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Managing the AMASS® File System

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NOTES

Preface

NOTES

Purpose of This Book

This book describes the management tasks, commands, utilities, and troubleshooting tools used to operate AMASS and manage the AMASS file system.

Who Should Read This Book

This book is written for the system administrators who use the command line to operate and troubleshoot AMASS.

It assumes the administrators have a strong familiarity with:

- The appropriate UNIX operating system

- Applications running in their site environment

How This Book is Organized

This book contains the following chapters:

Chapter 1: Initial Setup Tasks — Use AMASS commands to prepare the file system and media for use by AMASS. These tasks include the following:

- Preparing a Backup Volume

- Creating an entry in the File System Database for all media

- Assigning volume groups

Chapter 2: Operational Tasks — Use AMASS commands to manage the AMASS file system. These tasks include the following:

- Modifying the schedule to back up the AMASS File System Database

- Switching drives in and out of service

- Reading offline media

- Adding space to volume groups

- Activating and inactivating the file system

Chapter 3: Command Reference — Alphabetical list of AMASS commands

Chapter 4: Utility Reference — Alphabetical list of AMASS utilities

Chapter 5: Troubleshooting Tools — Procedures, scripts, and utilities for diagnosing problems

Appendix A: HP-UX Backup Scripts — Examples of backup scripts for HP environments

Appendix B: Fine-Tune Block Size — Configuring site-specific tape block sizes

Appendix C: Cache Commands — Using new AMASS commands to assign cache block list priority values for reads and writes per volume group.

> A system administrator can keep files for a specific volume group in cache longer and the files can consequently be accessed more quickly by client applications.

Conventions

The conventions used throughout the AMASS technical books are listed below:

Convention	Example
The word "library" usually includes "jukebox" and "standalone drive" and is a generic way to reference a storage device.	If using HP SunSpot jukeboxes, install patch 1234.

Screen text, file names, program names, and commands are in `Courier` font.	`Request to add a new volume:`
	`Volume group will be "20"`
	`Volume position will be "A123"`

The root prompt is shown as a number symbol.	**# su root**
What you should type in is shown in `Courier` **bold** font.	**bulkinlet 1,2-10,21,23**
Site-specific variables are in a *Times italics* font.	**tar -xvf** *tapedevicename*
A backward slash (\ ) denotes the input is continued onto the next line; the printed page is just not wide enough to accommodate the line.	**# rsh** *nodename* **-n dd ** **if=/cdrompath/amass/load.tar** **bs=20b │ tar xvBfb - 20** (Type the entire command without the backward slash.)
Pressing <Return> after each command is assumed.	
A menu name with an arrow refers to a sequence of menus.	Edit Policy —> Add Library

Books

The CD contains the AMASS books formatted as PDF documents. The books described below are part of the technical documentation set:

AMASS Overview
An introduction to AMASS (Archival Management and Storage System). Contains a glossary.

Accessing Storage Devices
Alphabetically lists supported libraries and drives and provides AMASS-specific operating information. Describes how to use AMASS with standalone drives.

Installing AMASS
Describes: server requirements, installation and troubleshooting procedures, and configuration parameters.

Managing the AMASS File System
Perform system administrative tasks with AMASS commands and troubleshoot problems with AMASS utilities and scripts.

Errors and Corrective Action
Provides corrective action for system log errors.

Quick Reference Guide
Summarizes commands and utilities.

Contact Publications

To make corrections or to comment on AMASS publications, please contact Technical Publications at techdocs@adic.com.

Related Publications

The publications described in the following table are created and distributed on an as-needed basis:

Related Publications	Description

Release Notes	For each version of AMASS, the Release Notes contain:
	• Summary of enhancements.
	• Describes:
	   - Fixed problems.
	   - Known problems.

Product Alerts	Informs customers of technical problems and solutions.
Product Bulletins	Conveys technical information — not problems — to customers.

Secured Web Site

To receive access to the secured site on the ADIC home page containing technical product information (Release Notes, Product Alerts, Product Bulletins, FAQs), visit http://partners.adic.com/ and follow the password request procedure. In return, ADIC will send instructions and a password.

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1

Initial Setup Tasks

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Prepare Media to be the Backup Volume

Running the installation script created a Backup Volume entry in the AMASS File System Database. To prepare media to be the specified Backup Volume, perform the steps in the following table.

The Backup Volume must be identified as volume number 1 and have an INACTIVE status in the AMASS File System Database. An INACTIVE status means that AMASS cannot read or write to the volume.

> **Note**
>
> For detailed information on the AMASS commands, see the "Command Reference" chapter.

Slot Position

AMASS assumes the Backup Volume is in either the first or last slot, depending on the library; therefore no slot designation is required. If you have more than one library connected to AMASS, put the Backup Volume in the last slot in the first library. The Backup Volume in network-attached libraries can be in any slot so a slot designation is required.

Step	Command	Description
1	Log in as `amass` or `root`.	

Step	Command	Description
2	Physically designate the media as the Backup Volume in some outward way. See the following examples: • Write the words "Backup Volume" on the media. • Color code the media so it can be identified as a Backup Volume. • Make a note of either the home storage slot or the preprinted barcode and prominently display it. Even though the Backup Volume is in the last slot (such as, slot 100), if you add an expansion bay with 50 additional slots, you now have a "new" last slot (slot 150).	
3	For SCSI-attached libraries:	
	volinlet **NOTE:** Not applicable for volumes destined for libraries without a mailbox.	Load volume through mailbox.
	volloc **NOTE:** Not applicable for volumes destined for libraries without a mailbox.	Mark the volume ONLINE (-n) in the AMASS File System Database.

Step	Command	Description
	For network-attached libraries:	
	`bulkinlet`	Create an entry in the AMASS File System Database.
		Loads volume through mailbox.
		AMASS: • Gives media a unique volume number. • Marks the volume ONLINE in the AMASS File System Database. • Gives this first volume a BACKUP-VOLUME label.
	Barcode volumes **must** have their preprinted number in the Volume Label field instead of the words BACKUP-VOLUME. This field is displayed by the vollist command shown in the following table:	

```
# vollist

VOL   VOL   JUKE   POS   VOL     FLAGS   USED    AVAIL   DEAD   ERRS
NUM   GRP   NUM          LABEL           (MB)    (MB)    (%)

1     0     1            backup  I       0       20000   0      0
```

Step	Command	Description
	Change the Volume Label field from BACKUP-VOLUME to the preprinted media number with the vollabel command shown below. In our example, the preprinted number is 112102.	

Volume number assigned by `bulkinlet`

Volume label printed on media

```
# vollabel   1  112102
```

Step	Command	Description
	Now, the Volume Label field displays the preprinted number (`112102`).	

```
# vollist

VOL  VOL  JUKE  POS  VOL    FLAGS  USED  AVAIL  DEAD  ERRS
NUM  GRP  NUM        LABEL          (MB)  (MB)   (%)

1    0    1          112102 I       0     20000  0     0
```

Step	Command	Description
4	**For StorageTek Redwood tape drives only**:	
	`tapelength`	Enter length of tape *(lengthcode)* in the AMASS File System Database.

Step	Command	Description
5	`volformat` **NOTE:** Not applicable for CDs.	Format the Backup Volume. If you are using a standalone drive, you must format the volume from the `sysop` interface. For information on this interface, *Interface to Standalone Drives* chapter in *Accessing Storage Devices*.
6	Make AMASS aware of all your other media. For instructions, see "Create Entries in Database for Your Media" on Page 1-9.	
7	`amassbackup`	Perform a full backup (`-f`) with the verbose (`-v`) option of the AMASS database (`/usr/filesydb`) and transaction logs (`/home/filesysdb/journal`). For instructions, see "Manual Backup" on page 2-7.
8	`volstat`	Verify the status of the Backup Volume is INACTIVE in the AMASS File System Database. An INACTIVE status means that AMASS cannot read or write to the volume. This prevents AMASS from writing to this volume thus corrupting the backup data. Before using the `amassrestore` command to restore these files, change the status of the Backup Volume to ACTIVE with the `volstat -a` command.

Create File System Organization

The following tasks are presented as guidelines only since the actual setup required for your specific site is unique.

Step 1. Decide how you want to organize the AMASS file system. For example, what directories should be under the /archive mount point?

Step 2. Set permissions for these directories to allow clients to access the file system.

AMASS supports read and write permissions only; Access Control Lists (ACLs) are not supported.

Step 3. Decide if you want to apportion media into volume groups to keep project data or department data together on a specified number of volumes. For information, see "Volume Groups Defined" on Page 1-13.

Step 4. Load media and create entries in the AMASS File System Database for all your media. For instructions, see "Create Entries in Database for Your Media" on Page 1-9.

Step 5. See "Assign Directory to a Volume Group" on Page 1-19 to assign a project directory or department directory to a volume group and to enable the volume group to use the space pool if it runs out of space.

Step 6. Decide if you want to have a volume group for cleaning cartridges. For instructions, see "Create a Cleaning Volume Group" on Page 1-20.

Create Entries in Database for Your Media

Make AMASS aware of your media by creating an entry for each volume in the AMASS File System Database by performing the steps in the following table.

Note
For detailed information on the AMASS commands, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as `amass` or `root`.	
2A	For SCSI-attached libraries:	
	`volnew`	Create an entry for each volume in the AMASS File System Database.
		If desired, assign a volume to a volume group (3).
		Assign each volume to a home storage slot (A64).
		Give each volume a user-definable label (test).
	For example: `volnew 3 A64 test`	
		AMASS gives each piece of media a unique volume number (for example, 33).
	`cdimport`	Import a CD that already has data on it.
	`volinlet`	Load volume (33) through the mailbox.

Step	Command	Description
	For example: `volinlet 33`	
		NOTE: Not applicable for volumes destined for libraries without a mailbox.
	`vgimport`	Import metadata file for volume that already has data on it.
		NOTE: Must have used `vgexport` to export metadata file.
	`volloc`	Mark the volume (33) ONLINE (`-n`) in the AMASS File System Database.
	For example: `volloc -n 33`	
		NOTE: Not applicable for volumes destined for libraries without a mailbox.

Step	Command	Description
2B	For network-attached libraries:	

	`bulkinlet`
	For example:
	`bulkinlet 4`
		Create an entry in the AMASS File System Database for each volume.
		
		If desired, assign a volume to a volume group (4).
		
		Load multiple volumes through the mailbox.
		
		AMASS:
		
		• Gives each volume a unique volume number (for example, 34).
		
		• Marks all volumes ONLINE in the AMASS File System Database.

	`vgimport` **NOTE:** Must have used `vgexport` to export metadata file.	Import metadata file for volume that already has data on it.

	`vollabel`
	For example:
	`vollabel 12647NJK 34`
		AMASS enter the preprinted barcode (`12647NJK`) in the AMASS File System Database for a volume number (34).

Step	Command	Description
2C	**bulkload** For example: **bulkload -s**	You have just installed AMASS and must create many entries in the AMASS File System Database and mark them ONLINE. The **-s** option *synchronizes* both the AMASS File System Database and the **library's interface.**
	vollabel	AMASS enter the preprinted barcode in the AMASS File System Database.
3	**For StorageTek Redwood tape drives only**:	
	tapelength	Enter length of tape in the AMASS File System Database for a volume number.
4	**volformat** For example: **volformat -p 34**	Format the volume (34). **NOTE:** Not applicable for CDs. If you are using a standalone drive, you must format the volume from the sysop interface. For information on this interface, refer to the Interface to Standalone Drives chapter in *Accessing Storage Devices*.
5	**volstat** For example: **volstat -a 34**	Mark the volume (34) ACTIVE (**-a**) so AMASS can read and write to it.

Volume Groups Defined

A volume group is a method for partitioning the volumes in AMASS. You can assign the following types of volume groups:

- Media verification group (MV) for the optional Infinite File Life feature

  For more information about IFL, see the "Infinite File Life" manual.

- A numeric group, 1 through 2047

- A space pool (SP)

- A cleaning group (CL)

The following figure illustrates these volume groups.

Numeric Volume Group
Volumes can be assigned to a numeric volume group. The group can be a number from 1 through 2047.

Space Pool
Volumes can be assigned to the space pool (SP). These are formatted volumes with specific attributes. When a numeric volume group runs out of space, and it has been enabled to use the space pool, AMASS automatically takes a volume with the same attributes from the space pool and assigns it to the numeric group that ran out of space. Thus, AMASS can continue to write data to the numeric volume group.

Cleaning Group
Cleaning cartridges are assigned to the cleaning group (CL). When a drive needs cleaning, AMASS selects the appropriate cleaning volume from this group.

Media Verification
Media verification group. A volume assigned to the media verification (MV) volume group consists of media verified as "good" for the AMASS Infinite File Life (IFL) optional feature.

Uniform Media in Numeric and Cleaning Groups

Both numeric volume groups and the cleaning group must contain a homogeneous type of media.

At a site using both WORM and erasable optical platters, for example, volume group 47 can contain WORM platters or it can contain erasable platters, but it cannot contain both media types.

Likewise, the cleaning group must contain volumes with uniform, drive-specific attributes. For cleaning volume groups, see "Create a Cleaning Volume Group" on page 1-20.

Disparate Media in the Space Pool

The space pool can contain volumes with a variety of formats. Therefore, if a site uses both WORM and erasable optical platters, AMASS always has a selection of media from which to pick.

For example, if volume group 47 runs out of space, AMASS automatically takes a volume from the space pool with the appropriate attributes and reassigns it to the out-of-space volume group. Thus, AMASS continues to write data to volume group 47 and performance does not suffer.

Using Numeric Volume Groups

You can archive a specific directory by using numeric volume groups. This concept is shown in the following illustration:

AMASS archives /pubs files to volume group 2.
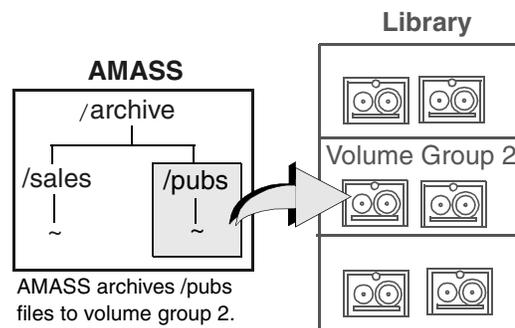
By allocating project files from a subdirectory to specific volumes, the data generated by the project can easily be added and removed from the library without affecting data generated by other projects. Or, you can mark the volumes OFFLINE and remove them from the library for offsite storage.

When you assign a subdirectory to a numeric volume group, only writes from that subdirectory are written to the specified volume group. No other data is placed in that volume group.

When a Group Runs Out-of-Space

To continue writing to an out-of-space volume group, you have two options:

- Assign more volumes to the numeric volume group.

- Allow AMASS to automatically take volumes from the space pool and reassign them to the out-of-space volume group. However, to allow AMASS to do this, you must enable the volume group to use the space pool.

Scenario

The following figure illustrates how directories can be defined under the AMASS mount point and how volume groups can be used to consign directories.
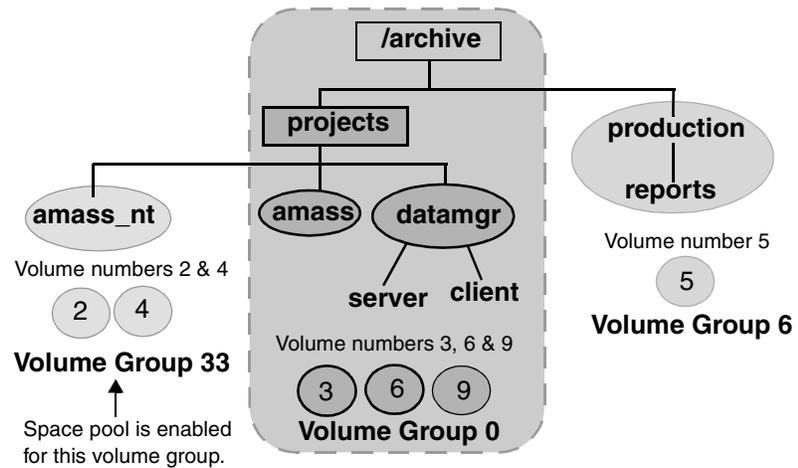
- The `projects` directory, is the root directory for volume group 0.

    - If new files or new directories are added under `archive`, they belong to volume group 0, unless you assign them to a specific volume group.

- The `amass_nt` directory is the root directory for volume group 33.

    - When volume group 33 runs out of space, AMASS automatically takes an appropriately formatted volume from the space pool because volume group 33 has been enabled to use the space pool.

- The `production` directory is the root directory for volume group 6.

    - When volume group 6 fills up, AMASS **does not** automatically assign it a volume from the space pool because it has **not** been enabled to use the space pool.

Instead, AMASS generates an out-of-space message, and you must assign more volumes to the volume group.

- If new directories are added under `amass_nt` or `production` directories, they belong to those directories' volume groups, either volume group 33 or 6.

Assign Directory to a Volume Group

To assign an existing directory to a volume group and enable the volume group to use the space pool if it runs out of space, perform the steps in the following table.

> **Note**
>
> For detailed information on the AMASS commands, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**setvolgrp** For example: **setvolgrp /archive/nt 34**	Assign a directory (/archive/nt) to a volume group (34).
3	**vgpool** For example: **vgpool -e 34**	Enable (**-e**) the volume group (34) to use the space pool if it runs out of space.

Create a Cleaning Volume Group

To create a volume group used solely for cleaning cartridges, use the procedure in the following table.

Currently the CL volume group can contain only one type of cleaning cartridge. For example, if you have both a DTF drive and a 3590 drive, your CL volume group must contain only DTF cleaning cartridges or exclusively 3590 cleaning cartridges.

Note
For detailed information on the AMASS commands, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**volnew**	Create an entry for each cleaning volume in the AMASS File System Database.
		Assign the volume to the **CL** (cleaning group) volume group.
		Assign each cleaning volume to a home storage slot (A77).
		Give each cleaning volume a user-definable label (clean).
	For example: **volnew CL A77 clean**	
		AMASS gives each piece of media a unique volume number (for example, 23).

Step	Command	Description
3	`volclattr` For example: `volclattr -t 6 23`	Define drive-specific attributes to the cleaning volume (23).
4	`vollist -g CL`	View attributes for the cleaning group.

NOTES

2

Operational Tasks

NOTES

Database and Journal Backups

File System Database—The File System Database contains tables of attributes—or metadata—representing the directory structure and media mounted under the AMASS file system. The metadata includes: media ID, media type, media location, ownership, and timestamp.

The default location of the Database is in /usr/filesysdb.

The File System Database tells AMASS where data is located on the media archived in your library (or where data is located on offline media). The following figure illustrates the concept of how the Database maps the file system to the volumes in the library.

Volumes contain "real" data.

The File System Database contains metadata, which includes the directory structure, file attributes, media information, and storage information.

AMASS File System Database

Inodes

Inodes

Inodes map the metadata to "real" data found on the media.

UNIX Server
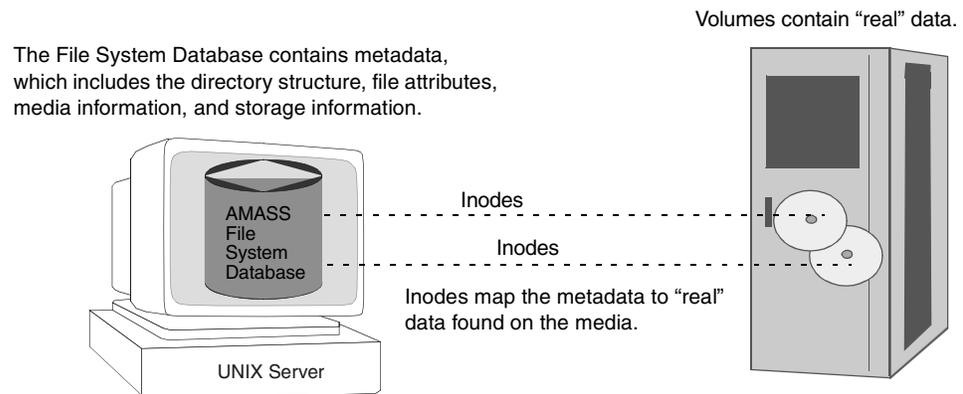
Journal—The Journal is a transaction log for the AMASS Database.

The default location of the Journal is in /usr/filesysdb/journal. Typically, this is a symbolic link pointing to a separate physical disk to keep the Journal on a different disk from the File System Database.

The Journal tells AMASS what transactions—what entries—have acted upon a file stored on a volume in a library. It is a daily diary of logged events.

Both the Database and Journal can be backed up automatically and manually. Both types of backups are described below.

> **Note**
>
> If your File System Database gets corrupted or the hard disk crashes, restore the Database with the full and partial backups you have taken.

Automatic Backups Via Cron Job

Because the File System Database and the Journal are extremely important, this information **must** be protected. Consequently, the amassbackup command, run from a cron job, regularly backs up both the Database and Journal. This cron job was created when AMASS was installed. The cron job backs up the Database and Journal to a Backup Volume at 3 a.m. using the following schedule:

*   First day of the month — Full Backup

*   All other days — Partial Backup
    After the backup completes, AMASS truncates the Journal file.

If the above schedule is not suitable for your site, modify the schedule by editing the crontab and changing the amassbackup entries.

> **Caution**
>
> Make sure these backup are successful. Look in the system log every morning for a "Backup was successful" message.

The "full backup" (backs up the Database and Journal) and "partial backups" (backs up just the Journal) will allow you to successfully restore your File System Database (and, therefore, allow you to know where data is located on what piece of media) if your current File System Database gets corrupted or the hard disk crashes.

If the Journal (/usr/filesysdb/journal) tends to fill up the available disk space before the normally scheduled full backup, increase the frequency of the full backups.

Assign Backup Volume

For detailed information on making a Backup Volume, see the "Initial Setup Tasks" chapter.

How to Modify Automated Schedule

To change the automatic backup schedule, use the procedure in the following table.

Step	Command	Description
1	Log in as **root**.	
2	# **cd /var/spool/cron/crontabs**	Change directory to where the crontab file is located.
3	Edit the /var/spool/cron/crontabs/amass table entry. The defaults are shown below. • The first line runs a full backup at 3 a.m. (2 a.m. for IBM platforms) on the first day of every month. The second line runs a partial backup at 3 a.m. (2 a.m. for IBM platforms) on all other days of the month. The six active fields are: minute, hour, day, month, day of week, and command. Each field, except the command field, may be an asterisk.	

```
                          ┌──────── day of month
         hour ───────┐    │    ┌────────── month
      minute ──────┐ │    │ ┌──────── day of week
                 ▼ ▼ ▼  ▼ ▼
                 0 3 1 * * /usr/amass/bin/amassbackup -fv
                 0 3 2-31 * * /usr/amass/bin/amassbackup -v
```

Step	Command	Description

4	`0 3 ` **`*`** ` ` **`*`** ` ` **`0`**
	`/usr/amass/bin/ama`
	`ssbackup -fv`
	`0 3 ` **`*`** ` ` **`*`** ` ` **`1-6`**
	`/usr/amass/bin/ama`
	`ssbackup -v`
		In our example, we edit the file so:
		
		• The first line runs a full backup at 3 a.m. every Sunday.
		• The second line runs a partial backup at 3 a.m. all other days, Monday through Saturday.
		
		The edits are shown in bold.

5	Save your edits.	

Manual Backup

Manually back up the Database and Journal under the following conditions prior to:

- updating your operating system

- updating AMASS

- making any major change to your system

- replacing the hard disk on the UNIX server

How to Use Backup Command

To perform a backup with the AMASS command, use the procedure in the following table.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as `amass` or `root`.	
2	Make sure the Backup Volume is formatted and is the last home storage slot in the first library. Moreover, the Backup Volume must be volume number 1 and have an INACTIVE status.	
3	`/usr/amass/utils/sysd bchk`	To make sure there has been no database corruption.

Step	Command	Description
4	**amassbackup -u**	As appropriate, perform either a: • Full (-f) backup with the verbose (-v) option. • Partial backup with the verbose option.
5	Check the system log for a "Backup was successful" message.	

Replace a Full Backup Volume

AMASS issues a warning message when the Backup Volume is almost full.

If you receive a "95% full" message *before* a backup starts, initialize a new Backup Volume and perform a full backup as described in the following table.

However, if you receive a "95% full" message while a backup is in progress, the backup procedure may fail in which case you must rerun the procedure with a new Backup Volume.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	After you have unloaded a full Backup Volume by entering the following command, store the backup volume in a safe place.	

The volume number of a Backup
Volume must be number 1.

```
# voloutlet 1
```

Step	Command	Description
3	To continue, see "Prepare Media to be the Backup Volume" on Page 1-3.	

Restore AMASS Database

To restore the AMASS File System Database and journal if the original files on the UNIX server becomes lost or corrupt, use the procedure in the following table.

To recover the AMASS File System Database if the database becomes corrupt, see "AMASS Database is Bad" on page -6.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**amassstat -u** For example: **amassstat -i -t 600**	INACTIVATE (**-i**) the AMASS file system. AMASS inactivates in 600 seconds, 10 minutes.
3	Reboot AMASS using one of the following ways:	
	amass_atboot	Disable the automatic startup of AMASS. For information on using this script, see amass_atboot in Chapter 4.
	Boot the system single-user.	Be sure to mount the partition containing the AMASS database (/usr/filesysdb), the AMASS journal (/home/filesysdb/journal), and the AMASS program files (/usr/amass).
4	**fsck**	Check integrity of the file system.

Step	Command	Description
5	Create the following two directories and one file, all with owner as `amass`: • `/usr/filesydb` • `/home/filesysdb/journal` • `/home/filesysdb/journal/dbv4jrnl` (This file must be a minimum of 8 bytes in size.)	
6	**`amassrestore -u`** For example: **`amassrestore -v -d /dev/rst12 -L 12N6J`**	Restore the AMASS File System Database from the Backup Volume. Restores database with verbose messages (**`-v`**), from a standalone drive (`/dev/rst12`). The Backup Volume's barcode is 12N6J.
7	Transition the system to multi-user mode or reboot the system.	

Restore with Earlier AMASS Version

To recover data on a Backup Volume containing a backup from an earlier version of AMASS, make sure the current MAXIOSIZE parameter on AMASS is configured to the same value as when the Backup Volume was made.

> For example, your current Backup Volume was made when the MAXIOSZ value on AMASS was 256 KB. (This value should be physically noted on the volume.)
>
> Upgrade AMASS and change the MAXIOSZ value to 1024 KB.
>
> Before attempting to read the Backup Volume, return the MAXIOSZ parameter on AMASS to 256 KB.

Reinitialize Database

To empty the existing AMASS File System Database and reinitialize it, use the procedure in the following table.

Caution
All file and directory entries as well as library, drive, and media information are deleted.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**amassstat -u**	INACTIVATE (**-i**) the AMASS file system.
3	Reboot AMASS using one of the following ways:	
	amass_atboot	Disable the automatic startup of AMASS. For information on using this script, see amass_atboot in Chapter 4.
	Boot the system single-user.	Be sure to mount the partition containing the AMASS database (/usr/filesysdb), the AMASS journal (/home/filesysdb/journal), and the AMASS program files (/usr/amass).

Step	Command	Description
4	`# cd` `# /usr/amass/utils/initamass`	Change directory and reinitialize the File System Database. **CAUTION**: All file and directory entries as well as library, drive, and media information are deleted.

Back Up Media in Library

There are a variety of ways to back up the data residing in the library. Even though a library is involved, the backup issues are fundamentally the same as for hard disks. The main difference is the amount of data contained in the library.

The solution depends on the available system resources and the backup requirements of your specific environment. The correct solution could even be a combination of the methods described below. For that reason, a step-by-step procedure is not included here. Three ways of backing up media are described below.

Use UNIX Utilities

One solution is to use conventional UNIX backup utilities for your media.

The practicality of doing this depends on the amount of data being written and the overall size of the library. Performing a full backup against a large library takes a long time so incremental backups may be appropriate.

Use Both UNIX Utilities and AMASS Commands

Another way to back up the media is to use AMASS commands and UNIX utilities to generate a sorted list of files contained on each volume in the library. Then, the sorted list can be directed to a backup. An example of using the `volfilelist` command to do this is described under "Practical Application" on Page 3-156.

This solution provides faster backups than if the data is accessed randomly because it requires fewer volume swaps. With this solution you can do full or incremental backups.

Use Redundant Media

A third solution is to use a second set of media stored offline, or outside of the library.

You can use the AMASS `volcopy` command to copy data from a source volume to a destination volume. If the original volume is lost, destroyed, or damaged, you can use the duplicate volume exactly like you would the original. For more information on this command, see "volcopy" on page 3-138.

Take a Drive Out of Service

To take a drive out of service — whether because of excessive failures or for maintenance — use the procedure in the following table.

If **all** drives are out of service, AMASS suspends requests until a drive is returned to service.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**drivelist** *drivenumber* For example: **drivelist 2**	AMASS displays the current status of the specified drive.
3	**drivestat -i** *drivenumber* For example: **drivestat -i 2**	INACTIVATE the specified drive. AMASS performs the following tasks: • If a volume is in the drive, it is returned to its home storage slot. • All operations currently in progress complete but no further requests are queued for the soon-to-be-inactive drive.

Return a Drive to Service

To return a drive to service, use the procedure in the following table.

> **Note**
>
> For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as `amass` or `root`.	
2	`drivelist` *drivenumber* For example: `drivelist 2`	AMASS displays the current status of the specified drive.
3	`drivestat -a` *drivenumber* For example: **drivestat -a 2**	ACTIVATE the specified drive.

Delete Files and Volume Number

To delete:

- All files on a volume

- Volume number from the AMASS File System Database

Use the procedure in the following table.

> **Note**
>
> For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2A	**voldelete** *volumenumber* For example: **voldelete 9**	Delete all files on the specified volume and delete the volume number from the AMASS database.
2B	**voldelete**	Or, delete all files on the specified volume **without** deleting the volume number from the database.
3A	For SCSI-attached libraries:	
	voloutlet *volumenumber* For example: **voloutlet 9**	Eject the volume from the library. AMASS marks the media OFFLINE in the database.

Step	Command	Description
3B	For network-attached libraries:	

	`bulkoutlet -u`
	For example:
	`bulkoutlet 1,2-10,21,23`
		Or, eject multiple volumes from the library.
		
		AMASS marks the media OFFLINE in the database.

Delete Volume Group

To delete a Volume Group, use the procedure in the following table.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as `amass` or `root`.	

2	`adf -u`
	For example:
	`adf -r`
		View directories and volumes assigned to the volume group that you want to eventually remove.
		
		Make sure there is no information in this volume group that you want to keep.

3	`volgroup` *oldvolumenumber newvolumegroup* For example: `volgroup 9 0`	Change the volume group from 9 to zero.
4	`vgroot` *volumegroup* For example: `vgroot 9`	View directories assigned to this volume group. It should return zero directories.
5	However, if directories still remain for the volume group,	
	`setvolgrp` *path volumegroup* For example: `setvolgrp techpubs 27`	Reassign any remaining directories (techpubs) to another volume group (27).

Recycle a Volume

To perform the following tasks, use the procedure described in the table:

- Move non-contiguous data onto other volumes

- Recycle volumes

> **Note**
>
> For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**volspace** *%deadspace* For example: **volspace 80**	List all volumes with a specified percentage of dead space. Media with scattered or randomly located data contains a lot of dead space. Lists all volumes with 80% dead space.
3	**volcomp** *volumenumber* For example: **volcomp 3**	Rewrite data to another volume. At the end of this process, the original volume is marked INACTIVE.
	volfilelist -u	See if any data remains on the original volume. If it does, rerun the volcomp command.

Step	Command	Description
4	`volformat` *volumenumber* For example: `volformat 3`	Reformat the now-empty volume. **NOTE:** Not applicable for CDs.
5	`volstat -a` *volumenumber* For example: `volstat -a 3`	ACTIVATE volume so AMASS can read and write to it.

Remove Media From Library

The following steps describe how to remove a volume after it has been written to by AMASS.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	When you installed AMASS, you accept the default value for the `omm_timeout` (Offline Media Management) parameter, which is 120 seconds (2 minutes).	
2	Clients wrote files to a volume for example volume number 47.	
3	Log in as **amass** or **root**.	
4	**volstat -i** *volumenumber* For example: **volstat -i 47**	Mark the specified volume INACTIVE in the AMASS File System Database.
5A	For SCSI-attached libraries:	
	voloutlet *volumenumber* For example: **voloutlet 47**	Ejects the volume from the library. AMASS marks it OFFLINE in the File System Database.
5B	For network-attached libraries:	
	bulkoutlet -u For example: **bulkoutlet 47**	Ejects multiple volumes from the library. AMASS marks them OFFLINE in the File System Database.

