



# Installing AMASS

**AMASS Version 5.3**  
**August 2002**  
**6-00027-01 Rev A**

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## NOTES

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# Preface

## **NOTES**

## **Purpose of This Book**

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This book describes how to install and configure AMASS (Archival Management and Storage System) software on a UNIX server.

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## **Who Should Read This Book**

This book is intended as a guide for the AMASS installation team, which is usually the site system administrators.

It assumes the system administrators have a strong familiarity with the following items:

- appropriate UNIX operating system
  - applications running in their site environment
- 

## **How This Book is Organized**

This book contains the following chapters:

**Chapter 1: Getting Started** — Lists supported platforms and operating system requirements including required disk space. Describes AMASS program files, database, and transaction log. Provides instructions on how to determine required cache space.

**Chapter 2: Installation Procedures** — Instructions for installing and configuring AMASS.

**Chapter 3: Site-Specific Tasks** — Post-installation tasks, such as: modifying the jobs scheduled in cron, sharing drives, installing a new authorization string, and moving AMASS to another UNIX server.

**Chapter 4: Troubleshoot Install Problems** — What to do if you have trouble with the installation process.

**Appendix A: Fine-Tune Configurations** — Adjusting AMASS configuration parameters for your site.

**Appendix B: Partition Cache on HP-UX** — Describes several ways to partition the cache space on HP.

**Appendix C: Barcode Conventions** — Label placement and entering barcodes in the AMASS database.

**Appendix D: Optional Parameters** — Configuration parameters to improve tape performance include: streaming tape I/O, maximum size of transferred data, and asynchronous I/O requests.

**Appendix E: Hot Spare Solution** — Install a hot spare configuration.

**Appendix F: Fibre Channel Support** — Describes the requirements for Fibre Channel support.

**Appendix G: Worksheet** — Provides a worksheet so you can assemble answers to the configuration questions before the actual installation and configuration process.

## Conventions

The conventions used throughout the AMASS technical books are listed in the following table:

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 <i>Courier</i> 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.	# <b>su root</b>
What you should type in is shown in <i>Courier bold</i> font.	<b>bulkinlet 1,2-10,21,23</b>
Site-specific variables are in a <i>Times italics</i> font.	<b>tar -xvf <i>tapedevicename</i></b>
A backward slash ( \ ) denotes the input is continued onto the next line; the printed page is not wide enough to accommodate the line.	# <b>rsh nodename -n dd \</b> <b>if=/cdrompath/amass/load.tar\</b> <b>bs=20b   tar xvBfb - 20</b> (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 files, which can be read by using Adobe® Acrobat® Reader®. To download a free copy of the most recent version of Adobe® Acrobat® Reader® software, visit the Adobe web sit at <http://www.adobe.com/>.

The following books 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](mailto: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: <ul style="list-style-type: none"><li>• Summary of enhancements</li><li>• Describes:<ul style="list-style-type: none"><li>- Fixed problems</li><li>- Known problems</li></ul></li></ul>
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 web 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.

## **NOTES**

# 1

## Getting Started

## **NOTES**

## Summary of Installation Steps

The following steps summarize the installation process. The tasks are presented as guidelines only. The actual steps required are site-specific:

Summary of Installation Steps	
1	For pre-installation instructions for a specific storage device, refer to <i>Accessing Storage Devices</i> .
2	Make sure the UNIX server has the recommended system requirements as listed in the Release Notes.
	Read the hard disk partitioning, space requirements, and guidelines on partitioning the cache in this chapter.
3	<b>Upgrades:</b> Make sure the cache is empty by running the <code>sysperf</code> command.
	Use <code>killdaemons</code> to inactivate AMASS, unmount the file system, and kill the AMASS daemons.
	<b>CAUTION:</b> Run the <code>sysdbchk</code> utility to make sure there has been no database corruption.
	<b>NOTE:</b> Make a full backup of the AMASS File System Database and Journal by running the <code>amassbackup -fv</code> command.
4	Upgrade the UNIX operating system, if required.
5	Shut down and power off the UNIX server where AMASS will be installed.

<b>Summary of Installation Steps</b>	
6	<p><b>SCSI-Attached Devices:</b> Connect the storage devices to the SCSI bus on the server. Make sure the SCSI bus is properly terminated. Refer to your library's user manual for instructions on setting the SCSI addresses.</p> <p>The AMASS installation script retrieves and displays device addresses to aid you in the AMASS configuration process.</p>
7	<p><b>Network-Attached Devices:</b> Connect the storage devices to the network.</p> <p>The AMASS installation script retrieves and displays device addresses to aid you in the AMASS configuration process.</p>
8	Apply power to the storage devices and boot the UNIX server.
9	<p>To assist you in answering the AMASS script questions, refer to the <i>Worksheet</i> appendix.</p> <p>To install AMASS, see the "Installation Procedures" chapter. For any last minute instructions, refer to the "Release Notes."</p>
10	After AMASS is installed, reboot the UNIX server if necessary.
11	To verify the configuration, run the <code>install_tests</code> script. For complete information on this script, see "Test the Installation (All Platforms)" on page 2-43.
12	<p><b>Upgrades:</b> AMASS, make a full backup of the AMASS File System Database and Journal by running the <code>amassbackup -fv</code> command with a <b>new</b> Backup Volume.</p>
13	Decide how you want to organize the AMASS file system. For example, what directories should be under the AMASS mount point? 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.

<b>Summary of Installation Steps</b>	
14	Load media and create entries in the AMASS database for all your media. For detailed steps, refer to the "Initial Setup Tasks" chapter in <i>Managing the AMASS File System</i> .
15	Decide if you want to apportion media into volume groups to keep project data or department data together on a specified number of volumes. Also, do you want to have a volume group for cleaning cartridges? For a description of volume groups, refer to "Volume Groups" on page 1-11 in <i>AMASS Overview</i> .

## System Requirements

For a list of requirements and operating system patches, refer to the Release Notes.

## Kernel

The following list describes the AMASS- required kernel components. If you are using Oracle, Ingres, or any other application that uses these kernel structures, increase the existing value by at least one.

- One semaphore and one semaphore undo structure  
(Semaphores allow processes to synchronize execution.)
- One shared memory segment  
(Shared memory allows processes to share parts of their virtual address space.)

### Tip

**Solaris only:** AMASS may require more shared memory than the default size allocated on your operating system. If this happens, messages similar to the following appear: "AMASS shared memory size of 1692944 bytes exceeds current system limit. Error getting shared memory via shmget, errno 22 - Invalid argument."

**Workaround:** Refer to the man page for `system(4)` on Solaris. In the

```
/etc/system
```

```
set shmsys:shminfo_shmmax=1692944
```

and reboot your Sun machine.

- **Kernel Memory:** When running `installamass` or `config_prod`, AMASS will display the amount of kernel memory required for the current set of configuration parameters.

For example:

```
./installamass
```

This configuration requires approximately 29966752 bytes of kernel memory. This value depends on `nblks_total` and `nfnodes`. Check your specific operating system documentation to determine the amount of kernel memory available.

The message states the approximate amount of kernel memory needed. This means AMASS needs at least this much and will actually use slightly more than this. Note that the amount of kernel memory used depends on the number of cache blocks and `nfnodes`. The number of cache blocks in turn depends on cache block size. Cache block size depends on `AMXIOSZ` and `NCUNITS`.

Cache block size = `MAXIOSZ * NCUNITS`

The value chosen for `MAXIOSZ`, `NCUNITS`, and `NFNODES` all influence the amount of kernel memory required.

**BEWARE:** Running out of kernel memory may cause AMASS/system to hang or crash.

## Platforms

To obtain details on supported platforms, contact your AMASS sales representative.

## Driver Support on HP 9000

SCTL drivers are supported on the following SCSI cards:

- PCI
- HP A679A

SPT drivers are supported on the following SCSI cards:

- HP 28655A
- HP 2696A

Note
Do not use the SPT driver on the same SCSI board as other system SCSI devices.

The following table details the previously listed requirements:

I/O	SCSI Card	Driver
HP-HSC	PCI	SCTL
EISA	HP A679A Single-Ended	
HP-PB	HP 28655A Single-Ended	SPT
	HP 28696A Fast and Wide	

## Operating Systems

The following caveats apply to all operating systems:

- The operating system must always be run in US English.

- The maximum file size is limited by the native operating system file system interface, not AMASS.

The following table lists the supported operating systems for this release of AMASS.

For the most recent list, refer to the Release Notes.

Operating System	Version <sup>§</sup>	Operating System	Version <sup>§</sup>
AIX <sup>®</sup>	4.3 4.3.1 4.3.2 4.3.3 5.1	IRIX <sup>®</sup>	6.2 6.5.3m <sup>¥</sup> 6.5.4m 6.5.5m 6.5.6m 6.5.7m 6.5.8m 6.5.9m 6.5.10m 6.5.11m 6.5.12m 6.5.13m 6.5.14m 6.5.15m 6.5.16m
hp Tru64 UNIX <sup>®</sup>	4.0D 4.0F 5.1, 5.1A	SPARC <sup>™</sup> Solaris <sup>™ §</sup>	8, 9 (32-bit and 64-bit)
HP-UX <sup>®*</sup>	11.0, 11i (32-bit and 64-bit) <sup>§</sup>		

<sup>§</sup> Allows files greater than 2 GB in size to be read and written. Because standard utilities may fail with large files, refer to your operating system's help pages for special options.  
<sup>¥</sup> AMASS supports the maintenance (m) version of IRIX 6.5.x, as opposed to the feature (F) version.

## Space Requirements

The following table shows the amount of hard disk space required by this release of AMASS.

For the most recent list, refer to the Release Notes.

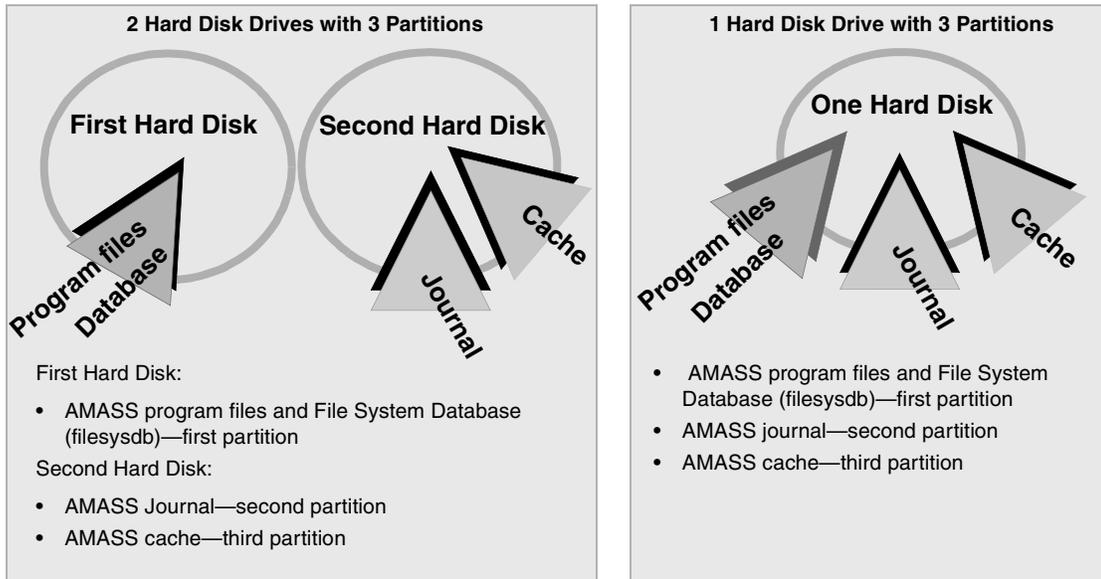
Operating System	AMASS Program Files <sup>†</sup>	AMASS Journal and Database*	Raw Cache <sup>‡</sup>
AIX 4.3 & 5.1	130MB	2MB to 2GB	80MB to 64PB
hp Tru64 UNIX 4.0D, 4.0F, 5.1, 5.1A	100MB		
HP-UX 11.0 32/64	199MB/146MB		
HP-UX 11i 32/64	154MB/183MB		
IRIX 6.2	215MB		
IRIX 6.5.x	233MB		
Solaris 8 32/64	176MB/313MB		
Solaris 9 32/64	197MB/313MB		
<p>† The <code>/usr/amass/logs/tac</code> directory contains log files so the initial size will grow.</p> <p>* AMASS will not load unless there is a minimum of 2MB. To calculate this space, refer to the illustration on page 1-15.</p> <p>‡ Used exclusively by AMASS. The maximum size is dependent on sector size and kernel architectural limits.</p>			

## Hard Disk Partitions

The AMASS application server must have one of the following:

- Two hard disk drives with three partitions  
(This configuration gives you better performance and higher data reliability.)
- One hard disk drive with three partitions

The following illustration shows how to partition the hard disk(s) for the AMASS software:



### Caution

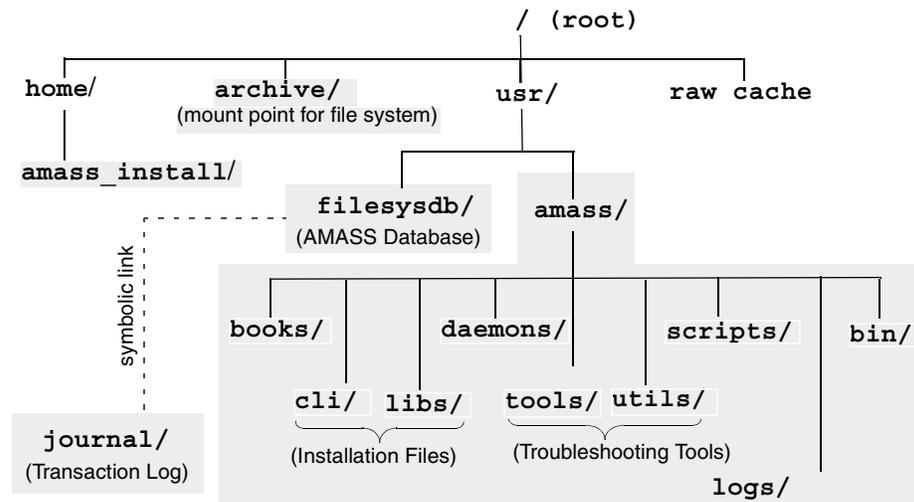
An improperly partitioned disk can corrupt data.

## Verify Device Nodes

When you partition the server's disk, verify that all device nodes exist for any cache partition that AMASS will use. For information on making device nodes, refer to your operating system manual.

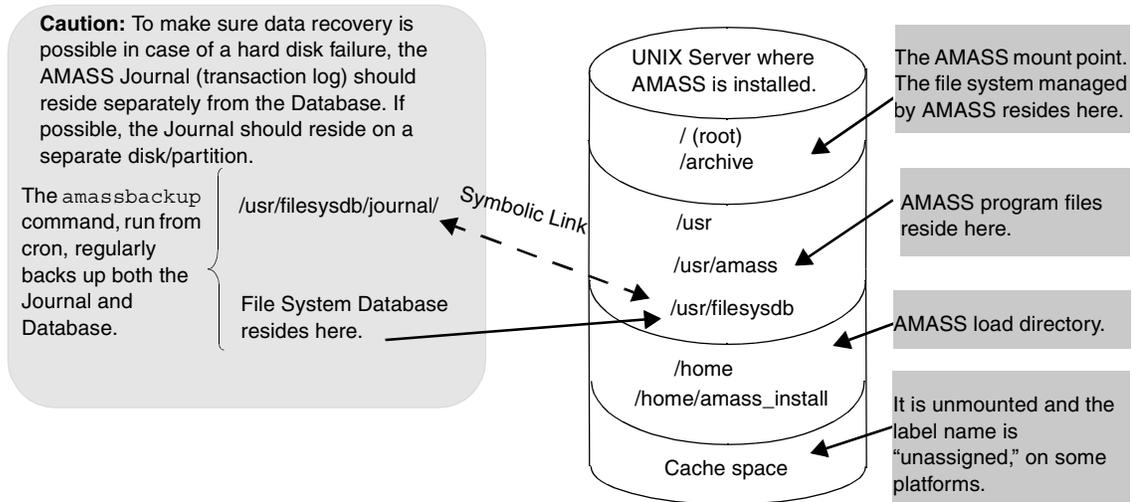
## File Hierarchy

The following illustration shows the AMASS file structure:



## Description of Files and Cache

The following illustration shows where AMASS files should be located on the UNIX server:



A description of the major AMASS components follow and may help determine how much actual hard disk space is required.

Topic	Page
Program Files	1-14
Journal	1-14
File System Database	1-14
Cache	1-17

## Program Files

Contains the installation and program files, administrative commands, scripts, utilities, and communication interfaces.

## Journal

The Journal is a transaction log for the AMASS Database. The Journal's default location 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.

The Journal's growth depends on the activity on the file system and how often the File System Database is backed up. For example, if daily backups are performed, the Journal could grow to 30 MB.

### Caution

To make sure data recovery is possible in case of a hard disk failure, place the AMASS Journal on either a separate disk or on a separate partition from the File System Database.

## 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.

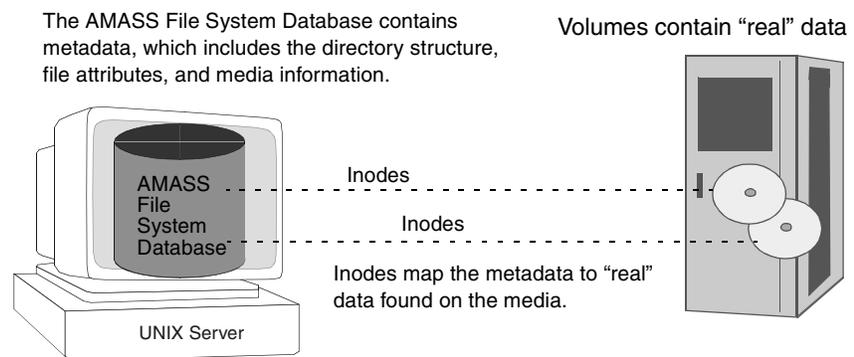
The metadata includes:

- media ID

- media type
- media location
- ownership
- 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 illustration shows the concept of how the AMASS Database maps the file system to the volumes in the library.



### *How to Estimate Database Space*

The File System Database grows an average of 120 bytes for each file or directory entry. You can estimate the size of the Database using one of the ways described in the following sections.

### *Estimate Files and Directories*

One way to approximate the size required by the Database is to use the following equation:

$$((\#Directories + \#Files) \times 120) + 204,800 = \text{Database Size in bytes}$$

↑                      ↑  
Estimates of the maximum  
number of files and directories

The values for #Directories and #Files are estimates of the maximum number of files and directories that can reside in the AMASS file system. When estimating these values, consider the following factors:

- AMASS keeps track of files and directories on online and offline media (online media is currently in the library; offline media is currently out of the library).
- Multiple libraries can be supported; the total capacity of each library needs to be considered.

For example, a system with the following factors:

- 200 directories
- 10,000 files

The Database size is calculated as follows:

$$\begin{aligned} \text{Database size} &= ((200 + 10,000) \times 120) + 204,800 \\ &= 1,428,800 \text{ bytes} \approx 1.36 \text{ MB} \end{aligned}$$

### *Estimate Media Capacity*

Another way to estimate the maximum number of files is to take the capacity of each tape or optical platter, divide by the average file size and multiply by the number of tapes or optical platters.

For example, a system with the following factors:

- average file size of 512 KB
- 10 optical platters with 650 MB (665,600 KB) capacity
- 5 optical platters with 1.3 GB (1,363,148 KB) capacity

The maximum number of files contained on those 15 optical platters is:

$$(665,600 \text{ KB} \div 512 \text{ KB}) \times 10 = 13,000 \text{ files}$$

$$(1,363,148 \text{ KB} \div 512 \text{ KB}) \times 5 = 13,312 \text{ files}$$

$$\text{Total files} = 26,312 \text{ files}$$

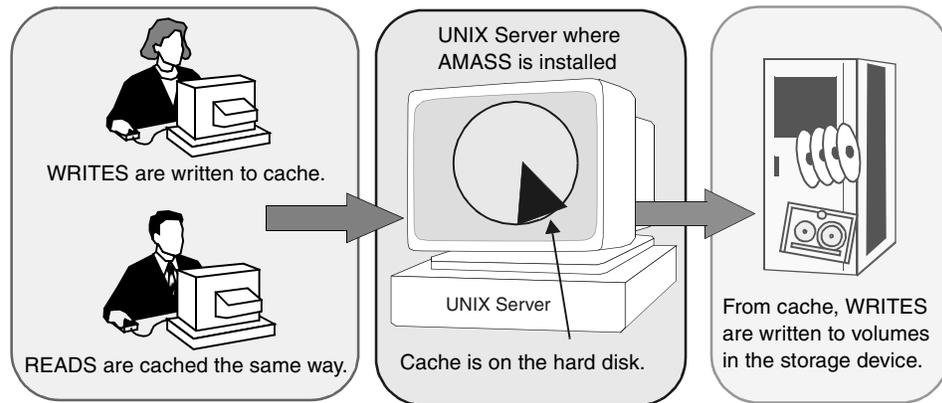
Although the previous example uses the full capacity of an optical platter to calculate the total system capacity, the formatted capacity of the media is typically less than the stated media capacity.

## Cache

AMASS uses the raw cache to:

- maintain open files
- stage writes and reads to and from the AMASS file system

The following illustration shows the raw cache staging concept.



If the system is rebooted, the AMASS cache is “flushed” but data that has not yet been written to media is saved.

AMASS must use the cache exclusively — it must not be mounted on any file system or configured for any other module. The cache space should consist of one or more raw partitions without a file system, on one or more hard disks. Each partition can span all or part of a disk.

### *Cache Size Affects Performance*

Being able to transfer large amounts of data with a single request can greatly enhance throughput. The larger the number of data blocks that are in the cache, the increased likelihood that the next requested block of data will already reside in the cache (a cache “hit”) and another request to the library can be avoided. Therefore, the performance of the AMASS file system, in most cases, can be enhanced by using a large cache space.

<b>Tip</b>
Poor performance is usually the result of not enough cache space for large request processing.

