green=Enabled Red=Disabled

 1)   a1277.corp.emc.com [1-E]                    2)  avamar-admin.ukesc.local [1-E]          3)  avamar-client1 [4-E]
 4)   avamarclient5.sc.sweden.emc.com [0-N]       5)  avamar-rec1 [1-E]                      6)  avamar-rec1 [1-E]
 7)   burafrad.burafr.emc.com [0-N]               8)  dell01srv6 [1-E]                      9)  fresmichojl1c.corp.emc.com [1-E]
 10)  fresquignel2c.corp.emc.com [0-N]            11) frsabayerll1c.corp.emc.com [0-N]      12) frsadossaml1c.corp.emc.com [1-E]
 13)  frsagronivl1c.corp.emc.com [0-N]            14) frsagrotzal2c.corp.emc.com [0-N]      15) frsagunenil2c.corp.emc.com [0-N]
 16)  frsalacapfl1c.corp.emc.com [0-N]            17) frsamalborl2c.corp.emc.com [0-N]      18) frsamichojl3c.corp.emc.com [0-N]
 19)  frsamoranal1c.corp.emc.com [0-N]            20) frsaquignel2c.corp.emc.com [0-N]      21) frtgbodecyl1c.corp.emc.com [0-N]
 22)  frtgdesaijl11c.corp.emc.com [0-N]           23) frtgdevijbl1c.corp.emc.com [0-N]      24) frtggardepl11c.corp.emc.com [0-N]
 25)  frtggunenil1c.corp.emc.com [0-N]            26) frtghasnial2c.corp.emc.com [0-N]      27) frtsporetf-lp [0-N]
 28)  fsc01srv1.ukesc.local [4-E]                 29) fsc01srv2.ukesc.local [3-D]           30) fsc01srv2.ukesc.local [3-D]
 31)  fsc01srv3.ukesc.local [1-E]                 32) fsc01srv4 [3-E]                       33) fsc01srv4.ukesc.local [2-E]
 34)  fsc01srv4.ukesc.local [2-E]                 35) GEENWEDEMJL1C.corp.emc.com [0-N]      36) GEESWEDEMJL1C [1-E]
 37)  geeswernem11c.corp.emc.com [1-E]            38) GEESWERNEM1L1C [0-N]                  39) GEESWERNEM1L1C [0-N]
 40)  irsatwomeml1c.corp.emc.com [3-E]            41) irsatwomeml1c.corp.emc.com [3-E]      42) ittgdeamil13c.corp.emc.com [0-N]
 43)  ittgfemmial12c.corp.emc.com [0-N]           44) lucia.tsdemonet.muc.local [1-E]       45) macbook-de-vg.local [0-N]
 46)  mscsiexchpr1.ukesc.local [0-N]              47) mscsisqlpr1.ukesc.local [0-N]         48) rm5iexchprn2.ukesc.local [0-N]
 49)  rm5iexchprn3.ukesc.local [0-N]              50) rm5iscsisqlprn2.ukesc.local [0-N]     51) rm5iscsisqlprn3.ukesc.local [0-N]
 52)  rm5iscsisrv1.ukesc.local [0-N]              53) rm5vmfsprox1.ukesc.local [0-N]        54) rm5vmfsprox2.ukesc.local [0-N]
 55)  swsathella12c.corp.emc.com [0-N]            56) swtgeriks12l3c.corp.emc.com [0-N]     57) ukesc-admin.ukesc.local [0-N]
 58)  ukescroftd211c.corp.emc.com [1-E]           59) ukesc-vdm3.ukesc.local [0-N]          60) ukescvisualsrm.ukesc.local [0-N]
 61)  ukeslawrekl1c.corp.emc.com [1-E]            62) ukeslawrekl1c.corp.emc.com [1-E]      63) ukeslawrekl1c.corp.emc.com [1-E]
 64)  ukeslawrekl1c.corp.emc.com [1-E]            65) uksahildirl1c.corp.emc.com [0-N]      66) vdm-win2k3-1.ukesc.local [0-N]

CLIENT REPORT FOR [25/08/09 11:24] DOMAIN/GROUP:

ATO-CLIENT-STATUS: Not-Configured=41   Configured=
```

Figure 12

With a text file report there is no color formatting therefore flags displayed in [ ] after the client name are used to determine its ATO status. [0-N] indicates not configured to ATO, [#-E] indicates the client is present in ATO configuration file this # of times. A client will have multiple entry counts if defined in more than one ATO client group. [#-D] indicates that at least one client entry of the # times indicated for this client is disabled to ATO.

Add or Modify a Client Entry

```
Client Manager: [D=Disable E=Enable M=Modify R=Report T=Audit V=Quick-View Def=Group-View>] > m

Enter a client# to add/modify or [Enter to Return]:> 2

Client [lablnx02.mexlab.emc] is currently defined in groups:

ak2 ak3 ak4 ak repl

Ready to Modify client [][lablnx02.mexlab.emc] in ATO configuration. Enter [Existing or New Group-ID]:  ak


================================================================================
          Review All Fields to Establish Selected Client Entry
================================================================================

        Fld-1 Group-ID Name [ak]: >
        Fld-2 Start-Date [AUTO]: >
        Fld-3 End-Date [AUTO]: >
        Fld-4 Domain-Name [/Mexico]: >
        Fld-5 Client-Name [lablnx02.mexlab.emc]: >
        Fld-6 Policy-Group-Name [n/a]: >
        Fld-7 Retention-Type [n/a]: >
        Fld-8 Exclude-Folders-Used [n/a]: >
        Fld-9 Output-FIle [DEFAULT]: >
        Fld-10 Stage-Destination-Directory [/data01/tapeout]: >
        Fld-11 Tape-BU-Scripts [AUTO]: >
        Fld-12 Tape-Monthly-Policy [tapeout_grp]: >
        Fld-13 Tape-EOY-Policy [n/a]: >
        Fld-14 Tape-Server-Policy [n/a]: >
        Fld-15 Staging-Server-Type WINDOWS | UNIX [UNIX]: >
        Fld-16 Destination-Path-Suffix [n/a]: >
        Fld-17 Selected-Folders [n/a]: >
        Fld-18 Incremental-Delete [n/a]: >


================================================================================

Confirm Client Entry. [C=Commit M=Modify Enter=Refresh Q=Quit]: >
```

Figure 13

The procedures for adding or modifying a client are similar. When adding a new client the above field values will be prompted for individually and default values provided where possible. To accept the default press enter or to modify enter the new value and enter. Once all fields are completed the above screen is displayed which can be looped through again using the "***M***" option as often as needed. When your input data is correct, use option "***C***" to commit the new or changed entry. This same screen is also displayed when modifying an existing client.

When adding new clients to an existing group, it will automatically inherit the characteristics of the first client already present in the group. If the inherited values are not what you wanted you will need to modify using the "***M***" option.

Note: Any time the client configuration file is modified it's always advisable to run a parse check on it.

The second less flexible method for adding clients allows you to define a complete line entry and apply it selectively to any non-configured clients. Key words DOMAINX and CLIENTX are significant to ATO and will be replaced with each selected clients correct domain and host name when you confirm or reject a given client. All clients added during a session will share this common line entry and belong to the group-id it contains. This method is available only by using the syntax shown.

Usage Syntax: ***ato –cfg add***

Alternate Client File Configuration Method

```
Scanning Avamar Domains, Please wait!
.........................
gidx,AUTO,AUTO,DOMAINX,CLIENTX,/,1,/clients/tapeoutato,DEFAULT,E:/tapeout,AUTO,tape_daily_grp,tape_eoy_grp,tape_server_grp,WINDOWS,n/a,n/a,n/a

All clients selected for addition this session will contain the default values highlighted above. If you want to modify this line
enter a complete new line as required leaving Field-4 DOMAINX and Field-5 CLIENTX values as is. Modify? Q=Quit Y/N [Def=No]: > y

 Enter New Line or Q=Quit = training,AUTO,AUTO,DOMAINX,CLIENTX,/,1,/clients/tapeoutato,DEFAULT,T:/tapeout,AUTO,tape_daily_grp,tape_eoy_grp,tape_server_grp,WINDOWS

training,AUTO,AUTO,DOMAINX,CLIENTX,/,1,/clients/tapeoutato,DEFAULT,T:/tapeout,AUTO,tape_daily_grp,tape_eoy_grp,tape_server_grp,WINDOWS,n/a,n/a,n/a

 Confirm New Line is Okay: Y/N [Def=No]: > y

 Manually confirm each client addition? Y/N [Def=Yes]: >
Confirm adding client [ /clients,avamar-rec1 ]  Y/N or Q=Quit [Def=No]:>
 Client Rejected

Confirm adding client [ /clients,ukeslawrekl1c.corp.emc.com ]   Y/N or Q=Quit [Def=No]:> y
 Client Added

Confirm adding client [ /clients,uksaingalcl1c.corp.emc.com ]   Y/N or Q=Quit [Def=No]:>
 Client Rejected

Confirm adding client [ /NetWorker/fsc01srv4,fsc01srv4 ]        Y/N or Q=Quit [Def=No]:> q