Step	Command	Description
5C	If — for some reason — you manually remove a volume from the library:	
	`volloc -o` *volumenumber* For example: `volloc -o 47`	Mark the volume OFFLINE(`-o`) in the AMASS File System Database.

Read Offline Volume

Offline Media Manager (OMM) provides read-access to volumes that have been **removed** from the library.

These volumes have a status of ACTIVE but OFFLINE in the AMASS File System Database.

Note
AMASS supports only one stand-alone drive configured for OMM. AMASS does not support two stand-alone drives configured for OMM.

Optional Feature

Optional Feature
Enable this optional feature with an authorization string obtained from ADIC. To request a string, refer to the refer to the Site-Specific Tasks chapter in *Installing AMASS*.

Prerequisites

To access offline media, the following items are required:

• Standalone drive daisy-chained to a library

• Enable Offline Media Manager with an authorization string

• When installing AMASS, use the omm_timeout parameter For information on this parameter, refer to "OMM_TIMEOUT" in *Installing AMASS*.

• Use the Standalone Operator Interface to monitor load requests. For information on this interface, see "sysop" on page 3-93.

> **Note**
>
> For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Read Offline Volumes

The following steps describe how to read an offline volume:

Step	Command	Description
1	`# sysop`	Start the Standalone Operator Interface.

2	`OPERATOR LOAD VOLUME`
	`REQUEST`
	`Please load VOLUME NUMBER`
	`47, SIDE A,LABEL pubs`
	`into JUKEBOX #2 DRIVE #1`
	`~`
	`Press RETURN when LOADED:`
		AMASS receives a request to read a file on volume 47.
		
		AMASS checks the File System Database and finds that volume is OFFLINE so the Standalone Operator Interface prompts you to load volume 47, side A, into a standalone drive.

3	You have 2 minutes to load volume 47 into the mailslot on the standalone drive and press <Return>. If the volume is not loaded within the time period, the request fails and AMASS displays an error. If 120 seconds is not long enough, increase the `omm_timeout` parameter with the `installamass` script.	
4	<Control-C>	Exit the interface.

The sysop interface used by OMM creates a /tmp/sysop.out file that contains entries similar to those shown in the following example. A customer can link their own functions into OMM to perform additional processing on each mount call by using either the sysop.out file or the sysop_print.o file.

```
UNMOUNT
VOLNO xx SIDE A
LABEL user_name
JUKE n DRIVE nn

MOUNT REQUEST
VOLNO xxx SIDE A
LABEL user_name
JUKE n DRIVE nnn
```

Return Media Without Starting AMASS

To return media in a drive to its home storage slot without starting AMASS, perform the steps in the following table.

> **Note**
>
> For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	`su amass`	The user must be `amass` when running the `amassrecovery` utility.
2	`/usr/amass/daemons/amass recovery -s`	The `-s` option returns media in a drive to its home storage slot.

Add Space to Volume Group

To add space to a volume group so AMASS can continue to write to the volume group, do one of the following:

- Add volumes to the volume group.

- Create a space pool and enable the volume group to use the space pool so AMASS can automatically add volumes to the out-of-space volume group.

For volume group information, see "Volume Groups Defined" on page 1-13.

> **Note**
>
> For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Add Volumes

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**volgroup** For example: **volgroup 42 121**	Assign additional media to the volume group. Volume number 42 is assigned to volume group 121.

Create Space Pool

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**volgroup** *volumenumber* **SP** For example: **volgroup 24 25 SP**	Assign a formatted volume to the space pool. Volume numbers 24 and 25 are assigned to the space pool.
3	**vgpool -e** *volumegroup* For example: **vgpool -e 31**	Enable a volume group to use the space pool. If volume group 31 runs out of space, it takes a volume from the space pool and writes continue.

Reassign Volume Group

To reassign new files in the amass_nt directory, as illustrated in the following figure, to another volume group, use the procedure in the following table.

Space pool is enabled for this volume group.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**vollist -g** *volumegroup* For example: **vollist -g 33**	List the volumes in a volume group (33). The output lists volumes 2 and 4 in volume group 33.

3	**vgroot** *volumegroup*
	For example:
	vgroot 33
		List the root directory of all subdirectories assigned to the specified volume group.
		Output lists the root directory and subdirectory for volume group 33 as:
		`/win_nt`
		`/win_nt/amass`
		`/win_nt/datamgr`

4	**setvolgrp** *pathname* *volumegroup* To reassign the `/amass_nt` directory to volume group 49 instead of 33, enter: **setvolgrp /amass_nt** **49**	Reassign the root directory (`/amass_nt`) so any new data is archived to a different volume group (49).
5	**volgroup** *volumenumber* *volumegroup* For example: **volgroup 5 49**	Assign a volume (5) to a volume group (49).

Activate the File System

To activate the AMASS file system, which allows AMASS file system files to be accessed, use the procedure in the following table.

> **Note**
>
> For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**amassstat -a**	ACTIVATE the AMASS file system. Any operations that were queued will complete.

Inactivate the File System

To deactivate the AMASS file system, which allows you to perform maintenance without intervention by users, perform the procedure in the following table.

Step	Command	Description
1	Log in as **amass** or **root**.	

Step	Command	Description

2	`amassstat -u`
	
	For example:
	
	`amassstat -i -t 600`
	
	AMASS inactivate in 600 seconds, 10 minutes.
		INACTIVATE the AMASS file system.
		
		AMASS generates an error if a client attempts to access files while the file system is INACTIVE.
		
		If files were waiting in the cache for more space to be added to a volume group, AMASS prints a warning message and maintains these files until the file system is reactivated and space is made available.

Modify Configuration File

Change the AMASS library configuration in response to the following circumstances if you:

- change a library's SCSI or RS-232 address

- upgrade or downgrade a library to a different model or vendor and you receive a new authorization string from your AMASS vendor

- change the number of drives in a library

- add a new library to the configuration and you receive a new authorization string from your AMASS vendor

- resize or move the cache space

- change configuration values

To modify the AMASS library configuration, use the procedure in the following table.

Note
For detailed information on the commands used in these steps, see the "Command Reference" chapter.

Step	Command	Description
1	Log in as **amass** or **root**.	
2	**sysperf [*updateinterval*]**	To make sure there are no pending write requests in the AMASS queue, view the queue with the sysperf command. Log in as root and enter the command as shown in the following steps. To stop the sysperf command, use <Control-C>. Run only one sysperf command at a time.
3	**cd /usr/amass/tools ./amass_atboot -d**	Disable AMASS at system startup.
4	Reboot the UNIX server and AMASS will not automatically start.	
5	**cd /usr/amass/scripts ./installamass**	Rerun the installamass script and make the necessary configuration changes.
6	Reboot the system for the changes to take effect.	
7	<AMASS_W_9031>: AMASS configuration has been changed...checkpoint area is invalid	If you change any of the AMASS cache-related configuration parameters, this error message may appear after AMASS restarts. Under these circumstances, this message can be ignored

MAXIOSZ Changes

If you want to change the MAXIOSZ, perform the following steps:

Step	Command
1	Log in as **amass** or **root**.
2	Remove your current Backup Volume (containing a backup of the AMASS File System Database and transaction file) from the library, label it with the "old" MAXIOSZ value, and store the volume in a safe place.
3	Upgrade to the current version of AMASS.
4	Immediately create a new Backup Volume with the amassbackup command.
5	Label the new Backup Volume with the "new" MAXIOSZ value.
6	To recover data on the old Backup Volume, return the MAXIOSZ parameter on AMASS to the old setting before attempting to read the old Backup Volume

NOTES

3

**Command
Reference**

NOTES

Commands

The commands described in this chapter are located in the directories listed in the following table. Specify this path in the system administrator's login PATH variable.

Command	Login	Path
sysop	amass	
all other commands	amass	/usr/amass/bin
	root	

> **Caution**
>
> ADIC recommends that you control the execution privileges for all commands as appropriate for the desired security level at your site.

Syntax

The command syntax is the same as standard UNIX style commands. The options shown in square brackets ([ ]) in this chapter are optional; all others are required.

Use in Scripts

For unattended operation, set up the cron file to run the AMASS commands. Similarly, to automate tasks, all the AMASS commands can be run from within a script. Make sure you check the return codes of the messages. Return codes are described in the following table:

Return Code	Description
-1	error
all other values	success

adf

View statistics for all volume groups in the AMASS File
System Database.

Options

```
/usr/amass/bin

./adf

[-u]

[-hrV]
```

Option	Description
-h	Display a message describing the output
-r (defaults to list the first path encountered in the Database)	View all relative paths for this volume group
-u	Usage statement
-V (defaults to print and underline column titles)	**Do not** print and underline the column titles in the output. Non-printed column titles are useful if you generate reports with UNIX utilities, like awk, sort, and sed.

Example

Step 1. Log in as either `amass` or `root`.

```
# su root
```

Step 2. See an example of the output in the following illustration:

The -r option lists 2 directories (techpubs and swtest) assigned to volume group 100.

```
# adf -r

Volume Group    Size      Used      Avail   Volumes  Rooted On
------------    -----     -----     -----   -------- --------
           0  128795    128700     48823          1        N/A
         100  128795     11412     16274          3      swdev
                                                  3    techpubs
         101   39006       894     36529          1     swtest
         104   78012      4426     57869          2    support
```

Output Fields Defined

The following fields are generated by this command.

Field	Description
Volume Group	Volume group assignment Valid assignments are a numeric value, 1 through 2047.
Size	Total size of this volume group in MB
Used	Amount of space, in MB, occupied by files in this volume group

Field	Description
Avail	Amount of space, in MB, available in this volume group
Volumes	Number of volumes assigned to this volume group
Rooted On	Directory assigned to this volume group

amassbackup

Back up to a Backup Volume in either a library or a standalone drive the following files:

- File System Database (`/usr/filesysdb`)

- Journal (`/usr/filesysdb/journal`)

Note

When an external tape device is used to backup the AMASS database (with -d flag) amassbackup will always unload the tape from the drive after successful backup completion.

While the backup is being completed, the Database is locked. Therefore, client requests cannot be satisfied.

Task	Full Backup	Partial Backup
Copy files to Backup Volume in a library.	yes	yes
Copy files to Backup Volume in a standalone drive.	yes	no
Back up the Journal (transaction logs) located in `/usr/filesysdb/journal`. When backup completes, AMASS truncates the Journal.	yes	yes
Back up the AMASS Database located in `/usr/filesysdb`.	yes	no

Prerequisites

Before using this command, use the vollist command to make sure the Backup Volume has the following characteristics:

- Volume number 1

- Formatted (not marked "U" for unformatted)

- Inactive "I" status

- In the **last** home storage slot or **last** position, in the first library. The last slot (for SCSI-attached storage devices) or the last barcode position (for network-attached storage devices) is defined as what is listed by the medialist utility. For information on this utility, see "medialist" on page 4-33.

Options

```
/usr/amass/bin

./amassbackup

[-uv]

[-f]
[-d tapedevice]
```

Option	Definition
For libraries only:	
no options	Perform a **partial** backup; back up just the Journal file to a Backup Volume in a library.
-f	Perform a **full** back up of the Database and Journal files to a Backup Volume in either a library or standalone drive.
-u	Usage statement
-v	Verbose messages
For standalone drive only:	
-d *tapedevice*	Enter the standalone tape device that will write to the Backup Volume. For example, *-d /dev/rst0*.
	Perform a **full** back up of the Database and Journal to a Backup Volume in a standalone drive.

Example

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. To perform a full backup to a volume with verbose information, enter the following options:

```
# amassbackup -fv
```

Additional Information

> For more information, see "Database and Journal Backups" on page 2-3.

amassreport

Report file system information. The following types of reports can be generated:

- **Formatted**
  Column titles are printed at the top of each page.

- **Raw**
  Although titles are not printed, data appears in the same sequence as found in the formatted report and is separated by tabs. A raw report is useful if you generate reports with UNIX utilities, like `awk`, `sort`, and `sed`.

Generated Column Titles

Both formatted reports and raw reports generate data under the topics listed in the following table. The sequence of the topics cannot be changed.

Topics	Description
Name	Name of file
Parent	Record ID of parent
Last Accessed	Last accessed date on timestamp
Mode	Permission IDs
Size	Size of file in MB
File ID	File number
UID	User ID
GID	Group ID

Topics	Description
Last Modified	Date and time showing date the file was last modified
Vol	File is located on this volume number

Options

```
/usr/amass/bin

./amassreport

[-dfPRS]

[-a date time]
[-e errnumber]
[-g gid]
[-L length]
[-l date time]
[-m mode]
[-n name]
[-o filename]
[-p prid]
[-r rid]
[-s size]
[-u uid]
[-v volnumber]
[-z volgroup]
```

Option	Description
no options	Generate formatted report
-d	Only list directories
-f	Only list files
-P	List files with an absolute path, starting from mount point. For example, `/archive/pubs/amass/v49/fileA`
-R	Generate raw report
-S	Displays in the Last Accessed field and in the Last Modified field the time in seconds since 1970
-a *date time* -a "<*date time*" -a ">*date time*" (*time* defaults to midnight)	Only list files with a timestamp that shows when file was **modified**: • On a specific *date* and *time*. Enter, for example, **-a 01/01/1998 13:30:00** to select all files modified on January 1, 1998, **at precisely** 1:30 p.m. • On an earlier or later timestamp. Enter a string that contains before (<) or after (>) relationship operator enclosed in quotes. For example, **-a "<01/01/1998 13:30:00"** selects all files modified **before** (<) January 1, 1998 at 1:30 p.m. Format for date is MM/DD/YYYY and the format for time is hh:mm:ss. The date is required. The date is required. The time defaults to midnight. For example, **-a "<01/01/1998"** selects all files before (<) midnight on January 1, 1998.

Option	Description
-e *errnumber* -e "<*errnumber*" -e ">*errnumber*"	Only list files that have a: • Specified *error number*. Enter for example, **-e 49** to select all files with an error of 49. • Lower or higher error number. Enter a string that contains less than (<) or greater than (>) relationship operator enclosed in quotes. For example, **-e ">20"** selects all files with an error number greater than 20.

Option	Description
-g *gid*	Only list files with a specified *group ID*
-L *length*	Only list files with a specified *page length*
-l *date time* -l "<*date time*" -l ">*date time*" (*time* defaults to midnight)	Only list files with a timestamp that shows when file was **accessed**: • On a specific *date* and *time* • On an earlier or later timestamp. Enter a string that contains before (<) or after (>) relationship operator enclosed in quotes. For example, **-l ">12/06/1998 08:00:00"** selects all files accessed **after** (>) December 6, 1998 at 8:00 a.m. Format for date is MM/DD/YYYY and the format for time is hh:mm:ss. The date is required. The time defaults to midnight. For example, **-l ">12/06/1998"** selects all files after (>) midnight on December 6, 1998.

Option	Description
-m *mode*	List only those files having one of the following permission IDs: • `rwxrwxrwx` • `r--r--r--` • `rwxr-xr-x`
-n *name* -n "* *name*"	Only list files that have a: • Specific *name* • Specific group of letters somewhere in the name. Enter a string that contains a wildcard character enclosed in quotes. For example, **-n "*.sales"** selects all files with an extension of .sales.

Option	Description
-o *filename*	Direct report to a specified filename
-p *prid*	Only list files with a specified parent record ID
-r *rid*	Only list files with a specified record ID
-s *size* -s "<*size*" -s ">*size*"	Only list files with that have a: • Specific *size* • Smaller or larger file size. Enter a string that contains less than (<) or greater than (>) relationship operator enclosed in quotes. For example, **-s "<2000"** selects all files with a size **less than** 2,000 bytes.

Option	Description
-u *uid*	Only list files with a specified user ID
-v *volnumber*	Only list files on a specified volume
-z *volgroup*	Only list directories in a specified volume group

Example

Step 1.   Log in as either amass or root.

```
# su root
```

Step 2.   Enter the following options to see file access and modification times *in seconds*:

```
# amassreport -S -n filename
```

Step 3.   See an example of the output for the LAST MODIFIED and LAST ACCESSED in *seconds* since 1970 in the following illustration:

```
NAME FILEID PARENT UID GID LAST MODIFIED LAST ACCESSED MODE     VOL  SIZE
fname  6084   3       0   1   937493088      937493088    -rw-------  4    85899345
```

Step 4.   Enter the following options to see file access and modification time *dates*:

```
# amassreport -n filename
```

Step 5.   See an example of the *dates* output in the following illustration:

NAME	FILEID	PARENT	UID	GID	LAST MODIFIED	LAST ACCESSED	MODE	VOL	SIZE
fname	6084	3	0	1	Sept 16 08:44	Sept 16 08:44	-rw-------	4	85899345

amassrestore

Restore from a Backup Volume located in either a library or a standalone drive the following files:

- File System Database

- Journal

Caution
Do not use this command when AMASS is running. To shutdown AMASS, refer to the Site-Specific Tasks chapter in *Installing AMASS.*

Options

```
/usr/amass/bin

./amassrestore

[-uv]

[-t]
[-D drivenumber]
[-d tapedevice]
[-e date]
[-J jukeboxnumber]
[-L label]
[-P slot]
```

Option	Definition
`-t`	View files on the Backup Volume Does not restore any files
`-u`	Usage statement
`-v`	Verbose messages
`-e` *date time*	Restore files from the Backup Volume with a timestamp equal to a specified *date* and *time*. Format is MM/DD/YYYY hh:mm:ss. The date is required. The time is optional.
`-J` *jukeboxnumber* (defaults to 1)	Enter the library number where Backup Volume resides
`-D` *drivenumber*	Enter drive number that reads the Backup Volume

Option	Definition
For SCSI-attached storage devices:	
`-P` *slot*	Enter the 4-alphanumeric home storage slot number where the Backup Volume resides. **NOTE**: Backup Volume should be in the last home storage slot in the library. If you have more than one library daisy-chained to AMASS the volume should be in the **last** slot in the **first** library. The last slot (for SCSI-attached storage device) is defined as what is listed by the `medialist` utility.

Option	Definition
For barcode-reading libraries:	
-L *label*	Enter the preprinted alphanumeric barcode of the Backup Volume.
For standalone drives:	
-d *tapedevice*	Enter the standalone tape device that reads the Backup Volume. For example, -d */dev/rst12.*

Example

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. Inactivate the AMASS file system with the following command:

```
# amassstat -i
```

Step 3. Check the integrity of the file system by running the UNIX fsck command.

```
# fsck devicename
```

Step 4. Make sure the Backup Volume is in the correct drive in the library. If there is another volume in the drive, return it to its home slot by using the following utility.

> **Note**
>
> The user must be amass. Use this utility only when AMASS is not running.

```
# su amass
Password:
# /usr/amass/daemons/amassrecovery -s
```

where:

Option	Description
-s	Performs the following: • Prevents system startup • Performs file recovery • Returns media to its home storage slot

Step 5. Restore the File System Database and Journal by entering the following options:

```
# amassrestore -v -d /dev/rst12 -L 12N6J
```

where:

Value	Description
`-v`	Verbose messages
`-d` */dev/rst12*	Backup Volume is on this standalone drive
`-L` *12N6J*	Preprinted barcode

amassstat

View and change the current status—Active or Inactive—of AMASS.

Note

After a system reboot, AMASS comes up in an Active state regardless of the status before the reboot.

Shutdown Tasks

Prior to shutting down, AMASS performs the following tasks:

- Prevents new files from being opened

- Waits five minutes (default) to allow all files to close

    - If this time expires and there still are open files, AMASS remains Active but sends a warning message, unless the -f option was used.

- Updates the checkpoint area

- Notifies clients of the impending shutdown

- Gracefully shuts down AMASS

- Sends a failure message to clients if they request a file from the AMASS file system after it is shutdown

Options

```
/usr/amass/bin

./amassstat

[-uy]

[-acfisvw]
[-f -t seconds]
```

Option	Definition
no options	View the status of AMASS
	When AMASS asks if you want to toggle the status, type **y** for yes and **n** for no.
-a	Activate AMASS
-c	View status, only
-f	Force AMASS to inactivate immediately
-f -t *seconds* (defaults to 300 seconds, 5 minutes)	Inactivate AMASS after the specified number of *seconds* expires, even if files are open. If files are still open, AMASS sends a message to clients.
-i	Inactivate AMASS **NOTE**: Clients *read* and *write* to *open* files but *not new* files.
-s	Suppress most messages
-u	Usage statement
-v	View the AMASS version number

Option	Definition
-w	Inactivate AMASS **NOTE**: Clients *read* from *open* files, only.
-y	Suppress interactive messages but return a code as defined below: • 0 = Active • 1 = Inactive

astats

View the status and attributes of the library, drives, and media.

```
/usr/amass/utils

./astats

[-chjuvw]
[-A]

[-s seconds]
```

Option	Definition
no options	Lists the number of libraries configured, the number of drives, the media supported, the volume ID of the volume in the drive and its status.
-c	Display device configuration flags
-h	Do not display headers
-j	Display number of libraries configured and their status
-u	Usage statement
-v	Display volume system flags
-w	Display device I/O mode flags
-A	Equivalent to -cjvw
-s *seconds*	Scan and display the information in a loop after sleeping for a specified number of seconds

Examples

The following examples show the output generated by the command with various options to obtain information and status of the libraries configured along with the drives and media supported.

The output indicates the number of libraries, number of drives. type of media supported, volume ID and the state of the library as well as of the media in the drive.

Following is the output when astats command is run without any option.

```
# su root

# astats

Library Drive Type Volume State
   1      1    Tape   3     UnAvailable,InUse,Writing
```

astats Output Fields Defined

The following fields are generated with this command:

Fields	Description
Library	Reference number
Drive	Reference number
Type	Drive Mode Flags: • CD-ROM - CDROM drive • MO-RW - drive supports REWRITABLE media • Tape - tape device • Worm - drive supports WORM media
Volume	Reference number of volume in the drive

Fields	Description
State	Device Status Flags: • AdminJob - do admin job pointed to by admjob • Assigned - next job already assigned • Clean-Busy - sysreq is servicing a drive clean and owns the drive • Clean-Done - drive cleaning completed • CLI-Clean - sysreq to start cleaning drive • EjectReq - volume eject requested • ForeignVol - foreign volume in drive • I/O-Clean - start drive cleaning • InUse - drive servicing a request • JobDone - no new jobs added since last queue scan • Loaded - device just loaded • Needs-Clean - drive cleaning deferred • NoDbRec - device database entry not found • NoEject - media in drive cannot be ejected • OutOfService - device is out of service • PendngIO - I/O is pending • ReadWait - set if read needs to be serviced • ReleaseReq - request to release drive • Reschedule - reschedule this device • VerifyLPBN - verify media last pbn on 1st write • WriteDed - device is a dedicated write drive • Writing - set when drive is writing

The following output is generated when the astats command is run with the -c option:

```
# su root

# astats -c

Library Drive Type Volume State

  1       1    Tape  3       UnAvailable,InUse,Writing,
                              ConfigBlkSiz,ConfigComprs,SIO-OK
```

astats -c Output Fields Defined

Fields	Description
State	Drive Flags: • ConfigBlkSiz - device block size is configurable • ConfigComprs - device compression is configurable • Non-LBA - device block address type is vendor-specific • No-SpaceEOD - tape does not support SPACE end of data • SIO-OK - device type is supported by streaming tape enhancements

The following output is generated when the astats command is run with the -j option.

```
# su root

# astats -j

Library Drive Type Volume State

  1                           AsyncEjectSupport,

  1       1    Tape  3        UnAvailable,InUse,Writing
```

astats -j Output Fields Defined

Fields	Description
State	Library System Flags: • AsyncEjectSupport - support for asynchronous eject • BackingUp - a backup is in progress • NoRWBuffers - ran out of buffers • QueuedRW - jobs have been added to the queues • QueuedVolEject - queued for tape effect

The following output is generated when the astats command is run with the -v option.

```
# su root

# astats -v

Library Drive Type Volume State

  1      1    Tape  3     FullVol
```

astats -v Output Fields Defined

Fields	Description
State	Volume System Flags: • AsyncEjectDone - eject of volume finished • AsyncEjectPending - eject of volume started • AsyncEjectReq - request to eject volume • ForeignVol - foreign volume • FullVol - volume is full • HeaderInvalid - volume is unknown to system (header invalid) • InactiveVol - volume is not active • OfflineVol - temporary state used to reserve a volume before changing it state • ReadonlyVol - do not use the volumes for writes

The following output is generated when the astats command is run with the -w option.

```
# su root

# astats -w

Library Drive Type Volume State

  1      1    Tape  3      UnAvailable,InUse,Writing,
                            WriteVerify
```

astats -w Output Fields Defined

Fields	Description
State	Device I/O mode flags: • BlankSearch - search for blank write mode • EraseWrite - erase before write mode • IFL-ExtendedStatus - get log sense data after each I/O • IFL-Sup pressed Logging - suppress IFL error logging • WriteVerify - write verify mode

bulkinlet

Load multiple volumes through the mailbox and mark online. This command is only valid for multislot mailbox libraries.

> **Tip**
>
> This command has slightly different meanings for SCSI and network-connected libraries.

Network Libraries

This command is valid for the following network-attached libraries:

- ADIC AML

- IBM 3494

- Storage Technology

Tasks

The following tasks are valid for network-attached libraries with multislot mailboxes:

- Load multiple volumes through the mailbox

- Create entries in the File System Database for **new** volumes

- Mark volumes Online in the Database

Note

For tracking purposes, AMASS assigns each **new** volume a unique volume number.

Tip

To create File System Database entries for volumes already residing in the library (bypass the mailbox), use the bulkload command.

Options

```
/usr/amass/bin

./bulkinlet

[-uy]
```
[volumegroup]
[jukeboxnumber]

Option	Description
no option	Load new media
-u	Usage statement
-y	Suppress interactive messages

Option	Description
volumegroup (defaults to 0)	Enter the volume group assignment for the media you are loading. Valid assignments are: • A numeric value, 1 through 2047 • SP, space pool A volume with files on it cannot be assigned to the space pool • CL, cleaning group • MV, media verification group for the optional Infinite File Life feature
jukeboxnumber (defaults to 1)	Enter the library number where new volumes will reside

Load New Volumes

Step 1.   Log in as either amass or root.

```
# su root
```

Step 2.   Place volumes in the mailbox.

Step 3.   Enter the command as shown in the following illustration. In our example, all the volumes are assigned to volume group 101.

```
# bulkinlet 101
```

AMASS assigns a unique volume number to each volume.

Step 4. All new volumes in the File System Database have an initial status of unformatted (U) and inactive (I). To further prepare the volumes so AMASS can read or write to them, use the commands listed in the following table.

Command	Description
vollabel	Enter the preprinted alphanumeric barcode label in the File System Database
StorageTek Redwood tape drives only:	
tapelength	Enter the length of tape in the Database
volformat	Format the volumes
volstat	Mark the volumes Active in the Database Active = allows AMASS to read and write to media

SCSI, Multislot Libraries

The following tasks are valid for SCSI-attached libraries with multislot mailboxes:

- bulkinlet -e *volumenumber* loads and marks existing volumes online in the File System Database.

- bulkinlet *volumegroup* assigns multiple volumes to a specified volume group.

Unsuccessful Loads

If you attempt to load several volumes at one time and one volume fails to load, AMASS will not load the remaining volumes after the first failure. For example, if you load volumes 1 through 6 and volume 3 is unsuccessful, AMASS successfully loads volumes 1 and 2 but does not load volumes 3, 4, 5, and 6.

Options

```
/usr/amass/bin

./bulkinlet

[-uy]

[-e volumenumber]
[volumegroup]
[jukeboxnumber]
```

Option	Description
-e	Loads and marks existing volumes online in the File System Database.

Option	Description
volumenumber	Enter the unique volume numbers you want to unload from the library and mark Online in the Database.
	To list more than one volume, separate the numbers with a comma or with a hyphen. For example:
	• `bulkinlet -e 1,8` ejects volumes 1 and 8
	• `bulkinlet -e 1-8` ejects volumes 1, 2, 3, 4, 5, 6, 7, and 8

Reload Existing Volumes

Step 1. Log in as either `amass` or `root`.

```
# su root
```

Step 2. Place several volumes in the multislot mailbox.

Step 3.   Enter the command as shown in the following illustration. In our example, we reload three volumes.

```
# bulkinlet -e 126, 134, 137
```

The picker reads the barcode and returns the volumes to their home storage position.

bulkload

> **Tip**
>
> This command is valid only for network-attached storage devices.

Supported Network Libraries

This command is valid for the following network-attached libraries:

- ADIC AML

- IBM 3494

- Storage Technology

Tasks

The following tasks are valid only for network-attached libraries:

Create entries and mark volumes Online in the File System Database, under the following circumstances:

- There are existing volumes in a network-attached library at a site where AMASS has just been installed

- You manually load volumes **directly** into a network-attached library

For tracking purposes, AMASS assigns each volume a unique volume number.

Note
To load new volumes through the mailbox, use the bulkinlet command.

Library Interfaces

AMASS manages the network-attached libraries through the library interfaces listed in the following table. For specific library information, refer to *Accessing Storage Devices.*

Library	Library Interface
ADIC AML	Distributed AML Server (DAS)
IBM 3494	Library Manager (LMCPD)
StorageTek	Automatic Cartridge System Library Software (ACSLS)

Options

```
/usr/amass/bin

./bulkload

[-s]
[volumegroup]
```

Option	Description
no options	Create entries and mark multiple volumes Online in the File System Database based on an inventory of the library
-s **NOTE:** Use this option if you have not recently updated the library's interface.	Besides creating entries and marking multiple volumes Online in the Database based on an inventory of the library, AMASS *synchronizes* both the Database and the **library's interface.** Because of the synchronization process, this task takes longer to complete than using no options. The status of a volume in the Database is based on an inventory of the library, regardless of the entry in the library's interface. For example, if media is marked On-line in the library's interface but the volume is not in the library, AMASS marks the volume Off-line in the Database.
volumegroup (defaults to 0)	Enter the volume group assignment for the media. Valid assignments are: • A numeric value (1 through 2047) • SP (space pool). A volume with files on it cannot be assigned to the space pool. • CL (cleaning group) • MV, media verification group for the optional Infinite File Life feature **NOTE:** You cannot **change** assignments with this command. To change an assignment, use the AMASS volgroup command.

Create Entries for Existing Volumes

You have just installed AMASS but your library already contains media known to your library's interface DAS. You must "introduce" this existing media to the File System Database by performing the following procedure:

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. Use the bulkinlet command to create the initial entries in the File System Database, and receive unique volume numbers from AMASS for each volume.

Step 3. Run bulkload -s to synchronize the Database that is based on an inventory of the library and the library's interface.

Step 4. New volumes in the File System Database have an initial status of unformatted (U) and inactive (I). To make the new volumes usable, change the characteristics of the volumes with the commands listed in the following table.

Command	Characteristic
vollabel	Enter the preprinted alphanumeric barcode label in the File System Database
StorageTek Redwood tape drives only:	
tapelength	Enter the length of tape in the Database
volformat	Format the volumes

Manually Load New Volumes

Introduce new volumes to both the File System Database and to the library interface by performing the following procedure:

Step 1. Make sure the power is off**.**

> **WARNING**
>
> Power off the library before opening the library door.

Step 2. Log in as either `amass` or `root`.

```
# su root
```

Step 3. Manually load media directly into a home storage slot or remove media from a slot.

Step 4. Run the appropriate command from the following list to update the library interface:

- AML - run the `inventory` command from DAS if you are using an AML.

- IBM - run a similar command from LMCPD if you are using an IBM.

- StorageTek ACS - run a similar command from the ACSLS Server if you are using a StorageTek ACS.

Step 5. Run the `bulkload -s` command to synchronize the File System Database to the library interface.

```
# bulkload -s
```

Step 6. New volumes in the Database have an initial status of unformatted (U) and inactive (I). To make the new volumes usable, define attributes and initialize the media with the commands listed in the following table:

Command	Characteristic
vollabel	Enter the preprinted alphanumeric barcode label in the Database
StorageTek Redwood tape drives only:	
tapelength	Enter the length of tape in the Database
volformat	Mark the volume Active • Active = allows AMASS to read and/or write to media

bulkoutlet

Eject multiple volumes to the mailbox and mark off-line. This command is valid for mutualist mailbox libraries only.