### *Variables That Affect Cache Size*

The following list describes variables that affect how big your cache space should be:

- average file size of files stored in the AMASS file system
- maximum number of concurrent reads from the AMASS file system
- maximum number of concurrent writes to the AMASS file system

### *Periodically Evaluate Cache Size*

Periodically evaluate the parameters that go into the sizing equation because both the applications and the AMASS file system usage patterns may change after AMASS has been running for a while. It is not unusual for the first implementation to be write-intensive while the data is being loaded into the AMASS file system, and then read-intensive when the loaded data is accessed.

*Supported Cache Partitions*

The following table lists the supported cache types. The X indicates the cache type is supported.

Operating System	raw	Logical Volume (LV)	VERITAS Logical Volume Manager (LVM)	Logical Storage Manager (LSM)	XLV	Cache Names for RAID Disks
AIX	X	X				X
hp Tru64 UNIX	X			X		X
HP-UX*	X	X	X			
IRIX 6.2 or 6.5 Only	X	X			X	X
Solaris	X	X	X			X

\* For information on partitioning the cache, see the Partition Cache on HP-UX appendix.

*Maximum Cache Size*

AMASS can support up to 256 cache partitions each with: 128 Tera\_disk\_blocks \* 512 bytes/disk\_block = 64 Petabytes.

**Install AMASS**

To install and test the AMASS configuration, see the "Installation Procedures" chapter in this manual.

## **NOTES**

## **NOTES**

# 2

## Installation Procedures

## **NOTES**

## **Pre-Installation Procedures**

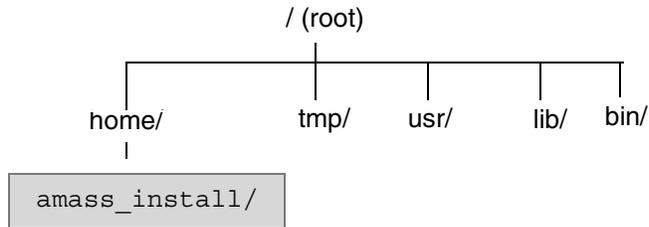
This section describes how to prepare for AMASS installation and how to create a load directory, procedures for new installs as well as upgrades, extracting files from the CD-ROM, and loading AMASS. Pre-installation procedures are:

- Create Load Directory
- New Installs or Upgrades
- Extracting Files from CD
- Load AMASS

## Create Load Directory

Create an installation directory, as shown in the following illustration, to contain the AMASS system modules and installation script extracted from the installation CD. The default directory is `/home/amass_install`.

For instructions on deleting this directory if space is limited, see “Remove Load Directory” on page 3-19:



### Note

Make sure that there is enough disk space available to contain the extracted AMASS files. For space amounts, “System Requirements” on Page 1-6.

## New Installs

### HP-UX Only

For any last-minute installation instructions, refer to the Release Notes.

Extracting files from the CD-ROM is the first stage in a two stage process. The second stage is the actual installation procedure.

#### Caution

Do not upgrade either the operating system or AMASS without first running the `sysdbchk` utility and running the `amassbackup -fv` command.

- Step 1.** Make sure the UNIX server has the recommended system requirements as listed in the Release Notes.
- Step 2.** Log in as `root`.
- Step 3.** Confirm that the drives are connected to the same SCSI bus location as the library.

#### Tip

Because of internal cable length limitations, ADIC recommends that you do not connect storage devices to the internal SCSI bus.

- Step 4.** Make sure that `/stand/system` represents your kernel configuration if you used a different directory for configuring the `vmunix` kernel. AMASS reads the `/stand/system` HP file.

**Step 5.** Upgrade your server's operating system at this time (if necessary.) Make sure you install all the system requirements.

**Step 6.** Do an `ls` on the `"/cdrompath/amass/load.tar"` to determine both the line extension and the case (either uppercase or lowercase) of the file names.

**Step 7.** Make sure that file names stay lower case and remove semicolons at the end of the file name by mounting the AMASS CD with the following command:

```
# mount -F cdfs -o ro,suid,cdcase  
/dev/cddevicename /cdrom
```

where:

<i>cddevicename</i>	Name of your CD device. For example, HP-UX = <code>dsk/c1t2do</code>
---------------------	--

**Step 8.** Change to your load directory. The default name is `/home/amass_install`.

**Step 9.** Proceed to the appropriate subsection shown in the following list to extract the AMASS software from the installation CD.

- *Extracting Files from CD*
- *CD on Remote Host*

### IRIX 6.2 or 6.5 Only

For any last-minute installation instructions, refer to the Release Notes.

Extracting files from the CD-ROM is the first stage in a two stage process. The second stage is the actual installation procedure.

**Caution**

Do not upgrade either the operating system or AMASS without first running the `sysdbchk` utility and running the `amassbackup -fv` command.

- Step 1.** Make sure that the UNIX server has the recommended system requirements as listed in the Release Notes.
- Step 2.** Log in as `root`.
- Step 3.** Set the following environment variables so that AMASS can add the appropriate file system module to the kernel:
  - `LD_LIBRARY_PATH=/usr/lib`
  - `LD_LIBRARYN32_PATH=/usr/lib32`
  - `LD_LIBRARY64_PATH=/usr/lib64`
- Step 4.** Upgrade your server's operating system at this time (if necessary.) Make sure you install all the system requirements.
- Step 5.** Do an `ls` on the "`/cdrompath/amass/load.tar`" to determine both the line extension and the case (either uppercase or lowercase) of the file names.
- Step 6.** Change to your load directory. The default name is `/home/amass_install`.

**Step 7.** Proceed to the appropriate subsection shown in the following list to extract the AMASS software from the installation CD.

- *Extracting Files from CD*
- *CD on Remote Host*

## ALL Others

For any last-minute installation instructions, refer to the Release Notes.

Extracting files from the CD-ROM is the first stage in a two stage process. The second stage is the actual installation procedure.

### Caution

Do not upgrade either the operating system or AMASS without first running the `sysdbchk` utility and running the `amassbackup -fv` command.

**Step 1.** Make sure that the UNIX server has the recommended system requirements as listed in the Release Notes.

**Step 2.** Log in as `root`.

**Step 3.** Upgrade your server's operating system at this time (if necessary.) Make sure you install all the system requirements.

**Step 4.** Do an `ls` on the "`/cdrompath/amass/load.tar`" to determine both the line extension and the case (either uppercase or lowercase) of the file names.

**Step 5.** Change to your load directory. The default name is /home/amass\_install.

**Step 6.** Proceed to the appropriate subsection shown in the following list to extract the AMASS software from the installation CD.

- *Extracting Files from CD*
- *CD on Remote Host*

## Upgrades

### HP-UX

For any last-minute installation instructions, refer to the Release Notes.

#### Caution

Do not upgrade either the operating system or AMASS without first running the `sysdbchk` utility and running the `amassbackup -fv` command.

- Step 1.** Make sure that the UNIX server has the recommended system requirements as listed in the Release Notes.
- Step 2.** Log in as `root`.
- Step 3.** Confirm that the drives are connected to the same SCSI bus location as the library.

#### Tip

Because of internal cable length limitations, ADIC recommends that you do not connect storage devices to the internal SCSI bus.

AMASS reads the `/stand/system` HP file. Consequently, if you use a different directory for configuring the `vmunix` kernel, make sure that `/stand/system` represents your kernel configuration.

- Step 4.** Run the `sysdbchk` utility to make sure there has been no database corruption:

```
# su root
# /usr/amass/utlils/sysdbchk
```

For more information on this utility, refer to the Utility Reference chapter in *Managing the AMASS File System*.

- Step 5.** Perform a full AMASS backup by entering the following command and options:

```
# su root
# /usr/amass/bin/amassbackup -fv
```

If you have used symbolic links, make sure the actual locations for the following directories are backed up:

```
/usr/filesysdb and
/home/filesysdb/journal
```

Make sure the backup of the database completes correctly, and AMASS has moved the Backup Volume to the last storage slot in the library.

- Step 6.** View the queue with the `sysperf` command to make sure that there are no pending write requests in the AMASS queue.

Log in as `root` and enter the command shown in the following illustration. To stop the `sysperf` command, use `<Control-C>`.

```
# sysperf [updateinterval]
```

where:

Option	Description
<i>updateinterval</i> (defaults to 60 seconds)	Enter the update interval time in seconds.

View the output generated by the `sysperf` command in the following illustration:

```

SYSTEM STATISTICS - Wed Apr 2 10:04:40
UPDATE INTERVAL  - 5 SEC
AVERAGE THROUGHPUT - 57 KBYTES/SEC

READ REQUESTS      # OF VOLUMES
      0              0
Indicates number  → WRITE REQUESTS      # OF VOL GROUPS
of outstanding    111                    3
write requests.

CACHE BLOCKS      612 Total    304 Free    308 Dirty
FNODES            304 Total    136 Free    168 Used

JUKE DRIVE VOLFLAG VOLUME VOLGRP KBYTES/SEC
  1    1    A        4      801    250
    
```

- Step 7.** Inactivate AMASS, unmount the file system, and kill the AMASS daemons by entering the following path and script name:

```
# /usr/amass/tools/killdaemons
```

If the `killdaemons` script returns a message indicating it cannot inactivate AMASS because files are open, force AMASS to inactivate by running `amasstat -f` and rerun `killdaemons`:

```
# amasstat -f
# /usr/amass/tools/killdaemons
```

- Step 8.** Upgrade your server's operating system at this time (if necessary.) Make sure you install all the system requirements.
- Step 9.** Do an `ls` on the "`/cdrompath/amass/load.tar`" to determine both the line extension and the case (either uppercase or lowercase) of the file names.
- Step 10.** Mount the AMASS CD with the following command to keep the file names lower case and to remove semicolons at the end of file names:

```
# mount -F cdfs -o ro,suid,cdcase
/dev/cddevicename /cdrom
```

where:

<i>cddevicename</i>	Name of your CD device. For example, HP-UX = <code>dsk/clt2do</code>
---------------------	--

**Step 11.** Change to your load directory. The default name is `/home/amass_install`.

**Step 12.** Proceed to the appropriate subsection shown in the following list to extract the AMASS software from the installation CD:

- *Extracting Files from CD*
- *CD on Remote Host*

### IRIX 6.2 or 6.5 Only

For any last-minute installation instructions, refer to the “Release Notes.”

#### Caution

Do not upgrade either the operating system or AMASS without first running the `sysdbchk` utility and running the `amassbackup -fv` command.

**Step 1.** Make sure the UNIX server has the recommended system requirements as listed in the “Release Notes.”

**Step 2.** Log in as `root`.

**Step 3.** Set the following environment variables so that AMASS can add the appropriate file system module to the kernel:

- `LD_LIBRARY_PATH=/usr/lib`
- `LD_LIBRARYN32_PATH=/usr/lib32`
- `LD_LIBRARY64_PATH=/usr/lib64`

- Step 4.** Run the `sysdbchk` utility to make sure there has been no database corruption:

```
# su root
# /usr/amass/utlils/sysdbchk
```

For more information on this utility, refer to the “Utility Reference” chapter in *Managing the AMASS File System*.

- Step 5.** Perform a full AMASS backup by entering the following command and options:

```
# su root
# /usr/amass/bin/amassbackup -fv
```

If you have used symbolic links, make sure the actual locations for the following directories are backed up:

```
/usr/filesysdb and
/home/filesysdb/journal
```

Make sure the backup of the database completes correctly, and AMASS has moved the Backup Volume to the last storage slot in the library.

- Step 6.** View the queue with the `sysperf` command to make sure there are no pending write requests in the AMASS queue.

Log in as `root` and enter the command as shown in the following illustration. To stop the `sysperf` command, use `<Control-C>`.

```
# sysperf [updateinterval]
```

where:

Option	Description
<i>updateinterval</i> (defaults to 60 seconds)	Enter the update interval time in seconds.

View the output generated by the `sysperf` command shown in the following illustration:

```

SYSTEM STATISTICS - Wed Apr 2 10:04:40
UPDATE INTERVAL - 5 SEC
AVERAGE THROUGHPUT - 57 KBYTES/SEC

READ REQUESTS      # OF VOLUMES
    0                0

Indicates number of outstanding write requests. → WRITE REQUESTS      # OF VOL GROUPS
    111              3

CACHE BLOCKS      612 Total    304 Free    308 Dirty
FNODES            304 Total    136 Free    168 Used

JUKE DRIVE VOLFLAG VOLUME VOLGRP KBYTES/SEC
  1    1    A        4      801    250
    
```

**Step 7.** Inactivate AMASS, unmount the file system, and kill the AMASS daemons by entering the following path and script name:

```
# /usr/amass/tools/killdaemons
```

If the `killdaemons` script returns a message indicating it cannot inactivate AMASS because files are open, force AMASS to inactivate by running `amasstat -f` and rerun `killdaemons`:

```
# amasstat -f
# /usr/amass/tools/killdaemons
```

- Step 8.** Upgrade your server's operating system at this time (if necessary.) Make sure you install all the system requirements.
- Step 9.** Do an `ls` on the "`/cdrompath/amass/load.tar`" to determine both the line extension and the case (either uppercase or lowercase) of the file names.
- Step 10.** Change to your load directory. The default name is `/home/amass_install`.
- Step 11.** Proceed to the appropriate subsection shown in the following list to extract the AMASS software from the installation CD:
- *Extracting Files from CD*
  - *CD on Remote Host*

## ALL Others

For any last-minute installation instructions, refer to the Release Notes.

### Caution

Do not upgrade either the operating system or AMASS without first running the `sysdbchk` utility and running the `amasbackup -fv` command.

**Step 1.** Make sure the UNIX server has the recommended system requirements as listed in the “Release Notes.”

**Step 2.** Log in as **root**.

**Step 3.** Run the `sysdbchk` utility to make sure there has been no database corruption:

```
# su root
# /usr/amass/utlils/sysdbchk
```

For more information on this utility, refer to the “Utility Reference” chapter in *Managing the AMASS File System*.

**Step 4.** Perform a full AMASS backup by entering the following command and options:

```
# su root
# /usr/amass/bin/amassbackup -fv
```

If you have used symbolic links, make sure the actual locations for the following directories are backed up:

```
/usr/filesysdb and
/home/filesysdb/journal
```

Make sure the backup of the database completes correctly, and AMASS has moved the Backup Volume to the last storage slot in the library.

**Step 5.** View the queue with the `sysperf` command to make sure there are no pending write requests in the AMASS queue:

Log in as `root` and enter the command shown in the following illustration. To stop the `sysperf` command, use `<Control-C>`.

```
# sysperf [updateinterval]
```

where:

Option	Description
<i>updateinterval</i> (defaults to 60 seconds)	Enter the update interval time in seconds.

View the output generated by the `sysperf` command shown in the following illustration:

```

SYSTEM STATISTICS - Wed Apr 2 10:04:40
UPDATE INTERVAL  - 5 SEC
AVERAGE THROUGHPUT - 57 KBYTES/SEC

READ REQUESTS          # OF VOLUMES
      0                  0
Indicates number of outstanding write requests. → WRITE REQUESTS          # OF VOL GROUPS
      111                3

CACHE BLOCKS    612 Total    304 Free    308 Dirty
FNODES          304 Total    136 Free    168 Used

JUKE DRIVE VOLFLAG VOLUME VOLGRP KBYTES/SEC
  1    1    A        4    801    250

```

**Step 6.** Inactivate AMASS, unmount the file system, and kill the AMASS daemons by entering the following path and script name:

```
# /usr/amass/tools/killdaemons
```

If the `killdaemons` script returns a message indicating it cannot inactivate AMASS because files are open, force AMASS to inactivate by running `amasstat -f` and rerun `killdaemons`:

```
# amasstat -f
# /usr/amass/tools/killdaemons
```

**Step 7.** Upgrade your server's operating system at this time (if necessary.) Make sure you install all the system requirements.

**Step 8.** Do an `ls` on the "`/cdrompath/amass/load.tar`" to determine both the line extension and the case (either uppercase or lowercase) of the file names.

**Step 9.** Change to your load directory. The default name is `/home/amass_install`.

**Step 10.** Proceed to the appropriate subsection shown in the following list to extract the AMASS software from the installation CD:

- *Extracting Files from CD*
- *CD on Remote Host*

## Extracting Files from CD

### CD on Local Host

Refer to the specific platform in the following list:

- *AIX*
- *Compaq Tru64 UNIX*
- *HP-UX*
- *IRIX 6.2 or 6.5 Only and Solaris*

#### *AIX*

```
# cd /home/amass_install
# tar xvf /cdrompath/amass/load.tar
```

#### *hp Tru64 UNIX*

```
# cd /home/amass_install
# dd if="/cdrompath/AMASS/LOAD.TAR" bs=20b
| tar xvBf -
```

#### *HP-UX*

```
# cd /home/amass_install
# dd if="/cdrompath/amass/load.tar" bs=20b
| tar xvfb - 20
```

*IRIX 6.2 or 6.5 Only and Solaris*

```
# cd /home/amass_install
# dd if=/cdrompath/amass/load.tar bs=20b |
tar xvBfb - 20
```

where:

Variable	Description
<i>cdrompath</i>	Path to where the CD has been mounted. For example, <i>cdrom/amassxx</i>

After you have extracted the files, proceed to the Load AMASS section.

## CD on Remote Host

Refer to the specific platform in the following list:

- *AIX, IRIX 6.2 or 6.5 Only, and Solaris*
- *HP-UX*
- *Compaq Tru64 UNIX*

*AIX, IRIX 6.2 or 6.5 Only, and Solaris*

```
# cd /home/amass_install
# rsh nodename -n dd
if=/cdrompath/amass/load.tar\
bs=20b | tar xvBfb - 20
```

**HP-UX**

```
# cd /home/amass_install
# remsh nodename -n dd
if="/cdrompath/amass/load.tar"\  
    bs=20b | tar xvfb - 20
```

**hp Tru64 UNIX**

```
# cd /home/amass_install
# rsh nodename -n dd
if="/cdrompath/AMASS/LOAD.TAR"\  
    bs=20b | tar xvBf -
```

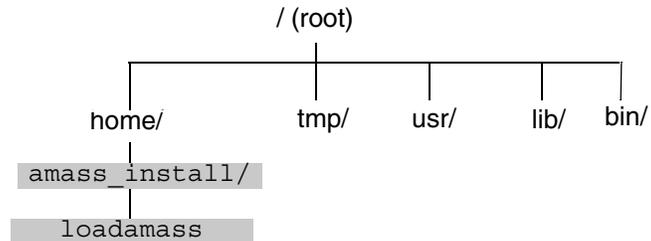
where:

Option	Description
<i>nodename</i>	Name of the remote node. To allow remote access to and from each host, make sure the node name is included in the <code>/.rhosts</code> file.
<i>cdrompath</i>	Path to where the CD has been mounted. For example, <code>cdrom/amassxx</code>

After you have extracted the files, proceed to the Load AMASS section.

## Load AMASS

At this point, a directory structure similar to the one shown in the following illustration is created:



**Step 1.** Run the `loadamass` script as `root` from your load directory. The default name is `/home/amass_install`.

```

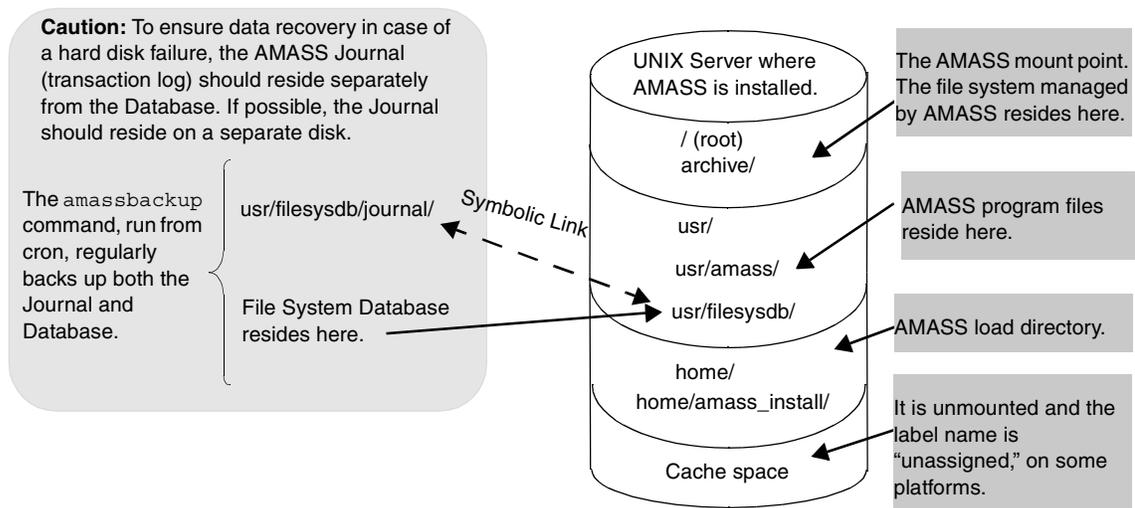
# su root
# cd /home/amass_install
# ./loadamass CDRom /cdrompath/amass
[nodename]
  
```

where:

Variable	Description
<i>cdrompath</i>	Path to where the CD has been mounted. For example, <code>cdrom/amassxx</code>
<i>nodename</i> <b>NOTE:</b> This parameter is required only if the drive is remote.	Name of the remote node. To allow access to and from each host, make sure the remote node name is included in the <code>.rhosts</code> file.

The `loadamass` script automatically creates the directories (and symbolic links) and loads the AMASS software. If you use symbolic links, enter the pathname of the **existing target directory** when prompted by the script. To follow the same directory placement and disk space requirements, see the "Getting Started" chapter.

The following illustration shows where the AMASS files will be located and where to run the `installamass` script:



## **Install AMASS**

The following sections describe the next step of the installation procedure:

- *AIX*
- *HP-UX*
- *IRIX 6.2 or 6.5 Only*
- *Solaris*
- *ALL Others*

In preparation for answering the AMASS script questions, refer to “Worksheet” on page C-1.

## AIX

- Step 1.** Upgrade to or install the current version of AMASS by entering the following path and script name:

```
# cd /usr/amass/scripts
# ./installamass
```

### Caution

If the installation fails, do **not** perform another backup. Contact your AMASS technical support representative for assistance.

- Step 2.** **New installs:** To answer the installation script questions, refer to “Worksheet” on page C-1.

