

**Oracle® Hierarchical Storage Manager and  
StorageTek QFS Software**

samu User Interface Guide

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---

# Preface

This document addresses the needs of system administrators, and network administrators, and service engineers who are tasked with configuring and operating file systems and archiving solutions using Oracle Hierarchical Storage Manager (formerly StorageTek Storage Archive Manager) and Oracle StorageTek QFS Software.

## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at

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Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

## Prerequisites for Using this Document

This document assumes that you are already familiar with the Oracle Solaris operating system, storage, and network administration. Please refer to the Solaris documentation and man pages and to storage hardware documentation for information on relevant tasks, commands, and procedures.

## Conventions

The following textual conventions are used in this document:

- *Italic* type represents book titles and emphasis.
- `Monospace` type represents commands and text displayed in a terminal window and the contents of configuration files, shell scripts, and source code files.
- **Monospace bold** type represents user inputs and significant changes to commandline output, terminal displays, or file contents. It may also be used to emphasize particularly relevant parts of a file or display.
- **Monospace bold oblique** type represents variable inputs and outputs in a terminal display or file.
- *Monospace oblique* type represents other variables in a terminal display or file.

- ... (three-dot ellipsis marks) represent file contents or command output that is not relevant to the example and has thus been omitted for brevity or clarity.
- \ (a backslash) at the end of a line in examples escapes the line break so that the following line is part of the same command.
- [ - ] (brackets surrounding values separated by a hyphen) delimit value ranges.
- [ ] (brackets) in command syntax descriptions indicate optional parameters.
- root@solaris:~# and [hostname]:root@solaris:~# represent Solaris command shell prompts.
- [root@linux ~]# represents Linux command shell prompts.

## Available Documentation

The *Oracle® Hierarchical Storage Manager and StorageTek QFS Software samu User Interface Guide* is part of the multivolume *Oracle HSM Customer Documentation Library*, available from [docs.oracle.com](http://docs.oracle.com).

For Solaris operating system documentation, see the *Oracle Solaris 11.1 Information Library*, also available from [docs.oracle.com](http://docs.oracle.com).



---

# Introducing samu

This document describes the Oracle HSM `samu` operator utility, a menu-driven, commandline user interface that greatly simplifies configuration and management tasks. With `samu`, you can monitor Oracle HSM devices and file system activity, control access to devices and file systems, and tune running file systems.

The `samu` utility is in some respects similar to the UNIX `vi` editor. You select displays, set display options, navigate within and between displays, enter commands, refresh displays, and quit the utility using similar control key sequences. The last line of each display window displays error messages. Displays refresh automatically unless an error occurs, in which case the display halts until the operator takes further action. When desired, you can take snapshots of display windows for later reference.

The remainder of this introduction describes [Prerequisites](#) for using `samu` and some [Common Tasks](#). Subsequent chapters provide detailed descriptions of the available commands.

## Prerequisites

The `samu` operator utility requires a display terminal that is at least 24 lines long by 80 characters wide.

Like the `vi` editor, `samu` is based on the UNIX `curses(3CURSES)` library. If you have trouble invoking `samu`, make sure that your terminal type is defined correctly.

Note that what you see in the sample screens below may differ from what you see online. The samples are representative rather than exact representations of any given installation. Actual displays depend on your terminal characteristics and on your file-system configuration. Many `samu` screens relate to storage and archive management, for example, and will not appear if you are using QFS file systems without archiving.

## Common Tasks

The following sections describe how to start and stop `samu`, interact with the utility, access the help windows, view operator displays, and bring up drives.

- [Start samu](#)
- [Stop samu](#)
- [Display a Screen](#)
- [Change a Drive State From down to on](#)
- [Get Help](#)

## Start samu

You can start the samu operator utility using the utility's defaults or you can specify display and/or command options:

- To start the operator utility using the default display options, enter the samu command at the system command prompt:

```
root@solaris:~# samu
```

The samu interface starts and displays the default initial screen, the help:

```
Help information          page 1/15   samu  version time date

Display control commands:
Displays:
  a  Archiver status           w      Pending stage queue
  c  Device configuration      C      Memory
  d  Daemon trace controls    D      Disk volume dictionary
  f  File systems             F      Optical disk label
  g  Shared clients           I      Inode
  h  Help information         J      Preview shared memory
  l  Usage information        K      Kernel statistics
  m  Mass storage status      L      Shared memory tables
  n  Staging status           M      Shared memory
  o  Optical disk status      N      File system parameters
  p  Removable media load requests P      Active Services
  r  Removable media         R      SAM-Remote
  s  Device status           S      Sector data
  t  Tape drive status       T      SCSI sense data
  u  Staging queue           U      Device table
  v  Robot catalog

more (ctrl-f)

samu on host
```

- To start the operator utility with a specified display, enter the samu command with the -d switch and the name of the command:

```
# samu -d commandname
```

The samu interface starts and shows the specified screen display. For example, to start samu with the configuration screen, you would enter the following:

```
# samu -d c
```

The utility starts with the device configuration screen:

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk  100  on    /etc/opt/SUNWsamfs/libraryA_T10K_parms  100  libraryA
ti  101  on    /dev/rmt/0cbn                  100  libraryA
ti  102  on    /dev/rmt/1cbn                  100  libraryA
ti  103  on    /dev/rmt/2cbn                  100  libraryA
hy  104  on    historian                      104
```

- To start the operator utility and change the default display refresh interval, enter the samu command with the -r switch and the length of the interval in seconds:

```
# samu -r seconds
```

- To start the operator utility and immediately run a specified command, enter the samu command with the -c switch and the name of the command:

```
# samu -c commandname
```

- To start the operator utility and immediately run a series of commands from a file containing one command per line, enter the `samu` command with the `-f` switch and the name of the command file:

```
# samu -c filename
```

## Stop samu

To exit `samu`, enter `:q` or `q`.

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/libraryA_T10K_parms  100 libraryA
ti  101 on    /dev/rmt/0cbn                  100 libraryA
ti  102 on    /dev/rmt/1cbn                  100 libraryA
ti  103 on    /dev/rmt/2cbn                  100 libraryA
hy  104 on    historian                      104
```

**q**

The `samu` operator utility exits and returns you to the command shell.

## Display a Screen

To display a particular `samu` screen, proceed as follows.

1. If you do not know the display control command that corresponds to the desired screen, enter `h` to call up the help screen. Lookup the required command in the list displayed.
2. Enter the display control command that corresponds to the desired screen.

For example, to display the library catalog and list the volume serial numbers (VSNs) for the tapes in the robotic tape library, enter `v`.

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/libraryA_T10K_parms  100 libraryA
ti  101 on    /dev/rmt/0cbn                  100 libraryA
ti  102 on    /dev/rmt/1cbn                  100 libraryA
ti  103 on    /dev/rmt/2cbn                  100 libraryA
hy  104 on    historian                      104

v
```

The utility displays the Robot VSN catalog:

```
Robot VSN catalog by slot : eq 900  samu          version time date
count 32

slot      access time  count  use flags          ty  vsn
0  2013/05/01 13:36    2  86% -il---b-----  li  S00001
1  2013/05/03 14:14    0  98% -il---b-----  li  S00002
2  2013/05/03 14:17    0  86% -il---b-----  li  S00003
3  2013/05/03 14:20    0  95% -il---b-----  li  S00004
4  none              0   0% -il-o-b-----  li  S00005 ...
```

3. If the display is longer than the available screen area, the utility breaks the information into pages and displays the prompt `more` near the bottom of the

screen. To navigate between pages, press the Ctrl-F (^f) key combination to move forward to the next page, or Ctrl-B (^b) to move back to the previous page.

## Enter a samu Command

You enter commands from the display screens using the procedure below:

1. On any samu screen, enter a **:** (colon).
2. When the **command:** prompt appears, enter the samu command.

```
Device configuration:          samu          version time date

ty  eq state  device_name          fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/libraryA_T10K_parms  100  libraryA
ti  101 on    /dev/rmt/0cbn          100  libraryA
ti  102 on    /dev/rmt/1cbn          100  libraryA
ti  103 down  /dev/rmt/2cbn          100  libraryA
hy  104 on    historian              104
:
command:q
```

## Run a Shell Command and Return

You run operating system shell commands from samu as follows:

1. On any samu screen, enter a **:** (colon).
2. When the **command:** prompt appears, enter **!** (exclamation point) followed by the shell command.

```
Device configuration:          samu          version time date

ty  eq state  device_name          fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/libraryA_T10K_parms  100  libraryA
ti  101 on    /dev/rmt/0cbn          100  libraryA
ti  102 on    /dev/rmt/1cbn          100  libraryA
ti  103 down  /dev/rmt/2cbn          100  libraryA
hy  104 on    historian              104
:
command:!!s
cores          faults          log          reports          sendtrap.log
tmpfiles
Press Return to continue
```

3. When you are ready to return to the samu interface, press Return.

## Change a Drive State From down to on

1. Open a samu display that shows drive and automated library device states. Enter **c**, **m**, **o**, **r**, **s**, or **t**.
2. In the **eq** field of the screen, note the equipment ordinal number for the down device.

```
Device configuration:          samu          version time date

ty  eq state  device_name          fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/libraryA_T10K_parms  100  libraryA
ti  101 on    /dev/rmt/0cbn          100  libraryA
```

```

ti 102 on      /dev/rmt/1cbn          100 libraryA
ti 103 down    /dev/rmt/2cbn          100 libraryA
hy 104 on      historian              104

```

3. Stop all device activity. Enter the command character: and, when the command prompt appears, enter the `off` command with the equipment ordinal number for the down device:

```

Device configuration:          samu          version time date

ty  eq state  device_name          fs  family_set
sk 100 on     /etc/opt/SUNWsamfs/libraryA_T10K_parms 100 libraryA
ti 101 on     /dev/rmt/0cbn         100 libraryA
ti 102 on     /dev/rmt/1cbn         100 libraryA
ti 103 down   /dev/rmt/2cbn         100 libraryA
hy 104 on     historian              104
:
command:off 103

```

4. Enter the command character: and, when the command prompt appears, enter the `on` command with the equipment ordinal number for the off device:

For example:

```

Device configuration:          samu          version time date

ty  eq state  device_name          fs  family_set
sk 100 on     /etc/opt/SUNWsamfs/libraryA_T10K_parms 100 libraryA
ti 101 on     /dev/rmt/0cbn         100 libraryA
ti 102 on     /dev/rmt/1cbn         100 libraryA
ti 103 off    /dev/rmt/2cbn         100 libraryA
hy 104 on     historian              104
:
command:on 103

```

## Get Help

You can reach the help pages from any `samu` display by entering `:h` or `h`.



---

## Commands Listed by Function

This chapter groups the `samu` commands by task and function. Locate the task that you need to carry out and then see the alphabetical command listings in [Chapter 3, "Operator Commands"](#), and [Chapter 4, "Service and Support Commands"](#), for more information:

- ["Controlling Operator Displays"](#)
- ["Tuning I/O Performance"](#) on page 2-2
- ["Configuring File Systems"](#) on page 2-4
- ["Configuring Shared File Systems"](#) on page 2-4
- ["Configuring Single-Writer/Multi-Reader File Systems"](#) on page 2-5
- ["Configuring File Systems for Oracle Real Application Clusters \(RAC\)"](#) on page 2-5
- ["Managing Storage Devices"](#) on page 2-5
- ["Managing Robotic Storage Libraries"](#) on page 2-5
- ["Archiving"](#) on page 2-6
- ["Staging"](#) on page 2-6
- ["Working with Service and Support Representatives"](#) on page 2-6

### Controlling Operator Displays

This section lists the `samu` operator display commands. Note that each command is a lower-case letter of the alphabet (uppercase letters are described in [Chapter 4, "Service and Support Commands"](#)).

- [a \(Display Archiver Status Screen\)](#)
- [c \(Display Device Configuration Screen\)](#)
- [d \(Display Daemon Trace Controls Screen\)](#)
- [f \(Display File Systems Screen\)](#)
- [h \(Display the Help Screen\)](#)
- [l \(Display Utilization Information\)](#)
- [m \(Display the Mass Storage Status Screen\)](#)
- [n \(Display the Staging Status Screen\)](#)
- [o \(Display the Optical Disk Status Screen\)](#)
- [p \(Display the Removable Media Load Requests Screen\)](#)

- [r](#) (Display the Removable Media Status Screen)
- [refresh](#) (Set the Automatic Refresh Interval for the [samu](#) Display)
- [s](#) (Display Device Status Screen)
- [snap](#) (Save a Snapshot of the Current Screen to a File)
- [t](#) (Display Tape Drive Status Screen)
- [u](#) (Display Staging Queue Screen)
- [v](#) (Display Robot VSN Catalog Screen)
- [w](#) (Display the Pending Stage Queue Screen)

## Tuning I/O Performance

This section starts with a brief summary of the factors that affect file-system performance, the objectives of performance tuning, and the Oracle HSM features that support tuning efforts. It then links to the commands that control the input/output methods that Oracle HSM supports: [Paged \(Buffered\) I/O](#), [Direct I/O](#), and [Switched I/O](#).

### Understanding I/O Performance Tuning Objectives and Options

Disk I/O (input/output) involves mechanical processes that are vastly more time-consuming than other file-system operations. So I/O performance tuning focuses on keeping the mechanical work to the absolute minimum necessary for transferring a given amount of data. This means reducing both the number of separate I/Os per data transfer and the number of *seeks* operations required to service each I/O.

So the basic objectives of I/O tuning are as follows:

- Read and write large blocks of data.
- Write blocks in units that align with the sector boundaries of the underlying media, so that the disk controller does not have to read and modify existing data before writing the new data.
- Queue up small I/Os in cache and write larger, combined I/Os to disk.

To achieve these objectives, Oracle HSM file systems support three kinds of I/O, each of which addresses a different set of file-system usage patterns.

[Paged \(Buffered\) I/O](#) is the default method because it works well with the usage characteristics of common, general-purpose file-systems. Most file-systems are used by multiple users and applications. Each reads and writes small amounts of data in blocks that often depend on application design rather than on disk sector boundaries. File access tends to be random rather than sequential. When properly configured, paged I/O is ideal for this kind of use. User data is cached in virtual memory pages until the Oracle Solaris kernel writes the data to disk. So users and applications write to and read from cache memory, where random access and small block sizes are less of a problem. Performance-critical, physical reads and writes to and from disk are made in larger, better aligned, more nearly sequential chunks.

[Direct I/O](#) addresses limitations of paged I/O that become apparent in file systems are dedicated to particular types of data, such as medical imagery, geological information bases, and real-time surveillance imagery. Generally, users and applications read and write large files sequentially in blocks that align with disk sector boundaries. So paging has no performance advantages. It does, however, impose system overhead and delays the point at which data is securely written from memory to disk—the latter



potentially critical in realtime applications. In this situation, direct I/O can significantly improve performance. Data is transferred directly between the local buffer on the application host and the Oracle HSM disk device, with no intermediate delays or additional complication.

**Switched I/O** is a combination of the other two that works by setting an I/O size threshold for the file system. Paged I/O is used until this threshold is reached. Thereafter, the system automatically switches to direct I/O until the request has been completely addressed. Most small requests are handled before the threshold is reached, so they are read from and written to cache memory and transferred to or from disk asynchronously, in larger, better aligned units. But larger requests are handled directly once the threshold is exceeded, without extra caching overhead.

## Paged (Buffered) I/O

The following commands let you tune the paged I/O characteristics of Oracle HSM file systems based on file size and usage.

- [flush\\_behind](#) (Set the Flush-Behind Parameter)
- [force\\_nfs\\_async](#) (Force Asynchronous NFS)
- [noforce\\_nfs\\_async](#) (Do Not Force Asynchronous NFS)
- [readahead](#) (Set The Maximum Read-Ahead Parameter)
- [wr\\_throttle](#) (Set the Maximum Size of Outstanding Writes)
- [writebehind](#) (Set the Write-Behind Parameter)

## Direct I/O

The following `samu` commands let you change the default I/O behavior of a specified family set device from paged I/O to direct I/O and vice versa:

- [forcedirectio](#) (Use Direct I/O by Default)
- [noforcedirectio](#) (Do Not Use Direct I/O by Default)

The commands below control how sparse files are initialized during direct I/O:

- [dio\\_szero](#) (Zero Uninitialized Areas of Sparse Files During Direct I/O)
- [nodio\\_szero](#) (Do Not Zero Uninitialized Areas of Sparse Files with Direct I/O)

## Switched I/O

As described above, Oracle HSM can be configured to switch from paged I/O to direct I/O when file reads and/or writes exceed specified thresholds. The commands below enable this feature and define the thresholds:

- [dio\\_rd\\_consec](#) (Limit the Number of Consecutive Direct Reads)
- [dio\\_rd\\_form\\_min](#) (Set the Size of Well-Aligned Direct I/O Reads)
- [dio\\_rd\\_ill\\_min](#) (Set the Size of Misaligned Direct I/O Reads)
- [dio\\_wr\\_consec](#) (Limit the Number of Consecutive Direct Writes)
- [dio\\_wr\\_form\\_min](#) (Set the Size of Well-Formed Direct I/O Writes)
- [dio\\_wr\\_ill\\_min](#) (Set the Size of Misaligned Direct I/O Writes)

## Configuring File Systems

- `add` (Add Equipment to a Mounted File System)
- `atime` (Configure Access Time Updates for a File System)
- `def_retention` (Set Default WORM Retention Time)
- `mm_stripe` (Set the Metadata Stripe Width)
- `noatime` (Disable Access Time Updates for a File System)
- `noqwrite` (Disable Simultaneous Reads/Writes from Different Threads)
- `nosuid` (Mount a File System with `setuid` Execution Disabled)
- `nosw_raid` (Turn Off Software RAID Mode)
- `notrace` (Disable File System Tracing)
- `qwrite` (Enable Simultaneous Reads/Writes to a File from Different Threads)
- `remove` (Move Data and Remove Equipment from a File System)
- `stripe` (Set the Stripe Width for a File System)
- `suid` (Mount a File System with `setuid` Execution Enabled)
- `sw_raid` (Turn On Software RAID Mode)
- `sync_meta` (Synchronize File System Metadata)
- `trace` (Enable File System Tracing)

## Configuring Archival File Systems

The commands below control the archiving and staging behavior of Oracle HSM file systems:

- `maxpartial` (Set the Maximum Partial Release Size for the File System)
- `nohwm_archive` (Do Not Start Archiving at the High Water Mark)
- `partial` (Set the Default Partial Release Size for the File System)
- `partial_stage` (Set Partial Stage-Ahead Point for the File System)
- `release` (Release Archived Data Files and Disable Allocation on a Device)
- `stage_flush_behind` (Set the Stage Flush Behind Size)
- `stage_n_window` (Size the Buffer for Reading Directly from Archival Media)
- `thresh` (Set High and Low Watermarks)

## Configuring Shared File Systems

The following commands control how Oracle HSM coordinates interactions between hosts that share a file system.

- `aplease` (Set Append Lease Expiration Time for a Shared File System)
- `lease_timeo` (Set the Unused Lease Timeout for a Shared File System)
- `maxallocsz` (Set the Maximum Allocation Size for a Shared File System)
- `mh_write` (Turn on Multi-Host Read/Write)
- `minallocsz` (Set the Minimum Allocation Size for a Shared File System)

- `min_pool` (Set the Minimum Number of Shared File System Threads)
- `nomh_write` (Turn Off Multi-Host Read/Write)
- `rdlease` (Set the Read Lease Time for a Shared File System)
- `wrlease` (Set the Write Lease Time for a Shared File System)

## Configuring Single-Writer/Multi-Reader File Systems

The commands below control how and when a read-only host obtains metadata updates from the metadata server.

- `invalid` (Set the Invalidate-Cache Delay for a Multi-Reader File System)
- `norefresh_at_eof` (Do Not Refresh at EOF in a Multi-Reader File System)
- `refresh_at_eof` (Refresh at EOF in a Multi-Reader File System)

## Configuring File Systems for Oracle Real Application Clusters (RAC)

The following commands are specific to implementations of Oracle Real Application Clusters (RAC) that store data on Oracle HSM file systems using asynchronous I/O and Solaris Volume Manager mirrored volumes.

- `abr` (Enable Application Based Recovery)
- `dmr` (Enable Directed Mirror Reads of Software Mirrors)
- `noabr` (Disable Application Based Recovery)
- `nodmr` (Disable Directed Mirror Reads of Software Mirrors)

## Managing Storage Devices

- `alloc` (Enable Storage Allocation on a Device)
- `clear` (Clear a Load Request for a Removable Storage Volume)
- `devlog` (Set Device Logging Options)
- `idle` (Idle Device)
- `noalloc` (Disable Storage Allocation on a Device)
- `off` (Turn Off A Device)
- `on` (Turn On A Device)
- `readonly | ro` (Make Device Read Only)
- `unavail` (Make a Device Unavailable to Oracle HSM)

## Managing Robotic Storage Libraries

- `audit` (Audit Library or Library Slot)
- `export` (Move Removable Media to the Robotic Library's Mailbox)
- `import` (Move Removable Media from the Mailbox into the Robotic Library)
- `load` (Load a Cartridge into a Drive)
- `priority` (Set Priority in Load-Request Preview Queue)

- [unload \(Unload a Drive\)](#)

## Archiving

- [aridle \(Stop Archiving Gracefully\)](#)
- [arrerun \(Restart the Archiver Non-Disruptively\)](#)
- [arrestart \(Restart the Archiver Disruptively\)](#)
- [armarchreq \(Remove Archive Requests\)](#)
- [arrun \(Start Archiving\)](#)
- [arscan \(Scan a File System for Unarchived Files\)](#)
- [arstop \(Stop All Archiving Immediately\)](#)
- [artrace \(Perform Archiver Tracing\)](#)

## Staging

- [stclear \(Clear a Stage Request\)](#)
- [stidle \(Stop Staging as Soon as Possible\)](#)
- [strun \(Start Staging\)](#)

## Working with Service and Support Representatives

The `samu` interface includes a number of commands that are designed to help you assist Oracle technical support and service representatives. These handle the following tasks:

- [Controlling Diagnostic Displays](#)
- [Gathering Diagnostic Information](#)

### Controlling Diagnostic Displays

The `samu` service and support display commands are designated by uppercase letters: C, D, F, I, J, K, L, M, N, P, R, S, T, and U. They provide debugging and internal state information that is not generally useful without the assistance of a member of the Oracle technical support staff.

- [:C \(Display the Contents of Shared Memory at a Specified Address\)](#)
- [D \(Display Disk Volume Dictionary Screen\)](#)
- [F \(Display Optical Disk Label Screen\)](#)
- [I \(Display Inode Information\)](#)
- [J \(Display the Shared Memory Segment for the Load-Request Preview Queue\)](#)
- [K \(Display Kernel Statistics\)](#)
- [L \(Display Shared Memory Tables and System Defaults\)](#)
- [M \(Display Raw Shared Memory\)](#)
- [N \(Display File System Parameters\)](#)
- [P \(Display Active Services\)](#)

- R (Display SAM-Remote Configuration Information)
- S (Display Raw Sector Data)
- T (Display SCSI Sense Data for a Current or Specified Device)
- U (Display Device Table in Human-Readable Form)

## **Gathering Diagnostic Information**

- `diskvols` (Set/Clear Flags on Disk Volumes Used for Archiving)
- `dtrace` (Enable/Configure Tracing for Oracle HSM Daemons)
- `open` (Open a Disk Storage Device for Reading)
- `read` (Read Sectors On a Disk Storage Device)



---

## Operator Commands

This section lists detailed summaries of `samu` operator commands in alphabetical order.

### a (Display Archiver Status Screen)

The `a` command opens the Archiver status screen and displays current archiver activity.

When issued without a parameter, the `a` command displays archiver status for all file systems. When the command is issued with the name of a file system, the command displays status for the specified file system only.

### Command Synopsis

```
a
:a filesystem
```

### Controls

**Ctrl-B (^b)**

Move back one file system.

**Ctrl-F (^f)**

Move forward one file system.

**Ctrl-D (^d)**

Move down one archive copy.

**Ctrl-U (^u)**

Move up one archive copy.

**Ctrl-J (^j)**

Toggle between binary and decimal units of size.

### Examples

The following example shows a typical archiver status screen. The archiver is idle:

```
Archiver Status          samu          version time date

sam-archiverd: Idle

sam-arfind:  samqfs1 mounted at /export/samqfs1
```

```
Files waiting to start 32          schedule 0          archiving 0
Monitoring file system activity.
```

The next example shows the same file system, but the archiver is actively archiving:

```
Archiver Status          samu          version time date

sam-archiverd: Archiving

sam-arfind:  samqfs1 mounted at /export/samqfs1
Files waiting to start 149          schedule 0          archiving 0
Monitoring file system activity.

sam-arcopy:  samqfs1.archset1.1.83 li.VOL119
Copying file /export/samqfs1/2014/data/A00876.dat
```

## Field Descriptions

The screen lists status information for all Oracle HSM file systems by file-system name and mount point. The fields in the detail display are explained below.

### **sam-archiverd**

The `sam-archiverd` field displays the current status of the Oracle HSM archiver daemon, the software component that copies modified files to backup media:

- Idle means that Oracle HSM is waiting for archive-ready files
- Archiving means that Oracle HSM is copying files to archival storage.
- Waiting for resources means that Oracle HSM is ready to copy files to archival storage, but is waiting for a drive to become available or for a volume to mount.
- Various other messages indicate errors.

### **sam-arfind**

The `sam-arfind` field displays the most recent results reported by the software component that monitors a file system and locates candidates for archiving. The results include:

- the name that you assign to the Oracle HSM file system (`samqfs1` in the example)
- the mount-point directory for the Oracle HSM file system (`/export/samqfs1` in the example)
- the number of archive-ready Files waiting to start archiving (32 in the example)
- the number of archive-ready files currently in the archiving schedule (0 in the example)
- the number of archive-ready files that are currently archiving (0 in the example).

### **sam-arcopy**

The `sam-arcopy` field displays the current activity reported by the software component that copies archive-ready files to archival media. It reports the following:

- the name of the file system (`samqfs1` in the example)

The files in an archive request file are members of the same *archive set* and thus share the same archiving characteristics and requirements. The filename consists of the name of the *copy directive* (the archiving rule that sets the criteria for copying and retaining a file on specified media) and a sequence number set by the archiver.



- the name of the archive set (archset1 in the example)
- the copy number of the current copy (1 in the example)
- a sequence number (83 in the example)
- the volume serial number of the media volume that is being used to store the current copy (VOL119 in the example).
- the path and file name of the file that is currently being copied (/export/samqfs1/2014/data/A00876.dat in the example).

## abr (Enable Application Based Recovery)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the abr command lets Oracle Real Application Clusters (RAC) use the Application Based Recovery feature of Solaris Volume Manager to handle recovery of databases stored in Oracle HSM file systems that use asynchronous I/O with Solaris Volume Manager mirrored volumes.

By default, ABR is enabled.

## Command Synopsis

```
:abr family-set-equipment-number
```

## Examples

The following example enables ABR on family-set device 20:

```
File systems          samu          version time date

ty  eq state  device_name  status      high  low  mountpoint  server
ma  20 on    sam2      -----2---r-  80%  70%  /sam2
mm  21 on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  22 on    /dev/dsk/c0t600A0B800026E584000021864C4943AA0s0
mr  23 on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma  10 on    sam1      m----2---r-  80%  70%  /sam1
mm  11 on    /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr  12 on    /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr  13 on    /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr  14 on    /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr  15 on    /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
:
command:abr 20
```

## add (Add Equipment to a Mounted File System)

When issued with an Oracle HSM equipment ordinal number, the add command updates the corresponding file system so that it can use disk devices that have been added to the family set definition in the mcf (Oracle HSM Master Configuration File) and set up with the samd config command.

See [remove \(Move Data and Remove Equipment from a File System\)](#).

## Command Synopsis

```
:add equipment-number
```

## Examples

For example, assume that we need to add an additional disk slice to file system family set qfs1. We start by adding a line to the `/etc/opt/SUNWsamfs/mcf` file that identifies the slice, `/dev/dsk/c5t8d0s3`, as Oracle HSM equipment ordinal number 13 (the selected equipment number must be unique within the Oracle HSM system):

```
root@solaris:~# vi /etc/opt/SUNWsamfs/mcf
...
# Section 1: File Systems
#
# Equipment      Equipment  Equipment  Family      Device  Additional
# Identifier      Ordinal    Type       Set          State   Parameters
# -----
qfs1              10         ma         qfs1         on
/dev/dsk/c5t8d0s0 11         mm         qfs1         on
/dev/dsk/c5t8d0s1 12         md         qfs1         on
/dev/dsk/c5t8d0s3 13         md         qfs1         on
:wq
root@solaris:~#
```

Then we reconfigure the running Oracle HSM daemon to incorporate the changes in the file:

```
root@solaris:~# samd config
```

At this point, the File systems screen shows that the equipment is off and thus not yet available. So we enter the add command with the user-assigned Oracle HSM equipment number of the new slice:

```
File systems                                samu                                version time date

ty eq state  device_name  status          high  low  mountpoint  server
ma 10 on     qfs1         -----2---r-   80%  70%
mm 11 on     /dev/dsk/c5t8d0s0
md 12 on     /dev/dsk/c5t8d0s1
md 13 off    /dev/dsk/c5t8d0s3
:
command:add 13
```

The device state changes to on:

```
File systems                                samu                                version time date

ty eq state  device_name  status          high  low  mountpoint  server
ma 10 on     qfs1         -----2---r-   80%  70%
mm 11 on     /dev/dsk/c5t8d0s0
md 12 on     /dev/dsk/c5t8d0s1
md 13 on     /dev/dsk/c5t8d0s3
```

## a1loc (Enable Storage Allocation on a Device)

When issued with an Oracle HSM equipment ordinal number, the `alloc` command starts storage allocation on the specified data device. See [noalloc \(Disable Storage Allocation on a Device\)](#).

## Command Synopsis

```
:alloc equipment-number
```

## Examples

The following example starts storage allocation on disk device 14:

```
File systems          samu          version time date

ty eq state  device_name  status      high  low  mountpoint  server
ma 20 on     sam2         -----2---r- 80%  70%
mm 21 on     /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22 on     /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr 23 on     /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma 10 on     sam1         m----2---r- 80%  70% /sam1
mm 11 on     /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr 12 on     /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr 13 on     /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr 14 noalloc /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr 15 on     /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
:
command:alloc 14
```

The device state changes to on:

```
File systems          samu          version time date

ty eq state  device_name  status      high  low  mountpoint  server
ma 20 on     sam2         -----2---r- 80%  70% /sam2
mm 21 on     /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22 on     /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr 23 on     /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma 10 on     sam1         m----2---r- 80%  70% /sam1
mm 11 on     /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr 12 on     /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr 13 on     /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr 14 on     /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr 15 on     /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
```

## aplease (Set Append Lease Expiration Time for a Shared File System)

Before appending data to a shared file, a host must request and obtain an *append lease* that grants it exclusive access to the file. The `aplease` command defines the number of seconds during which this lease remains valid on the specified device. If the specified time runs out before the append operation is complete, the host must reacquire the lease before proceeding.

The specified number of seconds must fall in the range [15-600]. The default is 30 seconds.

For related information, see [rdlease](#) (Set the Read Lease Time for a Shared File System), [wrlease](#) (Set the Write Lease Time for a Shared File System), and [lease\\_timeo](#) (Set the Unused Lease Timeout for a Shared File System).

## Command Synopsis

```
:aplease family-set-equipment-number interval_in_seconds
```

## Examples

The following example sets the append lease time to 2 minutes (120 seconds) on family set device 800:

```
File systems                                samu                                version time date

ty  eq  state device_name                    status      high low mountpoint server
ma  800  on   shareqfs1                      m----2c--r-  80% 70% /shareqfs1
mm  801  on   /dev/dsk/c6t50020F2300004655d0s0
mr  802  on   /dev/dsk/c6t50020F2300004655d0s1
ma  810  on   shareqfs2                      m----2c--r-  80% 70% /shareqfs2
mm  811  on   /dev/dsk/c6t50020F2300004655d0s6
mr  812  on   /dev/dsk/c6t50020F2300004655d0s7
:
command: aplease 800 120
```

## aridle (Stop Archiving Gracefully)

The `aridle` command stops archiving at the next logical point (such as the end of the current archive tar file). The command is typically used prior to disruptive maintenance, such as unmounting, growing, or shrinking file systems. Archiving remains inactive until the `arrun` command is entered.

When entered with no parameters, `aridle` stops all archiver activity.

When entered with the `dk` parameter, `aridle` stops all archiving to disk media.

When entered with the `rm` parameter, `aridle` stops all archiving to removable media, such as tape.

When entered with the `fs.` parameter and a file-system name, `aridle` stops all archiver activity on the specified file system.

## Command Synopsis

```
:aridle
:aridle dk
:aridle rm
:aridle fs.file-system-identifier
```

## Examples

In the first example, `aridle` stops all archiving:

```
Archiver Status                                samu                                version time date

sam-archiverd: Archiving

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0                      schedule 482                      archiving 0
Monitoring file system activity.

sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
:
```

command:**aridle**

After the aridle command is entered, the archiver daemon is Idle until the arrun command is entered:

|                 |      |                   |
|-----------------|------|-------------------|
| Archiver Status | samu | version time date |
|-----------------|------|-------------------|

sam-archiverd: **Idle**

sam-arfind: sam1 mounted at /sam1  
 Files waiting to start 0            schedule 482            archiving 0  
**Waiting for :arrun**

In the second example. aridle stops archiving on the sam1 file system only:

|                 |      |                   |
|-----------------|------|-------------------|
| Archiver Status | samu | version time date |
|-----------------|------|-------------------|

sam-archiverd: **Archiving**

sam-arfind: sam1 mounted at /sam1  
 Files waiting to start 0            schedule 482            archiving 0  
 Monitoring file system activity.

sam-arcopy: sam1.copy-directive.sequence-number vol-ser  
 Copying file path/filename  
 :  
 command:**aridle fs.sam1**

After the aridle command is entered, the archiver daemon is Waiting... until the arrun command is entered with the file-system directive fs.sam1:

|                 |      |                   |
|-----------------|------|-------------------|
| Archiver Status | samu | version time date |
|-----------------|------|-------------------|

sam-archiverd: **Waiting for :arrun fs.sam1**

sam-arfind: sam1 mounted at /sam1  
 Files waiting to start 0            schedule 482            archiving 0  
**Waiting for :arrun fs.sam1**

In the third example. aridle stops archiving to disk:

|                 |      |                   |
|-----------------|------|-------------------|
| Archiver Status | samu | version time date |
|-----------------|------|-------------------|

sam-archiverd: **Archiving**

sam-arfind: sam1 mounted at /sam1  
 Files waiting to start 0            schedule 482            archiving 0  
 Monitoring file system activity.

sam-arcopy: sam1.copy-directive.sequence-number vol-ser  
 Copying file path/filename  
 :  
 command:**aridle dk**

After the aridle command is entered, the archiver daemon is now Waiting... until the arrun command is entered with the dk (disk) directive:

|                 |      |                   |
|-----------------|------|-------------------|
| Archiver Status | samu | version time date |
|-----------------|------|-------------------|

sam-archiverd: **Waiting for :arrun dk**

sam-arfind: sam1 mounted at /sam1  
 Files waiting to start 0            schedule 482            archiving 0

Waiting for :arrun dk

## arrerrun (Restart the Archiver Non-Disruptively)

The `arrerrun` command restarts archiving without disrupting ongoing operations. The archiver daemons are restarted, and all work in progress is recovered. Compare `arrerrun` to [arrestart \(Restart the Archiver Disruptively\)](#).

### Command Synopsis

```
:arrerrun
```

### Examples

In the example, `arrerrun` restarts archiving and recovers work in progress:

```
Archiver Status                samu                version time date

sam-archiverd: Archiving

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0        schedule 482        archiving 0
Monitoring file system activity.

sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
:
command:arrerrun
```

## arrestart (Restart the Archiver Disruptively)

The `arrestart` command stops and restarts the archiver regardless of the state of the archiver. Compare the command with [arrerrun \(Restart the Archiver Non-Disruptively\)](#).

Use `arrestart` with caution, because it stops operations immediately, and any copy operations that fail to complete will need to be repeated. This waste space on archival media.

### Command Synopsis

```
:arrestart
```

### Examples

```
Archiver Status                samu                version time date

sam-archiverd: Archiving

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0        schedule 482        archiving 0
Monitoring file system activity.

sam-arcopy: sam1.copy-directive.sequence-number vol-ser
```

```
Copying file path/filename
:
command:arrestart
```

## arrmarchreq (Remove Archive Requests)

When issued with a file-system name and either the name of an archive-request file or a wildcard, the `arrmarchreq` command deletes the specified archive requests.

An archive-request filename consists of the name of the *copy directive* (the archiving rule that sets the criteria for copying and retaining a file on specified media) and a sequence number set by the archiver.

## Command Synopsis

```
:arrmarchreq file-system-name.archive-request-file-name
:arrmarchreq file-system-name.*
```

## Examples

In the first example, `arrmarchreq` deletes archive request file `data0.1.83` from the `sam1` file system:

```
Archiver Status          samu          version time date

sam-archiverd: Idle

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0          schedule 0          archiving 0
Monitoring file system activity.
:
command:arrmarchreq sam1.data0.1.83
```

In the second example, `arrmarchreq` deletes all archive request files from the `sam1` file system:

```
Archiver Status          samu          version time date

sam-archiverd: Idle

sam-arfind: sam2 mounted at /sam2
Files waiting to start 0          schedule 0          archiving 0
Monitoring file system activity.
:
command:arrmarchreq sam2.*
```

## arrun (Start Archiving)

The `arrun` command starts archiving.

When entered with no parameters, `arrun` starts all archiver activities.

When entered with the `dk` parameter, `arrun` starts archiving to disk media.

When entered with the `rm` parameter, `arrun` starts archiving to removable media.

When entered with the `fs.` parameter and a file-system name, arrun starts archiver activity on the specified file system.

## Command Synopsis

```
:arrun
:arrun dk
:arrun rm
:arrun fs.file-system-identifier
```

## Examples

In the first example, arrun starts all archiving:

```
Archiver Status          samu          version time date
```

```
sam-archiverd: Idle
```

```
sam-arfind: sam1 mounted at /sam1
```

```
Files waiting to start 0      schedule 482      archiving 0
```

```
Waiting for :arrun
```

```
:
```

```
command:arrun
```

After the arrun command is entered, the archiver daemon resumes Archiving:

```
Archiver Status          samu          version time date
```

```
sam-archiverd: Archiving
```

```
sam-arfind: sam1 mounted at /sam1
```

```
Files waiting to start 0      schedule 482      archiving 0
```

```
Monitoring file system activity.
```

```
sam-arcopy: sam1.copy-directive.sequence-number vol-ser
```

```
Copying file path/filename
```

In the second example, arrun starts archiving on the sam1 file system:

```
Archiver Status          samu          version time date
```

```
sam-archiverd: Waiting for :arrun fs.sam1
```

```
sam-arfind: sam1 mounted at /sam1
```

```
Files waiting to start 0      schedule 482      archiving 0
```

```
Waiting for :arrun fs.sam1
```

```
:
```

```
command:arrun fs.sam1
```

After the arrun command is entered, the archiver daemon resumes archiving file system sam1:

```
Archiver Status          samu          version time date
```

```
sam-archiverd: Archiving
```

```
sam-arfind: sam1 mounted at /sam1
```

```
Files waiting to start 0      schedule 482      archiving 0
```

```
Monitoring file system activity.
```



```
sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
```

In the third example, arrun starts archiving to disk media:

```
Archiver Status          samu          version time date
```

```
sam-archiverd: Waiting for :arrun dk
```

```
sam-arfind: sam1 mounted at /sam1
Files waiting to start 0      schedule 482      archiving 0
:
command:arrun dk
```

After the arrun command is entered, the resumes archiving to disk:

```
Archiver Status          samu          version time date
```

```
sam-archiverd: Archiving
```

```
sam-arfind: sam1 mounted at /sam1
Files waiting to start 0      schedule 482      archiving 0
Monitoring file system activity.
```

```
sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
```

## arscan (Scan a File System for Unarchived Files)

When issued with the name of an Oracle HSM file system, the arscan command scans the specified file system for unarchived files.

When entered with no parameters other than the file-system name, arscan recursively scans all directories in the specified file system.

When entered with the file-system name and a directory, arscan recursively scans all directories in the specified file system starting at the specified directory.

When entered with the file-system name and the .inodes key word, arscan scans the .inodes file. If most files in a file system are already archived, this is faster than scanning directories.

Entering an integer representing a number of seconds with any of the other parameters delays the scan for the specified number of seconds.

## Command Synopsis

```
:arscan file-system-name
:arscan file-system-name delay-in-seconds
:arscan file-system-name.starting-directory
:arscan file-system-name.starting-directory delay-in-seconds
:arscan file-system-name.inodes
:arscan file-system-name.inodes delay-in-seconds
```

## Examples

In the example, arscan:

```
Archiver Status          samu          version time date
```

```
sam-archiverd: Idle
```

```
sam-arfind: sam1 mounted at /sam1
Files waiting to start 0          schedule 482          archiving 0
:
command:arscan
```

## arstop (Stop All Archiving Immediately)

The arstop command stops archiving immediately.

When entered with no parameters, arstop stops all archiver activities.

When entered with the `dk` parameter, arstop stops archiving to disk media.

When entered with the `rm` parameter, arstop stops archiving to removable media.

When entered with the `fs.` parameter and a file-system name, arstop stops archiver activity on the specified file system.

## Command Synopsis

```
:arstop
:arstop dk
:arstop rm
:arstop fs.file-system-identifier
```

## Examples

In the first example, arstop stops all archiving:

```
Archiver Status          samu          version time date

sam-archiverd: Archiving

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0          schedule 482          archiving 0
Monitoring file system activity.
sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
:
command:arstop
```

In the second example, the arstop command stops archiving on file system sam1:

```
Archiver Status          samu          version time date

sam-archiverd: Archiving

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0          schedule 482          archiving 0
Monitoring file system activity.

sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
:
command:arstop fs.sam1
```

## artrace (Perform Archiver Tracing)

The artrace command starts archiver tracing.

Tracing writes a detailed log of archiver activity to the sam-archiverd file in the /var/opt/SUNWsamfs/trace/ subdirectory.

When entered with no parameters, artrace traces archiver activities on all file systems.

When entered with the fs. parameter and a file-system name, artrace traces archiver activity on the specified file system.

### Command Synopsis

```
:artrace
:artrace fs.file-system-identifier
```

### Examples

In the first example, artrace starts archiver tracing for all file systems:

```
Archiver Status                samu                version time date

sam-archiverd: Archiving

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0          schedule 482          archiving 0
Monitoring file system activity.
sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
:
command:artrace
```

In the second example, the artrace command starts archiver tracing for file system sam1:

```
Archiver Status                samu                version time date

sam-archiverd: Archiving

sam-arfind: sam1 mounted at /sam1
Files waiting to start 0          schedule 482          archiving 0
Monitoring file system activity.

sam-arcopy: sam1.copy-directive.sequence-number vol-ser
Copying file path/filename
:
command:artrace fs.sam1
```

## atime (Configure Access Time Updates for a File System)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device -1, 0, or 1, the atime command controls how and when the access time attribute is updated for files in the corresponding file system.

Setting a 0 (zero) value enables caching and delayed writes up to one minute for access time updates. Access time updates are only written to disk immediately when utilization of an Oracle HSM file system is above the low water mark, when the access

time change coincides with updates to the creation time (`ctime`) or modification time (`mtime`), or when the file system is unmounted. This setting reduces disk I/O and thus improves performance.

Setting a 1 value immediately updates the access time on disk whenever a file is accessed. This increases disk I/O and reduces performance accordingly.

Setting a -1 value or executing the `noatime` command disables access time updates. If access times are unimportant, this can significantly reduce I/O and thus improve performance. However, the POSIX standard requires that access times be marked on files. Never use this setting with an archiving, Oracle HSM file system.

The default is value is 0 (caching and delayed writes enabled).

For more information, see the `mount_samfs` and `stat` man pages for further information.

## Command Synopsis

```
:atime family-set-equipment-number -1|0|1
```

## Examples

The following example disables caching and forces immediate access time updates to disk on family set device 100:

```
File systems          samu          version time date

ty  eq  state device_name      status      high low  mountpoint server
ma  100 on  qfs1              m----2-----d  90% 70%  /qfs1
mm  101 on  /dev/dsk/c5t10d0s0
md  102 on  /dev/dsk/c5t10d0s1
md  103 on  /dev/dsk/c5t11d0s0
md  104 on  /dev/dsk/c5t11d0s1
:
command:atime 100 1
```

## audit (Audit Library or Library Slot)

When issued with the Oracle HSM equipment ordinal number of a robotic library and, optionally, a slot identifier, the `audit` command causes the specified automated library to mount volumes, read the volume serial number (VSN) of each volume, and rebuild the library catalog. If specified, the slot must be in use and physically occupied by media.

If the specified slot contains a tape cartridge, the `-e` parameter tells the audit to skip to the end of data (EOD) and determine the space available. Note, however, that this process is not interruptible and may take hours to complete.

If the specified slot contains a two-sided optical cartridge, identify the desired side as 1 or 2. If a side is not specified, both sides are audited.

For more information, see the `auditslot(1M)`, `mount_samfs` and `stat` man pages for further information.

## Command Synopsis

```
:audit equipment-number
```

```
:audit equipment-number:slot
:audit -e equipment-number:slot
:audit equipment-number:slot:side
:audit -e equipment-number:slot:side
```

## Examples

The following example audits slot 17 in the robotic library with Oracle HSM equipment ordinal number 900:

```
Robot VSN catalog by slot : eq 900 samu          version time date
                                         count 32
slot    access    time count  use  flags          ty vsn
  0      2013/07/02 12:53   3 96% -il-o-b----f  li VOL001
  1      2013/07/02 12:53   2 98% -il-o-b----f  li VOL002
  2      2013/07/02 12:52   1 86% -il-o-b----f  li VOL003
  3      2013/07/02 12:52   1 95% -il-o-b----f  li VOL004
  4      2013/07/02 12:51   1 79% -il-o-b----f  li VOL005
  5      2013/07/02 12:45   0 14% -ilEo-b----f  li VOL006 MEDIA ERROR
  6      2013/07/02 12:46   0 0%  -il-o-b----f  li VOL007
  7      2013/07/02 12:46   0 0%  -il-o-b----f  li VOL008
  8      2013/07/02 12:47   0 0%  -il-o-b----f  li VOL009
  9      2013/07/02 12:47   0 0%  -il-o-b----f  li VOL010
 10      2013/07/02 12:48   0 0%  -il-o-b----f  li VOL011
 11      2013/07/02 12:48   0 0%  -il-o-b----f  li VOL012
 12      2013/07/02 12:48   0 0%  -il-o-b----f  li VOL013
 13      2013/07/02 12:49   0 0%  -il-o-b----f  li VOL014
 14      2013/07/02 12:49   0 0%  -il-o-b----f  li VOL015
 15      2013/07/02 12:50   0 0%  -il-o-b----f  li VOL016
 16      2013/07/02 12:50   0 0%  -il-o-b----f  li VOL017
 17      2013/07/02 12:51   0 0%  -il-o-b----f  li VOL018
 18      2013/07/02 12:51   0 0%  -il-o-b----f  li VOL019
 19      none                50 0%  -il-oCb----f  li CLN020
:
command: audit 900:17
```

## c (Display Device Configuration Screen)

The **c** command opens the Device configuration screen, which lists all device names and equipment ordinal numbers.

### Command Synopsis

```
c
:c
```

### Controls

**Ctrl-B (^b)**  
Move back one page.

**Ctrl-F (^f)**  
Move forward one page.

**Ctrl-D (^d)**

Move down the page.

**Ctrl-U (^u)**

Move up the page.

## Example

The following example shows the device configuration screen:

```
Device configuration:          samu          version time date

ty  eq state  device_name                                fs  family_set
sk 100 on     /etc/opt/SUNWsamfs/SL8500_T10K_parms        100  SL8500
ti 101 down   /dev/rmt/0cbn                               100  SL8500
ti 102 down   /dev/rmt/1cbn                               100  SL8500
ti 103 down   /dev/rmt/2cbn                               100  SL8500
hy 104 on     historian                                    104
```

## Field Descriptions

**ty**

The `ty` field displays the Oracle HSM device type. Device-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

**eq**

The `eq` field displays the user-assigned Oracle HSM equipment ordinal number of the device.

**state**

The `state` field displays the current operating state of the device, which may include any of the following:

- `on` means that the device is available.
- `ro` means that the device is available read-only.
- `off` means that the device is not available.
- `down` means that the device is available for maintenance only.
- `idle` means that the device is completing operations that are already in progress but is not accepting new connections.
- `noalloc` means that no more storage can be allocated on this device. An administrator has run the `noalloc` command (see [noalloc \(Disable Storage Allocation on a Device\)](#)). The `noalloc` state persists until an administrator issues an `alloc` command (see [alloc \(Enable Storage Allocation on a Device\)](#)).

**device\_name**

The `device_name` field displays the path and file name of the device.

In this instance, the family set equipment type, `sk`, indicates an Oracle StorageTek ACSLS interface to a network-attached library. So the device name is the path to the parameters file for the library, `SL8500_T10K_parms`. For detailed information on network-attached libraries and parameter files, see the `mcf` man page.

**fs**

The `fs` field displays the user-assigned Oracle HSM equipment ordinal number for the family-set that contains a device.

**family\_set**

The `family_set` field displays the user-assigned name of the Oracle HSM family set that contains the device. Family sets represent the equipment associated with a Oracle HSM component, such as the group of disk devices associated with an Oracle HSM file system or the tape library associated with archiving.

## c1ear (Clear a Load Request for a Removable Storage Volume)

When issued with a volume serial number (VSN) and, optionally, an index value, the `clear` command cancels pending load requests for the specified VSN, clears any reference to the VSN from the Removable media load requests screen, and aborts any processes that are waiting for the volume to mount.

Optionally, you may specify the value of the index column of the row that corresponds to the VSN on the screen.

See [p \(Display the Removable Media Load Requests Screen\)](#) and [load \(Load a Cartridge into a Drive\)](#) for further information.

### Command Synopsis

```
:clear vsn
:clear vsn index
```

### Examples

The following example clears a load request for VSN VOL005:

```
Removable media load requests all both      samu          version time date
count: 0

index type pid  user      rb  flags      wait count  vsn
    0  li   0   root      900  -b-f---    0:00      VOL005
:
command: clear VOL005
```

## d (Display Daemon Trace Controls Screen)

The `d` command opens the `Daemon trace controls` screen, which displays the events that Oracle HSM is currently tracing, as specified in the `defaults.conf` file. For more information about enabling trace files, see the `defaults.conf` man page.

### Command Synopsis

```
d
:d
```

### Controls

**Ctrl-B (^b)**

Move back one page.

**Ctrl-F (^F)**

Move forward one page.

**Example**

The following example shows trace file information. It includes information about the daemons being traced, the paths to the trace files, the events being traced, and information about the size and age of the trace files.

```

Daemon trace controls          samu          version time date

sam-amld      /var/opt/SUNWsamfs/trace/sam-amld
               cust err fatal misc proc debug date
               size 10 age 0
sam-archiverd /var/opt/SUNWsamfs/trace/sam-archiverd
               cust err fatal misc proc debug date
               size 10 age 0
sam-catserverd /var/opt/SUNWsamfs/trace/sam-catserverd
               cust err fatal misc proc debug date
               size 10 age 0
sam-fsd       /var/opt/SUNWsamfs/trace/sam-fsd
               cust err fatal misc proc debug date
               size 10 age 0
sam-rftd      /var/opt/SUNWsamfs/trace/sam-rftd
               cust err fatal misc proc debug date
               size 10 age 0
sam-recycler  /var/opt/SUNWsamfs/trace/sam-recycler
               cust err fatal misc proc debug date
               size 10 age 0

```

**def\_retention (Set Default WORM Retention Time)**

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and a time interval, the `def_retention` command changes the default retention period for WORM-enabled files that do not have a specified retention period to the specified time interval.

The data and path of a WORM (*Write Once Read Many*) file cannot be changed or deleted until the retention period expires. Specify the retention period in any of three ways:

- To indicate that the file should never be deleted or changed, enter the string `permanent` or `0`.
- To specify an interval in years, days, hours, and/or minutes, enter a string of the form

```
[YEARSy] [DAYSD] [HOURS h] [MINUTESm]
```

where *YEARS* is the specified number of years (if any), *MONTHS* is the specified number of months (if any), *DAYS* is the specified number of days (if any), *HOURS* is the specified number of hours (if any), and *MINUTES* is the specified number of minutes (if any). For example, `5y3d1h4m` specifies 5 years, days, 1 hour, and 4 minutes, `10y` specifies 10 years, and `60d12h` specifies 60 days and 12 hours.

- To specify retention as a number of minutes, enter an integer in the range `[1-2147483647]`.



If left unchanged, the default retention period for WORM files is 43,200 minutes (30 days).

For additional information on WORM options, see the `mount_samfs` and `sam_worm` man page.

## Command Synopsis

```
:def_retention family-set-equipment-number retention-interval
```

## Examples

The following example sets the default retention period for WORM files stored in equipment ordinal number 10 (file system `samfs1`) to 7 years:

```
File systems          samu          version time date

ty   eq  state device_name          status      high low  mountpoint server
ma  10   on   samfs1                m----2----d  90% 70%  /samfs1
mm  11   on   /dev/dsk/c5t10d0s0
md  12   on   /dev/dsk/c5t10d0s1
md  13   on   /dev/dsk/c5t11d0s0
md  14   on   /dev/dsk/c5t11d0s1
:
command: def_retention 10 7y
```

## devlog (Set Device Logging Options)

When issued with the Oracle HSM equipment ordinal number of a device and a space-delimited list of event-logging options, the `devlog` command configures logging for the specified device.

Specify event-logging options using one or more of the following key words:

- `all` logs all events.
- `none` disables logging.
- `default` restores the default logging settings.
- `detail` logs events that help track the progress of operations.
- `err` logs error messages.
- `label` logs labeling operations.
- `mig` logs migration toolkit messages.
- `msg` logs thread and process communications.
- `retry` logs retries of device operations.
- `syserr` logs system library errors.
- `time` logs time device operations.
- `module` includes module names and source lines in log messages.
- `event` includes event names in the message in log messages.
- `date` includes event dates in the message.
- `- keyword` (a minus sign preceding one of the keywords above) clears removes the keyword from the current logging specification.

The default logging specification is `err retry syserr date`. For additional information, see the `samset man` page.

## Command Synopsis

```
:devlog equipment-number option [next-option]...
:devlog all option [next-option]...
:devlog equipment-number -option [-next-option]...
:devlog all -option [-next-option]...
```

## Examples

The following example logs the event name in addition to the standard options for device 101:

```
Removable media status: all          samu          version time date

ty eq  status      act use state  vsn
ti 101 -----p    0  0% notrdy
      empty
ti 102 -----p    0  0% notrdy
      empty
:
command:devlog 101 event err retry syserr date
```

## dio\_rd\_consec (Limit the Number of Consecutive Direct Reads)

The `dio_rd_consec` command specifies the number of consecutive reads larger than `dio_rd_form_min` or `dio_rd_ill_min` that Oracle HSM should perform using direct I/O.

The default value is 0, which disables direct reads based on I/O size and causes Oracle HSM to ignore `dio_rd_form_min` or `dio_rd_ill_min`.

For more information, see [dio\\_rd\\_form\\_min \(Set the Size of Well-Aligned Direct I/O Reads\)](#) and [dio\\_szero \(Zero Uninitialized Areas of Sparse Files During Direct I/O\)](#).

## Command Synopsis

```
:dio_rd_consec family-set-equipment-number number_of_consecutive_IOS
```

## Examples

The following example sets minimum size of well-formed direct reads for family set device 100 to 16:

```
Mass storage status          samu          version time date

ty eq  status      use state ord  capacity  free      ra part high low
ma 100 m----2---r- 1%  on      7.270T  7.270T  1M 16  80% 70%
mm 110          1%  on      0 465.253G 465.231G [975661056 inodes]
mr 120          1%  on      1  1.817T  1.817T
mr 130          1%  on      2  1.817T  1.817T
mr 140          1%  on      3  1.817T  1.817T
mr 150          1%  on      4  1.817T  1.817T
:
```

```
command:dio_rd_consec 100 16
```

## dio\_rd\_form\_min (Set the Size of Well-Aligned Direct I/O Reads)

The `dio_rd_form_min` command makes a specified number of kilobytes the minimum size at which Oracle HSM will automatically switch from paged I/O to direct I/O when reading well-aligned data on a specified family-set disk device (see ["Switched I/O"](#) on page 2-3).

The default value is 256 kilobytes. Setting the value to 0 disables switched I/O during reads of well-aligned data.

### Command Synopsis

```
:dio_rd_form_min family-set-equipment-number number_kilobytes
```

### Examples

The following example sets minimum size of well-formed direct reads for family set device 100 to 1024 kilobytes:

```
Mass storage status          samu          version time date

ty  eq  status      use  state  ord   capacity  free      ra  part high low
ma  100  m----2---r- 1%   on    0    7.270T    7.270T    1M  16   80% 70%
mm  110                1%   on    0  465.253G  465.231G [975661056 inodes]
mr  120                1%   on    1   1.817T    1.817T
mr  130                1%   on    2   1.817T    1.817T
mr  140                1%   on    3   1.817T    1.817T
mr  150                1%   on    4   1.817T    1.817T
:
```

```
command:dio_rd_form_min 100 1024
```

## dio\_rd\_ill\_min (Set the Size of Misaligned Direct I/O Reads)

The `dio_rd_ill_min` command makes a specified number of kilobytes the minimum size at which Oracle HSM will automatically switch from paged I/O to direct I/O when reading misaligned data on a specified family-set disk device (see ["Switched I/O"](#) on page 2-3).

The default value is 0 kilobytes which disables switched I/O during reads of misaligned data.

### Command Synopsis

```
:dio_rd_ill_min family-set-equipment-number number_kilobytes
```

### Examples

The following example sets minimum size of malformed direct reads for family set device 100 to 4096 kilobytes:

```
Mass storage status          samu          version time date
```

```

ty  eq  status      use  state  ord   capacity  free      ra  part high low
ma 100  m----2---r- 1%   on    ord   7.270T    7.270T    1M 16   80% 70%
mm 110                1%   on    0   465.253G  465.231G [975661056 inodes]
mr 120                1%   on    1    1.817T    1.817T
mr 130                1%   on    2    1.817T    1.817T
mr 140                1%   on    3    1.817T    1.817T
mr 150                1%   on    4    1.817T    1.817T
:
command:dio_rd_form_min 100 4096

```

## dio\_szero (Zero Uninitialized Areas of Sparse Files During Direct I/O)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `dio_szero` command makes direct I/O to the specified device handle sparse files in the same way that paged I/O handles them. Uninitialized areas are zeroed as the areas are accessed. Sparse file behavior the same as that for paged I/O. This reduces performance when writing sparse files directly.

The default is [nodio\\_szero \(Do Not Zero Uninitialized Areas of Sparse Files with Direct I/O\)](#).

## Command Synopsis

```
:dio_szero family-set-equipment-number
```

## Examples

The following example zeroes sparse files on family set device 100:

```

Mass storage status      samu      version time date

ty  eq  status      use  state  ord   capacity  free      ra  part high low
ma 100  m----2---r- 1%   on    ord   7.270T    7.270T    1M 16   80% 70%
mm 110                1%   on    0   465.253G  465.231G [975661056 inodes]
mr 120                1%   on    1    1.817T    1.817T
mr 130                1%   on    2    1.817T    1.817T
mr 140                1%   on    3    1.817T    1.817T
mr 150                1%   on    4    1.817T    1.817T
:
command:dio_szero 100

```

## dio\_wr\_consec (Limit the Number of Consecutive Direct Writes)

The `dio_wr_consec` command specifies the number of consecutive writes larger than `dio_wr_form_min` or `dio_wr_ill_min` that Oracle HSM should perform using direct I/O.

The default value is 0, which disables direct writes based on I/O size and causes Oracle HSM to ignore `dio_wr_form_min` or `dio_wr_ill_min`.

For further details, see [dio\\_wr\\_form\\_min \(Set the Size of Well-Formed Direct I/O Writes\)](#) and [dio\\_wr\\_ill\\_min \(Set the Size of Misaligned Direct I/O Writes\)](#).

## Command Synopsis

```
:dio_wr_consec family-set-equipment-number number_of_consecutive_IOs
```

## Examples

The following example sets minimum size of well-formed direct reads for family set device 100 to 16:

```

Mass storage status          samu          version time date

ty  eq  status      use  state  ord   capacity  free      ra  part high low
ma  100  m----2---r- 1%   on    0    7.270T    7.270T    1M  16   80% 70%
mm  110                1%   on    0   465.253G  465.231G [975661056 inodes]
mr  120                1%   on    1    1.817T    1.817T
mr  130                1%   on    2    1.817T    1.817T
mr  140                1%   on    3    1.817T    1.817T
mr  150                1%   on    4    1.817T    1.817T
:
command:dio_wr_consec 100 16

```

## dio\_wr\_form\_min (Set the Size of Well-Formed Direct I/O Writes)

The `dio_wr_form_min` command makes a specified number of kilobytes the minimum size at which Oracle HSM will automatically switch from paged I/O to direct I/O when writing well-aligned data to a specified family-set disk device (see "[Switched I/O](#)" on page 2-3).

The default value is 256 kilobytes. Setting the value to 0 disables switched I/O during writes of well-aligned data.

## Command Synopsis

```
:dio_wr_form_min family-set-equipment-number number_kilobytes
```

## Examples

The following example sets minimum size of well-formed direct writes for family set device 100 to 1024 kilobytes:

```

Mass storage status          samu          version time date

ty  eq  status      use  state  ord   capacity  free      ra  part high low
ma  100  m----2---r- 1%   on    0    7.270T    7.270T    1M  16   80% 70%
mm  110                1%   on    0   465.253G  465.231G [975661056 inodes]
mr  120                1%   on    1    1.817T    1.817T
mr  130                1%   on    2    1.817T    1.817T
mr  140                1%   on    3    1.817T    1.817T
mr  150                1%   on    4    1.817T    1.817T
:
command:dio_wr_form_min 100 1024

```

## dio\_wr\_ill\_min (Set the Size of Misaligned Direct I/O Writes)

The `dio_wr_ill_min` command makes a specified number of kilobytes the minimum size at which Oracle HSM will automatically switch from paged I/O to direct I/O when writing misaligned data to a specified family-set disk device (see "[Switched I/O](#)" on page 2-3).

The default value is 0 kilobytes which disables switched I/O during reads of misaligned data.

## Command Synopsis

```
:dio_wr_ill_min family-set-equipment-number number_kilobytes
```

## Examples

The following example sets minimum size of malformed direct writes for family set device 100 to 4096 kilobytes:

```
Mass storage status          samu          version time date

ty eq status      use state ord  capacity  free      ra part high low
ma 100 m----2---r- 1%  on   ord   7.270T   7.270T   1M 16   80% 70%
mm 110           1%  on   0   465.253G  465.231G [975661056 inodes]
mr 120           1%  on   1   1.817T   1.817T
mr 130           1%  on   2   1.817T   1.817T
mr 140           1%  on   3   1.817T   1.817T
mr 150           1%  on   4   1.817T   1.817T
:
command:dio_wr_form_min 100 4096
```

## diskvols (Set/Clear Flags on Disk Volumes Used for Archiving)

When issued with the name of an archival disk volume, a plus or a minus, and one of the flags listed below, the `diskvols` command sets or clears the specified flag on the specified volume. When troubleshooting hardware issues, you may want to change the values of the `U` and `E` flags. But leave the remainder alone:

- `l` means that the volume is labeled; a `seqnum` file has already been created.
- `r` means that the volume is defined on a remote host.
- `U` means that the volume is unavailable.
- `R` means that the volume is read only.
- `E` means that a media error occurred when writing to the disk archive directory.
- `A` means that the volume needs to be audited.
- `F` means that the volume is full.
- `c` means that the volume is ready for recycling.

## Command Synopsis

```
:diskvols volume +flag
:diskvols volume -flag
```

## Examples

The following example sets the `U` (unavailable) flag on the archival storage volume `disk01`:

```
Disk volume dictionary          samu          version time date
header
```

```

version 460
volumes
magic 340322 version 9 nkeys 2 ndata 2
index  space          capacity      used        flags  volume
   0  12882411520    12887785472    10291200    -----  disk01
   1  6443827200     6443892736      70656      -----  disk02
clients
magic 340322 version 9 nkeys 1 ndata 1
:
command:diskvols disk01 +U

```

The flag is set:

```

Disk volume dictionary      samu          version time date
header
version 460
volumes
magic 340322 version 9 nkeys 2 ndata 2
index  space          capacity      used        flags  volume
   0  12882411520    12887785472    10291200    --U--    disk01
   1  6443827200     6443892736      70656      -----  disk02
clients
magic 340322 version 9 nkeys 1 ndata 1

```

## dmr (Enable Directed Mirror Reads of Software Mirrors)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `dmr` command lets Oracle Real Application Clusters (RAC) use the Directed Mirror Reads feature of Solaris Volume Manager when databases are stored on Oracle HSM file systems that use asynchronous I/O with Solaris Volume Manager mirrored volumes. See [nodmr \(Disable Directed Mirror Reads of Software Mirrors\)](#).

By default, DMR is enabled.

## Command Synopsis

```
:dmr family-set-equipment-number
```

## Examples

The following example enables DMR on family-set device 20:

```

File systems      samu          version time date

ty eq state  device_name  status      high  low  mountpoint  server
ma 20 on    sam2        -----2---r-  80%  70%  /sam2
mm 21 on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22 on    /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr 23 on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma 10 on    sam1          m----2---r-  80%  70%  /sam1
mm 11 on    /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr 12 on    /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr 13 on    /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr 14 on    /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr 15 on    /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
:
command:dmr 10

```

## dtrace (Enable/Configure Tracing for Oracle HSM Daemons)

When issued with an Oracle HSM daemon specifier plus the keyword `on` or `off` or a variable name and value, the `dtrace` command controls how trace information is written to trace files.

Specify daemons using the keyword `all` (for all Oracle HSM daemons) or the name of a particular daemon. Valid daemon names include `sam-archiverd`, `sam-catserverd`, `sam-fsd`, `sam-rftd`, `sam-recycler`, `sam-sharefsd`, `sam-stagerd`, `sam-serverd`, `sam-clientd`, and `fsmgmt`.

Use the `on` keyword to enable tracing for the specified daemon(s).

Use the `off` keyword to disable tracing for the specified daemon(s).

Use a variable name with a value to control the tracing process for the specified daemon. Set the variable using the syntax `daemon-specifier.variable value`.

### Command Synopsis

```
:dtrace daemon-specifier on
:dtrace daemon-specifier off
:dtrace daemon-specifier.file path-filename
:dtrace daemon-specifier.options option_name1 option_name2 -option_name3 ...
```

### Variables

#### **file**

The `file` variable takes a path or file-name value:

- `all.file path-filename` names the directory that holds the trace files `path-filename`.

By default, trace files reside in `/var/opt/SUNWsamfs/trace`.

- `daemon-name.file path-filename` names the trace file `path-filename`.

By default, trace files are named for the daemon they trace.

#### **options**

The `options` variable takes a space-separated list of *trace options*, events to be traced or elements to be included in trace output. To deselect an option, use a minus sign with the option (`-option_name`).

The pre-defined event types are `cust`, `err`, `fatal`, `misc`, `proc`, and `rft`. The message elements `program[pid]` and `time` are always included and can't be deselected.

Optional events include the following:

- `none` excludes all event types.
- `all` includes the most useful events: `cust`, `err`, `fatal`, `ipc`, `misc`, `proc`, and `rft`.
- `alloc` includes memory allocation events.
- `cust` includes customer-notification, syslog and notify file messages.
- `err` includes non-fatal program errors.
- `fatal` includes fatal syslog messages.
- `files` includes file actions.
- `rft` includes file transfer events.



- ipc includes inter-process communications.
- misc includes miscellaneous, otherwise uncategorized events.
- oprmsg includes operator messages.
- proc process initiation and completion.
- queue archiver queue contents when changed.

Optional message elements include:

- date includes the date in the message (the time is always included).
- module includes the source file name and line number in the message.
- type includes the event type in the message.

#### age

The age variable sets the time between trace file rotations to the specified value (rotating trace files keeps their size within manageable limits). Set the value of age to a number of seconds, minutes, hours, days, weeks, and/or years greater than 2 minutes.

A value of two minutes or less disables trace-file rotation.

#### size

The size variable sets the file size at which trace file rotations occur. Set the value of size as an integer with one of the following suffixes specifying the units: b for *bytes*, k for *kilobytes*, M for *megabytes*, G for *gigabytes*, or T for *terabytes*.

## Examples

The following example excludes non-fatal errors from the sam-archiverd trace file and includes the event date and the source file and line number where the error occurred in each trace file entry:

```
Help information           page 1/15  samu           version time date
```

Displays:

|   |                               |   |                        |
|---|-------------------------------|---|------------------------|
| a | Archiver status               | w | Pending stage queue    |
| c | Device configuration          | C | Memory                 |
| d | Daemon trace controls         | D | Disk volume dictionary |
| f | File systems                  | F | Optical disk label     |
| g | Shared clients                | I | Inode                  |
| h | Help information              | J | Preview shared memory  |
| l | Usage information             | K | Kernel statistics      |
| m | Mass storage status           | L | Shared memory tables   |
| n | Staging status                | M | Shared memory          |
| o | Optical disk status           | N | File system parameters |
| p | Removable media load requests | P | Active Services        |
| r | Removable media               | R | SAM-Remote             |
| s | Device status                 | S | Sector data            |
| t | Tape drive status             | T | SCSI sense data        |
| u | Staging queue                 | U | Device table           |
| v | Robot catalog                 |   |                        |

:

```
command:dtrace sam-archiverd.options -err date module
```

## export (Move Removable Media to the Robotic Library's Mailbox)

When issued with the Oracle HSM equipment ordinal number of a robotic library and a slot identifier, the `export` command moves the cartridge that resides in the specified slot to the mailbox. If specified, the slot must be in use and physically occupied by media. If the slot contains a two-sided optical cartridge and no side is specified, both sides are audited.

When issued with an Oracle HSM media-type identifier and the Volume Serial Number (VSN) of a cartridge, the `export` command moves the specified cartridge to the mailbox.

If the specified equipment ordinal number identifies a StorageTek network-attached library, the `-f` parameter exports the cartridge to the library's Cartridge Access Port (CAP) and updates the Oracle HSM catalog. The `CAPID` parameter must be defined in the library parameters file. See the `stk` man page for details.

If the specified equipment ordinal number identifies some other network-attached library, the `export` command updates the Oracle HSM catalog but leaves physical movement of the cartridge to the library's control software.

See also [import \(Move Removable Media from the Mailbox into the Robotic Library\)](#).

Note that, by default, exported volumes are tracked by the Oracle HSM in the *historian*. The historian acts as a virtual library that can handle staging and archiving requests for volumes that are no longer resident in the library. An operator can then import the required cartridges to satisfy the load requests. Exporting cartridges from the historian itself deletes all information on the exported cartridge. The information about volumes on this cartridge will be lost. See the `historian` man page for further information.

## Command Synopsis

```
:export equipment-number:slot
:export -f equipment-number:slot
:export media-type.vsn
:export -f media-type.vsn
```

## Examples

In the following example, the first form of the command exports the contents of slot 1 in the robotic library with Oracle HSM equipment ordinal number 900. The second form exports the LTO cartridge with VSN VOL004.

```
Robot VSN catalog by slot : eq 900 samu          version time date
                                     count 32

slot    access    time count  use  flags          ty vsn
  0      2013/07/02 12:53   3 96% -il-o-b----f li VOL001
  1      2013/07/02 12:53   2 98% -il-o-b----f li VOL002
  2      2013/07/02 12:52   1 86% -il-o-b----f li VOL003
  3      2013/07/02 12:52   1 95% -il-o-b----f li VOL004
...
:
command:export 900:1
...
command:export li.VOL004
```

## f (Display File Systems Screen)

The `f` command opens the File systems screen and displays the components of Oracle HSM file systems.

### Command Synopsis

```
f
:f
```

### Controls

None.

### Examples

The following example shows the file systems screen. Note that member drives are indented one space and appear directly below the file system to which they belong.

```
File systems                                samu                                version time date

ty  eq  state  device_name          status      high low  mountpoint server
ms  10  on    sam1                m----2----d  90%  70%  /sam1
    md  11  on    /dev/dsk/c5t8d0s3
    md  12  on    /dev/dsk/c5t8d0s4
    md  13  on    /dev/dsk/c5t8d0s5
    md  14  on    /dev/dsk/c5t8d0s6
    md  15  on    /dev/dsk/c5t8d0s7
ms  20  on    sam2                m----2----d  90%  70%  /sam2
    md  21  on    /dev/dsk/c5t9d0s3
    md  22  on    /dev/dsk/c5t9d0s4
    md  23  on    /dev/dsk/c5t9d0s5
    md  24  on    /dev/dsk/c5t9d0s6
    md  25  on    /dev/dsk/c5t9d0s7
ma  30  on    qfs1                m----2----d  90%  70%  /qfs1
    mm  31  on    /dev/dsk/c5t10d0s0
    md  32  on    /dev/dsk/c5t10d0s1
ma  40  on    qfs2                m----2----d  90%  70%  /qfs2
    mm  41  on    /dev/dsk/c5t11d0s0
    md  42  on    /dev/dsk/c5t11d0s1
ma  50  on    qfs3                m----2---r-  90%  70%  /qfs3
    mm  51  on    /dev/dsk/c5t12d0s0
    mr  52  on    /dev/dsk/c5t12d0s1
ma  60  on    qfs4                m----2---r-  90%  70%  /qfs4
    mm  61  on    /dev/dsk/c5t13d0s0
    mr  62  on    /dev/dsk/c5t13d0s1
ma 100  on    shareqfs1            m----2c--r-  80%  70%  /shareqfs1 server
    mm 101  on    /dev/dsk/c6t50020F2300004655d0s0
    mr 102  on    /dev/dsk/c6t50020F2300004655d0s1
ma 110  on    shareqfs2            m----2c--r-  80%  70%  /shareqfs2 server
    mm 111  on    /dev/dsk/c6t50020F2300004655d0s6
    mr 112  on    /dev/dsk/c6t50020F2300004655d0s7
```

### Field Descriptions

#### ty

The `ty` field displays the Oracle HSM device type. Device-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

**eq**

The `eq` field displays the user-assigned Oracle HSM equipment number of the device.

**state**

The `state` field displays the current operating state of the device:

- `on` means that the device is available.
- `ro` means that the device is available read-only.
- `off` means that the device is not available.
- `down` means that the device is available for maintenance only.
- `idle` means that the device is completing operations that are already in progress but is not accepting new connections.
- `noalloc` means that no more storage can be allocated on this device. An administrator has run the [noalloc \(Disable Storage Allocation on a Device\)](#) command. The `noalloc` state persists until an administrator issues an [alloc \(Enable Storage Allocation on a Device\)](#) command.

**device\_name**

The `device_name` field displays the path and file name of the device.

**status**

The `status` field displays an eleven-character string where each character position represents the value of a different file-system attribute. Character positions are numbered starting from the left, position 1, and ending at the right, position 11. The following table defines the possible state codes for each position in the status string.

| Position | Value       | Meaning  |
|----------|-------------|--|
| 1        | m-----      | A lowercase <code>m</code> in position 1 means that the file system is mounted.  |
| 1        | M-----      | An uppercase <code>M</code> in position 1 means that the file system is being mounted.   |
| 2        | -u-----     | A lowercase <code>u</code> in position 2 means that the file system is being unmounted.  |
| 3        | --A-----    | An uppercase <code>A</code> in position 3 means that data is being <i>archived</i> (copied to nearline or offline storage).                                  |
| 4        | ---R-----   | An uppercase <code>R</code> in position 4 means that previously archived data is being <i>released</i> from online disk storage to free space for new files. |
| 5        | ----S-----  | An uppercase <code>S</code> in position 5 means that previously released data is being <i>staged</i> (copied from archival media to online disk storage).    |
| 6        | -----1----- | The numeral <code>1</code> in position 6 means that this is a version-1 file system.   |
| 6        | -----2----- | The numeral <code>2</code> in position 6 means that this is a version-2 file system.   |
| 7        | -----c----  | A lowercase <code>c</code> in position 7 means that this is a shared file system.  |
| 8        | -----W---   | An uppercase <code>W</code> in position 8 means that this is a single-writer file system.  |
| 9        | -----R--    | An uppercase <code>R</code> in position 9 means that this is a multi-reader file system.   |
| 10       | -----r-     | A lowercase <code>r</code> in position 10 means that the file system stores data on single-allocation <code>mr</code> devices.                               |
| 11       | -----d      | A lowercase <code>d</code> in position 11 means that the file system stores data on dual-allocation <code>md</code> devices.                                 |

**high**

The *high* field displays the *high-water mark*, a storage utilization threshold expressed as the percentage of the file system's total capacity. When percent utilization exceeds the high-water mark, Oracle HSM starts deleting files that have been archived to backup media, starting with the largest and least recently used files. If users subsequently access the deleted files, Oracle HSM restores them to disk from an archival copy.

**low**

The *low-water mark*, a storage utilization threshold expressed as the percentage of the file system's total capacity. When percent utilization drops below the low-water mark, Oracle HSM stops deleting files from the disk. The low-water mark balances the need to maintain free disk space for new files against file-system performance by keeping files resident on disk and avoiding the need for excessive staging from archival media.

**mountpoint**

The directory where the file system attaches to the host's root file system.

**server**

The name of the metadata server (MDS) for a file system that is shared by multiple hosts.

## flush\_behind (Set the Flush-Behind Parameter)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and a number of kilobytes, the `flush_behind` command configures the corresponding file system to asynchronously write the specified number of kilobytes from dirty (modified) cache memory pages to disk.

As files change in memory, flush-behind insures that the changes are quickly saved to non-volatile storage media. When a process writes modified data to cache memory pages, the flushing follows close behind, copying the changes to disk even as the main write process continues. Unsaved, *dirty* cache pages are kept to a minimum, which helps to maintain the integrity of the file data.

On the other hand, flush-behind increases overhead and can reduce write performance. The process of flushing a data block may delay subsequent re-writes of that block. So flush-behind is disabled by default.

Set the specified value in the range [0-8192] kilobytes, where 0—the default—disables the flush-behind capability.

## Command Synopsis

```
:stage_flush_behind family-set-equipment-number number_kilobytes
```

## Examples

The following example sets staging flush-behind for family set device 100 to 1024 kilobytes:

| Mass storage status |     |            |     |       | samu | version time date |          |            |         |      |     |
|---------------------|-----|------------|-----|-------|------|-------------------|----------|------------|---------|------|-----|
| ty                  | eq  | status     | use | state | ord  | capacity          | free     | ra         | part    | high | low |
| ma                  | 100 | m---2---r- | 1%  | on    |      | 7.270T            | 7.270T   | 1M         | 16      | 80%  | 70% |
| mm                  | 110 |            | 1%  | on    | 0    | 465.253G          | 465.231G | [975661056 | inodes] |      |     |
| mr                  | 120 |            | 1%  | on    | 1    | 1.817T            | 1.817T   |            |         |      |     |
| mr                  | 130 |            | 1%  | on    | 2    | 1.817T            | 1.817T   |            |         |      |     |
| mr                  | 140 |            | 1%  | on    | 3    | 1.817T            | 1.817T   |            |         |      |     |

```
mr 150          1%   on      4      1.817T      1.817T
:
command:flush_behind 100 1024
```

## forcedirectio (Use Direct I/O by Default)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `forcedirectio` command makes direct I/O the default for all input/output operations on the specified device.

Paged I/O is the default.

For more information, see ["Understanding I/O Performance Tuning Objectives and Options"](#) on page 2-2, the `noforcedirectio` (Do Not Use Direct I/O by Default) command, and the `directio`, `setfa`, `sam_setfa`, and `sam_advise` man pages.

## Command Synopsis

```
:forcedirectio family-set-equipment-number
```

## Examples

The following example makes direct I/O the default for family set device 100:

```
Mass storage status          samu          version time date

ty eq status      use state ord  capacity  free      ra part high low
ma 100 m----2---r- 1%   on      7.270T   7.270T   1M 16   80% 70%
mm 110           1%   on      0 465.253G 465.231G [975661056 inodes]
mr 120           1%   on      1   1.817T   1.817T
mr 130           1%   on      2   1.817T   1.817T
mr 140           1%   on      3   1.817T   1.817T
mr 150           1%   on      4   1.817T   1.817T
:
command:forcedirectio 100
```

## force\_nfs\_async (Force Asynchronous NFS)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `force_nfs_async` command causes the specified device to override the Oracle HSM default and cache NFS (Network File System) data on the server, even if NFS has requested that the data be written through to disk.

The `force_nfs_async` command is effective only if the file system is mounted as an NFS server and only if the clients are mounted with the `noac` NFS mount option. For more information about mounting an NFS file system, see the `mount_nfs` man page.

---

**Caution:** Use this command with caution. In the event of a server interruption, data can be lost!

The `force_nfs_async` option violates NFS protocols. Data is cached on the NFS server and cannot be seen immediately by all the clients when multiple NFS servers are present (multiple NFS servers can be enabled within the QFS shared file system).

---

## Command Synopsis

```
:force_nfs_async family-set-equipment-number
```

## Examples

The following example sets `force_nfs_async` on family set 100:

```
Mass storage status          samu          version time date

ty  eq  status          use  state  ord  capacity  free      ra  part high low
ma  100  m----2---r-  1%   on    0    7.270T    7.270T    1M  16   80% 70%
mm  110          1%   on    0  465.253G  465.231G [975661056 inodes]
mr  120          1%   on    1    1.817T    1.817T
mr  130          1%   on    2    1.817T    1.817T
mr  140          1%   on    3    1.817T    1.817T
mr  150          1%   on    4    1.817T    1.817T
:
command:force_nfs_async 100
```

## g (Display Shared File System Clients)

The `g` command opens the Shared clients screen and displays current configuration information.

When issued without a parameter, the `a` command displays archiver status for all file systems. When the command is issued with the name of a file system, the command displays status for the specified file system only.

## Command Synopsis

```
g
:g
```

## Controls

### Ctrl-I (^I)

Toggle between the abbreviated and detailed views.

### Ctrl-B

Move back one page.

### Ctrl-B (^b)

Move back one page.

### Ctrl-F (^f)

Move forward one page.

### Ctrl-D (^d)

Move down the page.

### Ctrl-U (^u)

Move up the page.

## Field Descriptions

### ord

The `ord` field displays the Oracle HSM server ordinal number. The server ordinal distinguishes the currently active metadata server from potential metadata servers and clients:

- Ordinal 1 indicates the active metadata server.
- Ordinal 2 or higher indicates a potential metadata server.
- Ordinal 0 indicates a client.

### hostname

The `hostname` field displays the name of the server, potential server, or client host.

### status

The `status` field displays the mount status, host type (server or client), file system type, and distributed I/O (datamover) status. In the abbreviated view, the field is displayed in bit-mask form. In the detailed view, they are expanded as shown in the example.

### config and conf1

The `config` and `conf1` fields display file system configuration details. In the abbreviated view, the fields are displayed in bit-mask form. In the detailed view, they are expanded as shown in the example.

### flags

The `flags` field displays abbreviated, textual status information such as mount status (MNT) and host type (SVR or CLI).

## Examples

The following example shows the default, abbreviated view:

```
Shared clients          samu          version time date
samsharefs is shared, server is samsharefs-mds, 2 clients 3 max

ord hostname          seqno nomsgs status  config  conf1  flags
1 samsharefs-mds      14      0   8091  808540d  4051  0 MNT SVR
2 samsharefs-client1  71      0   a0a1  808540d  4041  0 MNT CLI
```

This example shows the detailed view:

```
Shared clients          samu          version time date
samsharefs is shared, server is samsharefs-mds, 2 clients 3 max

ord hostname          seqno nomsgs status  config  conf1  flags
1 samsharefs-mds      14      0   8091  808540d  4051  0 MNT SVR

    config : CDEVID      ARCHIVE_SCAN  GFSID  OLD_ARCHIVE_FMT
    "      : SYNC_META   TRACE   SAM_ENABLED  SHARED_MO
    config1 : NFSV4_ACL  MD_DEVICES   SMALL_DAUS  SHARED_FS
    flags   :
    status  : MOUNTED    SERVER  SAM      DATAMOVER
    last_msg : Wed Jul  2 10:13:50 2014

2 samsharefs-client1  127      0   a0a1  808540d  4041      0 MNT CLI

    config : CDEVID      ARCHIVE_SCAN  GFSID  OLD_ARCHIVE_FMT
```



```

"      : SYNC_META  TRACE   SAM_ENABLED    SHARED_MO
config1 : NFSV4_ACL  MD_DEVICES    SHARED_FS
flags   :
status  : MOUNTED   CLIENT  SAM           SRVR_BYTEREV
"      : DATAMOVER
last_msg : Wed Jul  2 11:09:04 2014

```

## h (Display the Help Screen)

The **h** command opens the Help information screen. The help screen summarizes **samu** displays and controls. By default, this is the first display that the system presents when you enter the **samu** command at the command line.

### Command Synopsis

```

h
:h

```

### Controls

**Ctrl-B**  
Move back one page.

**Ctrl-B (^b)**  
Move back one page.

**Ctrl-F (^f)**  
Move forward one page.

**Ctrl-D (^d)**  
Move down the page.

**Ctrl-U (^u)**  
Move up the page.

### Examples

There are fifteen Oracle HSM help screens in all, but archive-related displays are not shown if the Oracle Hierarchical Storage Manager software is not installed.

#### Help for Display Commands

The first example shows the first page that appears by default whenever you launch **samu**. Subsequent help screens show **samu** commands.

```

Help information      page 1/15      samu      version time date
Displays:
a  Archiver status    w  Pending stage queue
c  Device configuration  C  Memory
d  Daemon trace controls  D  Disk volume dictionary
f  File systems       F  Optical disk label
h  Help information   I  Inode
l  Usage information  J  Preview shared memory
m  Mass storage status K  Kernel statistics
n  Staging status     L  Shared memory tables
o  Optical disk status M  Shared memory

```

|   |                               |   |                        |
|---|-------------------------------|---|------------------------|
| p | Removable media load requests | N | File system Parameters |
| r | Removable media               | P | Active Services        |
| s | Device status                 | R | SAM-Remote             |
| t | Tape drive status             | S | Sector data            |
| u | Staging queue                 | T | SCSI sense data        |
| v | Robot catalog                 | U | Device table           |

more (ctrl-f)

### Help for **samu** Interface Controls

The second page of the help shows the hot keys that control the **samu** interface. Note that some controls are only applicable to certain displays:

Help information                      page 2/15    samu                      *version time date*

#### Hot Keys:

```

q   Quit
:   Enter command
sp  Refresh display
^f  Page display forward
^b  Page display backward
^d  Half-page display forward
^u  Half-page display backward
^i  Show details (selected displays)
^j  Toggle power for size, base 2 or 10 (selected displays)
^k  Advance display format
^l  Refresh display (clear)
^r  Toggle refresh
/   Search for VSN (v display)
%   Search for barcode (v display)
$   Search for slot (v display)

```

more (ctrl-f)

### Help for Controlling Displays from the **samu** Command Prompt

The third page of the help shows display-control commands that can be entered at the same command prompt that control the displays. Note that some controls are only applicable to certain displays:

Help information                      page 3/15    samu                      *version time date*

#### Display control commands:

|                |                               |
|----------------|-------------------------------|
| a [filesystem] | Archiver status               |
| n [media]      | Staging status                |
| p [media]      | Removable media load requests |
| r [media]      | Removable media               |
| u [media]      | Staging queue                 |
| v [eq]         | Robot catalog                 |
| w [media]      | Pending stage queue           |
| C address      | Memory                        |
| I [inode]      | Inode                         |
| J [address]    | Preview shared memory         |
| M [address]    | Shared memory                 |
| R [eq]         | SAM-Remote                    |
| S [address]    | Sector data                   |
| T [eq]         | SCSI sense data               |
| U [eq]         | Device table                  |

more (ctrl-f)

To view the archive display for a specified file system, you would enter the command-prompt hot key : (the colon). Then, at the samu command prompt, you would enter a *filesystem-equipment-identifier* as shown below:

```
...
T [eq]                SCSI sense data
U [eq]                Device table

more (ctrl-f)
Command: a filesystem-equipment-identifier
```

The samu interface then displays a detailed archiving status report for the specified file system:

```
Archiver status          samu          version time date

sam-archiverd: Waiting for resources

sam-arfind:  filesystem-equipment-identifier mounted at /mountpoint-directory
Files waiting to start 0  schedule 482  archiving  0
Monitoring file system activity.
Examine: noscan Interval: 4m
Logfile: /var/opt/SUNWsamfs/archiver.log
events      12,138  syscalls 41,537  buffers  2
archive      0
change       3
close       7,961
create     3,927
hwm        29
modify      0
rearchive   0
rename      9
remove     209
unarchive   0
idstat     18,101  opendir  28 getdents  28 cached
```

## Help for Miscellaneous File System Commands

The fourth page of the help shows various file-system commands that can be entered at the samu command prompt:

```
Help information          page 4/15  samu          version time date

File System commands - miscellaneous:
stripe eq value           Set stripe width
suid eq                   Turn on setuid capability
nosuid eq                  Turn off setuid capability
sync_meta eq value        Set sync_meta mode
atime eq value             Set access time (atime) update mode
trace eq                   Turn on file system tracing
notrace eq                 Turn off file system tracing
add eq                     Add eq to mounted file system
remove eq                  Remove eq; copy files to ON eqs
release eq                 Release eq and mark files offline
alloc eq                   Enable allocation on partition
noalloc eq                 Disable allocation on partition
def_retention eq interval Set default WORM retention time

more (ctrl-f)
```

For more information on individual commands, see the full descriptions listed below:

- [stripe](#) (Set the Stripe Width for a File System)
- [suid](#) (Mount a File System with `setuid` Execution Enabled)
- [nosuid](#) (Mount a File System with `setuid` Execution Disabled)
- [sync\\_meta](#) (Synchronize File System Metadata)
- [atime](#) (Configure Access Time Updates for a File System)
- [trace](#) (Enable File System Tracing)
- [notrace](#) (Disable File System Tracing)
- [add](#) (Add Equipment to a Mounted File System)
- [remove](#) (Move Data and Remove Equipment from a File System)
- [release](#) (Release Archived Data Files and Disable Allocation on a Device)
- [alloc](#) (Enable Storage Allocation on a Device)
- [noalloc](#) (Disable Storage Allocation on a Device)
- [def\\_retention](#) (Set Default WORM Retention Time)

### Help for Oracle HSM File System Commands

The fifth page of the help shows Oracle HSM file-system commands that can be entered at the `samu` command prompt:

```
Help information           page 5/15   samu           version time date
```

File System commands - SAM:

|  |  |
|--|--|
| <code>hwm_archive eq</code>              | Turn on hwm archiver start                 |
| <code>nohwm_archive eq</code>            | Turn off hwm archiver start                |
| <code>maxpartial eq value</code>         | Set maximum partial size in kilobytes      |
| <code>partial eq value</code>            | Set size to remain online in kilobytes     |
| <code>partial_stage eq value</code>      | Set partial stage-ahead point in kilobytes |
| <code>stage_flush_behind eq value</code> | Set stage flush behind size in kilobytes   |
| <code>stage_n_window eq value</code>     | Set direct stage size in kilobytes         |
| <code>thresh eq high low</code>          | Set high and low release thresholds        |
| <br><code>more (ctrl-f)</code>           |  |

For more information on individual commands, see the full descriptions listed below:

- [hwm\\_archive](#) (Start Archiving When the High Water Mark is Reached)
- [nohwm\\_archive](#) (Do Not Start Archiving at the High Water Mark)
- [maxpartial](#) (Set the Maximum Partial Release Size for the File System)
- [maxpartial](#) (Set the Maximum Partial Release Size for the File System)
- [partial](#) (Set the Default Partial Release Size for the File System)
- [partial\\_stage](#) (Set Partial Stage-Ahead Point for the File System)
- [stage\\_flush\\_behind](#) (Set the Stage Flush Behind Size)
- [stage\\_n\\_window](#) (Size the Buffer for Reading Directly from Archival Media)
- [thresh](#) (Set High and Low Watermarks)

## Help for File System I/O Commands

The sixth page of the help summarizes file-system input/output (I/O) commands that can be entered at the `samu` command prompt:

Help information                      page 6/15    samu                      *version time date*

File System commands - I/O:

|                                       |   |
|---------------------------------------|---|
| <code>dio_rd_consec eq value</code>   | Set number of consecutive dio reads     |
| <code>dio_rd_form_min eq value</code> | Set size of well-formed dio reads       |
| <code>dio_rd_ill_min eq value</code>  | Set size of ill-formed dio reads        |
| <code>dio_wr_consec eq value</code>   | Set number of consecutive dio writes    |
| <code>dio_wr_form_min eq value</code> | Set size of well-formed dio writes      |
| <code>dio_wr_ill_min eq value</code>  | Set size of ill-formed dio writes       |
| <code>flush_behind eq value</code>    | Set flush behind value in kilobytes     |
| <code>forcedirectio eq</code>         | Turn on directio mode                   |
| <code>noforcedirectio eq</code>       | Turn off directio mode                  |
| <code>force_nfs_async eq</code>       | Turn on NFS async                       |
| <code>noforce_nfs_async eq</code>     | Turn off NFS async                      |
| <code>readahead eq value</code>       | Set maximum readahead in kilobytes      |
| <code>writebehind eq value</code>     | Set maximum writebehind in kilobytes    |
| <code>sw_raid eq</code>               | Turn on software RAID mode              |
| <code>nosw_raid eq</code>             | Turn off software RAID mode             |
| <code>wr_throttle eq value</code>     | Set outstanding write size in kilobytes |
| <code>abr eq</code>                   | Enable Application Based Recovery       |
| <code>noabr eq</code>                 | Disable Application Based Recovery      |
| <code>dmr eq</code>                   | Enable Directed Mirror Reads20a         |
| <code>nodmr eq</code>                 | Disable Directed Mirror Reads           |

For more information on individual commands, see the full descriptions listed below:

- [dio\\_rd\\_consec \(Limit the Number of Consecutive Direct Reads\)](#)
- [dio\\_rd\\_form\\_min \(Set the Size of Well-Aligned Direct I/O Reads\)](#)
- [dio\\_rd\\_ill\\_min \(Set the Size of Misaligned Direct I/O Reads\)](#)
- [dio\\_wr\\_consec \(Limit the Number of Consecutive Direct Writes\)](#)
- [dio\\_wr\\_form\\_min \(Set the Size of Well-Formed Direct I/O Writes\)](#)
- [dio\\_wr\\_ill\\_min \(Set the Size of Misaligned Direct I/O Writes\)](#)
- [flush\\_behind \(Set the Flush-Behind Parameter\)](#)
- [forcedirectio \(Use Direct I/O by Default\)](#)
- [noforcedirectio \(Do Not Use Direct I/O by Default\)](#)
- [force\\_nfs\\_async \(Force Asynchronous NFS\)](#)
- [noforce\\_nfs\\_async \(Do Not Force Asynchronous NFS\)](#)
- [readahead \(Set The Maximum Read-Ahead Parameter\)](#)
- [writebehind \(Set the Write-Behind Parameter\)](#)
- [sw\\_raid \(Turn On Software RAID Mode\)](#)
- [nosw\\_raid \(Turn Off Software RAID Mode\)](#)
- [wr\\_throttle \(Set the Maximum Size of Outstanding Writes\)](#)
- [abr \(Enable Application Based Recovery\)](#)
- [noabr \(Disable Application Based Recovery\)](#)
- [dmr \(Enable Directed Mirror Reads of Software Mirrors\)](#)

- [nodmr \(Disable Directed Mirror Reads of Software Mirrors\)](#)

### Help for QFS File System Commands

The seventh page of the help summarizes QFS file-system commands that can be entered at the `samu` command prompt:

Help information                      page 7/15    samu                      *version time date*