Tip
This command is valid for both network-attached storage devices and SCSI-attached storage devices.

This command is valid for the following network-attached libraries:

- ADIC AML

- IBM 3494

- Storage Technology

Tasks

The following tasks are valid for mutualist mailbox libraries:

- Eject multiple volumes

- Mark volumes Off-line in the File System Database

Options

```
/usr/amass/bin

./bulkoutlet

[-uy]

[volumenumber]
```

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Enter the unique volume numbers you want to unload from the library and mark Off-line in the Database.
	To list more than one volume, separate the numbers with a comma or with a hyphen. For example:
	• **bulkoutlet 1,8** ejects volumes 1 and 8
	• **bulkoutlet 1-8** ejects volumes 1, 2, 3, 4, 5, 6, 7, and 8

Outlet Volumes

Step 1. Log in as either amass or root..

```
# su root
```

Step 2. See the following example: a total of 12 volumes—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 21, and 23—are ejected from the library.

```
# bulkoutlet 1,2-10,21,23
```

Step 3. Remove the volumes from the mailbox.

Unsuccessful Ejects

If you attempt to eject several volumes at one time and one volume fails to eject, after the first failure, AMASS will not eject the remaining volumes.

For example, if you eject volumes 1, 2, 3, 4, and 5 and volume 3 is unsuccessful, AMASS successfully ejects 1 and 2 but does not eject 3, 4, and 5.

cdimport

Import data from CDs formatted by the standards prescribed by:

- High Sierra

- ISO 9660

- Rockridge (an ISO 9660 format with extensions)

Note
Space pool (SP) and cleaning (CL) volumes cannot be imported.

Note
AMASS does not support writable CDs.

Optional Feature

Optional Feature
Enable this optional feature with an authorization string obtained from ADIC. To request a string, refer to the Site-Specific Tasks chapter in *Installing AMASS*.

Prevent Mount of Internal CD Drive

To prevent the server from mounting an internal CD drive, perform the following steps:

Solaris

> **Step 1.** Use the UNIX vi editor or a similar product to edit the `/etc/vold.conf` file.

> **Step 2.** Comment out the internal CD drive entry as shown in the following illustration. The entry with the asterisk in the name identifies the internal CD drive.
>
> Replace that entry with an entry for a supported external CD drive name.

```
~
Devices to use
#use cdrom drive /dev/rdsh(c*s2) dev_cdrom.so cdrom%d
use cdrom drive /dev/rdsh/c0t6d0s2 dev_cdrom.so cdrom%d
use floppy drive /dev/rdiskette[0-9] dev_floppy.so floppy%d
~
```

Use a pound sign (#) to comment out the line containing the "wildcard" name with the asterisk.

Replace wildcard name (c*s2) with the specific name of the internal CD drive (for example, c0t6d0s2).

> **Step 3.** Reboot the Sun machine for the changes to take effect.

IRIX

> **Step 1.** Use the UNIX editor `vi` or a similar product to create an `/etc/fsd.auto` file.

> **Step 2.** Create an entry for each drive similar to the entries shown in the following illustration. Drive information is obtained from the `/etc/fsd.tab` file.

```
# vi /etc/fsd.auto

# /dev/scsi/sc3d3l0     /CDROM3     iso9660     mon=off  00
```

```
# /dev/scsi/sc3d5l0      /CDROM      iso9660      mon=off  00

# /dev/scsi/sc3d4l0      /CDROM2     iso9660      mon=off  00

# /dev/scsi/sc3d1l0      /CDROM4     iso9660      mon=off  00
```

> **Step 3.** Reboot the SGI machine for the changes to take effect.

Options

```
/usr/amass/bin

./cdimport

[-uv]

[-lLrRU]
[-n userlable]
[-p path]
volumenumber
```

Option	Description
-l (defaults to AMASS import path)	Use the CD header
-L	Display the CD's header information to the screen Does not import any files
-r	Replace old path with the AMASS import path

Option	Description
`-R` (defaults to Read-Only)	Mark the volume group available for both Reads and Writes
`-u`	Usage statement
`-U` (defaults to lowercase)	Display file names as uppercase On ISO 9660-formatted and High Sierra-formatted CDs, file names are displayed as lowercase. Rockridge-formatted CDs allow both uppercase and lowercase.
`-v`	Verbose messages
`-n` *userlabel* (defaults to volume ID)	Specify a user-identifiable label
`-p` *path*	Enter the absolute path where you want to place the imported data. For example, */archive/cdpubs* .
volumenumber	Enter the unique volume number

Example

Step 1. Log in as either `amass` or `root`.

```
# su root
```

Step 2. Create a directory (for example, `cdpubs`) under the AMASS mount point (default is /archive) for the files on the CD.

```
# mkdir /archive/cdpubs
```

Step 3. Use the AMASS volnew command to create an entry in the File System Database for the CD.

AMASS assigns the CD a unique volume number (49) and asks for confirmation of the process. Your response in bold is shown in the following illustration:

Home storage slot number. "N/A" is valid for a standalone drive.

Volume group assignment.

Label

CD volume resides in library 2.

```
# volnew 20 N/A fmdocs 2

Request to add a new volume:
Volume group will be 20
Volume position will be N/A
Volume label will be fmdocs
Volume jukebox number will be 2
    Is this information correct? [y - n]: y
Volume 49 has been added, status is Active.
```

AMASS assigned this CD a unique volume number of 49.

Step 4. Use the cdimport command as shown in the following illustration:

```
# cdimport -p /archive/cdpubs 49
```

Identify the absolute path where you want the data to reside in the AMASS file system.

Volume Number

Step 5. To verify that the process worked, list the files (ls) under /archive/cdpubs on the UNIX server and you should see the files previously found on the CD.

If this operation is unsuccessful, the CD may be left in the drive. If this happens, manually remove the CD.

dirfilelist

View, recursively, files under a directory, one entry per line.

Options

```
/usr/amass/bin

./dirfilelist

[-uv]

[-h]
[path]
```

Option	Description
StorageTek drives:	
-h	View start of the file's block address as a hexadecimal value enclosed in parentheses
-u	Usage statement
-v	Verbose messages
path	Enter the path to where you want to view files. The path can be either: • Absolute, such as */archive/accting* • Relative to the mount point, such as */accting*

Verbose Example

The following example assumes we:

- Use Storage Technology drives (-h)

- Want to see the absolute path for all the files (-v)

- Want to view all files under the /archive/prodcode directory
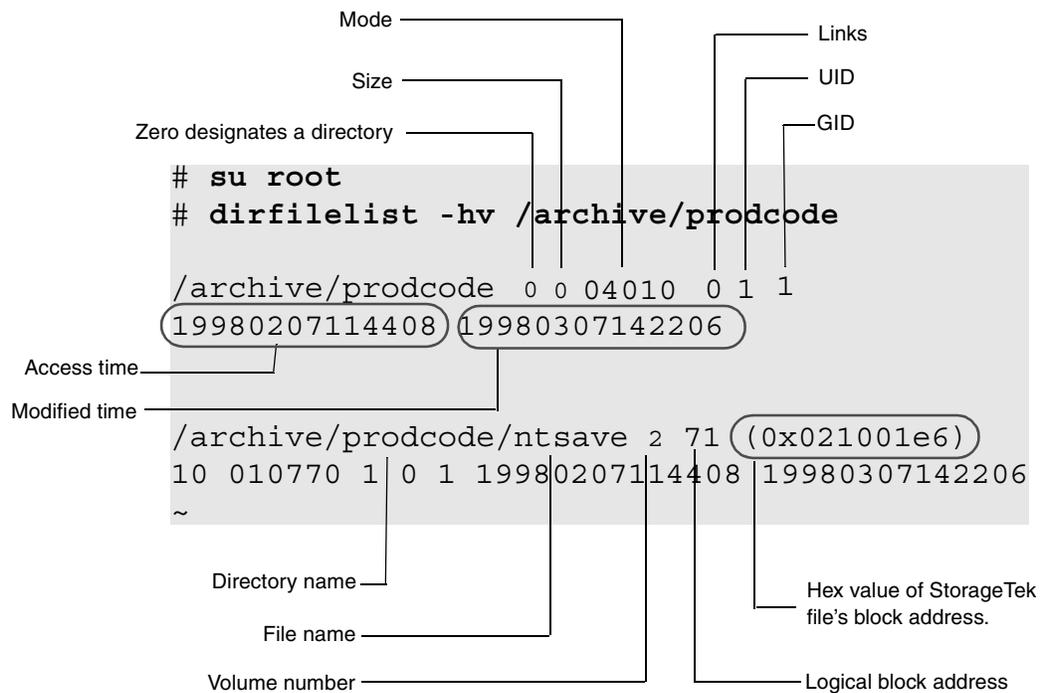
Nonverbose Example

The following example assumes we:

- Want to see the relative path for all the files

• Want to view all the files under the /prodcode directory

Logical block address
Zero designates a directory

```
# su root
# dirfilelist /prodcode

/prodcode  0  0
/prodcode/ntsave 2  71
~
```

Directory name

File name
Volume number
Logical block address
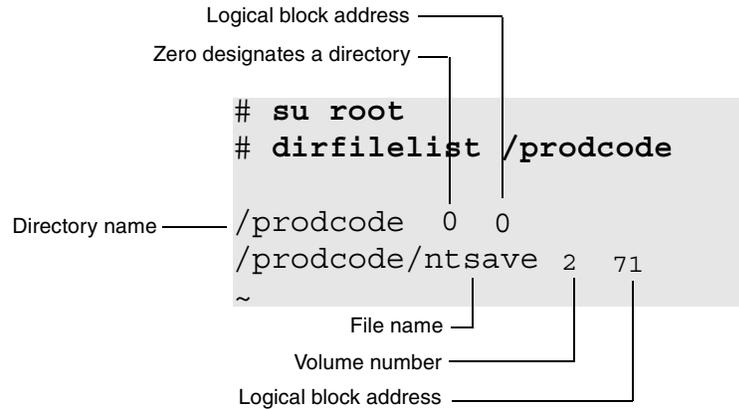
Output Fields Defined

The following fields are generated by the verbose option:

Field	Description
Name	File names • If you enter an absolute path (/archive/accting), the list will begin with the AMASS mount point. • If you enter a relative path (/accting), the list will be relative to the mount point.
Directory	• Zero = directory
Logical block address	Start of file's block address in logical format
StorageTek drives: Displays only if the -h option is used	
Device block address	Start of the file's block address appears as a hexadecimal number enclosed in parentheses

Field	**Description**
Size	Total size of the file in MB
Mode	File permissions
Links	Number of hard links for this file
UID	Numeric user ID
GID	Numeric group ID
Access_time	Last time file was accessed
Modified_time	Last time file was modified

TIME Format

The Access_time and Modified_time values have the following format: yyyymmddhhmmss. For example, the value 19980307114408 = 1998, March 07, 11:44:08 a.m.

This format allows you to sort by time, which is useful when creating a list of files created at a specific date and time.

Practical Application

In the following example, we use this command to back up files from one volume group to another:

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. Enter the following commands to pipe all of the files from /archive/accting (a rewritable volume group) to /archive/fian, (a write-once volume group):

Numerically sorts files based first upon volume,
then based upon logical block address. ───────┐

                                                         ┌─Prints just the file names.

```
# cd /archive/accting

# dirfilelist . | sort -n +1 +2 | awk ' {print $1} ' |\
   cpio -oc | (cd /archive/fian; cpio -icdvum)
```

Lists files. ─┘   The cd command insures the data will go to the
correct source directory.

Backs up the files. To speed up the backup process, we use two
cpio -p commands so AMASS can read and write data in parallel.

driveclean

Mount a cleaning volume in a tape drive, clean the drive, and eject the cleaning volume.

Prerequisites

To prepare for tape drive cleaning, perform the following steps:

Step 1. Assign a cleaning volume to the cleaning group (CL) with the volnew command for SCSI-attached libraries or the bulkinlet command for network-attached libraries.

Step 2. Use the volclattr command to define drive-specific attributes.

> **Note**
>
> Currently the CL volume group can contain only one type of cleaning cartridge. For example, if you have both a DTF drive and a 3590 drive, your CL volume group must contain only DTF cleaning cartridges or exclusively 3590 cleaning cartridges.

- For appropriate cleaning attributes, refer to your drive manual.

- Accept the AMASS-generated default values for IBM 3590 drives. Do not alter these values!

Step 3. View cleaning attributes with the `vollist - g CL` command, if desired.

Options

```
/usr/amass/bin

./driveclean

[-uy]

[-V volumenumber]
[drivenumber]
[jukeboxnumber]
```

Option	Description
-u	Usage statement
-y	Suppress interactive messages
-V *volumenumber*	Enter the unique volume number that represents a cleaning volume If this option is not used, AMASS selects an appropriate cleaning volume from the CL (cleaning) volume group.
drivenumber	Enter the drive number that needs cleaning
jukeboxnumber (defaults to 1)	Enter the library number where the specified drive resides

Example

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. Assign a cleaning volume to the cleaning group.

For SCSI-attached storage devices, use the volnew command.

```
# volnew CL n/a cleanme
```

For network-attached storage devices, use the bulkinlet command.

where:

Value	Description
CL	Assign to the cleaning volume group
n/a	Designate a home storage slot n/a = standalone drive
cleanme	Enter a user-defined name for this volume

AMASS assigns this media a unique volume number, for example, 49.

Step 3. Define drive-specific attributes to this cleaning volume with the volclattr command. For the required cleaning values, refer to your specific drive manual.

```
# volclattr -m 106 -t 120 49
```

where:

Value	Description
`-m 106`	Number of times this cleaning volume can be used
-t 120	Number of seconds drive will be cleaned
`49`	Cleaning volume number

Step 4. To view the current attributes of our cleaning volume and verify that we have done this exercise correctly, use `vollist` with the `-g` option to view the attributes of the cleaning group.

Cleaning volumes must be: unformatted "U," Inactive "I," and Online:

Cleaning volumes always have "CL" for the volume group.

Cleaning volumes always have the flags: "I" (inactive) and "U" (unformatted).

```
# vollist -g CL

NUM  GRP  JUKE  POS    LABEL  FLAGS  USED  AVAIL  DEAD%  ERRS
49   CL   1     NET    clean  IU     0     0      0      0

1 volumes in volume group CL
```

Step 5. **Standalone drive only:** Because we are using a standalone drive, we need to run the Standalone Operator Interface so enter the command in the following illustration. For more information about this interface, *Interface to Standalone Drives* chapter in *Accessing Storage Devices*.

```
# sysop
```

Step 6. To manually start the drive cleaning process, enter:

```
# driveclean -V 49 1
```

where:

Value	Description
-V 49	Cleaning volume number
1	Dirty drive number

Step 7. **Standalone drive only:** The sysop interface returns the following message that prompts you to load the cleaning volume:

```
*OPERATOR LOAD VOLUME REQUEST*
Please load VOLUME NUMBER 49
      LABEL   cleaner
into JUKEBOX #1   DRIVE #1

after cleaner has been loaded, press
return:

or IF INCORRECT VOLUME enter eject

or TO ABORT REQUEST enter abort
```

> The drive ejects the cleaning volume after the specified amount of time (120 seconds in our example) has elapsed.
>
> To exit the `sysop` interface, use <Control-C>.

Step 8. After cleaning, use the AMASS `drivestat -a` *drivenumber* command to reactivate the drive.

AMASS Will Not Clean

AMASS will not clean drives under the following conditions, if a cleaning volume:

- exceeds the maximum number of errors

- exceeds its usage count

- is not available

Automatic Cleaning

AMASS supports automatic drive cleaning. Refer to the AMASS Release Notes for a list of drives that support automatic drive cleaning.

Exceptions

Drive cleaning exceptions are noted below:

ADIC AML with DAS

Before using the AMASS `driveclean` command, comment out all cleaning-related configuration data in the `\das\etc\config` file on the OS/2 server.

ADIC Scalar 1000

AMASS does not support automatic drive cleaning on the ADIC Scalar 1000 with firmware earlier than level 2.10. Consequently, the Cleaning Mode must be disabled as follows:

Step 1. From the operator panel, enter the Main menu by pressing Escape $\circlearrowleft$.

Step 2. Scroll the Main menu using the navigation buttons ▲ or ▼. Select the Setup menu by pressing Enter ↵ .

Step 3. Scroll the Setup menu using the navigation buttons, and select the Cleaning menu by pressing Enter.

Step 4. Scroll the Cleaning menu using the navigation buttons, and select the Drives dialog box by pressing Enter.

Step 5. Determine if the first line in the box that shows if automatic drive cleaning is disabled reads, "Auto Clean: N". If so, no further action is required. Press the Escape button until you reach the Status Display menu (the initial screen).

However, if the first line shows that automatic drive cleaning is enabled, "Auto Clean: Y", change the Y to an N with the navigation buttons.

Move to the "ACCEPT:N" part of the screen by pressing Enter, and change the N to a Y with the navigation buttons.

Step 6. Save the changed cleaning state by pressing Enter.

Step 7. Press Escape until you reach the Status Display menu (the initial screen).

drivededicate

Dedicate a drive's use to one of the following:

- Write-Only

- Read and Write

Tip
If your client applications use many write-intensive applications, dedicating a drive to Write-Only may improve performance.

Options

```
/usr/amass/bin

./drivededicate

[-uy]

[-dn]
[drivenumber]
[jukeboxnumber]
```

Option	Description
no options	View status of the specified drive
	When AMASS asks if you want to toggle the status, type **y** for yes and **n** for no.

Option	Description
-d	Dedicate the drive for Write-Only requests
	NOTE: If all drives in the library are marked as Write-Only, AMASS arbitrarily picks a drive for read requests.
-n	Mark the drive for both read and write requests
-u	Usage statement
-y	Suppress interactive messages
drivenumber	Enter the drive number
jukeboxnumber (defaults to 1)	Enter the library number where the specified drive resides

drivelist

View condition and errors for drives.

Options

```
/usr/amass/bin

./drivelist

[-uy]

[drivenumber]
[jukeboxnumber]
```

Option	Description
no options	View condition of all drives in all libraries
-u	Usage statement
-y	Suppress interactive messages
drivenumber	View condition and errors of specified drive
jukeboxnumber (defaults to 1)	Enter the library number where the specified drive resides

Reset to Zero

Use the setdrverr command to reset the error counts reported by the drivelist command to zero. For syntax, see "setdrverr" on page 3-86.

Example

Following is an example of output generated by this command to obtain status on library number 3, which has two drives.

The output indicates that drive 1 of library 3 is Active and marked as dedicated-write, and drive 2 of library 3 is Inactive. None of the drives have any errors.

```
# su root
# drivelist 1 3
# drivelist 2 3

DRIVE           JUKE            STATUS          ERRORS

1               3               AD              0

DRIVE           JUKE            STATUS          ERRORS

2               3               I               0

drivelist: 2 drives configured in this system.
```

Output Fields Defined

The following fields are generated by this command:

Field	Description
Drive	Reference number
Juke	Reference number

Field	Description
Status	Drive status: • A = Active drive used by AMASS • I = Inactive drive not currently used by AMASS • D = Drive dedicated to writes requests
Errors	Number of errors on the drive **NOTE:** Drives that have excessive errors should be taken offline for maintenance. To inactivate a drive, use the drivestat command.

drivestat

View and change the status of drives.

Note

If media is in a drive when you INACTIVATE the drive, AMASS returns the volume to its home storage slot.

Options

```
/usr/amass/bin

./drivestat

[-uy]

[-e secs  drivenumber]
[-a drivenumber]
[-i drivenumber]
[jukeboxnumber]
```

Option	Description
no options	View status of all drives
	When AMASS asks if you want to toggle the status, type **y** for yes and **n** for no.
-u	Usage statement
-y	Suppress interactive messages

Option	Description
-e *secs drivenumber*	Dynamically reset the idle eject feature on a per tape drive basis
-a *drivenumber*	Activate specified drive
-i *drivenumber*	Inactivate—AMASS will not use—the specified tape drive
jukeboxnumber (defaults to 1)	Enter the library number where the specified tape drive is located

Output Examples

Following is an example of output generated by using no options:

```
# drivestat

DRIVE    JUKE    STATUS    ERRORS    IDLETIME

1        1       A         0         0

2        1       A         0         360

drivestat: 2 drives configured in this system
```

NOTE: The IDLETIME displayed by the drivestat output is the per-drive value, not the global value.

IDLETIME

The IDLETIME parameter—configured during AMASS installation—defines the length of time in seconds a drive will remain idle before AMASS will remove tape media from the drive. This parameter affects all your drives. For configuration information, refer to "IDLETIME" in *Installing AMASS*.

NOTE: Idle eject is not supported for optical drives.

The idle eject `drivestat -e` *secs drivenumber* command will override the global `IDLETIME` setting on a per drive basis.

Note

If the global `IDLETIME` parameter has been set to a non-zero value, although you can physically reset the idle eject value to zero with the `drivestat` command, the feature will **not** be disabled.

The following figure illustrates how both the global `IDLETIME` parameter and the per drive `drivestat` command option affects your drives:

Per Drive drivestat -e *sec drive#* Command

Drive1

The `drivestat` command configured any time during AMASS operation affects behavior on a specified drive.

Global IDLETIME Parameter

Drive1 **Drive2** **Drive3**

The IDLETIME parameter configured during AMASS installation affects all drives.
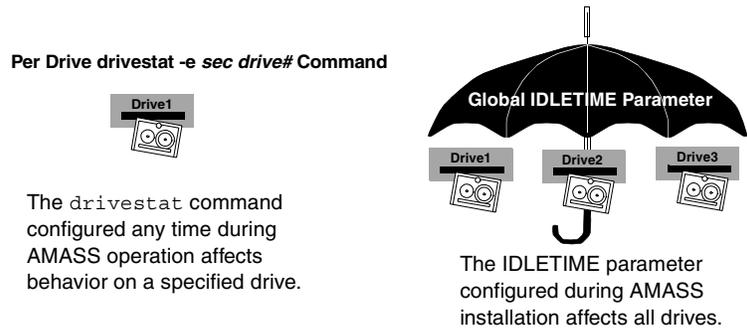
To disable the idle eject feature for all your drives, both the global `IDLETIME` parameter and the per drive `drivestat` command must be set to zero. The following table summarizes the correlation between the global and per drive values:

Behavior	**Global**	**Per Drive**
Per Drive value takes affect	N/A	>0
Global value takes affect	>0	0
Feature disabled	0	0

Output Examples

Following are examples of output generated by the idle eject option.

Eject Value for A Drive

In the following example, we set the tape drive to eject idle volumes after 480 seconds:

```
# drivestat -e 480 1

Setting Idle Eject value for drive 1, juke 1, from
0 to 480 seconds. OK [y/n]? y

Drive 1, in juke 1, will eject idle volumes after
480 seconds.
```

Eject Value for All Drives

In the following example, we set the drive to zero timeout; the idle eject feature will be disabled for **all** drives.

Note

This example assumes the global IDLETIME parameter has been set to zero also.

```
# drivestat -e 0 all

Setting Idle Eject value on all drives from 480
to 0 seconds. OK [y/n]? y

Drives will not eject idle volumes (feature
disabled).
```

Disable Feature for A Drive-Succeeds

In the following example, we set the drive to zero timeout; the idle eject feature will be **disabled** for the specified drive.

Note

This example assumes the global IDLETIME parameter has been set to zero also.

```
# drivestat -e 0 1

Setting Idle Eject value for drive 1, juke 1,
from 480 to 0 seconds. OK [y/n]? y

Drive 1, in juke 1, will not eject idle volumes
(feature disabled).
```

Disable Feature for A Drive-Fails

In the following example, we set the drive to zero timeout; but the idle eject feature will **not** be disabled.

Note

This example assumes the global IDLETIME parameter has been set to 31 seconds.

```
# drivestat -e 0 1

Setting Idle Eject value for drive 1, juke 1, from
480 to 0 seconds. OK [y/n]? y

Drive 1, in juke 1, will eject idle volumes after
31 seconds (global idletime).
```

View Current Values

To view a list of current values, enter a question mark (?):

```
# drivestat -e "?" all

DRIVE            JUKE             IDLETIME

1                1                480

2                1                0
```

fileonmedia

Reports whether a file has been completely stored on media.

Options

```
/usr/amass/bin

./fileonmedia

[-uv]
```
[*filename*]

Option	Description
-u	Usage statement
-v	Verbose messages
filename	Enter the full path to file you want information on. For example, /archive/*directory*/*filename*

File States

A file in the AMASS file system can have the following states:

State	Description
Located	The file is totally stored on media, there are no dirty cache blocks in the AMASS IO cache.
	NOTE: The file may also be completely or partially residing in the AMASS cache because of a read or write IO request.
Not Located	The file has one or more dirty cache blocks in the AMASS IO cache.
	NOTE: Overwrites or appends will cause a file to be considered "not located" because there will be dirty cache blocks associated with the file.

Examples

Following are examples of the output generated by using the
fileonmedia command:

```
# fileonmedia -v
/archive/amass412/getstart.fm6

getstart.fm6 is NOT LOCATED on media
```

```
# fileonmedia -v
/archive/amass412/sitetasks.fm6

sitetasks.fm6 is LOCATED on media
```

healthcheck

Test several AMASS components. The command does not correct any malfunction that it encounters, it just advises you that a test failed.

Note

Run the healthcheck command on a quiescent system, otherwise the tests may fail because of a lack of available drives, lack of write resources, or the inability to exclusively lock the File System Database.

Tip

If all the tests are run—depending on the size of your system—it may take several minutes to complete.

Options

```
/usr/amass/bin

./healthcheck

[-uv]

[-icCsw]
[-f path]
[-l jukeboxnumber drivenumber  volumenumber]
```

Option	Description
-i	Test integrity of the Database using the dbcheck utility. For information on this utility, see "dbcheck" on page 4-55. To prevent requests from using the Database while AMASS is running this test, the Database is locked. AMASS tries for one minute to lock the Database, if it is unsuccessful, the test fails.
-c	Verify the cache partitions by reading the first and last block in each partition.
-C (defaults to stop testing)	If a test fails, continue testing.
-s	View a summary report of the tests on the console. **NOTE:** Unless you use this option, AMASS does not display any messages informing you that a test passed or failed.
-u	Usage statement
-v	Verbose messages
-w	Analyze write resources by checking cache blocks and FNODES using the sysperf -k command.

Option	Description
`-f` *path*	Test the file transfer procedure. • Enter the absolute path (beginning with the mount point) of the file you want AMASS to use for this test. For example, `/archive/test/jasonfile`. • The volume where the file resides must be Online and Active in the Database. • AMASS must be able to read the volume within 10 minutes or the test fails.

Option	Description

`-l` *jukeboxnumber drivenumber volumenumber*	Test library components.
	
	• Enter the library number.
	
	• Enter the drive number.
	
	  Or, enter 0 to test all drives.
	
	  - Drive must be marked Active in the Database.
	
	  - To prevent requests from using the drive while AMASS is running this test, the drive is marked Inactive. If all drives will be tested, only one drive at a time is marked Inactive as it is tested, thereby allowing the remaining drives to service requests.
	
	(continued)

Option	Description

(continued)
-l *jukeboxnumber*
drivenumber
volumenumber
	• Enter the volume number you want AMASS to use for this test. During the test, data will not be written to this volume.
	
	  - Volume must be formatted
	
	  - Volume must be marked Active in the Database. To prevent requests from using this volume while AMASS is running this test, the volume is marked Inactive.
	
	  - Data on the volume must not span media

Example

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. The following example runs all of the tests. If a test fails AMASS will continue running the other tests (-C). A summary report (-s) is returned to the screen.

Tests the file transfer procedure.   Tests the library components.

```
# healthcheck -icCsw  -f /archive/test/jasonfile  -l  10 6
```

Jukebox number

Test all drives

Volume number
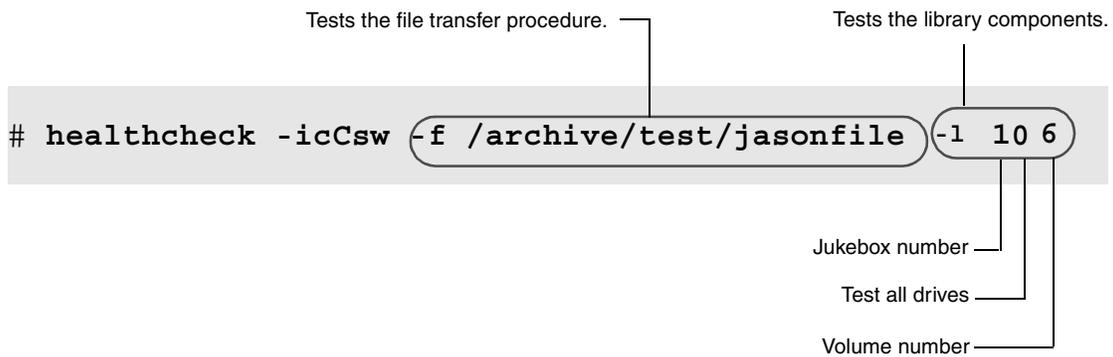
Step 3.   An example of a summary report (`-s`) generated by this command is shown in the following illustration.

```
--- healthcheck summary ---
    dbcheck was successful.
    library was successful.
    file transfer was successful.
    read 10485760 bytes in 39 seconds.
    write resources test was successful.
        cache blocks: free 1274 total 1274
         FNODES: free 633 total 635
    cache test was successful.
```

setdrverr

Resets the error counts to zero reported by the drivelist command.

Options

```
/usr/amass/bin

./setdrverr

[-uy]

[jukeboxnumber]
[drivenumber]
```

Option	Description
-u	Usage statement
-y	Suppress interactive messages
jukeboxnumber (defaults to 1)	Enter the library number where the drive resides
drivenumber	Reset error counts on the specified drive

setvolerr

Resets the error counts to zero reported by the vollist command.

Options

```
/usr/amass/bin

./setvolerr

[-uy]
```

volumenumber
 [*jukeboxnumber*]

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Reset error counts on the specified volume
jukeboxnumber (defaults to 1)	Enter the library number where the volume resides

setvolgrp

Assign directories and subdirectories to a specified volume group. This assignment allows you to restrict the allocation of space for the directory and its subdirectories to a specified set of volumes.

Note

The AMASS file system must be mounted and running prior to using this command.

Note

This command is not valid for volumes in the space pool or in the cleaning group.

The process recursively descends through the specified path assigning the terminating directory and any of its subdirectories (whose original volume group matched that of the parent directory) to the volume group.

Because new directories and files are always put into the volume group of their parent directory, this assignment creates a logical UNIX mount point where all files stored in this tree are placed.

Options

```
/usr/amass/bin

./setvolgrp

[-uy]
```

```
[-f]
```
path
volumegroup

Option	Description
`-f`	Force the assignment of new files to a specified volume group, even if there are existing files under the `path` tree. **NOTE:** This option works only six levels deep.Therefore, run it as many times as necessary.
`-u`	Usage statement
`-y`	Suppress interactive messages
path	Enter the absolute path (such as `/archive/dir1`) to the directory **NOTE:** This directory must already exist.
volumegroup (defaults to 0)	Enter the numerical volume group assignment. Valid assignments are 1 through 2047.

Initial File System

Step 1. See the following figure, which illustrates an initial file system. All directories and files are in volume group number 0, which is the default volume group.

Volume Group 0

```
            /archive
               |
            projects
               |
          amass_unix
            /      \
         hpux     sunos
```
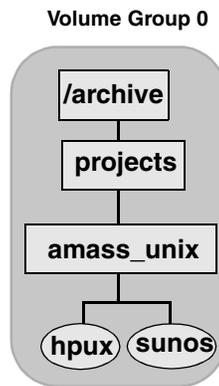
Assign New Directory to Volume Group Two

Step 2. Log in as either amass or root.

```
# su root
```

Step 3. Create an amass_nt directory under /archive/projects.