**Upgrades:** The script asks if you want to make any configuration changes. Make the changes at this time.

- Step 3.** Disable the getty on the tty port by entering the following command (if the storage device is connected to a tty port:)

```
# smit chgtty
```

When the `smit` menu appears, select the following:

Field	Value
tty Device	Select the appropriate device
Change/Show TTY Program	

Field	Value
Name of initial program to run	[ ]
Enable Program	<b>OFF</b>

The `installamass` script displays a list of changeable optional software features similar to what is shown in the following illustration:

```
VOL COPY feature is ENABLED
VG IMPORT feature is DISABLED
CD IMPORT feature is ENABLED

Script done, file is typescript.
```

For information on these features, see the Optional Parameters appendix.

**Step 4.** Reboot the system because a successful installation or upgrade adds modules to the kernel.

**Note**

No reboot is necessary on platforms that support Dynamic Load. For the most recent list, refer to the Release Notes.

The AMASS installation process adds the elements shown in the following list to pre-defined directory locations.

- Kernel and daemon modules
- Database used to maintain metadata

- Commands and utilities
- Module for network-attached storage devices
- SCSI storage device driver (AIX and Solaris only).

**Step 5.** "Troubleshoot Install Problems" chapter if the installation fails.

**Step 6.** Print a copy of the `typescript` log or copy the `typescript` log to a place for safe keeping.

The `/usr/amass/scripts/typescript` log file contains all the information entered during the installation.

**Step 7.** The `amassrecovery` utility must have write permission to `/var/tmp`. Change the permissions with the following command:

```
# su root
# cd /var/tmp
# chmod 777 /var/tmp
```

**Step 8.** Run `install_tests` to verify the configuration. For instructions on running this script, See "Test the Installation (All Platforms)" on page 2-43.

## HP-UX

In preparation for answering the AMASS script questions, see “Worksheet” on page C-1.

**Step 1.** Upgrade to or install the current version of AMASS by entering the following path and script name:

```
# cd /usr/amass/scripts
# ./installamass
```

### Caution

If the installation fails, do **not** perform another backup. Contact your AMASS technical support representative for assistance.

**Step 2.** **New installs:** To answer the installation script questions, see “Worksheet” on page C-1.

**Upgrades:** The script asks if you want to make any configuration changes. Make the changes at this time.

**Step 3.** If the storage device is connected to a tty port, disable the getty on that port by editing the `/etc/inittab` file. Find the statement referencing the tty port where the storage device is connected and make sure the word “`off`” is in the third field. For example, if the storage device is connected to tty port “`a`,” the following entry would be as shown:

```
ttya:2:off /etc/getty /dev/tty0
```

**Step 4.** The `installamass` script displays a list of changeable optional software features similar to what is shown in the following illustration:

```
VOL COPY feature is ENABLED
VG IMPORT feature is DISABLED
CD IMPORT feature is ENABLED

Script done, file is typescript.
```

For information on these features, see the [Optional Parameters appendix](#).

**Step 5.** Reboot the system because a successful installation or upgrade adds modules to the kernel.

**Note**

No reboot is necessary on platforms that support Dynamic Load. For the most recent list, refer to the [Release Notes](#).

The AMASS installation process adds the elements shown in the following list to pre-defined directory locations.

- Kernel and daemon modules
- Database used to maintain metadata
- Commands and utilities
- Module for network-attached storage devices
- SCSI storage device driver (AIX and Solaris only).

**Step 6.** Refer to the "Troubleshoot Install Problems" chapter if the installation fails.

**Step 7.** Print a copy of the `typescript` log or copy the `typescript` log to a place for safe keeping.

The `/usr/amass/scripts/typescript` log file contains all the information entered during the installation.

**Step 8.** The `amassrecovery` utility must have write permission to `/var/tmp`. Change the permissions with the following command:

```
# su root
# cd /var/tmp
# chmod 777 /var/tmp
```

**Step 9.** Run `install_tests` to verify the configuration. For instructions on running this script, See “Test the Installation (All Platforms)” on page 2-43.

## IRIX 6.2 or 6.5 Only

In preparation for answering the AMASS script questions, see “Worksheet” on page C-1.

**Step 1.** Upgrade to or install the current version of AMASS by entering the following path and script name:

```
# cd /usr/amass/scripts
# ./installamass
```

### Caution

If the installation fails, do **not** perform another backup. Contact your AMASS technical support representative for assistance.

**Step 2.** **New installs:** To answer the installation script questions, refer to “Worksheet” on page C-1.

**Upgrades:** The script asks if you want to make any configuration changes. Make the changes at this time.

**Step 3.** If the storage device is connected to a tty port, disable the getty on that port by editing the `/etc/inittab` file. Find the statement referencing the tty port where the library is connected and make sure the word “`off`” is in the first field. For example, if the storage device is connected to tty port “2,” the following entry would be as shown:

```
# cd /etc/inittab
~
```

```
t2:23:off:      /sbin/getty -N
ttyd2 co_9600   # port2
~
```

**Step 4.** The `installamass` script displays a list of changeable optional software features similar to what is shown in the following illustration:

```
VOL COPY feature is ENABLED
VG IMPORT feature is DISABLED
CD IMPORT feature is ENABLED

Script done, file is typescript.
```

For information on these features, see the [Optional Parameters](#) appendix.

**Step 5.** Reboot the system because a successful installation or upgrade adds modules to the kernel.

**Note**

No reboot is necessary on platforms that support Dynamic Load. For the most recent list, refer to the [Release Notes](#).

The AMASS installation process adds the elements shown in the following list to pre-defined directory locations.

- Kernel and daemon modules
- Database used to maintain metadata
- Commands and utilities
- Module for network-attached storage devices

- SCSI storage device driver (AIX and Solaris only).

**Step 6.** Refer to the "Troubleshoot Install Problems" chapter.

**Step 7.** For future use, print a copy of the `typescript` log or copy the `typescript` log to a place for safe keeping.

The `/usr/amass/scripts/typescript` log file contains all the information entered during the installation.

**Step 8.** The `amassrecovery` utility must have write permission to `/var/tmp`. Change the permissions with the following command:

```
# su root
# cd /var/tmp
# chmod 777 /var/tmp
```

**Step 9.** Run `install_tests` to verify the configuration. For instructions on running this script, See "Test the Installation (All Platforms)" on page 2-43.

## Solaris

In preparation for answering the AMASS script questions, see “Worksheet” on page C-1.

**Step 1.** Upgrade to or install the current version of AMASS by entering the following path and script name:

```
# cd /usr/amass/scripts
# ./installamass
```

### Caution

If the installation fails, do **not** perform another backup. Contact your AMASS technical support representative for assistance.

**Step 2.** **New installs:** To answer the installation script questions, see “Worksheet” on page C-1.

**Upgrades:** The script asks if you want to make any configuration changes. Make the changes at this time.

**Step 3.** If the storage device is connected to a tty port, disable the `ttymon` getty on that port by using the `admintool/serial port manager`. For information on using this tool, refer to the Sun administration manual.

After configuring the SCSI addresses, the script asks if you want to install the package named `AAPjuke`. This is the SCSI driver and must be installed.

If `installamass` fails trying to build AMASS device drivers and returns the messages shown in the following illustration, reboot and run the `installamass` script again.

```
Running 'make install' on kernel
rem_drv vg
Driver (vg) not installed.
***Error code 1 (ignored)
rem_drv vtl
Driver (vtl) not installed.
***Error code 1 (ignored)
rem_drv amass.
Driver (amass) not installed.
***Error code 1 (ignored)
unlink/dev/rkrw0
~

Problem with making new kernel.
Please correct this and re-run.
~
```

**Step 4.** The `installamass` script displays a list of changeable optional software features similar to what is shown in the following illustration:

```
VOL COPY feature is ENABLED
VG IMPORT feature is DISABLED
CD IMPORT feature is ENABLED

Script done, file is typescript.
```

For information on these features, see the [Optional Parameters appendix](#).

**Step 5.** Reboot the system because a successful installation or upgrade adds modules to the kernel.

**Note**

No reboot is necessary on platforms that support Dynamic Load. For the most recent list, refer to the Release Notes.

The AMASS installation process adds the elements shown in the following list to pre-defined directory locations.

- Kernel and daemon modules
- Database used to maintain metadata
- Commands and utilities
- Module for network-attached storage devices
- SCSI storage device driver (AIX and Solaris only).

**Step 6.** Refer to the "Troubleshoot Install Problems" chapter.

**Step 7.** For future use, print a copy of the `typescript` log or copy the `typescript` log to a place for safe keeping.

The `/usr/amass/scripts/typescript` log file contains all the information entered during the installation.

**Step 8.** The `amassrecovery` utility must have write permission to `/var/tmp`. Change the permissions with the following command:

```
# su root
# cd /var/tmp
# chmod 777 /var/tmp
```

**Step 9.** Run `install_tests` to verify the configuration. For instructions on running this script, See “Test the Installation (All Platforms)” on page 2-43.

## ALL Others

In preparation for answering the AMASS script questions, see “Worksheet” on page C-1.

**Step 1.** Upgrade to or install the current version of AMASS by entering the following path and script name:

```
# cd /usr/amass/scripts
# ./installamass
```

### Caution

If the installation fails, do **not** perform another backup. Contact your AMASS technical support representative for assistance.

**Step 2.** **New installs:** To answer the installation script questions, see “Worksheet” on page C-1.

**Upgrades:** The script asks if you want to make any configuration changes. Make the changes at this time.

**Step 3.** The `installamass` script displays a list of changeable optional software features similar to what is shown in the following illustration:

```
VOL COPY feature is ENABLED
VG IMPORT feature is DISABLED
CD IMPORT feature is ENABLED

Script done, file is typescript.
```

For information on these features, see the Optional Parameters appendix.

- Step 4.** Reboot the system because a successful installation or upgrade adds modules to the kernel

**Note**

No reboot is necessary on platforms that support Dynamic Load. For the most recent list, refer to the Release Notes.

The AMASS installation process adds the elements shown in the following list to pre-defined directory locations.

- Kernel and daemon modules
- Database used to maintain metadata
- Commands and utilities
- Module for network-attached storage devices
- SCSI storage device driver (AIX and Solaris only).

- Step 5.** Refer to the "Troubleshoot Install Problems" chapter.

- Step 6.** Print a copy of the `typescript` log or copy the `typescript` log to a place for safe keeping.

The `/usr/amass/scripts/typescript` log file contains all the information entered during the installation.

**Step 7.** The `amassrecovery` utility must have write permission to `/var/tmp`. Change the permissions with the following command:

```
# su root
# cd /var/tmp
# chmod 777 /var/tmp
```

**Step 8.** Run `install_tests` to verify the configuration. For instructions on running this script, See “Test the Installation (All Platforms)” on page 2-43.

## Test the Installation (All Platforms)

After the installation has completed and you have rebooted the system, run the `install_tests` script to verify the configuration and to test the connected storage devices.

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.
- At least one tape or optical platter must be in the library; this volume should be the Backup Volume. 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” on page 2-13 in *Accessing Storage Devices*.

## What the Script Tests

The following table lists the tests that this script runs.

<b>Tip</b>
These tests can take a long time to complete if a library is large or if there are several libraries.

<b>Group</b>	<b>Test Name</b>	<b>Definition</b>
Drive	configured	Checks if drives are properly configured
	media	Checks if drives are loaded with media
Picker*	istat	Inventories library
	move	Moves media and reads barcode for tape libraries, not jukeboxes

\* As part of the Picker test, 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 volume (for network-attached libraries) to a drive.

The "last" volume or barcode is defined as what is listed by the `medialist` utility. (For information on this utility, refer to the "Troubleshooting Tools" chapter in the *Managing the AMASS File System*.) This last volume should be the Backup Volume. 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 **every** library using **every** drive.

## Tasks

The `install_tests` script performs the following configuration tasks:

- Modifies the AMASS startup script file to automatically start AMASS at bootup (can be disabled)
- Runs the `amass_start` script, which starts AMASS using `-b` (can be disabled using `-n` flag)
- Runs the `amass_tests` script, which tests AMASS configuration and operation

## Running the Script

**Step 1.** Login in as `root` and enter the script shown in the following illustration:

```
# su root
# /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 4 11:30:50
1999
Script started on Tue May 4
11:30:52 1999
script done on Tue May 4 11:35:00
1999
```

If AMASS passes these tests, AMASS automatically starts.

However, if AMASS fails these tests, messages display on the console and are sent to the system log.

- If you have an Inactive drive, the script fails and AMASS does not start. If this is the only problem, you can start AMASS by:

```
# amass_start
```

- If you do not have media in the library, the script prints a message indicating the library is empty. Under these circumstances, you can ignore this message.
- For instructions on resolving other install problems, "Troubleshoot Install Problems" chapter.

**Step 2.** After correcting any problems, run `install_tests` again.

---

## AMASS Startup (All Platforms)

When AMASS starts, it automatically runs the `amassrecovery` utility that performs the following tasks:

- Tests AMASS during startup to detect problems.
- Returns media in the drives to their home storage slots.
- Recovers files in cache and completes the write requests. These files were “stranded” in cache when AMASS was brought down.
- Retrieves the checkpoint data from the disk drive. When the system is first brought up after the file system is created, the following error message **may** appear and should be ignored:

```
Checkpoint area version: n does not  
match current version: m
```

## Location of Startup Commands

During installation, the AMASS startup commands were added to the appropriate files as follows:

<b>Operating System</b>	<b>File</b>
AIX	/etc/rc.amass
hp Tru64 UNIX	/sbin/rc2.d/S59amass
HP-UX	/sbin/init.d/amass
IRIX 6.2 or 6.5 Only Solaris	/etc/init.d/amass

## Next Step

Step	Procedure
1 through 11	See <i>Summary of Installation Steps</i> in Chapter 1.
12	<b>Upgrades:</b> AMASS, make a full backup of the AMASS File System Database and Journal by running the <code>amassbackup co</code>
13	Decide how you want to organize the AMASS file system. For example, what directories should be under the AMASS mount point? 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.
14	Load media and create entries in the AMASS database for all your media. For detailed steps, refer to the "Initial Setup Tasks" chapter in <i>Managing the AMASS File System</i> .
15	Decide if you want to apportion media into volume groups to keep project data or department data together on a specified number of volumes. Also, do you want to have a volume group for cleaning cartridges? For a description of volume groups, refer to "Volume Groups" on page 1-11 in <i>AMASS Overview</i> .

## **NOTES**



# 3

## Site-Specific Tasks

## **NOTES**

## Schedule cron Jobs

During installation, AMASS puts the entries described in the following table in the `root` crontab on the UNIX application server.

If the default schedule does not suit your site's needs, edit the `crontab` file. For information, "Edit cron File" on page 3-5.

Time	Task
Nightly at 11:45 p.m.	<p>Runs the <code>/usr/amass/logs/clearlog.sh</code> script, which backs up the log to <code>/usr/amass/log/transfile</code> and truncates the file. The log contains a file that registers all the AMASS transactions. After running the <code>clearlog.sh</code> script, AMASS saves the log as <code>transfile.x</code>. For more information, "Save log Files" on page 3-4. The <code>clearlog</code> script also saves the current and last four system logs.</p>
Nightly at 3 a.m.	<p>Runs the <code>amassbackup</code> command, which backs up the AMASS File System Database and Journal. Performs a full backup on the first day of each month and a partial backup on all other days. After the backup completes, AMASS truncates the Journal file. For more information, refer to "Database and Journal Backups" on page 2-3 in <i>Managing the AMASS File System</i>.</p> <p><b>CAUTION:</b> Make sure these backup are successful. Get into the habit of looking in the system log every morning for a "Backup was successful" message.</p>

## Assign Backup Volume

For detailed information on making a Backup Volume, refer to the "Initial Setup Tasks" chapter in *Managing the AMASS File System*.

## Save log Files

The log files located in `/usr/amass/logs` are named `transfile.x`, where "x" is an age-related counter with the smaller number being the most current. At installation, AMASS schedules a nightly cron job that backs up the log and saves the current transfile log to a `transfile.x` file and then creates a new file called `transfile`. However, the old `transfile.x` files are never deleted. For more information about this cron job, "Schedule cron Jobs" on page 3-3.

The format of the `transfile.x` is as follows:

```
hhmmss:MMDDYYYY type blocks copy BFID ftoken bfserver
logid errors filepath
```

Field	Description
hhmmss	Time of SSD log entry
MMDDYYYY	Date of SSD log entry
type	Creat = File was created in AMASS
	Delet = File was deleted in AMASS
	Renam = File was renamed in AMASS
blocks	Number of 512-byte blocks (Valid only for Creat type)
copy	File replication copy number (Valid only for Creat type)

Field	Description
BFID	Bitfile ID identifies a file that has been archived to the AMASS file system. Valid for Creat type. and Delet type. For Renam types, this is the original bitfile name.
ftoken	AMASS RID (record ID)
bfsserver	BFS server name Valid only for Creat type.
logid	Internal log ID number used by DataMgr
errors	Zero indicates success; non-zero indicates failure
filepath	Path name to file. For Renam type, this is the new filename

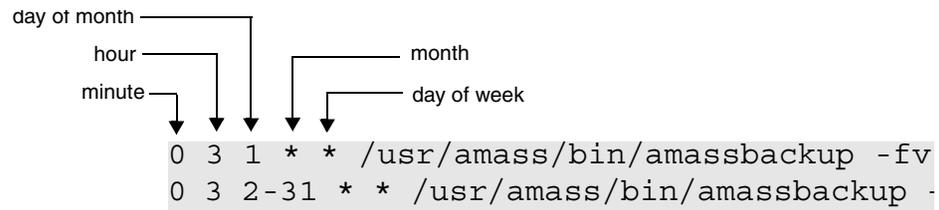
To review these files in case of system errors, ADIC recommends that you do not delete these “old” `transfile.x` files, but place them into an AMASS file system directory.

## Edit cron File

If the default schedule does not suit your site’s needs, perform the following steps to edit the `cron` file:

- Step 1.** Log in as `root`.
- Step 2.** Change to the `/var/spool/cron/crontab` file.

**Step 3.** Using an editor, such as vi, modify the crontab entry.



**Step 4.** Save and exit this file.

---

## **Initial Operating Tasks**

For information on operating tasks, refer to the "Initial Setup Tasks" chapter in Managing the AMASS File System.

## Share Drives

Drive sharing assumes there is another client application that needs access to the library and volumes in the library. To avoid contention by the two clients, you need to logically partition the media, which restricts their use by AMASS.

AMASS has provided a mask file, which can contain one or more barcode masks, to assist you in partitioning the volumes.

Drive sharing is valid for the following network-attached libraries:

- ADIC AML
- IBM 3494
- Storage Technology

## Edit Media File

To edit the mask file, perform the following steps:

- Step 1.** To restrict AMASS to use a subset of volumes within a single library, edit the following file:

```
# vi  
/usr/amass/.juke/media_file_jukebo  
xnumber
```

### Caution

To avoid unexpected results, edit this file carefully!

**Step 2.** If there is more than one installation of AMASS, more than one `media_file_jukeboxnumber` file will exist. Make sure that each AMASS installation recognizes a distinct list of volume numbers. If the same volume number is seen by both installations, both instances of AMASS may think wrong media types are in a library.

**Step 3.** For editing instructions, refer to the `/media_file_jukeboxnumber` file.

Use the UNIX regular expression (RE) pattern matching to edit the file and match either the RE or a set of REs.

If a media mask is specified, AMASS has access only to the media that matches the media mask. Otherwise, if a media mask is not specified, AMASS has access to all media in all libraries.

**Step 4.** After modifying this file, reboot the system to process these changes.

---

## Shutdown Procedures

To bring AMASS down, use one of the following procedures:

Topic	Page
Graceful Shutdown	3-10
Quick Shutdown	3-11
Disable AMASS at Startup	3-12

### Graceful Shutdown

Use the `amasstat` command to perform the following tasks:

- Prevent new files from being opened in the file system
- Allow all operations currently in progress to complete
- Update the checkpoint area
- Notify the operator of shutdown

To run `amasstat`, perform the following steps:

**Step 1.** Log in as `root`.

**Step 2.** Inactivate AMASS as shown in the following illustration. For more information on this command, refer to the "Command Reference" chapter in the *Managing the AMASS File System*.

```
# su root
# amasstat -i
```

**Step 3.** Reactivate AMASS as shown in the following illustration:

```
# amasstat -a
```

**Step 4.** When AMASS is reactivated, any writes that were in the cache complete so no data is lost.

## Quick Shutdown

Use the `killdaemons` script to bring down AMASS in a quick but controlled fashion. To run `killdaemons`, perform the following steps:

**Step 1.** Log in as `root`.

**Step 2.** To make sure there are no pending write requests in the AMASS queue, view the queue with the `sysperf` command. Enter the command as shown in the following illustration.

To stop the `sysperf` command, use `<Control-C>`.

```
# su root
# sysperf [updateinterval]
```

**Step 3.** Enter the following path:

```
# /usr/amass/daemons/killdaemons
```

This script performs the following tasks:

- Inactivates AMASS by running the `amasstat -i` command

- Unmounts the AMASS file system
- Kills the AMASS daemons

**Step 4.** If the `killdaemons` script returns a message indicating it cannot inactivate AMASS because files are open, force AMASS to inactivate by running the `amasstat -f` command and rerun `killdaemons` as shown:

```
# amasstat -f
# /usr/amass/daemons/killdaemons
```

## Disable AMASS at Startup

To prevent AMASS from starting when you reboot the server, perform one of the following.

### Use AMASS Command

**Step 1.** Log in as `root`.

**Step 2.** Enter the following:

```
# su root
# cd /usr/amass/tools
# ./amass_atboot -d
```

**Step 3.** Reboot the system (AMASS will not automatically start.)

**Step 4.** To enable AMASS so it automatically starts when the system is booted, enter the following:

```
# cd /usr/amass/tools
# ./amass_atboot -e
```

### Run in Single User Mode

Select the appropriate option from the following list to run in a single user state:

#### HP

Refer to the `hpux (1M)` manual page.

#### IBM, SGI

Use the `-s` flag on boot.

#### SUN

**Step 1.** Use the `-s` flag on boot.

**Step 2.** Reboot the system in multi-user mode to start AMASS even though you may have rebooted the system in single user mode.

If you exit single user mode and the boot proceeds to multi-user mode, AMASS will not start correctly.