 CLIENT ADD SUMMARY: Processed=5 Exists=2 Added=1 Rejected=2
```

Figure 14

Client Groups

Client groups are an integral part of ATO enabling you to segment its workflow. It is advantageous to organize client groups in some way and to establish a meaningful naming convention. The example given here takes advantage of an ATO concept referred to as subgroups. Subgroups rely on a common base name combined with a sequential numeric suffix keeping related client's logically grouped together while in several smaller groups as opposed to one large one.

eng1 eng2 eng3

The above example shows three client groups belonging to an engineering department each having a common base name of ***eng*** and sub group names of ***1 2 3***. . When configuring a batch profile for these groups a single profile can be established which references all groups and ATO will process each sub group sequentially but as one job. Any of these groups can still be called individually, all at once or any combination of the sub group names involved. If the requirement is to run these individually three batch profiles would be needed but if all together as subgroups then a single batch profile would suffice. The details of each subgroups execution will be logged to the base name profile log.

A bulk batch profile provides another approach to handling multiple client groups. With this method and using the above example each group will have its own profile defined but will be referenced in a bulk profile. Executing the bulk profile will initiate each individual profile it contains in sequence. The bulk profile log will contain only an abbreviated status showing initiation and completion status per profile and each individual profile log will contain the details of its execution.

Every client needing to perform tape out must be present in the client configuration file. Clients must be configured to an ATO group which is referenced during the tape out process. Well organized and appropriately named groups improve your ability to manage and control the entire tape out process.

Considerations for establishing client groups;

- there is no limit to the number of client groups allowed
- group names must not contain spaces or special characters
- a group can contain any number of clients limited only by the workload they entail
- a client name can be present in any number of groups but only once per group
- tape policy definition fields Fld-12, 13 & 14 must be the same values for all clients in the group
- staging location Fld-10 can vary between clients in a group
- staging server type Fld-15 must be the same for all clients in a group
- With the Networker de-dupe node, cross platform recoveries Unix/Linux -> Windows or vice versa is not supported therefore all clients within a group must be compatible with the staging platform type defined in Fld-15.
- various filter and control fields 6,7,8 & 16,17,18 can vary between clients in a group
- when a group is first established you must acknowledge the contents of each of the 18 fields most of which contain default values and you modify only those required. When adding additional clients to a group it will automatically inherit the contents from the first client in the group. If this is not the required contents you can interactively modify it afterwards.

Operational Cycle

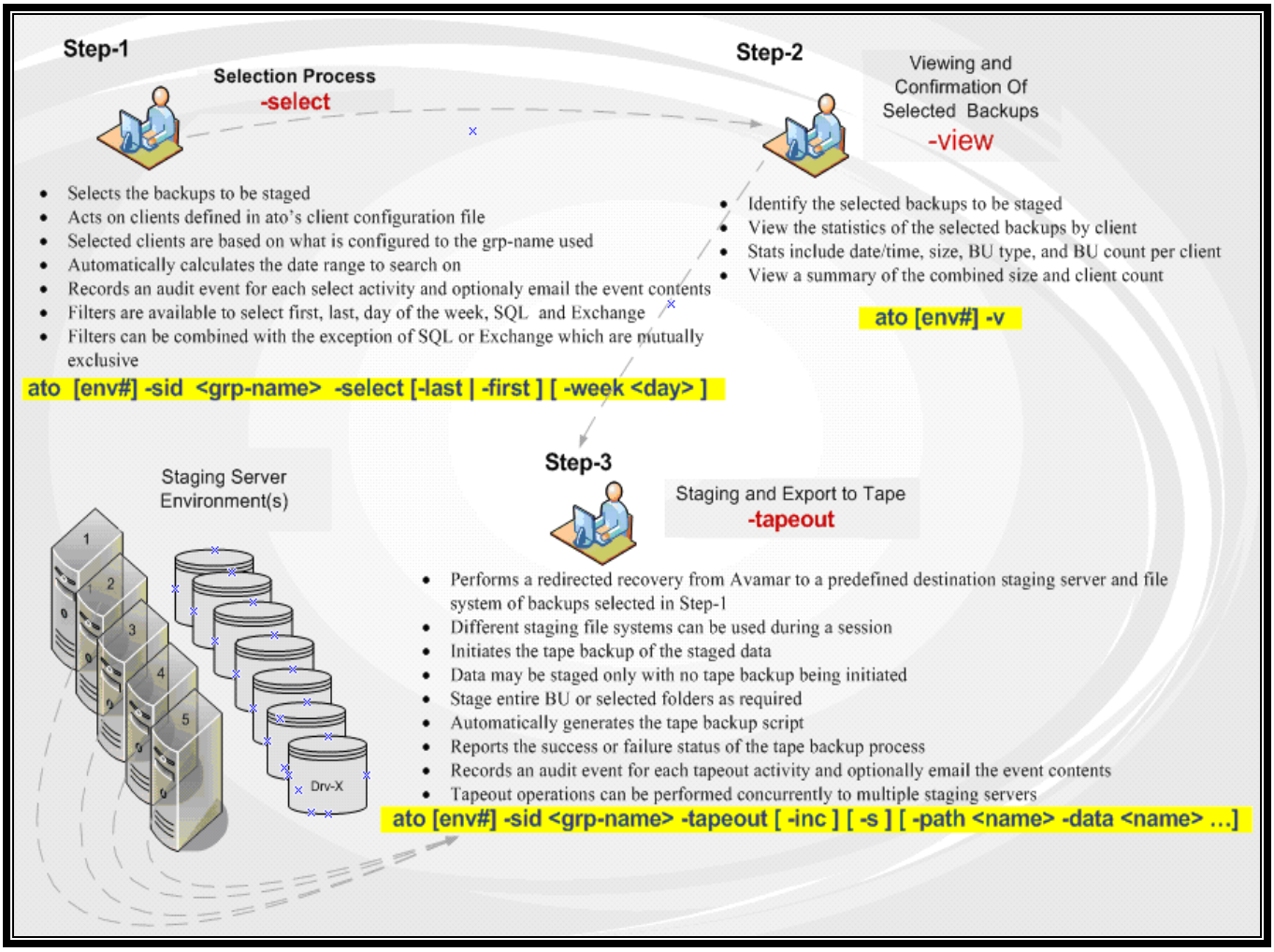

Figure 15

Notes:

1. The ***–tapeout*** process acts on backups identified by the last ***–select*** process relative to the environment number used. The ***-view*** command can be used to display and confirm what's been selected

2. With ***–tapeout*** command you can optionally specify the ***–s*** or ***–stageonly*** option to perform only the staging phase bypassing initiation of the tape backup. Likewise, the opposite scenario is possible with the ***–tapeonly*** option which performs only the tape backup phase. When using ***–tapeonly*** you must ensure the original selection is still valid and the same command line option specified as used during the original ***–tapeout*** session.

3. With ***–tapeout*** you can specify the ***–inc*** option to perform an incremental recovery of the staged data. For this option to be effective staged data must remain on the staging server between ATO sessions. The initial stage session will be a full recovering all data involved however subsequent staging operations recovers only those files with newer timestamps reducing staging times dramatically often by a factor of several times. It also facilitates an effective incremental backup to tape with time and media savings equal to that of the staging phase. Ensure the ***avtar.cmd*** file on UNIX or ***avtar.txt*** on a Windows SS if it exists has the ***--overwrite*** flag commented out or removed if present otherwise incremental staging will not work.

4. With ***–tapeout*** you can also specify the ***–incdel*** option which functions similar to ***–inc*** in terms of destination path and may still be able to leverage a incremental tape backup. However, a significant difference is it will delete all staged data

once successfully confirmed to be backed up to tape. This option serves two purposes, the first being to synchronize the staging server contents occasionally with that of the source client involved. The second is an incremental tape strategy may still be possible in situations where not enough disk staging area is available to sustain a full incremental TO strategy. This is dependent on the tape solution involved and how it handles incremental's based on file modification times. With Networker, this works as expected on Red-Hat Linux but not on Windows. Other tape solutions would need to be verified individually.

5. Staged data is recovered to one of the following directory tree structures. They represent the view visible from the tape solution recovery interface and are relative to the staging server involved. A user specified path value is defined in the client configuration file but the other portions of the path shown in red are defined by ATO.

Staging Path Structure

ATO recovers data to a structured directory path as shown. Portions of this path are user defined while the portions highlighted in red are not. When establishing the tape policies used by ATO you must ensure appropriate save set definitions are defined to capture the intended staging location(s). Incremental and non-incremental save sets should not share the same tape policy as their requirements differ.

The user specified path at the beginning of the path structure is defined in the ATO client configuration file ***Fld-10*** may vary between staging servers used, ATO client groups or between clients within a group. Using multiple mounts points and/or folders permit multiple save set definitions facilitating the ability to multiplex when writing to tape to improve performance.

Destination folders are considered part of the critical ATO path components and are continually audited by ATO (see next section) to track where the staged data can be found on tape. Normally these paths will not change frequently but if and when they do, it has a direct impact on where the tape operator needs to go to locate data on tape.

ATO Non-Incremental Destination Path

<***user-specified-path***>/**BYDATE/**<***client-name***>/<***date-time-buid#***>/<user-*backup-data*>

ATO Incremental Destination Path

<***user-specified-path***>/**INCREMENTAL/**<***client-name***>/<*user-backup-data*>

An exception to the above path specifications is when the ***–path*** or ***Fld-16*** is used. This value will be appended to the ATO predefined portion of the path with the revised destination path containing the added ***user-defined-path*** shown in bold being included.

ATO Non-Incremental Destination Path

<*user-specified-path*>/**BYDATE/**<***client-name***>/<***date-time-buid#***>/<***user-defined-path***>/<user-*backup-data*>

ATO Incremental Destination Path

<*user-specified-path*>/**INCREMENTAL/**<***client-name***>/<***user-defined-path***>/<*user-backup-data*>

Audit Log

The ATO audit log maintains a history of all staging and tape backup activity it performs on a per client basis. All critical path components impacting recovery procedures from tape are audited. For example, if a client is moved to a different staging server this represents a change in the critical path therefore an audit record is created to reflect this change. At any time an operator can view the audit log on a per client basis to determine its staging history and determine when critical path changes took place allowing them to quickly identify where to locate a given client's data on tape.

The audit log is accessed from the Configuration Manager from any view where individual clients are displayed using function ***T=Audit***. A summary report displays only those entries where a critical path event occurred referred to as an environment change and impacting tape recovery procedures. The detailed report displays every staging event performed for a client including the critical path changes.

Contents of the audit log could be incorporated into a more sophisticated user defined script using the tape application CLI to generate an appropriate backup report which cross references the ATO audit log to provide an integrated report showing the TO client data's location on tape.

Summary Audit Report

```
 Config Options: [D=Disable E=Enable M=Modify R=Report T=Audit V=Quick-View Def=Group-View>] > t

 Enter a client# to audit or [ Press Enter to Return ]:> 1

 demo

Enter group name to limit audit or [ Press Enter to Continue ]:> demo

Display detailed or summarized audit report? Def=Summarized D=Detail or [ Press Enter to Continue ]:>

 Environment Audit Client: rjocpdxr01

05/13/10 14:29 Grp=demo TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL BU#=610 StgOnly=1
05/13/10 14:43 Grp=demo TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/BYDATE BU#=610 StgOnly=0
05/13/10 14:52 Grp=demo TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL BU#=633 StgOnly=0

<Press Enter to Continue>
```

Figure 16

Detailed Audit Report

```
 Config Options: [D=Disable E=Enable M=Modify R=Report T=Audit V=Quick-View Def=Group-View>] > t

 Enter a client# to audit or [ Press Enter to Return ]:> 1

 demo

Enter group name to limit audit or [ Press Enter to Continue ]:> demo

Display detailed or summarized audit report? Def=Summarized D=Detail or [ Press Enter to Continue ]:> d

 Environment Audit Client: rjocpdxr01
Environment Change: 05/13/10 14:29  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=610
=1
05/13/10 14:31  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=610 StgOnly=0
05/13/10 14:38  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=610 StgOnly=0
Environment Change: 05/13/10 14:43  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/BYDATE TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=610 StgOr
Environment Change: 05/13/10 14:52  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=633
=0
05/13/10 15:11  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=629 StgOnly=0
05/13/10 16:10  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=609 StgOnly=1
05/14/10 13:45  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=609 StgOnly=1
05/14/10 13:45  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=610 StgOnly=1
05/19/10 17:47  SSrv=snedcvbk01.internal.timbrasil.com.br SPath=M:/tapeout/INCREMENTAL TSrv=snehpu43 TPolicy=tapeout_ato_grp|n/a|n/a Grp=demo BU#=610 StgOnly=0
```

Figure 17

Interactive Select

The selection process can be configured and executed interactively as shown here but in a production environment it's normally performed automatically as part of an ATO batch job. From the main menu select ***Opt-10*** or ***S*** to initiate. You will first be prompted for the environment to use and afterwards a series of questions from which your input will be used to build an appropriate ***–select*** statement. Questions will vary depending on your responses and will prompt for additional information if required. At the end of the configuration you are given the opportunity to run the selection statement.

A number of filters are available to ensure only the desired backups are chosen and eliminate or minimize sending redundant data to tape. Usage information of available filters is documented in the command line section later in this document and basic definitions can be viewed in the following images. For best results it is advised you familiarize yourself with all filters and how and where to apply them. Filters used on the command line pertain to all clients in the referenced group. Some filters can be applied on the command line or in the client configuration file. When used in the client file they pertain only to the client name involved.

Due to architectural differences between Avamar native versus Networker de-dupe node some operational differences exist. When using ***–data*** or ***–xdata*** filters Avamar native mode requires these be applied during the ***–tapeout*** phase while Networker requires they be applied during the ***–select*** phase and refer to save-set names. Behavior of ***–first*** and ***–last*** filters behave differently as well. Avamar clients are filtered by backup ID number with one backup being selected while Networker clients are filtered by save-set name with the first or last backup of each save-set name being selected so their backup dates may differ.

Note: Networker clients are detected automatically and processed accordingly

Interactive Selection - Avamar Mode

```
The next series of prompts requests user input needed to perform the ATO selection process.
If a default value provided is acceptable, press enter accept and continue.

 ak ak2 ak3 ak4 ak6 aknew repl

Enter a group name from list provided Def=[] or Q=Quit: > ak

Limit selection process to a specified client in group [ak]? If yes, enter client name Def=[N] or Q=Quit: >

sql exch ndmp oracle shpt FS

Limit selection process to a Plug-IN type? If yes, choose 1 from list provided. Def=[FS] or Q=Quit: >

mod cod nah

Include non scheduled backups in selection process? If yes, choose types from list provided. Def=[] or Q=Quit: >

[first | first_F] Select first backup within the defined date range
[last | last_F ]  Select last backup within the defined date range
[week]            Select backups for a specifc day of the week
[rdate]           Select a relative date range backwards in time by month
[sdate [edate]]   Override automated search date range
[rtype]           Limit selection to a specific retention type
[gname]           Limit selection to a specific policy group name

Limit selection process using reduction filters? If yes. choose the desired filters from list provided. Def=[] or Q=Quit: > week rdate

sun mon tue wed thu fri sat

Choose the desired day of the week from list provided. Def=[] or Q=Quit: > mon

0 1 2 3 4 5

Choose a day instance of the month from list provided where 0=All. Def=[0] or Q=Quit: >

Enter a relative month count backwards in time from current date. IE: 1-12 Def=[] or Q=Quit: > 1

 Execute-CMD: ato  -gid ak -select   -week mon  -rdate 1

 Execute the selection process? [Def=Yes] or Q=Quit: >
```

Figure 18

Interactive Selection - Networker Mode

```
The next series of prompts requests user input needed to perform the ATO selection process.
If a default value provided is acceptable, press enter to accept and continue.

 demo gidx nwto nwtow

Enter a group name from list provided Def=[] or Q=Quit: > nwto

Limit selection process to a specified client in group [nwto]? If yes, enter client name Def=[N] or Q=Quit: >

[first | first_F] Select first backup per client within the defined date range
[last | last_F ]  Select last backup per client within the defined date range
[week]            Select backups ffrom a specifc day of the week
[rdate]           Select a relative date range backwards in time by # of months
[data | xdata]    Include or exclude specific Networker backups by save-set names
[nwinc]           Include Networker incremental backups
[sdate [edate]]   Override automated start and end date search range

Limit selection process using reduction filters? Enter desired filters from list provided. Def=[] or Q=Quit: > week rdate nwinc

sun mon tue wed thu fri sat

Choose the desired day of the week from list provided. Def=[] or Q=Quit: > sat

0 1 2 3 4 5

Choose a day instance of the month from list provided where 0=All. Def=[0] or Q=Quit: > 1

Enter a relative month count backwards in time from current date. IE: 1-12 Def=[] or Q=Quit: > 1

 Select-CMD: ato  -gid nwto -select -week sat_1 -rdate 1 -nwinc

 Execute the selection process? [ Def=Yes ] or Q=Quit: >
```

Figure 19

Select Examples

The following are sample executions demonstrating the selection process when using various filters. All examples are using the base environment therefore no environment number has been specified. All commands can pertain to any environment all of which are independent of one another.

1. This example shows multiple backups selected for the client possibly due to the default daily retention being longer than the configured monthly retention. Various filters are available to ensure no redundant data is selected to go to tape.

ato -gid test2 -select

Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-01A: Active-Auto Date Range - 2009-06-01 to 2009-06-16
Scanning siteid - client name [test2]-[fsc01srv2.ukesc.local]...
INFO-07: Configuration check succeeded
INFO-05: The total Save Set reduction count this session is [0]
INFO-14: Total backup count selected [12]
Env-1 Session Complete: 06/16/09 02:28

2. Added the ***–first*** filter reducing the selected backups to one. Note the message INFO-05 indicating the reduction in dataset-id's selected for this run.

ato -gid test -select -first

```
ato -sid test2 -select -first
Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-01A: Active-Auto Date Range - 2009-06-01 to 2009-06-16
Scanning siteid - client name [test2]-[fsc01srv2.ukesc.local]...
INFO-07:  Configuration check succeeded
INFO-05:  The total Save Set reduction count this session is [11]
INFO-14:  Total backup count selected [1]
Env-1 Session Complete: 06/16/09 02:41
```

3. This example uses ***–client <client-name>*** filter to act on the single client name only. The multiple backup selections of two are the result of two scheduled backups existing for this client on the first backup of the month.

ato -gid fs -select -client fsc01srv1.ukesc.local -first