Step 4. Enter the following to assign the /archive/projects/amass_nt directory to volume group 2.

```
# setvolgrp /archive/projects/amass_nt 2
```

The following figure shows that all new subdirectories or files created under the amass_nt directory belong to volume group 2.
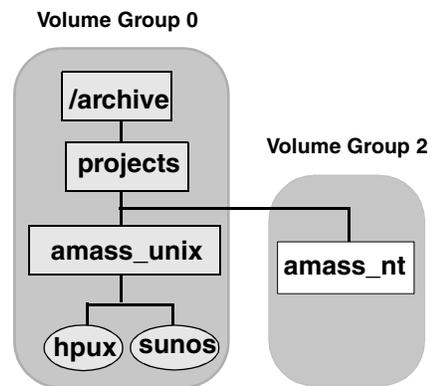
Assign Any New Files to Volume Group One

Step 5. To assign any "new" files under the /archive/projects/amass_unix directory to volume group 1 enter:

```
# setvolgrp -f
/archive/projects/amass_unix 1
```

The -f option is used because there are existing files under the amass_unix directory and we want to "force" all new files to belong to volume group 1.

The following figure illustrates that aix file, a "new" file created after the setvolgrp assignment, is assigned to volume group 1. The "old" hpux and sunos files remain assigned to volume group 0.

Volume Group 0

Volume Group 1

Volume Group 2

```
/archive
  projects
    amass_unix
      aix
      hpux  sunos
  amass_nt
```
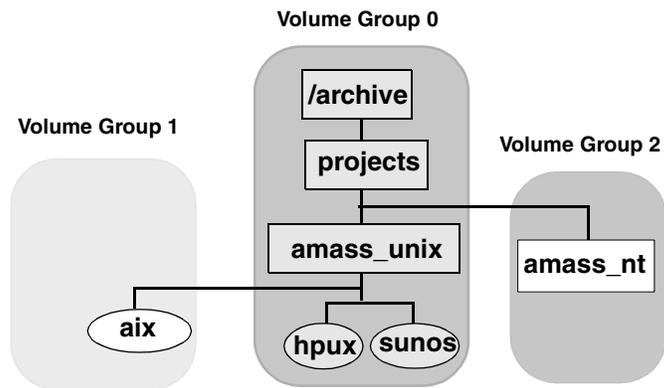
Any "new" files created under /archive or /archive/projects are assigned to volume group 1 as illustrated in the following figure.

Volume Group 0

Volume Group 1

Volume Group 2

```
/archive
  projects
    datamgr
    amass_unix
      aix
      hpux  sunos
  amass_nt
```
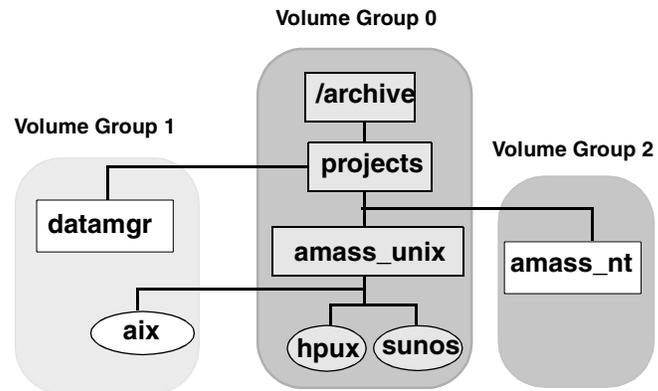
sysop

System administrators must use the Standalone Operator Interface to have full read-access and write-access to media in standalone drives.

The standalone drive must be daisy-chained to a library. AMASS considers multiple standalone drives as one virtual library.

The Standalone Interface was automatically installed when you installed AMASS and is located in the `/usr/amass/bin` directory. Specify this directory in the system administrator's login `PATH` variable.

Options

```
/usr/amass/bin

./sysop

[-ckul]
[-f filename]
[-w wait_time]
```

Option	Description
-c	Display cache block queue information
-k	Display kernel information
-u	Usage statement

Option	Description
-l	Enable external program
-f *filename*	Log information to specified *filename* as well as to the screen. **NOTE**: This file output is suitable for importing the I/O data into most spreadsheet programs.
-w *wait_time*	Enter how long—in seconds—AMASS should display the mount information. A zero *wait_time* means zero minutes consequently the message will not display.

Tasks

Use the Standalone Interface for the following tasks:

- All management operations for the AMASS file system

- I/O requests

- Back up the File System Database with the amassbackup command

Note

You cannot restore the File System Database with the Standalone Interface.

Running the Interface

Run the Standalone Interface from either a standard shell tool window or basic ASCII terminal. Normally, the interface is run from one window or terminal while AMASS is run from another window or terminal.

> **Tip**
>
> Do not use the UNIX abort command with the Standalone Interface to stop the AMASS volcopy process.

To run the Standalone Interface, perform the following steps:

Step 1. Log in as **amass**.

> **Note**
>
> The user must be amass.

Step 2. Enter the following command:

```
# sysop
```

Step 3. The interface prompts you to load a volume into a specific drive. The prompt always specifies a volume number, a volume side, and the volume label. For example, if a request requires you to load side A of volume number 2, text similar to the following appears:

```
***** OPERATOR LOAD VOLUME REQUEST *****
Please load              VOLUME NUMBER 2,
                                  SIDE A,
                     LABEL datavolume 2
into JUKEBOX #2 DRIVE #1
after VOLUME has been loaded, press return
or IF INCORRECT VOLUME enter eject
or TO ABORT REQUEST enter abort
Press RETURN when LOADED:
```

Step 4. To exit the interface, use <Control-C>.

sysperf

View AMASS I/O activity.

To exit this program, use <Control-C>.

Options

```
/usr/amass/bin

./sysperf

[-cku]
[-f filename]
[updateinterval]
```

Option	Description
-c	Display cache block queue information
-k	Display kernel information
-u	Usage statement
-f *filename*	Log information to specified *filename* as well as to the screen **NOTE**: This file output is suitable for importing the I/O data into most spreadsheet programs.
udateinterval (defaults to 60 seconds)	Enter how often—in seconds—AMASS should update the information

Example

Output from the `sysperf` command is shown in the following table:

```
# su root
# sysperf 5 -k -c

SYSTEM STATISTICS  - Mon Feb 2 10:04:40
UPDATE INTERVAL    - 5 SEC
AVERAGE THROUGHPUT - 9216 KBYTES/SEC

READ REQUESTS    # OF VOLUMES

0                0

WRITE REQUESTS   # OF VOLUME GROUPS

111              3

CACHE BLOCKS     2012        2006        6 Dirty
                 Total       Free

                 2 Qued      2 Pend      0 Done

NFNODES          128 Total   126 Free    2 Used

JUKE    DRIVE    VOLFLAG     VOLUME      VOLGRP    KBYTES/
                                                  SEC

1       1        A           4           801       9216
```

Output Fields Defined

The following fields are generated by this command:

Fields	Description
Update Interval	How often, in seconds, AMASS updates the screen
Average Throughput	Number of KB transferred since the last snapshot. This value first appears as a zero.
Read Requests	Number of outstanding read requests

Fields	Description
# of Volumes	Number of volumes associated with the request
Write Requests	Number of outstanding write requests
Juke	Reference number
Drive	Reference number

Fields	Description
VolFlags For more information, see "VolFlags Defined" on page 3-102.	Status of volume: • A = Active volume used by AMASS • C = Volume is being volcomped or a volcomp procedure has aborted • I = Inactive volume not currently used by AMASS • K = Reserved • O = Offline volume • Q = Volume has been quick formatted • R = Volume is marked as Read-Only This occurs as a result of either: (1) a write error that makes the media unwritable or (2) a user has forced the media to be Read-Only with the volreadonly command. • U = Volume not formatted • W = Media type is WORM
Volume	Volume number
Volgrp	Volume group assignment

Fields	Description
Kbytes/Sec	Average I/O rate for specified drive since the last snapshot **NOTE**: The value displayed by `sysperf` and `sysop` is a transfer rate; on the other hand, the value logged in the file is the number of Kbytes transferred since the last entry. These values will not agree in real-time.

Fields	Description
Appears only if the `-k` option is used:	
Cache Blocks	• Total = total number of cache blocks • Free = number of cache blocks available • DIRTY_BLOCKS = number of cache blocks filled with data that has not yet written to the media
NFNODES	• Total = total number of files that can be opened at one time • Free = number of closed files • Used = number of files currently opened

Fields	Description
Appears only if the `-c` option is used:	
Queued	Cache block of data waiting for I/O to start
Pending	Cache block of data in the drives's buffer
Done	Cache blocks that have been verified as written to media

VolFlags Defined

The following table describes the Active, Inactive, Online, and Offline values a volume can have in the VolFlags field:

	Online	**O = Offline**
A = Active	Volume is **in** library. AMASS **can** read and write to volume.	Volume is **not** in library. AMASS **can** read and write to volume with Offline Media Manager (OMM). For OMM information, see "Read Offline Volume" on page 2-25.
I = Inactive	Volume is **in** library. AMASS **cannot** read or write to volume.	Volume is **not** in library. AMASS **cannot** read or write to volume.

tapelength

Define the length of unformatted tape to the File System
Database for the Storage Technology Redwood SD-3 drive.

Options

```
/usr/amass/bin

./tapelength

[-uy]
```
volumenumber
lengthcode

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Unique volume number of the tape media being defined

Option	Description	
lengthcode	Enter the tape length.	
	Code	**Redwood**
	0 (default)	A (10 GB)
	1	B (25 GB)
	2	C (50 GB)
	3	D (Cleaning)
	-1	Length has not been established. AMASS still operates correctly but: (1) Reports false capacity values you see with the vollist command. (2) Records to the end of the media then returns an end-of-media error.

Create a Template File

If you use tape volumes of different lengths, create a template file that imbeds a specified tape length in the barcode in the File System Database.

When AMASS reads the Database, it knows the media length and can accurately display capacity values when the vollist command is used.

If required, you can override the template file with the tapelength command. Instructions for creating a template file follow:

Step 1.   Use an editor, such as `vi`, to create a template file
similar to the file shown in the following example:

```
# length code in 5th position of
# volume label
# D=n
# xxxxLxxxxxxxx
```

Step 2.   The `D=n` string, indicates the tape length value.

To define a 50 GB length for a tape, enter a value of
C as shown in the following example:

```
# length code in 5th position of
# volume label
# D=C
# xxxxLxxxxxxxx
```

Step 3.   The `xxxxLxxxxxxxx` string indicates the location
of the tape length value imbedded on the barcode.

To imbed the length in the fifth position on the
barcode, enter an **L** in the **fifth** position as shown in
the following example:

```
# length code in 5th position of
# volume label
# D=C
# 1R34L5M891J34
```

Step 4.   Save and name the template file
`/usr/amass/BarcodeTemplate`.

vgexport

Export data and attributes (metadata file) for a volume group to another AMASS file system.

The metadata file contains the directory structure and media attributes (such as media type, ownership, and timestamp) for a volume group. The metadata is part of the File System Database and is located in `/usr/amass/filesysdb`. It is exported as standard ASCII text.

Optional Feature

> **Optional Feature**
>
> Enable this optional feature with an authorization string obtained from ADIC. To request a string, refer to the Site-Specific Tasks chapter in *Installing AMASS*.

Disable Volume Verification

As part of the export process, AMASS mounts the volumes assigned to the volume group and verifies the header on each media with the volume label found in the File System Database.

If you have, for example, 10 volumes assigned to volume group 124, AMASS mounts all 10 volumes in a drive to read their header. This can take some time. To speed up the process, you can use the `-q` option to skip this step.

Limitations

The following limitations apply to the export process:

• Hard links and soft links are not exported. If the volume group being exported contains these file types, a warning message appears, but the export continues.

• Only volumes formatted with AMASS Version 4.7.1 and later can be exported.

• Run only one vgexport or vgimport on the system at a time.

Name Contention

HP-UX only: Because AMASS and HP-UX both have a vgexport command, make sure you use the full path to differentiate which command you want to use. For example, to use the AMASS command, enter it as shown in the following example:

```
# su root
# cd /usr/amass/bin
# ./vgexport
```

Or, make sure your PATH variable has /usr/amass/bin **before** the HP-UX /usr/sbin/vgexport.

Options

```
/usr/amass/bin

./vgexport
```

```
[-uy]

[-dgq]
-f metafilepath
volumegroup
```

Option	Description
-d	Remove all entries associated with the exported volume group from the Database on the **source** server
-g	Ignore volume verification
-q (defaults to mount volumes for header verification)	Do not mount and verify the volume header for each volume associated with the specified volume group
-u	Usage statement
-y	Suppress interactive messages
-f *metafilepath*	Enter a user-defined path for the metadata you are exporting **NOTE:** The metadata file is useless without the accompanying *volumegroup.*
volumegroup	Enter the volume group assignment of the accompanying metadata. Valid assignments are 1 through 2047. This volume group must not contain either hard links or symbolic links. **NOTE:** After the process has completed, AMASS marks the volume group as Read-Only to prevent it from being changed.

Example

This example assumes we have two AMASS installations, one in Denver and one in Texas, that need to share data. The Denver site collects data used by the Texas site.

At the Source Site

Step 1. In Denver, collect data and write it to volume group 3 in the AMASS file system.

Step 2. Every Friday afternoon, log in as either **amass** or **root**.

Step 3. **For SCSI-attached storage devices:** Use the voloutlet command to unload volume 67, which is assigned to volume group 3, from the library. (**For network-attached storage devices:** Use the bulkoutlet command.)

```
# su root
# voloutlet 67
```

Step 4. Use the vgexport command as shown in the following example:

User-defined metadata path ─────────┐

```
# vgexport ( -f /tmp/newcustomers ) 3
```

Volume Group ──────

Note

This metadata file is useless without the accompanying volume (67) assigned to a volume group (3).

Step 5. AMASS marks the volume group Read-Only to prevent the files from being changed.

Step 6. Use FTP (File Transfer Protocol) or something similar to send the *newcustomers* metadata file to Texas. The following figure illustrates our example to this point in time:

1. Export metadata that describes specified volume group.

2. Unload volumes assigned to specified volume group.
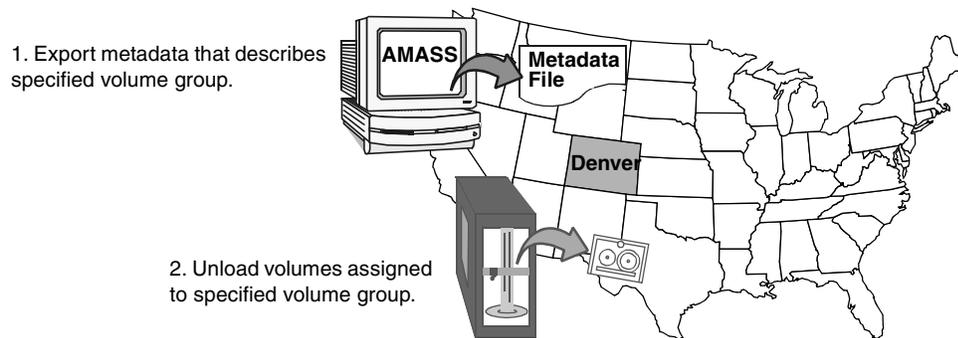
Step 7. To continue, see the vgimport command.

vgimport

Import data and attributes (metadata file) for a volume group from another AMASS file system.

Optional Feature

Optional Feature
Enable this optional feature with an authorization string obtained from ADIC. To request a string, refer to the Site-Specific Tasks chapter in *Installing AMASS*

Name Contention

HP-UX only: Because AMASS and HP-UX both have a vgimport command, make sure you use the full path to differentiate which command you want to use. For example, to use the AMASS command, enter it as shown in the following example:

```
# su root
# cd /usr/amass/bin
# ./vgimport
```

Or, make sure your PATH variable has /usr/amass/bin **before** the HP-UX /usr/sbin/vgimport.

Options

```
/usr/amass/bin

./vgimport

[-uy]

[-p path]
-v volumenumber
metafilepath
```

Option	Description
-u	Usage statement
-y	Suppress interactive messages
-p *path* (defaults to path at source site)	Enter a path relative to the mount point where you want to put the files that are currently on the imported volume. For example, if the **source** path is /denver, by default, that is the path that will be used at the destination site.
	If the imported volume exists under multiple directories, use the -p option for **each** directory. For example, to import the metadata for a volume that exists in both /denver and /texas directories, use **-p /denver** and **-p /texas** to correctly import the metadata.
	AMASS prevents you from overwriting existing files. For example, if the path and name at the **source** site is /denver/filename and the same name exists at the destination site, the import process will not complete.

Option	Description

-v *volumenumber*	Enter the volume number—**not** the volume group—associated with the metadata file.
	
	To list more than one volume, separate the numbers with a comma or with a hyphen. For example:
	
	• **vgimport -v 2-4**
	  imports volume numbers 2, 3, and 4
	
	• **vgimport -v 2,4**
	  imports volume numbers 2 and 4

metafilepath	Enter the user-assigned path for the metadata you are importing. Make sure this file has write permission enabled for either amass or public. **NOTE:** The metadata file is useless without the accompanying -v *volumenumber.*

Example

The following steps outline the same scenario we began with the vgexport command.

Step 1. To begin, see the vgexport command. The following figure illustrates our example:
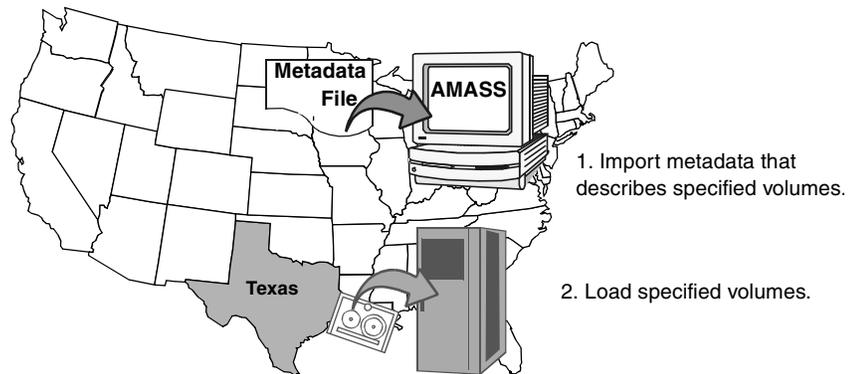
At the Destination Site

Step 2. **For barcode-reading libraries:** Open the /usr/amass/.juke/media_file *jukebox-number* file to verify that the barcode on the imported volume (67) will appear in the identified_masks group. If it will not appear, run the update mask command.

After modifying the .juke files, do the following:

- **IRIX only:** Reboot the server to process these changes on AMASS.

- **Other operating systems:** Restart AMASS to process these changes.

Step 3. **For network-attached storage devices:** Use the bulkinlet command to load volume 67 into the mailbox, assign it to volume group 3, mark it Online, and move it to a home storage slot. (**For SCSI-attached storage devices:** Use the volnew, volinlet, and volloc commands.)

```
# su root
# bulkinlet 3
```

AMASS assigns this media a **new** volume number, it is now volume number 55.

Step 4. Use vgimport to import the metadata—that was sent with FTP—into the File System Database. The options in our example:

- Imports the /tmp/newcustomers metadata file.

- The metadata information applies to volume number 55.

```
# vgimport -v 55 /tmp/newcustomers
```

AMASS compares the /tmp/newcustomers metadata with volume number 55 in the library and expects the attributes to match. If there is a discrepancy, AMASS returns an error.

vglist

View attributes for a volume group.

Note

By default, the view will not include block size or compression attributes, unless specifically requested with the -a option.

Options

```
/usr/amass/bin

./vglist

[-uy]

[-a]
[volumegroup]
```

Option	Description
no options	List all volume groups and their attributes
-a	View both the tape block size and the compression attributes
	NOTE: By default, block size and compression attributes will not display, unless you use this option.
-u	Usage statement
-y	Suppress interactive messages

Option	Description
volumegroup	Enter the unique volume numbers you want to load in the library and mark them Online in the Database.
	To list more than one volume, separate the numbers with a space. For example: **vglist 1 5** lists volume groups 1 and 5.

Example

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. To view attributes, including tape block size and compression, for volume group 801, enter the options shown in the following table:

```
# vglist -a 801

VOLGRP   JUKE   ----FLAGS----   blk   comp   vols   used   avail

801      0      !full  !worm    256   On     1      0      19503
```

Output Fields Defined

The following fields are generated by this command:

Field	Description
Volume Group	Volume group assignment
Jukebox Number	Reference number

Field	Description
Flags	Status of volume, **not volume group**: • full = space on volume group is full • worm = Media type • rw = Read and Write • TAPE = Media type • cdrom = Media type • SP = space pool • ro = Read-Only
Volume	Number of volumes assigned to the volume group
Used	Amount of space, in MB, occupied by files on the volume group
Avail	Amount of space, in MB, available on the volume group

Field	Description
Appears only if the -a option is used:	
Block Size	Tape's block size
Compression	Status. Valid values are: • On (default) = compression ON • Off = compression OFF • Dflt = status is undetermined because volumes are unformatted

vgpool

Define media for an out-of-space volume group to one of the following:

- Use the space pool.

- Use specific media (rewritable, WORM, tape, CD) from the space pool.

- Look for the space pool on a specific library or on any library.

When a volume group runs out of space—**if you have enabled it to use the space pool—**AMASS assigns a compatible volume from the space pool to the out-of-space volume group so archiving can continue without interruption. Consequently, if your site uses different types of media, the space pool should contain a mixture of media.

> **Note**
>
> A space pool is defined with the AMASS volgroup command.

Options

```
/usr/amass/bin

./vgpool

[-uy]
```

```
[-cdeirstw]
[-j jukeboxnumber]
volumegroup
```

Option	Description
-c	Limits the specified volume group to use only CD media
-d	Disable space pool
-e	Enable space pool
-i	View whether or not the specified volume group can use the space pool. When AMASS asks if you want to toggle the status, type **y** for yes or **n** for no.
-j *jukeboxnumber*	AMASS will only use the space pool located in the specified library. Use this option if you want AMASS to pull media from the space pool on a specific library. Consequently, when that space pool media is used up, no more space is left.
-r (defaults to optical media)	Limit specified volume group to only use rewritable optical platters from the space pool.
-s	Use standard (non-NSR) media in this volume group.
-t	Limit specified volume group to use only tape media from the space pool.
-u	Usage statement
volumegroup	Enter the numerical volume group. Valid values are 1 through 2047.

Option	Description
-w	Limit specified volume group to only use WORM optical platters from the space pool
-y	Suppress interactive messages

Enable Volume Group to use Space Pool

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. For more information about enabling volume groups to use the space pool, see "Volume Groups Defined" on page 1-13.

Step 3. To enable volume group 6 in jukebox 1 to use the space pool if it runs out of volumes, enter the command as shown in the following example.

Your input is shown in bold:

```
# vgpool 6

Volume group 6 is currently space pool Disabled:
Would you like to change its status? [y - n]: y
Volume group 6 is now Space Pool Enabled
```

Limit Media Usage and Location of Space Pool

Step 1. Log in as either `amass` or `root`.

Step 2. To enable space pool, use rewritable optical platter, and use the space pool located on library 2, enter the command as shown in the following example.

Your input is shown in bold:

```
# vgpool -r -j2 3

Volume group 3 is currently space pool disabled:
Would you like to change its status? [y - n]: y
Volume group 3 is now Space Pool Enabled
Volume group 3 is now Rewritable
Jukebox number is now 2
```

Step 3. Another way of entering the same information, but without prompts from AMASS is illustrated in the following example:

```
# vgpool -re -j2 3

Volume group 3 is now Space Pool Enabled
Volume group 3 is now Rewritable
Jukebox number is now 2
```

Enable Volume Group to use Tape Media

Step 1.   Log in as either amass or root.

Step 2.   To define media for an out-of-space volume group that **currently** is without volumes in it, AMASS defaults to optical media. If you want tape, you must use the -t option with the vgpool command.

```
# vpgool -t
```

vgreadonly

Define a volume group as one of the following:

- Read-Only

- Read and Write

Note

A volume group identified as the space pool (SP) or cleaning group (CL) cannot be marked Read-Only.

Characteristics

A volume group with Read-Only media has the following characteristics:

- Volume group is not available for writes, deletes, volcomps, or volcleans.

- New directories cannot be added to the volume group and existing directories cannot be deleted.

- A file in the volume group cannot be removed or renamed and its metadata (file attributes, such as access time, user id, etc.) cannot be changed.

Options

```
/usr/amass/bin

./vgreadonly
```

```
[-uy]

[-rw]
```
volumegroup

Option	Description
no options	View status for the specified volume group When AMASS asks if you want to toggle the status, type **y** for yes and **n** for no.
-r	Mark a specified volume group as Read-Only
-u	Usage statement
-w	Mark a specified volume group for both Reads and Writes
-y	Suppress interactive messages
volumegroup	Enter the numerical volume group. Valid values are 1 through 2047.

vgroot

View the directories assigned to a volume group.

If you have assigned more than one directory to the same volume group, AMASS returns the relative paths for all the directories. The path is relative to the AMASS mount point (the default is /archive).

Options

```
/usr/amass/bin

./vgroot

[-uy]
```
volumegroup

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumegroup	Enter the numerical volume group. Valid values are 1 through 2047.

Example

> **Step 1.** Log in as either amass or root.
>
> ```
> # su root
> ```
>
> **Step 2.** To view the relative paths for files assigned to volume group 674, enter the command as shown in the following example.
>
> The following output shows that two directories have been assigned to volume group 674:
>
> ```
> # vgroot 674
>
> ./techpubs
> ./mrktpubs
> The total count of roots for volume
> group 674 is 2
> ```
>
> **Step 3.** To assign the techpubs directory to another volume, use the setvolgrp command.

volclattr

Define attributes for cleaning volumes. For more information on drive cleaning, see the driveclean command.

Note

If a library automatically performs drive cleaning, do not configure a cleaning volume group in AMASS.

Prerequisites

To prepare for either automatic or manual drive cleaning, perform the following steps:

Step 1. Assign a cleaning volume to the cleaning group with the volnew command for SCSI-attached libraries (or bulkinlet command for network-attached libraries).

Step 2. Define drive-specific attributes to a cleaning volume with the volclattr command. For the required cleaning values, refer to your specific drive manual.

Note

Currently the CL volume group can contain only one type of cleaning cartridge. For example, if you have both a DTF drive and a 3590 drive, your CL volume group must contain only DTF cleaning cartridges or exclusively 3590 cleaning cartridges.

AMASS automatically defines the correct drive-specific values for IBM 3590 drives. Do not alter these values!

> **Step 3.** View cleaning attributes with the `vollist -g CL` command, if desired. Cleaning volumes must be: unformatted (U), Inactive (I), and Online.

Options

```
/usr/amass/bin

./volclattr

[-uy]

[-c currentusage]
[-e errorcount]
[-m maxusage]
[-t cleaningtime]
volumenumber
```

Option	Description
`-u`	Usage statement
`-y`	Suppress interactive messages
`-c` *currentusage*	Redefine how many times this cleaning volume has been used **NOTE:** Use this option to prolong the life of a cleaning volume.
`-e` *errorcount* (defaults to zero)	Enter how many errors can be logged to this cleaning volume before AMASS refuses to use it **NOTE:** Use this option to prolong the life of a cleaning volume.

Option	Description
-m *maxusage*	Enter the maximum number of times this cleaning volume can be used, even if the error count remains at zero
-t *cleaningtime*	Enter the time—in seconds— that this cleaning volume should remain in the drive before AMASS stops the cleaning process and returns the volume to its home storage slot
volumenumber	Enter the unique volume number for this cleaning volume **NOTE:** Only volumes previously assigned to the cleaning group can be entered.

volclean

Delete:

> All the files on a volume, but **not** the volume number from the File System Database.

Note

This command is not valid for volumes in the space pool or in the cleaning group.

Note

If you create a zero length file within an AMASS directory, ex. "touch filename", the file is not associated with a volume or volume group. This command will ignore such files. However, a zero length file, i.e. a non-zero length file that was written to tape and then truncated to zero length, will be recognized.

Prerequisites

Prior to using this command, make sure the volume is in its home storage slot. The volume must be Online (volloc -n), readable, writable, and Inactive (volstat -i).

If AMASS determines files exist on this volume, it prompts you to confirm their deletion. If a file is appended—spans—to another volume, AMASS deletes the entire file.

After volclean completes, make the volume available for reuse by using the volformat command.

Options

```
/usr/amass/bin

./volclean

[-uy]
```
volumenumber

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Enter the unique volume number

volcomp

Recover dead space by rewriting remaining data on a volume to a different volume in the same volume group.

Note

This command is not valid for volumes in the space pool or in the cleaning group.

Note

If you create a zero length file within an AMASS directory, ex. "touch filename", the file is not associated with a volume or volume group. This command will ignore such files. However, a zero length file, i.e. a non-zero length file that was written to tape and then truncated to zero length, will be recognized. Volcomp will not move the file and will exit with "These are files left after volcomp."

Dead space is space that has been previously written to by AMASS. A volume that contains scattered files separated by great expanses of dead space is a waste of media. This command helps you to recycle this wasted space.

After the volcomp process completes, the original volume is without data so AMASS marks it Inactive in the File System Database. To reuse the volume, format it with the volformat command.

Dead Space   Dead Space

Volume number 49
has a lot of dead
space.

File2

Source Volume 49

AMASS rewrites File2
to volume number 50,
which is in the same
volume group as
volume 49.

File5   File6   File7
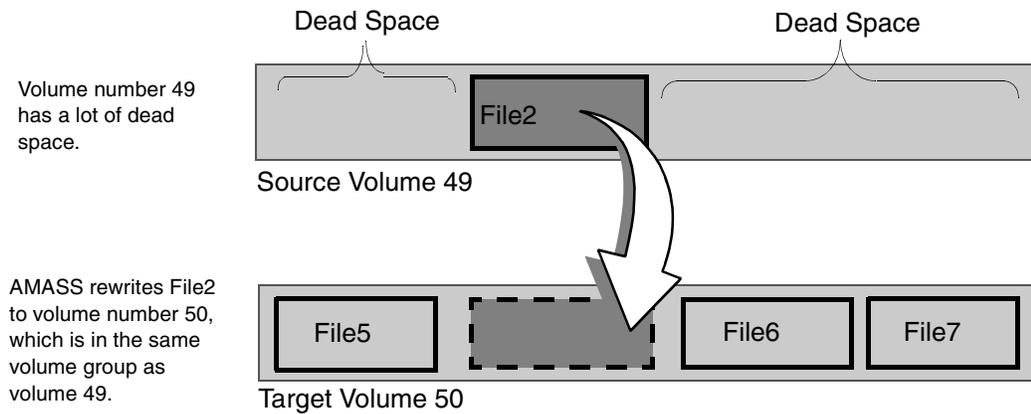
Target Volume 50

Prerequisites

Before using this command:

• Mark the target volume Active with the volstat command.

• Mark the volume group for Reads and Writes with the vgreadonly -w *volumegroup* command.

• There must be enough free space in the volume group to rewrite all data from the source volume.

• You must have at least one available drive.

• Run volcomp during off-hours.

• For better performance, run this command on a volume group when no other activity is taking place on the specified volume group.

Options

```
/usr/amass/bin

./volcomp

[-uvy]
```

volumenumber

Option	Description
-u	Usage statement
-v	Enable progress reporting
-y	Suppress interactive messages
volumenumber	Enter the unique volume number to volcomp

Example

Step 1. Log in as either amass or root.

```
# su root
```

Step 2. In the following example, we used the volspace command to list all volumes that have more than one-third (33%) dead space.

The output shows that volume number 2 meets this requirement.

```
# volspace 33
```

VOLGRP	JUKE	POS	LABEL	VOLFGS		VOLNUM	USERID	AVAIL	DEAD	ERRS
4	0	0A03	adm	o	w	2	386	0	33	0

Step 3.   Run the volcomp command on specified volume
number (2) as shown in the following example:

```
# volcomp 2
```

The few files on volume number 2 are moved to
another volume in the same volume group.

While the original volume is being volcomped,
AMASS marks the volume, shown in the Flag
column, with a "C" for volcomp and sets it
Read-Only "R"; this can be viewed in the output
generated by the vollist command. At the end of the
process, the original volume status, shown in the Flag
column, is "I" for Inactive.

Additional Information

For more information on recovering dead space, see "Recycle a
Volume" on page 2-21.

volcopy

Copy data from a source volume to a destination volume. If the original volume is lost, destroyed, or damaged, you can use the duplicate volume exactly like you would the original.

AMASS supports `volcopy` on the following media:

- WORM

- Rewritable optical (MO)

- Tape

This command copies the Backup Volume as well as all other volumes "known" to the File System Database. A volume is known to AMASS when an entry is created in the Database and AMASS assigns it a unique volume number.

Caution
If you write to the source volume again or use the volcomp command on it—**without recreating** a duplicate copy—data corruption may result because the duplicate is no longer exactly like the original volume.