---

## New Authorization String

Enter new authorization strings under the following conditions:

- change from an evaluation site to a purchase site
- add or change storage devices
- move AMASS to a different UNIX server

## Required Information

To request an authorization string, gather the following information:

**Step 1.** Write down the serial number from the AMASS distribution media:

AMASS serial number \_\_\_\_\_

**Step 2.** Write down your UNIX server host ID:

Host ID \_\_\_\_\_

To obtain the host ID, enter the command for the appropriate platform listed in the following table:

Operating System	Command
AIX	uname -m
hp Tru64 UNIX	/usr/amass/utills/validate_key -H
HP-UX	uname -i

Operating System	Command
IRIX 6.2 or 6.5 Only	sysinfo -s
Solaris	hostid

**Step 3.** Write down all the temporary product keys you were issued, if any:

Temporary Product Key \_\_\_\_\_

**Step 4.** Email the information you collected to the ADIC Technical Assistance Center at support@adic.com. They will provide you with a permanent authorization string.

Permanent Authorization String  
\_\_\_\_\_

**Step 5.** After receiving the permanent string, enter the following path and script name:

```
# su root
# cd /usr/amass/scripts
# ./change_auth
```

**Step 6.** The script displays the current authorization string and prompts you to enter the new string.

## Deinstall AMASS

To deinstall AMASS, perform the following steps:

**Step 1.** Inactivate AMASS by entering the following command:

```
# amassstat -fi
```

**Step 2.** Enter the following path and script name:

```
# cd /usr/amass/scripts  
# ./deinstallamass
```

**Step 3.** **Sun only:** If you receive the following messages after running the `deinstallamass` script, reboot and run the script again.

```
Running 'make install' on kernel  
~  
rem_drv vg.  
Driver (vg) not installed  
***Error code 1 (ignored)  
~  
rem_drv vtl.  
Driver (vtl) not installed  
***Error code 1 (ignored)  
~
```

```
rem_drv amass. No such device
Cannot get major number for:
amass
***Error code 1 (ignored)
~
Problem with making new kernel.
Please correct this and re-run.
```

**Step 4.** Reboot the system.

**Step 5.** Remove the directories and their contents with the UNIX `rm` command shown in the following table (the script does not remove these directories.)

Directory	Description
<code>/usr/filesysdb</code>	Location of the AMASS database
<code>/usr/amass</code>	Location of the program files
<code>/home/filesysdb/journal</code>	Location of the transaction log

---

## Reinstall AMASS

The procedure to reinstall the same version of AMASS is the same as the procedure to initially install AMASS.

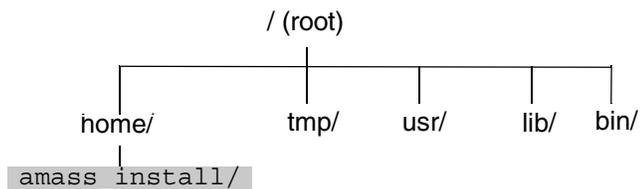
### Note

For detailed information on the AMASS commands used in these steps, refer to the "Command Reference" chapter in Managing the AMASS File System.

To reinstall AMASS, refer to "Installation Procedures" on page 2-1.

## Remove Load Directory

- Step 1.** Remove the extracted AMASS files from the machine where they were loaded after the installation is complete.



- Step 2.** Enter the following UNIX command to remove the load directory:

```
# cd /home/amass_install
# rm -r /home/amass_install
```

where:

Option	Description
load_directory (defaults to /home/amass_install)	Enter the name of the temporary directory where you loaded the AMASS files from the distribution CD.

---

## Move AMASS to a Different Server

If you move AMASS to another UNIX server, obtain a new authorization string for each library from your AMASS vendor.

### Note

For detailed information on the AMASS commands used in these steps, refer to the "Command Reference" chapter in Managing the AMASS File System.

## Procedure on the Existing Server

**Step 1.** Log in as root.

**Step 2.** Perform a full AMASS backup by entering the following command and arguments:

```
# /usr/amass/bin/amassbackup -fv
```

Make sure that the AMASS backup completes correctly before proceeding.

**Step 3.** Shut down AMASS using the `killdaemons` script. For shutdown instructions, refer to "Quick Shutdown" on page 3-11.

**Step 4.** Back up the old host system using your normal system backup procedure, making sure that the actual locations for the following paths are backed up:

```
/usr/filesysdb and  
/usr/filesysdb/journal
```

- Step 5.** Use `cp -p` to copy the `/usr/filesysdb` directory to the new system and preserve modes.

## Procedure on the New Server

- Step 1.** Log in as `root`.
- Step 2.** Back up the new host system using your normal system backup procedure.
- Step 3.** Create an `amass` login on the new system. Use the `amass` login on the old host as an example.
- Step 4.** Change ownership of the newly copied AMASS database and journal directories and files to `amass` by entering the following path and command:

```
# cd /usr/filesysdb
# chown -R amass
```

- Step 5.** Create the target entries on the new host if you want to relocate the `/usr/amass` directory to a different partition. Refer to see “AMASS Files” on page C-13.
- Step 6.** Refer to “Extracting Files from CD” on page 2-21 to complete the installation.

### Note

If the installation fails, do **not** perform another backup before continuing the install.

- Step 7.** Run `install_tests` to verify the installation. For instructions, refer to “Test the Installation (All Platforms)” on page 2-43.

**Step 8.** Perform a full backup of the AMASS database by entering the following command and arguments after the installation is successful and AMASS is running. This backup insures that any changes to the database tables are saved on the backup volume.

```
# /usr/amass/bin/amassbackup -fv
```

# 4

## Troubleshoot Install Problems

## **NOTES**

## makeall in tools Fails

The installamass script fails and returns the message shown in the following illustration:

```
chown amass amassmain
chmod 4755 amassmain
~

*** Signal 10
make: Fatal error: Command failed for
target `amassrecovery'
./makeamass: command
`/usr/amass/tools/makeall' failed in
/usr/amass/tools;
please contact your vendor for
assistance.

Removing temporary files...

Problem building the amass
filesystem...please contact your vendor
for assistance.

Script done, file is typescript.
```

## Solution

Make sure that you have enough disk space available, particularly in the /tmp directory.

---

## Unrecognized Device on Solaris Only

**Solaris only:** If an “unrecognized” device is attached to a Solaris system with multiple SCSI controllers, Solaris does not see the bus and consequently does not build the appropriate device files, hence AMASS fails to install.

### Solution

- Step 1.** Use the `probe-scsi-all` command to display the attached devices.
- Step 2.** Add the device node directory manually, for example, `QLCG, isp@1,10000`.
- Step 3.** Reboot the Sun system.
- Step 4.** Install AMASS.

## NIS Issues

The following table lists the problems and solutions for Network Information Service (NIS), the client/server administrative tool:

Issue	Problem	Solution
Password File	If your site uses NIS, the last entry in the <code>/etc/passwd</code> file must be an NIS entry. However, as part of the installation process, AMASS, creates a user named "amass" that is appended to the end of this file. Consequently, the <code>/etc/passwd</code> file is now invalid.	Use a text editor, for example <code>vi</code> , to edit the <code>/etc/passwd</code> file and move the <code>amass</code> entry up at least one row to allow the NIS entry to be the last entry in the file.
Ownership Files	On machines running NIS, AMASS incorrectly reads the ownership files from the local password file instead of from the network.	Add <code>amass</code> as a valid user to the local password file.

## Solaris Only - Cannot Build Device Drivers

**Solaris only:** The `installamass` script fails trying to build AMASS device drivers and returns the messages shown in the following illustration. You may also receive these messages after running the `deinstallamass` script.

```
Running 'make install' on kernel

rem_drv vg.
Driver (vg) not installed.
***Error code 1 (ignored)

rem_drv vtl.
Driver (vtl) not installed.
***Error code 1 (ignored)

rem_drv amass. No such device. Cannot get
major number for: amass
***Error code 1 (ignored)
~

Problem with making new kernel. Please
correct this and re-run.
```

## Solution

Reboot and run the `installamass` script again.

---

## Insufficient Space in File System

**hp Tru64 UNIX only:** If your root file system has insufficient space, the `installamass` script issues a warning as shown in the following illustration:

```
Warning: Your root directory has
insufficient space (xxxxx blocks
remaining) to hold the new kernel. AMASS
will leave this new kernel in
"/sys/HOSTNAME/vmunix" (xxxx KB).
```

```
After resolving the disk space conflict,
manually copy "/sys/HOSTNAME/vmunix" to
your root file system.
```

## Solution

AMASS will leave the new kernel in the `/sys/HOSTNAME/vmunix` file.

- Step 1.** Copy your “old” kernel to another area.
- Step 2.** Replace your “old” kernel with the new AMASS-created kernel by manually moving the new kernel to root (/).
- Step 3.** Reboot the Tru64 UNIX machine.

---

## Messages Generated by AMASS

AMASS generates the following types of messages as described in the following table:

Message	Description
Operator Interactive	Because most AMASS commands and AMASS utilities are operator interactive, they use standard in ( <code>stdin</code> ) and standard error ( <code>stderr</code> ). Lists are written to standard out ( <code>stdout</code> ), which you can redirect to either a file or a printer.
Technical Support	Technical support-specific AMASS messages appear under the <code>/usr/amass/logs</code> directory. These messages are neither intended for customers nor are they documented for customers.
Customer-specific	<p>Customer-specific AMASS daemon, database, kernel, and operation messages appear in the <code>/usr/amass/logs/parms</code> file and are sent to the system log file for viewing by the AMASS system administrator. (They are sent to the <code>/usr/amass/logs/tac</code> file as well.)</p> <p>These system log messages help you to: assess system operation, resolve problems, check system health, and monitor performance.</p> <p>For location of the system log and corrective action for messages, refer to Errors and Corrective Action.</p>

## NFS Timeouts

If the AMASS mount point is not properly defined in a client/server environment, clients may experience a large number of Network File System (NFS) timeouts when attempting to access the file system. These timeouts are caused by the inherent nature of a removable media device and the stateless design of NFS.

## Hard Mount File System

To avoid NFS timeouts, hard mount the AMASS file system so that:

- If the client does not receive a response, the request is re-sent. After three unsuccessful attempts, a message displays.
- Each request sent over NFS waits one minute for a response.
- Subsequent client requests continue to be sent.

Setting the mount point is platform-specific; instructions follow:

- HP Clients
- IBM Clients
- SGI Clients
- Sun Clients

## HP Clients

Edit either the `/etc/checklist` file or the `fstab` file on each HP client machine with the following NFS mount statement:

```
server:/mountpoint/localdir nfs
rw,hard,intr,bg,timeo=600,retrans=3 0 0
```

where:

Option	Description
server	Enter the name of the client's server.
mountpoint (defaults to <code>/archive</code> )	Enter the AMASS file system directory to mount.
localdir	Enter the name of the directory on the client machine over which the remote AMASS file system is mounted.

## IBM Clients

Edit the `/etc/filesystems` file on each IBM client machine with the following NFS mount statement:

```
server:/mountpoint/localdir nfs
rw,hard,intr,bg,timeo=600,retrans=3 0 0
```

where:

Option	Description
server	Enter the name of the client's server.
mountpoint (defaults to <code>/archive</code> )	Enter the AMASS file system directory to mount.
localdir	Enter the name of the directory on the client machine over which the remote AMASS file system is mounted.

**SGI Clients**

Edit the `/etc/fstab` file on each SGI client machine with the following NFS mount statement:

```
server:/mountpoint/localdir nfs
rw,hard,intr,bg,timeo=600,retrans=3 0 0
```

where:

Option	Description
server	Enter the name of the client's server.
mountpoint (defaults to <code>/archive</code> )	Enter the AMASS file system directory to mount.
localdir	Enter the name of the directory on the client machine over which the remote AMASS file system is mounted.

**Sun Clients**

Edit the `/etc/vfstab` file on each Solaris client machine with the following NFS mount statement:

```
server:/mountpoint - /localdir nfs - yes
rw,hard,intr,bg,timeo=600,retrans=3
```

where:

Option	Description
server	Enter the name of the client's server.
mountpoint (defaults to <code>/archive</code> )	Enter the AMASS file system directory to mount.
localdir	Enter the name of the directory on the client machine over which the remote AMASS file system is mounted.

## Prevent Timeouts

When DOS machines experience NFS timeouts, they:

- Do not attempt to reconnect
- Display the following error message:

```
Error reading from Drive L
Abort, Retry, Cancel
```

NFS timeouts are caused by the following conditions:

- AMASS cache space is full
- Network is busy or has a bottleneck
- Library cannot load a volume to complete writes because all the drives are busy

## Correct Timeouts

To correct NFS timeouts, retry the command as described in the following steps:

- Step 1.** Wait 30 seconds after receiving the above error.
- Step 2.** Enter **R** (for “retry”) and the process should continue archiving the file.
- Step 3.** Wait an additional 30 seconds and retry the command if the process has not continued.

## Prevent Timeouts

To prevent the NFS time-out, perform one of the following tasks:

- Slow Down Transfer Rate
- Avoid Timeouts

Both tasks are described in the following sections.

#### *Slow Down Transfer Rate*

Edit the `PCTCP.INI` file with the following information:

```
[pctcp idrive mountpoint]  
set writes=1024
```

where:

Option	Description
mountpoint	Enter the AMASS file system directory to mount. (defaults to <code>/archive</code> )
1024	Value that slows down the write performance of the PC/TCP product.

#### *Avoid Timeouts*

Use either the `ftp` or the `rsh` command that comes with the NFS product to move data.

- To use the `ftp` command, enter the command as shown in the following illustration:

```
# ftp amass  
# cd /mountpoint/directory  
# put bigfilename  
# bye
```

- To use the `rcp` command, enter the command as shown in the following illustration:

```
# rcp bigfilename  
# amass: /mountpoint/directory bigfilename
```

where:

<b>Option</b>	<b>Description</b>
mountpoint (defaults to <code>/archive</code> )	Enter the AMASS file system directory to mount.

## HP - Hardware Problems

**HP only:** If a picker or drive does not appear to be operational, use the `ioscan` command to retrieve the hardware status as shown in the following illustration:

```
# ioscan -fk
```

The following output shows that the library is connected to the system on SCSI card hardware path 44, target IDs are 0, 1, and 2.

Class	LU	H/W	Path	Driver	H/W Status	S/W Status
scsi	-	44		scsi1	ok(0x3980)	ok
target	-	44.0		scsi1.target	ok(0x8800202)	ok
sctl	0	44.0.0		scsi1.target.sctl	ok(0x8800202)	ok
disk	7	44.0.0		scsi1.target.disc3	ok(0x8800202)	HW/Driv_Mismatch
target	-	44.1		scsi1.target	ok(0x7800202)	ok
sctl	1	44.1.0		scsi1.target.sctl	ok(0x7800202)	ok
disk	2	44.1.0		scsi1.target.disc3	ok(0x7800202)	HW/Driv_Mismatch
target	-	44.2		scsi1.target	ok(0x7800202)	ok
sctl	2	44.2.0		scsi1.target.sctl	ok(0x7800202)	ok
disk	3	44.2.0		scsi1.target.disc3	ok(0x7800202)	HW/Driv_Mismatch

Hardware path: 44

Target IDs: 0,1,2

“HW/Driv\_Mismatch” entry appears when the autoconfiguration is overridden by the sctl driver; this is expected behavior. **NOTE:** Although the status can be cleared, ADIC recommends that you do not clear it because it does not affect normal operation and clearing it incorrectly can cause undesired system behavior.

Otherwise, output similar to what is shown in the following illustration means the system cannot probe the library because the:

- hardware is not connected to the system
- hardware is not powered on
- system is experiencing a communication problem

CLASS	LU	H/W PATH	DRIVER	H/W STATUS	S/W STATUS
=====					
scsi	3	44.3	scsii.target.sctl	No_Hardware	Cannot_Access

---

## Upgrade Issues

To upgrade your operating system as well as AMASS, perform the following steps:

- Step 1.** Run the `sysdbchk` utility to make sure there has been no database corruption.
- Step 2.** Perform a successful backup of your AMASS File System Database and Journal by running the `amassbackup -fv` command.
- Step 3.** Upgrade the UNIX operating system.
- Step 4.** Upgrade AMASS.

### IRIX Version 6.5.x Only

**IRIX Version 6.5.x only:** If you upgraded to IRIX Version 6.5.x, the operating system moves the location of the hardware device files from `/dev/scsi` to `/hw/scsi`. Therefore, running the AMASS `install_tests` script returns an error. Consequently, to create the proper links, you must answer the AMASS script questions again for the juke and drive SCSI configurations when you run `installamass`.

## Installation Issues

The following table lists installation issues:

Operating System	Issues
All Using NFS	<p>Because NFS processes requests serially, the system hangs when an AMASS request must wait for an fnode to become available.</p> <p><b>Workaround:</b> Increase the number of NFNODES with the <code>installamass</code> script.</p>
All	<p>When DAS returns an EPROBVOL error for a drive, AMASS makes the volume INACTIVE but it should sometimes make the drive INACTIVE. DAS maps 11 different EPROBVOL errors all to tape problems, but some are drive related.</p>
All	<p>AMASS does not support <code>mmap(2)</code>.</p>
IRIX 6.2 or 6.5 Only	<p>On SGI workstations, the <code>mediad</code> daemon, which automounts peripheral devices, conflicts with AMASS and must be disabled.</p> <p><b>Workaround:</b> To determine if your system uses this daemon, run</p> <pre>ps -ef   grep mediad.</pre> <p>For disabling instructions, either refer to your SGI documentation or add "ignore" statements in the <code>/etc/config/mediad.config</code> file.</p>
Solaris	<p>Upon startup, the following message appears:</p> <pre>"Error getting shared memory via shmget, errno 22 (EINVAL). MAXIOSZ =1024k, NCUNIT = 1, Cache size =56 GB, FNODES = 1000."</pre> <p><b>Workaround:</b> Reduce the FNODE to 200 and increase NCUNITS to 4.</p>

<b>Operating System</b>	<b>Issues</b>
Solaris	AMASS has problems with the standard Sun tool S95symon (system monitor). <b>Workaround:</b> Move S75amass to S99amass.
Solaris	Fibre Channel drivers must be configured with the Persistent Names option. Consult the vendor documentation that accompanied the Fibre Channel card.

---

## Prior to Contacting 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 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

Prior to 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`” in *Managing the AMASS File System*.

**Step 3.** Run the `amass_snap` script to collect system information. To run this script, see “`amass_snap`” in *Managing the AMASS File System*.

**Step 4.** Obtain, and be prepared to supply the following information:

- AMASS Serial Number: \_\_\_\_\_
- Site ID: \_\_\_\_\_

**A**

# **Fine-Tune Configuration**

## **NOTES**

## Optimize Drive Spinup

AMASS spinup characteristics for any drive can be changed via the following environmental variables:

- `AMASS_SPINUP_DELAY` - override default spinup delay
- `AMASS_RELOAD_RETRIES` - specify the number of times to reload media if encountering errors during spinup

The environmental variables can be added to the `/usr/amass/tools/amass_start` script as follows:

```
AMASS_SPINUP_DELAY=90
```

```
AMASS_RELOAD_RETRIES=3
```

```
export AMASS_SPINUP_RELAY
```

```
export AMASS_RELOAD_RETRIES
```

---

## Optimize Cache Parameters

Some cache parameters are defined by the system administrator while others are automatically calculated based upon related parameters and the total cache size available.

The objective in sizing the AMASS cache space and configuring the cache parameters is to transfer data to and from the storage device as quickly as possible by maximizing the use of cache block space without wasting cache space resource. For cache information, see “Cache” on page 1-17.

## Calculate Average File Size

In determining the size of `NCUNITS`, the goal should be to have the size slightly larger than the average small file size at your site. Thus, an average file will **divide evenly** into cache.

If the average file size is only 200 KB and `MAXIOSZ` is 256 KB, with `NCUNITS` as 2 (512 KB cache block), an average hit to the cache would use only one cache block, half of which would be used. In this case, half of the cache partition would effectively be wasted because the cache blocks are only half full of data. This waste could be reduced if you set `NCUNITS` to 1 to more closely match the file configuration and minimize the waste of system resources.

If the average file size varies greatly, the cache block size should be set as a logical common multiplier of the file size ranges, keeping in mind read-ahead functionality.

## Determine Application Usage

In some environments, only a portion of a file is accessed instead of the entire file. This is often true with database applications where database tables are stored on the AMASS file system. In this environment, requests for data are very random and you should disable the READAHEAD parameter so that each read request only reads one cache block of data and does not populate the cache space with unneeded additional cache blocks. Adjust the NCUNITS parameter depending on how much data needs to be accessed and available in the cache for a typical read request.

### Example

The following example demonstrates how the cache parameters should be set.

**Step 1.** Determine the average size of the files being written to the AMASS file system. In our example, we assume:

Average File Size = 2 MB

**Step 2.** Determine the AMASS file system access patterns. In our example, we assume:

Cache Space Size = 200 MB

Other pertinent values include:

READAHEAD = Enabled

MAXIOSZ = 256 KB

**Step 3.** Size the cache block so that four cache blocks can contain an average sized file. This accommodates the three block read ahead feature (four blocks total) and provides flexibility for reading and writing files that are smaller or larger than an average file with minimum cache waste.

Use the following equation to calculate the cache block size:

$$\text{Average File Size} \div 4 = \text{Cache Block Size}$$

The value for cache block size in this example is:

$$2 \text{ MB} \div 4 = .5 \text{ MB (512 KB) as the Cache Block Size}$$

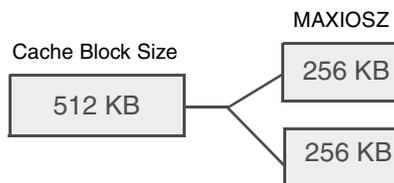
**Step 4.** Determine the NCUNITS parameter from the following equation:

$$\text{Cache Block Size} \div \text{MAXIOSZ} = \text{NCUNITS}$$

The value for NCUNITS in this example is:

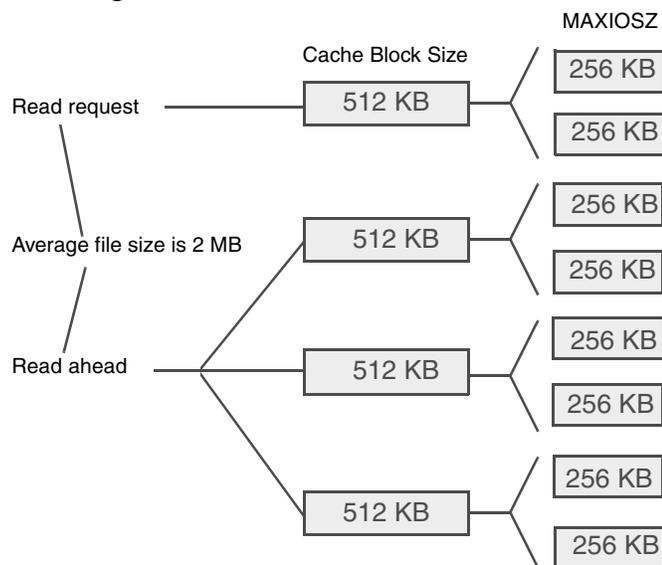
$$512 \text{ KB} \div 256 \text{ KB} = 2$$

Therefore, one cache block equals 512 KB and consists of 2 MAXIOSZ units of 256 KB each. This configuration is shown in the following illustration:



**Step 5.** Enable the READAHEAD parameter so AMASS reads the first block of a requested file and then an additional three blocks for a total of four.