```
File System commands - QFS:
  mm_stripe eq value           Set meta stripe width
  qwrite eq                   Turn on qwrite mode
  noqwrite eq                  Turn off qwrite mode

  more (ctrl-f)
```

For more information on individual commands, see the full descriptions listed below:

- [mm\\_stripe \(Set the Metadata Stripe Width\)](#)
- [qwrite \(Enable Simultaneous Reads/Writes to a File from Different Threads\)](#)
- [noqwrite \(Disable Simultaneous Reads/Writes from Different Threads\)](#)

### Help for Multi-Reader File System Commands

The eighth page of the help summarizes multi-reader file-system commands that can be entered at the `samu` command prompt:

Help information                      page 8/15    samu                      *version time date*

```
File System commands - multireader:
  invalid eq value             Set multireader invalidate cache delay
  refresh_at_eof eq           Turn on refresh at eof mode
  norefresh_at_eof eq         Turn off refresh at eof mode

  more (ctrl-f)
```

For more information on individual commands, see the full descriptions listed below:

- [invalid \(Set the Invalidate-Cache Delay for a Multi-Reader File System\)](#)
- [refresh\\_at\\_eof \(Refresh at EOF in a Multi-Reader File System\)](#)
- [norefresh\\_at\\_eof \(Do Not Refresh at EOF in a Multi-Reader File System\)](#)

### Help for Shared File-System Commands

The ninth page of the help summarizes shared file-system commands that can be entered at the `samu` command prompt:

Help information                      page 9/15    samu                      *version time date*

```
File System commands - shared fs:
  minoallocsz eq value        Set minimum allocation size
  maxallocsz eq value         Set maximum allocation size
  meta_timeo eq interval      Set shared fs meta cache timeout
  lease_timeo eq interval     Set shared fs lease relinquish timeout
  min_pool eq value           Set shared fs minimum threads count
  mh_write eq                  Turn on multihost read/write
  nomh_write eq               Turn off multihost read/write
  aplease eq interval         Set append lease time
  rdlease eq interval         Set read lease time
  wrlease eq interval         Set write lease time
```

```
more (ctrl-f)
```

For more information on individual commands, see the full descriptions listed below:

- [minallocsz \(Set the Minimum Allocation Size for a Shared File System\)](#)
- [maxallocsz \(Set the Maximum Allocation Size for a Shared File System\)](#)
- [meta\\_timeo \(Set the Metadata Cache Timeout for a Shared File System\)](#)
- [lease\\_timeo \(Set the Unused Lease Timeout for a Shared File System\)](#)
- [min\\_pool \(Set the Minimum Number of Shared File System Threads\)](#)
- [mh\\_write \(Turn on Multi-Host Read/Write\)](#)
- [nomh\\_write \(Turn Off Multi-Host Read/Write\)](#)
- [aplease \(Set Append Lease Expiration Time for a Shared File System\)](#)
- [rdlease \(Set the Read Lease Time for a Shared File System\)](#)
- [wrlease \(Set the Write Lease Time for a Shared File System\)](#)

### Help for Device Commands

The tenth page of the help summarizes shared device commands that can be entered at the samu command prompt:

```
Help information          page 10/15  samu          version time date
```

Device commands:

|                        |                            |
|------------------------|----------------------------|
| devlog eq [option ...] | Set device logging options |
| idle eq                | Idle device                |
| off eq                 | Turn off device            |
| on eq                  | Turn on device             |
| readonly eq            | Make device read only      |
| ro eq                  | Make device read only      |
| unavail eq             | Make device unavailable    |
| unload eq              | Unload device              |

```
more (ctrl-f)
```

For more information on individual commands, see the full descriptions listed below:

- [devlog \(Set Device Logging Options\)](#)
- [idle \(Idle Device\)](#)
- [off \(Turn Off A Device\)](#)
- [on \(Turn On A Device\)](#)
- [readonly | ro \(Make Device Read Only\)](#)
- [unavail \(Make a Device Unavailable to Oracle HSM\)](#)
- [unload \(Unload a Drive\)](#)

### Help for Robot Commands

The eleventh page of the help summarizes robot commands that can be entered at the samu command prompt:

```
Help information          page 11/15  samu          version time date
```

```

Robot commands:
  audit [-e] eq[:slot[:side]]      Audit slot or library
  import eq                        Import cartridge from mailbox
  export [-f] eq:slot              Export cartridge to mailbox
  export [-f] mt.vsn               Export cartridge to mailbox
  load eq:slot[:side]              Load cartridge in drive
  load [-f] mt.vsn                 Load cartridge in drive
  priority pid priority             Set priority in preview queue

more (ctrl-f)

```

For more information on individual commands, see the full descriptions listed below:

- [audit \(Audit Library or Library Slot\)](#)
- [import \(Move Removable Media from the Mailbox into the Robotic Library\)](#)
- [export \(Move Removable Media to the Robotic Library's Mailbox\)](#)
- [load \(Load a Cartridge into a Drive\)](#)
- [priority \(Set Priority in Load-Request Preview Queue\)](#)

### Help for Archiver Commands

The twelfth page of the help summarizes archiver commands that can be entered at the samu command prompt:

Help information                      page 12/15   samu                      *version time date*

```

Archiver commands:
  aridle [dk | rm | fs.fsname]      Idle archiving
  arrerun                             Soft restart archiver
  arrestart                          Restart archiver
  arrmarchreq fsname.[* | arname]    Remove ArchReq(s)
  arrun [dk | rm | fs.fsname]        Start archiving
  arscan fsname[dir | ..inodes][int] Scan filesystem
  arstop [dk | rm | fs.fsname]       Stop archiving
  artrace [fs.fsname]                Trace archiver

more (ctrl-f)

```

For more information on individual commands, see the full descriptions listed below:

- [aridle \(Stop Archiving Gracefully\)](#)
- [arrerun \(Restart the Archiver Non-Disruptively\)](#)
- [arrmarchreq \(Remove Archive Requests\)](#)
- [arrun \(Start Archiving\)](#)
- [arscan \(Scan a File System for Unarchived Files\)](#)
- [arstop \(Stop All Archiving Immediately\)](#)
- [artrace \(Perform Archiver Tracing\)](#)

### Help for Stager Commands

The thirteenth page of the help summarizes stager commands that can be entered at the samu command prompt:

Help information                      page 13/15   samu                      *version time date*



```

Stager commands:
  stclear mt.vsn          Clear stage request
  stidle                  Idle staging
  strun                   Start staging

more (ctrl-f)

```

For more information on individual commands, see the full descriptions listed below:

- [stclear \(Clear a Stage Request\)](#)
- [stidle \(Stop Staging as Soon as Possible\)](#)
- [strun \(Start Staging\)](#)

## Help for Miscellaneous Commands

The fourteenth page of the help summarizes miscellaneous commands that can be entered at the `samu` command prompt:

```

Help information          page 14/15  samu          version time date

```

```

Miscellaneous commands:
  clear vsn [index]          Clear load request
  dtrace daemon[.variable] value Daemon trace controls
  fs [filesystem]           Select a filesystem name (ex samfs1)
  mount mountpoint          Select a mount point
  open eq                    Open device
  q                           Exit from samu
  refresh [interval]        Set display refresh interval in seconds
  read address               Read sector from device
  snap [filename]           Snapshot screen to file
  diskvols volume +flag | -flag Set or clear disk volume flags
  !shell-command            Run command in a shell

more (ctrl-f)

```

See the full descriptions for more information on the commands listed below:

- [clear \(Clear a Load Request for a Removable Storage Volume\)](#)
- [dtrace \(Enable/Configure Tracing for Oracle HSM Daemons\)](#)
- [open \(Open a Disk Storage Device for Reading\)](#)
- [refresh \(Set the Automatic Refresh Interval for the samu Display\)](#)
- [read \(Read Sectors On a Disk Storage Device\)](#)
- [snap \(Save a Snapshot of the Current Screen to a File\)](#)
- [diskvols \(Set/Clear Flags on Disk Volumes Used for Archiving\)](#)

## Help for Media Types

The fifteenth page of the help lists media type codes recognized by the `samu` interface:

```

Help information          page 15/15  samu          version time date

```

```

Media types:
  all All media types          tp  tape
  at  Sony AIT tape            sa  Sony Super AIT tape
  d2  Ampex DST310 (D2) tape
  d3  STK SD-3 tape
  dt  4mm digital tape (DAT)

```

|    |                                   |    |                          |
|----|-----------------------------------|----|--------------------------|
| fd | Fujitsu M8100 128track tape       |    |                          |
| i7 | IBM 3570 tape                     | ib | IBM 3590 tape            |
| li | IBM 3580, Seagate Viper 200 (LTO) | m2 | IBM 3592 tape            |
| lt | digital linear tape (DLT)         |    |                          |
| se | STK 9490 tape                     | sf | STK T9940 tape           |
| sg | STK 9840 tape                     | st | STK 3480 tape            |
| so | Sony DTF tape                     |    |                          |
| vt | Metrum VHS tape                   |    |                          |
| xm | Exabyte Mammoth-2 8mm tape        | xt | Exabyte 8mm tape         |
| od | optical                           |    |                          |
| mo | 5 1/4 in. erasable optical disk   |    |                          |
| wo | 5 1/4 in. WORM optical disk       | o2 | 12 in. WORM optical disk |

## hwm\_archive (Start Archiving When the High Water Mark is Reached)

When issued with an Oracle HSM family-set equipment ordinal number, the `hwm_archive` command configures the corresponding file system to start archiving automatically when the total size of the stored files passes the *high water mark*, the maximum space-utilization threshold specified for the file system. See [nohwm\\_archive \(Do Not Start Archiving at the High Water Mark\)](#).

### Command Synopsis

```
:hwm_archive equipment-number
```

### Examples

The following example configures disk family-set device 20 to automatically start archiving when the corresponding file-system is 80% full:

| File systems                   |    | samu  | version  | time        | date                       |
|--------------------------------|----|-------|--|-------------|----------------------------|
| ty                             | eq | state | device_name                                      | status      | high low mountpoint server |
| ma                             | 20 | on    | sam2   | -----2---r- | 80% 70% /sam/sam2          |
| mm                             | 21 | on    | /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0 |             |                            |
| mr                             | 22 | on    | /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0 |             |                            |
| mr                             | 23 | on    | /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0 |             |                            |
| :                              |    |       |  |             |                            |
| command: <b>hwm_archive 20</b> |    |       |  |             |                            |

## idle (Idle Device)

The `idle` command blocks new connections to the device specified by an Oracle HSM equipment ordinal number. Operations that are already in progress continue.

### Command Synopsis

```
:idle equipment-number
```

### Examples

The example below idles device 103:

|                       |      |         |      |      |
|-----------------------|------|---------|------|------|
| Device configuration: | samu | version | time | date |
|-----------------------|------|---------|------|------|

```

ty  eq  state  device_name                      fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/ libraryB_T10K_parms 100  libraryB
ti  101 on    /dev/rmt/0cbn                      100  libraryB
ti  102 on    /dev/rmt/1cbn                      100  libraryB
ti  103 on    /dev/rmt/2cbn                      100  libraryB
hy  104 on    historian                          104
:
command: idle 103

```

The device state changes to idle:

```

Device configuration:          samu              version time date

ty  eq  state  device_name                      fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/ libraryB_T10K_parms 100  libraryB
ti  101 on    /dev/rmt/0cbn                      100  libraryB
ti  102 on    /dev/rmt/1cbn                      100  libraryB
ti  103 idle  /dev/rmt/2cbn                      100  libraryB
hy  104 on    historian                          104

```

## import (Move Removable Media from the Mailbox into the Robotic Library)

When issued with the Oracle HSM equipment ordinal number of a robotic library, the **import** command tells the library to move media from the library's mailbox to the first available slot in the library.

See also [export \(Move Removable Media to the Robotic Library's Mailbox\)](#).

## Command Synopsis

```
:import equipment-number
```

## Examples

The following example below imports the contents of the mailbox in the robotic library with Oracle HSM equipment ordinal number 900:

```

Robot VSN catalog by slot : eq 900  samu              version time date
                                                count 32

slot    access    time count  use  flags          ty vsn
  0      2013/07/02 12:53   3 96% -il-o-b----f  li VOL001
  1      2013/07/02 12:53   2 98% -il-o-b----f  li VOL002
  2      2013/07/02 12:52   1 86% -il-o-b----f  li VOL003
  3      2013/07/02 12:52   1 95% -il-o-b----f  li VOL004
  4      2013/07/02 12:51   1 79% -il-o-b----f  li VOL005
  5      2013/07/02 12:45   0 14% -ilEo-b----f  li VOL006 MEDIA ERROR
...
:
command: import 900

```

## invalid (Set the Invalidate-Cache Delay for a Multi-Reader File System)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device that is mounted read-only in a single-writer/multi-reader file system, the

`invalid` command tells the readers of a single-writer/multi-reader file system to delay invalidating their file-system metadata caches for a specified number of seconds. When files are modified, the host waits the prescribed interval before checking the metadata server for updates.

---

**Caution:** Setting a non-zero delay value keeps stale file-system metadata cached, so the host may not have a consistent, current view of a read-only file system during the delay.

---

The specified number of seconds must fall in the range [0-60]. The default is 0 seconds.

## Command Synopsis

```
:invalid family-set-equipment-number interval_in_seconds
```

## Examples

The following example sets the cache invalidation delay to 30 seconds on family set device 900:

```
File systems          samu          version time date

ty   eq   state  device_name      status      high  low  mountpoint server
ma   900  on    qfs1             m---2--R-d  90%  70%  /qfs1
mm   901  on    /dev/dsk/c5t10d0s0
md   902  on    /dev/dsk/c5t10d0s1
md   903  on    /dev/dsk/c5t11d0s0
md   904  on    /dev/dsk/c5t11d0s1
:
command:invalid 900 30
```

## 1 (Display Utilization Information)

The `1` command opens the Usage information screen. The screen displays storage utilization statistics for the file systems and associated archival storage.

## Command Synopsis

```
1
:l
```

## Controls

**Ctrl-J (^j)**

Toggle between binary and decimal units of size.

## Examples

The following example shows a sample usage screen.

```
Usage information          samu          version time date
```

```

hostid = 0xID      OS name: SunOS      Architecture: SPARC      CPUs: 2 (2 online)
library  40:      capacity 389.3G bytes space 291.1G bytes, usage 25%
library  51:      capacity  9.5G bytes space  9.5G bytes, usage  0%
library  55:      capacity  0 bytes space  0 bytes, usage  0%
library  56:      capacity 10.7G bytes space 10.7G bytes, usage  0%
library totals:    capacity 409.5G bytes space 311.3G bytes, usage 24%

filesystem samfs3: capacity 54.5M bytes space 13.4M bytes, usage 75%
filesystem samfs4: capacity 319.5M bytes space 298.0M bytes, usage 7%
filesystem samfs7: capacity 96.6M bytes space 69.6M bytes, usage 28%
filesystem samfs6: capacity 5.0G bytes space 4.9G bytes, usage 3%
filesystem samfs8: capacity 5.0G bytes space 4.9G bytes, usage 2%
filesystem totals: capacity 10.5G bytes space 10.2G bytes, usage 3%

```

## lease\_timeo (Set the Unused Lease Timeout for a Shared File System)

When issued with the Oracle HSM equipment ordinal number of a shared disk family-set device and a number, the `lease_timeo` command configures the way in which the corresponding shared file system manages unused read, write, and append leases.

Specify a number in the range [0-15] to force processes to relinquish leases that remain unused for the specified number of seconds.

Specify the number -1 to disable unused lease timeouts and let processes hold unused leases for the full terms specified by [aplease \(Set Append Lease Expiration Time for a Shared File System\)](#), [rdlease \(Set the Read Lease Time for a Shared File System\)](#), and [wrlease \(Set the Write Lease Time for a Shared File System\)](#). The default is 0.

Note that read and write leases are not relinquished if [mh\\_write \(Turn on Multi-Host Read/Write\)](#) is enabled.

## Command Synopsis

```

:lease_timeo family-set-equipment-number 0-to-15-seconds
:lease_timeo family-set-equipment-number -1

```

## Examples

The following example sets the unused lease timeout for shared file system `shareqfs1` on family set device 800 to 5 seconds:

```

File systems                                     samu                                     version time date

ty eq state device_name                        status      high low mountpoint server
ma 800 on   shareqfs1                          m----2c--r- 80% 70% /shareqfs1
mm 801 on   /dev/dsk/c6t50020F2300004655d0s0
mr 802 on   /dev/dsk/c6t50020F2300004655d0s1
ma 810 on   shareqfs2                          m----2c--r- 80% 70% /shareqfs2
mm 811 on   /dev/dsk/c6t50020F2300004655d0s6
mr 812 on   /dev/dsk/c6t50020F2300004655d0s7
:
command:lease_timeo 800 5

```

# load (Load a Cartridge into a Drive)

The `load` command loads media into the drive specified by either an Oracle HSM equipment ordinal number and slot location or a specified Oracle HSM media type and volume serial number (VSN). Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

## Command Synopsis

```
:load equipment-number:slot[:side]
:load media-type.vsn
```

## Examples

The following example loads the LTO (1i) with volume serial number VOL001:

```
Device configuration:          samu          version time date

ty  eq state  device_name          fs  family_set
sk  100 on    /etc/opt/SUNWsamfs/SL8500_T10K_parms  100  SL8500
li  101 on    /dev/rmt/0cbn          100  SL8500
li  102 on    /dev/rmt/1cbn          100  SL8500
li  103 on    /dev/rmt/2cbn          100  SL8500
hy  104 on    historian              104
:
command:load li.VOL001
```

# m (Display the Mass Storage Status Screen)

The `m` command opens the Mass storage status screen. The screen displays the status of mounted file systems and their member drives.

## Command Synopsis

```
m
:m
```

## Controls

**ctrl-J (^j)**  
Toggle between binary and decimal units of size.

## Examples

In the following example, note that member drives are indented one space and appear directly below the file system to which they belong.

```
Mass storage status          samu          version time date

ty  eq  status      use state ord  capacity  free      ra part high low
ms  10  m----2----d  1% on      0   68.354G  68.343G  1M  16  90% 70%
  md   11           1% on      0   13.669G  13.666G
  md   12           1% on      1   13.669G  13.667G
  md   13           1% on      2   13.669G  13.667G
  md   14           1% on      3   13.674G  13.672G
```

```

mcd 15          1% on      4    13.674G  13.672G
ms   20  m----2----d  1% on          68.354G  68.344G  1M   16   90% 70%
mcd 21          1% on      0    13.669G  13.667G
mcd 22          1% on      1    13.669G  13.667G
mcd 23          1% on      2    13.669G  13.667G
mcd 24          1% on      3    13.674G  13.672G
mcd 25          1% on      4    13.674G  13.672G
ma   30  m----2----d  4% on          64.351G  61.917G  1M   16   90% 70%
mm   31          1% on      0     4.003G   3.988G [8363840 inodes]
mcd 32          4% on      1    64.351G  61.917G
ma   40  m----2----d  1% on          64.351G  64.333G  1M   16   90% 70%
mm   41          1% on      0     4.003G   3.997G [8382784 inodes]
mcd 42          1% on      1    64.351G  64.333G

```

## Field Descriptions

### ty

The `ty` field displays the Oracle HSM device type. Device-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

### eq

The `eq` field displays the user-assigned Oracle HSM equipment ordinal number for the mass storage device.

### status

The `status` field displays an eleven-character string in which each character position represents the value of a different file-system attribute. Character positions are numbered starting from the left, position 1, and ending at the right, position 11. The following table defines the possible state codes for each position in the status string.

| Position | Value       | Meaning  |
|----------|-------------|--|
| 1        | m-----      | A lowercase <code>m</code> in position 1 means that the file system is mounted.  |
| 1        | M-----      | An uppercase <code>M</code> in position 1 means that the file system is being mounted.   |
| 2        | -u-----     | A lowercase <code>u</code> in position 2 means that the file system is being unmounted.  |
| 3        | --A-----    | An uppercase <code>A</code> in position 3 means that data is being <i>archived</i> (copied to nearline or offline storage).                                  |
| 4        | ---R-----   | An uppercase <code>R</code> in position 4 means that previously archived data is being <i>released</i> from online disk storage to free space for new files. |
| 5        | ----S-----  | An uppercase <code>S</code> in position 5 means that previously released data is being <i>staged</i> (copied from archival media to online disk storage).    |
| 6        | -----1----- | The numeral <code>1</code> in position 6 means that this is a version-1 file system.   |
| 6        | -----2----- | The numeral <code>2</code> in position 6 means that this is a version-2 file system.   |
| 7        | -----c----- | A lowercase <code>c</code> in position 7 means that this is a shared file system.  |
| 8        | -----W---   | An uppercase <code>W</code> in position 8 means that this is a single-writer file system.  |
| 9        | -----R--    | An uppercase <code>R</code> in position 9 means that this is a multi-reader file system.   |
| 10       | -----r-     | A lowercase <code>r</code> in position 10 means that the file system stores data on single-allocation <code>mr</code> devices.                               |

| Position | Value  | Meaning  |
|----------|--------|--|
| 11       | -----d | A lowercase d in position 11 means that the file system stores data on dual-allocation md devices. |

**use**

The use field displays the percentage of disk space in use.

**state**

The state field displays the current operating state of the device:

- on means that the device is available.
- ro means that the device is available read-only.
- off means that the device is not available.
- down means that the device is available for maintenance only.
- idle means that the device is completing operations that are already in progress but is not accepting new connections.
- noalloc means that no more storage can be allocated on this device. An administrator has run the [noalloc \(Disable Storage Allocation on a Device\)](#) command. The noalloc state persists until an administrator issues an [alloc \(Enable Storage Allocation on a Device\)](#) command.

**ord**

The ord field displays the ordinal number of the device within the user-defined Oracle HSM family set (family sets represent the equipment associated with an Oracle HSM component, such as the group of disk devices associated with an Oracle HSM file system or the tape library associated with archiving).

**capacity**

The capacity field displays the number of 1024-byte blocks of usable space on the disk.

**free**

The free field displays the number of 1024-byte blocks of disk space available.

**ra**

The ra field displays the read-ahead size in kilobytes.

**part**

The part field displays the partial stage size in kilobytes.

**high**

The high field displays the high water mark for the file system. The high water mark is the percentage disk utilization at which Oracle HSM starts to delete files that have archive copies from disk, so that there is space for new files.

**low**

The low displays the low water mark for the file system. The low water mark is the percentage disk utilization at which Oracle HSM has freed enough space for new files and stops deleting archived files.



## maxallocsz (Set the Maximum Allocation Size for a Shared File System)

When issued with the Oracle HSM equipment ordinal number of a shared disk family-set device and a kilobyte value, the `maxallocsz` command sets maximum number of kilobytes that are allocated ahead of a write to the specified shared file system. See [minallocsz \(Set the Minimum Allocation Size for a Shared File System\)](#).

The specified allocation size must be a multiple of 8 kilobytes in the range [16-4194304]. The default value is 8 times the device allocation unit (DAU). See the discussion of the `-a` option on the `sammkfs` man page for additional information on DAUs.

### Command Synopsis

```
:maxallocsz family-set-equipment-number number_kilobytes
```

### Examples

The following example sets the maximum allocation to 1024 kilobytes on family set device 800:

```
File systems                                samu                                version time date

ty  eq  state  device_name                  status      high low  mountpoint server
ma 800  on    shareqfs1                    m----2c--r- 80% 70% /shareqfs1
mm 801  on    /dev/dsk/c6t50020F2300004655d0s0
mr 802  on    /dev/dsk/c6t50020F2300004655d0s1
ma 810  on    shareqfs2                    m----2c--r- 80% 70% /shareqfs2
mm 811  on    /dev/dsk/c6t50020F2300004655d0s6
mr 812  on    /dev/dsk/c6t50020F2300004655d0s7
:
command: maxallocsz 800 1024
```

## maxpartial (Set the Maximum Partial Release Size for the File System)

When issued with an Oracle HSM family-set equipment ordinal number and a number of kilobytes, the `maxpartial` command sets the maximum number of bytes from the start of a file that can be retained in disk cache when the file is released.

A large file that has been designated for partial release can open more quickly when restaged from archival media because the beginning of the file is already on disk when staging begins. For further information, see [partial \(Set the Default Partial Release Size for the File System\)](#), [partial\\_stage \(Set Partial Stage-Ahead Point for the File System\)](#), and the `release` man page.

The specified kilobyte value must be an integer in the range [8-2097152]. The default is 16 kilobytes.

### Command Synopsis

```
:maxpartial equipment-number number_of_kilobytes
```

### Examples

The following example configures disk family-set device 20 to allow retention of a maximum of 512 kilobytes on disk for each file designated for partial release:

```

File systems                                samu                                version time date

ty eq  state device_name                    status      high low mountpoint server
ma 20  on   sam2                          -----2---r- 80% 70% /sam1
mm 21  on   /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22  on   /dev/dsk/c0t600A0B800026E584000021864C4943AA0s0
mr 23  on   /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command: maxpartial 20 512

```

## meta\_timeo (Set the Metadata Cache Timeout for a Shared File System)

When issued with the Oracle HSM equipment ordinal number of a shared disk family-set device and a number of seconds, the `meta_timeo` command sets the maximum metadata cache age for the specified device to the value supplied. Hosts use cached file-system attributes and directory data for the specified number of seconds, then refresh the cache by checking with the metadata server (MDS).

The default caching interval is 3 seconds. An interval of 0 disables metadata caching.

### Command Synopsis

```
:meta_timeo family-set-equipment-number interval_in_seconds
```

### Examples

The following example sets the cache interval on family set device 800 to 0 seconds, so that the host checks metadata consistency with the MDS prior to each use of the file system:

```

File systems                                samu                                version time date

ty eq  state device_name                    status      high low mountpoint server
ma 800 on   shareqfs1                      m----2c--r- 80% 70% /shareqfs1
mm 801 on   /dev/dsk/c6t50020F2300004655d0s0
mr 802 on   /dev/dsk/c6t50020F2300004655d0s1
ma 810 on   shareqfs2                      m----2c--r- 80% 70% /shareqfs2
mm 811 on   /dev/dsk/c6t50020F2300004655d0s6
mr 812 on   /dev/dsk/c6t50020F2300004655d0s7
:
command: meta_timeo 800 0

```

## mh\_write (Turn on Multi-Host Read/Write)

When issued with the Oracle HSM equipment ordinal number of a shared disk family-set device, the `mh_write` command enables simultaneous reads and writes to the same file from multiple hosts.

By default, shared Oracle HSM file systems allow simultaneous reads from multiple hosts but not writes. To reverse the effects of the `mh_write` command, use [nomh\\_write \(Turn Off Multi-Host Read/Write\)](#).

### Command Synopsis

```
:mh_write family-set-equipment-number
```

## Examples

The following example enables multi-host reads on family set device 800:

```
File systems          samu          version time date

ty  eq  state  device_name          status      high low  mountpoint server
ma  800  on    shareqfs1          m---2c--r-  80% 70%  /shareqfs1
mm  801  on    /dev/dsk/c6t50020F2300004655d0s0
mr  802  on    /dev/dsk/c6t50020F2300004655d0s1
ma  810  on    shareqfs2          m---2c--r-  80% 70%  /shareqfs2
mm  811  on    /dev/dsk/c6t50020F2300004655d0s6
mr  812  on    /dev/dsk/c6t50020F2300004655d0s7
:
command: mh_write 800
```

## min\_pool (Set the Minimum Number of Shared File System Threads)

The number of execution threads associated with a shared file system grows and shrinks dynamically based on load. The `min_pool` command sets a minimum number of shared file system threads that the system must maintain.

For the number of threads, specify an integer in the range [8-2048]. For Solaris systems, the default is 64 threads. For Linux clients, the default is 8 threads.

## Command Synopsis

```
:min_pool family-set-equipment-number number_of_threads
```

## Examples

The following example sets the minimum number of threads to 128 on family set device 800:

```
File systems          samu          version time date

ty  eq  state  device_name          status      high low  mountpoint server
ma  800  on    shareqfs1          m---2c--r-  80% 70%  /shareqfs1
mm  801  on    /dev/dsk/c6t50020F2300004655d0s0
mr  802  on    /dev/dsk/c6t50020F2300004655d0s1
ma  810  on    shareqfs2          m---2c--r-  80% 70%  /shareqfs2
mm  811  on    /dev/dsk/c6t50020F2300004655d0s6
mr  812  on    /dev/dsk/c6t50020F2300004655d0s7
:
command: min_pool 800 128
```

## minallocsz (Set the Minimum Allocation Size for a Shared File System)

When issued with the Oracle HSM equipment ordinal number of a shared disk family-set device and a kilobyte value, the `minallocsz` command sets minimum number of kilobytes that are allocated ahead of a write to the specified shared file system. See [maxallocsz \(Set the Maximum Allocation Size for a Shared File System\)](#).

The specified allocation size must be a multiple of 8 kilobytes in the range [16-4194304]. The default value is 8 times the device allocation unit (DAU). See the discussion of the `-a` option on the `sammkfs` man page for additional information on DAUs.

## Command Synopsis

```
:minallocsz family-set-equipment-number number_kilobytes
```

## Examples

The following example sets the minimum allocation to 512 kilobytes on family set device 800:

```
File systems          samu          version time date

ty  eq  state  device_name          status      high low  mountpoint server
ma  800  on    shareqfs1                m----2c--r-  80% 70%  /shareqfs1
mm  801  on    /dev/dsk/c6t50020F2300004655d0s0
mr  802  on    /dev/dsk/c6t50020F2300004655d0s1
ma  810  on    shareqfs2                m----2c--r-  80% 70%  /shareqfs2
mm  811  on    /dev/dsk/c6t50020F2300004655d0s6
mr  812  on    /dev/dsk/c6t50020F2300004655d0s7
:
command:minallocsz 800 512
```

## mm\_stripe (Set the Metadata Stripe Width)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and a number of disk allocation units (DAUs) per stripe, the `mm_stripe` command configures the corresponding file system to write the specified number of 16-kilobyte disk allocation units (DAUs) to each logical unit number (LUN) that is available for metadata storage.

The default value, 1 DAU, writes one DAU of metadata to one LUN before switching to another LUN. A 0 (zero) value disables striping and writes metadata DAUs to metadata LUNs round-robin.

See also [stripe \(Set the Stripe Width for a File System\)](#) and the `mount_samfs` man page.

## Command Synopsis

```
:mm_stripe family-set-equipment-number number_DAUs
```

## Examples

The following example disables metadata striping on family set device 10:

```
File systems          samu          version time date

ty  eq  state  device_name          status      high low  mountpoint server
ma  10  on    sam2                -----2---r-  80% 70%  /sam2          /server3
mm  11  on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  12  on    /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr  13  on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
```

```
:
command:mm_stripe 20 0
```

## n (Display the Staging Status Screen)

The `n` command opens the `Staging status` screen. The screen displays the status of the stager and a list of outstanding stage requests.

When issued without a parameter, the `n` command displays staging status for all media types. When the command is issued with an Oracle HSM media-type identifier, the command displays status for the specified media type only. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

## Command Synopsis

```
n
:n mediatype
```

## Controls

**Ctrl-B (^b)**  
Move back one page.

**Ctrl-F (^f)**  
Move forward one page.

**Ctrl-D (^d)**  
Move down the page.

**Ctrl-U (^u)**  
Move up the page.

## Example

The following example shows the staging status screen.