Optional Feature

Optional Feature
Enable this optional feature with an authorization string obtained from ADIC. To request a string, refer to the Site-Specific Tasks chapter in *Installing AMASS*.

Requirements

Before using this command:

- Two drives are required—one drive to read the **source** volume and one drive to write to the **destination** media. The drives can be either standalone or in a library.

    - Although a standalone drive can be used, it is tedious because you must manually flip each volume several times. If you use a standalone drive you must also use the Standalone Operator Interface, which is run by using the sysop command. For complete information about this interface, refer to the Interface to Standalone Drives chapter in *Accessing Storage Devices*.

- The **source** volume must be:

    - Marked Online and Active in the File System Database

    - In its home storage slot at the beginning of the volcopy process

- The **destination** media must be:

    - An unknown piece of media. Unknown media does not have a volume number assigned by AMASS; therefore, the volume does not have an entry in the Database.

      If you need to use media previously used by AMASS, make sure you use the voldelete command to delete all the files on the media and to delete the volume number from the Database.

• Both source and destination media must be of the same type and have the same block size and capacity.

Tip

Manufacturing variations make "equal" tapes have variable lengths. Consequently, AMASS does not check tape lengths before allowing you to do the `volcopy` process.

The system administrator must make sure the source and destination tapes are the same types.

However, AMASS will check MO and WORM lengths.

Requirements are illustrated by the following figure:

Read Drive

Write Drive

Source Media

• Media is known to File System Database.

• Block size and capacity is same as destination volume.

• Inlet and outlet the volumes with either the volinlet and voloutlet commands or the bulkinlet and bulkoutlet commands, depending on the library connection.

• To prevent changes to the source volume, it is marked Read-Only after the volcopy process begins. The exception is the Backup Volume. AMASS recognizes the Backup Volume and leaves its' status as read-write.

Destination Media

• Media is unknown to File System Database—it does not have a volume number.

• Block size and capacity is same as source volume.

• Load and unload the volumes with the mediamove utility.

• During process, destination volume is flagged as IU (Inactive, Unformatted) and assigned to SP (space pool) volume group when displayed with the sysperf, sysop, and vollist commands.

Name Contention

Solaris and HP-UX only: Because AMASS, Solaris, and
HP-UX all have a volcopy command, make sure you use the
full path to differentiate which command you want to use. For
example, to use the AMASS command, enter it as shown in the
following example:

```
# su root
# cd /usr/amass/bin
# ./volcopy
```

Or, make sure your PATH variable has /usr/amass/bin **in
front of** the Solaris or HP-UX /usr/sbin/volcopy.

Standalone Optical Drives

Do not use the abort command with the Standalone Operator
Interface (run with the sysop command) to stop the AMASS
volcopy process.

Options

```
/usr/amass/bin

./volcopy

[-uy]
```
type **-c** | **-v** | **-cv**
```
[-f]
```
sourcevolume
destslottype
 [*destjukebox*]

Option	Definition
type	Enter one of the following copy types: • -c = Copy *sourcevolume* data to *destslot* media • -v = Verify copy process by reading and comparing the duplicate copy with the original volume • -cv = Copy and verify **NOTE:** Valid only for optical media.
-f	Force a copy even if the destination media contains a valid AMASS header or data
-u	Usage statement
-y	Suppress interactive messages
sourcevolume	Enter volume number of the source volume This volume must be in jukebox 1, online, formatted, and Active. **NOTE:** After the process has completed, AMASS marks this original volume as Read-Only to prevent it from being changed.

Option	Definition
destslottype	Enter the home storage slot where the destination media resides and where it will be returned. Destination media is unknown to the Database—it does not have a volume number.
	Valid slot designations are:
	• 4-alphanumeric designation (**0A12**) = SCSI-attached storage device
	• **n/a** = standalone drive
	• **NET** = network-attached storage device Enter the *barcode* as the next parameter.
	NOTE: During the process, AMASS flags this duplicate volume as IU (Inactive, Unformatted) and assigns it to SP (space pool) volume group when displayed with the sysperf, sysop, and vollist commands.
destjukebox (defaults to 1)	Enter the library number where the destination media resides

Example

To perform a volume copy, follow the steps below.

> **Note**
>
> For unattended operation, set up the AMASS `cron` file to run these commands.

Step 1. Log in as either `amass` or `root`.

```
# su root
```

Step 2. If the **source** volume is not in its home storage slot, use the `mediamove` utility to move the **source** volume to its slot in the library.

When the volcopy process starts, the source volume **must** be in its home storage slot.

Step 3. To move the **destination** media to a position in the library, use the `mediamove` utility. For complete information on this utility, see "mediamove" on page 4-36.

Step 4. Run the volcopy command as shown in the following example:

The destination media is located
in a standalone drive (n/a).

Force (-f) a copy.

volcopy -cv -f 6 n/a 2

Verifies (-v) the copy (-c) process.

The source volume number is 6.

Library
number is 2
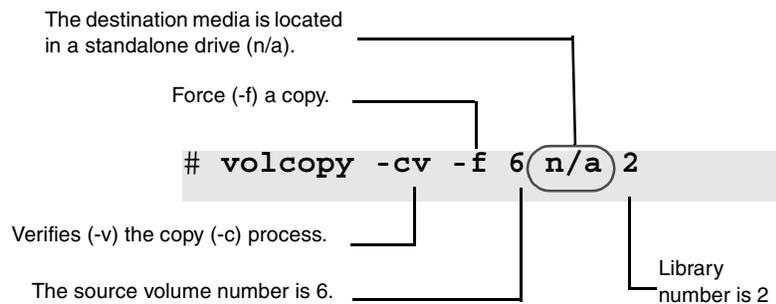
AMASS performs the following tasks:

- Loads the **destination** media from the standalone to a drive. If the volume needs formatting, AMASS performs this task.

- While the **source** volume is being copied, AMASS marks it as unavailable for both reads and writes.

• After the copy has completed, AMASS returns the destination media to its original location. In our example, AMASS returns it to the standalone.

Because the copy procedure depends on the amount of data on the source volume, the process can take as long as an hour to complete.

> **Note**
>
> After starting a volcopy procedure, do not attempt to kill the process with the `kill-9` command.

Step 5. If the verification process is successful, unload the destination media, mark it as a "COPY," and store it in a safe place.

• If the destination media is in the mailbox, simply remove the volume.

• However, if the destination media is in a home storage slot, use the `mediamove` utility to remove it from the library.

voldelete

Delete:

- All the files on a volume

- Volume number from the File System Database

Before a volume is deleted, AMASS checks to see if any files exists on the volume and asks you to confirm their deletion. If a file spans volumes, designated by an append record, AMASS deletes the whole file.

Note

Before using this command, mark the volume Offline (with volloc) and Inactive (with volstat). If the volume resides in the library, outlet the volume (use voloutlet for SCSI-attached storage devices or bulkoutlet for network-attached storage devices).

Note

If you create a zero length file within an AMASS directory, ex. "touch filename", the file is not associated with a volume or volume group. This command will ignore such files. However, a zero length file, i.e. a non-zero length file that was written to tape and then truncated to zero length, will be recognized.

Options

```
/usr/amass/bin

./voldelete

[-uy]
```

volumenumber

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Unique number of volume to be deleted

Additional Information

For more information on deleting a volume, see "Delete Files and Volume Number" on page 2-18.

voldir

View:

- All files on a volume
  (Files that span media are marked with an asterisk)

- Time and date the file was last accessed

Note

If you create a zero length file within an AMASS directory, ex. "touch filename", the file is not associated with a volume or volume group. This command will ignore such files. However, a zero length file, i.e. a non-zero length file that was written to tape and then truncated to zero length, will be recognized.

Options

```
/usr/amass/bin

./voldir

[-u]
```
volumenumber

Example

Option	Description
-u	Usage statement
volumenumber	Enter the unique volume number where you want to view directories

Following is an example of output generated by this command for volume 3. The default AMASS mount point is /archive.

```
# voldir 3

-rw-r--r-- 1 root daemon 2044 Aug 24 17:20
/archive/vgrp1/list1
-r--r--r-- 1 amass daemon 2446 Aug 25 08:2
/archive/vgrp1/testfile1 **
```

The asterisks indicate this file started on another volume and is continued on this volume.

```
-rw-rw-r-- 1 amass daemon 6892 Aug 25 10:0
/archive/dir1/listings
```

volfilelist

View all files on a volume, one file per line.

Note
If you create a zero length file within an AMASS directory, ex. "touch filename", the file is not associated with a volume or volume group. This command will ignore such files. However, a zero length file, i.e. a non-zero length file that was written to tape and then truncated to zero length, will be recognized.

Options

```
/usr/amass/bin

./volfilelist

[-uv]

[-ahilnr]
```
volumenumber

Option	Description
-a	Print absolute path, starting with the AMASS mount point For example, /archive/dir1.

Option	Description
StorageTek drives:	
-h	View start of the file's block address as a hexadecimal value enclosed in parentheses
-i	Print the file's inode number
-l	Print file names (a variable length field) last, similar to the format for the UNIX ls command. This option will make it easier to sort or manipulate the output in a script.
-n	Do not list appended files
-r (defaults to relative path)	Print relative path For example, ./dir1.
-u	Usage statement
-v	Verbose messages
volumenumber	Enter the unique volume number

Verbose Example

The following example illustrates output for:

- Storage Technology drives (-h)

- Absolute paths (-a)

- Verbose messages (-v)

- Files on volume number 2

Mode ─────────────── Links

Size ─────────────── UID

Zero designates a directory ─── GID

```
# su root
# volfilelist -hav 2
/archive/prodcode 0 0 04010  0 1 1
19980207114408  19980307142206
```

Access time ───
Modified time ───

```
/archive/dirname/filename 2 71 (0x021001e6)
10 010770 1 0 1 19980207114408 19980307142206
~
```

Hex value of
StorageTek file's
block address.

Directory name ───

File name ───

Volume number ───

Logical block address
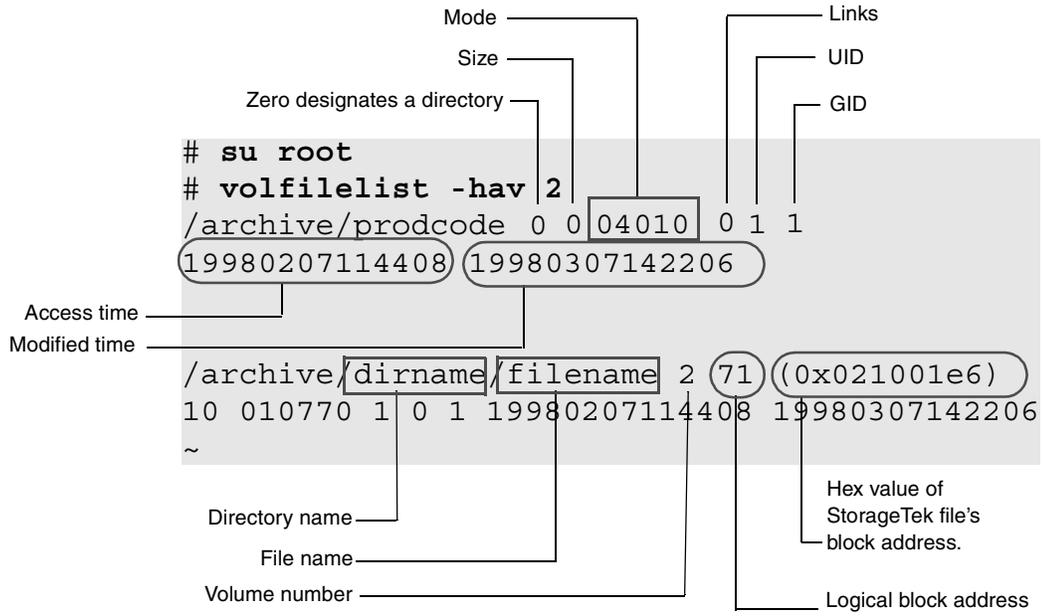
Nonverbose Example

The following example illustrates output for:

- Relative paths (-r)

• Files on volume number 2
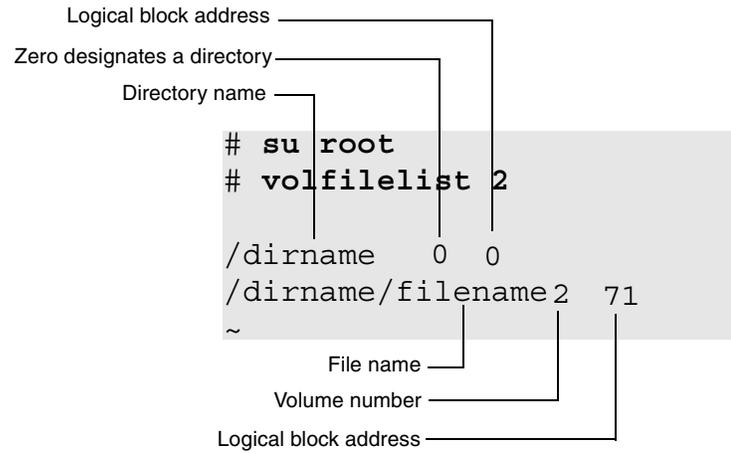
Logical block address ────────────────────┐

Zero designates a directory ──────────┐   │

Directory name ──────┐   │   │

```
# su root
# volfilelist 2

/dirname    0   0
/dirname/filename 2  71
~
```

File name ─────────┘

Volume number ──────────┘

Logical block address ────────────┘

Output Fields Defined

The following fields are generated by this command.

Fields	Description
Name	Directory name or file name on the specified volume
Directory	Zero = directory
Logical block address	Start of file's block address in logical format
Size	Size of the file in MB
Mode	File permissions
Links	Number of hard links for this file
UID	Numeric user ID
GID	Numeric group ID
Access_time	Last time file was accessed
Modified_time	Last time file was modified

Fields	Description
StorageTek drives: Displays only if the `-h` option is used.	
Device block address	Start of the file's block address appears as a hexadecimal number enclosed in parentheses

TIME Format

The Access_time and Modified_time values have the following format: `yyyymmddhhmmss`. For example, the value `19980307114408` = 1998, March 07, 11:44:08 a.m.

This format allows you to sort by time, which is useful when creating a list of files created at a specific date and time.

Inode Example

The following output shows an example of the inode output for volume number 2:

```
# volfilelist -i 2

/vg800/bg1              6       2       204801
/vg800/01Mar182007     15       2       977033
```

File Name   Volume Number

Inode   Logical Block Address

File Names Last Example

The following output shows an example of the file names in the last field position:

```
# volfilelist -l 2

2        204801      /vg800/bg1
2        977033      /vg800/01Mar182007
```

Volume Number   File Name

Logical Block Address

Practical Application

The following example uses this command to back up files, in optimized order, from a volume to a tape. AMASS backs up entire files, even if they span media. Both scenarios assumes the AMASS mount point is /archive.

Using cpio Command

Step 1.   Log in as either amass or root.

```
# su root
```

Step 2.   Enter the commands as shown in the following example.

Lists all files on volume 2.

Numerically sorts files based first upon volume, then based upon logical block address.

```
# cd /archive

# (volfilelist 2) | (sort) -n +1 +2 | (awk '{print $1}' | \
     cpio -oc >/dev/rmt/0m
```

Backs up the files to a tape loaded in drive /dev/rmt/0m.

Prints just the file names.
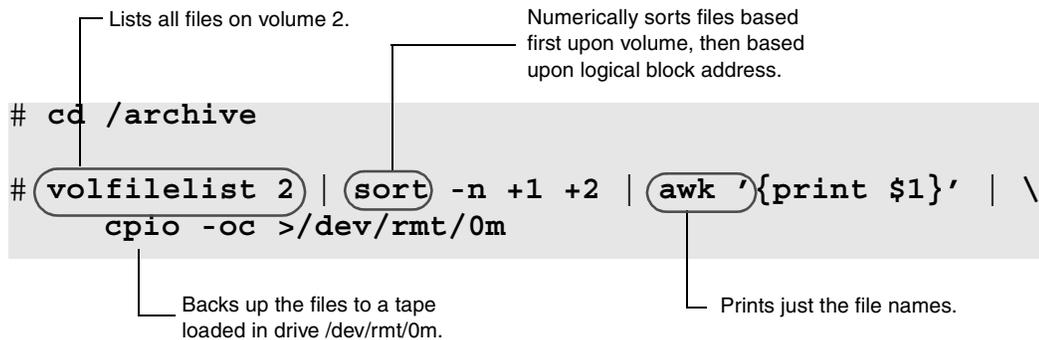
Step 3.   When AMASS backs up partialfile, which starts on volume 2 and is appended onto volume 3, AMASS switches the media in the drive to back up the remainder of partialfile on volume 3. AMASS then reloads Volume 2 so it can continue the backup process.

Using tar Command

> **Step 1.** Log in as either `amass` or `root`.

```
# su root
```

> **Step 2.** Enter the commands as shown in the following example.

Backs up the files to a tape
loaded in drive /dev/rmt/0m.   Lists all files on volume 2.

```
# cd /archive

# tar -cvf /dev/rmt/0m  volfilelist 2 | sort -n +1 +2 |\
      awk '{print $1}'`
```

Prints just the file names.

Numerically sorts files based
first upon volume, then based
upon logical block address.

> **Step 3.** To back up the files on volume 2 to your magnetic disk, substitute */mydir/vol2.tar* for `/dev/rmt/0m`

volformat

Format media with specified attributes.

Tip
Optical platters only: Because a full format can take a long time—more than 40 minutes—ADIC recommends that you format these volumes during off-hours.

Note
If you create a zero length file within an AMASS directory, ex. "touch filename", the file is not associated with a volume or volume group. This command will ignore such files. However, a zero length file, i.e. a non-zero length file that was written to tape and then truncated to zero length, will be recognized.

Prerequisites

Before using this command, the volume must have the following characteristics:

- Be Online
  (Use the volloc command to view and toggle status.)

- Contain no data that you want to keep

- Not assigned to the cleaning volume group (CL)

Options

```
/usr/amass/bin

./volformat

[-uy]

[-pq]
[-b blocksize]
[-c {on|off}]
[-d num]
[volumenumber]
```

Option	Description
no options **NOTE:** Not valid for WORM because the volume cannot be erased.	**For optical platters:** Perform a full format that includes these tasks: • Erases both sides of the platter • Formats both sides of the platter • Writes header information **For tape:** • Writes header information
-u	Displays this usage statement Usage: volformat [-b blocksize] [-c on|off] [-pquyd] [volumelist]
-y	Suppress confirmation and informational messages.

Option	Description
volumenumber	Enter the unique volume number of the media you are formatting
	To list more than one volume, separate the numbers with a space. For example: `volformat 6 12 47 49` formats volumes 6, 12, 47, and 49.
	In addition, to list more than one volume as a range, separate the range of numbers with a dash. For example: `volformat 6-12 47-49` formats volumes 6, 7, 8, 9, 10, 11, 12, 47, 48, and 49.
	You may combine the two ways to list single numbers and ranges. For example: `volformat 4 6-8 10-12 47-49 53` formats volumes 4, 6, 7, 8, 10, 11, 12, 47, 48, 49, and 53.

Option	Description
For optical platters:	
`-p` **NOTE:** Not valid for WORM because the volume cannot be erased.	force physical format
`-q`	quick -- formats faster, but writes are slower!

Option	Description
For tape drives:	
`-b` *blocksize* (defaults are drive-dependent) **NOTE:** Valid only for specified drives, see "Configure Block Size" on page 3-164.	Enter the tape's block size. Valid values are: • If MAXIOSZ is 1024 (HP, IBM, SGI, and Solaris): enter 16K, 32K, 64K, 128K, 256K, 512K, or 1024K • If MAXIOSZ is 256: enter 16K, 32K, 64K, 128K, or 256K • If MAXIOSZ is 128: enter 16K, 32K, 64K, or 128K Sizes can be entered with upper case K, lower case k, as a multiple of 1024. For example: • 16K (upper case K) • 16k (lower case k) • 16384 (the product of 16 x 1024) • 32768 (the product of 32 x 1024) • 65536 (the product of 64 x 1024) and so on
`-c on` (Default) `-c` off **NOTE:** Valid only for specified drives, see "Configure Compression" on page 3-164.	Specify device compression mode
`-d` num	use multiple (num) drives.

Format a New Volume

Step 1.   Log in as either **amass** or **root**.

Step 2.   To make the initial entry in the File System Database and receive from AMASS a unique volume number, use the volnew command.

Step 3.   To load the specified volume number in a library, use the volinlet command.

> **Note**
>
> This command is not valid for libraries without a mailbox.

Step 4.   To mark the specified volume number Online in the File System Database, use the volloc command.

> **Note**
>
> This command is not valid for libraries without a mailbox.

Step 5.   **Storage Tek Redwood tape drives:** Enter the length of tape in the File System Database with the tapelength command.

Step 6.   To format volume 33, enter the command shown in the following example.

   After you enter the list of volume numbers, AMASS asks for confirmation of the process.

```
# volformat 33
```

```
WARNING, volformat will overwrite the
entire volume
DO NOT FORMAT volumes which have good
files on them
You cannot format active volumes
Do you want to continue?
[y - n] y
The following volumes will be formatted:
    33
1 volume(s) to be formatted?
[y - n] y
volformat: format of volume 33 started
volformat: format of volume 33 complete
volformat: completed formatting all
volumes
```

Step 7. To further prepare the volume so AMASS can read or write to it, use the commands listed in the following table.

Command	Description
volstat	Mark the volume Active in the Database
	Active allows AMASS to read and write to media

Attributes Within Volume Groups

Each volume's attributes within a numerical volume group must be uniform. For example, if the first volume in a numerical volume group has been formatted with compression ON and a block size of 64 KB, all the volumes in that volume group will have these identical attributes.

If you reassign media from one volume group to another volume group (with the volgroup -f option), AMASS makes sure the media attributes from the first volume group match the

attributes of the second volume group. If the values do not match, AMASS issues an error and does not complete the reassignment. For information on numerical volume groups, see "Volume Groups Defined" on page 1-13.

Configure Block Size

Thoroughly understand what this option does before using it.

Caution

Use the tape block size option (-b *blocksize*) with care.

Tip

For detailed information on optimizing block size, see "Fine-tune Block Size" on page B-1.

Refer to the AMASS Release Notes for a list of drives that support configurable block size.

Configure Compression

Refer to the AMASS Release Notes for a list of drives that support compression.

Note

AMASS assumes a compressed capacity of 2:1 ratio, but some newer drives may have a compressed capacity of 3:1. Consequently, the capacity displayed by the vollist command after a volformat will currently show a 2:1 native GB capacity.

Example Configuring Block Size and Compression

> **Step 1.** Log in as either **amass** or **root**.
>
> **Step 2.** The following example formats volume number 1 with a block size of 128 KB and compression is enabled.

Block size ─────────────────────┐   ┌───────── Compression

Suppress messages ──────────┐   │   │   ┌──── Volume number

```
# volformat -y ( -b 128k ) ( -c on ) 1
```

Tools that Display Block Size and Compression

> The following tools display both a tape block size (blksiz) and compression (cmpr) field that allows you to view these configurations:
>
> • vglist command—By default, both block size and compression attributes do not display, unless specifically requested with the -a option. For more information about this command, see "vglist" on page 3-117.
>
> • volprint utility—By default, both block size and compression attributes do not display, unless specifically requested with the -a option. For more information about this utility, see "volprint" on page 4-72.

volgroup

Assign a volume to one of the following groups:

- Numeric volume group numbered 1 through 2047

- Space pool
  A volume with files on it cannot be assigned to the space pool (SP). When a volume group runs out of space AMASS assigns a compatible volume from the space pool to the out-of-space volume group so archiving can continue without interruption. Consequently, if your site uses different types of media, the space pool should contain a mixture of media.

- Cleaning group
  Cleaning cartridges are assigned to the cleaning group (CL).

> **Note**
>
> If a library automatically performs drive cleaning, do not configure a cleaning volume group in AMASS.

- Media verification group
  A volume assigned to the media verification (MV) volume group consists of media verified by a third party to be "good" for the AMASS Infinite File Life (IFL) optional feature. For more information about IFL, refer to the "Infinite File Life" manual.

> **Tip**
>
> For a definition of volume groups, see "Volume Groups Defined" on page 1-13.

Options

```
/usr/amass/bin

./volgroup

[-uy]

[-f]
```
volumenumber
volumegroup

Option	Description
-f	Force the assignment of a volume to a volume group, even if files exist on the media
	NOTE: This option does not **change** the assignment for the directories and files. To change an assignment, use the setvolgrp command.
	NOTE: Make sure the metadata (or attributes) of the volume matches the attributes of the volume group you force the assignment to. If the attributes do not match, AMASS issues a message and does not complete the reassignment.
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Enter the unique volume number

Option	Description
volumegroup	Enter the volume group assignment. Valid assignments are either: • A numeric value, 1 through 2047 • SP, space pool A volume with files on it cannot be assigned to the space pool. • CL, cleaning group • MV, media verification group for the optional Infinite File Life feature

Attributes Within Volume Groups

Each volume's attributes within a numerical volume group must be uniform. For example, if the first volume in a numerical volume group has been formatted with compression ON and a block size of 64 KB, all the volumes in that volume group will have these identical attributes.

If you reassign media from one volume group to another volume group (with the volgroup -f option), AMASS makes sure the media attributes from the first volume group match the attributes of the second volume group. If the values do not match, AMASS issues an error and does not complete the reassignment. For information on numerical volume groups, see "Volume Groups Defined" on page 1-13.

Change Volume Group Number

Step 1. Log in as either **amass** or **root**.

Step 2. To assign volume number 23 to volume group 100, enter the command as shown in the following example.

AMASS asks for confirmation of the process.

```
# su root
# volgroup 23 100

Request to change volume group on volume 23
     Old group is 0
     New group is 100
Is this information correct? [y - n]: y
Volume 23 has been added to volume group 100
```

Step 3.   Use the setvolgrp command to update the directories and files with the new volume number.

> **Note**
>
> This command works only six levels deep. Therefore, run it as many times as necessary.

Assign Volume to Space Pool

Step 1.   Log in as either **amass** or **root**.

Step 2.   To assign volume number 10 to the space pool, enter the command as shown in the following example.

AMASS asks for confirmation of the process.

```
# volgroup 10 SP

Request to change volume group on volume 10:
     Old group is 1
     New group is SP
Is this information correct? [y - n]: y
Volume 10 has been added to volume group SP
```

volinlet

Load previously defined volume through the mailbox and mark online.

Tip

This command is valid only for SCSI-attached storage devices.

Note

This command is not valid for libraries without a mailbox.

Options

```
/usr/amass/bin

./volinlet

[-uy]
```
volumenumber

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Enter the unique volume number you want to load and mark Online in the Database

Load a New Volume

Step 1. Log in as either **amass** or **root**.

Step 2. To make the initial entry in the File System Database and receive from AMASS a unique volume number, use the volnew command.

Step 3. To load volume number 33 in a library, enter the command as shown in the following example. AMASS prints instructions for putting the volume into the library. This instruction line is specific to the library being used.

```
# su root
# volinlet 33

Place volume into inlet with side A up.
```

Step 4. After placing the volume in the mailbox, AMASS asks for confirmation of the process.

```
# volinlet 33

Place volume into inlet with side A up.
Ready? (y/n) y
Inlet operation completed.
```

If you are using the Standalone Operator Interface, AMASS prompts you to put the volume in the mailbox.

Step 5. To further prepare the volume so AMASS can read or write to it, use the commands listed in the following table:

Command	Description
volloc **NOTE:** Not valid for libraries without a mailbox.	Mark the volume Online in the Database Online = media is in storage device
StorageTek Redwood tape drives only:	
tapelength	Enter the length of tape in the Database
volformat	Format the volume
volstat	Mark the volume Active in the Database Active allows AMASS to read and write to media

vollabel

Reassign AMASS volume to media with a different label or change the volume label (-r).

Options

```
/usr/amass/bin

./vollabel

[-uyr]
```

volumenumber
newvolumelabel

Option	Description
-r	Change volume label after it was physically replaced on media
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Enter the unique volume number whose label you are changing

Option	Description
newvolumelabel	Enter one of the following: • User-assigned name that is a maximum of 13 characters long • Preprinted barcode that is a maximum of 13 alphanumeric characters long **NOTE:** For barcode-reading libraries, a barcode label is required.

Change Volume Label

Step 1. Log in as either **amass** or **root**.

Step 2. To change a volume label on volume number 2 to pubsvolume, enter the command as shown in the following example.

AMASS asks for confirmation of the process.

```
# su root
# vollabel 2 pubsvolume

Request to change volume label on volume 2:
     Old label is volume2
     New label is pubsvolume
Is this information correct? [y - n]: y
New Volume label is pubsvolume
Volume 2 label has been changed
```

volleft

Write how much space—in kilobytes—remains on a volume to standard out (stdout).

Options

```
/usr/amass/bin

./volleft

[-uy]
```
volumenumber

Option	Description
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Enter the unique volume number you want space information on

Example

Following is an example of output generated by this command for volume 2.

```
# su root
# volleft 2
```

```
338652
```

There is 338,652 KB of space remaining on this volume.

vollist

View attributes for:

- One volume

- All volumes

- A volume group

If you think there may be a discrepancy between what is in your library and the File System Database or if you want to verify what is **actually** in the home storage slots, use the medialist utility. For instructions on using this utility, see the "Troubleshooting Tools" chapter.

Note

By default, the view will not include cleaning attributes, unless specifically requested with the -g CL option.

Options

```
/usr/amass/bin

./vollist

[-uy]

[-g volumegroup]
[volumenumber]
```

Option	Description
no options	View attributes for all volumes
-u	Usage statement
-y	Suppress interactive messages
-g *volumegroup*	View attributes for the specified volume group
	Valid volume groups are:
	• Numeric value, 1 through 2047
	• SP, space pool
	• CL, cleaning group
	NOTE: By default, cleaning attributes will not display unless specifically requested by entering **-g CL**.
	• MV, media verification group for the optional Infinite File Life feature
volumenumber	View attributes for specified volume

Reset to Zero

Use the setvolerr command to reset the error counts reported by the vollist command to zero. For syntax, see "setvolerr" on page 3-87.

View Attributes for One Volume

Following is an example of the output for volume number 2.

```
# su root
# vollist 2

VOL    VOL    JUKE  POS   VOLLA   FLAGS  USED     AVAIL (MB)   DEAD%   ERRS
NUM    GRP                BEL            (MB)

2      673    1     net   PUBS    A      0        19503        0       0

1 volumes in volume group 673
```

Note

AMASS assumes a compressed capacity of 2:1 ratio, but some newer drives may have a compressed capacity of 3:1. Consequently, the capacity displayed by the vollist command after a volformat will currently show a 2:1 native GB capacity.

View Attributes for All Volumes

Following is an example of the output for all volumes in a library:.

```
# vollist

VOL    VOL    JUKE  POS   VOLLABEL       FLAGS  USED    AVAIL   DEAD   ERRS
NUM    GRP                                      (MB)    (MB)    %

1             1     net   BACKUPVOLUME   I      23      42984   0      0

2      800    1     net   data1          A      29827   12012   3      0

3      801    1     net   data2          A      7730    35276   0      0

4      800    1     net   data3          I      820     42187   0      0
```

```
5     MV    1     net   data5          I     0        43007  0      0

5 volumes in filesystem
```

View Attributes for Cleaning Group

Following is an example of status output for the volumes in the cleaning group:

Cleaning volumes always have "CL" for the volume group.