In this example, these four blocks make up the average 2 MB file and will, therefore, be read in a single transmission. This concept is shown in the following illustration:



The system automatically calculates the number of available cache blocks in the cache space (NCBLKS) based upon the value for NCUNITS that you enter.

The equation for NCBLKS is:

$$\text{Cache Space Size} \div \text{Cache Block Size} = \text{NCBLKS}$$

The value for NCBLKS in this example is:

$$200 \text{ MB} \div .5 \text{ MB} = 400$$

The number of available fnodes in the AMASS file system (NFNODES) can then be determined. The equation for NFNODES is:

$$(NCBLKS \div 2) - 2 = NFNODES$$

The value for NFNODES in this example is:

$$(400 \div 2) - 2 = 198$$

However, since most applications and systems typically have less than 50 simultaneous open AMASS files, the default NFNODES is 50.

## Optimize Library Parameters

With the library parameters, you can fine-tune media exchange delays.

Because tape systems require more time to unload and search for data than optical systems, the following parameters are more important for tape media.

### Using MINLTIME

If your tapes must be rewound before they can be removed from a drive, which is very time consuming, avoid the premature removal of a tape by increasing `MINLTIME` by 5-10 seconds. This ensures that all requests to a specific tape have completed before it is exchanged.

Moreover, if there are unexpectedly high levels of media exchanges (thrashing), increase the `MINLTIME` parameter. If this is happening, media is being swapped before all operations have completed.

Otherwise, decrease `MINLTIME` if there are long idle periods while requests wait in the queue.

It is usually better to have slightly longer wait times than to have excessive media swaps because library thrashing is more time consuming and harder on the hardware.

### Using MAXLTIME

To insure that all requests in progress have completed, thereby avoiding the possibility of needing to return to a tape later, increase the `MAXLTIME` by 100-300 seconds.

If access patterns require long, uninterrupted I/O operations, increase the `MAXLTIME` parameter.

Otherwise, if users are forced to wait for excessive periods of time in order to get access to a drive, decrease `MAXLTIME`.

---

## 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, refer to the "Command Reference" chapter in the Managing the AMASS File System.

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:

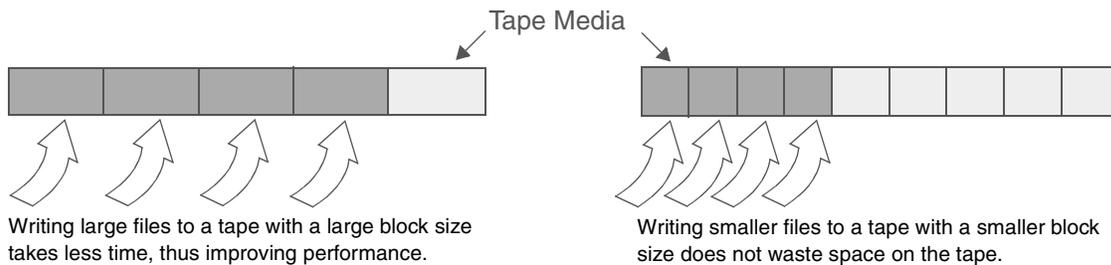
- typical file size
- media utilization capacity
- expected site performance throughput

- system's MAXIOSIZE value
- 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 in the following steps.

### Correlate with File Size

To improve performance on file systems with large files, it is usually best to have AMASS write to a tape with a large block size. Otherwise, on file systems with smaller files, it is usually best to have AMASS write to a tape with a smaller block size. This concept is shown in the following illustration:



### Correlate with MAXIOSZ

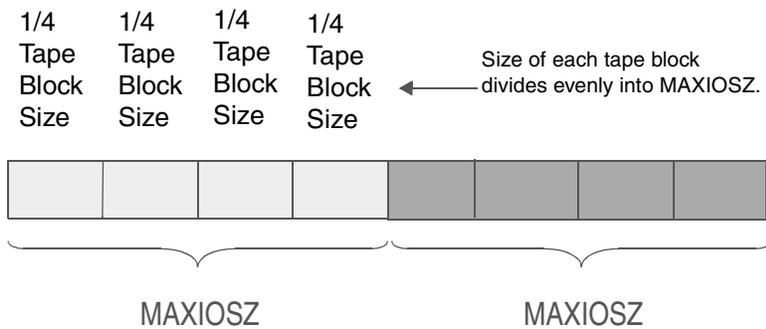
Calculating a block size for tape media must be correlated with the MAXIOSZ parameter. The MAXIOSZ is defined when installing AMASS. MAXIOSZ is the maximum size, in bytes, that AMASS uses internally to read data from and write data to the optical or tape media. This value is limited by the maximum DMA size of the specific SCSI hardware. The size can vary between hardware platforms and operating systems.

For more information on MAXIOSZ, see “MAXIOSZ” on page -38.

### Caution

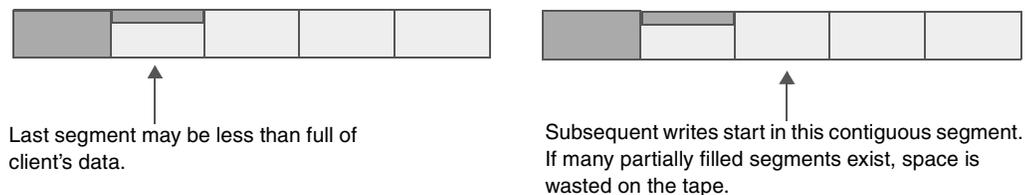
If you change the MAXIOSZ value after using AMASS, you may **not** be able to read or write to previous volumes that were formatted with the old MAXIOSZ parameter. You will, at the very least, see a significant decrease in throughput.

The configurable `volformat -b blocksize` should evenly divide into the MAXIOSZ value. This concept is shown in the following illustration:



## 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 shown in the following illustration:

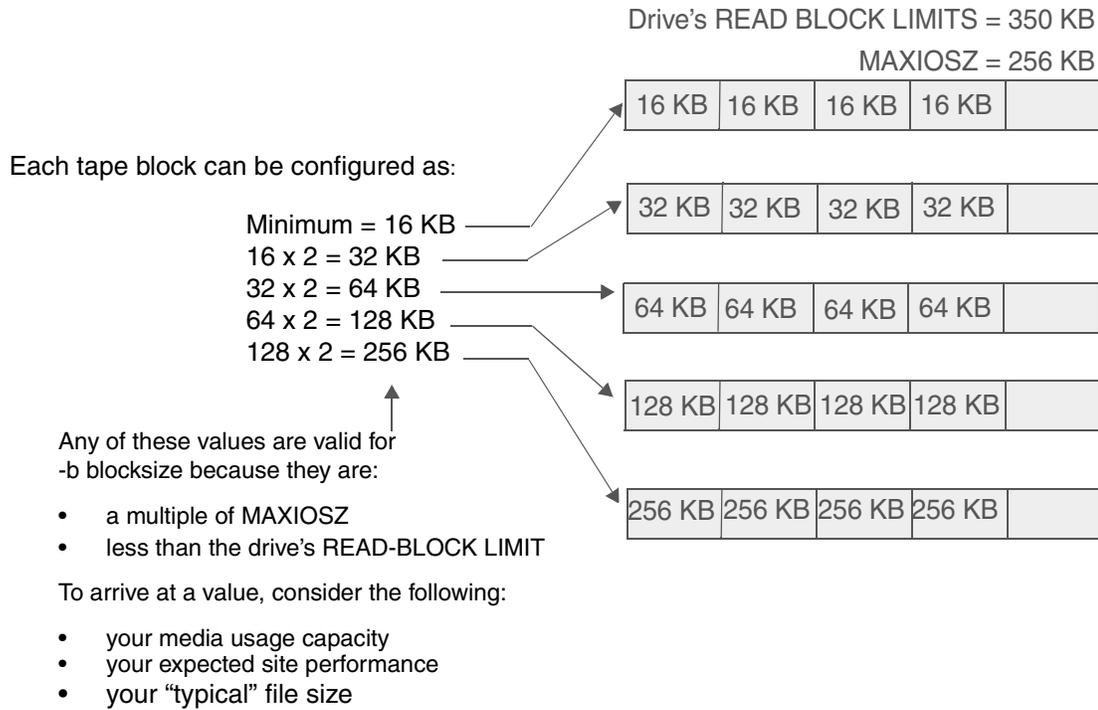


To determine the `READ-BLOCK LIMIT` value, refer to your drive's manual. Your goal is to have a complete file fit into a tape block segment, without having partially filled segments as illustrated in the following illustration:

### Tip

The configurable `volformat -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 shown in the following illustration:



## Optimize Write Requests

Disable the `OUTORDERBATCH` parameter under the following conditions:

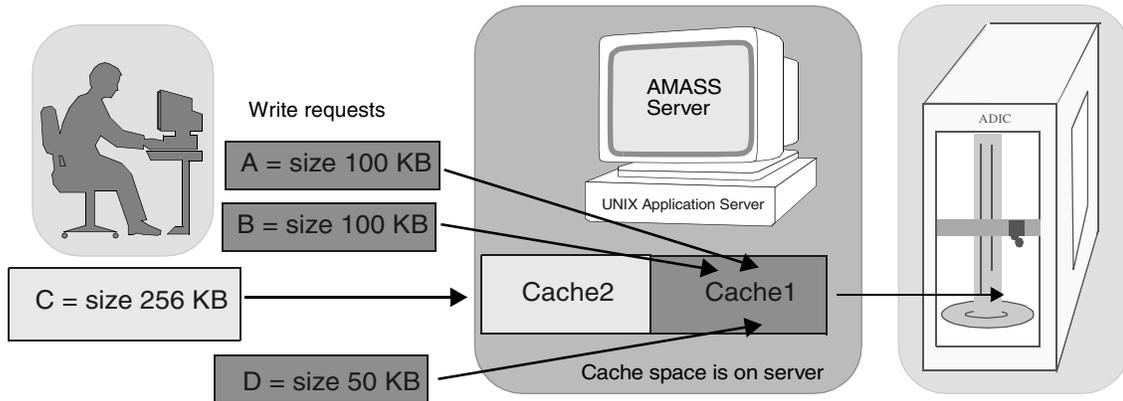
- You use a tape library.
- Client applications have many small file writes. A small file is defined as a size less than your `MAXIOSZ` value.
- Clients typically read files in the same order as they are written.

## Batching Requests

The size of the cache is equal to `MAXIOSZ`. `MAXIOSZ` is the maximum size, in bytes, that AMASS uses internally to read data from and write data to the optical or tape media. This value is limited by the maximum DMA size of the specific SCSI hardware. The size can vary between hardware platforms and operating systems.

In our example, there are 4 files, labeled A, B, C, and D, in the queue destined for the same volume.

The following illustration shows how AMASS processes write requests when `OUTORDERBATCH` is enabled. AMASS processes the requests in the following sequence:



- Files A, B, and D are sent to cache1 (file C does not fit). To maximize throughput, AMASS attempts to fill the cache before sending data to the library.
- AMASS processes file C in cache2.
- If the files are read in the order the write requests were made (A, B, C, and D), this is the sequence AMASS must go through:
  - Drive reads Files A and B
  - Drive is repositioned to read file C
  - Drive is repositioned to read file D

For an optical drive, this is not a problem because seeks are quick. But for tape drives, this read-sequence calls for a lot of tape movement.

## Batching Disabled

If you disable the `OUTORDERBATCH` parameter, AMASS would process the requests in the following sequence:

- Files A and B are sent to cache1.
- File C does not fit so the data in cache1 is sent to the library.
- File C is processed.
- File D is processed.
- If the files are read in the order the write requests were made (A, B, C, and D), this is straightforward because this is the order in which they were written to the volume.

## Filling Media

By default, AMASS follows the sequence in the following sequence when filling space on media:

- AMASS writes to one volume at a time and keeps that volume available for writing until it is completely full.
- When the volume does not have enough free space on it for the next write request, AMASS writes to a second volume.
- The free space on the first volume is used if AMASS receives a write request that fits in that space. It may take some time for AMASS to completely fill a volume.

Meanwhile, other volumes are being written to.

Enabling `MARKVOLFULL` is useful in environments where volumes are backed up after being filled. If you enable the `MARKVOLFULL` parameter, AMASS uses the following sequence:

- The first write request that fails because of insufficient space causes AMASS to mark that volume “FULL.”
- AMASS writes to a second volume and does not return to the first volume.



# **B**

## **Barcode Conventions**

## **NOTES**

## Barcode Labels

Optical platters have two physical labels — one for the top side of the media and one for the bottom side of the media.

The barcodes for both labels must have identical alphanumeric characters except the top side is identified with the last character as A, while the bottom side is identified with a B.

## Label Placement

Place the barcode on the optical volume as follows:

- Side A
- Side B

Refer to the following illustration for barcode label placement on a cartridge.

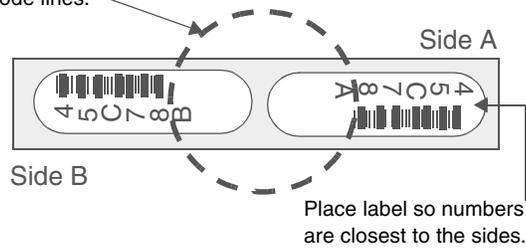
Look closely at the labels. Usually the lower part of the label where the A and B suffix is, has more white space than the upper part.

Place both labels on the cartridge so there is as much white space as possible between the actual barcode lines. This is done so the reader on the picker does not get “confused” when reading the lines.

## Side A

Place side A face-up with the end of the cartridge where labels are placed closest to you. Place the barcode label for side A on the right half of the label end of the cartridge. The numbers on the barcode label should be closest to side A.

Place labels so there is as much white space as possible between the actual barcode lines.



## Side B

Place the barcode label for side B on the left half of the label end of the cartridge.

## Entering Barcodes in AMASS

When entering the preprinted barcode label in AMASS, do not enter the suffix A or B. For example, although the preprinted labels are 45C78A and 45C78B, you must enter only 45C78

**C**

**Worksheet**

## **NOTES**

---

## Installation Worksheet

This worksheet describes the configuration questions asked during the procedure described in the *Installation Procedures* chapter.

**Tip**

For library-specific and drive-specific installation instructions, refer to *Accessing Storage Devices*.

**Tip**

To maximize your configuration, see the *Fine-Tune Configuration* appendix.

In answering the configuration questions, you have two choices:

- accepting the default values by pressing <Enter>  
The default values are indicated by square brackets [].
- entering your site-specific values

ADIC suggests that you make a copy of this worksheet to fill in as you read through this chapter. Moreover, because the number of storage devices may differ from the number shown on this worksheet, make as many copies of those worksheet pages as necessary to completely define your site configuration.

Platform	Question	Description	Your Response (examples in <i>italics</i> )
<b>AMASS Files</b>			
All	Where do you want the AMASS program files to reside?	refer to "AMASS Files" on page C-13.	<i>/usr/amass</i>
	Where do you want the AMASS database to reside?		<i>/usr/filesysdb</i>
	Where do you want the AMASS file system journal (transaction log) to reside?		<i>/usr/filesysdb/journal</i>
<b>User and Group IDs</b>			
All	Enter a numeric UID (user ID) for user <i>amass</i> .	refer to "User, Group IDs" on page C-15.	<i>356</i>
	Enter a numeric GID (group ID) for group <i>amass</i> .		<i>356</i>
<b>Mount Point</b>			
All	Enter mount point for the file system managed by AMASS.	refer to "Mount Point" on page C-15.	<i>/archive</i>
<b>Export via NFS</b>			
All	Will network clients use NFS to access file system?	refer to "Export via NFS" on page C-15.	<i>y (yes)</i>

Platform	Question	Description	Your Response (examples in italics)
<b>System Logging</b>			
All	Should AMASS modify your <code>syslog.conf</code> file to send AMASS-specific messages to the system log file?	refer to "System Logging" on page C-16.	<i>y (yes)</i>
<b>Cache Space Names</b>			
AIX	DEVNAME1	refer to "Cache Space Names" on page C-17.	
	raw device name		<i>/dev/ramasscache</i>
	block device name		<i>/dev/amasscache</i> <b>NOTE:</b> This example assumes the logical volume is named "amasscache." <b>NOTE:</b> Do NOT create a Logical Volume called 'amass' to store the AMASS Program Files -- that name is reserved in the ODM.
hp Tru64 UNIX	DEVNAME1		
	raw device name		<i>/dev/rrz13c</i>
	block device name		<i>/dev/rz13c</i>
HPUX	DEVNAME1		
	raw device name		<i>/dev/rdisk/c201d0s2</i>
	block device name		<i>/dev/dsk/c201d0s2</i>
IRIX 6.2 or 6.5 Only	DEVNAME1		
	raw device name		<i>/dev/rdisk/dks2ds5</i>
	block device name		<i>/dev/dsk/dks2d2s5</i>

Platform	Question	Description	Your Response (examples in italics)
SGI: RAID	DEVNAME1	refer to "Cache Space Names" on page C-17.	
	raw device name		<i>/dev/rdisk/dks3d3l3s5</i>
	block device name		<i>/dev/dsk/dks3d3l3s5</i>
Solaris	DEVNAME1		
	raw device name		<i>/dev/rdsk/clt2d0s4</i>
	block device name		<i>/dev/dsk/clt2d0s4</i>
All	Do you wish to (a)dd, (d)elete, or (u)se cache spaces?		<i>a (add)</i>
<b>Authorization Strings</b>			
All	Number of jukeboxes?	refer to "Authorization Strings" on page C-18.	<i>1</i>
	JUKEBOX 1		<i>1234ABCD5678EFGH</i>
<b>Optional Features</b>			
All	Offline Media Manager Text Import and Export Volume Copy CD Import Infinite File Life	refer to "Optional Features" on page C-21.	
<b>Product Serial Number</b>			
All	Enter the AMASS product serial number.	see "Product Serial Number" on page C-22.	<i>A126194752</i>

Platform	Question	Description	Your Response (examples in italics)
<b>SCSI-Attached Address</b>			
hp Tru64 UNIX	JUKEBOX 1 SCSI bus number	refer to "hp Tru64 UNIX" on page C-25.	<i>1</i>
	JUKEBOX 1 Target		<i>1</i>
	JUKEBOX 1 Logical Unit Number		<i>0</i>
	DRIVE 1 SCSI bus number		<i>1</i>
	DRIVE 1 Target		<i>2</i>
	DRIVE 1 Logical Unit Number		<i>0</i>
<b>SCSI-Attached Address</b>			
HPUX	JUKEBOX 1 SCSI hardware path of controller	refer to "HP" on page C-27.	<i>12</i>
	JUKEBOX 1 Target ID		<i>4</i>
	JUKEBOX 1 Target LUN		<i>0</i>
	DRIVE 1 Target ID		<i>5</i>
	DRIVE 1 Target LUN		<i>0</i>

Platform	Question	Description	Your Response (examples in italics)
<b>SCSI-Attached Address</b>			
AIX IRIX 6.2 or 6.5 Only	JUKEBOX 1 SCSI bus number	refer to "AIX" on page C-29. "IRIX 6.2 or 6.5 Only" on Page 3-31	
	JUKEBOX 1 Target		
	JUKEBOX 1 Logical Unit Number		<i>0</i>
	DRIVE 1 SCSI bus number		
	DRIVE 1 Target		
	DRIVE 1 Logical Unit Number		<i>0</i>
<b>SCSI-Attached Address</b>			
Solaris	JUKEBOX 1 DRIVE 1 SCSI bus number	refer to "Solaris" on page C-32.	<i>4</i>
	JUKEBOX 1 DRIVE 1 Target		<i>2</i>
	JUKEBOX 1 DRIVE 1 Logical Unit Number		<i>0</i>
<b>RS-232 Attached Address</b>			
RS-232	JUKEBOX 1 Full pathname to serial port where library 1 is attached	refer to "RS-232-Attached Addresses" on page C-34.	<i>/dev/ttya</i>

Platform	Question	Description	Your Response (examples in italics)
<b>Network-Attached Address</b>			
AML StorageTek	JUKEBOX 1 Host name	refer to "AML" on page C-35.	<i>myjuke</i>
	DRIVE 1 Target	refer to "Storage Technology" on page C-37.	<i>4</i>
	DRIVE 1 Logical Unit Number		<i>4</i>
	DRIVE 1 Physical (or Hardware) drive number or name		<i>If AMASS can connect to the network-attached library, it automatically populates this field.</i>
	DRIVE 1 Media type		<i>If AMASS can connect to the network-attached library, it automatically populates this field.</i>
IBM 3494	JUKEBOX 1 IP address	refer to "IBM 3494" on page C-36.	<i>192.168.30.4</i>
	DRIVE 1 Target		<i>3</i>
	DRIVE 1 Logical Unit Number		<i>0</i>
	DRIVE 1 Physical (or Hardware) drive number or name		<i>If AMASS can connect to the network-attached library, it automatically populates this field.</i>
	DRIVE 1 Media type		<i>If AMASS can connect to the network-attached library, it automatically populates this field.</i>

<b>Platform</b>	<b>Question</b>	<b>Description</b>	<b>Your Response (examples in italics)</b>
<b>Configuration Parameters</b>			

<b>Platform</b>	<b>Question</b>	<b>Description</b>	<b>Your Response (examples in italics)</b>
All	MAXIOSZ	refer to "MAXIOSZ" on page C-38.	<i>Default is platform-dependent.</i>
	NCUNITS	refer to "NCUNITS" on page C-39.	<i>Default is platform-dependent.</i>
	NFNODES	refer to "NFNODES" on page C-40.	<i>Default is platform-dependent.</i>
	DIRTY_BLOCKS	refer to "DIRTY_BLOCKS" on page C-42.	9
	READAHEAD	refer to "READAHEAD" on page C-44.	1 ( <i>enabled</i> )
	FULLFILEREAD-AHEAD	refer to "FULLFILEREADAHEAD" on page C-46.	0 ( <i>disabled</i> )
	SCAT_WRITE_STATUS	refer to "SCAT_WRITE_STATUS" on page C-49.	0 ( <i>disabled</i> )
	SCAT_WRITE_DRIVES	refer to "SCAT_WRITE_DRIVES" on page C-50.	2
	SCAT_WRITE_THRESHOLD	refer to "SCAT_WRITE_THRESH OLD" on page C-51.	<i>Default is device-dependent.</i>
	MAXLTIME	refer to "MAXLTIME" on page C-52.	<i>Default is device-dependent.</i>
	IDLETIME	refer to "IDLETIME" on page C-54.	0 ( <i>default</i> )
	MINLTIME	refer to "MINLTIME" on page C-53.	<i>Default is device-dependent.</i>
	OMM_TIMEOUT	refer to "OMM_TIMEOUT" on page C-57.	0 ( <i>disabled</i> )
OUTORDERBATCH	refer to "OUTORDERBATCH" on page C-58.	<i>Default is device-dependent.</i>	

<b>Platform</b>	<b>Question</b>	<b>Description</b>	<b>Your Response (examples in italics)</b>
All (continued)	UPDATEDIR	refer to "UPDATEDIR" on page C-58.	<i>0 (disabled)</i>
	MARKVOLFULL	refer to "MARKVOLFULL" on page C-59.	<i>0 (disabled)</i>

**Note**

For optional configuration parameters, see the Optional Parameters appendix.