```
Staging status                samu                version time date

Log output to: /var/opt/SUNWsamfs/stager/log

Stage request: li.VOL001
Loading VSN VOL001

Staging queues
ty pid  user      status  wait files  vsn
li 16097 root      active  0:00   12  VOL001
```

## noabr (Disable Application Based Recovery)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `noabr` command does not let Oracle Real Application Clusters (RAC) use the Application Based Recovery feature of Solaris Volume Manager to handle recovery of databases stored in Oracle HSM file systems that use asynchronous I/O with Solaris Volume Manager mirrored volumes.

By default, ABR is enabled. See [abr \(Enable Application Based Recovery\)](#).

## Command Synopsis

```
:noabr family-set-equipment-number
```

## Examples

The following example disables ABR on family-set device 20:

```
File systems                                samu                                version time date

ty eq state device_name                    status      high low mountpoint server
ma 20 on   sam2          -----2---r-    80%    70%  /sam2
mm 21 on   /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22 on   /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr 23 on   /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma 10 on   sam1          m----2---r-    80%    70%  /sam1
mm 11 on   /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr 12 on   /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr 13 on   /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr 14 on   /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr 15 on   /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
:
command: noabr 20
```

## noalloc (Disable Storage Allocation on a Device)

When issued with an Oracle HSM equipment ordinal number, the noalloc command stops storage allocation on the specified data device until an administrator issues an [alloc \(Enable Storage Allocation on a Device\)](#) command.

## Command Synopsis

```
:noalloc equipment-number
```

## Examples

The following example stops storage allocation on disk device 14:

```
File systems                                samu                                version time date

ty eq state device_name                    status      high low mountpoint server
ma 20 on   sam2          -----2---r-    80%    70%  /sam/sam2  server4
mm 21 on   /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22 on   /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr 23 on   /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma 10 on   sam1          m----2---r-    80%    70%  /sam/sam1  server4
mm 11 on   /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr 12 on   /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr 13 on   /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr 14 on   /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr 15 on   /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
:
command: noalloc 14
```

The device state changes to noalloc:

```
File systems                                samu                                version time date

ty  eq  state  device_name                    status      high low  mountpoint server
ma  20  on    sam2                        -----2---r-  80% 70%  /sam/sam2  server4
mm  21  on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  22  on    /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr  23  on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma  10  on    sam1                        m----2---r-  80% 70%  /sam/sam1  server4
mm  11  on    /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr  12  on    /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr  13  on    /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr  14  noalloc /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr  15  on    /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
```

## noatime (Disable Access Time Updates for a File System)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `noatime` command disables updates to the access time attribute on the corresponding file system. It is equivalent to the command `atime -1`. See [atime \(Configure Access Time Updates for a File System\)](#).

Never use the `noatime` command with an archiving, Oracle HSM file system.

## nodio\_szero (Do Not Zero Uninitialized Areas of Sparse Files with Direct I/O)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `nodio_szero` command makes direct I/O to the specified device skip the zeroing of uninitialized areas. This improves performance when writing sparse files directly.

The default is `nodio_szero`.

For further information, see [dio\\_szero \(Zero Uninitialized Areas of Sparse Files During Direct I/O\)](#).

## Command Synopsis

```
:nodio_szero family-set-equipment-number
```

## Examples

The following example disables the zeroing of sparse files on family set device 100:

```
Mass storage status                                samu                                version time date

ty  eq  status  use  state  ord  capacity  free ra  part high low
ma  100  m----2---r-  1%  on      7.270T  7.270T 1M  16    80% 70%
mm  110      1%  on      0  465.253G  465.231G [975661056 inodes]
mr  120      1%  on      1  1.817T  1.817T
mr  130      1%  on      2  1.817T  1.817T
mr  140      1%  on      3  1.817T  1.817T
mr  150      1%  on      4  1.817T  1.817T
:
command:nodio_szero 100
```

## nodmr (Disable Directed Mirror Reads of Software Mirrors)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `dmr` command does not let Oracle Real Application Clusters (RAC) use the Directed Mirror Reads feature of Solaris Volume Manager when databases are stored on Oracle HSM file systems that use asynchronous I/O with Solaris Volume Manager mirrored volumes. See [dmr \(Enable Directed Mirror Reads of Software Mirrors\)](#).

By default, DMR is enabled.

### Command Synopsis

```
:nodmr family-set-equipment-number
```

### Examples

The following example disables DMR on family-set device 20:

```
File systems          samu          version time date

ty eq state  device_name  status      high  low  mountpoint  server
ma 20 on    sam2        -----2---r- 80%   70%  /sam2
mm 21 on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22 on    /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr 23 on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
ma 10 on    sam1          m----2---r- 80%   70%  /sam1
mm 11 on    /dev/dsk/c0t600A0B8000118ACA000009594E1565E8d0s0
mr 12 on    /dev/dsk/c0t600A0B8000114D5400000CA64E156793d0s0
mr 13 on    /dev/dsk/c0t600A0B8000114D5400000CAA4E156897d0s0
mr 14 on    /dev/dsk/c0t600A0B8000118ACA0000095B4E1568C8d0s0
mr 15 on    /dev/dsk/c0t600A0B8000118ACA0000095D4E156948d0s0
:
command: nodmr 20
```

## noforcedirectio (Do Not Use Direct I/O by Default)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `noforcedirectio` command restores the usual default I/O method, [Direct I/O](#), on the specified device.

For more information, see ["Understanding I/O Performance Tuning Objectives and Options"](#) on page 2-2, the [forcedirectio \(Use Direct I/O by Default\)](#) command, and the `directio`, `setfa`, `sam_setfa`, and `sam_advise` man pages.

### Command Synopsis

```
:noforcedirectio family-set-equipment-number
```

### Examples

The following example restores the default, paged I/O, on family set device 100:

```
Mass storage status          samu          version time date
```



```

ty eq status use state ord capacity free ra part high low
ma 100 m----2---r- 1% on 7.270T 7.270T 1M 16 80% 70%
mm 110 1% on 0 465.253G 465.231G [975661056 inodes]
mr 120 1% on 1 1.817T 1.817T
mr 130 1% on 2 1.817T 1.817T
mr 140 1% on 3 1.817T 1.817T
mr 150 1% on 4 1.817T 1.817T
:
command: noforcedirectio 100

```

## noforce\_nfs\_async (Do Not Force Asynchronous NFS)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `noforce_nfs_async` command causes the specified device to write NFS (Network File System) data through to disk unless NFS has requested that the data be cached.

### Command Synopsis

```
:noforce_nfs_async family-set-equipment-number
```

### Examples

The following example sets `noforce_nfs_async` on family set 100:

```

Mass storage status samu version time date

ty eq status use state ord capacity free ra part high low
ma 100 m----2---r- 1% on 7.270T 7.270T 1M 16 80% 70%
mm 110 1% on 0 465.253G 465.231G [975661056 inodes]
mr 120 1% on 1 1.817T 1.817T
mr 130 1% on 2 1.817T 1.817T
mr 140 1% on 3 1.817T 1.817T
mr 150 1% on 4 1.817T 1.817T
:
command: noforce_nfs_async 100

```

## nohwm\_archive (Do Not Start Archiving at the High Water Mark)

When issued with an Oracle HSM family-set equipment ordinal number, the `nohwm_archive` command configures the corresponding file system so that it does not start archiving automatically when the total size of the stored files passes the *high water mark*, the maximum space-utilization threshold specified for the file system. See [maxpartial \(Set the Maximum Partial Release Size for the File System\)](#).

### Command Synopsis

```
:nohwm_archive equipment-number
```

### Examples

The following example configures disk family-set device 20 so that it does not automatically start archiving when the corresponding file-system is 80% full:

```

File systems                                samu                                version time date

ty  eq  state  device_name  status      high  low  mountpoint  server
ma  20  on    sam2          -----2---r-  80%   70%  /sam2
mm  21  on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  22  on    /dev/dsk/c0t600A0B800026E584000021864C4943AA0s0
mr  23  on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command:nomh_write 20

```

## nomh\_write (Turn Off Multi-Host Read/Write)

When issued with the Oracle HSM equipment ordinal number of a shared disk family-set device, the `nomh_write` command disables simultaneous reads and writes to the same file from multiple hosts and restores the default setting for the specified device.

By default, shared Oracle HSM file systems allow simultaneous reads from multiple hosts but not writes. Use `nomh_write` to restore the default after running [mh\\_write \(Turn on Multi-Host Read/Write\)](#).

## Command Synopsis

```
:nomh_write family-set-equipment-number
```

## Examples

The following example disables multi-host reads on family set device 800:

```

File systems                                samu                                version time date

ty  eq  state  device_name  status      high low mountpoint server
ma  800 on  shareqfs1  m----2c--r-  80%  70% /shareqfs1
mm  801 on  /dev/dsk/c6t50020F2300004655d0s0
mr  802 on  /dev/dsk/c6t50020F2300004655d0s1
ma  810 on  shareqfs2  m----2c--r-  80%  70% /shareqfs2
mm  811 on  /dev/dsk/c6t50020F2300004655d0s6
mr  812 on  /dev/dsk/c6t50020F2300004655d0s7
:
command:mh_write 800

```

## norefresh\_at\_eof (Do Not Refresh at EOF in a Multi-Reader File System)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device that is mounted read-only in a single-writer/multi-reader file system, the `norefresh_at_eof` command disables automatic updates of the file size attribute when the read buffer exceeds the end of file. See [refresh\\_at\\_eof \(Refresh at EOF in a Multi-Reader File System\)](#).

## Command Synopsis

```
:norefresh_at_eof family-set-equipment-number interval_in_seconds
```

## Examples

The following example disables automatic refresh of the file size attribute on family set device 900:

```
File systems                                samu                                version time date

ty  eq  state  device_name                    status          high  low  mountpoint server
ma  900  on    qfs1                        m---2--R-d      90%  70%  /qfs1
mm  901  on    /dev/dsk/c5t10d0s0
md  902  on    /dev/dsk/c5t10d0s1
md  903  on    /dev/dsk/c5t11d0s0
md  904  on    /dev/dsk/c5t11d0s1
:
command: norefresh_at_eof 900
```

## noqwrite (Disable Simultaneous Reads/Writes from Different Threads)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `noqwrite` command disables simultaneous read and write operations to a single file from different threads. One writer has exclusive access to the file and other writers and readers must wait for the file to be released, per the UNIX standard.

While simultaneous multi-thread reads and writes to a single file can be useful in database applications (see [qwrite \(Enable Simultaneous Reads/Writes to a File from Different Threads\)](#), this capability is not generally useful or desirable. So `noqwrite` is the default setting.

## Command Synopsis

```
:noqwrite family-set-equipment-number
```

## Examples

The following example disables simultaneous read and write operations to a single file on family set device 100:

```
File systems                                samu                                version time date

ty  eq  state  device_name                    status          high  low  mountpoint server
ma  100  on    qfs1                        m---2--R-d      90%  70%  /qfs1
mm  101  on    /dev/dsk/c5t10d0s0
md  102  on    /dev/dsk/c5t10d0s1
md  103  on    /dev/dsk/c5t11d0s0
md  104  on    /dev/dsk/c5t11d0s1
:
command: noqwrite 100
```

## nosuid (Mount a File System with setuid Execution Disabled)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `nosuid` command mounts the file system with the `setuid` file attribute disabled. The `setuid` attribute (*set user ID upon execution*) lets file system users run executables with the temporarily elevated permissions that may be required when using the files.

See [suid \(Mount a File System with setuid Execution Enabled\)](#) and the mount man page for further information.

The default is suid, mount the file system with the setuid attribute enabled.

Command Synopsis

```
:nosuid family-set-equipment-number
```

Examples

The following example mounts the file system on family set device 100 with the setuid attribute disabled:

```
File systems                                samu                                version time date

ty eq  state  device_name      status      high  low  mountpoint server
ma 100  on    qfs1              m----2--R-d  90%  70%  /qfs1
mm 101  on    /dev/dsk/c5t10d0s0
md 102  on    /dev/dsk/c5t10d0s1
md 103  on    /dev/dsk/c5t11d0s0
md 104  on    /dev/dsk/c5t11d0s1
:
command: nosuid 100
```

nosw\_raid (Turn Off Software RAID Mode)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the nosw\_raid command disables software RAID mode on the specified device and restores the Oracle HSM default.

Command Synopsis

```
:nosw_raid family-set-equipment-number
```

Examples

The following example disables software-RAID mode for family set device 100:

```
Mass storage status                        samu                                version time date

ty eq  status      use  state  ord  capacity  free  ra  part high low
ma 100 m----2---r-  1%  on    0    7.270T    7.270T  1M  16   80% 70%
mm 110              1%  on    0    465.253G  465.231G [975661056 inodes]
mr 120              1%  on    1     1.817T    1.817T
mr 130              1%  on    2     1.817T    1.817T
mr 140              1%  on    3     1.817T    1.817T
mr 150              1%  on    4     1.817T    1.817T
:
command:nosw_raid 100
```

## notrace (Disable File System Tracing)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `notrace` command disables tracing for the corresponding file system.

The default is `trace` (enabled).

For more information about file system tracing, see "[trace \(Enable File System Tracing\)](#)" and the `defaults.conf` man page.

## Command Synopsis

```
:no
trace family-set-equipment-number
```

## Examples

The following example disables tracing for the file system on family set device 100:

```
File systems          samu          version time date

ty  eq  state  device_name      status      high  low  mountpoint server
ma  100  on    qfs1          m---2--R-d   90%  70%  /qfs1
mm  101  on    /dev/dsk/c5t10d0s0
md  102  on    /dev/dsk/c5t10d0s1
md  103  on    /dev/dsk/c5t11d0s0
md  104  on    /dev/dsk/c5t11d0s1
:
command: notrace 100
```

## o (Display the Optical Disk Status Screen)

The `o` command opens the `Optical disk status` screen. The screen displays the status of all optical disk drives configured within the environment.

## Command Synopsis

```
o
:o
```

## Controls

### Ctrl-K (^k)

Select (manual, automated library, both, priority)

### Ctrl-B (^b)

Move back one page.

### Ctrl-F (^f)

Move forward one page.

### Ctrl-D (^d)

Move down the page.

### Ctrl-U (^u)

Move up the page.

## Examples

The following example shows the optical disc drive status display.

```
Optical disk status          samu          version time date

ty  eq  status      act use  state  vsn
mo 35  --l---wo-r  1   29%  ready  OPD004
```

## Field Descriptions

The following table shows the field descriptions for this display.

### ty

The **ty** field displays the Oracle HSM media type. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

### eq

The **eq** field displays the user-assigned Oracle HSM equipment ordinal number of the optical disc drive.

### status

The **status** field displays a ten-character string in which each character position represents the value of a different removable-media device attribute. Character positions are numbered starting from the left, position 1, and ending at the right, position 10. The following table defines the possible state codes for each position in the status string.

| Position | Value      | Meaning  |
|----------|------------|--|
| 1        | s-----     | A lowercase <b>s</b> in position 1 means that media is being scanned.  |
| 1        | m-----     | A lowercase <b>m</b> in position 1 means that the automated library is operational.  |
| 1        | M-----     | An uppercase <b>M</b> in position 1 means that the device is in maintenance mode.  |
| 2        | -E-----    | An uppercase <b>E</b> in position 2 means that the device encountered an unrecoverable error during scanning.  |
| 2        | -a-----    | A lowercase <b>a</b> in position 2 means that the device is in audit mode.   |
| 3        | --l-----   | A lowercase <b>l</b> in position 3 means that media has a label.   |
| 3        | --L-----   | An uppercase <b>L</b> in position 3 means that the media is being labeled  |
| 3        | --N-----   | An uppercase <b>N</b> in position 3 means that the media is foreign (not part of the Oracle HSM archive).  |
| 4        | ---I-----  | An uppercase <b>I</b> in position 4 means that the device is idle and not available for new connections. But operations already in progress are continuing until completion. |
| 4        | ---A-----  | An uppercase <b>A</b> in position 4 means that the device needs operator attention.  |
| 5        | ----C----- | An uppercase <b>C</b> in position 5 means that the device needs cleaning.  |
| 5        | ----U----- | An uppercase <b>U</b> in position 5 means that an unload has been requested.   |

| Position | Value      | Meaning  |
|----------|------------|--|
| 6        | -----R---- | An uppercase R in position 6 means that the device is reserved.  |
| 7        | -----w---  | A lowercase w in position 7 means that a process is writing to the media.  |
| 8        | -----o--   | A lowercase o in position 8 means that the device is open.   |
| 9        | -----P-    | An uppercase P in position 9 means that the device is positioning a tape volume.   |
| 9        | -----F-    | For a tape library, an uppercase F in position 9 means that all storage slots are occupied.<br>For a drive, an uppercase F in position 9 means that the currently mounted removable media is full. |
| 10       | -----R     | An uppercase R in position 10 means that the device is ready and the media is read-only.   |
| 10       | -----r     | A lowercase r in position 10 means that the device is spun up and ready.   |
| 10       | -----p     | A lowercase p in position 10 means that the device is present.   |
| 10       | -----W     | An uppercase W in position 10 means that the device is write protected.  |

**act**

The `act` field displays the activity count.

**use**

The `use` field displays the percentage of cartridge space used.

**state**

The `state` field displays the current operating state of the optical disc drive:

- `ready` means that the device is on and media are loaded.
- `notrdy` means that the device is on, but media are not loaded.
- `idle` means that the device is completing operations that are already in progress but is not accepting new connections.
- `off` The device is not available.
- `down` means that the device is available for maintenance only.

**vsn**

The `vsn` field displays either the volume serial number assigned to the media volume or the keyword `nolabel` if the volume is not labeled.

## off (Turn Off A Device)

The `off` command sets the device specified by an Oracle HSM equipment ordinal number offline. All operations stop.

## Command Synopsis

```
:off equipment-number
```

## Examples

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk  100  on    /etc/opt/SUNWsamfs/SL8500_T10K_parms  100  libraryA
ti  101  on    /dev/rmt/0cbn          100  libraryA
ti  102  on    /dev/rmt/1cbn          100  libraryA
ti  103 on    /dev/rmt/2cbn          100  libraryA
hy  104  on    historian                104
:
command:off 103
```

The device state changes to off:

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk  100  on    /etc/opt/SUNWsamfs/SL8500_T10K_parms  100  libraryA
ti  101  on    /dev/rmt/0cbn          100  libraryA
ti  102  on    /dev/rmt/1cbn          100  libraryA
ti  103 off   /dev/rmt/2cbn          100  libraryA
hy  104  on    historian                104
```

## on (Turn On A Device)

When issued with the Oracle HSM equipment ordinal number of a device, the **on** command brings the device specified by an Oracle HSM equipment ordinal number online.

## Command Synopsis

```
:on equipment-number
```

## Examples

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk  100  on    /etc/opt/SUNWsamfs/SL8500_T10K_parms  100  libraryA
ti  101  on    /dev/rmt/0cbn          100  libraryA
ti  102  on    /dev/rmt/1cbn          100  libraryA
ti  103 off   /dev/rmt/2cbn          100  libraryA
hy  104  on    historian                104
:
command:on 103
```

The device state changes to on:

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk  100  on    /etc/opt/SUNWsamfs/SL8500_T10K_parms  100  libraryA
ti  101  on    /dev/rmt/0cbn          100  libraryA
ti  102  on    /dev/rmt/1cbn          100  libraryA
ti  103 on    /dev/rmt/2cbn          100  libraryA
hy  104  on    historian                104
```



## open (Open a Disk Storage Device for Reading)

When issued with the Oracle HSM equipment ordinal number of a disk device, the `open` command opens the device for the [read \(Read Sectors On a Disk Storage Device\)](#) command.

### Command Synopsis

```
:open equipment-number
```

### Examples

The following example opens device 23:

```
File systems          samu          version time date

ty    eq    state  device_name    status    high low mountpoint server
ma    20    on    sam2          -----2---r-  80% 70% /sam/sam2
mm    21    on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr    22    on    /dev/dsk/c0t600A0B800026E584000021864C4943AA0s0
mr    23    on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command:open 23
```

The screen switches to displaying disk sectors, starting at sector 0:

```
Sector:  00000000 (0)    raw    samu          version time date

00000000 00000000 00000000 00000000 00000000 .....
00000010 00000000 00000000 00000000 00000000 .....
00000020 00000000 00000000 00000000 00000000 .....
00000030 00000000 00000000 00000000 00000000 .....
00000040 00000000 00000000 00000000 00000000 .....
00000050 00000000 00000000 00000000 00000000 .....
00000060 00000000 00000000 00000000 00000000 .....
00000070 00000000 00000000 00000000 00000000 .....
...
```

## p (Display the Removable Media Load Requests Screen)

The `p` command opens the Removable media load requests screen. The screen displays information about pending load requests for removable media. Four different screen formats are available:

- Both manual and automated library requests sorted by user
- Both manual and automated library requests sorted by priority.
- Manual requests only
- Automated library requests only.

When issued without a parameter, the `p` command displays load requests for all media. When the command is issued with an Oracle HSM media-type identifier, the command displays load requests for the specified media type only. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

## Command Synopsis

```
p
:p mediatype
```

## Controls

You can use the following control keys on this screen:

**Ctrl-K (^k)**

Toggle between the different display formats.

**Ctrl-B (^b)**

Move back one page.

**Ctrl-F (^f)**

Move forward one page.

**Ctrl-D (^d)**

Move down the page.

**Ctrl-U (^u)**

Move up the page.

## Examples

The following example shows the removable media load requests display.

```
Removable media load requests all both      samu          version time date
count: 1

index type pid   user    rb  flags  wait count vsn
      0 li  15533 root    150 W--f--- 0:00      VOL002
```

## Field Descriptions

**index**

The `index` field displays the corresponding request's position in the preview table.

**type**

The `type` field displays the media type code assigned to the removable media.

**pid**

The `pid` field displays the UNIX process identifier. A process identifier of 1 indicates NFS access.

**user**

The `user` field displays the name assigned to the user requesting the load.

**priority**

The `priority` field displays the degree to which the request may take precedence over other requests.

**rb**

The `rb` field displays the user-assigned equipment ordinal number of the automated library in which the requested VSN resides.

**flags**

The `flags` field displays a seven-character strings in which each character position represents the value of a property of the request. Character positions are numbered starting from the left, position 1, and ending at the right, position 7. The following table defines the possible flag codes for each position in the status string.

| Position | Flag    | Meaning  |
|----------|---------|--|
| 1        | W-----  | An uppercase W in position 1 means that write access has been requested.                               |
| 2        | -b----- | A lowercase b in position 2 means that the request is busy.  |
| 3        | --C---- | An uppercase C in position 3 means that the request for the VSN has been cleared.                      |
| 4        | ---f--- | A lowercase f in position 4 means that file-system access has been requested.                          |
| 5        | ----N-- | An uppercase N in position 5 means that the requested media is foreign to the Oracle HSM file system.  |
| 6        | -----S- | An uppercase S in position 6 means that the flip side of a two-sided optical-media volume is mounted.  |
| 7        | -----s  | A lowercase s in position 7 means that a file is to be staged from removable media to the file system. |

**wait**

The `wait` field displays the elapsed time since the mount request was received.

**count**

The `count` field displays the number of requests for this VSN, if a file is being staged.

**vsn**

The `vsn` field displays the volume serial name of the removable media volume.

## partial (Set the Default Partial Release Size for the File System)

When issued with an Oracle HSM family-set equipment ordinal number and a number of kilobytes, the `partial` command sets the default number of bytes from the start of a file that can be retained in disk cache when the file is released.

A large file that has been designated for partial release can open more quickly when restaged from archival media because the beginning of the file is already on disk when staging begins. Users can override the default on a file-by-file basis by specifying a size when marking a file for partial release. For further information, see [maxpartial \(Set the Maximum Partial Release Size for the File System\)](#), [partial\\_stage \(Set Partial Stage-Ahead Point for the File System\)](#), and the `release` man page.

The specified kilobyte value must be an integer in the range `[8-maximumpartial]`, where `maximumpartial` is the value set by the `maxpartial` command. The default is 16 kilobytes.

## Command Synopsis

```
:partial equipment-number number_of_kilobytes
```

## Examples

The following example configures disk family-set device 20 to retain 256 kilobytes on disk for each file designated for partial release:

```
File systems                                samu                                version time date

ty  eq state  device_name  status          high  low  mountpoint  server
ma  20 on     sam2        -----2---r-   80%   70%  /sam2
mm  21 on     /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  22 on     /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr  23 on     /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command:partial 20 256
```

## partial\_stage (Set Partial Stage-Ahead Point for the File System)

When issued with an Oracle HSM family-set equipment ordinal number and a number of kilobytes, the `partial_stage` command defines a file offset beyond which a file designated for partial release is staged to disk in its entirety rather than in part.

Partially staging a large file can give users access to data more quickly because the file can open before it is fully staged from archival media to the disk cache. But, once enough data is in cache to start opening the file, there is no further advantage to partial staging. For further information, see [maxpartial \(Set the Maximum Partial Release Size for the File System\)](#), [partial \(Set the Default Partial Release Size for the File System\)](#), and the `release` man page.

The specified kilobyte value must be an integer in the range `[8-maximumpartial]`, where `maximumpartial` is the value set by the `maxpartial` command. The default is the value set by the `partial` command.

## Command Synopsis

```
:partial_stage equipment-number number_of_kilobytes
```

## Examples

The following example sets the partial stage-ahead point for disk family-set device 20 to 5124 kilobytes (5 megabytes):

```
File systems                                samu                                version time date

ty  eq state  device_name  status          high  low  mountpoint  server
ma  20 on     sam2        -----2---r-   80%   70%  /sam2
mm  21 on     /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  22 on     /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr  23 on     /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command:partial_stage 20 5124
```

## priority (Set Priority in Load-Request Preview Queue)

When issued with the process identifier (`pid`) of a load request and an integer value, the `priority` command moves the load request to the specified position in the list of waiting jobs.

Specify the pid for one of the load requests listed by the [p \(Display the Removable Media Load Requests Screen\)](#) command. Specify the desired priority as an integer, with 0 (zero) being first in line (the highest priority).

## Command Synopsis

```
:priority pid priority
```

## Examples

The following example gives the load request with pid 17708 (for volume VOL202) a priority of 0:

```
Removable media load requests all both      samu              version time date
count: 4

index  type pid    user  rb  flags    wait count  vsn
  0  li   13850   root  900  W--f---   0:42      VOL002
  1  li   15533   root  900  ---f---   0:28      VOL001
  2  li   17708   root  900  ---f---   0:28      VOL202
  3  li   19937   root  900  ---f---   0:05      VOL015

:
command:priority 17708 0
```

With its new priority, pid 17708 moves from third in the queue (index 2) to first (index 0):

```
index  type pid    user  rb  flags    wait count  vsn
  0  li   17708   root  900  ---f---   0:28      VOL202
  1  li   15533   root  900  ---f---   0:28      VOL001
  2  li   15533   root  900  ---f---   0:28      VOL001
  3  li   19937   root  900  ---f---   0:05      VOL015
```

## qwrite (Enable Simultaneous Reads/Writes to a File from Different Threads)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the qwrite command enables simultaneous read and write operations to a single file from different threads.

In databases and other applications that handle multiple simultaneous transactions to the same file, simultaneous reads and writes improve I/O performance by queuing multiple requests at the drive level.

The default is [noqwrite \(Disable Simultaneous Reads/Writes from Different Threads\)](#).

## Command Synopsis

```
:qwrite family-set-equipment-number
```

## Examples

The following example enables simultaneous read and write operations to a single file on family set device 100:

```
File systems              samu              version time date
```

```
ty  eq  state  device_name      status      high low  mountpoint server
ma 100  on    qfs1             m----2----d  90% 70%  /qfs1
mm 101  on    /dev/dsk/c5t10d0s0
md 102  on    /dev/dsk/c5t10d0s1
md 103  on    /dev/dsk/c5t11d0s0
md 104  on    /dev/dsk/c5t11d0s1
:
command: qwrite 100
```

r (Display the Removable Media Status Screen)

The `r` command opens the Removable media status screen. The screen displays the activity on removable media devices such as tape drives. You can monitor either a specific type of device or a family of devices such as all tape devices.

When issued without a parameter, the `r` command displays the status for all removable media devices. When the command is issued with an Oracle HSM media type identifier, the command displays the status of the specified media type only. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

Command Synopsis

```
r
:r mediatype
```

Examples

The following example shows the removable media status display.