Cleaning volumes always have the flags: "I" (inactive) and "U" (unformatted).

```
# vollist -g CL

NUM  GRP  JUKE   POS   LABEL   FLAGS   USED   AVAIL   DEAD%   ERRS
49   CL   1      NET   clean   IU      0      0       0       0

1 volumes in volume group CL
```

Output Fields Defined

The following fields are generated by this command:

Field	Description
Volume Number	Volume number
Volume Group	Volume group assignment
Jukebox Number	Reference number
Position	Home storage slot. Valid values are: • 4-Alphanumeric designation (**0A12**) = SCSI-attached storage device • n/a = standalone drive • NET = network-attached storage device

Field	Description
Volume Label	Either: • User-assigned name • Preprinted barcode

Field	Description
Flags For more information, see "Flags Defined" on page 3-183.	Status of volume: • A = Active volume used by AMASS • C = Volume is being volcomped or a volcomp procedure has aborted • I = Inactive volume not currently used by AMASS • K = Reserved • O = Offline volume • Q = Volume has been quick formatted • R = Volume is marked as Read-Only. This occurs as a result of either: (1) a write error that makes the media unwritable or (2) a user has forced the media to be Read-Only with the volreadonly command. • U = Volume not formatted • W = Media type is WORM
Used	Amount of space, in MB, occupied by files on the volume

Field	Description
Avail	Amount of space, in MB, available on the volume
	NOTE: AMASS assumes a compressed capacity of 2:1 ratio, but some newer drives may have a compressed capacity of 3:1. Consequently, the capacity displayed by the `vollist` command after a `volformat` will currently show a 2:1 native GB capacity.
Dead	Amount of space no longer referenced by files
	Expressed as a percentage of the total volume space; the higher the percentage, the greater the amount of dead space
	NOTE: Volumes with high percentages are good candidates for the volcomp process.
Errors	Number of errors on this volume

Field	Description
For volumes in the cleaning group (CL):	
Current Usage	Number of times a cleaning volume has been used
Max Usage	Maximum number of times a cleaning volume may be used
Clean Time	Amount of time, in seconds, a cleaning volume will remain in a drive

Flags Defined

The following table describes the Active, Inactive, Online, and Offline values a volume can have in the Flag field:

	Online	**O = Offline**
A = Active	Volume is **in** library AMASS **can** read and write to volume.	Volume is **not** in library AMASS **can** read and write to volume with Offline Media Manager (OMM). For OMM information, see "Read Offline Volume" on page 2-25.
I = Inactive	Volume is **in** library AMASS **cannot** read or write to volume.	Volume is **not** in library AMASS **cannot** read or write to volume.

volloc

Mark a volume in the File System Database as either:

- -n (Online) = Inside the library

- -o (Offline) = Outside the library

Note

Use this command if you had to use the mediamove utility to move a volume thus the File System Database did not get updated.

This command is not valid for storage devices without a mailbox.

Options

```
/usr/amass/bin

./volloc

[-uy]

[-no]
```
volumenumber

Option	Description
-n	Mark volume Online in the Database • Online = media is in storage device

Option	Description
`-o`	Mark volume Offline in the Database and eject the volume from the drive • Offline = media is stored outside storage device
`-u`	Usage statement
`-y`	Suppress interactive messages
volumenumber	Enter the unique volume number

Mark New Volume Online

Step 1. Log in as either **amass** or **root**.

Step 2. To make the initial entry in the File System Database and receive from AMASS a unique volume number, use the volnew command.

Step 3. To load the specified volume number in a library, use the volinlet command.

Step 4. To mark volume number 33 Online in the File System Database, enter the command as shown in the following example.

```
# volloc -n 33
```

Step 5. To further prepare the volume so AMASS can read or write to it, use the commands listed in the following table.

Command	Description
StorageTek Redwood tape drives only:	
tapelength	Enter the length of tape in the Database
volformat	Format the volume
volstat	Mark the volume Active in the Database • Active allows AMASS to read and/or write to media

volnew

Create an entry in the File System Database for new, unknown media.

> **Note**
>
> For tracking purposes, AMASS assigns the **new** volume a unique volume number.

Options

```
/usr/amass/bin

./volnew

[-uy]
```

volumegroup
slot
volumelabel
 [*jukeboxnumber*]

Option	Description
-u	Usage statement
-y	Suppresses interactive messages

Option	Description
volumegroup	Enter the volume group assignment. Valid assignments are: • A numeric value, 1 through 2047 • SP, space pool. A volume with files on it cannot be assigned to the space pool. • CL, cleaning group • MV, media verification group for the optional Infinite File Life feature
slot	Enter a home storage slot where you want the media to reside. Valid slot entries are: • 4-alphanumeric designation (0A12) = SCSI-attached storage device • `n/a` = standalone drive • `NET` = network-attached storage device
volumelabel	Enter one of the following: • User-assigned name that is a maximum of 13 characters long • Preprinted barcode that is a maximum of 13 alphanumeric characters long. **NOTE:** For barcode-reading libraries, a barcode label is required.
jukeboxnumber (defaults to 1)	Enter the library number where the new volume will reside

Create Database Entry for New Volume

The following example illustrates how to create an entry in the File System Database for a new volume, assign it to volume group 4, slot 0A64 in library number 2, and label it with a volume label of "test."

Step 1.   Log in as either **amass** or **root**.

Step 2.   To create an entry in the File System Database and receive a unique volume number from AMASS, enter the command as shown in the following example.

AMASS asks for confirmation of the process.

New volumes have an initial status of:

- Inactive (I)
- Unformatted (U)
- Offline (O). **NOTE**: When volumes are destined for libraries without a mailbox, their status is Online.

```
# su root
# volnew 3 0A64 test 2

Request to add a new volume:
Volume group will be 3
Volume position will be 0A64
Volume label will be test
Volume jukebox number will be 2
    Is this information correct? [y - n]: y
Volume 33 has been added, status is Inactive
be sure volume is formatted before activatir
```

AMASS assigned this volume a unique volume number of 33.

Step 3.   To load the volume into the library and continue with the initialization process, use the commands listed in the following table.

Command	Description
volinlet **NOTE:** Not valid for libraries without a mailbox.	Load volume into the library
volloc **NOTE:** Not valid for libraries without a mailbox.	Mark the volume Online in the Database • Online = media is in storage device
StorageTek Redwood tape drives only:	
tapelength	Enter the length of tape in the Database
volformat	Format the volume
volstat	Mark the volume Active in the Database • Active allows AMASS to read and/or write to media

volnote

Enter a user-defined 255-character description for a volume.

Options

```
/usr/amass/bin

./volnote

[-uy]
```

volumenumber
volumenumber "text"
-d *volumenumber*

Option	Description
no options	Generates a list of all volumes and their corresponding descriptions
-u	Usage statement
-y	Suppress confirmation messages
volumenumber	Display the description for the specified volume number
volumenumber "text"	Enter a 255-character user-defined description for the specified volume. Enclose the string in quotes.
-d *volumenumber*	Delete the description for the specified volume

The following example generates a list of all volumes and their descriptions:

```
# su root
# volnote

VOLNUM      DESCRIPTION
1           Backup volume.
2           This is a Cleaning volume.
3           Project Y2k for accounting dept.
```

The following example generates the description for volume #2:

```
# volnote 2

This is a Cleaning volume.
```

The following example allows you to create the description for volume #4. Using the -y option suppresses the confirmation message. You can also change the description by using this combination of options.

```
# volnote -y 0004 "This volume contains
information about our super duper new
product that is extremely important to
the whole wide world."
```

The following example allows you to delete the description for volume number #3. Using the -y option suppresses the confirmation message.

```
# volnote -y -d 3
```

Tip

To remove the volume description as well as **all** other information pertaining to the volume, use the AMASS voldelete command.

For offline volumes, the Offline Media Manager, run with the sysop command, displays the volume description as part of the mount request if the notation is at least eight bytes long and contains no unprintable characters that would corrupt the display. For more information on reading offline volumes, see "Read Offline Volume" on page 2-25.

voloutlet

Eject volume to the mailbox and mark offline.

Tip
This command is valid for both SCSI-attached and network-attached storage devices.

Tasks

The following tasks are valid for libraries with a mailbox:

• Ejects a volume from home storage slot to the mailbox

• Marks the volume Offline in the File System Database

If media is currently in the drive, AMASS returns the media to its home storage slot before outletting the specified volume to the mailbox.

Options

```
/usr/amass/bin

./voloutlet

[-uy]
```
volumenumber

Option	Description
`-u`	Usage statement
`-y`	Suppress interactive messages
volumenumber	Enter the unique volume number you want to outlet from the library and mark Offline in the Database

volreadonly

Mark volume either:

- Read-Only

- Read and Write

Note

This command is not valid for volumes in the space pool or in the cleaning group.

Options

```
/usr/amass/bin

./volreadonly

[-uy]

[-rw]
```
volumenumber

Option	Description
no options	View status of the specified volume
	When AMASS asks if you want to toggle the status, type **y** for yes and **n** for no.
-r	Mark volume Read-Only
-u	Usage statement

Option	Description
-w	Mark volume Read and Write
-y	Suppress interactive messages
volumenumber	Enter the unique volume number

volslot

Change a volume's home storage slot in the File System Database, but the volume is **not** physically moved.

This command can also be used to assign an offline volume to a standalone drive if you have Offline Media Manager (OMM). For OMM information, see "Read Offline Volume" on page 2-25.

Note

Before using this command, the volume must be Offline (use the volloc command).

Options

```
/usr/amass/bin

./volslot

[-uy]
```
volumenumber
slot
 [*jukeboxnumber*]

Option	Description
-u	Usage statement
-y	Suppress interactive messages

Option	Description
volumenumber	Enter the unique volume number
slot	Enter a home storage slot where you want the media to reside Valid slot entries are: • 4-alphanumeric designation (0A12) = SCSI-attached storage device • `n/a` = standalone drive • `NET` = network-attached storage device. Enter the *barcode* as the next parameter.
jukeboxnumber (defaults to 1)	Enter the library number where the specified volume resides

Change Slot Assignment

To change the home storage slot number for volume number 15 from slot 0A02 to 0A56 in library number 1, perform the following steps:

Step 1. Log in as either **amass** or **root**.

Step 2. Outlet volume number 15 as shown in the following example.

Use voloutlet for SCSI-attached storage devices and bulkoutlet for network-attached storage devices.

```
# su root
# voloutlet -y 15
```

Step 3. Change the volume's home storage slot number to 0A56 with the following options and values:

```
# volslot -y 15 0A56
```

Step 4. Insert the volume into the mailbox and enter the following option and values:

```
# volinlet -y 15
```

The library moves volume number 15 to slot 0A56.

volspace

View all volumes with a specified percentage of dead space.

Dead space is space that has been previously written to by AMASS. A volume that contains scattered files separated by great expanses of dead space is a waste of media. See the volcomp command.

> **Note**
>
> This command does not report information on volumes in the cleaning group.

Options

```
/usr/amass/bin
./volspace
[-uy]
```
%deadspace

Option	Description
-u	Usage statement
-y	Suppress interactive messages
%deadspace (defaults to 0)	Enter a value between 0 and 99 percent

Example

Following is an example of output generated with a dead space percentage greater than or equal to 33 percent.

AMASS asks for confirmation of the process.

```
# su root
# volspace 33

Retrieving all volumes with dead space >= 33%
Is this correct? [y - n]: y

NUM    GRP    JUKE   POS    LABEL   FLAGS   USED      AVAIL      DEAD%   ERRS

2      1      1      NET    TEST    A       195033    310        33      0

25     19     1      NET    PUBS    A   C   195033    10         45      0

67     673    1      NET    ENG     A   C   195033    0          37      0

3 volumes have dead space >= 33%
```

Output Fields Defined

The following fields are generated by this command:

Field	Description
Volume Number	Volume number
Volume Group	Volume group assignment
Jukebox Number	Reference number

Field	Description
Position	Home storage slot. Valid entries are: • 4-alphanumeric designation = SCSI-attached storage device • n/a = standalone drive • NET = network-attached storage device
Volume Label	Either: • User-assigned name • Preprinted barcode
Flags For more information, see "Flags Defined" on page 3-205.	Status of volume, **not volume group**: • A = Active volume used by AMASS • C = Volume is being volcomped or a volcomp procedure has aborted. After a volcomp completes, the volume is marked Inactive. • I = Inactive volume not currently used by AMASS • K = Reserved • O = Offline volume • Q = Volume has been quick formatted **NOTE:** Valid only for optical media. • R = Volume is marked as Read-Only. This occurs as a result of either: (1) a write error that makes the media unwritable or (2) a user has forced the media to be Read-Only with the volreadonly command. • U = Volume not formatted • W = Media type is WORM
Used	Amount of space, in MB, occupied by files on the volume
Avail	Amount of space, in MB, available on the volume

Field	Description
Dead	Amount of space no longer referenced by files
	Expressed as a percentage of the total volume space; the higher the percentage, the greater the amount of dead space
	NOTE: Volumes with high percentages are good candidates for the volcomp process.
Errors	Number of errors on this volume

Field	Description
For volumes in the cleaning group (CL):	
Current Usage	Number of times a cleaning volume has been used
Max Usage	Maximum number of times a cleaning volume may be used
Clean Time	Amount of time, in seconds, a cleaning volume will remain in a drive

Flags Defined

The following table describes the Active, Inactive, Online, and Offline values a volume can have in the Flags field:

	Online	**O = Offline**
A = Active	Volume is **in** library AMASS **can** read and write to volume.	Volume is **not** in library AMASS **can** read and write to volume with Offline Media Manager (OMM). For OMM information, see "Read Offline Volume" on page 2-25.
I = Inactive	Volume is **in** library AMASS **cannot** read or write to volume.	Volume is **not** in library AMASS **cannot** read or write to volume.

volstat

View and change the current status—Active or Inactive—of a volume.

Name Contention

hp Tru64 UNIX only: Because both AMASS and hp Tru64 UNIX have a volstat command, make sure you use the full path to differentiate which command you want to use. For example, to use the AMASS command, enter it as shown in the following example:

```
# su root
# cd /usr/amass/bin
# ./volstat
```

Or, make sure your PATH variable has the /usr/amass/bin **before** the hp Tru64 UNIX /usr/sbin/volstat.

Options

```
/usr/amass/bin

./volstat

[-uy]

[-ai]
```
volumenumber

Option	Description
no options	View status of the specified volume
	When AMASS asks if you want to toggle the status, type **y** for yes and **n** for no.
-a	Activate the volume in the Database
-i	Inactivate the volume in the Database, eject it from the drive, and return the volume to its home storage slot.
	AMASS returns an I/O failure for any read requests associated with this volume.
-u	Usage statement
-y	Suppress interactive messages
volumenumber	Enter the unique volume number

Activate New Volume

Step 1. Log in as either **amass** or **root**.

Step 2. To create an entry in the File System Database and receive from AMASS a unique volume number, use the volnew command.

Step 3. To load specified the volume number in a library, use the volinlet command.

> **Note**
>
> This command is not valid for libraries without a mailbox.

Step 4. To mark the specified volume number Online in the Database, use the volloc command.

> **Note**
>
> This command is not valid for libraries without a mailbox.

Step 5. **StorageTek Redwood tape drives:** Enter the length of tape in the Database with the tapelength command.

Step 6. To format the specified volume number, use the volformat command.

Step 7. In the following example, AMASS displays the current status of volume number 33 before asking if we want to change it. Your response is shown in bold.

```
# su root
# volstat 33

Volume 33 in jukebox 1 is currently Inactive:
     Would you like to change its status? [y - n]:
y
Volume 33 status is now Active
```

Step 8. The following example illustrates the status for a volume used for drive cleaning.

```
# volstat 4

Volume 4 in jukebox 1 is in the cleaning volume
group.
```

volusage

View statistics for all volumes in the AMASS file system.

Options

```
/usr/amass/bin

./volusage

[-u]

[-hHV]
```

Option	Description
-h	Display a message describing the output
-H (defaults to print and underline column titles)	**Do not** print and underline the column titles in the output. Non-printed column titles are useful if you generate reports with UNIX utilities, like awk, sort, and sed.
-u	Usage statement
-V	Verify the volume number and display any inconsistencies between the Database entry and volume header

Example

Step 1. Log in as either **amass** or **root**.

Step 2.   An example of the output is shown in the following illustration.

```
# su root
# volusage

Vol    Slot    Mounts      R+W(MB)    Err    Last Mounted

1      NET     1           0          0      Fri Aug 29 03:00:15 1998

2      NET     0           0          0      ---

3      NET     15 (Cl)     N/A        0      Thu Sep 11 18:17:22 1998
```

Output Fields Defined

The following fields are generated by this command.

Field	Description
Volume	Volume number
Slot	Home storage slot where this volume resides. Valid entries are: • 4-alphanumeric slot designation (0A12) = SCSI-attached storage device • n/a = standalone drive • NET = network-attached storage device
Mounts	How often this volume has been mounted in a drive since the Database entry was created • CL = Cleaning volume • Volumes in the space pool (SP) are not represented
R+W (MB)	This field is not implemented in this release. It will always display a zero.
Errors	Number of errors for this volume

Field	Description
Last Mounted	Date and time this volume was last mounted in a drive • Hyphen (—) = Volume has not been mounted

NOTES

4

**Utility
Reference**

NOTES

Utilities

The utilities described in this chapter are located in the directories listed in the following table. Specify these directories in the system administrator's login PATH variable.

Tool(s)	Login	Path
scripts	root	/usr/amass/tools
Hardware Utilities	root	/usr/amass/utils
Database Utilities	root	/usr/amass/utils
amassrecovery	amass	/usr/amass/daemons

Caution

ADIC recommends that you control the execution privileges for all utilities as appropriate for the desired security level at your site.

Scripts in /usr/amass/tools

The following AMASS scripts help to identify and resolve operation problems:

Operation Script	Page
amass_atboot	4-5
amass_log	4-7
amass_snap	4-9
amass_start	4-10
amass_tests	4-12
install_tests	4-16
killdaemons	4-22

amass_atboot

Define status of AMASS startup commands.

Options

```
/usr/amass/tools

./amass_atboot

[-de]
```

Option	Description
no option	View current status of AMASS at reboot
-d	Do not start AMASS upon reboot
-e	Enable AMASS upon reboot

Example

Step 1. Log in as root.

```
# su root
```

Step 2. If AMASS is hung, disable AMASS at reboot by entering the following path, script name, and option:

```
# cd /usr/amass/tools
# ./amass_atboot -d
```

Step 3. Reboot the system.

amass_log

Redirect the AMASS system log messages to the console.

AMASS sends messages to the system log. For a numerical list of AMASS system log messages and corrective action, refer to *Errors and Corrective Action*.

When to Use Script

For an example of when to use this script, see:

- "AMASS Appears Hung" on Page -3

- "AMASS Database is Bad" on Page -6

- "AMASS Does Not Start" on Page -16

- "Requests Not Getting to Library" on Page -22

- "Command Gives Unexpected Results" on Page -26

Options

```
/usr/amass/tools

./amass_log

[-w]
```
logfilepath

Option	Description
`-w` (defaults to 80-characters wide)	Print messages to 120-characters wide
logfilepath	Enter the pathname of the system log file The location of the system log file varies depending on the platform. For the default path, refer to *Errors and Corrective Action.*

Example

Step 1. Log in as `root`.

```
# su root
```

Step 2. Following the path and script name, enter the path to your system log. For default system log locations, refer to *Errors and Corrective Action*.

```
# cd /usr/amass/tools
# ./amass_log /var/adm/messages
```

Because the log will probably have several days' worth of messages. Make sure the messages being looked at are for the current date and time. For example, on a Sun, it is `/var/adm/messages.1`.

Step 3. Perform the action the message recommends.

Step 4. If the problem cannot be corrected see "Prepare to Contact Technical Support" on page -32.

amass_snap

Collect system information after a problem occurs.

When to Use Script

For an example of when to use this script, see "AMASS Appears Hung" on page -3.

Example

Step 1. Log in as root.

```
# su root
```

Step 2. Following the path and script name, enter the process ID.

```
# cd /usr/amass/tools
# ./amass_snap processID
```

The output looks similar to the following:

```
amassconfig

# this file was generated by config_prod
vlk_data_size = 2698
vlk_nochash = 3
vlk_maxch = 40
arch_dsectsz = 512

vlk_cbchain_size = 8
cachesize_kilobytes = 4097786
ncblks_total = 79
vlk_sendbcount = 5
```

amass_start

Performs the following tasks:

- Start the AMASS daemons.

- Mount the AMASS file system.

When to Use Script

For an example of when to use this script, see:

- "AMASS Does Not Start" on Page -16

- "UNIX Server's Partitions Crash" on Page -17

Example

Step 1. Log in as root.

```
# su root
```

Step 2. Following the path and script name, enter your AMASS mount point.

```
# /usr/amass/tool/amass_start /archive
```

List of Startup Daemons

The startup daemons are located in `/usr/amass/daemons` and are listed in the following table:

Daemon	Description
amassmain	AMASS database manager and parent of other daemons
amassrecovery	AMASS startup and recovery program
lm_ip	AMASS database lock controller
qset	Schedules both read and write request, including automatic drive cleaning
libsched	Subset of `qset` Schedules library transport One `libsched` is required for each library managed by AMASS
libio	Subset of `qset` Schedules drive I/O One `libio` is required for each drive managed by AMASS

amass_tests

AMASS must be running prior to executing the test:

- Storage device hardware

- AMASS File System Database, volumes, system files, and message files

- No output means that amass_tests was successful.

Prerequisites

AMASS must be running prior to executing amass_tests.

When to Use Script

For an example of when to use this script, see:

- "AMASS Appears Hung" on Page -3

- "Requests Not Getting to Library" on Page -22

- "Command Gives Unexpected Results" on Page -26

List of Tests

The script runs the tests listed in the following table:

Group	Test Name	Definition
Backup	Scheduled	Makes sure that backups are scheduled in `cron`
	Volume	Makes sure a Backup Volume exists and is formatted, another volume is assigned to that home storage slot, and a backup has been run
Database	Check	Runs database checks (`dbcheck` and `sysdbchk`)
	Journalsize	Makes sure journal is not too large
	Permissions	Checks ownership and permissions of database files
	Taf	Checks if `taf` file is correct size; it must be 352 bytes large
Drive	Inactive	Checks for inactive drives
	Active	Checks if all active volumes have a cartridge in their assigned home storage slot
Messages	Syslog	Makes sure `syslog` daemon is running on the machine so AMASS messages are recorded
	Syslogconf	Makes sure AMASS messages are sent to syslog
Picker	Getty	Checks for gettys on RS-232 libraries

Group	Test Name	Definition
System	Amassuserid	Makes sure AMASS user ID and group ID are in the password and group file
	Configdump	Dumps configuration for debugging
	Daemons	Checks to see if correct daemons are running
	Development	Makes sure there is a C compiler and `make` function available
	Devicefiles	Checks AMASS device files
	Fnodes	Checks for a minimum number of fnodes
	Notmounted	Checks to see if AMASS is mounted
	Null	Makes sure `/dev/null` is a character device file
	Outoffnodes	Checks to see if system is out of fnodes
	Owners	Checks ownership of files in `/usr/amass/bin`
Volumes	Compress	Checks to see if data is being compressed
	Inactive-volumes	Checks for INACTIVE volumes in volume group
	Novgpaths	Makes sure each volume group has a root path assigned to it
	Spaceavail	Makes sure all volume groups have space available in them

Example

Step 1.   Log in as root.

```
# su root
```

Step 2.   Enter the path and script name.

```
# cd /usr/amass/tools
# ./amass_tests
```

Step 3.   Because the utilities are operator interactive, they use standard in (stdin) and standard error (stderr). Lists are written to standard out (stdout), which you can redirect to either a file or a printer.

install_tests

Performs the following tasks:

- Test storage device hardware.

- Modify AMASS startup script to automatically start AMASS at bootup (uses the `amass_atboot` script).

- Run the `amass_start` script.

- Run the `amass_tests` script.

When to Use Script

For an example of when to use this script, see:

- "AMASS Does Not Start" on Page -16

- "Library or Drive is Nonfunctional" on Page -28

Options

```
[-u]
[-b]
[-d]
[-n]
```

Option	Description
-u	show usage
-b	do not enable AMASS at boot See AMASS at Boot description
-d	bypass drive load tests WARNING: this should only be used if no drive changes have been made!
-n	do not start AMASS upon completion

Prerequisites

Before running this script, the following conditions must be met:

• AMASS must not be running when you run install_tests.

• The drives must be empty but **Active**.

• At least **one** tape or optical platter must be in a home storage slot; this volume should be the Backup Volume. Just make sure this volume is **not** a cleaning cartridge because a cleaning volume does not return a "tape loaded status" to AMASS and thus install_tests will fail.

• If more than one client (besides AMASS) is sharing a drive through DAS for an AML, the drive must be allocated to AMASS for install_tests to successfully complete. For instructions on configuring AMASS as a DAS client, refer to "Using DAS as a Library Interface" in *Accessing Storage Devices*.

List of Hardware Tests

The script runs the tests listed in the following table. These tests can take a long time to complete if the storage device is large.

Group	Test Name	Definition
Picker	Istat	Performs library inventory and sees if it has changed
	Move*	Checks if picker can move media and read barcode label
Drive	Configured	Checks if drives are properly configured

* AMASS makes sure each drive can move media by loading and unloading the last volume (for SCSI-attached libraries) or loading and unloading the last barcoded-platter (for network-attached libraries) to the drive.
The "last" volume or barcoded-platter is defined as what is listed by the `medialist` utility. This last volume should be the Backup Volume. Just make sure this volume is **not** a cleaning volume because a cleaning volume does not return a "tape loaded status" to AMASS and thus `install_tests` will fail.
If you have more than one library configured for AMASS, this test is done on **each** library.

Example

Make sure all the libraries are connected to the system and running.

Step 1.   Log in as `root`.

```
# su root
```

Step 2. If AMASS is active, inactivate it with the option shown in the following example. For command information, see "amassstat" on page 3-24.

```
# killdaemons -f
```

Step 3. Enter the following path and script name:

```
# cd /usr/amass/tools
# ./install_tests
```

The following output shows typical messages for a successful test of a new installation.

```
Script started, File is typescript
TESTS/DRIVE
TESTS/PICKER
TESTS/PICKER
Script done on Tue May 13 11:30:50 1997
Script started on Tue May 13 11:30:52
1997
script done on Tue May 13 11:35:00 1997
```

Step 4. If AMASS passes these tests, it automatically starts.

Step 5. If AMASS fails these tests, messages display on the console and are also sent to the system log.

For more information, see "amass_start" on page 4-10.

Step 6. If you **do not have media** in the library, the script prints a WARNING message indicating the library is empty. Under these circumstances, you can ignore this message.

Step 7. For instructions on resolving other problems, see "amass_log" on page 4-7.

Step 8. After correcting any problems, run install_tests again.

User Defined Test Volume Capability

To define the volume(s) to use to test each library, create the file /usr/amass/.juke/drive_test_volumes (or modify the supplied template file.) The file should contain the slot number or volume label of the media to use for the test in each library in order or use the word "None" for install_tests to automatically determine which media to use. Comments are preceded by "#".

The example template file /usr/amass/tools/TESTS/PICKER/drive_test_volumes.template shows examples of valid definitions:

```
#

#      This file should contain a list of the volumes to be used
#      by install_tests and move.t to test the loading of the
#      drives in each jukebox.

#      Format: One volume name per line for each automated
#      jukebox configured in AMASS or "None" if the volume
#      to use is to be determined by the scripts. EG:

#

#              MLE0037# Test volume for jukebox 1
#              SAM0001# "    "    "    "    2
#              0A01  # " slot   "    "    3
#              None  # No test volume for jukebox 4

#
```

```
None            # Test volume for jukebox 1
None            # "    "    "    "    2
None            # "    "    "    "    3
None            # "    "    "    "    4
None            # "    "    "    "    5
None            # "    "    "    "    6
None            # "    "    "    "    7
None            # "    "    "    "    8
None            # "    "    "    "    9
None            # "    "    "    "    10
```

killdaemons

Performs the following tasks:

- Inactivate AMASS by running the `amassstat -i` command.

- Unmount the AMASS file system.

- Kill the AMASS daemons.

When to Use Script

For an example of when to use this script, see:

- "AMASS Database is Bad" on Page -6

- "UNIX Server's Partitions Crash" on Page -17

Options

```
/usr/amass/tools

./killdaemons

[-f]
[-f -t seconds]
```

Option	Description
no options	Brings AMASS down, if there are no outstanding IO requests
-f	Forces AMASS down, cancels all outstanding IO requests
-t *seconds*	AMASS will come down in the specified number of seconds

Note

As a result of using killdaemons, the system administrator may notice that flag states (flags, such as A=active, C=volcomped, I=inactive, K=reserved, O=offline, Q=quick formatted, U=unformatted) may be affected. For example, a volume might show a flag state of both "Q" and "U" (formatted and unformatted).

To display the correct flags, you must rerun the AMASS administrative command that manipulates the flag, for example, rerun the volformat command. Internal ADIC testing has found this to affect the volformat, volinlet, and voloutlet commands.

Example

To run killdaemons, perform the following steps:

Step 1.   Log in as root.

```
# su root
```

Step 2. To make sure there are no pending write requests in the AMASS queue, view the queue with the `sysperf` command. To stop the `sysperf` command, use <Control-C>.

```
# sysperf
```

Step 3. To bring AMASS down immediately, enter the -f (force) option:

```
# /usr/amass/tools/killdaemons -f
```

Step 4. Or, to bring AMASS down in the specified number of seconds, use the -t *seconds* option:

```
# killdaemons -t 60
```

Hardware Utilities in /usr/amass/utils

The following AMASS utilities help to identify, diagnose, and possibly correct hardware problems:

Hardware Utility	Page
init_element	4-26
mediaeject	4-28
mediaerase	4-30
medialist	4-33
mediamove	4-36
mediaread	4-39
mediawrite	4-41
printjournal	4-43
quedisplay	4-45
sl_logger	4-49

init_element

Run the element_status command that physically scans the library then updates the library's database (*not* the AMASS File System Database).

Prerequisites

Before using this utility:

- Inactivate AMASS.

- Make sure all operations have ceased on the library.

Options

```
/usr/amass/utils

./init_element

[jukeboxnumber]
```

Option	Description
jukeboxnumber	Enter the AMASS library number

Example

Step 1. Log in as root.

```
# su root
```

Step 2.   Enter the following:

```
# cd /usr/amass/utils
# init_element 1
```

mediaeject

Eject media from a specified drive.

Options

```
/usr/amass/utils

./mediaeject
```

drivenumber
 [*jukeboxnumber***]**

Option	Description
drivenumber	Enter the drive number where the media is mounted
jukeboxnumber (defaults to 1)	Enter the AMASS library number

Note

The mediaeject option ejects the media from the drive, but does not return it to a storage slot. The mediamove option will eject the media and move it to the given destination

Example

Step 1. Log in as root.

```
# su root
```

Step 2.   To eject media from drive 1 in library 2:

```
# cd /usr/amass/utils
# mediaeject 1 2
```

Step 3.   If a hardware error occurs, refer to your hardware
manuals.

mediaerase

Erase media starting at a specific block address through to one
of the following:

- ending block address

- end of the media

Caution

This utility destroys data! Do not use this utility on media that
contains data you want to keep.

Note

This utility only supports optical media.

Options

```
/usr/amass/utils

./mediaerase
```

drivenumber
startblock
endblock
 [*jukeboxnumber*]

Option	Description
drivenumber	Enter the drive number where the media is mounted
startblock	Start at this block address
endblock	Erase data until you reach: • specified block address • -l = End of tape
jukeboxnumber (defaults to 1)	Enter the AMASS library number

Example

Step 1.   Log in as root.

```
# su root
```

Step 2.   To erase data on a standalone drive and stop at the end of the media, enter the path, utility, and options similar to what is shown in the following example:

```
# cd /usr/amass/utils
# mediaerase /dev/rst12 6 -1
```

where:

Value	Description
/dev/rst12	Drive number for a standalone drive where the media is mounted
6	Start at this block address
-1	Erase data until you reach the end of the media

Step 3.   If a hardware error occurs, refer to your hardware manuals.

medialist

Performs the following tasks:

- Read the library's database (*not* the AMASS File System Database).

- Display the status of elements.

Options

```
/usr/amass/utils

./medialist

-j jukeboxnumber
-s element
```

Option	Description
-j *jukeboxnumber* (defaults to 1)	Enter the AMASS library number
-s *element*	Enter one of the following elements: • *xxxx* = Home storage slot or barcode • *x* = Drive number • **m** or **M** = Mailbox • **T***x* = Transport number

View Status for All Elements

Step 1. Log in as `root`.

```
# su root
```

Step 2. To display the status for all elements in library number 2, enter the path, utility, and options similar to what is shown in the following example:

```
# cd /usr/amass/utils
# medialist -j 2
```

Step 3. If you have a SCSI-attached library, the output is similar to the example in the following example:

For a network-attached library, the output displays a bar code instead of the slot address. →

```
TRANSPORT 1 EMPTY
SLOT 0A01 EMPTY
SLOT 0A02 FULL
SLOT 0A03 FULL
SLOT 0A04 FULL
SLOT 0A05 FULL
SLOT 0A06 FULL
SLOT 0A07 FULL
SLOT 0A08 FULL
~
MAILBOX 1 EMPTY
DRIVE 1 SCSI_ID 5 FULL FROM 0A01
INVERTED
DRIVE 2 SCSI_ID 6 FULL
```

FULL indicates there is a volume in the home storage slot.