---

## Configuration Questions

The following sections provide answers to the questions asked by the AMASS installation script.

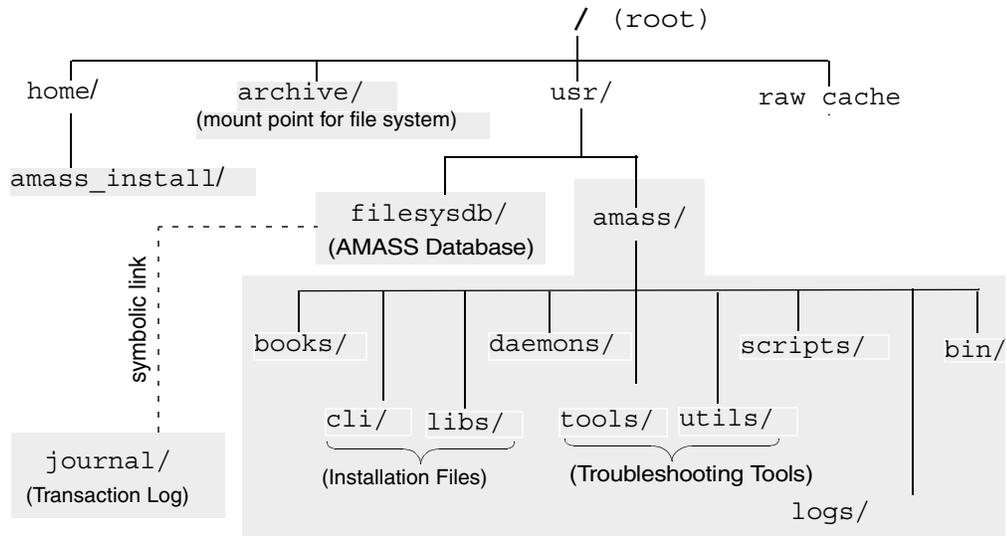
### AMASS Files

If this is the first time AMASS has been installed on this system, verify that the default directories listed in the questions do not currently exist on your system. If a conflict exists, resolve it before continuing with the installation.

#### Caution

To make sure you can recover data in case of a hard disk failure, place the AMASS journal (`/filesysdb/journal`) on either a separate disk or a separate partition from the AMASS database (`/filesysdb`). For information on disk partitioning, see “Hard Disk Partitions” on page 1-11.

The installation process creates the directories and places the executables under the listed directories as shown in the following illustration:



To install AMASS in a location other than the following default directories, create the directory locations prior to running the install script. AMASS creates the symbolic links to your directories during the installation process.

Default directories:

- /usr/amass
- /usr/filesysdb
- /usr/filesysdb/journal

## User, Group IDs

AMASS creates a new login entry for user `amass` to the `/etc/passwd` file, which is the system password file. Typically, this ID is used by the system administrator for AMASS.

The maximum GID number cannot be greater than 32767.

**AIX:** This script question is not applicable for AIX.

**HP-UX:** AMASS selects an unused UID during installation and the GID defaults to 4 (`adm`). However, you can override this default and select both a new UID and GID.

**IRIX 6.2 or 6.5 Only:** AMASS creates the user ID entry in `/etc/passwd`, not in `/etc/shadow`, if that file exists.

## Mount Point

The name of the AMASS file system. The default is `/archive`. AMASS will create this directory if it does not exist. AMASS also adds this mount point to the system mount table to make it appear as part of the standard tree structure.

## Export via NFS

If network clients will be using Network File System (NFS) to access the archived file system, AMASS adds the mount point for the file system to the system's NFS export table.

## System Logging

AMASS modifies your `syslog.conf` file so that all customer-specific AMASS messages are appended to the system log.

### Note

AMASS uses the UNIX user-definable `LOG_LOCAL2` logging process to send AMASS messages to the system log. If you are currently using local 2, modify the `SL_SYSLOG_FACILITY` parameter in the `/usr/amass/logs/log_parms` file. For more information on modifying this file, refer to the Errors and Corrective Action manual.

### Send All Messages to Console

To have all customer-specific messages appear on the system console as well as sent to the system log, manually add the following line to the `syslog.conf` file:

```
local2.debug          /dev/console
```

### Send Warning Messages Only to Console

To have Warning messages only (these identify that system resources are running short) appear on the system console, manually add the following line to the `syslog.conf` file:

```
local2.warning       /dev/console
```

## Cache Space Names

AMASS uses one or more partitions as cache space to:

- maintain open files
- stage reads from and writes to the AMASS file system

<b>Tip</b>
The raw cache device must have the value of “unassigned.”

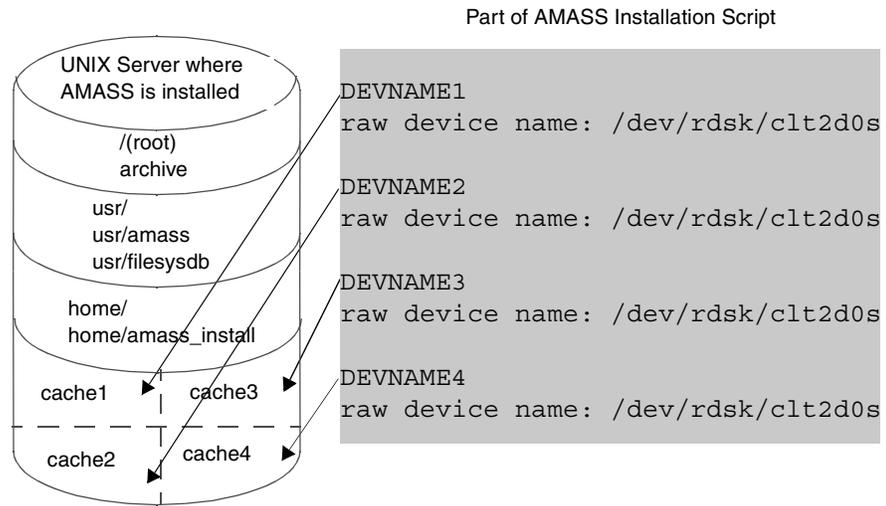
These raw partitions must be used exclusively by AMASS and must not contain any files. For information on sizing the cache space, see “Cache Size Affects Performance” on page 1-19.

To avoid the Administrator inadvertently using a disk partition containing data for the cache device, certain checks are made on the selected device.

If using an AIX logical volume, the volume type must be set to ‘vlk.’

If using a raw device, which has previously contained a file system, all traces of it should be erased. This can be achieved by using 'dd' to write directly to the partition to be used thus overwriting the residual file system information.

Correlation between the script questions and the cache space names can be seen in the following illustration:



## Authorization Strings

ADIC requires either an authorization string or a temporary product key for each storage device that it supports.

### Note

The sequence of the authorization strings (and consequently the storage devices) must be maintained throughout the installation process.

If you have more than one authorization string and one of the strings expire, AMASS sets the **whole** file system as READONLY.

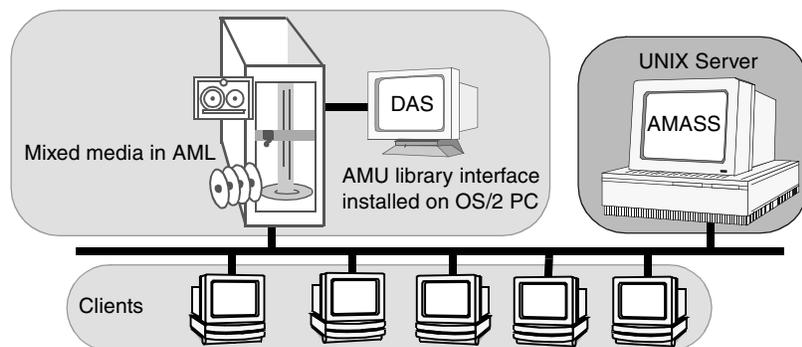
## Standalone Drives

AMASS considers one or more standalone drives as one logical library.

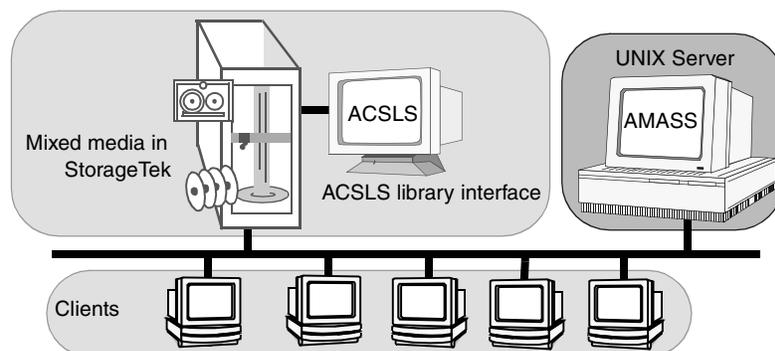
## Mixed Media

AMASS supports mixed media in the following libraries:

The following illustration shows a network-attached AML using Distributed AML Server (DAS) as the library management software on the AMU. DAS is an ADIC software product with both client and server components. The server component is installed on the AMU OS/2 server and the client component is embedded in AMASS.



The following illustration shows a network-attached Storage Technology storage device using Automatic Cartridge System Library Software (ACSLs).



During AMASS installation, configure each media type with its own authorization string. For example, if your AML contains both DLT and 3590 media, configure AMASS with two different authorization strings. For more information about DAS and ACSLS, refer to the *Accessing Storage Devices* manual.

## Software Certificate

You should receive one Software Certificate for each storage device at your site. Each Certificate includes one of the following:

- Authorization String
- Product Key

### *Authorization String*

The authorization string is a 20-character string based on both your UNIX host ID and your storage device. Enter the authorization string in upper or lower case. The hyphens can be used or removed.

- XXXX-XXXX-XXXX-XXXX-XXXX
- XXXXXXXXXXXXXXXXXXXXXXXX

### *Product Key*

The product key serves as a 30-day temporary key whose format is based upon the type of storage device.

Seven days before the 30-day time limit, AMASS displays a message on the system console indicating it will expire.

#### Note

To receive a permanent authorization string, refer to "New Authorization String" on Page 3-14.

If a valid authorization string is not entered by the end of the expiration period, AMASS converts to READONLY mode; no data is lost.

#### Note

If you enter—for multiple library configurations—both a permanent authorization string and a temporary product key, AMASS expires when the temporary string expires.

#### Note

If you have more than one authorization string and one of the strings expire, AMASS sets the **entire** file system as READONLY.

## Optional Features

Unless you have an additional authorization string, the optional features listed in the following table are disabled:

Feature	For More Information
Offline Media Manager	<ul style="list-style-type: none"> <li>• see "OMM_TIMEOUT" on page C-57.</li> <li>• "Read Offline Volume" on Page 2-25 in Managing the AMASS File System</li> <li>• "Optional Features" on Page 1-25 in AMASS Overview</li> </ul>

Feature	For More Information
Text Import and Export	Refer to: <ul style="list-style-type: none"><li>• "vgexport" on Page 3-107 and "vgimport" on Page 3-112 in Managing the AMASS File System</li><li>• "Optional Features" on Page 1-25 in AMASS Overview</li></ul>
Volume Copy	Refer to: <ul style="list-style-type: none"><li>• "volcopy" on Page 3-139 in Managing the AMASS File System</li><li>• "Optional Features" on Page 1-25 in AMASS Overview</li></ul>
CD Import	Refer to: <ul style="list-style-type: none"><li>• "cdimport" on Page 3-50 in Managing the AMASS File System</li><li>• "Optional Features" on Page 1-25 in AMASS Overview</li></ul>
Infinite File Life	Refer to: <ul style="list-style-type: none"><li>• "Configure AMASS for Infinite File Life" on page F-1.</li><li>• "Optional Features" on Page 1-25 in AMASS Overview</li></ul>

## Product Serial Number

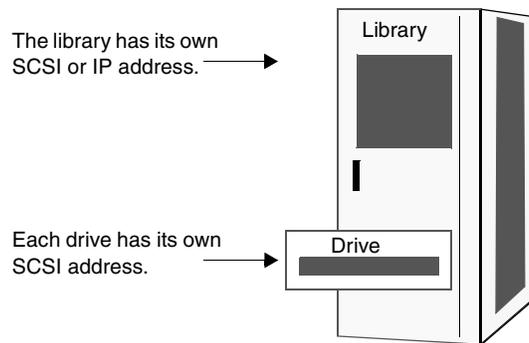
The script prompts you to enter your AMASS serial number. The serial number is stored in `/usr/amass/scripts/serial`.

## Storage Device Addresses

ADIC recommends that you connect the storage hardware prior to installing AMASS. After the devices are connected, the AMASS installation script retrieves and displays the addresses listed in the following table to aid with address configuration.

Storage Device	Address Displayed
SCSI-attached	SCSI address for the library
	SCSI address for the drive
Network-attached	Network IP address for the library
	SCSI address for the drive
RS-232-attached	Full path to serial port

The following illustration shows library and drive addresses:



### Note

If you configure more than one storage device, the sequence used throughout the script must follow the same order you use when entering the authorization strings.

<b>Tip</b>
For a list of supported libraries and drives, refer to <i>Accessing Storage Devices</i> .

Follow the steps under the appropriate platform in the following table to configure the addresses connected to your system.

Device	Page
<b>SCSI-Attached Addresses</b>	
hp Tru64 UNIX	C-25
HP	C-27
IBM	C-29
IRIX 6.2 or 6.5 Only	H-33
Solaris	C-32
<b>RS-232- Attached Addresses</b>	C-34
<b>Network-Attached Addresses</b>	
ADIC AML	C-35
IBM 3494	C-36
Storage Technology	C-37

Drive Device Nodes

<b>Note</b>
Make sure that any device nodes pointing to a drive being used by AMASS have the correct permissions set.

## SCSI-Attached Addresses

To aid you in configuring SCSI-attached storage devices, AMASS retrieves and displays the addresses of attached devices. If AMASS cannot connect to the device, you can still install AMASS but you must locate the required information manually.

### *hp Tru64 UNIX*

**Step 1.** Use the hp Tru64 UNIX `scu` command to generate and verify SCSI addresses connected to the hp Tru64 UNIX server displayed by AMASS.

A sample output from this command is shown in the following illustration:

```
# scu
# scu> scan edt
Scanning all available buses, please be patient...
# scu> show edt

CAM Equipment Device Table (EDT) Information:
Device: RZ29B      Bus: 0, Target: 0, Lun: 0, Type: Direct Access
Device: RZ29B      Bus: 0, Target: 1, Lun: 0, Type: Direct Access

Device: RZ29B      Bus: 0, Target: 4, Lun: 0, Type: Direct Access
Device: RZ29B      Bus: 0, Target: 5, Lun: 0, Type: Direct Access

Device: RRD43      Bus: 0, Target: 6, Lun: 0, Type: Read-Only Direct Access
Device: Quad47     Bus: 1, Target: 0, Lun: 0, Type: Medium change

Device: DLT7000    Bus: 1, Target: 5, Lun: 0, Type: Sequential Access
Device: DLT7000    Bus: 1, Target: 6, Lun: 0, Type: Sequential Access
```

AMASS displays all the SCSI hardware, targets, and LUNs connected to the hp Tru64 UNIX server. A sample script output is shown in the following illustration

```
The following scsi controllers are defined for your system:
0
Please enter the controller for jukebox 1: [0]
The following SCSI targets are on controller 0:
0 1 2 3 4 5
Device: RZ29B      Bus: 0, Target: 0, Lun: 0, Type: Direct Access
Device: MAXLY     Bus: 0, Target: 1, Lun: 0, Type: Changer
Device: T4-2600   Bus: 0, Target: 2, Lun: 0, Type: Optical
Device: T4-2600   Bus: 0, Target: 3, Lun: 0, Type: Optical
Device: C3324A    Bus: 0, Target: 4, Lun: 0, Type: Direct Access
Device: RRD45     Bus: 0, Target: 5, Lun: 0, Type: Read-Only Direct Access
```

**Step 2.** Input the entries described in the following illustration into the installation script. The values were displayed by AMASS and the values verified by using the scu command.

```
Jukebox 1
Controller:          1
Target:             0
LUN:                0
Drive 1
Controller/SCSI bus: 1
Target:             5
LUN:                0
```

HP

**Step 1.** Use the HP-UX `ioscan` command to generate SCSI addresses connected to the HP server to verify the SCSI addresses displayed by AMASS. A sample output from this command is shown in the following illustration:

```

# ioscan -f
Class      I H/W Path      Driver S/W State H/W Type  Description
-----
bc         0          root      CLAIMED  BUS_NEXUS
ext_bus    0 8         scsi3     CLAIMED  INTERFACE HP 28696A SCSI I
target     0 8.4       target    CLAIMED  DEVICE
disk       0 8.4 0      disk3     CLAIMED  DEVICE      SEAGATE ST 15230
ext_bus    1 12        target    CLAIMED  DEVICE
target     3 12.4      target    CLAIMED  DEVICE
spt        3 12.4.0    spt       CLAIMED  DEVICE      HP 5.25 MF Drv
target     4 12.5      target    CLAIMED  DEVICE
spt        4 12.5.0    spt       CLAIMED  DEVICE      HP 5.25 MF Drv
target     5 12.6      target    CLAIMED  DEVICE
spt        1 12.6.0    spt       CLAIMED  DEVICE      HP C1710 M

```

Diagram annotations:

- Jukebox 1 (points to the `ioscan -f` command)
- Jukebox 1 SCSI hardware path of controller (points to the `Path` column)
- Jukebox 1 SCSI target ID (points to the `target` driver entries)
- Drive 1 (points to the `target` entry with `Path: 12.4`)
- Drive 2 (points to the `target` entry with `Path: 12.5.0`)
- Drive 2 target LUN (points to the `Path: 12.5.0` part)
- Drive 2 SCSI target ID (points to the `target` driver entry)

**Tip**

If you have trouble with the path and IDs, determine if the `mknodes` on your machine are correct.

For an example of an `ioscan` output after AMASS has been installed on the system, see “HP - Hardware Problems” on page 4-15.

AMASS displays all the SCSI hardware, targets, and LUNs connected to the HP server.

**Step 2.** Use the values displayed by AMASS and the values verified by the `ioscan` command to enter the values in the installation script as shown in the following illustration:

```
Jukebox 1
SCSI path of controller:      12
SCSI target ID:              4
SCSI target LUN:             0

Drive 1
SCSI target ID:              4
SCSI target LUN:             0

Drive 2
SCSI target ID:              5
SCSI target LUN:             0
```

If AMASS detects more than one driver or if both an SPT and an SCTL driver is connected to the HP, AMASS displays a driver list and prompts you to choose the correct driver major number.

Otherwise, if only one driver is found, AMASS uses that number, by default.

**Step 3.** To verify the correct driver displayed by AMASS, generate driver information with both the `lsdev -d sctl` command and the `lsdev -C spt` command. A sample output from these commands are shown in the following illustration:

	CHARACTER	BLOCK	DRIVER	CLASS
	~			
Major number →	<b>75</b>	<b>-1</b>	<b>spt</b>	<b>spt</b>
	116	-1	echo	pseudc
	119	-1	dlpi	pseudc
	122	-1	inet_cots	unknow
	~			
Major number →	<b>203</b>	<b>-1</b>	<b>sctl</b>	<b>spt</b>
	207	-1	sy	pseudc
	212	-1	tape0	tape
	227	-1	kepd	pseudc
	~			

The major numbers are not fixed and depend on kernel configuration installed on a specific machine.

## AIX

**Step 1.** Use the `lsscsi` utility copied from the AMASS distribution media to generate SCSI addresses connected to the IBM server to verify the SCSI addresses displayed by AMASS.

```
# cd /usr/amass/scripts
# ./lsscsi
```

A sample output from this utility is shown in the following illustration:

	Target ID	LUN	Bus ID	
hdisk0	0	0	"scsi0"	400 MB SCSI Disk Drive
cd0	5	0	"scsi0"	CD-ROM Drive
rmt0	6	0	"scsi0"	150 MB 1/4 Inch Tape Drive
hdisk2	3	0	"scsi1"	Other SCSI Disk Drive

The second column contains the SCSI address, where the first digit is the target ID and the second digit is the logical unit number (LUN).

The third column contains the bus ID where scsi0 is bus 0 and scsi1 is bus 1. For example, the device rmt0 is on bus 0, target ID 6 and logical unit 0.

AMASS displays all the SCSI hardware, targets, and LUNs connected to the IBM server.