```
Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-01A: Active-Auto Date Range - 2009-06-01 to 2009-06-16
Scanning siteid - client name [fs]-[fsc01srv1.ukesc.local]...
Scanning siteid - client name [fsc01srv1]-[fsc01srv1.ukesc.local]...
INFO-07:  Configuration check succeeded
INFO-05:  The total Save Set reduction count this session is [28]
INFO-14:  Total backup count selected [2]
Env-1 Session Complete: 06/16/09 11:56
```

4. This example is a repeat of the previous but using the ***–first_F*** switch reducing the first BU count to the first of the two available on the selected date. Be careful using this switch because you can potentially unselect desired BU data. If you truly want just one of the scheduled BU's then refer to the ***–gname*** filter which limits the selection for this client by an Avamar policy group name only.

ato -gid fs -select -client fsc01srv1.ukesc.local -first_F

```
Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-01A: Active-Auto Date Range - 2009-06-01 to 2009-06-16
Scanning siteid - client name [fs]-[fsc01srv1.ukesc.local]...
Scanning siteid - client name [fsc01srv1]-[fsc01srv1.ukesc.local]...
INFO-07:  Configuration check succeeded
INFO-05:  The total Save Set reduction count this session is [29]
INFO-14:  Total backup count selected [1]
Env-1 Session Complete: 06/16/09 12:03
```

5. This example uses the ***–buid*** filter to select a specific backup ID# from a previously identified list of available backups. This could be useful for testing purposes to limit the ATO process to a specific BUID or ID's only. Note, this filter is not available within the interactive selection process.

ato -gid fs -select -client fsc01srv1.ukesc.local -buid 5141

```
Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-01A: Active-Auto Date Range - 2009-06-01 to 2009-06-16
Scanning siteid - client name [fs]-[fsc01srv1.ukesc.local]...
Scanning siteid - client name [fsc01srv1]-[fsc01srv1.ukesc.local]...
INFO-07:  Configuration check succeeded
INFO-05:  The total Save Set reduction count this session is [29]
INFO-14:  Total backup count selected [1]
Env-1 Session Complete: 06/16/09 12:08
```

6. This example uses the ***–rdate*** filter to select backups from a previous month. Normal date range calculation is relative to the first of the current month to the current date but in this example it goes back in time one month. Note the INFO-01A message, showing the adjusted search date range to one month prior. A use case for this would be to automate tape out where only the last BU's of the month are required and a batch job could perform this without the need to constantly modify the date search range.

ato -gid fs -select -rdate 1 -last

```
Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-01A: Active-Auto Date Range - 2009-05-01 to 2009-05-31
Scanning siteid - client name [fs]-[fsc01srv1.ukesc.local]...
Scanning siteid - client name [fs]-[fsc01srv2.ukesc.local]...
Scanning siteid - client name [fs]-[fsc01srv3.ukesc.local]...
INFO-07:  Configuration check succeeded
INFO-05:  The total Save Set reduction count this session is [1]
INFO-14:  Total backup count selected [1]
```

7. This example uses the **–week** filter to select backups from the second Sunday of the month.

ato -gid fs -select -week sun_2

```
Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-01A: Active-Auto Date Range - 2009-06-01 to 2009-06-16
Scanning siteid - client name [fs]-[fsc01srv1.ukesc.local]...
Scanning siteid - client name [fs]-[fsc01srv2.ukesc.local]...
Scanning siteid - client name [fs]-[fsc01srv3.ukesc.local]...
INFO-07:  Configuration check succeeded
INFO-05:  The total Save Set reduction count this session is [51]
INFO-14:  Total backup count selected [3]
Env-1 Session Complete: 06/16/09 12:21
```

Interactive Tape-Out

The ***-tapeout*** phase can be configured and executed interactively or via a batch profile. When run as a batch process a log file ***atobatch-ONDEMAND.log*** will automatically be established and can be viewed with Batch Manager. From the main menu enter ***Opt-11*** or ***T*** to initiate the configuration process. You will first be prompted for the environment to use and afterwards a series of questions from which your input is used to build an appropriate ***–tapeout*** statement. Questions will vary depending on your responses and will prompt for additional information if required. At the end of the configuration you are given the choice to execute it interactively or as a batch process.

Interactive Tapeout – Avamar Mode

```
The next series of prompts requests user input needed to perform the ATO tapeout process.
If a default value provided is acceptable, press enter to accept and continue.

Using last selected group name for Environment-1 [ak2] or Q=Quit: >

Would you like to review selected backups in group [ak2] before proceeding? Y/N Def=No or Q=Quit: >

Auto detected staging method for this group will utilize [MCCLI] or Q=Quit: >

[avtar]             Override auto detected recovery method forcing the use of avtar
[D d]               D=log debug info to STDOUT d=log debug info to event log
[data | xdata]      Specify folders to include or exclude from the staging process
[inc]               Enable incremental staging
[path]              Specify a path name to be appended to generated path for each client
[sdate]             Increase date range to include backups older than 2 months
[sdelay]            Override delay between staging progress messages defined in environment file
[server]            Initiate tape backup script using the tape backup server versus the staging client
[stageonly | s]     Perform staging activity only and skip the tape backup initiation
[tapeonly | t]      Initiate tape backup phase only skip all staging activity
[tdelay]            Override delay between tape backup progress messages defined in environment file

Enter on this line all required options from the list provided. Def=[] or Q=Quit: > -inc -s
Usage: grep [OPTION]... PATTERN [FILE]...
Try `grep --help' for more information.
/usr/local/avamar/bin/ato_: [: 0: unexpected operator/operand

 Tapeout-CMD: ato 1 -gid ak2 -tapeout -d

Execute Tapeout session Interactively or Batch? [B=Batch I=Interactive] or Q=Quit: > b

BATCH Session Initiated Using: [Env-1 Profile-atobatch-ONDEMAND File-atobatch-ONDEMAND.5261]
          To Monitor Progress: Return to Batch Log Viewer or tail -f /usr/local/avamar/var/log/atobatch-ONDEMAND.log

Press Enter to Continue
```

Figure 20

Interactive Tapeout – Networker Mode

```
The next series of prompts requests user input needed to perform the ATO tapeout process.
If a default value provided is acceptable, press enter to accept and continue.

Using last selected group name for Environment-1 [nwto] or Q=Quit: >

Would you like to review selected backups in group [nwto] before proceeding? Y/N Def=No or Q=Quit: >

Auto detected recovery method for this group will utilize [NETWORKER] or Q=Quit: >
[D d]               D=log debug info to STDOUT d=log debug info to event log
[inc]               Enable incremental staging
[nwbrowse]          Perform a Networker browse recovery versus default of SSID
[path]              Specify a path name to be appended to generated path for each client
[sdelay]            Override delay between staging progress messages defined in environment file
[server]            Initiate tape backup script using the tape backup server versus the staging client
[stageonly | s]     Perform staging activity only and skip the tape backup initiation
[tapeonly | t]      Initiate tape backup phase only skip all staging activity
[tdelay]            Override delay between tape backup progress messages defined in environment file
[upre]              User defined pre-script called from auto generated tape script
[upst]              User defined post-script called from auto generated tape script

Enter on this line all required option names from the list provided. Based on your input additional parameters
may be requested. Def=[] or Q=Quit: > inc nwbrowse s

 Tapeout-CMD: ato  1 -gid nwto -tapeout -d -stageonly -inc -nwbrowse

Execute Tapeout session Interactively or Batch? [B=Batch I=Interactive] or Q=Quit: > b

BATCH Session Initiated Using: [Env-1 Profile-atobatch-ONDEMAND File-atobatch-ONDEMAND.14775]
          To Monitor Progress: Return to Batch Log Viewer or tail -f /usr/local/avamar/var/log/atobatch-ONDEMAND.log

Press Enter to Continue
```

Figure 21

Interactive Tapeout - Batch Manager View

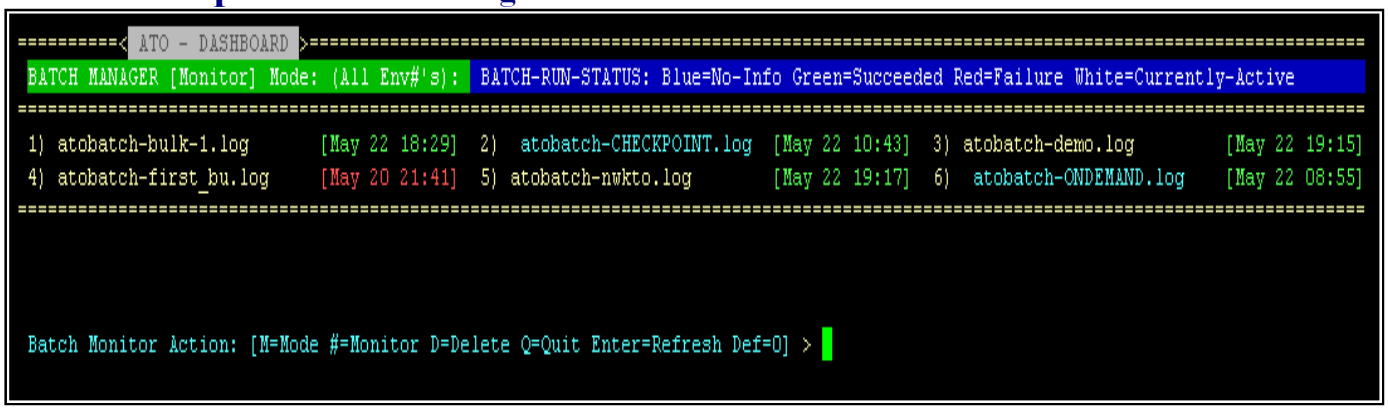

Figure 22

Tape-Out Examples

1. In this example the ***–tapeout*** switch is used initiating the staging of the selected backups followed by the initiation of the automatically generated tape script to export the staged data to tape. However, in this case ***–inc*** is used to specify using an incremental strategy and ***–s*** indicates stop after the staging process has completed. Refer to next example for a complete ***–tapeout*** session.

ato –gid test4 -tapeout -inc -s

Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-07: Configuration check succeeded
16-06-09 23:48:27 Staging client->[fsc01srv2.ukesc.local BU-id-612]->STGSRV[fsc01srv4.ukesc.local]->FS[H:/tapeout/FS1/INCREMENTAL]->Files[All][]
Initiating Recovery Session: 1 of 1
16-06-09 23:48:27 Staging client [fsc01srv2.ukesc.local BU-id-612] RunTime=00:00:15 Status=Running Progress: 0 of 4603571K bytes
16-06-09 23:48:44 Staging client [fsc01srv2.ukesc.local BU-id-612] RunTime=00:00:30 Status=Running Progress: 0 of 4603571K bytes
16-06-09 23:49:01 Staging Completed Status=Completed Progress: 4,713,988,096
INFO-09B: Staging only was performed
Env-1 Session Complete: 06/16/09 23:49

2. In this example the ***–tapeout*** switch is used initiating the staging of the selected backups followed by the initiation of the auto generated tape script to export the staged data to tape. ***–inc*** is used to specify the use of an incremental strategy.

ato -gid test4 -tapeout -inc

Active environment configuration file: /usr/local/avamar/etc/atoenv.cfg
INFO-07: Configuration check succeeded
17-06-09 00:14:00 Staging client->[fsc01srv2.ukesc.local BU-id-612]->STGSRV[fsc01srv4.ukesc.local]->FS[H:/tapeout/FS1/INCREMENTAL]->Files[All][]
Initiating Recovery Session: 1 of 1
17-06-09 00:14:00 Staging client [fsc01srv2.ukesc.local BU-id-612] RunTime=00:00:15 Status=Running Progress: 0 of 4603571K bytes
17-06-09 00:14:16 Staging Completed Status=Completed Progress: 4,713,988,096
17-06-09 00:14:20 Tape-Backup-Product->[networker]->BUSRV[fsc01srv4.ukesc.local]->POLICY[tapeoutVTL]
17-06-09 00:14:20 Exporting data to tape Please Wait ... Status=Initiating
17-06-09 00:14:20 Exporting data to tape Please Wait ... RunTime=00:00:15
17-06-09 00:14:37 Exporting data to tape Please Wait ... RunTime=00:00:30
17-06-09 00:14:53 Exporting data to tape Please Wait ... RunTime=00:00:45
17-06-09 00:15:10 Exporting data to tape Please Wait ... RunTime=00:00:60
17-06-09 00:15:27 Exporting data to tape Please Wait ... RunTime=00:01:15
17-06-09 00:15:43 Tape Export Phase Ended
INFO-09D: Tape export process Completed Ok
Env-1 Session Complete: 06/17/09 00:15

View

At any time you can view the selected backups to confirm what has been selected. Sample output from the **–v** or **–view** option is shown below. The count/client field will change color when the selected count per day is greater than one and informational flags may be displayed following the count field to indicate when selected files or ***incdel*** options are in effect for the client. With a Networker dedup node the count field is usually greater than one because each Networker save set represents a separate entry unlike Avamar native mode where all backups are normally represented by a single dataset backup. In the lower portion of the view a summary line is displayed indicating the combined backup size and a breakdown of how much data is destined for each staging file-system involved.

Usage Syntax: ***ato [env#] –v | -view***

View - Avamar Mode

```
**********< Environment=1 >**********
**** <<  Selected for Tape-Backup  >> ****
**** <<        Group=fs            >> ****
***********************************************

==========================================================================================================================
 BU-ID    AVAMAR-DOMAIN / CLIENT-NAME                                  DATE        TIME       SIZE       PLUG-IN  COUNT/CLIENT
==========================================================================================================================
 [780]    /Win2K3/fsc01srv2.ukesc.local/                               2009-08-15  19:16:48   12383678K  Windows  [1]
 [281]    /Win2K3/fsc01srv3.ukesc.local/                               2009-08-02  04:06:09   500507464K Windows  [1]
 [47]     /NetWorker/fsc01srv4/fsc01srv4/                              2009-08-03  09:26:38   3203810K   networker [1]

--------------------------------------------------------------------------------------------------------------------------

 STAGING SUMMARY: Total Backup Size: 516.9 GB's Client-Count: 3 Backup-Count: 3

 Staging-Server-Type: WINDOWS Staging-Server-Name: /Win2K3/fsc01srv4.ukesc.local Staging-File-System-Count: 3