On ADIC FastStor libraries, the message says "FULL FROM unknown so"

The word INVERTED indicates the media is B-side up in the drive (assuming the media was properly loaded into the library, A-side up). →

View Status for One Element

Be careful when you ask for the status for a single element because the output could be misleading, as illustrated in this example.

To display the inventory for one element, perform the following steps:

Step 1.   Log in as `root`.

```
# su root
```

Step 2.   Using the previous example, we request an inventory for home storage slot 0A01 in library number 2:

```
# cd /usr/amass/utils
# medialist -s 0A01 -j 2
```

The output is similar to the following example:

```
SLOT 0A01 EMPTY
```

Because the output says "EMPTY" you would assume that home storage slot 0A01 is available.

However, the media that is normally in slot 0A01 is currently in drive 1. We know this because of the output from the previous example that stated "DRIVE 1 SCSI_ID 5 FULL FROM 0A01 INVERTED."

mediamove

Library	Description
ADIC FastStor	The AMASS `medialist` utility output displays "FULL" to indicate media in a home storage slot for SCSI-attached libraries. However, on ADIC FastStor libraries, the message says "FULL FROM unknown so."

Move volumes from and to the locations listed in the following table:

From	To
mailbox	mailbox drives storage slots transport
drive	
storage slot	
transport	

Note

When moving media from a drive, mediamove will eject the media

Options

```
/usr/amass/utils

./mediamove
```

source
destination
`[0｜1]`
`[`*jukeboxnumber*`]`

Option	Description
source	Enter one of the following elements identified on the source library: • *xxxx* = Home storage slot or barcode. • *x* = Drive number. **NOTE:** This number identifies the drive in the library, not what is configured in AMASS. For example, drive 1 is the first drive in the library, not drive 1 configured in AMASS. • m*x* or M*x* = Mailbox number (defaults to 1) • t*x* or T*x* = Transport number
destination	Enter one of the following elements identified on the destination library: • *xxxx* = Home storage slot or barcode • *x* = Drive number. **NOTE:** This number identifies the drive in the library, not what is configured in AMASS. For example, drive 2 is the second drive in the library, not drive 2 configured in AMASS. • m*x* or M*x* = Mailbox number (defaults to 1) • t*x* or T*x* = Transport number
0 1	Enter one of the following values to indicate the side of media to load: • 0 = Media • 1 = Flip media to side B. (Assumes the media is properly loaded into the library with side A up.)

Option	Description
jukeboxnumber (defaults to 1)	Enter the AMASS library number

Example

Step 1. Log in as root.

```
# su root
```

Step 2. In the following example, AMASS instructs the drive to move the media in home storage slot 0A03 to drive two, and flip it to side B:

```
# cd /usr/amass/utils
# mediamove 0A03 2 1
```

Step 3. In the second example, AMASS moves the media (0) from the third mailbox (m3) to the first home storage slot (0A01) in library 1:

```
# cd /usr/amass/utils

# mediamove m3 (0A01) 0 1
```

Third Mailbox ——
Home Storage Slot ——
—— Library
—— Media

Step 4. If a hardware error occurs, refer to your hardware manuals.

mediaread

Performs the following tasks:

- Read a specific block of data.

- Write the data to /tmp/mediaread.

When to Use Utility

Use this utility to:

- Read corrupted data blocks.

- Verify that a mediawrite has been successful.

Options

```
/usr/amass/utils

./mediaread
```

drivenumber
blocknumber
 [*jukeboxnumber]*

Option	Description
drivenumber	Enter the drive number that is reading the media
blocknumber	Enter the starting block address
jukeboxnumber (defaults to 1)	Enter the AMASS library number

Example

Step 1. Log in as root.

```
# su root
```

Step 2. To read block six on drive 2, enter the path, utility, and options similar to what is shown in the following example:

```
# cd /usr/amass/utils
# mediaread 2 6
```

AMASS writes the data in block six to /tmp/mediaread.

Step 3. To display the output to the screen, enter the UNIX concatenate command:

```
# cat /tmp/mediaread
```

Step 4. If a hardware error occurs, refer to your hardware manuals.

mediawrite

Write a predetermined line beginning at EOD for tape or at a specified block number for optical media.

> **Caution**
>
> This utility destroys data on optical media. Do not use this utility on optical media that contains data you want to keep.

Options

```
/usr/amass/utils

./mediawrite
```

[-b *blocksize*]
drivenumber
blocknumber
jukeboxnumber

Option	Description
-b *blocksize*	Enter the blocksize value in bytes, kilobytes (10K or 10k), or megabytes (10M or 10m)
drivenumber	Enter the drive number that is writing to the media
blocknumber	Optical: Enter the starting block address. Tape: Enter a number to be written into the block written to tape.
jukeboxnumber (defaults to 1)	Enter the AMASS library number

Example

Step 1. Log in as root.

```
# su root
```

Step 2. To have drive two write to block six, enter the path, utility, and options similar to what is shown in the following example:

```
# cd /usr/amass/utils
# mediawrite 2 6
```

AMASS writes the following text to block number 6:

```
A SECTOR OF DATA FOR BLOCK 6
```

Step 3. If a hardware error occurs, refer to your hardware manuals.

Step 4. To verify the mediawrite was successful, use the mediaread utility to read block six.

```
# mediaread 2 6
```

printjournal

Print to `stdout` the contents of the `journal`, which is the daily transaction log for the AMASS File System Database. For more information about this `journal`, refer to "Journal" in *Installing AMASS*.

Options

```
/usr/amass/utils

./printjournal

[-d did] [-e date] [-f fid] [-j fullpath]
[-J jukeboxnum][-k] [-L label] [-n] [-P position]
[-s dates][-t][-v vid]
```

Option	Description
	Print contents of journal file to stdout
-d did	specific drive id to print
-e date	ending date of print (MM/DD/YYYY hh:mm:ss)
-f fid	specific file id to print
-j fullpath	current on disk journal only
-J jukeboxnum	backup volume located in this jukebox
-k	keep journal file on disk when done printing
-L label	backup volume with this media label

Option	Description
-n drive	drive number to use (1 relative)
-P position	backup volume is in this slot
-s date	starting date of print (MM/DD/YYYY hh:mm:ss)
-t	print journal directory
-v vid	specific volume id to print

quedisplay

Display what is in the queues. The queues consists of a snapshot of the following items:

•   An I/O queue of READ and WRITE requests

•   An admin queue of AMASS administration commands

•   List of libraries, drives, and what volumes they manage

Prerequisites

AMASS must be running prior to executing quedisplay.

Options

```
/usr/amass/utils

./quedisplay

[-cq]
```

Option	Description
-c	View streaming tape I/O cache blocks **NOTE:** Valid only for specific tape drives.
-q	Displays the volume number and the number of read and write requests in the I/O queue for that volume

When to Use Utility

Use this utility, to diagnose the following problems:

- You write to a file but the drive light does not come on.

- The system is slowing down.

- An AMASS command does not complete.

Supported Drives

The following table lists tape drives that support streaming I/O.

Tip
To obtain the current list, contact your AMASS sales representative.

Tape Drives	
IBM 3570	Quantum DLT 8000 ¥
IBM 3590 B1A	Sony GY-2120 (DTF-2) Requires FW level 1.10
IBM 3590B1A-ultra	StorageTek Redwood SD-3
IBM 3590E1A	StorageTek 9840
Quantum DLT 7000 ¥	Sony SDX-500
¥ DLT customers: ADIC recommends that you enable the Tape Streaming feature. Using tape streaming IO will eliminate start/stop cycles on these drives, which leads to better tape handling. For instructions on configuring AMASS for tape streaming, refer to the "Optional Parameters" appendix in the *Installing AMASS* book.	

Example

Step 1. Log in as `root`.

```
# su root
```

Step 2. Enter the path and utility as shown in the following example:

```
# cd /usr/amass/utils
# ./quedisplay
```

Step 3. For help in reading the output, see "Prepare to Contact Technical Support" on page -32.

The output looks similar to the example shown in the following example.

Displays with the -q option.

A read request

Record ID

Record is located on volume 3.

```
READQ rid=52696, fptr=0xf0227c5c, vol=3, fnode_flags=0x110
VOLUME vid=7, num_reads=0, num_writes=30
WRITEQ rid=79, fptr=0xc00eff54, vol=5, fnode_flags=0x8048844
RESCHEDQ rid=xx, fptr=xxxxxx, vol=x, fnode_flags=xxxxx
ADMINQ:cmd=1, flags=0x6, vol=32, juke=1, pid=1047, ftype=0, err=0
JUKEBOX 1 DRIVE 1, vid=32, vflag=0x100, status=0
JUKEBOX 1 DRIVE 2, no volume in drive
```

A volformat command (cmd=1) was issued on volume 32.

Process ID

The last two entries are a list of libraries, drives, and corresponding volume IDs.

Output for streaming tape I/O (`quedisplay -c`) looks similar to the example shown in the following example:

The tp_sblk and tp_eblk fields are the start and end archive device block locations where the cache block is written.

The tp_iocc field is the byte count associated with the cache block.

The cbq_stat field is the current state of the streaming cache block.

The cbq_cbdata field is an I/O descriptor containing the device number, block address offset, byte count, and file offset of the cache device data being copied to tape.

Cache block number (c_blno) 0x00230010 is pending physical I/O completion.

Cache block 0x40230010 is currently being copied. (This can be deduced from (cbq_stat == QUED) && (tp_iocc > 0) && (tp_iocc < c_bcnt)).

```
# quedisplay -c
VOLUME vid=7, num_reads=0, num_writes=30
WRITEQ rid=27931,
fptr=0xc00000000031c078, vol=3,
fnode_flags=0xb040804
Request Cache blocks:
~
cbq_ptr: 0x04030c90
        UNADJ_cbque_flink: 0x04030c
        UNADJ_cbque_blink: 0x04030c
        tp_sblk : 0x0000260f
        tp_eblk : 0x0000264e
        tp_iocc : 0x01000000
        cbq_stat: PEND
        cbq_cbdata:
         c_blno: 0x00230010
         c_bcnt: 0x01000000
         c_boff: 0x27000000

cbq_ptr: 0x04030cb8
        UNADJ_cbque_flink: 0x04030c
        UNADJ_cbque_blink: 0x04030c
        tp_sblk : 0x0000264f
        tp_eblk : 0x00000000
        tp_iocc : 0x00e00000
        cbq_stat: QUED
        cbq_cbdata:
         c_blno: 0x40230010
         c_bcnt: 0x01000000
```

sl_logger

The `sl_logger` utility allows you to redirect messages to a location other than to the system log.

Options

```
/usr/amass/utils

./sl_logger

[-u]

[-n pathname]
[-f filename]
[-p priority]
[-t tag]
[location]
```

Option	Description
-u	Usage statement
-n *pathname* (defaults to /tmp)	Specify path to the redirected `logs` directory
-f *filename*	Specify a name for the redirected file
-p *priority*	Specify the priority level of message you want to redirect. Valid values are: • syslog.0-6 • tac.0-9 • history.0-9 • trace.0-9
-t *tag*	*tag* identifies the log requester

Option	Description
location (defaults to `stdin`)	Specify where message should be redirected

Database Utilities

The following AMASS utilities help diagnosis problems with the AMASS File System Database:

Database Utility	Page
amassrecovery	4-52
dbcheck	4-55
fileincache	4-57
filepath	4-59
fileprint	4-61
initamass	4-64
initjournal	4-65
keybuild	4-66
sysdbchk	4-68
volprint	4-72
writecachemru	4-77

amassrecovery

Performs the following tasks:

- Recover the AMASS file system.

- Initialize the checkpoint.

Note

The user must be amass.

When to Use Utility

This utility automatically runs every time the system is rebooted.

For an example of when to use this utility:

- see "AMASS Database is Bad" on page -6

- see "Return Media Without Starting AMASS" on page 2-28

Note

Use this utility only when AMASS is **not** running.

Options

```
/usr/amass/daemons

./amassrecovery

[-is]
```

Option	Description
no options	**Start** AMASS **Recover** files in cache, it completes write operations. These files were "stranded" in cache when AMASS was brought down. **Return** media in drives to their home storage slots
-i	**Start** AMASS **Do not recover** files in cache
-s	**Do not start** AMASS **Recover** files in cache **Return** media in drives to their home storage slots

Example

Step 1. Log in as root.

```
# su root
```

Step 2. If AMASS is active, inactivate it as shown in the following example. For command information, see killdaemons.

```
# killdaemons -f
```

Step 3.   Enter the path as shown in the following example:

```
# su amass
Password:
#
/usr/amass/daemons/amassrecovery
```

dbcheck

Test integrity of the AMASS File System Database.

This test can be time consuming, because the following components are checked:

- Volume tables

- Data tables

- Key tables

- Timestamp for records and database

When to Use Utility

For an example of when to use this utility, see "AMASS Database is Bad" on page -6.

Note

AMASS must be shut down before this utility is run, otherwise the tests will fail because of the inability to exclusively lock the AMASS File System Database.

Options

```
/usr/amass/utils

./dbcheck

-a databasename
{filesvN|vgdvN}
```

Option	Description
-a *databasename* (defaults to /usr/filesysdb)	Check integrity of the AMASS File System Database
filesv*N* vgdv*N*	Enter one of the following: • filesv*N* = Checks the files in the File System Database • vgdv*N*= Checks the volumes in the File System Database *N* = Current version number of the AMASS File System Database **NOTE:** Do not use the .dbd file extension when running this utility.

Example

Step 1. Log in as root.

```
# su root
```

Step 2. From the AMASS File System Database directory, enter the path, utility, and options similar to what is shown in the following example:

```
# /usr/amass/utils/dbcheck -a /usr/filesysdb/filesv49
# /usr/amass/utils/dbcheck -a /usr/filesysdb/vgdv49
```

fileincache

Report on the status of a specified file in the AMASS cache.
Exit codes follow:

Exit Code	Description
1	Specified file is completely resident in cache
2	Specified file is partially resident in cache
3	Specified file is not resident in cache, but volumes are online
4	Specified file is not resident in cache, but volumes are offline
-1	Error with a message to stderr

Options

```
/usr/amass/bin

./fileincache

[-uv]
```
fullpath_filename

Option	Description
-u	Usage statement
-v	Verbose messages
fullpath_filename	Specify the full path to the file you want status on

filepath

Display the full path for the file indicated by the record ID (*rid)*.

If the *rid* appears in an AMASS error message, use this utility to view the full path for the file.

Options

```
/usr/amass/utils

./filepath

[-u]
```
rid

Option	Description
-u	Usage statement
rid	Enter the AMASS File System Database record ID number

Example

Step 1. Log in as root.

```
# su root
```

Step 2. Enter the record ID number as shown in the following example:

```
# /usr/amass/utils/filepath 52696
```

Step 3. AMASS returns the file's full path as shown in the following example:

```
# /archive/swpubs/amass/chap2.fm6
```

fileprint

Print the AMASS File System Database entry information for one of the following:

- File

- Directory

- Symbolic link

The File System Database information includes: type of entry, field values, start of logical block address, start of device block address, and, if appropriate, multivolume and append record information.

Options

```
/usr/amass/utils

./fileprint

[-u]

[-h]
```
*[filename │ \\#rid │ **-r** rid]*

Option	Description
-h **NOTE:** Valid for StorageTek drives, only.	Display the start of the file's block address as a decimal value and as a hexadecimal value enclosed in parentheses

Option	Description
-u	Usage statement
	Print entry for the specified file. Enter one of the following:
filename	• A file name
\\#*rid*	• Or, the AMASS database record ID (rid) number. **NOTE:** You must use the backward slash (\\) as an escape character so UNIX does not interpret *#rid* as a comment.
-r *rid*	• Or, the rid number preceded by -r

Example

> **Step 1.** The following path and utility example displays File System Database information for a file named testplan.

> # **/usr/amass/utils/fileprint /archive/testplan**

The output looks similar to the display shown in the
following example:

```
FILE test plan:
        rid       = 4
        prid      = 3
        size      = 1048576
        start blk = 1 (0x14000001)
        vol       = 2
        ltvol     = 2
        mode      = 81a4
        links     = 1
        ~
```

For StorageTek drives
only, the start block
address is shown as a
hexadecimal value
enclosed in parentheses.

Step 2.   The following path and utility example displays the
same File System Database information for the same
file named testplan but instead uses its AMASS
rid number.

```
# /usr/amass/utils/fileprint \#4
```

Or:

```
# /usr/amass/utils/fileprint -r 4
```

initamass

Clear the existing AMASS File System Database by reinitializing it to an empty database. Typically, this is done only for disaster recovery.

Caution
All file system data as well as library, drive, and media configuration is destroyed!

Options

None

Example

Step 1. Log in as root.

```
# su root
```

Step 2. If AMASS is active, run the command with the option shown in the following example. For command information, refer to killdaemons.

```
# killdaemons -f
```

Step 3. To re-initialize the File System Database, enter the following path and utility:

```
# /usr/amass/utils/initamass
```

Prior to proceeding, AMASS asks if you would like to continue.

initjournal

Clear the existing transaction log by reinitializing it to an empty journal. Typically, this is done only for disaster recovery.

Caution
All transaction logs are deleted!

Example

Step 1. Log in as root.

```
# su root
```

Step 2. If AMASS is active, inactivate AMASS with the option shown in the following example. For command information, refer to killdaemons.

```
# killdaemons -f
```

Step 3. To initialize the journal, enter the following path and utility:

```
# /usr/amass/utils/initjournal
```

Before proceeding, AMASS asks if you want to continue.

After the journal has been initialized, the queue is empty and AMASS reads the Backup Volume to restore the File System Database and journal logs.

keybuild

Rebuild the AMASS File System Database key tables.

Caution

Use this utility only when AMASS is **not** running!

When to Use Utility

For an example of when to use this utility, see "AMASS Database is Bad" on page -6.

Options

```
/usr/amass/utils

./keybuild
```

databasename
[filesv*N* | vgdv*N*]

Option	Description
databasename (defaults to /usr/filesysdb)	Enter the AMASS File System Database directory

Option	Description
filesv*N* vgdv*N*	Enter one of the following: • filesv*N* = Checks the files in the File System Database • vgdv*N*= Checks the volumes in the File System Database *N* = Current version number of the AMASS File System Database **NOTE:** Do not use the .dbd file extension when running this utility.

Example

Step 1. Log in as root.

```
# su root
```

Step 2. If AMASS is active, inactivate AMASS with the option shown in the following example. For command information, refer to killdaemons.

```
# killdaemons -f
```

Step 3. From the AMASS File System Database directory, enter the path, utility, and options similar to what is shown in the following example:

```
# /usr/amass/utils/keybuild /usr/filesysdb filesv49
# /usr/amass/utils/keybuild /usr/filesysdb vgdv49
```

sysdbchk

Sysdbchk is an AMASS utility that verifies the consistency of the AMASS file system and either:

- Displays errors

- Corrects errors

> **Note**
>
> Run this utility on a quiescent system, otherwise the tests may fail because of the inability to exclusively lock the AMASS File System Database.

When to Use Utility

For an example of when to use this utility, see "AMASS Database is Bad" on page -6.

Options

```
/usr/amass/utils

./sysdbchk

[-c dir]
[-d]
[-h]
[-i]
[-l dir]
[-q]
[-y]
```

Option	Description
no option	Check only — do not correct — errors
-c dir	Set directory for temporary cache files to 'dir' (specified directory) (new option)
-d	Check file names duplicates (very slow)
-h	show this help
-i	Use interactive mode to repair errors (new) **NOTE:** ADIC recommends against using the -i option as it requires an in-depth understanding of AMASS filesystem organization. Use of this option can cause data loss.
-l dir	Set directory for log files to 'dir' (new option)
-q	Do not print to the screen (new option), quiet mode, all log information is in the logfile sysdbchk.log
-y	Repair all "single choice correction" errors, use "preferred correction" for errors with multiple choice

Example

Step 1. Log in as `root`.

```
# su root
```

Step 2. Because this utility modifies the AMASS File System Database, first make a copy of the AMASS database, `/usr/filesysdb`.

Step 3. Enter the path and utility shown in the following example:

```
# /usr/amass/utils/sysdbchk
```

Note

The sysdbchk program creates a log file after each run containing all found errors. The name of the file is sysdbchk.log and is created in the current directory by default.

Note

Sysdbchk uses temporary files to carry out its function. By default these files are created in /usr/filesysdb/tmp. Use the -c option to redirect temporary files to a specified directory. This can also be done by using the environment variable SYSDBCHK_CACHE_DIR.

The following figure illustrates the hierarchy that is created because AMASS found a lost file named "misplaced_file." The mountpoint is /archive.
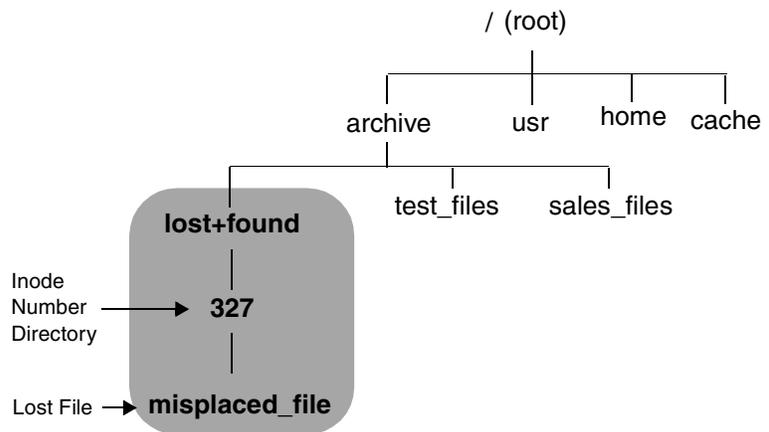
Step 4. For help in interpreting the sysdbchk output, see "Prepare to Contact Technical Support" on page -32.

volprint

Display the attributes for one of the following:

- One volume

- All volumes

Note

By default, the attributes will **not** include block size or compression values, unless you request these values with the -a option.

Name Contention

hp Tru64 UNIX only: Because AMASS and hp Tru64 UNIX both have a volprint utility, make sure you use the full path to differentiate whose tool you want to use. For example, to use the AMASS utility, enter it as shown in the following example:

```
# su root
# cd /usr/amass/utils
# ./volprint
```

Or, make sure your PATH variable has the /usr/amass/utils/volprint **before** the hp Tru64 UNIX /usr/sbin/volprint.

Options

```
/usr/amass/utils

./volprint

[-a]
[-u]
[-y]
```
volumenumber

Option	Description
no options	Display information for all volumes
-a	Display both tape block size and compression values **NOTE:** By default, tape block size and compression attributes will not display, unless specifically requested.
-u	Usage statement
-y	Suppress interactive messages but return a code as defined below: • 0 = Active • 1 = Inactive
volumenumber	Enter the unique volume number

Example

Step 1. Log in as `root`.

```
# su root
```

Step 2. To display tape block size and compression values for volume six, enter the path, utility, and options shown in the following example:

```
# /usr/amass/utils/volprint -a 6
```

The output is illustrated in the following example:

```
# volprint -a 6

VOL    VGR    POS    FLGS    LASTPBN    VOLSZ    DEAD    BLKSZ    CMPR    ERRS    LABEL

6      3      NET    I       124        24821    0       512      On      0       Pics
```

Output Fields Defined

The following fields are generated by this utility:

Field	Description
Volume Number	Unique volume number
Volume Group	Volume group assignment
Position	The home storage slot number Valid values are: • An alphanumeric value • **n/a** is valid for standalone drives • **NET** is valid for network-attached drives

Field	Description
Flags	Status of volume, **not volume group**: • A = Volume is Active • C = Volume is being volcompressed or a volcompress procedure has aborted. After volcompression completes, the volume is marked Inactive. • I = Volume is Inactive • K = Reserved. To clear, bring AMASS down and back up. • O = Volume is Offline • Q = Volume has been quick formatted **NOTE:** This is valid only for optical media. • R = Volume is marked as Read-only. This occurs as a result of either: a write error that makes the media unwritable or a user has forced the media to be read-only with the `volreadonly` command. • U = Volume not formatted • W = Media type is WORM
Last PBN	Last physical block number used on the media
Volume Size	The number of blocks available

Field	Description
Dead Blocks	Amount of previously written space on the volume that is no longer referenced by files This is expressed as a percentage of the total volume space; the higher the percentage, the greater the amount of dead space. **NOTE:** Volumes with high percentages are good candidates for the volcomp process.
Errors	Number of errors on this volume
Volume Label	The user-assigned volume label or preprinted barcode

Field	Description
The following two fields are valid if you use the `-a` option.	
Block Size	Tape's block size
Compression	Data compression. Valid values are: • On (default) = compression ON • Off = compression OFF • Dflt = compression is undetermined because media is un-formatted

writecachemru

Allow AMASS to use WRITE cache blocks before READ cache blocks. Consequently, READ cache blocks are used last.

Options

```
/usr/amass/bin

./writecachemru

[-de]

[-u]
```

Option	Description
-d (default)	AMASS reuses non-dirty or empty (data has already been written to media) cache blocks on a least-recently used basis
-e	AMASS reuses the empty WRITE cache blocks before READ cacheblocks
-u	Usage statement

5

Trouble-
shooting
Tools

NOTES

AMASS Appears Hung

There is no AMASS activity, including:

- All drives in all libraries are inactive

- All volumes are inactive

To correct, perform the following steps:

Step 1. Log in as **root.**

Step 1. Run amass_tests script to identify storage device hardware problems or AMASS problems. For more information, see "amass_tests" on page 4-12.

Step 2. If amass_tests hangs or if a problem was not identified, change to the tools directory and print the /usr/amass/tools/typescript file.

```
# su root
# cd /usr/amass/tools
```

Also, print the output for the following two scripts:

- amass_log

- amass_snap

For information on these scripts, see the "Utility Reference" chapter.

Step 3. For help in reading these files, see "Prepare to Contact Technical Support" on page -32.

Cancel Outstanding Requests

You can cancel an outstanding READ or WRITE request to the AMASS file system by using <Control C>, which is the standard UNIX interrupt signal. This can be used during normal AMASS operation.

When there has been a fatal error in AMASS, the system administrator can cancel outstanding requests, gracefully bring AMASS down, and restart AMASS (run `amass_start`)—without rebooting—by using `/usr/amass/tools/killdaemons -f -t` *seconds*, which brings AMASS down in the specified number of seconds.

Note

As a result of using `killdaemons`, the system administrator may notice that flag states (flags, such as A=active, C=volcomped, I=inactive, K=reserved, O=offline, Q=quick formatted, U=unformatted) may be affected. For example, a volume might show a flag state of both "Q" and "U" (formatted and unformatted).

To display the correct flags, you must rerun the AMASS administrative command that manipulates the flag, for example, rerun the `volformat` command. Internal ADIC testing has found this to affect the `volformat`, `volinlet`, and `voloutlet` commands.

Operating Issues

The following table lists operating issues:

Operating System	Issues
All	AMASS supports a file pathname limit of 1023 characters. For example, if files are going under /archive/oursitefiles on AMASS, then the length of this string (21 characters) must be subtracted from 1023 (1023-21=1002). Consequently, succeeding file pathnames can be a total of 1002 characters in length.
All	AMASS does not support running binaries in the AMASS file system.
All	The Macintosh operating system uses a separate data stream called a resource fork to store icons and other resource information. When AMASS archives this file, the UNIX system truncates this resource fork without generating any messages.
All	When AMASS lists file names, it uses the metadata file from the AMASS File System Database stored on the UNIX server. However, Windows 95 and Windows NT operating systems use executable files with icons stored as part of the file. Consequently, to display these icon-embedded file names that AMASS has archived, AMASS must reload the file from the library.
IRIX 6.2 Using NFS 3	Using the UNIX xfsdumps command to transfer large files (800MB and greater in size) over NFS Version 3 may degrade AMASS performance. *Acceptable performance is attained if the AMASS cache block size is set to 50MB with 9 (or more) dirty blocks and on NFS a write buffer size is set to 32KB.*

AMASS Database is Bad

An error message occurs that points to an AMASS File System Database problem.

To correct, perform the following steps:

Step 1. Log in as **root**.

Step 2. Shut down AMASS with the killdaemon script.

```
# su root
# /usr/amass/tools/killdaemons
```

Step 3. Lock the AMASS File System Database:

```
# /usr/amass/tools/lm_ip
```

Step 4. Back up your existing AMASS File System Database using a standard utility, such as tar or cpio. Make sure both the /usr/filesysdb and /usr/filesysdb/journal directories are backed up.

> **Note**
>
> Do not use the AMASS amassbackup command.

Step 5.   Check the integrity of the AMASS File System
Database by running the dbcheck utility:

```
# /usr/amass/utils/dbcheck -a /usr/filesysdb/filesvN
# /usr/amass/utils/dbcheck -a /usr/filesysdb/vgdvN
```

where:

Option	Description
-a	Performs consistency check on: • Key access • Key data • Complete set Also performs a timestamp check for records and sets.
filesv*N* vgdv*N*	Enter one of the following: • filesv*N* = Checks the files in the File System Database. • vgdv*N* = Checks the volumes in the File System Database. *N* = Current version number of the AMASS File System Database. **NOTE:** Do not use the. dbd file extension when running this utility.

If dbcheck reports errors, proceed to Step 6., Step
7., Step 8., or Step 9. Otherwise, go to Step 10.

Step 6. To resolve database key errors, run the AMASS `keybuild` utility. Examples of these errors are illustrated in the following example:

```
* key field RID_KEY(15) error:
slot 20's record-dba=[0:30065] has
invalid record-id and/or
inconsistent dba

*key field RID_KEY(15) error: has a
missing key
```

Run `keybuild` as follows:

```
# /usr/amass/utils/keybuild\
     /usr/filesysdb/{filesvN|vgdvN}
```

where:

Option	Description
filesvN vgdvN	Enter one of the following: • filesvN = Checks the files in the File System Database • vgdvN= Checks the volumes in the File System Database N = Current version number of the AMASS File System Database **NOTE:** Do not use the. dbd file extension when running this utility.

After running `keybuild`, rerun `dbcheck` on the affected database to make sure that all problems are fixed. If successful, reboot the system so AMASS can start.

Step 7. To fix bad chain errors or deleted File System Database records, run dchain. Examples of these errors are illustrated in the following example:

```
* record is deleted, but is not on
the delete chain

Problems at record 0:
*delete chain's next-pointer=131072
is out of range
```

Run dchain as follows:

Caution

Follow instructions precisely or data corruption may result.

```
# cd /usr/amass/libs
# dd if=dbudata conv=swab | uncompress |
tar xvf - dchain
# chown amass dchain
# chmod 4755 dchain
# /usr/amass/utils/inittaf
# cd /usr/filesysdb
# dchain /usr/filesydb/{filesvN | vgdvN}
```

where:

Option	Description
filesv*N* vgdv*N* **NOTE:** Do not use the .dbd file extension when running this utility.	Enter one of the following: • filesv*N* = Checks the files in the File System Database • vgdv*N*= Checks the volumes in the File System Database N = Current version number of the AMASS File System Database

After running dchain, rerun dbcheck on the affected database to make sure that all problems are fixed. If successful, reboot the system so AMASS can start.

Step 8. To resolve -907 TAF/log file errors (database will not lock), follow the suggestion in this step. When you ran the lm_ip daemon in Step 3., it should have opened up a database lock file that looks similar to the following example. (Depending on your platform, the permissions will vary.)

```
# ls -la /usr/amass/fslock1

p--------- 1 amass other 0 Feb 4
08:42 /usr/amass/fslock1
```

If the database lock file is missing, manually start a lock manager daemon with the following command:

```
# /usr/amass/daemon/lm_ip -a fslock1 -u 50 -f 40 -q 80 -nd
```

Verify that the lock has been set by using the
ls -la /usr/amass/fslock1 command.

After the problem has been resolved, rerun dbcheck
on the affected database to make sure that all
problems are fixed. If successful, reboot the system
so AMASS can start.