**Step 2.** Use the values displayed by AMASS and the values verified by the `lsscsi` utility, as shown in the following illustration, to enter in the installation script:

```
Jukebox 1
Controller/SCSI bus:      scsi0
Target:                   6
Logical Unit Number:     0
```

```
Controller/SCSI bus:      scsi0
Target:                  5
Logical Unit Number:    0
```

*IRIX 6.2 or 6.5 Only*

- Step 1.** Use the IRIX `hinv` command to generate SCSI addresses connected to the SGI server to verify the SCSI addresses displayed by AMASS. A sample output from this command is shown in the following illustration:

```
# /bin/hinv
```

- Step 2.** Enter the following command from the console if the PROM monitor is available. If you receive an error message, the PROM monitor is not available.

```
>> hinv
```

AMASS displays all the SCSI hardware, targets, and LUNs connected to the SGI server.

- Step 3.** Use the values displayed by AMASS and the values verified by the `hinv` command, as shown in the following illustration, for entries that are to be entered in the installation script.

```
Jukebox 1
Controller/SCSI bus:      0
Target:                  0
Logical Unit Number:    0
```

```
Controller/SCSI bus:      0
Target:                  1
Logical Unit Number:    0
```

### Solaris

- Step 1.** Use the appropriate Solaris command to generate SCSI addresses connected to the Sun server to verify the SCSI addresses displayed by AMASS.

On SPARC machines, use the following command to view information for multiple SCSI controllers:

```
ok probe-scsi-all
```

On Sun4c and later, use the following command to view information for the motherboard's SCSI controller:

```
ok probe-scsi
```

A sample output from this command is shown in the following illustration:

```

ok probe-scsi
/iommu@0,10000000/smbus@0,10001000/espdma@4,87000000/esp@4,88000000
Target 0
Target 0
  Unit 0 Removable Device type 8 HP C1710M 4.78
Target 1
  Unit 0 Removable Disk HP 5.25 MF Drv 0004.1

```

esp@4 indicates the SCSI bus number.

Target 0

Target 1

AMASS displays all the SCSI hardware, targets, and LUNs connected to the Sun server. A sample script output is shown in the following illustration:

```

SCSI bus names on this machine
-----
[1] io-unit@f,e0200000/sbi@0,0/dma@o,81000/esp@0,80000
[2] io-unit@f,e0200000/sbi@0,0/QLGC,isp@2,10000
[3] io-unit@f,e0200000/sbi@0,0/QLGC,isp@3,10000
[4] io-unit@f,e1200000/sbi@0,0/dma@o,81000/esp@0,80000

```

Drive 1 is connected to the SCSI bus identified in line [4].

**Step 2.** Use the values displayed by AMASS and the values verified by the `probe` command, to include the following entries in the installation script:

- Enter the appropriate line number (in our example [4]) to indicate the correct SCSI bus address.

- Use the output generated from the probe command to enter values for the drive's target and LUN as shown in the following illustration:

```
Jukebox 1
SCSI bus for juke 1 drive 1:    4
Target for juke 1 drive 1:     1
LUN for juke 1 drive 1:        0
```

### RS-232-Attached Addresses

If the storage device is connected by an RS-232 interface, enter the full pathname of the serial port.

```
JUKEBOX 1 path                /dev/tty2
Default is /dev/ttya
```

For library-specific installation instructions, refer to "Mountain Gate" on page 2-44 in *Accessing Storage Devices*.

### Network-Attached Addresses

To aid you in configuring network-attached libraries, AMASS retrieves and displays the device addresses. If AMASS cannot connect to the device, you can still install AMASS but must locate the required information manually.

## AML

**Step 1.** Enter the host name, as well as target and LUN for drive 1 as shown in the following illustration:

```

DAS OS/2 → JUKEBOX 1
server name → Hostname:          amlopt

DRIVE 1
Target:          0

Logical Unit Number: 0

```

AMASS then connects to the library on the network and returns information similar to that shown in the following illustration::

```

Drive information for jukebox 1
Optical01:          OD_THICK
8590ibm:            3590
DLTDE03:            DECDLT
Drive04:            3480

```

**Step 2.** When the physical drive name question appears, AMASS automatically populates the field with the first name from the list as shown in the following illustration:

```
Physical drive name: Optical01
```

↑  
The name can be a maximum of nine characters long with no embedded blanks. For example, Optical 01, with a space is invalid.

- Step 3.** Enter a valid name from the list previously displayed if this is not the desired drive name.

*Mixed Media*

To configure an AML for mixed media, perform the following steps:

- Step 1.** Refer to Using DAS as a Library Interface in *Accessing Storage Devices* prior to installing AMASS.
- Step 2.** Configure each media type with its own authorization string during the AMASS installation.

For example, if an AML/J contains both DLT and 3590 media, configure AMASS with two authorization strings. One string identified for DLT JUKEBOX 1 and the other string identified for 3590 JUKEBOX 2.

If the library has more than one client, see “Share Drives” on page 3-8.

*IBM 3494*

- Step 1.** Enter the IP address, as well as target and LUN for drive 1 as shown in the following illustration:

```
JUKEBOX 1
IP address:           192.168.30.4

DRIVE 1
Target:              3
Logical Unit Number: 0
```

After AMASS connects to the library on the network and returns drive addresses, AMASS automatically populates the field with the first name from the list as shown in the following illustration:

```
Physical drive number: 123123
```

↑  
These are the component IDs  
that identify the physical  
location of the drives.

- Step 2.** Enter a valid name from the displayed list if this is not the desired drive name.

### Storage Technology

- Step 1.** Enter the host name, where the Automatic Cartridge System Library Software (ACSL) software is installed, as well as target and LUN for drive 1 as shown in the following illustration:

```

JUKEBOX 1
ACSL server name → Hostname:           stkjuke

DRIVE 1
Target:             4
Logical Unit Number: 0

```

After AMASS connects to the library on the network and returns drive addresses, AMASS automatically populates the field with the first name from the list as shown in the following illustration:

Physical drive number: n,n,n,n

↑  
Component IDs that represent the  
physical location of the drives.  
n = integer

- Step 2.** Enter a valid name from the previously displayed list if this is not the desired drive name.

## Parameters

### Tip

To maximize your configuration, see the Fine-Tune Configuration appendix.

## MAXIOSZ

The MAXIOSZ is defined when installing AMASS. MAXIOSZ is the maximum size, in bytes, that AMASS uses internally to read data from and write data to the optical or tape media. This value is limited by the maximum DMA size of the specific SCSI hardware. The size can vary between hardware platforms and operating systems.

### Note

**IRIX 6.2 or 6.5 only:** To configure a larger MAXIOSZ value on SGI servers, see the Optional Parameters appendix.

*Default Values*

Default values are listed in the following table. The default value is the system's maximum DMA transfer size.

<b>MAXIOSZ</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
1024 KB
<b>NOTE:</b> The MAXIOSZ value can be defined as a smaller value, but never larger than the default.

**NCUNITS**

NCUNITS, the number of cache units, is an integer (greater than 0) used in combination with the MAXIOSZ parameter to define the AMASS cache block size. The relationship between NCUNITS, MAXIOSZ, and cache block size is represented by the following equation:

$$\text{NCUNITS} = \text{cache block size} \div \text{MAXIOSZ}$$

The cache block is the basic unit used by AMASS to transfer data to and from cache. When a file is read from or written to the AMASS file system media, it passes through the cache in cache block sized packets. If a file is smaller than a cache block, part of the block will go unused. For this reason, it is important to set NCUNITS so that the cache block size makes efficient use of the cache block for the size of files being written to the AMASS file system.

**Note**

All data passes through the cache prior to being *written to or read from* the media.

**Tip**

To avoid having too many units partially filled with data, set `NCUNITS` so the size of each unit makes efficient use of the cache for the *average* file size used at your site.

*Default Values*

Default values are listed in the following table:

<b>NCUNITS</b>		
<b>HPUX</b>	<b>AIX, Solaris, hp Tru64 UNIX</b>	<b>IRIX</b>
4 HP Series 700	4	1
1 HP Series 800		

**NFNODES**

`NFNODES` define the number of files that can concurrently be open in the AMASS file system.

This parameter is automatically calculated by the system and is based on the number of available cache blocks (NCBLKS) as represented by the following equation:

$$(\text{NCBLKS} \div 2) - 2 = \text{NFNODES}$$

↑  
This is the number of files that can be opened on the AMASS file system at one time and must be a number between 10 and 3200.

If the system calculated value is greater than 50, AMASS sets the NFNODES value to 50. In most cases, this default should be used.

**Tip**

If your site has many simultaneous reads and writes of small files, increase the NFNODES value to several hundred. However, if this value is set too large, performance will suffer because AMASS searches all the fnodes whenever a new file is accessed.

Otherwise, if the value is too small, clients may end up waiting for an fnode to become available.

*Default Values*

Default values are listed in the following table:

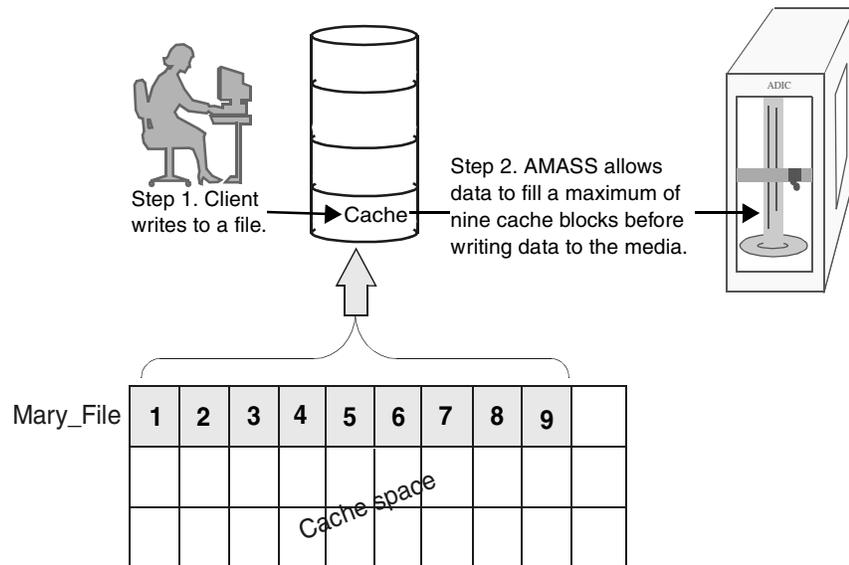
<b>NFNODES*</b>	
<b>HPUX</b>	<b>AIX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"> <li>• System calculated value</li> <li>• Or, 500 (whichever number is less)</li> </ul>	<ul style="list-style-type: none"> <li>• System calculated value</li> <li>• Or, 50 (whichever number is less)</li> </ul>
<p>* If you use DataMgr's File Replication or Multi-tier Migration policies, double the default value of this parameter.</p> <p>* If your system has a directory hierarchy that is x-levels deep, this parameter must have a value the same as or greater than x. For example, if your directory hierarchy is 20-levels deep, set the NFNODES value to at least 20.</p>	

**DIRTY\_BLOCKS**

DIRTY\_BLOCKS defines the number of “dirty”—not yet written to media—cache blocks that can accumulate per fnode. Fnodes define the number of opened files.

During a write, AMASS allows a client to fill a maximum of, for example, nine, cache blocks before writing the data to media. If the write request is bigger than nine cache blocks in size, AMASS allows other users to use the cache and have their requests processed before again writing data to a maximum of nine cache blocks to satisfy the original request.

The following illustration shows how AMASS handles requests using a value of nine DIRTY\_BLOCKS.



#### Note

By limiting the writes to a nine-block chunk (for example), the original client application cannot monopolize AMASS and subsequently the cache.

*Default Values*

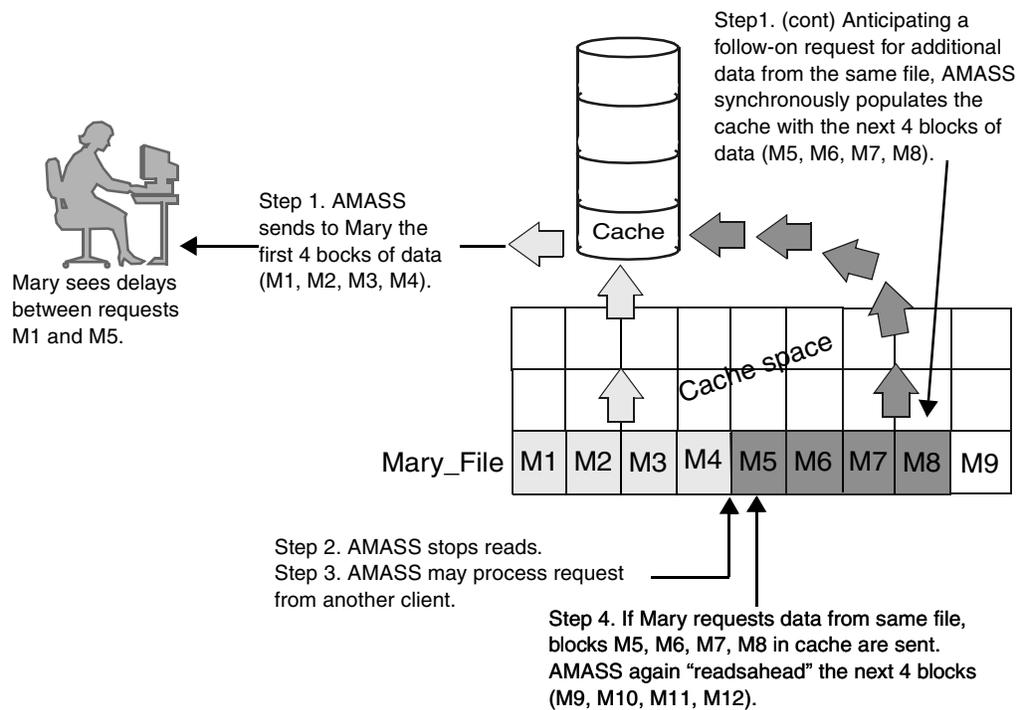
The allowable value depends on several other cache parameters that are defined during the installation process. Consequently, the DIRTY\_BLOCKS value can fill between 9 and 340 cache blocks before AMASS stops writing data to satisfy the first request as listed in the following table:

<b>DIRTY_BLOCKS</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
9 through 340*
* The value depends on operating system, cache size, and other cache parameter values.

**READAHEAD**

If READAHEAD is enabled, AMASS assumes that when clients request a file, they only want the requested portion of a file and perhaps a follow-on request using contiguous data. In anticipation of this follow-on request, AMASS fills the next four blocks in the cache with data from the same file. While AMASS waits for the client to request this queued data, it satisfies other client requests. Although the initial client may eventually read the entire file, the client may experience a delay in the file coming to the user because the entire file is sent to the cache in chunks, with delays in-between chunks.

The following illustration shows how AMASS handles requests if READAHEAD is enabled.



### Tip

Usually, enabling `READAHEAD` improves overall performance because the queued data reduces hardware thrashing (but only if the client needs the queued data) and more client requests can be satisfied.

Otherwise, a file system consisting mainly of database tables whose data access patterns are typically noncontiguous would only populate the cache with unneeded data.

### Performance Factors

The performance gained by enabling this parameter depends on the following factors:

- size of the AMASS cache
- size of your files
- amount of I/O activity on the AMASS file system

### Default Values

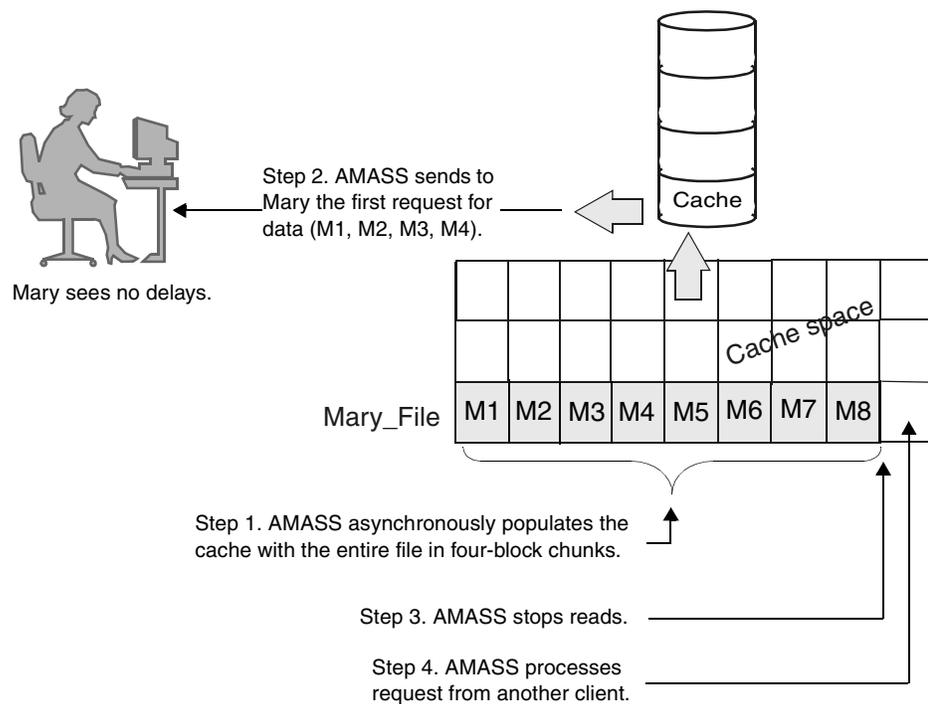
Default values are listed in the following table:

<b>READAHEAD*</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"><li>• 1 = Enabled (default) AMASS reads a maximum of four cache blocks of data, at a time.</li><li>• 0 = Disabled</li></ul>
* If FULLFILEREADAHEAD is enabled, this parameter is disabled.

### FULLFILEREADAHEAD

If you enable this parameter, AMASS assumes that when clients request a file, they always want the entire file and there is no delay in that entire file coming to them because the entire file can comfortably fit in the cache.

The following illustration shows how AMASS handles requests if FULLFILEREADAHEAD is enabled.



When Mary requests a file, AMASS sends the first “chunk” of data to her.

The size of the chunk of data depends on how big your cache size is. When you defined your cache, you took the average size of your files and divided that number by four. This first chunk of data is one cache block in size.

While Mary processes this first chunk of data, AMASS sees that FULLFILEREADAHEAD parameter has been enabled.

Asynchronously, AMASS loads the rest of Mary's file into cache—in four-block chunks—until the entire file is in cache.

Ideally, subsequent reads to Mary's file are satisfied from the cache, thereby giving Mary better performance.

AMASS populates the cache in chunks of four blocks. If the entire file fits in the cache, Mary will not experience any delays. However, if the file is larger than the cache, Mary will experience a delay while AMASS waits for the cache to have enough room until it can bring in another four-block chunk of data. This effectively monopolizes the cache.

Moreover, since Mary's file is monopolizing the cache, other users are experiencing delays with their requests.

<b>Tip</b>
For best results, enable <code>FULLFILEREADAHEAD</code> <b>only</b> if you have a few applications that process small files.

### *Performance Factors*

The performance gained by enabling this parameter depends on the following factors:

- size of the AMASS cache
- size of files
- amount of I/O activity on the AMASS file system

*Default Values*

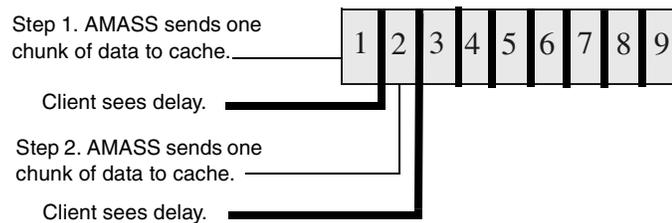
Default values are listed in the following table:

<b>FULLFILEREADAHEAD*</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"> <li>• 0 = Disabled (default)</li> <li>• 1 = Enabled (AMASS reads the entire file into cache)</li> </ul>
* If READAHEAD is enabled, this parameter is disabled.

*Both Parameters Disabled*

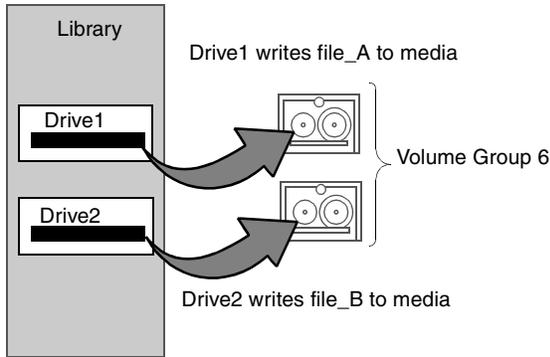
If both READAHEAD and FULLFILEREADAHEAD are disabled, AMASS does not read-ahead any of the file, neither in four-block chunks (READAHEAD enabled) nor the entire file (FULLFILEREADAHEAD enabled).

The following illustration shows how AMASS handles requests if both READAHEAD and FULLFILEREADAHEAD are disabled.

**SCAT\_WRITE\_STATUS**

When AMASS receives more than one request to write to the same volume group, AMASS uses a single drive, by default, to write to one volume at a time. However, performance is improved by enabling scattered writes.

Scattered writes allows AMASS to use more than one drive to write to volumes in a volume group as shown in the following illustration:



Enabling scattered writes allows AMASS to use more than one drive to write data to the same volume group. Consequently, performance is improved.

*Default Values*

Default values are listed in the following table:

SCAT_WRITE_STATUS
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"><li>• 0 = Disabled (default) AMASS uses a single drive to write to volumes in the same volume group.</li><li>• 1 = Enabled AMASS uses more than one drive to write to volumes in the same volume group.</li></ul>

**SCAT\_WRITE\_DRIVES**

SCAT\_WRITE\_DRIVES defines the maximum number of drives that AMASS can use to write to volumes.

*Default Values*

Default values are listed in the following table:

<b>SCAT_WRITE_DRIVES*</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
2
The value must be equal to or greater than 2, but equal to or less than the total number of your drives.
* If SCAT_WRITE_STATUS is enabled, this parameter appears.

**SCAT\_WRITE\_THRESHOLD**

SCAT\_WRITE\_THRESHOLD is the size of the write request, in KB, that triggers AMASS to use scattered writes.

*Performance Factors*

This parameter depends on the following conditions:

- hardware throughput rate
- cache size
- cache configuration

**Tip**

100 KB is a good starting point for this value; adjust it as necessary to meet your site's needs.

### Default Values

Default values are listed in the following table

<b>SCAT_WRITE_THRESHOLD*</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
102,400 KB
* If SCAT_WRITE_STATUS is enabled, this parameter appears.