```
Removable media status: all          samu          version time date

ty  eq  status      act use state  vsn
li 150 --1-----r   0 63% ready  VOL004
```

Field Descriptions

The following table shows the field descriptions for this display.

**ty**  
The `ty` field displays Oracle HSM media type. Device-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

**eq**  
The `eq` field displays the user-assigned Oracle HSM equipment ordinal number of the mass storage device.

**status**  
The `status` field displays a ten-character string in which each character position represents the value of a different removable-media device attribute. Character positions are numbered starting from the left, position 1, and ending at the right, position 10. The following table defines the possible state codes for each position in the status string.

| Position | Value      | Meaning  |
|----------|------------|--|
| 1        | s-----     | A lowercase s in position 1 means that media is being scanned.   |
| 1        | m-----     | A lowercase m in position 1 means that the automated library is operational.   |
| 1        | M-----     | An uppercase M in position 1 means that the device is in maintenance mode.   |
| 2        | -E-----    | An uppercase E in position 2 means that the device encountered an unrecoverable error during scanning.   |
| 2        | -a-----    | A lowercase a in position 2 means that the device is in audit mode.  |
| 3        | --l-----   | A lowercase l in position 3 means that media has a label.  |
| 3        | --L-----   | An uppercase L in position 3 means that the media is being labeled   |
| 3        | --N-----   | An uppercase N in position 3 means that the media is foreign (not part of the Oracle HSM archive).   |
| 4        | ---I-----  | An uppercase I in position 4 means that the device is idle and not available for new connections. But operations already in progress are continuing until completion.                              |
| 4        | ---A-----  | An uppercase A in position 4 means that the device needs operator attention.   |
| 5        | ----C----- | An uppercase C in position 5 means that the device needs cleaning.   |
| 5        | ----U----- | An uppercase U in position 5 means that an unload has been requested.  |
| 6        | -----R---- | An uppercase R in position 6 means that the device is reserved.  |
| 7        | -----w---  | A lowercase w in position 7 means that a process is writing to the media.  |
| 8        | -----o--   | A lowercase o in position 8 means that the device is open.   |
| 9        | -----P-    | An uppercase P in position 9 means that the device is positioning a tape volume.   |
| 9        | -----F-    | For a tape library, an uppercase F in position 9 means that all storage slots are occupied.<br>For a drive, an uppercase F in position 9 means that the currently mounted removable media is full. |
| 10       | -----R     | An uppercase R in position 10 means that the device is ready and the media is read-only.   |
| 10       | -----r     | A lowercase r in position 10 means that the device is spun up and ready.   |
| 10       | -----p     | A lowercase p in position 10 means that the device is present.   |
| 10       | -----W     | An uppercase W in position 10 means that the device is write protected.  |

## rdlease (Set the Read Lease Time for a Shared File System)

Before reading a shared file, a host must request and obtain an *read lease* that grants it exclusive access to the file. The `rdlease` command defines the number of seconds during which this lease remains valid on the specified device. If the specified time runs out before the read operation is complete, the host must reacquire the lease before proceeding.

The specified number of seconds must fall in the range [15-600]. The default is 30 seconds.

For related information, see [aplease \(Set Append Lease Expiration Time for a Shared File System\)](#), [wrlease \(Set the Write Lease Time for a Shared File System\)](#), and [lease\\_timeo \(Set the Unused Lease Timeout for a Shared File System\)](#).

Command Synopsis

```
:rdlease family-set-equipment-number interval_in_seconds
```

Examples

The following example sets the read lease time to 2 minutes (120 seconds) on family set device 800:

```
File systems                                samu                                version time date

ty eq  state device_name                    status      high low mountpoint server
ma 800 on  shareqfs1                        m----2c--r- 80% 70% /shareqfs1
mm 801 on  /dev/dsk/c6t50020F2300004655d0s0
mr 802 on  /dev/dsk/c6t50020F2300004655d0s1
ma 810 on  shareqfs2                        m----2c--r- 80% 70% /shareqfs2
mm 811 on  /dev/dsk/c6t50020F2300004655d0s6
mr 812 on  /dev/dsk/c6t50020F2300004655d0s7
:
command:rdlease 800 120
```

read (Read Sectors On a Disk Storage Device)

When issued with a hexadecimal sector address on a previously opened disk device, the read command displays disk sectors starting at the specified address. See also [open \(Open a Disk Storage Device for Reading\)](#).

Command Synopsis

```
:read hexadecimal-address
```

Examples

The following example reads device 23 starting at sector 1f4 (500):

```
Sector: 00000000 (0)      raw      samu      version time date

00000000 00000000 00000000 00000000 00000000 .....
00000010 00000000 00000000 00000000 00000000 .....
00000020 00000000 00000000 00000000 00000000 .....
00000030 00000000 00000000 00000000 00000000 .....
00000040 00000000 00000000 00000000 00000000 .....
00000050 00000000 00000000 00000000 00000000 .....
00000060 00000000 00000000 00000000 00000000 .....
00000070 00000000 00000000 00000000 00000000 .....
...
:
command:read 1f4
```

The screen displaying disk sectors starting at sector 1f4:

```
Sector: 000001f4 (500)      raw      samu      version time date
```



```

00000000 0a01c1c1 e39ce073 8e00e319 39e80195 ..AAc.`s..c.9h..
00000010 a40cd199 bfd5285f ba1509f9 41c03820 $.Q.?U(_:..yA@8
00000020 90780583 7f78825b 9fa0a58b 4a519c5d .x...x.[. %JQ.]
00000030 d2774afa bb256497 569bd2fb b775ddf2 RwJz;%d.V.R{7u}r
00000040 ba5cd1b7 2a56d93d 6e9dafab ba8b5e56 : \Q7*VY=n./+..^V
00000050 d5686a5b 334d1f96 70060ec1 b46483c8 Uhj[3M..p..A4d.H
00000060 190339e7 3ce3e5e7 a702ff00 9394528c ..9g<ceg'.....R.
00000070 4c9f3990 6dc05c1e b907e6dd 918e14e4 L.9.m@\ .9.f]...d
...

```

## readahead (Set The Maximum Read-Ahead Parameter)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `readahead` command specifies the minimum number of contiguous bytes that the device should read into memory. When correctly configured, read-ahead improves file-system performance by reducing disk I/O and making larger, contiguous blocks of information immediately available in memory.

Specify a read-ahead value in the range [1-8192] kilobytes. The default is 1024 kilobytes (1 megabyte).

You can also set a `readahead` directive in the `samfs.cmd` file. See the `samfs.cmd` man page for details.

## Command Synopsis

```
:readahead family-set-equipment-number number_kilobytes
```

## Examples

The following example sets the read-ahead value for family set device 100 to 1 megabyte (1024 kilobytes):

```

Mass storage status          samu          version time date

ty eq  status      use state ord  capacity  free  ra  part high low
ma 100 m----2---r- 1%  on      7.270T  7.270T 128K 16   80% 70%
mm 110              1%  on      0  465.253G 465.231G [975661056 inodes]
mr 120              1%  on      1  1.817T   1.817T
mr 130              1%  on      2  1.817T   1.817T
mr 140              1%  on      3  1.817T   1.817T
mr 150              1%  on      4  1.817T   1.817T
:
command:readahead 100 1024

```

The read-ahead value changes to 1 megabyte.

```

Mass storage status          samu          version time date

ty eq  status      use state ord  capacity  free  ra  part high low
ma 100 m----2---r- 1%  on      7.270T  7.270T 1M 16   80% 70%
mm 110              1%  on      0  465.253G 465.231G [975661056 inodes]
mr 120              1%  on      1  1.817T   1.817T
mr 130              1%  on      2  1.817T   1.817T
mr 140              1%  on      3  1.817T   1.817T
mr 150              1%  on      4  1.817T   1.817T

```

## readonly | ro (Make Device Read Only)

The `readonly` or `ro` command applies the read-only attribute to the device specified by an Oracle HSM equipment ordinal number.

### Command Synopsis

```
:readonly device-equipment-number
:ro device-equipment-number
```

### Examples

The following example makes device 12 read-only:

```
Mass storage status          samu          version time date

ty      eq  status          use state  ord  capacity    free    ra  part high low
ma      10  m----2---r-    1% on      0    7.270T    7.270T    1M   16  80% 70%
mm      11              1% on      0  465.253G  465.231G [975661056 inodes]
mr      12              1% on      1    1.817T    1.817T
mr      13              1% on      2    1.817T    1.817T
mr      14              1% on      3    1.817T    1.817T
mr      15              1% on      4    1.817T    1.817T
:
command: readonly 12
```

## refresh (Set the Automatic Refresh Interval for the samu Display)

When issued with a number of seconds, the `refresh` command configures `samu` to refresh screens after the specified number of seconds has passed.

### Command Synopsis

```
:refresh interval_in_seconds
```

### Examples

The following example configures `samu` to refresh the display every 20 seconds:

```
File systems          samu          version time date

ty  eq  state device_name          status          high low  mountpoint server
ma  900  on   qfs1                  m----2--R-d    90% 70%  /qfs1
mm  901  on   /dev/dsk/c5t10d0s0
md  902  on   /dev/dsk/c5t10d0s1
md  903  on   /dev/dsk/c5t11d0s0
md  904  on   /dev/dsk/c5t11d0s1
:
command: refresh 20
```

## refresh\_at\_eof (Refresh at EOF in a Multi-Reader File System)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device that is mounted read-only in a single-writer/multi-reader file system, the

`refresh_at_eof` command forces an update of the file size attribute whenever the read buffer exceeds the end of file. See [norefresh\\_at\\_eof \(Do Not Refresh at EOF in a Multi-Reader File System\)](#).

## Command Synopsis

```
:refresh_at_eof family-set-equipment-number interval_in_seconds
```

## Examples

The following example enables automatic refresh of the file size attribute on family set device 900:

```
File systems                                     samu                                     version time date

ty  eq  state  device_name                      status      high low  mountpoint server
ma  900  on    qfs1                          m----2--R-d  90%  70%  /qfs1
mm  901  on    /dev/dsk/c5t10d0s0
md  902  on    /dev/dsk/c5t10d0s1
md  903  on    /dev/dsk/c5t11d0s0
md  904  on    /dev/dsk/c5t11d0s1
:
command: refresh_at_eof 900
```

## release (Release Archived Data Files and Disable Allocation on a Device)

When issued with an Oracle HSM equipment ordinal number, the `release` command releases all archived files that are stored on the device, including any space associated with files otherwise designated for partial release, and turns the specified device `off`.

The `release` command sets the specified device to the [noalloc \(Disable Storage Allocation on a Device\)](#) state and has the `sam-fsd` daemon run a sub-process, `sam-shrink`. The `sam-shrink` process places all archived files that reside on the specified device in the `offline` state, so that the data are available from archival media only. When the process completes successfully, the specified device is left in the `off` state. If the process encounters any unarchived files or files that are in the process of being archived or staged back from archive to disk, the process fails and the specified equipment remains in the `noalloc` state.

The `release` process can take a significant amount of time. Monitor its progress via `samu` and/or via the `/var/opt/SUNWsamfs/trace/sam-shrink` file and the log file configured in `/etc/opt/SUNWsamfs/shrink.cmd` (if any).

Note that both [remove \(Move Data and Remove Equipment from a File System\)](#) and `release` shrink a file system by taking disk devices from a family set without losing data. They differ because the `remove` command has to consolidate files on the remaining disk devices in the set before freeing the specified device. The `release` command does not: in an archiving file system, all data is already duplicated on removable media. See [add \(Add Equipment to a Mounted File System\)](#), [remove \(Move Data and Remove Equipment from a File System\)](#), and the `sam-shrink` man page for related information.

## Command Synopsis

```
:release equipment-number
```

## Examples

The following example, releases all files on disk slice `/dev/dsk/c5t8d0s8` and shrinks family set `samfs4`:

```
File systems                                samu                                version time date

ty eq state  device_name  status      high  low  mountpoint  server
ma 20 on    samfs4      -----2---r- 80%   70%
mm 21 on    /dev/dsk/c5t8d0s6
md 22 on    /dev/dsk/c5t8d0s7
md 23 on    /dev/dsk/c5t8d0s8
:
command: release 23
```

The device state changes to `noalloc`:

```
md 23 noalloc /dev/dsk/c5t8d0s8
```

Finally, when the process completes successfully, the device state changes to `off`:

```
md 23 off      /dev/dsk/c5t8d0s8
```

## remove (Move Data and Remove Equipment from a File System)

When issued with an Oracle HSM equipment ordinal number, the `remove` command moves data from the specified device to the remaining devices in the file system and then turns the specified device `off`.

The `remove` command sets the specified device to the [noalloc \(Disable Storage Allocation on a Device\)](#) state and has the `sam-fsd` daemon run a sub-process, `sam-shrink`, to carry out the actual work. The `sam-shrink` process moves data from the specified equipment to the file system's other, on storage devices (if the specified equipment is a stripe group, there has to be another stripe group with the same number of devices). When the process completes successfully, the specified device is left in the `off` state. If data could not be moved for any reason, the equipment is not removed and remains in the `noalloc` state.

The removal process can take a significant amount of time. Monitor its progress via `samu` and/or via the `/var/opt/SUNWsamfs/trace/sam-shrink` file and the log file configured in `/etc/opt/SUNWsamfs/shrink.cmd` (if any).

Note that both [release \(Release Archived Data Files and Disable Allocation on a Device\)](#) and `remove` shrink a file system by taking disk devices from a family set without losing data. They differ because the `remove` command has to consolidate files on the remaining disk devices in the set before freeing the specified device. The `release` command does not: in an archiving file system, all data is already duplicated on removable media. See [add \(Add Equipment to a Mounted File System\)](#), and the `sam-shrink` man page for related information.

## Command Synopsis

```
:remove equipment-number
```

## Examples

The following example moves all files from disk slice /dev/dsk/c5t8d0s3 and shrinks family set qfs1:

```
File systems                                samu                                version time date

ty  eq  state  device_name  status          high  low  mountpoint  server
ma  10  on    qfs1         -----2---r-   80%   70%
mm  11  on    /dev/dsk/c5t8d0s0
md  12  on    /dev/dsk/c5t8d0s1
md  13  on    /dev/dsk/c5t8d0s3
:
command:remove 13
```

The device state changes to noalloc:

```
md 13 noalloc /dev/dsk/c5t8d0s3
```

Finally, when the process completes successfully, the device state changes to off:

```
md 13 off      /dev/dsk/c5t8d0s3
```

## s (Display Device Status Screen)

The `s` command opens the Device status screen. The screen displays the status for all devices configured within the environment.

## Command Synopsis

```
s
:s
```

## Controls

You can use the following control keys on this screen:

**Ctrl-B (^b)**

Move back one page.

**Ctrl-F (^f)**

Move forward one page.

**Ctrl-D (^d)**

Move down the page.

**Ctrl-U (^u)**

Move up the page.

## Examples

The following example shows the device status display.

```
Device status                                samu                                version time date

ty  eq   state  device_name                                fs  status
sk  100   on    /etc/opt/SUNWsamfs/dcstkconf              100 m-----r
      stk_dismount / (2275) 0, volser VOL073
```

```

sg 120  on    /dev/rmt/2cbn          100 -----p
sg 130  on    /dev/rmt/5cbn          100 --l----o-r
      Ready for data transfer
sg 140  on    /dev/rmt/6cbn          100 -----p
sg 150  on    /dev/rmt/4cbn          100 -----p
hy 151  on    historian             151 -----

```

## Field Descriptions

### ty

The **ty** field displays Oracle HSM media type. Device-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

### eq

The **eq** displays the user-assigned Oracle HSM equipment ordinal number of the mass storage device.

### state

The **state** field displays the current operating state of the device.

### device\_name

The **device\_name** field displays the path to the device. For file system devices, this is the file system name.

### fs

The **fs** field displays the user-assigned Oracle HSM equipment number of the family set to which the device belongs.

### status

The **status** field displays a ten-character string in which each character position represents the value of a different removable-media device attribute. Character positions are numbered starting from the left, position 1, and ending at the right, position 10. The following table defines the possible state codes for each position in the status string.

| Position | Value     | Meaning  |
|----------|-----------|--|
| 1        | s-----    | A lowercase <b>s</b> in position 1 means that media is being scanned.  |
| 1        | m-----    | A lowercase <b>m</b> in position 1 means that the automated library is operational.  |
| 1        | M-----    | An uppercase <b>M</b> in position 1 means that the device is in maintenance mode.  |
| 2        | -E-----   | An uppercase <b>E</b> in position 2 means that the device encountered an unrecoverable error during scanning.  |
| 2        | -a-----   | A lowercase <b>a</b> in position 2 means that the device is in audit mode.   |
| 3        | --l-----  | A lowercase <b>l</b> in position 3 means that media has a label.   |
| 3        | --L-----  | An uppercase <b>L</b> in position 3 means that the media is being labeled  |
| 3        | --N-----  | An uppercase <b>N</b> in position 3 means that the media is foreign (not part of the Oracle HSM archive).  |
| 4        | ---I----- | An uppercase <b>I</b> in position 4 means that the device is idle and not available for new connections. But operations already in progress are continuing until completion. |

| Position | Value      | Meaning  |
|----------|------------|--|
| 4        | ---A-----  | An uppercase A in position 4 means that the device needs operator attention.   |
| 5        | ----C----- | An uppercase C in position 5 means that the device needs cleaning.   |
| 5        | ----U----- | An uppercase U in position 5 means that an unload has been requested.  |
| 6        | ----R----- | An uppercase R in position 6 means that the device is reserved.  |
| 7        | -----w---  | A lowercase w in position 7 means that a process is writing to the media.  |
| 8        | -----o--   | A lowercase o in position 8 means that the device is open.   |
| 9        | -----P-    | An uppercase P in position 9 means that the device is positioning a tape volume.   |
| 9        | -----F-    | For a tape library, an uppercase F in position 9 means that all storage slots are occupied.<br>For a drive, an uppercase F in position 9 means that the currently mounted removable media is full. |
| 10       | -----R     | An uppercase R in position 10 means that the device is ready and the media is read-only.   |
| 10       | -----r     | A lowercase r in position 10 means that the device is spun up and ready.   |
| 10       | -----p     | A lowercase p in position 10 means that the device is present.   |
| 10       | -----W     | An uppercase W in position 10 means that the device is write protected.  |

## snap (Save a Snapshot of the Current Screen to a File)

When issued with a file path and name, the `snap` command saves the current screen as a text file with the specified name.

## Command Synopsis

```
:snap file-path-and-name
```

## Examples

The following example saves a snap shot of the File systems screen to the file `/export/home/samadmin/filsysscrn.txt`:

```
File systems                                samu                                version time date

ty  eq  state  device_name  status          high  low  mountpoint  server
ma  20  on    sam2        -----2---r-   80%   70%
mm  21  on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  22  on    /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr  23  on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command: snap /export/home/samadmin/filsysscrn.txt
```

## stage\_flush\_behind (Set the Stage Flush Behind Size)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and a number of kilobytes, the `stage_flush_behind` command configures the

corresponding file system to asynchronously write the specified number of kilobytes from dirty (modified) stage memory pages to disk.

As staged files are copied from archival media into memory, flush-behind insures that the staged data are quickly saved to the file system's non-volatile primary disk cache. Unsaved, *dirty* cache pages are kept to a minimum during staging, which helps to maintain the integrity of the file data.

On the other hand, flush-behind increases overhead and can reduce I/O performance. The process of flushing a data block may delay subsequent re-writes of that block. So flush-behind is disabled by default.

Set the specified value in the range [0-8192] kilobytes, where 0—the default—disables the flush-behind capability.

## Command Synopsis

```
:stage_flush_behind equipment-number number_of_kilobytes
```

## Examples

The following example sets the stage\_flush\_behind for disk family-set device 20 to 5124 kilobytes (5 megabytes):

```
File systems                                samu                                version time date

ty  eq  state  device_name  status          high  low  mountpoint  server
ma  20  on     sam2        -----2----r-  80%  70%
mm  21  on     /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  22  on     /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr  23  on     /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command:stage_flush_behind 20 5124
```

## stage\_n\_window (Size the Buffer for Reading Directly from Archival Media)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and a number of kilobytes, the stage\_n\_window command sets the buffer size that Oracle HSM uses when reading files from the corresponding file system that are configured to never automatically stage to disk. Oracle HSM reads such files directly from the archival media to memory in chunks of the specified number of kilobytes.

Specify a number of kilobytes in the range [64-2097152]. The default is 8192 kilobytes.

## Command Synopsis

```
:stage_n_window family-set-equipment-number number_of_kilobytes
```

## Examples

The following example sets the stage\_n\_window for disk family-set device 20 to 16384 kilobytes (16 megabytes):

```
File systems                                samu                                version time date

ty  eq  state  device_name  status          high  low  mountpoint  server
```



```

ma 20 on      sam2      -----2----r-   80%   70%
mm 21 on      /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr 22 on      /dev/dsk/c0t600A0B800026E584000021864C4943AA0s0
mr 23 on      /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command:stage_n_window 20 16384

```

## stclear (Clear a Stage Request)

When entered with an Oracle HSM media-type identifier and the volume serial number (VSN) of a removable media cartridge, the `stclear` command removes the corresponding staging request from the staging queue. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

## Command Synopsis

```
:stclear mediatype.volume-serial-number
```

## Examples

In the example, `stclear` clears the staging request for the LTO (li) volume with VSN VOL001 from the staging queue:

```

Staging queue by media type: all      samu      version time date

ty length  fseq  ino   position  offset  vsn
li 451.611k  20   1030   207cc    473  VOL001
li 341.676k  20   1031   207cc     7fc VOL002
li 419.861k  20   1032   207cc    aa9 VOL003
li 384.760k  20   1033   207cc    df2 VOL004
li 263.475k  20   1034   207cc   10f5 VOL005
li 452.901k  20   1035   207cc   1305 VOL006
li 404.598k  20   1036   207cc   1690 VOL007
:
command:stclear li.VOL001

```

The staging request for the LTO (li) volume VOL001 has been cleared:

```

Staging queue by media type: all      samu      version time date

ty length  fseq  ino   position  offset  vsn
li 341.676k  20   1031   207cc     7fc VOL002
li 419.861k  20   1032   207cc    aa9 VOL003
li 384.760k  20   1033   207cc    df2 VOL004
li 263.475k  20   1034   207cc   10f5 VOL005
li 452.901k  20   1035   207cc   1305 VOL006
li 404.598k  20   1036   207cc   1690 VOL007

```

## stidle (Stop Staging as Soon as Possible)

The `stidle` command idles the stager as soon as current staging operations are complete.

## Command Synopsis

```
:stidle
```

## Examples

In the example, stidle idles staging:

```
Staging queue by media type: all          samu          version time date

ty  length  fseq   ino    position  offset vsn
li  451.611k  20     1030    207cc     473 VOL001
li  341.676k  20     1031    207cc     7fc VOL002
li  419.861k  20     1032    207cc     aa9 VOL003
li  384.760k  20     1033    207cc     df2 VOL004
li  263.475k  20     1034    207cc     10f5 VOL005
li  452.901k  20     1035    207cc     1305 VOL006
li  404.598k  20     1036    207cc     1690 VOL007
:
command:stidle
```

## stripe (Set the Stripe Width for a File System)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and a number of disk allocation units (DAUs), the `stripe` command configures the corresponding file system to write the specified number of DAUs to each logical unit number (LUN) that is available for data storage.

Specify a number of DAUs in the range [0-255], where a 0 (zero) value disables striping and writes DAUs to LUNs round-robin.

For file systems of the `ms` equipment type and file systems of the `ma` type that do not include striped group equipment (`gXXX`), the default value is 1 DAU with a minimum DAU size of 128 kilobytes. For shared file systems and for `ma` file systems that include striped groups, the default is 0.

The system also sets stripe width to 0 automatically if a file system contains mismatched striped groups.

For more information about file system types, see the `mcf` man page and [mm\\_stripe \(Set the Metadata Stripe Width\)](#).

## Command Synopsis

```
:mm_stripe family-set-equipment-number number_DAUs
```

## Examples

The following example changes data striping on family set device 10 to two DAUs:

```
File systems          samu          version time date

ty  eq  state  device_name  status      high  low  mountpoint  server
ma  10  on    sam2        -----2---r-  80%  70%  /sam/sam2
mm  11  on    /dev/dsk/c0t600A0B800026B6F000001F0F4CCFF833d0s0
mr  12  on    /dev/dsk/c0t600A0B800026E584000021864C4943AAd0s0
mr  13  on    /dev/dsk/c0t600A0B800026E5840000218B4CBD9C4Ed0s0
:
command:stripe 20 2
```

## strun (Start Staging)

The **strun** command starts the stager.

### Command Synopsis

```
:strun
```

### Examples

In the example, **strun** starts staging:

```
Staging queue by media type: all          samu          version time date

ty  length  fseq    ino  position  offset  vsn
li  451.611k  20     1030   207cc     473    VOL001
li  341.676k  20     1031   207cc     7fc    VOL002
li  419.861k  20     1032   207cc     aa9    VOL003
li  384.760k  20     1033   207cc     df2    VOL004
li  263.475k  20     1034   207cc     10f5   VOL005
li  452.901k  20     1035   207cc     1305   VOL006
li  404.598k  20     1036   207cc     1690   VOL007
:
command: strun
```

## suid (Mount a File System with **setuid** Execution Enabled)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the **suid** command mounts the file system with the **setuid** attribute enabled. The **setuid** attribute (*set user ID upon execution*) lets file system users run executables with the temporarily elevated permissions that may be required when using the files.

See [nosuid \(Mount a File System with \*\*setuid\*\* Execution Disabled\)](#) and the mount man page for further information.

The default is **suid**, mount the file system with the **setuid** attribute enabled.

### Command Synopsis

```
:suid family-set-equipment-number
```

### Examples

The following example mounts the file system on family set device 100 with the **setuid** attribute enabled:

```
File systems          samu          version time date

ty  eq  state  device_name      status      high low  mountpoint server
ma  100 on    qfs1             m----2----d  90% 70%  /qfs1
mm  101 on    /dev/dsk/c5t10d0s0
md  102 on    /dev/dsk/c5t10d0s1
md  103 on    /dev/dsk/c5t11d0s0
md  104 on    /dev/dsk/c5t11d0s1
:
```

command: **sw\_raid 100**

## sw\_raid (Turn On Software RAID Mode)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `sw_raid` command enables software RAID mode on the specified device.

### Command Synopsis

`:sw_raid family-set-equipment-number`

### Examples

The following example enables software-RAID mode for family set device 100:

```

Mass storage status                                samu                                version time date

ty  eq  status      use  state  ord  capacity      free      ra  part high low
ma 100  m----2---r-  1%  on                    7.270T      7.270T    1M 16   80% 70%
mm 110                    1%  on                    465.253G   465.231G [975661056 inodes]
mr 120                    1%  on                    1.817T      1.817T
mr 130                    1%  on                    1.817T      1.817T
mr 140                    1%  on                    1.817T      1.817T
mr 150                    1%  on                    1.817T      1.817T
:
command:sw_raid 100

```

## sync\_meta (Synchronize File System Metadata)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and a Boolean value (0 for *no* or 1 for *yes*), the `sync_meta` command determines whether metadata is written to disk every time it changes. A 0 (*no*) value configures the file system to cache metadata changes in a buffer prior to writing. This reduces the amount of physical I/O, improves I/O efficiency, and thus improves overall performance. A 1 (*yes*) value configures Oracle HSM to write metadata changes to disk immediately. This sacrifices performance in order to maximize data consistency.

For Oracle HSM file systems that are neither shared nor mounted multi-reader, the default is 0. For shared and multi-reader file systems, the default is 1. If a shared file system is configured for failover, the value must be 1.

### Command Synopsis

`:sync_meta family-set-equipment-number 0/1`

### Examples

The following example configures the file system on family set device 100 to synchronize metadata for maximal data consistency:

```

File systems                                samu                                version time date

ty  eq  state  device_name  status      high low  mountpoint server
ma 100  on     qfs1         m----2----d  90% 70%  /qfs1

```

```

mm 101 on      /dev/dsk/c5t10d0s0
md 102 on      /dev/dsk/c5t10d0s1
md 103 on      /dev/dsk/c5t11d0s0
md 104 on /    dev/dsk/c5t11d0s1
:
command: sync_meta 100 1

```

The second example configures the file system on family set device 200 to cache metadata changes for best performance:

```

File systems                                samu                                version time date

ty eq state  device_name    status      high low  mountpoint server
ma 200 on qfs2              m----2----d  90% 70%  /qfs2
  mm 201 on /dev/dsk/c5t10d0s3
  md 202 on /dev/dsk/c5t10d0s4
  md 203 on /dev/dsk/c5t11d0s3
  md 204 on /dev/dsk/c5t11d0s4
:
command: sync_meta 200 0

```

## t (Display Tape Drive Status Screen)

The `t` command opens the Tape drive status screen. The screen displays status information for all tape drives configured within the environment.

### Command Synopsis

```

t
:t

```

### Controls

You can use the following control keys on this screen:

#### **Ctrl-B (^b)**

Move back one page.

#### **Ctrl-F (^f)**

Move forward one page.

### Examples

The following example shows the tape drive status display.

```

Tape drive status                                samu                                version time date

ty eq status  act use  state  vsn
sg 120 -----p  0  0%  notrdy
sg 130 -----p  0  0%  notrdy
sg 140 -----p  0  0%  down
           drive set down due to ACS reported state
sg 150 --l-----r  0 41%  ready  VOL014

```

## Field Descriptions

### ty

The `ty` field displays Oracle HSM media type. Device-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

### eq

The `eq` displays the user-assigned Oracle HSM equipment ordinal number of the mass storage device.

### status

The `status` field displays a ten-character string in which each character position represents the value of a different removable-media device attribute. Character positions are numbered starting from the left, position 1, and ending at the right, position 10. The following table defines the possible state codes for each position in the status string.

| Position | Value      | Meaning  |
|----------|------------|--|
| 1        | s-----     | A lowercase s in position 1 means that media is being scanned.   |
| 1        | m-----     | A lowercase m in position 1 means that the automated library is operational.   |
| 1        | M-----     | An uppercase M in position 1 means that the device is in maintenance mode.   |
| 2        | -E-----    | An uppercase E in position 2 means that the device encountered an unrecoverable error during scanning.   |
| 2        | -a-----    | A lowercase a in position 2 means that the device is in audit mode.  |
| 3        | --l-----   | A lowercase l in position 3 means that media has a label.  |
| 3        | --L-----   | An uppercase L in position 3 means that the media is being labeled   |
| 3        | --N-----   | An uppercase N in position 3 means that the media is foreign (not part of the Oracle HSM archive).   |
| 4        | ---I-----  | An uppercase I in position 4 means that the device is idle and not available for new connections. But operations already in progress are continuing until completion.                                  |
| 4        | ---A-----  | An uppercase A in position 4 means that the device needs operator attention.   |
| 5        | ----C----- | An uppercase C in position 5 means that the device needs cleaning.   |
| 5        | ----U----- | An uppercase U in position 5 means that an unload has been requested.  |
| 6        | -----R---- | An uppercase R in position 6 means that the device is reserved.  |
| 7        | -----w---  | A lowercase w in position 7 means that a process is writing to the media.  |
| 8        | -----o--   | A lowercase o in position 8 means that the device is open.   |
| 9        | -----P-    | An uppercase P in position 9 means that the device is positioning a tape volume.   |
| 9        | -----F-    | For a tape library, an uppercase F in position 9 means that all storage slots are occupied.<br><br>For a drive, an uppercase F in position 9 means that the currently mounted removable media is full. |
| 10       | -----R     | An uppercase R in position 10 means that the device is ready and the media is read-only.   |

| Position | Value  | Meaning  |
|----------|--------|--|
| 10       | -----r | A lowercase r in position 10 means that the device is spun up and ready. |
| 10       | -----p | A lowercase p in position 10 means that the device is present.           |
| 10       | -----W | An uppercase W in position 10 means that the device is write protected.  |

**act**

The status field displays the activity count.

**use**

The use field displays the percentage of cartridge space used.

**state**

The state field displays the current operating state of the device. Valid device states include:

- on means that the device is available.
- ro means that the device is available read-only.
- off means that the device is not available.
- down means that the device is available for maintenance only.
- idle means that the device is completing operations that are already in progress but is not accepting new connections.
- noalloc means that no more storage can be allocated on this device. An administrator has run the `noalloc eq` command, where `eq` is the equipment ordinal number of the device. The `noalloc` state persists until an administrator issues an `alloc eq` command.

**vsn**

The vsn field displays the volume serial number assigned to a media volume, the keyword `noLabel` if a volume is not labeled, or a blank if a volume is not loaded or if the device is off.

## thresh (Set High and Low Watermarks)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device and two percentages, the `thresh` (*threshold*) command defines the *high* and *low water marks* for the corresponding file system.

The high water mark is the percentage disk utilization where the Oracle HSM releaser process starts to delete archived (backed-up) files from disk in order to make space for new files. The low-water mark is the percentage of disk utilization where the Oracle HSM releaser has freed enough space for new files and stops deleting archived files from the disk. When properly configured, these two parameters insure that the largest possible number of files are kept available on disk while maintaining sufficient space for new and enlarged files, thus minimizing excessive staging activity and maximizing performance and capacity.

For each watermark, specify an integer value in the range [0-100]. A high of 80% and a low of 70% is a typical setting.

## Command Synopsis

```
:thresh family-set-equipment-number high% low%
```

## Examples

The following example sets the high and low water marks to 80% and 70% percent for the sam1 file system on family set device 100:

```
File systems                                samu                                version time date

ty  eq   state device_name                status          high low  mountpoint server
ma 100   on   sam1                      m----2----d    90% 60%  /sam1
mm 101   on   /dev/dsk/c5t10d0s0
md 102   on   /dev/dsk/c5t10d0s1
md 103   on   /dev/dsk/c5t11d0s0
md 104   on   /dev/dsk/c5t11d0s1
:
command: thresh 100 80 70
```

```
File systems                                samu                                version time date

ty  eq   state device_name                status          high low  mountpoint server
ma 100   on   sam1                      m----2----d    80% 70%  /sam1
mm 101   on   /dev/dsk/c5t10d0s0
md 102   on   /dev/dsk/c5t10d0s1
md 103   on   /dev/dsk/c5t11d0s0
md 104   on   /dev/dsk/c5t11d0s1
```

## trace (Enable File System Tracing)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the trace command enables tracing for the corresponding file system.

The default is trace (enabled).

For more information about file system tracing, see [notrace \(Disable File System Tracing\)](#) and the `defaults.conf` man page.

## Command Synopsis

```
:trace family-set-equipment-number
```

## Examples

The following example enables tracing for the file system on family set device 100:

```
File systems                                samu                                version time date

ty  eq   state device_name                status          high low  mountpoint server
ma 100   on   qfs1                      m----2-----d  90% 70%  /qfs1
mm 101   on   /dev/dsk/c5t10d0s0
md 102   on   /dev/dsk/c5t10d0s1
md 103   on   /dev/dsk/c5t11d0s0
md 104   on   /dev/dsk/c5t11d0s1
:
command: trace 100
```



## u (Display Staging Queue Screen)

The `u` command opens the Staging queue screen. The screen lists all files in the staging queue.

When issued without a parameter, the `u` command displays the staging queue for all media. When the command is issued with an Oracle HSM media-type identifier, the command displays the staging queue for the specified media type only. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

## Command Synopsis

```
u
:u mediatype
```

## Controls

You can use the following control keys on this screen:

**Ctrl-B (^b)**

Move back one page.

**Ctrl-F (^f)**

Move forward one page.

**Ctrl-D (^d)**

Move down the page.

**Ctrl-U (^u)**

Move up the page.

**Ctrl-K (^k)**

Display the path on the second line of each entry

## Examples

The following example shows the staging queue display.