 File-System-Summary: [12.3]GB's    -> H:/tapeout/FS3
 File-System-Summary: [500.5]GB's   -> H:/tapeout/FS
 File-System-Summary: [3.2]GB's     -> H:/tapeout/NWK
```

Figure 23

View - Networker Mode

```
**********< Environment=1 >**********
**** <<  Selected for Tape-Backup  >> ****
**** <<        Group=nwto          >> ****
***********************************************

==========================================================================================================================
 BU-ID  SSID-LEVEL-NAME      NWK-SERVER=rarsles9          CLIENT       DATE        TIME       SIZE       PLUG-IN  COUNT/CLIENT
==========================================================================================================================
 [8][3686901088 full /emc/reitmr/personal_CVS_repos]      rigel        2010-04-11  02:57:24   18983K     networker [2]
 [9][3670123873 full /emc/reitmr/rreitmey/scripts]        rigel        2010-04-11  02:57:29   149771K    networker [2]
 [10][3636569460 incr /etc]                               rigel        2010-04-11  02:57:38   2791K      networker [1]
 [11][3603015075 full /emc/reitmr/scripts]                rigel        2010-04-11  02:58:24   4616K      networker [2]
 [12][3619792291 full /emc/reitmr/EMC_CVS_REPOSITORY]     rigel        2010-04-11  02:58:28   22607K     networker [2]
 [13][3334588607 full /emc/reitmr/scripts]                rigel        2010-04-11  05:27:53   4616K      networker [2]
 [14][3368143038 full /emc/reitmr/personal_CVS_repos]     rigel        2010-04-11  05:28:00   18983K     networker [2]
 [15][3317811391 full /emc/reitmr/rreitmey/scripts]       rigel        2010-04-11  05:28:14   149771K    networker [2]
 [16][3351365823 full /etc]                               rigel        2010-04-11  05:28:15   49037K     networker [1]
 [17][3284256987 full /emc/reitmr/EMC_CVS_REPOSITORY]     rigel        2010-04-11  05:28:26   22607K     networker [2]

--------------------------------------------------------------------------------------------------------------------------

 STAGING SUMMARY: Total Staging Size: 443782 KB's Client Count: 2 Unique Backup Count: 10

 Staging-Server-Type: UNIX Staging-Server-Name: /clients/rarsles9 Staging-File-System-Count: 1

 File-System-Summary: [443782]KB's  -> /space/tapeout
```

Networker Info
- NW-Server name
- Save-Set ID#
- Backup Level
- Save-Set Name

Figure 24

Recovery Manager RM

ATO Recovery Manager (RM) provides a checkpoint mechanism with the ability to recover failed staging items or items not processed due to a premature end of a ATO session. The failed staging items are saved to a retry checkpoint while items missed due to a premature end of an ATO session are saved to rerun checkpoint. Each type is maintained separately in RM but the only difference between them is what their contents represent.

Checkpoints

A tapeout session is normally comprised of multiple backups selected from different clients to be staged and subsequently backed up to tape. As each backup item is processed one or more may fail which may need to be rerun after the issue has been identified and resolved. Failed items are saved to a checkpoint which can be run at a later time. Checkpoint contents can be displayed in a format similar to that of a normal view. Checkpoints are maintained on a per environment basis with the quantity defined in environment file variable ***MAX_RECOVERY_SESSIONS***. RM displays a list of available checkpoints color coded for quick identification reflecting their execution status ***Blue=<never run> Green=<successfully run> Red=<rerun & failed>***. Selecting a checkpoint by number displays its contents, its last run status if available and the required syntax to execute it directly from the command line. The preferred method for checkpoint execution is to initiate it as a batch run using the "***E'*** option within RM itself. When run as a batch job a log file ***atobatch-CECHKPOINT.log*** is automatically established and can be viewed in Batch Manager. RM operational modes ***retry*** and ***rerun*** is accessed using the mode option "***M***".

Accessing Recovery Manager

Recovery Manager is accessed from the ATO menu initially placing you into retry mode and if no retry checkpoints exist it will try rerun mode. In a case where all staging succeeded but the tape backup failed, a checkpoint will be established for reference only but contains no backup ID's. To reinitiate a failed tape backup rerun the original –***select*** statement followed by the original –***tapeout*** syntax and include the –***tapeonly*** option.

Running a checkpoint is normally done interactively from within RM however it can also be run on the command line directly.

To Initiate a Retry: ***ato –gid <grpid> -tapeout –retry # [-inc –data –path etc…]***
To Initiate a Rerun: ***ato –gid <grpid> -tapeout –rerun # [-inc –data –path etc…]***

When a new checkpoint is created it will always become the first in the list and any existing checkpoints will shift right until they eventually roll of the end if the maximum count is exceeded. Therefore to execute a checkpoint its number must be confirmed in RM first. At any time a checkpoint can be deleted with the remaining ones re-sequenced accordingly.

In the sample recovery screen shot below you can identify the following

- failed backup-id's displayed in the top half of the screen
- heading area is highlighted in red to distinguish it as a recovery view versus a normal view
- lower portion of the screen displays a list of the available checkpoints
- checkpoint numbers 1,4 &5 have been executed successfully indicated by their date/time shown in green
- checkpoints 2 & 3 shown in blue indicates they have never been executed
- user prompt provides options to switch modes, select the checkpoint to view, delete or execute
- selecting a checkpoint displays the syntax required to execute it
- normal backup metrics are displayed for each backup-id's involved with recalculated totals

Retry View

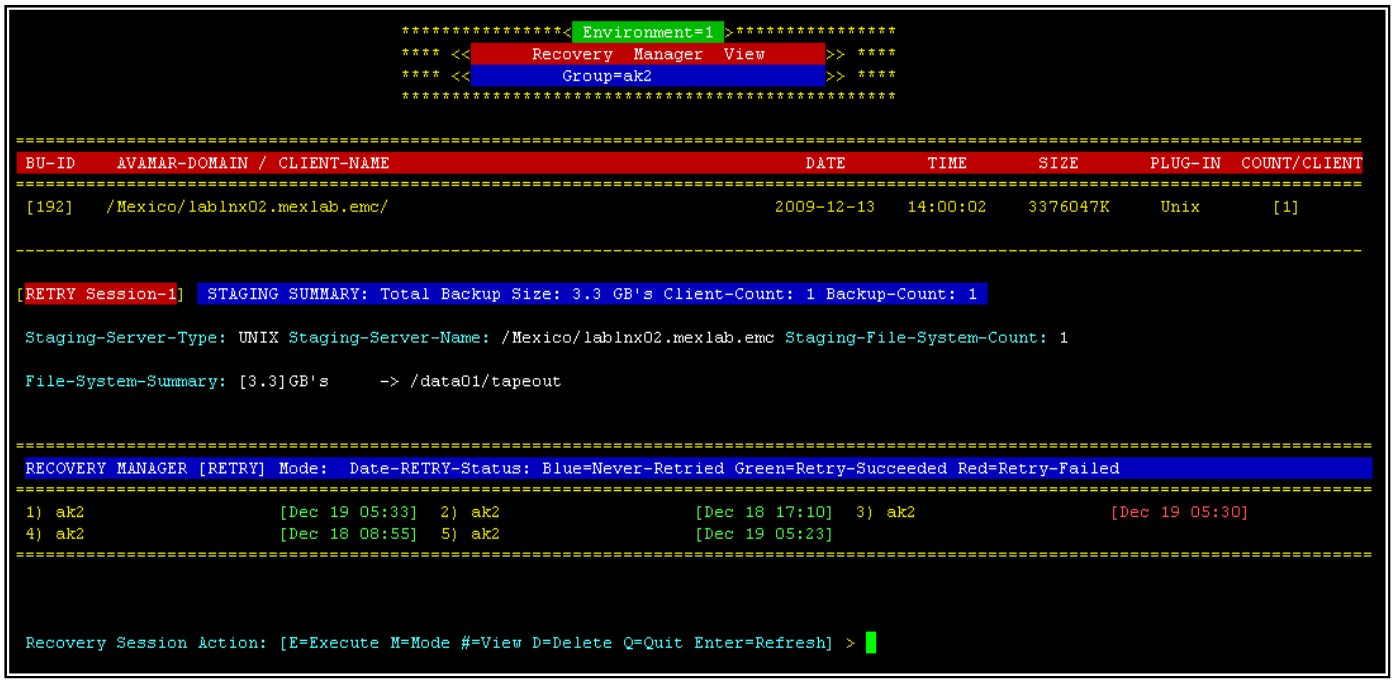

Figure 25

Rerun View

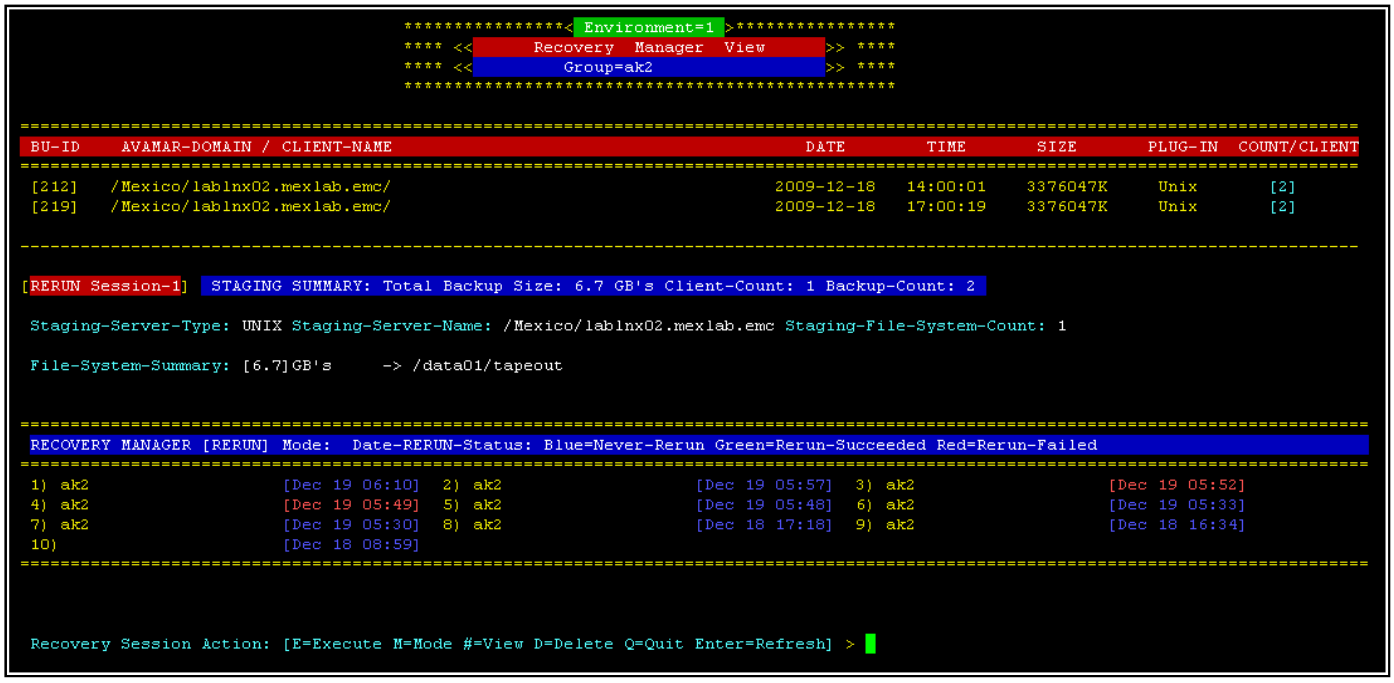

Figure 26

Networker View

Figure 27

Batch Manager BM

Batch Manager BM is used to manage all aspects of ATO batch processing whether they are executed interactively or from CRON. Establish batch profiles containing appropriate input parameters needed to perform a complete ATO tape out session. BM executes these profiles which maintain their own unique log and viewed using BM. Batch log timestamps are displayed color coded for quick confirmation of their last run status. ***Blue=<never been run>, Green=<last execution succeeded> White=<currently active>, Red=<last execution failed>*** and the date value itself represents the last run date.

BM tracks batch sessions from all environments therefore acts as a dashboard of all ATO activity. It has two operational modes Monitor and Configuration mode. Monitor or Dashboard mode is entered initially and used to monitor active batch sessions and confirm status of completed ones. To switch to configuration mode enter "***m***" at the prompt. Configuration mode is used to create, view, modify, schedule and execute batch profiles and access the CRON interface. Batch profiles are created interactively by responding to a series of prompts requesting input for a ***–select***, ***-view*** and ***–tapeout*** calls.

Batch profiles can be run concurrently providing each are configured with a unique environment number and staging server. Two types of batch profiles exist, a single profile used to establish a single batch session and a bulk profile used to call in sequence a series of single profiles treating them as one batch run. Bulk profiles eliminate the need for managing start times when a series of single profiles need to be run eliminating any time delays between each call. In all cases the single profile batch log is maintained containing detailed information and the bulk profile log contains abbreviated information including each single profile name along with its start and end time and a line identifying their completion status.

Batch profiles are stored in ***/usr/local/Avamar/etc/atobatch-*.cfg*** and their corresponding logs in ***/usr/local/Avamar/var/log/atobatch-*.log***. The portion of the name shown with an asterisk is the user defined name you assign when creating the profile.

Using Batch Manager

To enter Batch Manager: ***ato -batch***
To initiate a batch profile: ***ato –batch <profile-name>*** | ***ato –BATCH <profile-name>***

To increase the verbosity of information logged by batch sessions ***–D*** flags can be used within the batch profile. Upper case debug flags log to ***stdout*** only therefore will not be written to ATO's Event Log but their output will be captured in the batch profile log. Lower case debug flags ***–d*** log to both locations therefore it's recommended to use lower case debug flags sparingly to help prevent overloading the event log. Both may be used in conjunction with one another and included in batch profiles as desired. Using lower case ***–batch*** will return the command prompt immediately while upper case ***–BATCH*** will return after the profile completes.

Monitor or Dashboard View

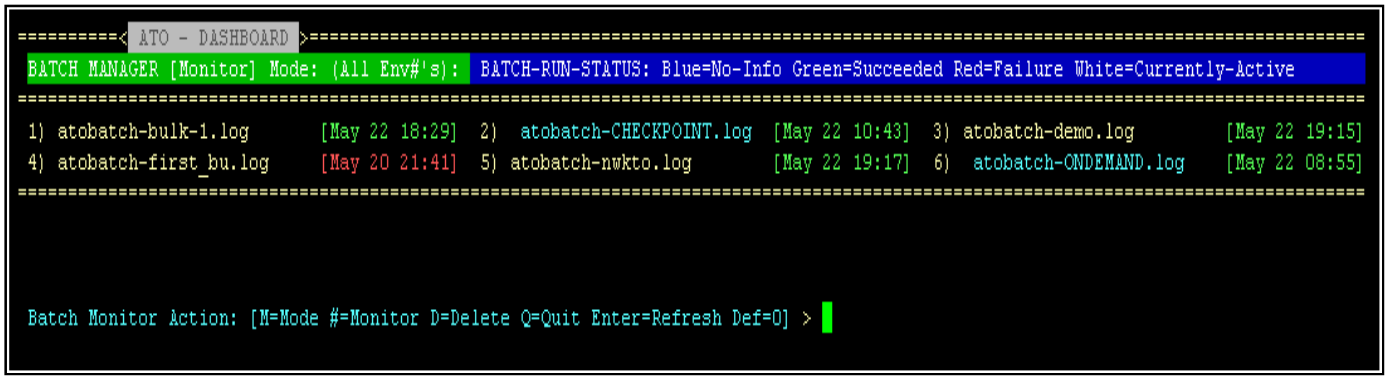

Figure 28

Configuration View