Step 9. To resolve -925 network layer errors, follow the
suggestions in this step. Changing network settings
on the machine running AMASS can affect
AMASS' ability to lock the database. If this
happens, an error similar to the following example
will be generated:

```
Raima Data Manager Version 3.21A
Database Consistency Check Utility
Copyright(C)1985-1992 Raima
Corporation, All Rights Reserved.

*** Raima Data Manager database
error -925 -
   errno=0

Database consistency check
prematurely terminated
   Last db-status=-925

1 error was encountered in 0
records/nodes
```

A) Generate the PID of the lm_ip process by using the UNIX ps command.

```
# ps -ef | grep lm_ip

amass  915 1 0 16:30:31 ? 0:01
/usr/amass/daemons/lm_ip -a fslock1
-u 128 -f 256 -q 128
```

If the lm_ip process is running, stop the process by using the kill -9 command with the *pid* option, which is the number from the second column (915) shown in the above example.

```
# kill -9 915
```

If the lm_ip process is not running, manually remove the database lock.

```
# rm /usr/amass/fslock1
```

Recreate the lock with the lm_ip command.

```
# /usr/amass/daemons/lm_ip -a fslock1 -u 50 -f 40 -q 80 -nd
```

Reboot the server to reset the IPC sockets. Rerun dbcheck. If the problem still exists, check the following items:

B) Run **ifconfig** *adapter* and compare the inet
address to the expected IP address. Use the following
table to determine the default primary Ethernet
adapter:

Platform	Adapter
AIX	en0
HP-UX	lan0
IRIX	ec0
Solaris	le0

C) If you are using Domain Name Service (DNS), is
the DNS running?

D) If you are using DNS, is there a route to the DNS
server?

E) If you are using Network Information Service
(NIS), is the NIS running?

F) Is the /etc/hosts file corrupted?

After the problem has been resolved, rerun dbcheck
on the affected database to make sure that all
problems are fixed. If successful, reboot the system
so AMASS can start.

Step 10. If the AMASS File System Database reflects
inconsistencies in the AMASS file system, use the
sysdbchk -y utility to automatically correct any
errors. Enter the following:

```
# /usr/amass/utils/sysdbchk -y
```

Rerun the `sysdbchk` utility without the `-y` option to make sure that all errors have been fixed. Examples of errors returned by this utility are illustrated in the following example.

```
file/dir 771279 has pdir 771278
which is not a directory

file 417631 is marked as APR but has
no append header record
```

Step 11. If the above procedures are not able to fix the database problems, restore the last backup of the AMASS File System Database with the `amassrestore` command. However, before using this command, make sure the following tasks have been done:

- You have previously performed a valid backup with the `amassbackup` command.

- Make sure you have backed up your existing AMASS File System Database using a standard utility, such as `tar` or `cpio` as instructed in Step 4.

- Make sure the Backup Volume is in the correct drive in the library. If there is another volume in the drive, return it to its home slot by using the following utility.

> **Note**
>
> The user must be amass. Use this utility only when AMASS is not running.

```
# su amass
Password:
# /usr/amass/daemons/amassrecovery -s
```

where:

Option	Description
-s	Performs the following actions: • Prevents system startup. • Performs file recovery. • Returns media to its home storage slot.

Step 12. Restore the AMASS File System Database and journal by entering the following command:

```
# /usr/amass/bin/amassrestore -u
```

Step 13. Run the dbcheck utility again as described above.

AMASS Does Not Start

AMASS does not start.

To correct, perform the following steps:

Step 1.   Log in as **root**.

Step 2.   Use the amass_log script to display the system log messages. For more information on this script, see "amass_log" on page 4-7.

Make sure the messages being looked at are for the current time period. Review prior messages to determine if any errors indicate the cause of the problem. For additional information regarding messages, refer to *Errors and Corrective Action*.

Step 3.   After performing corrective action, start AMASS using amass_start. For more information on this script, see "amass_start" on page 4-10.

Step 4.   If the problem persists or if the cause can not be determined through the system log, make sure the library is properly connected and run the install_tests script. For more information on this script, see "install_tests" on page 4-16. Check the script output for recommended corrective action.

Step 5.   After the corrective action has been performed, start AMASS using the amass_start script. For more information on this script, see "amass_start" on page 4-10.

Step 6.   If the problem persists, see "Prepare to Contact Technical Support" on page -32.

UNIX Server's Partitions Crash

An AMASS partition on the UNIX server's hard disk crashes.

To correct, perform the appropriate steps in the following procedure.

> **Note**
>
> These steps assume the File System Database
> (`/usr/filesysdb`) and journal
> (`/usr/filesysdb/journal`) were installed on different
> partitions as recommended during the installation process.

If Journal Partition Crashes

If the journal (`/home/filesysdbjournal`) partition crashes, perform the following steps:

Step 1. Log in as **root**.

Step 2. Copy the database (`/home/filesysdb`) to media. This file is required to restore the AMASS database since the last backup.

Step 3. Shut down AMASS by entering the following:

```
# su root
# /usr/amass/tools/killdaemons
```

Step 4. Restore the crashed journal (`/home/filesysdbjournal`) partition.

Step 5. To restore the File System Database and journal, from the Backup Volume enter the following command and options:

```
# amassrestore -v -D drivenumber -P slot
```

where:

Value	Description
`-v`	Displays a maximum amount of information.
For SCSI-attached libraries:	
`-D` *drivenumber*	Backup Volume is read by this drive.
`-P` *slot*	Backup Volume resides in this home storage slot.
For barcode-reading libraries:	
`-L` *label*	Backup Volume has this preprinted barcode.
For standalone drives:	
`-d` *tapedevice*	Backup Volume is read by this standalone tape drive. For example, `-d` */dev/rst12.*

Step 6. Copy your intact AMASS File System Database (`/home/filesysdb`) from Step 2. to the database partition.

Step 7. Start AMASS using `amass_start` as shown in the following example:

```
# /usr/amass/tool/amass_start /archive
```

If Database Partition Crashes

If the AMASS File System Database (`/usr/filesysdb`) partition crashes, perform the following steps:

> **Note**
>
> These steps assume the File System Database (`/usr/filesysdb`) and journal (`/usr/filesysdb/journal`) were installed on different partitions as recommended during the installation process.

Step 1. Log in as **root**.

Step 2. Copy the journal (`/home/filesysdbjournal`) to media. This transaction log is needed to restore the daily transactions since the last Database Backup.

Step 3. Shut down AMASS by entering the following:

```
# su root
# /usr/amass/tools/killdaemons
```

Step 4. Restore the crashed File System Database (`/usr/filesysdb`) partition.

Step 5. To restore the database and journal from the Backup Volume, enter the following command and options:

```
# amassrestore -v -D drivenumber -P slot
```

where:

Value	Description
-v	Displays a maximum amount of information.
For SCSI-attached libraries:	
-D *drivenumber*	Backup Volume is read by this drive.
-P *slot*	Backup Volume resides in this home storage slot.
For barcode-reading libraries:	
-L *label*	Backup Volume has this preprinted barcode.
For standalone drives:	
-d *tapedevice*	Backup Volume is read by this standalone tape drive. For example, -d */dev/rst12*.

Step 6. Copy your intact AMASS journal (/home/filesysdb/journal) from Step 2. to the journal partition.

Step 7. Start AMASS using amass_start as shown in
the following example:

```
# /usr/amass/tool/amass_start /archive
```

If Cache Partition Crashes

You have lost all write transactions that were pending in the
cache when the crash occurred.

Requests Not Getting to Library

AMASS is running but is not behaving as expected, for example, I/O requests are not going to the library.

To correct, perform the following steps:

Step 1.   Log in as **root**.

Step 2.   Use the amass_log script to display the system log messages. For more information on this script, see "amass_log" on page 4-7.

Make sure the messages being looked at are for the current time period. Review prior messages to determine if any errors indicate the cause of the problem. For additional information regarding messages, refer to *Errors and Corrective Action*.

Step 3.   If the problem persists or if the cause cannot be determined through the system log, make sure the library is properly connected and run the amass_tests script. For more information on this script, see "amass_tests" on page 4-12. Check the script output for recommended corrective action.

Step 4.   If the problem persists, see "Prepare to Contact Technical Support" on page -32.

System Panics

If a process causes a system panic, dump information to the core (memory) file. Save this file because it contains clues about what was going wrong when system came down.

To set your server to automatically dump data to the core file, perform the following steps for the appropriate platform.

Set Up for a Core Dump

HP

Step 1. By default, a core file is dumped to the /etc/rc file.

Step 2. After information has been dumped, enter the following:

```
# cd /etc/rc
# ls
```

Step 3. The /rc directory should contain entries similar to those shown in the following example. If more than one core has been dumped, there will be files with extensions greater than zero. The file with the highest number represents the latest core dump.

```
bounds     hp-ux.0      hp-core.0

bounds     hp-ux.0      hp-core.1

bounds     hp-ux.0      hp-core.2
```

Step 4. After determining the cause of the panic, delete any core files with the UNIX rm command.

IBM

Step 1. When the AIX operating system was installed, a dump device is automatically configured. The default on most models is `/dev/hd7`.

Step 2. When the system panics, it automatically dumps information to the `core` file and the LEDs on the front of the processor display "0c9."

Step 3. After information has been dumped, the LEDs flash "888."

For additional information on system-initiated dumps, refer to the IBM *Problem Solving Guide and Reference* manual.

SGI and Sun

Step 1. Create a directory called `/dir` where the `core` files can reside. Make sure there is plenty of disk space to contain this directory because the size of the dump depends on the amount of memory in the system and can be quite large.

Step 2. Modify the system startup file with a call to `savecore` as described for the appropriate operating system below:

Operating System	Task
IRIX	Edit the system startup `/etc/rc2.d/S48savecore` file with the following entry: `/usr/etc/savecore ${OPTIONS:=/dir}`
Solaris	Edit the system startup `/etc/init.d/sysetup` file with the following entry: `savecore /dir`

Step 3.   After information has been dumped, enter the
following:

```
# cd /dir
# ls
```

Step 4.   The /dir directory should contain entries similar to
those shown in the following example. If more than
one core has been dumped, there will be files with
extensions greater than zero. The file with the
highest number represents the latest core dump.

Operating System	Files in /dir Directory
IRIX	bounds unix.0 vmcore.0.comp bounds unix.0 vmcore.1.comp
Solaris	vmunix.0 vmcore.0 vmunix.0 vmcore.1

Step 5.   After determining the cause of the panic, delete any
core files with the UNIX rm command.

Command Gives Unexpected Results

A command gives an unexpected result.

To correct, perform the following steps:

Step 1. Log in as **root**.

Step 2. Use the quedisplay utility to make sure the command is showing up in the queue. For more information on this utility, see "quedisplay" on page 4-45.

Step 3. Use the amass_log script to display the system log messages. For more information on this script, see "amass_log" on page 4-7.

Make sure the messages being looked at are for the current time period. Review prior messages to determine if any errors indicate the cause of the problem. For additional information regarding messages, refer to *Errors and Corrective Action.*

Step 4. After performing corrective action, try the command again.

Step 5. If the problem persists or if the cause can not be determined through the system log, run the amass_tests script. For more information on this script, see "amass_tests" on page 4-12. Check the script output for recommended corrective action.

Step 6. After performing the corrective action, try the command again.

Step 7. If the problem persists, run the `script` command, which prints a line similar to the following:

```
Script started, file is typescript
```

Try the command again.

After typing **exit**, a line similar to the following is printed:

```
Script done, file is typescript
```

A file called `typescript` is created in the current directory that contains all the input and output of the command that is giving the unexpected results. Print this `typescript` file.

Step 8. For help in reading this file see "Prepare to Contact Technical Support" on page -32.

Library or Drive is Nonfunctional

A library or drive does not function as expected.

To correct, perform the following steps:

Step 1. Ensure that power is ON for the library and the communications cables are securely attached to the library and to the server where AMASS is installed.

Step 2. If the library control panel has a display area, check for an error code. Refer to the User's or Operator's manual for the specific library having the problem for instructions for handling error conditions.

Step 3. Log in as **root**.

Step 4. If AMASS is active, run the command shown below. For command information, see "amassstat" on page 3-24.

```
# su root
# amassstat -f
```

Step 5. Run install_tests. This script will test library operation and provide information on specific failures. For more information, see "install_tests" on page 4-16.

Step 6. If the problem cannot be resolved, contact your hardware technical support representative.

Power Failure

After a system is rebooted because of a power failure, AMASS attempts to automatically run the `amassrecovery` utility, which starts AMASS and recovers any files in the cache.

Instead, AMASS displays an "`filename has append record flags set but no append records`" message.

Run `/usr/amass/utils/sysdbchk` to verify the consistency of the file system and repair the incorrect flag. For more information on the `sysdbchk` utility, see "sysdbchk" on page 4-68.

Messages Generated by AMASS

AMASS generates the following types of messages:

- Operator Interactive Messages

- Technical Support Messages

- Customer-specific Messages

These messages types are described below.

Operator Interactive Messages

Because most AMASS commands and AMASS utilities are operator interactive, they use standard in (stdin) and standard error (stderr). Lists are written to standard out (stdout), which you can redirect to either a file or a printer.

Technical Support Messages

Technical support-specific AMASS message appear under the /usr/amass/logs/tac directory. These messages are neither intended for customers nor are they documented for customers.

Customer-specific Messages

Customer-specific AMASS daemon, database, kernel, and operation messages appear in the /usr/amass/logs/parms file and are sent to the system log file for viewing by the AMASS system administrator. (They are sent to the /usr/amass/logs/tac file as well.)

These system log messages help you to: assess system operation, resolve problems, check system health, and monitor performance.

For location of the system log and corrective action for messages, refer to *Errors and Corrective Action*.

Prepare to Contact Technical Support

Depending on how you purchased technical support, telephone support is provided either through your reseller or directly through ADIC. The ADIC Technical Assistance Center in Denver, Colorado provides world-wide service and support.

- In the USA and Canada, call 1-800-827-3822.

- Outside the USA and Canada, call 303-874-0188 or toll-free 00800-9999-3822.

- Send e-mail to: support@adic.com

Before contacting ADIC technical support, perform the following steps:

Step 1. Print the following files:

- `/usr/amass/tools/typescript.`

- `/usr/amass/tools/install/config.out.` (This file may not exist if the test scripts cannot detect an error.)

Step 2. Print the output from the `amass_log` script, making sure the correct system log file is scanned. To run this script, see "amass_log" on page 4-7.

Step 3. Run the `amass_snap` script to collect system information. To run this script, see "amass_snap" on page 4-9.

Step 4. Obtain the following information:

- AMASS Serial Number: _____

- Site ID: _____

Step 5. Contact technical support and be prepared to supply the above information to them.

NOTES

A

**Backup
Scripts for
HP-UX**

NOTES

Backup Example for Small File Systems

The script below performs:

- A complete backup every Friday (day 5) of all the files in a specified volume group.

- A partial backup every other day of the week (Monday through Thursday) of the files in the specified volume group that have changed since the last complete backup on Friday.

The script uses the `volfilelist` and `vollist` commands to generate a list of files in a volume group. Then, it pipes this list to a UNIX backup command.

To perform a complete library backup, run the script for every volume group in a library. The size of the AMASS File System Database determines how much time is required for this backup.

```sh
#!/bin/sh
# abackup
#
# Purpose:
# Store AMASS file system to tape.
# Use 'abackup 2' to backup volume
# group 2.
#
# Input:
# /tmp/archivedate - control file for
# backup, modified during every complete
# backup
# VOLGRP - the volume group to be
# archived from
# $1.
```

```
#
# Shell variables:
#     TEMPFILE -  temporary location for
# file listing
#     MOUNTPT -  the directory where the
# amass is mounted
#
# Output:
# A set of tapes the can be used to
# restore user files to an AMASS system
#
# Warning:
# This process can take a very long time.
# /tmp/BACKUPFILES and /tmp/${TEMPFILE}
# can be very large files.

#
day="`date +'%w'`"
MOUNTPT=`mount| grep amassdev| \
awk '{print $1}'` >${TEMPFILE}
VOLGRP=$1
cd ${MOUNTPT}
if [ ${day} = 5 ]
```

```
then
   if [ -f /etc/archivedate ]
   then
     /bin/mv /etc/archivedate \
žžžžž/etc/archivedate.AMASS
   fi
   >/etc/archivedate
   TEMPFILE=/tmp/FILES$$
   for disk in `/usr/amass/bin/vollist |
\
    awk ' $2=='$VOLNUM' {print $1}'`
   do
      /usr/amass/bin/volfilelist $disk \
žžžžžž>>${TEMPFILE}
done
   cat /tmp/${TEMPFILE} | sort +1n +2n | \
   awk '{print $1}'  >>/tmp/BACKUPFILES
   rm /tmp/${TEMPFILE}
else
   find . -newer /etc/archivedate -print
\   >/tmp/BACKUPFILES
fi
cat /tmp/BACKUPFILES | ftio -oxpp
>/dev/null


### end of Example script 1 ###
```

Backup Example for Large File Systems

The following script backs up data on large file systems. Consequently, a full backup completes over an extended period of time, usually one month.

Step 1. On the first day of the month (day 1) the script generates two lists:

- A complete list of files

- A list of files that have changed since the last complete backup

Step 2. The shell variable NMEGS determines how much data the system can back up in one evening.

> **Note**
>
> The amount of data can exceed the capacity of one optical platter.

Step 3. Every day, the script does a partial backup within a manageable period of time (one evening) of a group of volumes in a volume group.

Therefore, if you can divide the AMASS file system into 20 parts, the script can do a complete backup in 20 days.

```
#!/bin/sh
set -a
# abackup
#
# Purpose:
# Store AMASS file system to tape.
# Create a complete filelist of a given
# volume group in units of N volumes on
# an amass system for any streaming
# backup utility/peripheral that can
# accept filename data to stdin such as
#  cpio,ftio, and tar.
#

#  Input:
#     VOLGRP - the name of the volume
# that you which to archive from $1.
#  NMEGS - the number of megabytes to be
#          extracted per filelist from $2
#  /tmp/archivedate - control file for
# backup, modified during every complete
# backup

#
#  Shell variables:
#     TEMPFILE -  temporary location for
# file listing
#  MOUNTPT -  the directory where the
# amass is mounted
```

```
#
#  Output:
#     A set of tapes the can be used to
# restore user files to an amass system
#
#  Warning:
#     The output filelists can be very
# large.
#     Estimate 1 mb per 15,000 files.
#     This script uses the day of the
# month to index the appropriate file
# to be stored and must be executed
# every day.
#
if [ $# -ne 2 ]
then
  echo 'Usage:abackup #vol-group-num
#num-of-MB'
  exit
fi

DAYTYPE="`date +'%d'`"
DAYTYPE=1
VOLGRP=$1
NMEGS=$2
NVOLUME=0
TEMPFILE=/tmp/FILES$$
MOUNTPT=`mount| grep amassdev| awk
'{print $1}'`
COUNT=0
FILEINDEX=1
```

```
>${TEMPFILE}
>/tmp/BACKUPFILES
cd /
cd ${MOUNTPT}
if [ -f /etc/archivedate ]
then
#  find . -newer /etc/archivedate -print
>/tmp/BACKUPFILES
   echo " "
else
  >/etc/archivedate
fi

if [ ${DAYTYPE} = 1  ]
then
   /bin/mv /etc/archivedate
/etc/archivedate.AMASS
   >/etc/archivedate rm /tmp/AMASSOUT*
   /usr/amass/bin/vollist | awk '
$2=='$VOLGRP' {print $1" "$7}' |
  while read disk megs

do
    /usr/amass/bin/volfilelist $disk
>>${TEMPFILE}
     COUNT=`expr ${COUNT} + ${megs}
    if [  ${COUNT} -ge ${NMEGS} ]
    then
       COUNT=0
       cat ${TEMPFILE} | sort +1n +2n | \
       awk '{print $1}' >
/tmp/AMASSOUT${FILEINDEX}
       rm ${TEMPFILE}
       FILEINDEX=`expr ${FILEINDEX} + 1`
    fi
```

```
done
   if [ -f ${TEMPFILE} ]
   then
     cat ${TEMPFILE} | sort +1n +2n | \
      awk '{print $1}' >
/tmp/AMASSOUT${FILEINDEX}
     rm ${TEMPFILE}
   fi
else
find . -newer /etc/archivedate -print \
>/tmp/BACKUPFILES

fi
if [ -f /tmp/AMASSOUT${DAYTYPE} ]
then
  cat /tmp/AMASSOUT${DAYTYPE}
>>/tmp/BACKUPFILES
fi
cat /tmp/BACKUPFILES | ftio -oxpp
>/dev/null

## End of example 2 ##
```

B

Fine-tune
Block Size

NOTES

Optimize Tape Block Size

Overall system performance is generally improved by configuring the block size that AMASS uses to write to a tape drive.

Tape block size is configured with the `volformat -b` *blocksize* command. You cannot change block size on existing volumes, only on new volumes. For a description of this command, see "volformat" on page 3-158.

Thoroughly understand what this option does before making any configuration changes.

Caution
Use the tape block size option with care.

Supported Drives

Refer to the AMASS Release Notes for a list of drives that support configurable block size.

Calculating Block Size

Several factors must be considered when arriving at a value for your tape block size.

- Your "typical" file size, your media utilization capacity, and your expected site performance throughput

- Your system's `MAXIOSIZE` value

- Your drive's `READ-BLOCK LIMIT`

- Read the drive manufacturers published data on your drive's performance and block size

Some of these parameters are described below.

Correlate with File Size

To improve performance on file systems with large files, it is generally better to have AMASS write to a tape with a large block size. On the other hand, on file systems with smaller files, it is generally better to have AMASS write to a tape with a smaller block size. This concept is illustrated below.

Writing large files to a tape with a large block size takes less time, thus improves performance.

Writing smaller files to a tape with a smaller block size does not waste space on the tape.
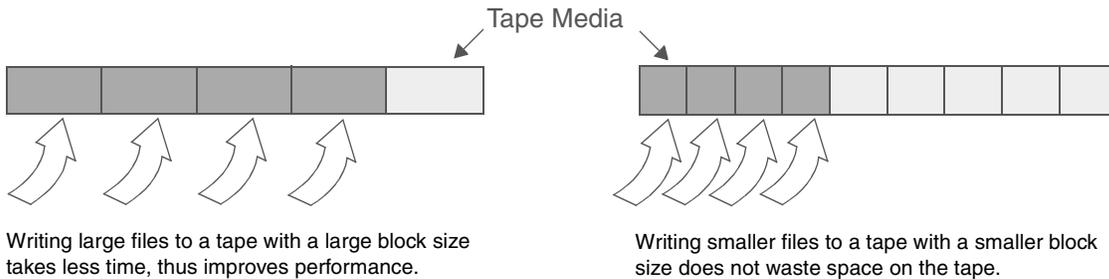
Correlate with MAXIOSZ

Calculating a block size for tape media must be correlated with the MAXIOSZ parameter. The MAXIOSZ is defined when installing AMASS and is the maximum size, in bytes, that AMASS uses to transfer data to and from the cache. The MAXIOSZ value varies depending on the operating system AMASS is installed on. For more information on MAXIOSZ, refer to "MAXIOSZ" in *Installing AMASS*.

> **Caution**
>
> If you change the MAXIOSZ value after using AMASS, you may **not** be able to read or write to previous volumes that were formatted with the old MAXIOSZ parameter. At the very least, you will see a significant decrease in throughput.

Tip

The configurable -b blocksize should evenly divide into the
MAXIOSZ value. This concept is illustrated below.

| 1/4 Tape Block Size | 1/4 Tape Block Size | 1/4 Tape Block Size | 1/4 Tape Block Size | Size of each tape block divides evenly into MAXIOSZ. |

MAXIOSZ   MAXIOSZ
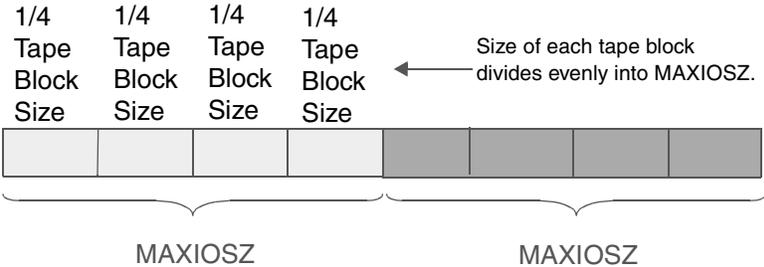
Correlate with
READ-BLOCK
LIMIT

A SCSI drive writes to tape in a fixed block segment determined
by the READ-BLOCK LIMIT of the drive. This means that at the
end of every write, the last block segment may hold less than
one full block of data. Although this may not, at first, impact
performance, it does waste tape resources if the "average" file
size is small and the -b *blocksize* has been configured for larger
file sizes. This concept is illustrated below.

Last segment may be less than full of
client's data.

Subsequent writes start in this contiguous segment.
If many partially filled segments exist, space is
wasted on the tape.
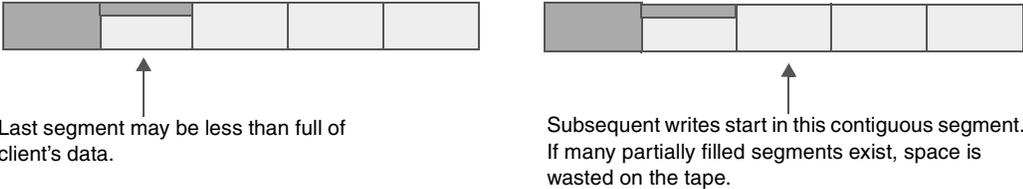
To determine the READ-BLOCK LIMIT value, refer to your drive's manual. Your goal is to have a complete file fit into a tape block segment, without having partially filled segments as illustrated above.

Tip
The configurable -b *blocksize* must be equal to or less than your drive's READ-BLOCK LIMIT value.

To calculate valid block size values, multiply the minimum block size, which is 16 KB, by 2 until you reach the value of your MAXIOSZ. Additionally, the calculated value is also less than your drive's READ-BLOCK LIMIT. This concept is illustrated below.

Drive's READ BLOCK LIMITS = 350 KB

MAXIOSZ = 256 KB

| 16 KB | 16 KB | 16 KB | 16 KB | |

Each tape block can be configured as:

Minimum = 16 KB

16 x 2 = 32 KB

32 x 2 = 64 KB

64 x 2 = 128 KB

128 x 2 = 256 KB

| 32 KB | 32 KB | 32 KB | 32 KB | |

| 64 KB | 64 KB | 64 KB | 64 KB | |

| 128 KB | 128 KB | 128 KB | 128 KB | |

| 256 KB | 256 KB | 256 KB | 256 KB | |

Any of these values are valid for
-b blocksize because they are:

• a multiple of MAXIOSZ.
• less than the drive's READ-BLOCK LIMIT.
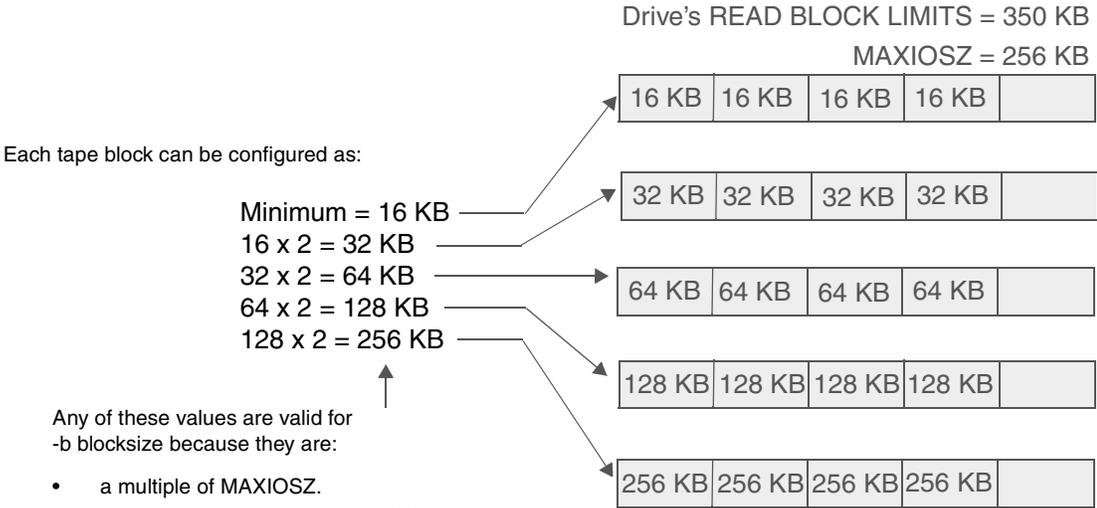
To arrive at a value, consider the following:

• your media usage capacity.
• your expected site performance.
• your "typical" file size.

NOTES

C

**Cache
Commands**

NOTES

Cache Commands

Using new AMASS commands, you can now assign cache block list values for reads and writes per volume group. If you do not use the Enhanced Cache Control feature, AMASS reuses the cache block at the head of the free list, which is the oldest cache block in the system. However, by using both the `setcblist` and `setcbwght` commands, AMASS will instead reuse the cache block list with the highest weight factor score. Therefore, a system administrator can keep files for a specific volume group in cache longer and the files can consequently be accessed more quickly by client applications. These new cache control commands are located in `/usr/amass/bin`.

Command	Page
setcblist	C-3
cblist	C-5
setcbwght	C-7
cbwghtlist	C-9

setcblist

Assigns a read and write cache block list value for a specific volume group. The values are separate for reads and writes within the volume group.

Options

```
/usr/amass/bin

./setcblist

-uy
[-r read_list volumegroup]
[-w write_list volumegroup]
```

Option	Description
-u	Usage statement
-y	Suppress confirmation and informational messages
-r *read_list volumegroup* (defaults to 1 cache list value)	Assign the specified volume group a read cache block list value. Values can be from 1 through 8
-w *write_list volumegroup* (defaults to 1 cache list value)	Assign the specified volume group a write cache block list value. Values can be from 1 through 8

Output

The example below illustrates how to assign volume group 126 both a read and write cache block list value of 2:

```
# su root
# setcblist -r 2 -w 2 126

Changing cache block list assignment for volume
group 126

Read list         current: 1        new: 2

Write list        current: 1        new: 2

Is this information correct? [y -n]: y
```

The following example illustrates how to assign volume group 52 a write cache block list value of 6:

```
# su root
# setcblist -w 6 52

Changing cache block list assignment for volume
group 52

Write list        current: 1        new: 6

Is this information correct? [y -n]: y
```

cblist

Displays the read and write cache block list values for a specific volume group.

Options

```
/usr/amass/bin

./cblist

-uy
```
volumegroup

Option	Description
-u	Usage statement
-y	Suppress confirmation and informational messages
volumegroup	Enter a specific volume group
	Separate a range of volume groups with a space. For example, `52  55` will display values for volume groups 52, 53, 54, and 55.

Output

The example below illustrates how to display cache block list values for volume group 52:

```
# su root
# cblist 52

VOLGRP          Read            Write

52              1               6
```

The example below illustrates how to display cache block list values for volume groups 121 through123:

```
# su root
# cblist 121 123

VOLGRP          Read            Write

121             1               6

122             3               2

123             2               2
```

setcbwght

Assigns weight factor values to the cache block list numbers. AMASS uses this weight factor to determine which cache block to reuse next and reuses the cache block with the highest score. The score is calculated by the weight factor (defined with the setcbwght command) associated with the list the cache block is on (defined with the setcblist command) multiplied by the age of the cache block.

weight factor * age of cache block = score

Age of cache block = current time MINUS time cache block was put on free list. When the cache block is reused, it is taken off the free list and put back on when processing has completed. When it is put back on, AMASS creates a new timestamp for the block. The oldest block is the one that has not been accessed for the longest period of time in seconds.

Options

```
/usr/amass/bin

./setcbwght

-uy
```
cachelist_number
weight_factor

Option	Description
-u	Usage statement
-y	Suppress confirmation and informational messages
cachelist_number	Enter a cache block list value from 1 through 8.
weight_factor (defaults to 1)	Enter a weight factor value • This value is a positive 32-bit number • 0 (zero) = Provides a way to prioritize blocks that reside on a specific list. These block will only be reused if no other cache blocks are available

Output

The example below illustrates how to set cache block list 8 for a weight factor of 100:

```
# su root
# setcbwght 8 100

Changing weight factor for cache block list 8

Weight factor    current: 1       new: 100

Is this information correct? [y -n]: y
```

cbwghtlist

Displays the weight factor values for each cache block list.

Output

The following example illustrates a sample output:

```
# su root
# cbwghtlist

List                    Weight

1                       1
2                       1
3                       1
4                       1
5                       1
6                       1
7                       1
8                       100
```

NOTES

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