```
Staging queue by media type: all          samu          version time date

ty  length  fseq   ino  position offset  vsn
li  451.611k  20    1030   207cc   473  VOL001
li  341.676k  20    1031   207cc   7fc  VOL002
li  419.861k  20    1032   207cc   aa9  VOL003
li  384.760k  20    1033   207cc   df2  VOL004
li  263.475k  20    1034   207cc   10f5 VOL005
li  452.901k  20    1035   207cc   1305 VOL006
li  404.598k  20    1036   207cc   1690 VOL007
```

## Field Descriptions

**ty**

The `ty` field displays the Oracle HSM device type. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

**length**

The length field displays the length of the file in kilobytes.

**fseq**

The fseq field displays the file system's user-assigned equipment ordinal number

**ino**

The ino field displays the inode number of the file that is being staged.

**position**

The position field displays the location of the archive file on the specified media volume.

**offset**

The offset field displays the position of the file that is being staged relative to the start of the archive file.

**vsn**

The vsn field displays the volume serial number assigned to the media volume, the keyword `nolabel` if the volume is not labeled, or a blank if a volume is not loaded or if the volume is loaded into a device that is `off`.

## unavail (Make a Device Unavailable to Oracle HSM)

The `unavail` command keeps Oracle HSM from using the device specified by a given Oracle HSM equipment ordinal number.

The command is useful when you want to reserve a drive for other uses, such as loading media for file-system restores during disaster recovery.

### Command Synopsis

```
:unavail equipment-number
```

### Examples

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk 100  on    /etc/opt/SUNWsamfs/SL8500_T10K_parms 100  libraryA
ti 101  on    /dev/rmt/0cbn                100  libraryA
ti 102  on    /dev/rmt/1cbn                100  libraryA
ti 103  on    /dev/rmt/2cbn                100  libraryA
hy 104  on    historian                  104
:
command:unavail 103
```

The device state changes to `unavail`:

```
Device configuration:          samu          version time date

ty  eq  state  device_name          fs  family_set
sk 100  on    /etc/opt/SUNWsamfs/SL8500_T10K_parms 100  libraryA
ti 101  on    /dev/rmt/0cbn                100  libraryA
ti 102  on    /dev/rmt/1cbn                100  libraryA
ti 103  unavail /dev/rmt/2cbn                100  libraryA
hy 104  on    historian                  104
```

## unload (Unload a Drive)

The `unload` command unloads media mounted on the device specified by an Oracle HSM equipment ordinal number. If the device has magazines, the command unloads the mounted cartridge and ejects the magazine. See [load \(Load a Cartridge into a Drive\)](#).

### Command Synopsis

```
:unload equipment-number
```

### Examples

```
Device status                                samu                                version time date

ty  eq   state  device_name                  fs  status
sn 100   on    /etc/opt/SUNWsamfs/dcstkconf  100 m-----r
      empty
li 101   on    /dev/rmt/2cbn                  100 -----p
      empty
li 102   on    /dev/rmt/5cbn                  100 -----p
      empty
li 103   on    /dev/rmt/6cbn                  100 --l-----r
      idle
li 104   on    /dev/rmt/4cbn                  100 -----p
      empty
hy 151   on    historian                      151 -----
:
command:unload 103
```

## v (Display Robot VSN Catalog Screen)

The `v` command opens the Robot VSN catalog screen. The screen lists catalog information for all media volumes stored in a given automated library.

When issued without a parameter, the `v` command displays the catalogs for all libraries. When the command is issued with a user-assigned Oracle HSM equipment ordinal number, the command displays the volume catalog for the specified device only.

### Command Synopsis

```
v
:v equipment-number
:v historian
```

### Controls

**Ctrl-B (^b)**  
Move back one page.

**Ctrl-F (^f)**  
Move forward one page.

**Ctrl-D (^d)**

Move down to the next catalog.

**Ctrl-U (^u)**

Move up to the previous catalog.

**Ctrl-I (^i)**

Display detailed information, two lines per entry. Press **Ctrl-I** once to display times and barcodes. Press **Ctrl-I** a second time to display volume reservations on the second line.

**1**

Sort entries by library slot.

**2**

Sort entries by count.

**3**

Sort entries by percent used.

**4**

Sort entries by Volume Serial Number (VSN).

**5**

Sort entries by access time.

**6**

Sort entries by barcode.

**7**

Sort entries by label time.

**Ctrl-K (^k)**

Toggle between the sorting methods enumerated above.

**/**

Search for a specified Volume Serial Number (VSN) and, if found, display the corresponding record at the top of the list.

**%**

Search for a specified barcode and, if found, display the corresponding record at the top of the list.

**\$**

Search for a specified slot number and, if found, display the corresponding record at the top of the list.

## Examples

The following example shows the automated library catalog display sorted by slot:

```
Robot VSN catalog by slot : eq 900 samu          version time date
count 32
slot      access time count use flags          ty vsn
0      2013/07/02 12:53   3 96% -il-o-b----f li VOL001
1      2013/07/02 12:53   2 98% -il-o-b----f li VOL002
2      2013/07/02 12:52   1 86% -il-o-b----f li VOL003
3      2013/07/02 12:52   1 95% -il-o-b----f li VOL004
```

|    |                  |    |     |              |    |        |             |
|----|------------------|----|-----|--------------|----|--------|-------------|
| 4  | 2013/07/02 12:51 | 1  | 79% | -il-o-b----- | li | VOL005 |             |
| 5  | 2013/07/02 12:45 | 0  | 14% | -ilEo-b----f | li | VOL006 | MEDIA ERROR |
| 6  | 2013/07/02 12:46 | 0  | 0%  | -il-o-b----- | li | VOL007 |             |
| 7  | 2013/07/02 12:46 | 0  | 0%  | -il-o-b----- | li | VOL008 |             |
| 8  | 2013/07/02 12:47 | 0  | 0%  | -il-o-b----- | li | VOL009 |             |
| 9  | 2013/07/02 12:47 | 0  | 0%  | -il-o-b----- | li | VOL010 |             |
| 10 | 2013/07/02 12:48 | 0  | 0%  | -il-o-b----- | li | VOL011 |             |
| 11 | 2013/07/02 12:48 | 0  | 0%  | -il-o-b----- | li | VOL012 |             |
| 12 | 2013/07/02 12:48 | 0  | 0%  | -il-o-b----- | li | VOL013 |             |
| 13 | 2013/07/02 12:49 | 0  | 0%  | -il-o-b----- | li | VOL014 |             |
| 14 | 2013/07/02 12:49 | 0  | 0%  | -il-o-b----- | li | VOL015 |             |
| 15 | 2013/07/02 12:50 | 0  | 0%  | -il-o-b----- | li | VOL016 |             |
| 16 | 2013/07/02 12:50 | 0  | 0%  | -il-o-b----- | li | VOL017 |             |
| 17 | 2013/07/02 12:51 | 0  | 0%  | -il-o-b----- | li | VOL018 |             |
| 18 | 2013/07/02 12:51 | 0  | 0%  | -il-o-b----- | li | VOL019 |             |
| 19 | none             | 50 | 0%  | -il-oCb----- | li | CLN020 |             |

The next example shows the same screen sorted by the percentage of each volume that has been used:

```
Robot VSN catalog by % used : eq 900      samu                                version time date
count 32
```

| slot | access time      | count | use | flags        | ty | vsn    |             |
|------|------------------|-------|-----|--------------|----|--------|-------------|
| 1    | 2013/07/02 12:53 | 2     | 98% | -il-o-b----f | li | VOL002 |             |
| 0    | 2013/07/02 12:53 | 3     | 96% | -il-o-b----f | li | VOL001 |             |
| 3    | 2013/07/02 12:52 | 1     | 95% | -il-o-b----f | li | VOL004 |             |
| 2    | 2013/07/02 12:52 | 1     | 86% | -il-o-b----f | li | VOL003 |             |
| 4    | 2013/07/02 12:51 | 1     | 79% | -il-o-b----- | li | VOL005 |             |
| 5    | 2013/07/02 12:45 | 0     | 14% | -ilEo-b----f | li | VOL006 | MEDIA ERROR |
| 12   | 2013/07/02 12:48 | 0     | 0%  | -il-o-b----- | li | VOL013 |             |
| 13   | 2013/07/02 12:49 | 0     | 0%  | -il-o-b----- | li | VOL014 |             |
| 14   | 2013/07/02 12:49 | 0     | 0%  | -il-o-b----- | li | VOL015 |             |
| 15   | 2013/07/02 12:50 | 0     | 0%  | -il-o-b----- | li | VOL016 |             |
| 16   | 2013/07/02 12:50 | 0     | 0%  | -il-o-b----- | li | VOL017 |             |
| 17   | 2013/07/02 12:51 | 0     | 0%  | -il-o-b----- | li | VOL018 |             |
| 19   | none             | 50    | 0%  | -il-oCb----- | li | CLN020 |             |
| 6    | 2013/07/02 12:46 | 0     | 0%  | -il-o-b----- | li | VOL007 |             |
| 7    | 2013/07/02 12:46 | 0     | 0%  | -il-o-b----- | li | VOL008 |             |
| 8    | 2013/07/02 12:47 | 0     | 0%  | -il-o-b----- | li | VOL009 |             |
| 9    | 2013/07/02 12:47 | 0     | 0%  | -il-o-b----- | li | VOL010 |             |
| 10   | 2013/07/02 12:48 | 0     | 0%  | -il-o-b----- | li | VOL011 |             |
| 11   | 2013/07/02 12:48 | 0     | 0%  | -il-o-b----- | li | VOL012 |             |
| 18   | 2013/07/02 12:51 | 0     | 0%  | -il-o-b----- | li | VOL019 |             |

## Field Descriptions

### ty

The ty field displays Oracle HSM media type. Device-type identifiers are listed in [Appendix A](#) and on the mcf man page.

### eq

The eq displays the user-assigned Oracle HSM equipment ordinal number of the mass storage device.

### count

The count field displays the number of accesses to this volume since the last audit operation.

**slot**

The `slot` field displays the slot number that identifies a storage cell in a robotic library.

**access time**

The `access time` field displays the date and time when the volume was last accessed.

**use**

The `use` field displays the percentage of cartridge space used.

**flags**

The **flags** field displays a twelve-character string in which each character position represents an attribute of the catalog entry. Character positions are numbered starting from the left, position 1, and ending at the right, position 12. In some cases, more than one flag can occur in a field, and one flag overrides the other.

The following table defines the possible flag codes for each position in the string:

| Position | Flag        | Meaning  |
|----------|-------------|--|
| 1        | A-----      | An uppercase A in position 1 means that the volume in the corresponding library slot needs an audit.   |
| 2        | -i-----     | A lowercase i in position 2 means that the corresponding library slot is in use.   |
| 3        | --l-----    | A lowercase l in position 3 means that the volume in the corresponding library slot is labeled.  |
| 3        | --N-----    | An uppercase N in position 3 means that the volume in the corresponding library slot is unlabeled or foreign to the Oracle HSM file system.    |
| 4        | ---E-----   | An uppercase E in position 4 means that there was a media error when accessing the corresponding volume.                                       |
| 5        | ----o-----  | A lowercase o in position 5 means that the corresponding library slot is occupied by a volume.   |
| 6        | -----C----- | An uppercase C in position 6 means that the corresponding library slot is occupied by a cleaning tape.   |
| 6        | -----p----- | A lowercase p in position 6 means that the corresponding library slot is occupied by a priority volume.  |
| 7        | -----b----- | A lowercase b in position 7 means that the volume in the corresponding library slot has a barcode.   |
| 8        | -----W----  | An uppercase W in position 8 means that the volume in the corresponding library slot is write-protected by a physical switch on the cartridge. |
| 9        | -----R---   | An uppercase R in position 9 means that the volume in the corresponding library slot is logically read-only.                                   |
| 10       | -----c--    | A lowercase c in position 10 means that the volume in the corresponding library slot has been selected for recycling.                          |
| 11       | -----d-     | A lowercase d in position 11 means that the volume in the corresponding library slot has a duplicate volume serial number.                     |
| 11       | -----U-     | An uppercase U in position 11 means that the volume that should reside in the corresponding library slot is unavailable.                       |
| 12       | -----f      | A lowercase f in position 11 means that the archiver found the volume in the corresponding library slot full.                                  |
| 12       | -----X      | An uppercase X in position 11 means that the corresponding library slot is an export slot.   |

**vsn**

The vsn field displays the volume serial number assigned to the media, the keyword nolabel if the volume is not labeled, or a blank if a volume is not loaded or if the device is off.

**LVTime**

The LVTime field displays the date and time when the entire tape was last verified.

**LVPos**

The LVPos field displays the position where the last verification was canceled.

**w (Display the Pending Stage Queue Screen)**

The w command opens the Pending stage queue screen. The screen displays requests for files that are not currently available on disk and must be staged from removable media volumes that are not currently loaded.

When issued without a parameter, the w command displays queued stage requests for all media types. When the command is issued with an Oracle HSM media-type identifier, the command displays the pending stage requests for the specified media type only. Media-type identifiers are listed in [Appendix A](#) and on the mcf man page.

**Command Synopsis**

```
w
:w mediatype
```

**Controls**

You can use the following control keys on this screen:

**Ctrl-B (^b)**

Move back one page.

**Ctrl-F (^f)**

Move forward one page.

**Ctrl-D (^d)**

Move down the page.

**Ctrl-U (^u)**

Move up the page.

**Ctrl-K (^k)**

Display the path on the second line of each entry

**Examples**

The following example shows the pending stage queue screen for all media types. Thirteen requested files reside on one volume that is waiting to load:

```
Pending stage queue by media type: all      samu      version time date
volumes 1 files 13

ty    length fseq ino position offset  vsn
li    1.383M  1  42    3a786   271b  VOL002
li    1.479M  1  56    3a786   5139  VOL002
li 1018.406k  1  60    3a786   6550  VOL002
```

|    |          |   |     |       |       |        |
|----|----------|---|-----|-------|-------|--------|
| li | 1.VOLM   | 1 | 65  | 3a786 | 7475  | VOL002 |
| li | 1.528M   | 1 | 80  | 3a786 | 99be  | VOL002 |
| li | 1.763M   | 1 | 92  | 3a786 | ce57  | VOL002 |
| li | 1.749M   | 1 | 123 | 3a786 | 11ece | VOL002 |
| li | 556.559k | 1 | 157 | 3a786 | 1532f | VOL002 |
| li | 658.970k | 1 | 186 | 3a786 | 17705 | VOL002 |
| li | 863.380k | 1 | 251 | 3a786 | 1dd58 | VOL002 |
| li | 1.268M   | 1 | 281 | 3a786 | 1f2b7 | VOL002 |
| li | 1.797M   | 1 | 324 | 3a786 | 23dfa | VOL002 |
| li | 1.144M   | 1 | 401 | 3a786 | 2bb6d | VOL002 |

## Field Descriptions

### ty

The `ty` field displays the Oracle HSM device type. Media-type identifiers are listed in [Appendix A](#) and on the `mcf` man page.

### length

The `length` field displays the length of the file in kilobytes.

### fseq

The `fseq` field displays the file system's user-assigned equipment ordinal number

### ino

The `ino` field displays the inode number of the requested data file.

### position

The `position` field displays the location on the media where the required archive file starts.

### offset

The `offset` field displays the starting location of the requested data file relative to the archive file position.

### vsn

The `vsn` field displays the volume serial number assigned to the media, the keyword `no label` if the volume is not labeled, or a blank if a volume is not loaded or if the device is off.

## wr\_throttle (Set the Maximum Size of Outstanding Writes)

The `wr_throttle` command limits the amount of data that any one file can keep in memory before writing to the Oracle HSM disk family-set device specified by a supplied equipment ordinal number. Throttling keeps outstanding writes from consuming excessive memory.

The default data amount is 5% of the system memory, expressed in kilobytes.

```
:wr_throttle eq value
```

For `eq`, specify the user-assigned Oracle HSM equipment number for a file system.

For `value`, specify an integer number of kilobytes. If `value=0`, there is no limit.

## Command Synopsis

```
:wr_throttle family-set-equipment-number number_kilobytes
```



## Examples

The following example sets the `wr_throttle` value for family set device 100 to 838656 kilobytes (819 megabytes), which is 5% of the 16 gigabytes of memory available on the host system:

```

Mass storage status                                samu                                version time date

ty  eq  status      use  state  ord  capacity      free      ra  part high low
ma  100  m----2---r-  1%  on                    7.270T      7.270T    1M  16    80% 70%
mm  110                    1%  on          0  465.253G    465.231G [975661056 inodes]
mr  120                    1%  on          1   1.817T      1.817T
mr  130                    1%  on          2   1.817T      1.817T
mr  140                    1%  on          3   1.817T      1.817T
mr  150                    1%  on          4   1.817T      1.817T
:
command:wr_throttle 100 838656

```

## writebehind (Set the Write-Behind Parameter)

When issued with the Oracle HSM equipment ordinal number of a disk family-set device, the `writebehind` command specifies the maximum number of bytes that the device should cache in memory before writing data to disk. When correctly configured, write-behind improves file-system performance by writing information in larger, contiguous blocks.

Specify a write-behind value in the range [1-8192] kilobytes. The default is 512 kilobytes.

You can also set a `writebehind` directive in the `samfs.cmd` file. See the `samfs.cmd` man page for details.

## Command Synopsis

```
:writebehind family-set-equipment-number number_kilobytes
```

## Examples

The following example sets the write-behind value for family set device 100 to 1024 kilobytes (1 megabyte):

```

Mass storage status                                samu                                version time date

ty  eq  status      use  state  ord  capacity      free      ra  part high low
ma  100  m----2---r-  1%  on                    7.270T      7.270T    1M  16    80% 70%
mm  110                    1%  on          0  465.253G    465.231G [975661056 inodes]
mr  120                    1%  on          1   1.817T      1.817T
mr  130                    1%  on          2   1.817T      1.817T
mr  140                    1%  on          3   1.817T      1.817T
mr  150                    1%  on          4   1.817T      1.817T
:
command:writebehind 100 1024

```

## wrlease (Set the Write Lease Time for a Shared File System)

Before writing data to a shared file, a host must request and obtain an *write lease* that grants it exclusive access to the file. The `wrlease` command defines the number of seconds during which this lease remains valid on the specified device. If the specified time runs out before the write operation is complete, the host must reacquire the lease before proceeding.

The specified number of seconds must fall in the range [15-600]. The default is 30 seconds.

For related information, see [aplease \(Set Append Lease Expiration Time for a Shared File System\)](#), [rdlease \(Set the Read Lease Time for a Shared File System\)](#), and [lease\\_timeo \(Set the Unused Lease Timeout for a Shared File System\)](#).

### Command Synopsis

```
:wrlease family-set-equipment-number interval_in_seconds
```

### Examples

The following example sets the write lease time to 2 minutes (120 seconds) on family set device 800:

```
File systems                                samu                                version time date

ty  eq  state device_name                    status      high low mountpoint server
ma   800 on   shareqfs1                      m----2c--r-  80% 70% /shareqfs1
mm   801 on   /dev/dsk/c6t50020F2300004655d0s0
mr   802 on   /dev/dsk/c6t50020F2300004655d0s1
ma   810 on   shareqfs2                      m----2c--r-  80% 70% /shareqfs2
mm   811 on   /dev/dsk/c6t50020F2300004655d0s6
mr   812 on   /dev/dsk/c6t50020F2300004655d0s7
:
command:wrlease 800 120
```

## Service and Support Commands

This section lists detailed summaries of `samu` service and support commands in alphabetical order.

### :c (Display the Contents of Shared Memory at a Specified Address)

The C command displays the contents of a specified shared memory address. The screen supplies debugging information that may be needed by Oracle service and support staff.

The command is always issued with a parameter, the specified memory address in hexadecimal notation.

### Command Synopsis

```
:C 0xADDRESS
```

### Examples

The following example shows part of the memory screen output:

```
Memory base: 0x1234567 samu version time date

00000000 05961000 1881c7e0 0891e800 1c9de3bf .....G`..h...c?
00000010 40901020 90350419 207ffd0b d5921020 @.. .5.. }.U..
00000020 00b61000 08a00220 08d07620 287fffff .6... . .Pv (...
00000030 e5d05e20 10921020 00941020 06ba06e0 eP^ ... .. :.`
00000040 4039004b 46d076e0 009006e0 48b80723 @9.KFPv`...`H8.#
00000050 d87ff93c 6f961020 009006e0 50921020 X.y<o.. ...`P..
00000060 00941020 0133004b 467ffb41 11961020 ... .3.KF.{A...
00000070 00901000 1d921020 00941020 022d004b ..... ..-.K

00000080 467ff959 8f961020 00ea06a2 a02f004b F.yY... .j." /.K
00000090 46940663 64f873a8 af9805a3 749605e3 F..cdxs(/..#t..c
000000a0 6cc073a8 b7933d60 00b806a2 a0d05e20 l@s(7.=`.8." P^
000000b0 10ac1020 00b20720 c8400276 039a1020 ,. .2. H@.v...
000000c0 008b3da0 00d076e0 28af2970 03d05dc0 ..= .Pv`(/)p.P]@
000000d0 197ff96a fad25e20 10809000 08024000 ..yjzR^ .....@.
000000e0 08ac05a0 01973da0 0080a2e0 020a6fff ,. ..= .."`.o.
000000f0 f78b3da0 00108000 091b041a b0150419 w.= .....0...
```

## D (Display Disk Volume Dictionary Screen)

The **D** command displays the Disk volume dictionary screen. The screen supplies internal debugging information.

### Command Synopsis

```
D
:D
```

### Controls

You can use the following control keys on this screen:

#### **Ctrl-I (^j)**

Use detailed, two-line display format.

#### **Ctrl-J (^j)**

Toggle between binary and decimal units of size.

### Examples

The following example shows the device configuration screen.

```
Disk volume dictionary      samu          version time date

header
version 460

volumes
magic 340322 version 9 nkeys 2 ndata 2
index  space      capacity  used    flags  volume
   0  12882411520  12887785472  10291200  -----  disk01
   1   6443827200   6443892736    70656  -----  disk02
clients
magic 340322 version 9 nkeys 1 ndata 1
```

### Flags

Disk volume flags are five-character strings in which each character position represents an attribute of the disk volume. Character positions are numbered starting from the left, position 1, and ending at the right, position 5.

To set or clear a disk volume dictionary flag, use the [diskvols \(Set/Clear Flags on Disk Volumes Used for Archiving\)](#) operator command.

The following table defines the possible flag codes for each position in the string:

| Position | Flag  | Meaning   |
|----------|-------|---|
| 1        | 1---- | The volume is labeled; a seqnum file has been created. An administrator set the flag to prevent the software from creating a new seqnum file. |
| 2        | -r--- | The volume is defined on a remote host.   |
| 3        | --U-- | The volume is unavailable.  |
| 4        | ---R- | The volume is read only.  |

| Position | Flag  | Meaning  |
|----------|-------|--|
| 5        | ----E | A media error occurred when writing to the disk archive directory. |

## F (Display Optical Disk Label Screen)

The Optical disk label screen displays the label on an optical disc. Oracle support staff may request that you run this command in support of debugging.

## I (Display Inode Information)

The I command displays the Inode screen for a given mount point. Oracle support staff may request that you run this command in support of debugging.

When issued without a parameter, the I command displays all inodes for the current file-system mount point, starting with Inode 0x1 (1). If a mount point directory is not currently specified, you are prompted for one.

When the command is issued with a decimal or hexadecimal inode number, the command displays the specified inode.

## Command Synopsis

```
I
:I
:I inode-number
:I 0xinode-number
```

## Controls

You can use the following control keys on this screen:

### Ctrl-B (^b)

Move back one inode.

### Ctrl-F (^f)

Move forward one inode.

### Ctrl-K (^k)

Step through the following display formats:

- archive
- raw
- rawincore
- file, Extents (4k displayed as 1k)
- file, Extents (raw)

## Example

The following example shows an abbreviated inode screen for Inode 0x1 (1) in file, Extents (4k displayed as 1k) format:

```
Inode 0x1 (1) format: file      samu      version time date
incore: y
```

```

00008100 mode      -r-----      409cdf57 access_time
00000001 ino        (1)             1d32ea20
00000001 gen        (1)             4096b499 modify_time
00000002 parent.ino (2)             02588660
00000002 parent.gen (2)             4096b499 change_time
00000000 size_u                      02588660
000c0000 size_l      (786432)       4096b443 creation_time
01000000 rm:media/flags               409a8a7c attribute_time
00000000 rm:file_offset               409c0ce6 residence_time
00000000 rm:mau                      00000000 unit/cs/arch/flg
00000000 rm:position                  00000000 ar_flags ...

```

## J (Display the Shared Memory Segment for the Load-Request Preview Queue)

The J command displays the Preview shared memory screen displays the shared memory segment for the removable media load-request preview queue. Oracle support staff may request that you run this command in support of debugging.

### Command Synopsis

```

J
:J
:J 0xMemoryAddress

```

### Controls

#### Ctrl-B (^b)

Move back one page.

#### Ctrl-F (^f)

Move forward one page.

#### Ctrl-D (^d)

Move down the page.

#### Ctrl-U (^u)

Move up the page.

### Sample Display

The following example shows the preview shared memory display. This sample output has been truncated.

```

Preview shared memory size: 155648      samu              version time date

00000000 00040000 00014d58 00000000 00000000 .....MX.....
00000010 00000000 00000000 73616d66 73202d20 .....samfs -
00000020 70726576 69657720 6d656d6f 72792073 preview memory s
00000030 65676d65 6e740000 00026000 00000000 egment.....
00000040 00025fff 00000000 00040000 00014d58 .._.....MX
00000050 00000000 00000000 00000000 00000000 .....
00000060 0000d9e0 00000064 00000000 000001b8 ..Y.....d.....8
00000070 3f800000 447a0000 0000d820 00000008 ?...Dz....X ....

```

## K (Display Kernel Statistics)

The **K** command displays the `Kernel statistics` screen. It shows various statistics for the Oracle HSM kernel module. The screen supplies debugging information that may be needed by Oracle service and support staff.

### Command Synopsis

```
K
:K
```

### Controls

**Ctrl-B (^b)**  
Move back one page.

**Ctrl-F (^f)**  
Move forward one page.

### Examples

The following example shows the kernel statistics display.

```
Kernel statistic          samu          version time date

module: SAM-QFS name: general instance: 0 class: fs
version                  version date time
configured file systems   8
mounted file systems      8
nhino                    16384
ninodes                  129526
inocount                 129527
inofree                   128577
```

## L (Display Shared Memory Tables and System Defaults)

The **L** command displays the `Shared memory tables` screen. It shows shared memory-table attributes and system defaults that are kept in shared memory. The screen supplies debugging information that may be needed by Oracle service and support staff.

### Command Synopsis

```
L
:L
```

### Controls

None.

### Examples

```
Shared memory tables          samu          version time date
```

|                    |                                  |                |       |
|--------------------|----------------------------------|----------------|-------|
| shm ptr            | tbl:                             | defaults:      |       |
| size               | f000 (61440)                     | optical        | mo    |
| left               | 212a (8490)                      | tape           | li    |
| scanner pid        | 12673                            | timeout        | 600   |
| fifo path          | 01a8 /var/opt/SUNWsamfs/previews |                | 100   |
| dev_table          | 01c4                             | stages         | 1000  |
| first_dev          | 0e80                             | log_facility   | 184   |
| scan_mess          | 6260                             | label barcode  | TRUE  |
| preview_shmid      | 83886122                         | barcodes low   | FALSE |
| flags              | 0x40000000                       | export unavail | FALSE |
| preview stages     | 53780                            | attended       | TRUE  |
| preview avail      | 100                              | start rpc      | FALSE |
| preview count      | 0                                | div            | OFF   |
| preview sequence   | 0                                | distio         | OFF   |
| age factor         | 1                                | vsn factor     | 1000  |
| fs tbl ptr         | 0xd1dc                           | fs count       | 1     |
| fseq 10 samfs1     | state 0                          | 0              | 0     |
| fseq 20 samfs2     | state 0                          | 0              | 0     |
| fseq 30 qfs1       | state 0                          | 0              | 0     |
| fseq 40 qfs2       | state 0                          | 0              | 0     |
| fseq 50 qfs3       | state 0                          | 0              | 0     |
| fseq 60 qfs4       | state 0                          | 0              | 0     |
| fseq 100 shareqfs1 | state 0                          | 0              | 0     |
| fseq 110 shareqfs2 | state 0                          | 0              | 0     |

## M (Display Raw Shared Memory)

The M command displays the Shared memory screen. The screen shows the raw shared memory segment at the current address or a specified address. Oracle support staff may request that you run this command in support of debugging.

### Command Synopsis

```
M
:M
:M 0xMemoryAddress
```

### Controls

#### Ctrl-B (^b)

Move back one page.

#### Ctrl-F (^f)

Move forward one page.

#### Ctrl-D (^d)

Move down the page.

#### Ctrl-U (^u)

Move up the page.

### Examples

The following example shows an abbreviated shared memory display.

```
Shared memory    size: 73728          samu          version time date
```



```

00000000 00040000 00014d58 00000000 00000000 .....MX.....
00000010 00000000 00000000 73616d66 73202d20 .....samfs -
00000020 73686172 6564206d 656d6f72 79207365 shared memory se
00000030 676d656e 74000000 00012000 000044c8 gment..... ..DH
00000040 0000dd20 00000000 00000742 00000745 ..] .....B...E
00000050 00000001 00000000 00000000 c0000000 .....@...
00000060 00000001 0001534d 00000000 00000000 .....SM.....
00000070 00000000 00000000 00000000 00000000 .....

00000080 00000000 00000000 00000000 00000000 .....
00000090 20000000 000001b0 000001cc 00000450 .....0...L...P
000000a0 0000cf50 00000001 00000001 4c696365 ..OP.....Lice
000000b0 6e73653a 204c6963 656e7365 206e6576 nse: License nev
000000c0 65722065 78706972 65732e00 00000000 er expires.....
000000d0 00000000 00000000 00000000 00000000 .....
000000e0 00000000 00000000 00000000 00000000 .....
000000f0 00000000 00000000 00000000 00000000 .....

```

## N (Display File System Parameters)

The **N** command displays the File system parameters screen. The screen shows mount-point parameters, the superblock version, and other file system information. Oracle support staff may request that you run this command in support of debugging.

### Command Synopsis

```

N
:N

```

### Controls

#### Ctrl-B (^b)

Move back one stage request.

#### Ctrl-F (^f)

Move forward one stage request.

#### Ctrl-D (^d)

Move down one in the status queue.

#### Ctrl-U (^u)

Move up one in the status queue.