```
================================================================================================================================
 BATCH MANAGER [Configuration] Mode: <profile-name> <Env#> <last-update>  CRON-STATUS: Green=Enabled Cyan=Disabled Blue=Not-Defined
================================================================================================================================
 1) atobatch-adam2.cfg [1]     [Dec 1 17:13]  2) atobatch-adam.cfg [1]      [Sep 16 06:15  3) atobatch-grp1-fs.cfg [1]    [Nov 6 03:16]
 4) atobatch-init.cfg [1]      [Dec 10 16:28  5) atobatch-lotus.cfg [1]     [Dec 6 06:16]  6) atobatch-repl.cfg [1]       [Aug 25 18:25
 7) atobatch-server.cfg [1]    [Dec 12 18:04  8) atobatch-subgroup.cfg [1]  [Nov 21 12:20  9) atobatch-this-is-a-very-1  [Oct 27 04:17
 10) atobatch-this-is-a-very-  [Oct 17 07:14  11) atobatch-view.cfg [1]     [Dec 10 02:56
================================================================================================================================


 Batch Configuration Action: [C=Cron D=Delete E=Execute M=Mode N=New Q=Quit U=Update V=View] >
```

Figure 29

Batch Profile - Single

```
==============< Batch Profile Configuration >==============
 Batch Profile: /usr/local/avamar/etc/atobatch-adam.cfg
============================================================

Environment_Number:     1
Base_Group_Name:        gidx-1
Sub_Group_Numbers:      0
Select_Flags:           -last -D -D -D
View_Flags:             -d
Tapeout_Flags:          -inc -D -D -D

============================================================

<Press Enter to Continue>
```

Figure 30

Batch Profile - Using Sub-Groups

```
==============< Batch Profile Configuration >==============
 Batch Profile: /usr/local/avamar/etc/atobatch-fstest.cfg
============================================================

Environment_Number:     1
Base_Group_Name:        fs
Sub_Group_Numbers:      2 4
Select_Flags:           -D -D -buid "780 47"
View_Flags:              -d
Tapeout_Flags:          -D -D -inc -s

============================================================

<Press Enter to Continue>
```

Figure 31

Batch Profile - Bulk

```
atobatch-demo.cfg
atobatch-nwkto.cfg


============================================================


<Press Enter to Continue>
```

Figure 32

ATO Automation in Production Environment

Batch profiles can be initiated using several methods including manually at the command line, interactively from within BM, using the CRON or an external scheduler or via a Networker ***pnpc*** script or its equivalent with other tape applications. With a ***pnpc*** script NMC displays the group as active for the duration of the tape out session then reflects its completion status of success or failure once complete.

Initiation Using Networker GUI & PNPC Call

PNPC Prerequisites;

- Networker Linux file system agent must be installed on the ATO administration host - Utility Node or Red Hat client
- A single client resource must be established for the ATO administration host, follow example provided below
- This common client resource can be assigned to any number of Networker groups used to initiate ATO batch sessions

Client Resource Definition Example, configure as per fields shown in circled areas

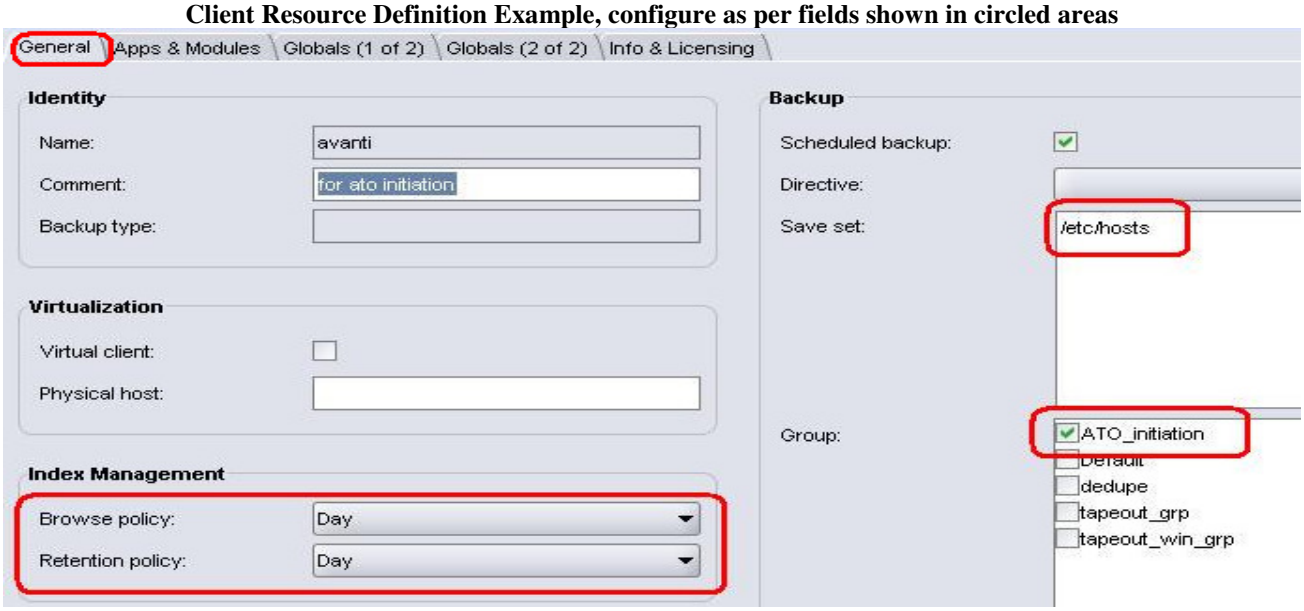

Figure 33

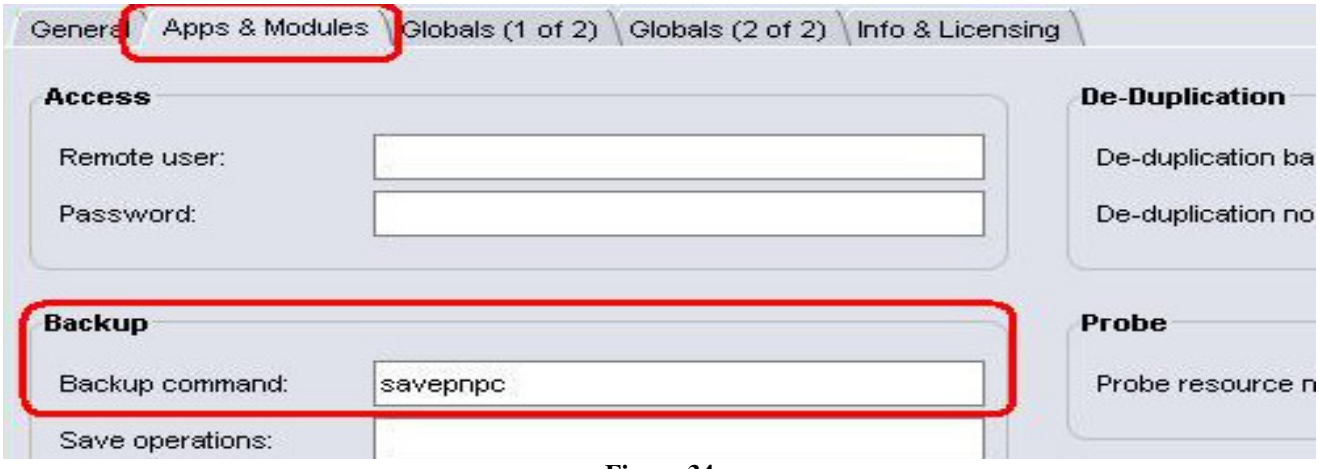

Figure 34

Group Resource Definition Example, configure as per fields shown in circled areas

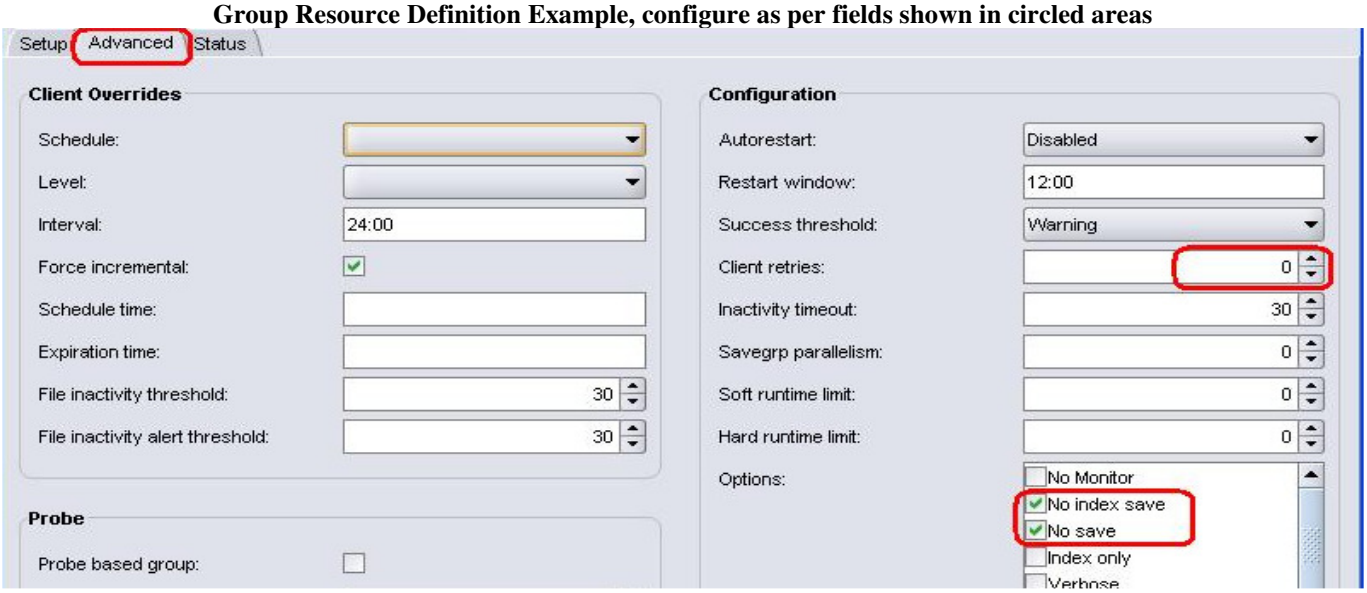

Figure 35

On ATO admin host, update contents in RED of the appropriate Group Resource .res file located in *<u>/nsr/res/<ntwk-group-name>.res</u>*

```
root@avanti:~/#: cd /nsr/res
root@avanti:/nsr/res/#: ls -rtl
total 12
-rwxr-xr-x   1 root root  119 May 23 09:45 Default.res
drwx------  12 root root 4096 Jun 25 09:09 nsrladb
-rwxr-xr-x   1 root root  117 Jul 18 09:46 ATO_initiation.res

cat  /nsr/res/ATO_initiation.res
type: savepnpc;
precmd: "/usr/local/avamar/bin/atopnpc atobatch-your-profile-name.cfg";
pstcmd: "";
abort precmd with group: Yes;
```

Figure 36

Figure 37 illustrates an ATO session initiated from Networker NMC with the group remaining active for the duration of the batch profile called. When completed, its final status will be reflected in NMC with corresponding details available in BM.

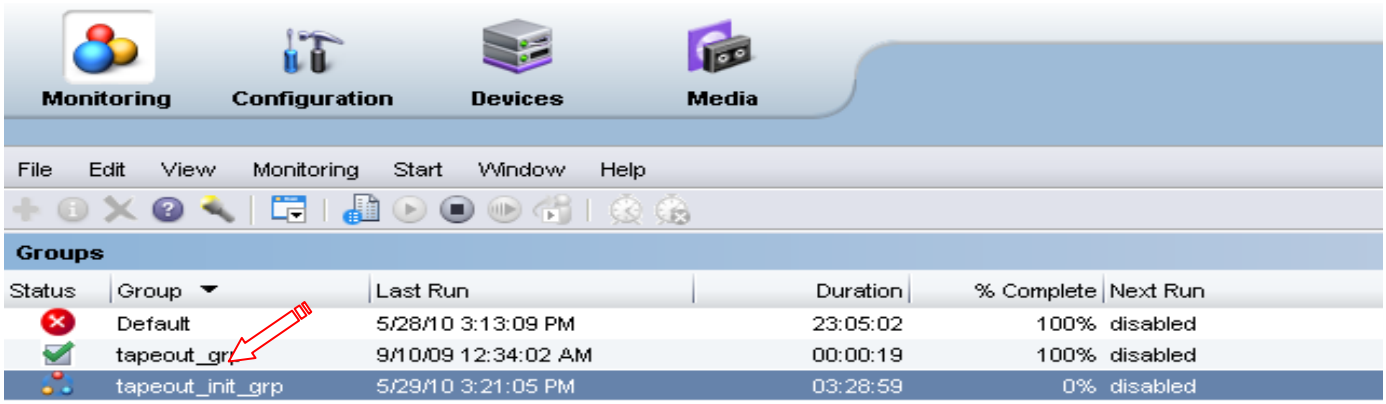

Figure 37

Auto Initiation from CRON or External Scheduler

Automation in a production environment will typically rely on CRON or perhaps a 3rd party scheduler. The following shows the syntax required to initiate a batch profile from CRON or scheduler. Using a scheduler it may be desirable to use upper case –***BATCH*** if any type of monitoring is being used.

0 11 * * * /usr/local/avamar/bin/ato –batch *<atobatch-profile-name>* >/dev/null 2>&1

or interactively at the command line

ato –batch *<batch-profile-name>*

CRON entries can be entered manually or using BM's own interface allowing you to add, modify or disable an entry as required. The profile name date fields are color coded to reflect its status in CRON.
green-underlined=enabled, cyan-underlined=disabled blue=not configured in CRON.

CRON Interface View