### MAXLTIME

MAXLTIME defines the maximum amount of time, in seconds, a volume remains in a drive—with other requests pending—before AMASS exchanges it for another volume.

If no requests are pending, a volume can use the drive as long as necessary. However, if other volumes are waiting for the drive, AMASS unloads the active volume when the configured time has been reached.

<b>Tip</b>
Because this parameter forces a volume to eject if other volumes are waiting to use the drive, it prevents clients from monopolizing AMASS.

*Default Values*

Default values are listed in the following table:

<b>MAXLTIME*</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"> <li>• 30 seconds = Default for optical media</li> <li>• 300 seconds = Default for tape media</li> </ul>
* The value must be a number greater than 10 seconds.

**Note**

If your site has both tape and optical libraries daisy-chained together, AMASS selects the default value for tape.

**MINLTIME**

MINLTIME defines the minimum amount of time, in seconds, a volume remains in a drive—as long as no requests are pending—before AMASS ejects the volume.

**Tip**

After completing a request, it is usually more efficient to keep media in a drive for a few extra seconds, rather than immediately unloading the volume only to reload it into the drive to satisfy a subsequent request.

Excessive swapping of media is referred to as “thrashing.” Thrashing causes access delays and premature hardware failure.

Because the MINLTIME parameter prevents volumes from being unloaded too soon, it reduces thrashing.

### Default Values

Default values are listed in the following table:

<b>MINLTIME*</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"><li>• 3 seconds = Default for optical media</li><li>• 30 seconds = Default for tape media</li></ul>
* The value must be a number equal to or greater than the default value.

<b>Note</b>
If your site has both tape and optical libraries daisy-chained together, AMASS selects the default value for tape.

### IDLETIME

IDLETIME defines the time duration in seconds a drive can remain idle before AMASS will remove the tape media from the drive.

This parameter helps in the following areas:

- reduces the time required to load tape media by not having to wait for the drive to be unloaded first
- alleviates tape head wear caused by idle spinning of helical scan systems

Moreover, the system administrator can reset the idle eject feature on a per drive basis any time while AMASS is running with the `drivestat -e secs drivenumber` command. For more information, refer to the "Command Reference" chapter in Managing the AMASS File System. The command value will override this global setting for the specified drive.

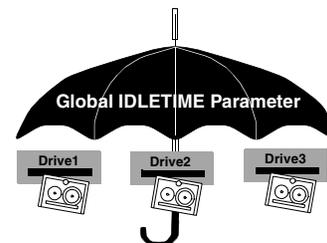
**Note**

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 illustration shows how both the global `IDLETIME` parameter and the per drive `drivestat` command option affects your drives

**Per Drive `drivestat -e sec drive#` Command**

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



The `IDLETIME` parameter configured during AMASS installation affects all drives.

To disable the idle eject feature for all your tape 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

#### Default Values

Default values are listed in the following table:

IDLETIME
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"> <li>• 0 = zero timeout Will not eject idle volumes (default)</li> <li>• 1 through 65,534 = seconds till timeout</li> </ul>

Tip
For maximum flexibility, ADIC recommends that you use the zero default <code>IDLETIME</code> global value and use the <code>drivestat</code> command if you need to dynamically set the idle eject time value.

Note
Idle eject is not supported for optical drives.

## OMM\_TIMEOUT

The OMM\_TIMEOUT value defines the length of time, in seconds, AMASS waits for an operator to fulfill a request to load an offline volume in a standalone drive. If the load or flip request is not satisfied before the timeout, AMASS sends an error and the volume is marked Inactive.

### Note

OMM\_TIMEOUT is valid only for Offline Media Manager. For information on this feature, refer to "Read Offline Volume" on page 2-25 in the Managing the AMASS File System.

### Tip

Make sure the parameter is set high enough to allow an operator to: detect the load or flip request, locate the specified volume, and load or flip it into the drive.

### Optional Feature

Enable this optional feature with an authorization string obtained from ADIC. To request a string, see "New Authorization String" on page 3-14

### Default Values

Default values are listed in the following table:

OMM_TIMEOUT
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"> <li>• 0 = Disables Offline Media Management (default)</li> <li>• 1 second or more = Enables Offline Media Manager</li> <li>• -1 = The I/O request does not time out</li> </ul>

## OUTORDERBATCH

OUTORDERBATCH batches writes for small files. The size of a small file is defined as less than the `MAXIOSZ`. When the output buffer is full, AMASS schedules the writes in a single process.

### Default Values

Default values are listed in the following table:

OUTORDERBATCH
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"><li>• 1 = Enabled (default for optical media) AMASS groups small-file-writes, then writes to media in a single process.</li><li>• 0 = Disabled (default for tape media) Writes are written to media as they arrive. They are not batched.</li></ul>

#### Note

If your site has both tape and optical libraries daisy-chained together, AMASS selects the default value for tape.

## UPDATEDIR

UPDATEDIR controls this parameter is valid for tape drives only whether or not AMASS automatically updates the parent directory's time of last access when one of its files is accessed.

#### Note

Because extra time is required to update the access time, this value affects throughput.

*Default Values*

Default values are listed in the following table:

<b>UPDATEDIR</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"> <li>• 0 = AMASS updates the parent directory times in the directory cache (default). (Do not confuse this directory cache with the I/O cache discussed in this book.) Therefore, if a customer does a file list (ls) on the parent directory while in cache, the times will be changed.</li> <li>• 1 = AMASS updates the parent directory times in the directory cache and in the AMASS File System Database. Enable this parameter if you are running applications that check a directory's time of last access to determine if files in that directory have changed.</li> </ul>

**MARKVOLFULL**

When a write occurs, a write-size, which consists of either the file size or the four cache blocks, is seen by the process that writes to the volume. If this write-size does not completely fit on the volume where writes are being scheduled, AMASS automatically marks the volume “full” and selects another volume from the volume group to satisfy this write request.

**Tip**

Enabling MARKVOLFULL ensures that data is written to volumes in chronological order; however, each volume will not normally be completely full when it is marked FULL. In the worst-case, “dead” space will be less than the size of four cache blocks.

*Default Values*

Default values are listed in the following table:

<b>MARKVOLFULL</b>
<b>AIX, HPUX, IRIX, Solaris, hp Tru64 UNIX</b>
<ul style="list-style-type: none"><li>• 0 = Disabled (default)</li><li>• 1 = Enabled</li></ul> AMASS marks a volume full if there is not enough space remaining on the volume to fulfill the next write request.

---

## **Optional Configuration Parameters**

For detailed information, see the Optional Parameters appendix in this document.

## **NOTES**

**D**

**Optional  
Parameters**

## **NOTES**

---

## Optional Configuration Parameters

The following optional parameters will *usually* improve write throughput.

Topic	Page
Configure MAXIOSZ Value	D-3
Asynchronously Queue Requests	D-5
Streaming Tape I/O	D-6
Cache Interleave	D-11

### Caution

Reinstalling AMASS or upgrading AMASS, reinitializes these optional parameters. Consequently, you must rerun `config_prod -o` to redefine these tape drive performance parameters.

## Configure MAXIOSZ Value

- Step 1.** Run the `installamass` script as described in “Install AMASS” on Page 2-26.
- Step 2.** Change directory and enter the script and option as shown in the following illustration:

```
# cd /usr/amass/sys
# ./config_prod -o
```

**Step 3.** AMASS prompts you to respond to the configuration question described in the following illustration:

```
(AMASS displays your currently
configured cache spaces)
~
(AMASS displays your kernel maxdmasz.)
~
To avoid changing the number and size of
cache blocks, consider varying both
MAXIOSZ and NCUNITS.
~
Enter MAXIOSZ (in kilobytes) 4096
(press return to accept default of 1024,
or enter number)

Enter NCUNITS 4
(press return to accept default of 16,
or enter number)
```

**IRIX 6.2 or 6.5 only:** MAXIOSZ is the maximum size, in KB, that AMASS uses to transfer data to and from the cache. Also, MAXIOSZ partially defines the overall system requirements for memory. NCUNITS defines the number of cache blocks. For detailed information on these parameters, see “MAXIOSZ” on page C-38. and refer to “NCUNITS” on page C-39.

**Caution**

Changing the MAXIOSZ invalidates your current AMASS Backup Volume. If you change the MAXIOSZ value, immediately perform a full backup of the AMASS File System Database.

**Step 4.** Reboot the system.

- Step 5.** Run the `install_tests` script as described in “Test the Installation (All Platforms)” on Page 2-43.

## Asynchronously Queue Requests

Throughput is *usually* improved by optimizing a tape drive’s performance by using multiple data streams to and from the AMASS IO cache.

- Step 1.** Run the `installamass` script as described in “Install AMASS” on Page 2-26.
- Step 2.** Change directory and enter the script and option.

```
# cd /usr/amass/sys
# ./config_prod -o
```

- Step 3.** AMASS prompts you to respond to the configuration question described in the following illustration:

```
System supports these configurable
options:
    Config option: CFG_OPT_AIO

    Option is currently Disabled.  c
Do you wish to (c)hange, or (u)se
this setting? (c,u)
```

**IRIX 6.2 or 6.5 Only, hp Tru64 UNIX, HP-11, Solaris:** When the Asynchronous I/O parameter is:

- **Disabled:** Requests are serially queued (Default).

- **Enabled:** Requests are asynchronously queued—multiple data streams are sent to and from the AMASS IO cache.

**Step 4.** Reboot the system.

**Step 5.** Run the `install_tests` script as described in “Test the Installation (All Platforms)” on Page 2-43.

## Streaming Tape I/O

Throughput is *usually* improved by streaming requests through a tape drive. However, improved performance depends on: file size, number of files, and drive type.

Refer to the AMASS Release Notes for a list of valid drives for I/O tape streaming.

To configure tape streaming, perform the following steps:

**Step 1.** Run the `installamass` script as described in “Install AMASS” on Page 2-26.

**Step 2.** Change directory and enter the script and option.

```
# cd /usr/amass/sys
# ./config_prod -o
```

**Step 3.** Respond to the configuration question described in the following illustration:

```
System cfg opts:
  CFG_OPT_SIO = Enabled
```

**All:** When the Streaming Tape I/O parameter is:

- **Disabled:** AMASS flushes a tape drive's buffer after sending four cache blocks of data and after sending the last cache block of data to a drive (Default).
- **Enabled:** AMASS provides a constant flow of data output to a drive, thereby lessening start and stop operations. AMASS monitors the drive so after data has been archived to tape, AMASS releases the cache blocks. Consequently, if there is any interruption of data flow, data is not lost; it is either on the tape or in the AMASS cache.

**Step 4.** Reboot the system.

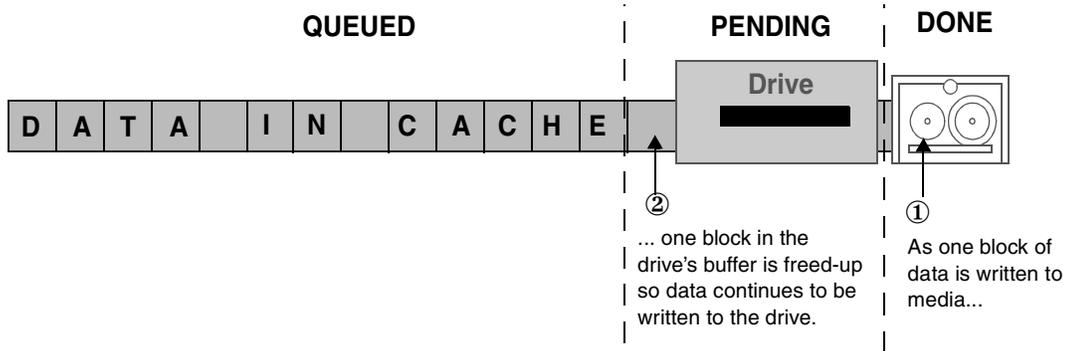
**Step 5.** Run the `install_tests` script as described in “Test the Installation (All Platforms)” on Page 2-43.

## Options Report Tape Streaming Status

As a result of tape streaming, both the `sysperf` command and the `quedisplay` utility have a new `-c` option that reports the status of streaming tape I/O cache blocks. During processing, a cache block has the three states described:

- 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

The following illustration shows the *Queued*, *Pending*, and *Done* states.



*sysperf Command*

An example of output from the `sysperf -c` command is shown in the previous illustration. For more information on the command, refer to *Managing the AMASS File System*.

```

# 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 Total    2006 Free    6 Dirt
                       2 Qued        2 Pend       0 Done
NFNODES                128 Total    126 Free    2 Used

```

Streaming I/O Statistics. Two cache blocks are queued, 2 cache blocks are pending, and no cache blocks have been written to tape.

*quedisplay Utility*

An example of output from the `quedisplay -c` utility is shown in the following illustration. For more information on the utility, refer to *Managing the AMASS File System*.

```

# quedisplay -c
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

```

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`)).

### *Cache Interleave*

This feature controls how cache blocks are placed on the cache block free list at AMASS start up. It is only beneficial with an AMASS cache that consists of multiple disks.

At AMASS start up, the free list is built up containing cache blocks from each disk in the AMASS cache. By default, one disk is opened, all cache blocks added to the free list, followed by each disk in succession. This means that all cache blocks from the first disk will have to be allocated before the next disk. In a multiple disk configuration, this can impede cache performance.

With cache interleave, all the disks are opened at the same time with a block being added to the free list in a round robin fashion. This leads to blocks being allocated from all the disks much sooner than with the default method.

## **NOTES**

**E**

**Hot Spare  
Solution**

## **NOTES**

---

## Hot Spare Installation

A hot spare configuration allows continued file serving in the event of a catastrophic hardware failure on a primary UNIX server by having you manually move AMASS components located on hard disks from the primary server to a spare (secondary) server.

### Note

A hot spare system is different from a fail safe environment where the failure recovery process is integrated with a “high availability-aware” software detection system and an automatic failover resource.

The AMASS components of cache, File System (metadata) Database, and journal transaction logs are located on separate disks on the primary server. When a failure occurs, these components are manually moved to the spare server. The system disk (defined as the disk with the `root` partition on it and containing the AMASS program files `/usr/amass`), is **not** shared and will **not** be moved between servers if a failure occurs.

## Failover Summary

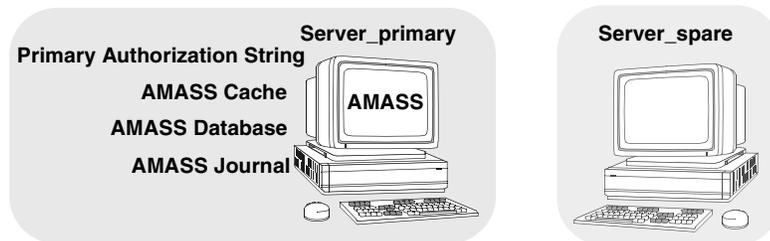
Two separate UNIX servers are required. In our example, their names are `Server_primary` and `Server_spare`.

- Step 1.** From ADIC, obtain two authorization strings for AMASS:
- One string for AMASS on `Server_primary`
  - A *hot spare* string for AMASS on `Server_spare`

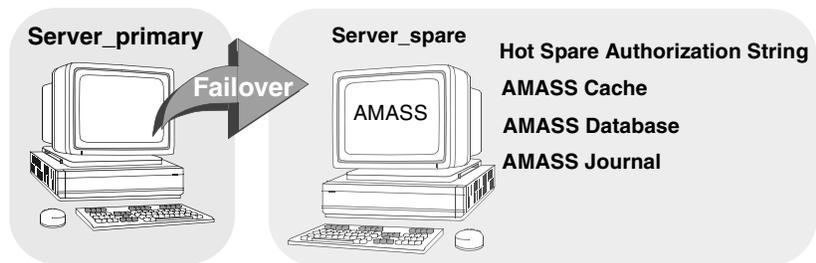
**Step 2. On Server\_primary:** Install AMASS and enter the primary authorization string during the installation process. Make sure Server\_primary has at least three hard disks with two partitions that contain the following AMASS components:

	Hard Disk #1	Hard Disk #2	Hard Disk #3
Partition #1	AMASS program files located in /usr/amass	AMASS File System Database located in /usr/filesysdb	AMASS Journal located in /usr/filesysdb/journal  <b>NOTE:</b> Make sure the Journal is symbolically linked to the Database. The amassbackup command, run from cron, regularly backs up both the Database and Journal.
Partition #2	-	Raw cache used by AMASS	-

The following illustration shows two separate UNIX servers named Server\_primary and Server\_spare.



- Step 3.** Assume a failure occurs on `Server_primary`.
- Step 4.** Physically move hard disk #2 and #3 containing AMASS' cache, database, and journal from `Server_primary` to `Server_spare`.



- Step 5.** **On `Server_spare`:** Run the `change_auth` script to change the primary authorization string to the hot spare authorization string in the configuration file.
- Step 6.** **On `Server_spare`:** Run the `installamass` script to edit the cache space names from the primary host ID to the spare host ID name.
- Step 7.** **On `Server_spare`:** Bring up AMASS by running the `amass_start` script. For instructions on using this script, refer to the Troubleshooting Tools chapter in Managing the AMASS File System.

## **NOTES**

**F**

**Fibre  
Channel  
Support**

## **NOTES**

## Fibre Channel Support

The table below lists **all** of the Fibre Channel configurations certified by AMASS:

Operating System	Platform	Host Bus Adapter (HBA)		Fibre Channel (FC) Router		Drive				
		QLogic FC	X	ADIC FC Router Model 200	HP FC-SCSI Multiplexer A3511A*	Quantum DLT 7000 tape	IBM 3590B1A tape	Storage-Tek 9840 tape	HP C1113J optical	Sony AIT-2
IRIX 6.5.8m	SGI Origin 200.	X								
Solaris 7	Sun Ultra.	X	X			X				
Solaris 8	Sun Ultra.	X	X			X				

\* The HP A3511A FC-SCSI Mux is the field-racked version of the A3308A.

## Mappings

Fibre Channel routers can usually be configured for multiple mapping schemes of SCSI bus: target: LUN address to FC LUN addresses.

The host adapter board can then have its own mapping of FC LUNS to target:LUN combinations.

Some routers and Fibre Channel Host Adapter Boards also support non-permanent mappings that can dynamically change as devices are added or removed from the buses. (This has been seen with the HP testing as described in the caveat table below.)

Note
To avoid the problems of a dynamically changing bus address, configure the ADIC FCR to use indexed addressing, which permanently maps bus:target:LUN to FC:LUN.

## Caveats

**Caveats:** The following caveats apply to Fibre Channel support using AMASS:

Platform	Caveats
IRIX 6.5.8m	Install the required Fibre Channel software and driver on the SGI Origin 200 server.
Solaris 7	Install the required Fibre Channel software and driver on the Sun Ultra server.
	Install Sun patch 107544-03.
	Install Sun patch 106541-10.
	If you need to reinstall AMASS, while using the <code>installamass</code> script, you must deinstall the AAPjuke driver and then a few questions later in the script reinstall it.
Solaris 8	Install the required Fibre Channel software and driver on the Sun Ultra server.
	If you need to reinstall AMASS, while using the <code>installamass</code> script, you must deinstall the AAPjuke driver and then a few questions later in the script reinstall it.

## **NOTES**



**G**

**Partition  
Cache on  
HP-UX**

## **NOTES**

## Partitioning the HP-UX Cache

The cache for HP-UX can be partitioned in one of the following ways:

- Use Separate Disk
- Use Fixed Partition
- Use Logical Volume Manager

Following is a description of each method.

### Use Separate Disk

The simplest method is to use a dedicated disk drive. The device files for the disk drive look similar to the following example.

Logical unit number is 2 (c2)

```
Character device file = /dev/rdisk/c2d0s2
Block device file = /dev/dsk/c2d0s2
```

Specifies partition number 2 (s2) or the entire disk.

### Drawback

The drawback to this method is that you must dedicate the entire disk as the cache. This may be more disk space than your site requires.

## Use Fixed Partition

This method uses one of the predefined hard partitions on the disk. They are called hard partitions because the sizes of the various partitions are fixed and cannot be changed.

There can be up to 16 hard partitions on a disk; a number from 0 through 15 is used to specify the particular partition. The `/etc/disktab` file contains a map that shows how the partitions are arranged.

**NOTE:** The partitions sometimes overlap. For the example as shown in the following illustration, do not use partition 8 if partition 13 is already in use.

The device files for the fixed partition look similar to the following illustration::

Logical unit number is 2 (c2).

```
Character device file = /dev/rdisk/c2d0s13
Block device file = /dev/dsk/c2d0s13
```

Specifies a partition number of 0 through 15; our example uses partition 13 (s13).

The diagram shows two lines of text representing device file paths. The first line is "Character device file = /dev/rdisk/c2d0s13" and the second line is "Block device file = /dev/dsk/c2d0s13". The 'c2' in both paths is circled, and an arrow points from the text "Logical unit number is 2 (c2)." above to it. The 's13' in both paths is boxed, and an arrow points from the text "Specifies a partition number of 0 through 15; our example uses partition 13 (s13)." below to it.

## Drawback

The drawback to this method is that the size of the available hard partitions are not always convenient. Additionally, useful features like disk striping and device mirroring cannot be used with hard partitions.

## Use Logical Volume Manager

You can use logical volume manager (LVM) to configure partitions and to enable features such as disk striping and disk mirroring.

For example, perform the following steps to create a logical volume of 100 MB on the `/dev/rdisk/c1d0s2` disk partition:

**Step 1.** Create a physical volume for the specified device.

```
# pvcreate /dev/rdisk/c1d0s2
```

**Step 2.** Create a volume group. In our example, we create volume group 03.

### Note

This volume group is **not** the same as an AMASS “volume group” assignment.

```
# vgcreate -s2 /dev/vg03  
/dev/rdisk/c1d0s2
```

**Step 3.** Create a logical volume of 100 MB in volume group vg03.

```
# lvcreate -L100 /dev/vg03
```

**Step 4.** Use the command and option shown in the following illustration to view the logical volumes on your system. It prints out the relationship between logical volumes and physical volumes as well as other data.

```
# vgsdisplay -v
```

The device files created for logical volume 03 are shown in the following illustration. These are the DEVNAME files you will enter for the cache space names (raw device name and block device name) when installing AMASS.

```
Character device file =  
/dev/vg03/rlvol1  
Block device file =  
/dev/vg03/lvol1
```

- Step 5.** Refer to your documentation to find out how to adjust the size of the logical volumes. After modifying the size, rerun the `./all` script.

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