#### Ctrl-I (^i)

Display detailed status interpretations

### Example

| File system Parameters | samu          | version | time date |
|------------------------|---------------|---------|-----------|
| mount_point : /samml   | partial       | :       | 16k       |
| server :               | maxpartial    | :       | 16k       |
| filesystem name: samml | partial_stage | :       | 16384     |
| eq type : 100 ma       | flush_behind  | :       | 0         |

```

state version :    0    2          stage_flush_beh: 0
(fs,mm)_count :    3    1          stage_n_window : 8388608
sync_meta     : 0                stage timeout  : 0
atime         : default          dio_consec r,w :    0    0
stripe        : 2                dio_frm_min r,w: 256 256
mm_stripe     : 1                dio_ill_min r,w:    0    0
high low      : 50% 30%          ext_bsize     : 4096
readahead     : 1048576          def_retention  : 43200
writebehind   : 524288
wr_throttle   : 214725632
rd_ino_buf_size: 16384
wr_ino_buf_size: 512
maxphys       : ccc7400
config        : 0x0c08500c        config1      : 0x00000050
status        : 0x00000001        mflag       : 0x00000044
                                   : WORM Emulation Lite mode

```

#### Device configuration:

| ty | eq  | state | device_name              | fs  | family_set |
|----|-----|-------|--------------------------|-----|------------|
| mm | 101 | on    | /dev/zvol/dsk/dpool/vol1 | 100 | sammal     |
| md | 103 | on    | /dev/zvol/dsk/dpool/vol2 | 100 | sammal     |
| md | 104 | on    | /dev/zvol/dsk/dpool/vol3 | 100 | sammal     |

## P (Display Active Services)

The P command displays the Active Services screen lists the services registered with the Oracle HSM single port multiplexer. Oracle support staff may request that you run this command in support of debugging.

## Command Synopsis

```

P
:P

```

## Controls

### Ctrl-B (^b)

Move back one page.

### Ctrl-F (^f)

Move forward one page.

## Examples

The following example shows the active services display.

```

Active Services          samu          version time date

Registered services for host 'server1':
  sharedfs.qfs2
  sharedfs.qfs1
  2 services registered.

```

## R (Display SAM-Remote Configuration Information)

The **R** command displays the **SAM-Remote** screen, which shows the status of SAM-Remote configurations. Oracle support staff may request that you run this command in support of debugging.

## s (Display Raw Sector Data)

The **S** command **sector data** screen displays raw device data. Oracle support staff may request that you run this command in support of debugging.

When issued without a parameter, the **S** command displays sector data for the currently open device or prompts you to issue an open command if no device is open. When the command is issued with a user-assigned Oracle HSM equipment ordinal number, the command displays sector data for the specified device.

## Command Synopsis

```
S
:S
:S equipment-number
```

## Controls

### Ctrl-B (^b)

Move back one page.

### Ctrl-F (^f)

Move forward one page.

### Ctrl-D (^d)

Move down the page.

### Ctrl-U (^u)

Move up the page.

### Ctrl-K (^k)

Step through the following display formats:

- raw
- inode
- archive
- label
- sblk

## Examples

The following example shows an abbreviated **raw** data view for equipment ordinal **12**:

```
Sector:  00000012 (18)      raw      samu      version time date

00000000  00000000 00000000 00000000 00000000  .....
00000010  00000000 00000000 00000000 00000000  .....
00000020  00000000 00000000 00000000 00000000  .....
...
```

## T (Display SCSI Sense Data for a Current or Specified Device)

The `T` command displays SCSI sense data screen. The screen shows the SCSI status of a current or specified SCSI device. Oracle support staff may request that you run this command in support of debugging.

When issued without a parameter, the `T` command displays SCSI sense data for the currently open device or returns `No sense data available` if no device is open.

When the command is issued with a user-assigned Oracle HSM equipment ordinal number, the command displays SCSI sense data for the specified device, if available, or returns `No sense data available`.

### Command Synopsis

```
T
:T
:T equipment-number
```

### Controls

#### **Ctrl-B (^b)**

Move back one equipment ordinal number.

#### **Ctrl-F (^f)**

Move forward one equipment ordinal number.

### Examples

This example shows some of the sense data returned by a drive with equipment ordinal number 101:

```
SCSI sense data eq: 101 addr: 0xADDRESS      samu          version time date

Sense data:                                Additional sense bytes:
00      valid/code: not VALID                [18] 00000000
00      segment                             [22] 00000000
00      fmk/eqm/ili/key:No Sense             [26] 00000000
00000000 info[0-3]                           [30] 00000000
      00 add_len ...
```

## U (Display Device Table in Human-Readable Form)

The `U` command displays the `Device` table as a human-readable screen.

When issued without a parameter, the `U` command displays the device table for the device with the lowest, user-defined Oracle HSM equipment ordinal number or the most recently specified ordinal number.

When the command is issued with an equipment ordinal number, the command displays the device table for the specified device.

## Command Synopsis

```
U
:U
:U equipment-number
```

## Controls

### Ctrl-B (^b)

Move back one equipment ordinal number.

### Ctrl-F (^f)

Move forward one equipment ordinal number.

## Examples

The following example shows part of the device table for equipment ordinal **101**, a tape drive:

```
Device table: eq: 803   addr: 000043e0   samu           version time date

message: empty
Inquiry: HP           Ultrium 4-SCSI   rev:          A3K6 serial: 10000033

4d58000100000004 0000000000000000          0000003c delay
0000000000000000 mutex                    0000000f unload_delay
00004b80 next                               00000000 mtime
386c7476 set:  vtl800                      0000000a scan_tid
00003030                               ffffffff slot
00000000                               00000000 eod_position
00000000                               00000000 stage position
03230320 eq/fseq                          00000000 next_read
02110211 type/equ_type                    00040000 def blk-size
0000      state                          00000708 pos timeout
00000000 st_rdev                          00000000 max blksize
0000002e ord/model                        9184e72a dflt cap
0000c2e8 mode_sense                      00000000 drvblkksz
0000c0c0 sense                           00000000 fsn
00000000 space                           ffffffff mask
00000000 capacity                        0000 drv indx
00000000 active                          00 medium
00000000 open
00004000 sector_size
00000000 label_address
00000000 vsn:
00000000 Wed Dec 31 17:00:00 1969
00000000
00000000
00020000 status: -----p
00000000 samnm:
7665642f name: /dev/rmt/2cbn
```



---

## Glossary of Equipment Types

The value of the `Equipment Type` field of the Master Configuration File (`mcf`) identifies devices and device configurations within the Oracle Hierarchical Storage Manager and StorageTek QFS Software. Equipment types are specified as two-character codes. This glossary lists the codes for quick reference when working with the samples or when interpreting an existing `mcf` (for full details see the `mcf(4)` man page).

For convenience, the codes are divided into three sections and then listed alphabetically:

- [Recommended Equipment and Media Types](#)
- [Other Equipment and Media Types](#)

### Recommended Equipment and Media Types

This section describes all of the equipment codes that you normally need: the generic equipment codes (`rb`, `tp`, and `od`) and codes for identifying network-attached library interfaces and the Oracle HSM historian.

The generic equipment codes `rb`, `tp`, and `od` are the preferred equipment type codes for all SCSI-attached libraries, tape drives, and optical disk devices. When you specify a generic equipment type, Oracle HSM can automatically set the correct type based on SCSI vendor codes.

#### **gXXX**

Where `XXX` is an integer in the range [0-127], a striped group of disk devices that is part of an `ma` disk-cache family set.

#### **hy**

The Oracle HSM historian, an optional, virtual library that maintains a media catalog, but has no associated hardware. Used for tracking exported media.

#### **ma**

A high-performance QFS file system that maintains file-system metadata on one or more dedicated `mm` disk devices. File data resides on separate `md`, `mr`, or `gXXX` data devices.

#### **md**

A disk device that stores file data for an `ma` file system or data and metadata for an `ms` file system. `md` devices store file data in small, 4-kilobyte Disk Allocation Units (DAUs) and large, 16-, 32-, or 64-kilobyte DAUs. The default DAU is 64-kilobytes.

#### **mm**

A disk device that stores file-system metadata for a high-performance `ma` file system.

**mr**

A disk device that stores file data for an `ma` file system. `mr` devices store file data in large, fully adjustable Disk Allocation Units (DAUs) that are multiples of 8 kilobytes in the range 8-65528 kilobytes. The default DAU is 64 kilobytes.

**ms**

A Oracle HSM file system that maintains file-system metadata on the same devices that store file data.

**od**

Any SCSI-attached optical disk. Oracle HSM sets the appropriate equipment type automatically using the SCSI vendor code.

**rb**

Any SCSI-attached tape library. Oracle HSM sets the appropriate equipment type automatically using the SCSI vendor code.

**rd**

The SAM-Remote pseudo-device. In the Master Configuration File (`mcf`), the corresponding `Equipment Identifier` field has to contain the path to the pseudo-device (such as `/dev/samrd/rd2`). The corresponding `Family Set` field has to contain the hostname of the SAM-Remote server.

**sc**

A SAM-Remote client system. In the Master Configuration File (`mcf`), the corresponding `Equipment Identifier` field has to contain the path the SAM-Remote client-configuration file for the client. The corresponding `Family Set` field has to contain the family set name of the server. The `Additional Parameters` field must contain the full path to the client's library catalog file.

**sk**

An Oracle StorageTek ACSLS interface to a network-attached library. In the Master Configuration File (`mcf`), the corresponding `Equipment Identifier` field has to contain the path to the parameters file for the ACSLS interface. For more information, see the `stk(7)` man page.

**ss**

A SAM-Remote server. In the Master Configuration File (`mcf`), the corresponding `Equipment Identifier` field has to contain the path to the SAM-Remote server-configuration file. The corresponding `Family Set` field has to contain the family set name of the server, which must match the name used in the `Family Set` field of the `mcf` on the client.

**tp**

Any SCSI-attached tape drive. Oracle HSM sets the appropriate equipment type automatically using the SCSI vendor code. No, however, that if you do use more specific equipment codes such as `li` and `ti`, you must do so consistently. If you specify `li` (LTO) tape equipment in the `mcf` file, for example, you cannot refer to the same equipment as `tp` equipment in the `archiver.cmd` file

## Other Equipment and Media Types

The equipment types listed in this section are also supported.

Note that, in most cases, Oracle recommends identifying SCSI-attached libraries, tape drives, and optical disk devices using the generic equipment types `rb`, `tp`, and `od`. The generic equipment types tell Oracle HSM to identify the hardware dynamically, using



SCSI vendor IDs. The type codes below are essential when migrating from one media type to another and may sometimes be useful for management purposes. But using them in a Master Configuration File (`mcf`), for example, hard-codes a static equipment configuration that may, at some point, no longer match the actual hardware.

**ac**

A Sun 1800, 3500, or L11000 tape library.

**at**

A Sony AIT-4 or AIT-5 tape drive.

**cy**

A Cygnet optical disk library.

**d3**

A StorageTek D3 tape drive.

**dm**

A Sony DMF library.

**ds**

A DocuStore or Plasmon optical disk library.

**dt**

A DAT 4-mm tape drive.

**e8**

An Exabyte X80 library.

**fd**

A Fujitsu M8100 128-track tape drive.

**h4**

An HP SL48 or SL24 library.

**hc**

An Hewlett Packard L9-/L20-/L60-series library.

**i7**

An IBM 3570 tape drive.

**ic**

An IBM 3570 media changer.

**il**

An IBM 3584 tape library.

**li**

An LTO-3 or later tape drive.

**lt**

A Digital Linear Tape (DLT), Super DLT, or DLT-S4 tape drive.

**me**

A Metrum library.

**mf**

An IBM Multi Function optical drive.

**mo**

A 5.25-in erasable optical drive.

**o2**

A 12-in WORM drive.

**ov**

An Overland Data Inc. Neo Series tape library.

**pd**

A Plasmon D-Series DVD-RAM library.

**q8**

A Qualstar 42xx, 62xx, or 82xx library.

**s3**

A StorageTek SL3000 library.

**s9**

An Oracle StorageTek 97xx series library.

**se**

A StorageTek 9490 tape drive.

**sf**

A StorageTek T9940 tape drive.

**sg**

A StorageTek 9840C or later tape drive.

**sl**

A Spectra Logic or Qualstar tape library.

**st**

A StorageTek 3480 tape drive.

**ti**

A StorageTek T10000 (Titanium) tape drive.

**vt**

A Metrum VHS (RSP-2150) tape drive.

**wo**

A 5.25-in optical WORM drive.

**xt**

An Exabyte (850x) 8-mm tape drive.

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## Product Accessibility Features

Users with low vision, blindness, color blindness, or other visual impairments can access the Oracle Hierarchical Storage Manager and StorageTek QFS Software (Oracle HSM) via the commandline interface. This text-based interface is compatible with screen readers, and all functions are controlled using a keyboard.



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# Glossary

This glossary focuses on terms specific to Oracle HSM software and file systems. For industry standard definitions, please refer to the dictionary maintained by the Storage Networking Industry Association at <http://www.snia.org/education/dictionary/>.

## **addressable storage**

The storage space encompassing online, nearline, offsite, and offline storage that is user-referenced through an Oracle HSM file system.

## **admin set ID**

A storage administrator-defined set of users and/or groups that share common characteristics. Admin sets are typically created to administer storage for projects that involve users from several groups and span multiple files and directories.

## **archival media**

The media to which an archive file is written. Archival media includes both removable tape or magneto-optical cartridges and disk file systems configured for archiving.

## **archival storage**

Data storage space created on archival media.

## **archive set**

An archive set identifies a group of files to be archived, and the files share common criteria that pertain to the size, ownership, group, or directory location. Archive sets can be defined across any group of file systems.

## **archiver**

The archive program that automatically controls the copying of files to removable cartridges.

## **associative staging**

Staging a group of related files when any one member of the group is staged. When files inhabit the same directory and are frequently used together, file owners can associate them by setting the Oracle HSM associative-staging file attribute. Then if any files in the group are offline when one of them is accessed by an application, Oracle HSM stages the entire group from archival media to disk cache. This insures that all needed files re available at the same time.

## **audit (full)**

The process of loading cartridges to verify their VSNs. For magneto-optical cartridges, the capacity and space information is determined and entered into the automated

library's catalog. See [volume serial number \(VSN\)](#).

### **automated library**

A robotically controlled device designed to automatically load and unload removable media cartridges without operator intervention. An automated library contains one or more drives and a transport mechanism that moves cartridges to and from the storage slots and the drives.

### **backup**

A snapshot of a collection of files for the purpose of preventing inadvertent loss. A backup includes both the file's attributes and associated data.

### **block allocation map**

A bitmap representing each available block of storage on a disk and indicating whether the block is in use or free.

### **block size**

The size of the smallest addressable data unit on a block device, such as a hard disk or magnetic tape cartridge. On disk devices, this is equivalent to the *sector size*, which is typically 512 bytes.

### **cartridge**

A container for data-storage media, such as magnetic tape or optical media. Also called a [volume](#), *tape*, or *piece of media*. See [volume serial number \(VSN\)](#).

### **catalog**

A record of the removable media volumes in an automated library. There is one catalog for each automated library and, at a site, there is one historian for all automated libraries. Volumes are identified and tracked using a [volume serial number \(VSN\)](#).

### **client-server**

The model of interaction in a distributed system in which a program at one site sends a request to a program at another site and awaits a response. The requesting program is called the client. The program satisfying the response is called the server.

### **connection**

The path between two protocol modules that provides reliable stream delivery service. A TCP connection extends from a TCP module on one machine to a TCP module on the other.

### **data device**

In a file system, a device or group of devices upon which file data is stored.

### **DAU**

See [disk allocation unit \(DAU\)](#).

### **device logging**

A configurable feature that provides specific error information for the hardware devices that support a Oracle HSM file system.

**device scanner**

Software that periodically monitors the presence of all manually mounted removable devices and that detects the presence of mounted cartridges that can be requested by a user or other process.

**direct access**

A file attribute (stage never) designating that a nearline file can be accessed directly from the archive media and need not be retrieved to disk cache.

**direct attached library**

An automated library connected directly to a server using a SCSI interface. A SCSI-attached library is controlled directly by the Oracle HSM software.

**direct I/O**

An attribute used for large block-aligned sequential I/O. The `setfa` command's `-D` option is the direct I/O option. It sets the direct I/O attribute for a file or directory. If applied to a directory, the direct I/O attribute is inherited.

**directory**

A file data structure that points to other files and directories within the file system.

**disk allocation unit (DAU)**

In Oracle HSM file systems, the minimum amount of contiguous space that each I/O operation consumes, regardless of the amount of data written. The disk allocation unit thus determines minimum number of I/O operations needed when transferring a file of a given size. It should be a multiple of the [block size](#) of the disk device.

Disk allocation unit vary depending upon the Oracle HSM device type selected and user requirements. The `md` device type uses dual-allocation units: the DAU is 4 kilobytes for the first eight writes to a file and then a user-specified 16, 32, or 64 kilobytes for any subsequent writes, so that small files are written in suitably small blocks, while larger files are written in larger blocks. The `mr` and [striped group](#) device types use a DAU that is adjustable in increments of 8 within the range [8-65528] kilobytes. Files are thus written in large, uniform blocks that can closely approximate the size of the large, uniformly sized files.

**disk buffer**

In a SAM-Remote configuration, the buffer on the server system that is used for archiving data from the client to the server.

**disk cache**

The disk-resident portion of the file system software, used to create and manage data files between online disk cache and archive media. Individual disk partitions or an entire disk can be used as disk cache.

**disk space threshold**

The maximum or minimum level of disk cache utilization, as defined by an administrator. The releaser controls disk cache utilization based on these predefined disk space thresholds.

**disk striping**

The process of recording a file across several disks, thereby improving access performance and increasing overall storage capacity. See also [striping](#).

**drive**

A mechanism for transferring data to and from a removable media volume.

**Ethernet**

A packet-switched local-area network technology.

**extent array**

The array within a file's inode that defines the disk location of each data block assigned to the file.

**family device set**

See [family set](#).

**family set**

A logical grouping of independent physical devices, such as a collection of disks or the drives within an automated library. See also [storage family set](#).

**FDDI**

Fiber-distributed data interface, a standard for data transmission in a local area network that can extend in range up to 200 km (124 miles). The FDDI protocol is based on the token ring protocol.

**Fibre Channel**

The ANSI standard that specifies high-speed serial communication between devices. Fibre Channel is used as one of the bus architectures in SCSI-3.

**file system**

A hierarchical collection of files and directories.

**file-system-specific directives**

Archiver and releaser directives that follow global directives in the `archiver.cmd` file, are specific to a particular file system, and begin with `fs =`. File-system-specific directives apply until the next `fs =` directive line or the end of file is encountered. If multiple directives affect a file system, the file-system-specific directives override the global directives.

**ftp**

File Transfer Protocol, a network protocol for transferring files between two hosts. For a more secure alternative, see [sftp](#).

**global directives**

Archiver and releaser directives that apply to all file systems and that appear before the first `fs=` line.

**grace period**

In a [quota](#), the amount of time that the file system allows the total size of files belonging to specified user, group, and/or [admin set IDs](#) to exceed the [soft limit](#) specified in the quota.

**hard limit**

In a [quota](#), the absolute maximum quantity of storage resources that specified user, group, and/or [admin set IDs](#) can consume. See [soft limit](#).



**high-water mark**

1. In an archiving file system, the percentage disk-cache utilization at which Oracle HSM file systems start the releaser process, deleting previously archived files from disk. A properly configured high-water mark insures that the file system always has enough space available for new and newly staged files. For more information, see the `sam-releaser` and `mount_samfs` man pages. Compare [low-water mark](#).
2. In a removable media library that is part of an archiving file system, the percentage media-cache utilization that starts the recycler process. Recycling empties partially full volumes of current data so that they can be replaced by new media or relabeled.

**historian**

The Oracle HSM historian is a catalog of volumes that have been exported from automated media libraries that are defined in the `/etc/opt/SUNWsamfs/mcf` file. By default, it is located on the Oracle HSM file-system host at `/var/opt/SUNWsamfs/catalog/historian`. For details, see the Oracle HSM `historian` man page.

**hosts file**

The hosts file contains a list of all of the hosts in a shared file system. If you are initializing a file system as a Oracle HSM shared file system, the hosts file, `/etc/opt/SUNWsamfs/hosts.fs-name`, must be created before the file system is created. The `sammkfs` command uses the hosts file when it creates the file system. You can use the `samsharefs` command to replace or update the contents of the hosts file at a later date.

**indirect block**

A disk block that contains a list of storage blocks. File systems have up to three levels of indirect blocks. A first-level indirect block contains a list of blocks used for data storage. A second-level indirect block contains a list of first-level indirect blocks. A third-level indirect block contains a list of second-level indirect blocks.

**inode**

Index node. A data structure used by the file system to describe a file. An inode describes all the attributes associated with a file other than the name. The attributes include ownership, access, permission, size, and the file location on the disk system.

**inode file**

A special file (`.inodes`) on the file system that contains the inode structures for all files resident in the file system. Inodes are 512 bytes long. The inode file is a metadata file, which is separated from file data in the file system.

**kernel**

The program that provides basic operating system facilities. The UNIX kernel creates and manages processes, provides functions to access the file system, provides general security, and supplies communication facilities.

**LAN**

Local area network.

**lease**

A function that grants a client host permission to perform an operation on a file for a specified period of time. The metadata server issues leases to each client host. The leases are renewed as necessary to permit continued file operations.

**library**

See [automated library](#).

**library catalog**

See [catalog](#).

**local file system**

A file system that is installed on one node of a Solaris Cluster system and is not made highly available to another node. Also, a file system that is installed on a server.

**low-water mark**

In an archiving file system, the percentage disk-cache utilization at which Oracle HSM file systems stops the releaser process and stops deleting previously archived files from disk. A properly configured low-water mark insures that the file system retains as many file in cache as possible, for best performance, while making space available for new and newly staged files. For more information, see the `sam-releaser` and `mount_samfs` man pages. Compare [high-water mark](#).

**LUN**

Logical unit number.

**mcf**

Master Configuration File. The file that is read at initialization time that defines the relationships between the devices (the topology) in a file system environment.

**media**

Tape or optical disk cartridges.

**media recycling**

The process of recycling or reusing archive media with few active files.

**metadata**

Data about data. Metadata is the index information used to locate the exact data position of a file on a disk. It consists of information about files, directories, access control lists, symbolic links, removable media, segmented files, and the indexes of segmented files.

**metadata device**

A device (for example, a solid-state disk or mirrored device) upon which file system metadata is stored. Having file data and metadata on separate devices can increase performance. In the `mcf` file, a metadata device is declared as an `mm` device within an `ma` file system.

**mirror writing**

The process of maintaining two copies of a file on disjointed sets of disks to prevent loss from a single disk failure.

**mount point**

The directory on which a file system is mounted.

**multireader file system**

A single-writer, multireader capability that enables you to specify a file system that can be mounted on multiple hosts. Multiple hosts can read the file system, but only one host can write to the file system. Multiple readers are specified with the `-o reader` option with the `mount` command. The single-writer host is specified with the `-o writer` option with the `mount` command. For more information, see the `mount_samfs` man page.

**name space**

The metadata portion of a collection of files that identifies the file, its attributes, and its storage locations.

**nearline storage**

Removable media storage that requires robotic mounting before it can be accessed. Nearline storage is usually less expensive than online storage, but it takes somewhat longer to access.

**network attached automated library**

A library, such as those from StorageTek, ADIC/Grau, IBM, or Sony, that is controlled using a software package supplied by the vendor. The QFS file system interfaces with the vendor software using a Oracle HSM media changer daemon designed specifically for the automated library.

**NFS**

Network file system, a file system that provides transparent access to remote file systems on heterogeneous networks.

**NIS**

Network Information Service, a distributed network database containing key information about systems and users on the network. The NIS database is stored on the master server and all slave servers.

**offline storage**

Storage that requires operator intervention for loading.

**offsite storage**

Storage that is remote from the server and is used for disaster recovery.

**online storage**

Storage that is immediately available, such as disk cache storage.

**Oracle HSM**

1. A common abbreviation for Oracle Hierarchical Storage Manager.
2. An adjective describing a [QFS](#) file system that is configured for archiving and managed by Oracle HSM software.

**partition**

A portion of a device or a side of a magneto-optical cartridge.

**preallocation**

The process of reserving a contiguous amount of space on the disk cache for writing a file. Preallocation can be specified only for a file that is size zero. For more information, see the `setfa` man page.

**pseudo device**

A software subsystem or driver with no associated hardware.

**QFS**

The Oracle HSM QFS Software product, a high-performance, high-capacity, UNIX file system that can be used on its own or as an archiving file system controlled by Oracle Hierarchical Storage Manager.

**qfsdump**

See [samfsdump \(qfsdump\)](#).

**qfsrestore**

See [samfsrestore \(qfsrestore\)](#).

**quota**

The amount of storage resources that specified user, group, or [admin set IDs](#) are allowed to consume. See [hard limit](#) and [soft limit](#).

**RAID**

Redundant array of independent disks. A disk technology that uses several independent disks to reliably store files. It can protect against data loss from a single disk failure, can provide a fault-tolerant disk environment, and can provide higher throughput than individual disks.

**recovery point**

A compressed file that stores a point-in-time backup copy of the metadata for a Oracle HSM file system.

In the event of a data loss—anything from accidental deletion of a user file to catastrophic loss of a whole file system—an administrator can recover to the last known-good state of the file or file system almost immediately by locating the last recovery point at which the file or file system remained intact. The administrator then restores the metadata recorded at that time and either stages the files indicated in the metadata to the disk cache from archival media or, preferably, lets the file system stage files on demand, as users and applications access them.

**recycler**

A Oracle HSM utility that reclaims space on cartridges that is occupied by expired archive copies.

**regular expression**

A string of characters in a standardized pattern-matching language that is designed for searching, selecting, and editing other character strings, such as file names and configuration files. For full details of the regular expression syntax used in Oracle HSM file-system operations, see the Oracle HSM Solaris `regex` and `regcmp` man pages.

**release priority**

The priority according to which a file in a file system is released after being archived. Release priority is calculated by multiplication of various weights of file properties and then summation of the results.

**releaser**

A Oracle HSM component that identifies archived files and releases their disk cache copies, thus making more disk cache space available. The releaser automatically regulates the amount of online disk storage according to high and low thresholds.

**remote procedure call**

See [RPC](#).

**removable media file**

A special type of user file that can be accessed directly from where it resides on a removable media cartridge, such as magnetic tape or optical disk cartridge. Also used for writing archive and stage file data.

**robot**

An [automated library](#) component that moves cartridges between storage slots and drives. Also called a [transport](#).

**round-robin**

A data access method in which entire files are written to logical disks in a sequential fashion. When a single file is written to disk, the entire file is written to the first logical disk. The second file is written to the next logical disk, and so on. The size of each file determines the size of the I/O. See also [disk striping](#) and [striping](#).

**RPC**

Remote procedure call. The underlying data exchange mechanism used by NFS to implement custom network data servers.

**SAM**

A common abbreviation for Storage Archive Manager, the former name of the Oracle Hierarchical Storage Manager product.

**SAM-Remote client**

An Oracle HSM system with a client daemon that contains a number of pseudodevices, and can also have its own library devices. The client depends on a SAM-Remote server for archive media for one or more archive copies.

**SAM-Remote server**

Both a full-capacity Oracle HSM storage management server and a SAM-Remote server daemon that defines libraries to be shared among SAM-Remote clients.

**SAM-QFS**

1. A common abbreviation for older versions of the Oracle Hierarchical Storage Manager product.
2. An adjective describing a [QFS](#) file system that is configured for archiving and managed by Oracle HSM software.

**samfsdump (qfsdump)**

A program that creates a control structure dump and copies all the control structure information for a given group of files. It does not generally copy file data. With the `-U` option, the command also copies data files. If the Oracle Hierarchical Storage Manager packages are not installed, the command is called `qfsdump`.

**samfsrestore (qfsrestore)**

A program that restores inode and directory information from a control structure dump. See also [samfsdump \(qfsdump\)](#).

**SAN**

Storage Area Network.

**SCSI**

Small Computer System Interface, an electrical communication specification commonly used for peripheral devices such as disk and tape drives and automated libraries.

**seeking**

Moving the read/write heads of a disk device from one disk location to another during random-access I/O operations.

**shared hosts file**

When you create a shared file system, the system copies information from the hosts file to the shared hosts file on the metadata server. You update this information when you issue the `samsharefs -u` command

**Small Computer System Interface**

See [SCSI](#).

**soft limit**

In a [quota](#), the maximum amount of storage space that a specified user, group, and/or [admin set IDs](#) can fill for an indefinite period. Files can use more space than the soft limit allows, up to the hard limit, but only for a short [grace period](#) defined in the quota. See [hard limit](#).

**sftp**

Secure File Transfer Protocol, a secure implementation of [ftp](#) based on [ssh](#).

**ssh**

Secure Shell, an encrypted network protocol that allows secure, remote command-line login and command execution.

**staging**

The process of copying a nearline or offline file from archive storage back to online storage.

**Storage Archive Manager**

The former name of the Oracle Hierarchical Storage Manager product.

**storage family set**

A set of disks that are collectively represented as a single logical device.

**storage slots**

Locations inside an automated library in which cartridges are stored when not being used in a drive.

**stripe size**

The number of disk allocation units (DAUs) to be allocated before writing proceeds to the next device of a stripe. If the `stripe=0` mount option is used, the file system uses round-robin access, not striped access.

**striped group**

A collection of devices within a file system that is defined in the `mcf` file as one or more `gXXX` devices. Striped groups are treated as one logical device and are always striped with a size equal to the disk allocation unit (DAU).

**striping**

A data access method in which files are simultaneously written to logical disks in an interlaced fashion. Oracle HSM file systems provide two types of striping: "hard striping," using stripe groups, and "soft striping," using the `stripe=x` mount parameter. Hard striping is enabled when a file system is set up, and requires the definition of stripe groups within the `mcf` file. Soft striping is enabled through the `stripe=x` mount parameter, and can be changed for the file system or for individual files. It is disabled by setting `stripe=0`. Hard and soft striping can both be used if a file system is composed of multiple stripe groups with the same number of elements. See also [round-robin](#).

**SUNW.qfs**

A Solaris Cluster resource type that supports Oracle HSM shared file systems. The `SUNW.qfs` resource type defines failover resources for the shared file system's metadata server (MDS)

**superblock**

A data structure in the file system that defines the basic parameters of the file system. The superblock is written to all partitions in the storage family set and identifies the partition's membership in the set.

**tar**

Tape archive. A standard file and data recording format used for archive images.

**TCP/IP**

Transmission Control Protocol/Internet Protocol. The internet protocols responsible for host-to-host addressing and routing, packet delivery (IP), and reliable delivery of data between application points (TCP).

**timer**

Quota software that keeps track of the period starting when a user reaches a soft limit and ending when the hard limit is imposed on the user.

**transport**

See [robot](#).

**vfstab file**

The `vfstab` file contains mount options for the file system. Mount options specified on the command line override those specified in the `/etc/vfstab` file, but mount options specified in the `/etc/vfstab` file override those specified in the `smfs.cmd` file.

**volume**

1. On storage media, a single, accessible, logical storage area, usually addressed by a **volume serial number (VSN)** and/or volume label. Storage disks and magnetic tape cartridges can hold one or more volumes. For use, volumes are *mounted* on a file system at a specified **mount point**.
2. A magnetic tape **cartridge** that holds a single logical volume.
3. On a random-access disk device, a file system, directory or file that is configured and used as if it were a sequential-access, removable-media cartridge, such as a tape.

**volume overflow**

A capability that enables the system to span a single file over multiple **volumes**. Volume overflow is useful for sites using very large files that exceed the capacity of their individual cartridges.

**volume serial number (VSN)**

1. A serial number assigned to a tape or disk storage volume. A volume serial number can consist of up to six uppercase, alphanumeric characters, must start with a letter, and must identify the volume uniquely within a given context, such a tape library or partition. The volume serial number is written on the volume label.
2. Loosely, a specific storage **volume**, especially a removable media **cartridge**.

**WORM**

Write-Once-Read-Many. A storage classification for media that can be written only once but read many times.