```
================================================================================================================================
 BATCH MANAGER [Configuration] Mode: <profile-name> <Env#> <last-update>  CRON-STATUS: Green=Enabled Cyan=Disabled Blue=Not-Defined
================================================================================================================================
 1) atobatch-bulk-1.cfg []    [May 15 08:58]  2) atobatch-demo.cfg [1]     [May 15 08:57]  3) atobatch-first_bu.cfg [1] [May 15 07:10]
 4) atobatch-nwkto.cfg [2]    [May 14 21:25]
================================================================================================================================


 Batch Configuration Action: [C=Cron D=Delete E=Execute M=Mode N=New Q=Quit U=Update V=View] > c

 To view or modify CRON enter [#=Profile# V=View-Current-Entries or < Press Enter to Return >]:  1

           Run Start Time HH:MM [ Def=00:#DISABLED ]
     Run Day-of-Month 1-31 or *=Any [ Def=12 ]
    Run Month-of-Year 1-12 or *=Any [ Def=2 ]
Run Day-of-Week# IE. Sun=0 or *=Any [ Def=* ]

Cron-Entry: #DISABLED 00 12 2 * /usr/local/avamar/bin/ato -batch atobatch-bulk-1.cfg >/dev/null 2>&1

 Confirm this CRON-UPDATE: [C=Commit D=Disable E=Enable M=Modify or < Press Enter to Return >]: >
```

Figure 38

Command Line Options

Table 2

=not applicable on Networker de-dupe node *=applicable only to Networker de-dupe node**

Environment #	Identify the environment file to use. Up to 20 files can be defined and used concurrently. If not specified it will default to environment #1. To access environments 2-20 this optional must be specified and it must be the first argument to ATO
-select	Used to initiate the selection process identifying the backups to be sent to tape.
-tapeout	Used to initiate the staging and/or tape backup process
ato	Entering ***ato*** at the Linux prompt will open the ATO Operator Menu which is a fully interactive user interface.
-avtar	* override auto detected recovery method forcing the use of avtar directly
-backup	Backup an ATO environment for protection purposes
-batch **-batch <*profile-name*>**	-***batch*** provides an interactive interface used to manage all aspects of ATO batch sessions including the ability to create batch profiles used to initiating a batch session. Batch profiles can be executed within ATO interactively. Monitor or dashboard node allows you to view the progress of any number of batch sessions from all environments. Display is color coded reflecting each profiles ending status. Initiating a batch session from the command line or CRON the syntax remains the same
-buid <buid#...>	Select a backup by its backup-id number. The value used must be valid within the other selection criteria used. If more than one buid is desired enter them all in a single space separated quoted string. If you're not certain of the buid, run the **–select** first without this option and review the backups selected. If multiple clients are selected and happen to share a common buid number, you will need to use the –***client*** filter limiting the result to a single client.
-butype | -but <mod cod nah>	* By default only scheduled backups are selected during the select process. With this option you can also include backup types ***mod=on demand, cod=client*** initiated or ***nah***. When more than one type is specified you must enclose all in a single quote space separated string.
-cfg **-cfg hide** **-cfg <group-id>** **-cfg parse** **-cfg add or add_v** **-cfg update** **-cfg manager**	-***cfg*** when no group-id is specified the entire client configuration is displayed including comment fields. Comments will be highlighted in green and line entries in your base color. To inhibit comment fields from being displayed use –***cfg hide***. Significant fields will also be highlighted in color to draw your attention to them to ensure their accuracy. When a specific group-id is specified only that group will be displayed. -***cfg parse*** performs a validation check to help confirm correct file contents. It does not check Avamar domain and client names. However, if you use the ***add*** or manager function below the domain & client names will be accurate when using either of these interfaces to add clients. -***cfg add*** is used to interactively add new lines to the client configuration file. –***add_v*** provides more verbose information displaying client names already existing in the file. -***cfg update*** opens a vi session of the client configuration file for editing -***cfg manager*** provides an interactive menu interface which includes all the above functionality. Clients can be viewed by domain, group or all together and are color coded to reflect their current status relative to ATO. It also provides the ability to enable or disable a client to ATO as required.
-client <client-name>	Used with –**select** to limit the selected backups to only the client name specified. This argument must be followed by the desired client name.

-data <*file-folder name*> **-data** <*nwk-saveset-name*>	Used to select specific files or folders from a given backup rather than stage the entire contents. Multiple **–data** options can be used and when defined on command line and will pertain to all clients in the group. When defined in the client configuration file ***Fld-17*** it pertains to a specific client only. In the client file multiple names can be defined but must be separated using the | pipe character. If any name includes spaces, the entire string must be enclosed in quotes when used on command line. With Avamar native use during ***–tapeout*** phase and with Networker dedup node use during the ***–select*** phase. A limit of up to 6 names can be specified with Networker. With Networker the names refer to a Networker save-set name.
-d -D	***–d*** and/or ***–D*** flags are intended for debug purposes but could be useful to use anytime. Lowercase flags direct additional o/p to ATO event log and some to stdout while uppercase flags direct their o/p to stdout only. Any combination of the two is allowed up to a max of 6 of each. Uppercase is useful when running interactively but especially within batch profile as the o/p will be captured to the corresponding batch log.
-env **-env parse** **-env update**	***-env*** option is used to display the environment file(s) contents ***-env parse*** performs a validation check to help confirm correct environment file contents. ***-env update*** opens a vi session of the environment file for editing
-exch |-exchmsg | **-xchdb | -sql** **–ndmp | -oracle** **–shpt | -vmimage |** **-lotus**	* Limit backup selection to the specified backup type only. All other compatible filters can be used as required. These filters are mutually exclusive. **Note**: For ***–ndmp -oracle, -shpt*** , ***-lotus -exchmsg*** it's the users responsibility to determine whether recovered data is in a suitable format to be used by the associated application. During the staging phase the most appropriate recovery method ***avtar*** or ***mccli*** will be detected and used automatically.
-first | -last	Used to filter selected backups to either the first or last backup available in the defined search date range on a per client basis. By default scheduled backups only are considered. If multiple scheduled backups exist for a given client name sharing the same date, each backup will be selected. Used with Networker clients the selection is based on save-set name.
-first_F | –last_F	Same as **–first** or **–last** but forces the selected backups to the absolute first or last only in cases where multiple scheduled backups exist.
-gid <*group-name*>	Used to specify the client group name to use. This argument must be followed by the group or site name. This parameter is mandatory for –select and –tapeout actions.
-gname <*policy-group-name*>	* Limit selected backups to those belonging to the Avamar policy group name specified. This is useful in cases where a client has multiple scheduled backups per day. It can be defined on the command line or by using Fld-6 in the client configuration file. When used on command line it pertains to all selected clients. When specified in client file it pertains only to that client.
-grab	Collect all ATO related files for diagnostic purposes
-health	Perform a health check on client configuration and all available environment files saving the results to a zip file. Also included is the last completion status from each available batch log.
-inc	Perform an incremental tape-out strategy which can increase effective throughput by a factor of several times. A prerequisite for this feature is the staged data must remain on the staging server between TO sessions therefore sufficient staging disk area must be available to hold one copy of the TO source data size. ***–inc*** prides incremental staging and facilitates incremental tape backup improving run times and tape media savings significantly. When ***–inc*** is not specified a non incremental TO strategy will be used and the data will be removed from the staging server after each TO session. It is not possible to leverage any incremental benefit from the tape backup when not using ***-inc***. This option can be used with a Networker dedup node but the benefits can only be leveraged during the tape backup phase.

-incdel	Modifies the regular ***–inc*** behavior by deleting the staged data once it has successfully backed up to tape. This is a multi purpose option intended to synchronize the staging server file content with that of the client backup but still maintain an incremental strategy to tape. A second purpose is to use it in cases where limited staging space is available but there's still a desire to leverage an incremental tape backup. When specified on the command line it will pertain to all selected clients. If specified within the client configuration file Fld-18 it pertains only to the specified client and acted upon when using a normal ***–inc*** call. When viewing selected backups or during staging, a highlight flag is displayed to remind you if this function is enabled also during staging. Refer to Client Configuration section for details
-locate	Identify and display location of all ATO related files
-l | -log	View ATO's event log. Every **–select** and **–tapeout** session is audited. Each session is treated as an event and viewed as such. The event viewer interface enables browsing forward, backward or to jump to a specific event number. This is the primary tool for confirming or troubleshooting the status of a TO session.
-m	Mail the event associated with a given ***–select*** or ***–tapeout*** session. The mailing address list is defined within the appropriate environment file. The mail subject line will contain ERROR if an error was detected or STATUS if no errors.
-nwbrowse	** For Networker dedup node overide the default recover method by saveset-id and use a browse recovery.
-nwinc	** For Networker dedup node include incremental backups during the ***-select*** phase
-path *<path-name>*	Permits a user defined suffix to be appended to the predefined destination path. A value of **–path /mypath** will stage all selected backups to the destination path on a per client basis. Only one ***–path*** statement is permitted. When used on command line it will pertain to all selected clients. When defined in the client configuration file it pertains to the specific client only. If spaces exist in the path the complete path must be enclosed in quotes when used on the command line but quotes are not required if specified in the client file.
-rdate <#>	Adjusts the current auto date range by moving back in time the number of months specified. For example, **-rdate 1** will set the start and end date range to one month prior to your current month. If using the **–last** filter it makes it easy to automate the selection process for selecting the last backups of the month without the need to constantly adjust the date range.
-recover **-recover retry** **-recover rerun** **-retry #** **-rerun #**	- ***recover*** or Recovery Manager RM provides a failure checkpoint mechanism tracking individual staging failures or a premature end to a ATO session. Individual staging failures are referred to as a Retry while an unexpected session failure is referred to as a Rerun. RM tracks a user defined number of sessions for each failure type. Using RM failed sessions can be viewed similar to a normal view but contain only the failed items to be retried or in the case of a Rerun only the outstanding items not successfully processed during the original session. Re-executing a failed session is similar to initiating a normal TO session but with an added parameter to define the type of checkpoint and its associated number. When viewing existing checkpoints RM will display the syntax required to re-execute. All failed sessions are color coded to reflect whether they have been re-executed or not and if they have been whether they were successful or failed.
-rtype *<none|daily|weekly|monthly|yearly>*	* Limit selected backups to those with the specified retention tag. It can be defined on the command line or by using Fld-7 in the client configuration fil. When used on the command line it pertains to all selected clients. When specified in the client file it pertains only to that client.
-sdate **-edate**	Overrides the auto generated date range which by default starts the first of the current month to the current date. For example, if you wanted to select a specific date range use the following; ***–sdate yyyy-mm-dd –edate yyyy-mm-dd***
-sdelay *<#secs>* **-tdelay** *<#secs>*	Used to set the time delay between progress messages during the staging and tape backup phases. By default these delay values are taken from the environment file but if specified on the command line will overrides these defaults. ***–sdelay*** = staging delay ***–tdelay*** = tape backup delay

-server	Initiate the tape backup script using the tape backup server versus the default of using the staging client. This provides more options with respect to performing the tape backup such as making it easier to leverage multiplexing, cloning and improved monitoring from the tape application.
-s | -stageonly	Perform staging only, data will not be sent to tape.
-t | -tapeonly	Perform tape backup only, no data will be staged
-tpolicy *<policy-name>*	Specify a tape policy to be used by the auto generated tape script. When specified here it will override the defined value in the client configuration file ***Fld-12,13 & 14***
-upgrade	Perform an upgrade of the ATO utility. This requires the new ATO tar file be present in ***/usr/local/Avamar/src*** directory and that no ATO sessions are active. The upgrade process will automatically perform an backup enabling you to rollback to the previous version if necessary. It also runs a predefined upgrade script contained within the tar file used to adjust environment or client configuration files automatically if required to support the new version.
-upre *<script-name>*	Provides a user hook into the auto generated tape script to call a user defined ***pre-script*** run immediately prior to starting the tape backup. The script must be an executable file ,bat on Windows located on the staging server in the ***<Avamar install path>/etc/scripts*** folder.
-upst *<script-name>*	Provides a user hook into the auto generated tape script to call a user defined ***post-script*** run immediately after a successful tape back is complete. The script must be an executable file .bat on Windows located on the staging server in the ***<Avamar install path>/etc/scripts*** folder.
-v | -view	View the backups selected for TO based on the last ***–select*** process. Various metrics are displayed relative to the selected backups including the BU size, date/time, type and a summary line is provided indicating the combined data size and the destination FS's involved.
-week <*day***>** **-week <***day_#***>**	Limit selected backups to a day of the week or a day instance within the defined search date range. To select backups from Saturday ***use –week sat***, to select the last Saturday of the month use ***–week sat –last*****,** to select the first Saturday use ***–week sat_1*** or ***–week sat_2*** for the second etc. Day names are ***sun, mon, tue, wed, thu, fri, sat*** day numbers start at ***Sunday=1, 0=all days***
-xdata *<file-folder name>* **-xdata** *<nwk-saveset-name>*	Used to exclude specific files or folders from a given backup rather than stage the entire contents. Multiple ***–xdata*** options can be used and when defined on command line and will pertain to all clients in the group. When defined in the client configuration file ***Fld-8*** it pertains to a specific client only. In the client file multiple names can be defined but must be separated using the | pipe character. If any name includes spaces, the entire string must be enclosed in quotes when used on command line. With Avamar native use during ***–tapeout*** phase and with Networker dedup node use during the ***–select*** phase. A limit of up to 6 names can be specified with Networker. With Networker the names refer to a Networker saveset name.

Event Log

ATO event log permits quick and easy access to the latest or past events without the need to parse verbose log files. Events are displayed as separate events allowing you to browse forward or backwards, jump to a specific event number or search for a string. Contents are highlighted in color to draw attention to error messages. Sample events are shown here with some lines highlighted to emphasize their relevance and content. Separate event logs are maintained for each environment being used.

ato –l or -log

Sample select session filtered on latest backups only

```
------------------------< Event#=1247 of 1247 Env- >--------------------
06/22/09 00:08 ==== ATO Ver. 1.0.0 ==== SELECT
User-Input: -sid fs -select -last
INFO-01A: Active-Auto Date Range - 2009-06-01 to 2009-06-22
INFO-07:  Configuration check succeeded
INFO-02B: Limiting selected Snap-up count to last only per client/date [-last]
INFO-03B: Client [fsc01srv1.ukesc.local] Removing [26] Save Sets from worklist [Filter=Last]
INFO-03B: Client [fsc01srv2.ukesc.local] Removing [10] Save Sets from worklist [Filter=Last]
INFO-03B: Client [fsc01srv3.ukesc.local] Removing [11] Save Sets from worklist [Filter=Last]
INFO-05B: The total Save Set reduction count this session is [47]
INFO-14:  Total backup count selected [7]
Email Flag NOT Set; Skipping Email message
Env-1 Session Complete: 06/22/09 00:08
```

Sample of a failed incremental tapeout session due to mis-configured tape setup in Networker

```
------------------------< Event#=1244 of 1247 Env- >--------------------
06/21/09 21:55 ==== ATO Ver. 1.0.0 ==== TAPEOUT
User-Input: -sid fs -tapeout -inc
INFO-07:  Configuration check succeeded
INFO-12A: Using AUTO generated tape script for [networker]
INFO-16A:  Using incremental staging recovery
INFO-15A: Windows SS recovery completed okay, Status: Ok=1 Skipped=-0 Err=0 Total=1
networker Script-Created: Sun Jun 21 21:55:10 BST 2009
"CMD: C:\Progra~1\Legato\nsr\bin\savefs -s fsc01srv4.ukesc.local -g tapeoutVTL -q  H:\tapeout\FS2\INCREMENTAL >>
C:\progra~1\avs\etc\scripts\autotapeout.stat 2>&1"
7196:savefs: H:\tapeout\FS2\INCREMENTAL is not backup enabled,
nor is it listed in this client's resources
TAPE_BACKUP_NOTOK RC=1
ERROR-11B: Tape Export Process Incomplete RC=1, Check Event Log
Email Flag NOT Set; Skipping Email message
Env-1 Session Complete: 06/21/09 21:56
Email Flag NOT Set; Skipping Email message
```

Sample of a failed incremental tapeout due to a previously selected backup being expired on Avamar

```
------------------------< Event#=1236 of 1247 Env- >--------------------
06/21/09 21:00 ==== ATO Ver. 1.0.0 ==== TAPEOUT
User-Input: -sid fs -tapeout -inc
INFO-07:  Configuration check succeeded
INFO-12A: Using AUTO generated tape script for [networker]
ERROR-10A: Unable to stage data for [fsc01srv2.ukesc.local BU-id-622], selected but either no longer exists or outside
           date range. Try expanding search date by adding -sdate yyyy-mm-dd parameter on call line
INFO-16A:  Using incremental staging recovery
ERROR-09:  SS recovery incomplete, Status: Ok=0 Skipped=1 Err=0 Total=1
ERROR-05A: Skipping export to tape due to no successfully staged recoveries
INFO-11: Exiting Script ....
Env-1 Session Complete: 06/21/09 21:00
Email Flag NOT Set; Skipping Email message
```

Sample tapeout session with debug set to capture trace and tape related info.

```
------------------------< Event#=1913 of 1913 Env-1 >--------------------
08/25/09 15:32 ==== ATO Ver. 1.0.100 ==== TAPEOUT
User-Input: -sid fs -tapeout -inc -d -d
INFO-07E: Selected Group-ID's share a common Staging Server Type - Ok
INFO-07C: Selected Group-ID's share a common Tape-BU Script - Ok
INFO-07D: Selected Group-ID's share a common tape policy Group Name - Ok
INFO-07E: Selected Group-ID's share a common tape policy Pool Name - Ok
INFO-07F: Selected Group-ID's share a common tape policy EOY Pool Name - Ok
INFO-07:  Configuration check succeeded
INFO-12A: Using AUTO generated tape script for [networker]
TRACE-20: /usr/local/avamar/bin/mccli backup restore --domain=/NetWorker/fsc01srv4 --name=fsc01srv4 --dest-client-
name=/Win2K3/fsc01srv4.ukesc.local --labelNum=47 --dest-dir=H:/tapeout/NWK//INCREMENTAL/fsc01srv4 --cmd=--overwrite=newest --plug-in=3001

25-08-09 15:32:32 [MOD-1251210775807][3001] Initiating Recovery Session: 1 of 1
 Staging client->[fsc01srv4 BU-id-47]->STGSRV[fsc01srv4.ukesc.local]->FS[H:/tapeout/NWK/INCREMENTAL]->Files[All][]
INFO-16A: Using incremental staging recovery
INFO-15A: networker Staging sessions completed okay, Status: Ok=1 Skipped=-0 Err=0 Total=1
TRACE-10: /usr/local/avamar/bin/mccli backup restore --data=/tmp/atocfg/autotapeout.bat --dest-client-name=/Win2K3/fsc01srv4.ukesc.local --dest-client-
domain=/NetWorker/fsc01srv4 --dest-dir=C:/progra~1/avs/etc/scripts --labelNum=1354 --name=/clients/tapeoutato --cmd=overwrite=always --cmd=run-at-
end=autotapeout.bat --plug-in=3001

networker Script-Created: Tue Aug 25 15:32:31 BST 2009
"CMD: C:\Progra~1\Legato\nsr\bin\savefs -s fsc01srv4.ukesc.local -g tapeoutVTL -q H:\tapeout\NWK\INCREMENTAL"
fsc01srv4: H:\tapeout\nwk\INCREMENTAL level=incr,  0 KB 00:00:50      0 files
TAPE_BACKUP_OK RC=0
INFO-09D: Tape export process Completed Ok
Env-1 Session Complete: 08/25/09 15:34
Email Flag NOT Set; Email notification skipped
```

Sample tapeout where the tape policy was not configured to include one of the staging areas used.

```
------------------------< Event#=1916 of 1916 Env-1 >--------------------
08/25/09 15:51 ==== ATO Ver. 1.0.100 ==== TAPEOUT
User-Input: -sid fs -tapeout -inc -d -d
INFO-07E: Selected Group-ID's share a common Staging Server Type - Ok
INFO-07C: Selected Group-ID's share a common Tape-BU Script - Ok
INFO-07D: Selected Group-ID's share a common tape policy Group Name - Ok
INFO-07E: Selected Group-ID's share a common tape policy Pool Name - Ok
INFO-07F: Selected Group-ID's share a common tape policy EOY Pool Name - Ok
INFO-07:  Configuration check succeeded
INFO-12A: Using AUTO generated tape script for [networker]
TRACE-20: /usr/local/avamar/bin/mccli backup restore --domain=/Win2K3 --name=fsc01srv2.ukesc.local --dest-client-name=/Win2K3/fsc01srv4.ukesc.local
--labelNum=780 --dest-dir=H:/tapeout/FS3//INCREMENTAL/fsc01srv2.ukesc.local --cmd=--overwrite=newest --plug-in=3001

25-08-09 15:51:03 [MOD-1251211886044][3001] Initiating Recovery Session: 1 of 2
 Staging client->[fsc01srv2.ukesc.local BU-id-780]->STGSRV[fsc01srv4.ukesc.local]->FS[H:/tapeout/FS3/INCREMENTAL]->Files[All][]
TRACE-20: /usr/local/avamar/bin/mccli backup restore --domain=/NetWorker/fsc01srv4 --name=fsc01srv4 --dest-client-
name=/Win2K3/fsc01srv4.ukesc.local --labelNum=47 --dest-dir=H:/tapeout/NWK//INCREMENTAL/fsc01srv4 --cmd=--overwrite=newest --plug-in=3001
25-08-09 16:04:55 [MOD-1251212718476][3001] Initiating Recovery Session: 2 of 2
 Staging client->[fsc01srv4 BU-id-47]->STGSRV[fsc01srv4.ukesc.local]->FS[H:/tapeout/NWK/INCREMENTAL]->Files[All][]
INFO-16A: Using incremental staging recovery
INFO-15A: networker Staging sessions completed okay, Status: Ok=2 Skipped=-0 Err=0 Total=2
TRACE-10: /usr/local/avamar/bin/mccli backup restore --data=/tmp/atocfg/autotapeout.bat --dest-client-name=/Win2K3/fsc01srv4.ukesc.local --dest-client-
domain=/NetWorker/fsc01srv4 --dest-dir=C:/progra~1/avs/etc/scripts --labelNum=1359 --name=/clients/tapeoutato --cmd=overwrite=always --cmd=run-at-
end=autotapeout.bat --plug-in=3001
networker Script-Created: Tue Aug 25 15:51:01 BST 2009
"CMD: C:\Progra~1\Legato\nsr\bin\savefs -s fsc01srv4.ukesc.local -g tapeoutVTL -q H:\tapeout\FS3\INCREMENTAL"
7196:savefs: H:\tapeout\FS3\INCREMENTAL is not backup enabled,
nor is it listed in this client's resources
TAPE_BACKUP_NOTOK RC=1
ERROR-11B: Tape Export Process Incomplete RC=1, Check Event Log
        To RERUN Use: ato -sid fs -tapeout -tapeonly
Email Flag NOT Set; Email notification skipped
Env-1 Session Complete: 08/25/09 16:06
Email Flag NOT Set; Email notification skipped
```

User Defined Tape Scripts

When specifying your own tape scripts it must contain appropriate logic for determining success or failure of the tape backup and it must also capture this information in order for ATO to report its completion status. The following examples for Windows and UNIX can be used as a guide substituting your own syntax for initiating the tape backup shown in red. The rest of the lines are required by ATO although you may add additional code as required as long as its does not modify this logic flow. If this convention is not followed ATO will be unable to accurately report completion status which it will class as an error.

The auto generated tape script named ***autotapeout.bat*** on Windows or ***autotapeout.sh*** scripts can be viewed on the staging server in the <Avamar home path>/etc/scripts. You can also view the scripts on the Utility node by running a tapeout operation with x4 –d flags on the call line, the script will be located in ***/tmp/atocfg#*** where # represents the environment number being used. The script must be located on the Utility node for ATO to use, refer to client configuration file section Fld-11 as to how to define it to ATO.

WINDOWS:

C:\Progra~1\Legato\nsr\bin\savegrp -G tapeoutVTL_grp > C:/progra~1/avs/etc/scripts/autotapeout.stat 2>&1
if ERRORLEVEL 1 GOTO NOTOK
if ERRORLEVEL 0 GOTO OK
:OK
echo TAPE_BACKUP_OK RC=%ERRORLEVEL% >> C:/progra~1/avs/etc/scripts/autotapeout.stat
RMDIR /S /Q F:\data01\tapeout\BYDATE***clientx***
mkdir F:\data01\tapeout
GOTO END
:NOTOK
echo TAPE_BACKUP_NOTOK RC=%ERRORLEVEL% >> C:/progra~1/avs/etc/scripts/autotapeout.stat
GOTO END
:END
C:/progra~1/avs\bin\avtar -c --acnt=/clients/tapeoutato --hfsaddr=lablnx01.mexlab.emc --id=root --password=8RttoTriz
C:/progra~1/avs/etc/scripts/autotapeout.stat
C:/progra~1/avs\bin\avtar -c --acnt=/clients/tapeoutato --hfsaddr=lablnx01.mexlab.emc --id=root --password=8RttoTriz
C:/progra~1/avs/etc/scripts/autotapeout.stat

UNIX or LINUX:

#!/bin/ksh
/usr/sbin/savegrp -G tapeoutVTL_grp > autotapeout.stat 2>&1
if ["$?" -eq "0"]
then
echo TAPE_BACKUP_OK $? >> /usr/local/avamar/etc/scripts/autotapeout.stat
/usr/local/avamar/bin/avtar -c --acnt=/clients/tapeoutato --hfsaddr=lablnx01.mexlab.emc --id=root --password=8RttoTriz
/usr/local/avamar/etc/scripts/autotapeout.stat
/bin/rm -rf /data01/tapeout/BYDATE***clientx***
exit 0
else
echo TAPE_BACKUP_NOTOK $? >> /usr/local/avamar/etc/scripts/autotapeout.stat
/usr/local/avamar/bin/avtar -c --acnt=/clients/tapeoutato --hfsaddr=lablnx01.mexlab.emc --id=root --password=8RttoTriz
/usr/local/avamar/etc/scripts/autotapeout.stat
exit 1
fi

Notes:

1. The examples shown are for Networker and valid only if the staging server is also the Networker server. For client initiated backups the save command would need to be used rather than savegrp.
2. For tape solutions other than Networker the appropriate syntax would need to replace the lines in red

3. Lines highlighted in yellow are required only if not using incremental staging method. If using incremental staging they must be removed.

Informational Messages

INFO-01: [<diff-cnt>] DS's selected for -> siteid-x
Show the number of snap-up's selected for the site-id or client name specified. This message will only be displayed when at least one debug flag is specified to reduce log content in a large client environment.

INFO-01A: Active Date Range - <startdate> to <today's date>
Identify the effective date range used during the selection process.

INFO-01B: [??] DS's selected for -> <client-name>
Identify the number of backups selected for the specified client

INFO-02A: Minimize selected Snap-up count to first only per Plug-In type [-first]
Limit selected backups to the first one within the date range only. ***–first*** option specified on call line during the selection process

INFO-02B: Minimize selected Snap-up count to last only per Plug-In type [-last]
Limit selected backups to the last one within the date range only. ***–last*** option specified on call line during the selection process

INFO-02C: Limiting selected Snap-up count to specified day of the week [-week]
Limit selected backups to those on the specified day of the week or instance of the specified day

INFO-03A or B: Client [client-name] Removing [count] <first or last or week> Save Sets from work-list
Report the snap-up reduction count to be removed from the staging process when using the –first or –last options during the selection process. Note: the count value may be inaccurate when multiple filters are used concurrently

INFO-05: The total Save Set reduction count this session is *[<count>]*
Report the total snap-up reduction count to be removed from the staging process when using the –minimize option during the selection process.

INFO-06: Config verification checks failed
A previous error was detected causing the script to exit. An associated more detailed error message will be reported with this message.

INFO-06: Exiting script, Non-Zero return code, check failed

INFO-07: Configuration check succeeded
Confirmation all selected clients are configured to share common variables such as the tape policy fields a prerequisite for the tape-out process.

INFO-07B: *Selected Group-ID's share a common Tapeout Client – Ok*
Confirmation all selected clients are configured to share a common Tape-Out client or staging server type a prerequisite for a given selection process.

INFO-07C: *Selected Group-ID's share a common Tape-BU Script – Ok*
Confirmation all selected clients are configured to share a common Tape-Backup policy, a prerequisite for a given tape-out process.

INFO-07D: Selected Group-ID's share a common Networker Group Name – Ok
Confirmation all selected clients are configured to share a common Networker Group name. If the staging server is also the Networker server, the savegrp command can be used instead of the save command to initiate a tape backup automatically the group name is required as input to the savegrp command. When starting the tape backup with savegrp the group name must be shared by all selected clients. Starting by group name offers some advantages such as the ability to utilize automatic cloning and to view the backup status in the NMC report GUI.

INFO-09A: Tape-Out Backup completed – Ok
Acknowledgment the auto generated tape out backup script has completed okay.

INFO-09B: Staging only was performed
Acknowledgment the auto generated tape out backup script has been skipped and the data was staged only

INFO-09C: Staging only completed – Ok

INFO-09D: Tape export process Completed Ok
With a Windows or Unix staging server the tape backup process completed okay

INFO-10: Initiate staging using tapeout.pl
Using a Windows staging server the client recovery process was initiated

INFO-11: Exiting script...

INFO-12A: Using AUTO generated Tape-Out script for [<tape-backup-software>]
Confirmation the auto generated tape backup script will be used for the backup software type shown. Currently only Networker is supported for the auto generated tape backup script.

INFO-12B: Skipping AUTO generated Tape-Out script for [<tape-backup-software>]
Confirmation staging only option was specified and initiation of the tape back has been skipped.

INFO-14: Total backup count selected [snapup-cnt]
Display the total number of snapup-id's selected during the selection process

INFO-15A: Windows/Unix SS recovery completed okay,
Status: Ok=<#completed> Skipped=<#skipped> Err=<#errors> Total=<total-count>
Status summary of the backups selected to be staged. The total count represents the combined total of the 3 other counters.

INFO-16A: Using incremental-delete staging recovery
The ***incdel*** flag has been defined for a client in the client configuration file or ***–incdel*** switch was specified on the call line

Error Messages

ERROR: Unable to authenticate to MCS using current credentials <userid> <password>"
An additional message will be displayed identifying the file which is used to store the above credentials for MCS. A valid credential must be present in this file

ERROR: Unable to confirm creation of pseudo client /clients/tapeoutato
Unable to communicate with MCS to confirm existence of the pseudo client. This message is most likely to occur when running ATO from a RH client. Ensure that mccli is operational and verify the pseudo client exists.

ERROR: Incremental staging not supported with traditional Avamar-TO
When running on a Linux staging server in Avamar traditional mode, the incremental function is not supported

ERROR-01A Selected Group-ID's have different destination directories - Not-Ok
The selected clients are configured with more than one destination directory defined, a prerequisite for tape-out in AST mode is for all clients in a given group share a common destination staging directory.

ERROR-01B: Selected Group-ID's have different Tapeout Clients - Not-Ok (obsolete)
The selected clients are configured to use different TO pseudo clients, a prerequisite is for all selected clients share a common TO pseudo client.

ERROR-1C: Selected Group-ID's have different Tape-BU Scripts - Not-Ok
Selected group of clients are configured with more than one tape backup script defined, a prerequisite is all clients in a given group must share a common tape backup script.

ERROR-1D: Clients in selected group-id have different Tape Group Names defined - Not-Ok
Selected group of clients are configured with more than one tape backup policy defined, a prerequisite is all clients in a given group must share a common tape backup policy.

ERROR-01E: Selected Group-ID's have different Staging Server Names - Not-Ok
Selected group of clients are configured with more than one staging server type defined, a prerequisite is all clients from a given selection cycle share a common staging server type.

ERROR-01F: Clients in selected Group-id-ID have different Tape EOY Policy Names defined - Not-Ok
The selected client group is configured with more than one EOY tape policy name defined in Fld-13 in the client configuration file.

ERROR-03: Incompatible date values in config file
When using the automatic date range selection both the start and ending dates must be set to AUTO in the ***atoclient.cfg*** file. To override refer to –***sdate***, -***edate*** and –***rdate*** options.

ERROR-05: An error was detected by tapeout.pl, verify tapeout.log file for details
The perl script ***tapeout.pl*** detected an error condition returning a non zero return code. An additional error message may be reported with this error but the ***tapeout.log*** file will contain detailed information to help in diagnosing the reason for the failure.
Note: Applicable only to AST mode

ERROR-05A: Skipping export to tape due to no successfully staged recoveries
None of the selected backups have been staged successfully. Verify your staging environment is defined properly to ATO and is functional. Refer to Avamar client log for details.

ERROR-06A: GroupID not found, [<site-id>]
The site or group-id specified during the select process cannot be found in the ***atoclient.cfg*** file. Check your syntax or verify configuration file is accurate.

ERROR-06B: Client not found, [<client-id>]
The client-id specified during a select process cannot be found in the ***atoclient.cfg*** file. Check your syntax or verify your configuration file is accurate.

ERROR-06C: Group-ID [,site-id>] is configured for a LINUX SS, must execute from a LINUX SS$DEF
Clients in specified site-id are configured to use AST TO therefore this utility must be run from a configured RH staging server.

ERROR-06D: Group-ID [<site-id>] is configured for a UNIX or WINDOWS SS, must execute from the Utility node
Clients in specified site-id are configured to use ATO native mode operation therefore must be run from the Avamar Utility node.

ERROR-06E: GroupID [<siteid>] not found
The site-id or group-id specified is not found in the ***atoclient.cfg*** file, check your syntax or client configuration file.

ERROR-06F: GroupID [$Siteid] does not match siteid used for the -select process [$select_siteid]
A cross check performed when doing a ***–tapeout*** operation to ensure the site-id specified matches the one used during the ***-select*** process. The previous select and the current tapeout call must specify the same site-id or group-id.

ERROR-06G: The -server option is used to initiate a tape backup from the tape server versus a staging client. However, a required parameter is either missing or not configured correctly to support this option.
Two environment file variables must be present and configured to support the ***–server*** option, TAVAINSTALLPATH and TAVADOMAINNAME. An additional message will be displayed indicating which variable is suspect. Update each environment file as required.

ERROR-08: Custom Tape-Backup script doesn't exist [<script-name>]
The tape backup script name referenced in the ***atoclient.cfg*** file does not exist. Check the client configuration file is correct and verify the script exists. The complete script path name is required in the configuration file and the script must be located on the system being used to execute ATO from.
.
ERROR-09: Windows/Unix SS recovery incomplete, Status: Ok=? Skipped=? Err=? Total=?
The stats counters indicate the overall status of each backup staged. The Ok count should equal the Total count for a successful staging operation. If an abnormal condition is detected a log entry is made for each identifying the client involved. Refer to Activity monitor to review the client logs.

ERROR-10A: Unable to stage data for [client-name BU-id-num], selected but no longer exists
A backup identified during the selection process has since been deleted or expired and no longer available for recovery.

ERROR-10B: Staging process for client [$client BU-ID=?] has Failed or was Canceled Status=?
A Windows/Unix staging process has failed for the client and backup ID specified. Refer to Activity monitor to review the client logs.

ERROR-10C: Unexpected error with [Siteid client] exiting ...
A Windows/Unix staging activity has failed with an unknown error. Refer to Activity monitor to review the client logs. This error can occur when the client configuration file contains invalid values or incorrect number of fields. Perform a parse check on client configuration file.

ERROR-11A: Tape export initiation process has Failed or was Canceled
With a Windows/Unix staging server the tape backup initiation has failed. Refer to the tape backup solution to identify the cause or ATO event log for failure information returned by the tape call.

ERROR-11B: Tape export process Incomplete

With a Windows staging server the tape backup process is incomplete. Check ATO event log for more details.

ERROR-11C Unexpected error, cannot locate [autotapeout.stat] file
The stat file must be created by the tape backup script and must contain the keyword TAPE_BACKUP_OK or TAPE_BACKUP_NOTOK as required. This file is used to determine the status of the tape backup phase. Check your tape backup script to ensure this file is being created and is in the proper location. Check the staging server can resolve the Avamar server address by name, if not add it to the SS hosts file. Check the script timeout variable is set for a time duration longer than the time required to complete the tape backup.

ERROR-12: Invalid staging server type for [Siteid client], check atoclient.cfg file
Based on where ***ato*** is run, the staging server defined for the selected clients is invalid. If running ***ato*** on a Utility node the staging server type must be ***WINDOWS*** or ***UNIX***. If run from a LINUX staging server the staging sever type specified must be ***LINUX***

ERROR-13A: The *-**exch*** and *-**sql*** flags are mutually exclusive, specify one only

ERROR-30A & B: RETRY session [<*checkpoint-file-name*>] for [Grp-id] has failed
An execution of a previously failed checkpoint has been attempted and it has failed.

ERROR-40A,B,C: A CRON syntax error has been detected, no changes made
The syntax you are using to activate a batch profile in CRON is invalid, check your using appropriate syntax

ERROR-40D: Batch profile [<*profile-name*>] already in disabled state, no changes made
An attempt was made to disable an existing CRON entry but the entry is already disabled

ERROR-40E: Batch profile [<*profile-name*>] must be in an Enabled state to modify
An attempt was made to modify a disabled CRON entry but in order to modify it must be enabled first

ERROR-40F: Profile name [<*profile-name*>] already exists
An attempt was made to create a new profile but the name you have provided already exists

ERROR-40G: Environment # specified [#] is out of range, must be 1-20
While creating a new batch profile an invalid environment file# has been specified. Valid range is 1 thru 20

ERROR-40H or I: A valid base group name must be specified
When establishing a new batch profile an invalid ATO group name has been specified. Valid group names must be defined in the client configuration file before you try to use it

ERROR-40J: The batch profile-id specified [<*profile-name*>] doesn't exist
An attempt was made to execute an ATO batch profile but the profile name specified doesn't exist

ERROR-40K: A previous on demand batch session is locked preventing this session from starting
Remove lock file *[/tmp/atobatch-ONDEMAND.chk*] if appropriate and try again.
An attempt was made to run an interactive –***tapeout*** session but a previous session appears to still be active. Verify using Batch Manager if this is the case or if you are certain no on demand session is active remove the lock file shown and try again

ERRORX-??: An on demand checkpoint session is already active preventing this session from starting

ERRORX: Failed to retrieve list of selected backups, rerun the -select process
Currently no selected backups are selected for TO, perform the selection process to identify the backup ID's.

ERROR: New ATO session attempted but a previous session has Env-# locked

A previous session is either still active or ended prematurely leaving this environment files lock

ERRORX: Another ATO process has Env-<#> locked, Lock-File: <temp-path>/ato.lck exitting....
Normally this lock will be cleared automatically but if it does not and you are certain no other ATO process's have the environment locked, you can use rm command to delete the displayed lock file name.

ERRORX-xx: Recovery session [#] doesn't exist

ERRORX: Unable to confirm creation of pseudo client <pseudo-client-name>
Ensure the MCS service is started and operational. If your running ATO from a Red Hat client ensure that mccli rp has ben installed and is operational

ERRORX: Unable to authenticate to MCS using current credentials <userx> <passx>
Ensure MCS service is started and operational. If your running ATO from a Red Hat client ensure that mccli rpm is installed and operational.

ERRORX: Can't find ato_ file, some functions will be unavailable
ATO is comprised of two script files of which ato_ is one. It must exist in /usr/local/Avamar/bin

ERROR-13A: The -exch and -sql flags are mutually exclusive, specify only one at a time
When working with SQL or Exchange backups specify only one flag at a time

ERROR-90: The previous ATO session ended prematurely, event log has been truncated
This error may occur if an ATO session ends prematurely and being unable to properly end the event log