Sun StorEdge™ QFS and Sun StorEdge SAM-FS™ 4.1 Release Notes

Release 4.1

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Contents

Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 Release Notes

The Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 releases incorporate design changes, feature changes, and function enhancements. These releases also include fixes to the software. System administrators and programmers who are familiar with these software products will see changes that can affect daily operations and can affect automated scripts written to co-exist with this software. For these reasons, Sun Microsystems recommends that you study these release notes prior to upgrading to the Sun StorEdge QFS or Sun StorEdge SAM-FS 4.1 releases.

If you are installing this product's base release and its software patches, Sun Microsystems recommends that you study these release notes and the patch README files that are distributed with the software patches. The patch README files contain information that supplements the information in this document.

You can obtain a copy of the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 software through Sun Microsystems or through your authorized service provider.

Features in this Release

The following sections describe the new features in this release.

New Device Support

This release added support for the following new devices:

- Add IBM 3592 tape support to the IBM 3494 automated library.
- Sony PetaSite/S-AIT automated library.

- StorageTek SL8500 automated library.
- Overland Data, Inc., Neo Series automated tape library.
- Sony Super AIT drive. A new media type, `sa`, was added for the Sony Super AIT drive. It is qualified as a standalone, manually loaded drive.
- StorageTek T9840C drive. The media type is `sg`, which is the same as the media type of the other StorageTek 9840 drives.
- StorageTek T9940B drive.
- Hewlett-Packard Ultrium 2 (LTO-2) drive.
- Quantum SDLT320 drive.
- IBM Ultrium 2 (LTO-2). This drive requires firmware 38D0 or greater.
- IBM 3590H drive.

TapeAlerts

TapeAlert support was added for direct-attached libraries and tape drives. For more information, see the `tapealert`(1M) man page.

ACSLS Support Enhancements

The Sun StorEdge SAM-FS 4.1 release added support for ACSLS 6.1, 6.1.1, and the Sun Solaris™ operating system (OS) version of ACSLS 7.0 and 7.1. As of this release, the Sun StorEdge SAM-FS software supports one-step export of media from ACSLS-attached libraries. For more information, see the `export`(1M) man page. The cartridge access port (CAP) must be in manual mode to support this feature.

Large Device Support (Extensible Firmware Interface (EFI) Labels)

This release added support in the Sun StorEdge QFS and Sun StorEdge SAM-FS software for SCSI devices and Solaris Volume Manager volumes larger than 1 terabyte. The file system must be built using 4.1 software. It is not possible to grow an existing file system onto large devices.

Continuous Archiving

This release completed the implementation of continuous archiving. Continuous archiving was accomplished by replacing the `sam-arfind` file system scanning mechanism with a file system change detection mechanism. Each file system has a `sam-arfind` daemon executing a system call and requesting work. As files are created or modified, the file system notifies `sam-arfind`. The `sam-arfind` daemon determines the archive requirements for the file as defined in the archiver command file, `archiver.cmd`(4).

If the file is to be archived, the directory containing the file and the time for the archive action is recorded in a *ScanList* to be acted upon later. The earliest time for archive action is also kept. When this time is reached, the following occur:

- The ScanList is sorted by time.
- The directories containing files to be archived are scanned.
- The files are scheduled for archiving.

The ScanList is a file. It is mapped and kept in the archiver data directory for the file system. You can see the ScanList in the `showqueue`(1M) command's output.

Continuous archiving yields noticeable performance improvements for file systems containing large numbers of files, for example those with greater than 1,000,000 files. These file systems require long times to scan, sometimes several days. In most situations that involve large numbers of files, most of the files never need archive activity; the files were archived in the past and never change. Continuous archiving avoids scanning directories and the `.inodes` file, so these large file systems pose no burden on the archiver.

In the event of a system crash or an unexpected stoppage of `sam-arfind` processing, the software initiates a full directory scan as a background activity.

The `samu`(1M) utility's `arrestart` command causes all archiver work-in-progress to be discarded and initiates a full file system scan.

Continuous archiving is enabled by default. If you do not want to use continuous archiving, specify the `examine=scan` directive in the archiver command file, `archiver.cmd`(4).

Controlling how the Archiver Examines a File System

This release provides file system scanning alternatives. You can use the `examine=`*method* directive in the `archiver.cmd` file to specify the file system examination mode, as follows:

- If *method* is `scan`, a traditional (pre-4.1) scan is used. The first scan is a directory scan, and all successive scans are inode scans.
- If *method* is `scandirs`, all scans are directory scans. If the examine method is `scandirs` and the archiver finds a directory with the `archive`(1) `-n` (no archive) attribute set, that directory is not scanned. The no archive attribute allows you to identify directories and subdirectories that contain files for which no more archiving is needed. These could be read-only files that have already been archived, for example. Using the no archive attribute to identify files and subdirectories for which all archive copies have been made can dramatically reduce the work required to examine a file system.
- If *method* is `scaninodes`, all scans are inode scans.
- If *method* is `noscan`, directories are scanned when the content changes and archiving is required.

The `samu`(1M) utility's `arscan` *fsname*[`.`*directory* | `..inodes`] [*delay*] command causes the archiver to scan a file system. If this command is specified with no options, the system scans the file system recursively from the root. Specifying the `.inodes` option causes an inodes scan. The *directory* option specifies that directory to be scanned. The optional *delay* argument specifies that the scan be delayed by *delay* seconds.

Initiating File Archiving

As the system identifies files to be archived, it creates a list of files known as an archive request. The system schedules the archive request for archival at the end of a file system scan. The following archive set parameters have been added to better control the archiving workload and to ensure timely archival of files:

- `-startage` sets the interval between the first file to be archived in the archive request and the start of archiving. This allows time to accumulate archival work after the first file has been scheduled for archival.
- `-startcount` sets the start archiving file count. When this file count has been identified for archival in the archive request, the archival operation begins.
- `-startsize` sets the minimum total size of all files to be archived in the archive request. This allows the accumulation of archival work to be based on the total size of the files that have been scheduled for archival.

If more than one of `-startage`, `-startcount`, and `-startsize` are set, the first condition encountered initiates the archival operation. If none are set, the archival operation starts at the end of a file system scan. For more information, see the `archiver.cmd`(4) man page.

Archiver Extensions to `allsets`

The `allsets` feature for defining archive set parameters has been extended to allow you to specify a copy number. The format is `allsets.`*copy*. This new format allows you to define parameters for only a single archive set copy. Previously, any parameters assigned by `allsets` applied to all archive set copies.

You can use the `allsets` and `allsets.`*copy* parameters to define volume assignments. VSNs defined for `allsets` and `allsets.`*copy* are applied to any Archive Sets that do not have a VSN definition. For more information, see the `archiver.cmd`(4) man page.

Archiver Soft Restart

This release includes a soft restart capability for the archiver. When the archiver is stopped, for any reason (for example, it receives a signal such as a `SIGINT`, `SIGTERM`, `SIGKILL`, etc.) and subsequently started by the `sam-fsd` daemon, it recovers any work that was in progress.

The `samu`(1M) utility's `arrestart` command causes the archiver to discard all work in progress and restart all archiver daemons.

The `samu`(1M) utility's `arrerun` command causes the archiver to perform a soft restart. It restarts the archiver daemons and recovers all work in progress.

Provision for Choosing the Time Reference for Unarchiving File Copies

This release gives sites the choice of unarchiving by modify date instead of by access date. The new `-unarchage` *time_ref* archive set parameter allows sites to select which file time (access or modify) to use to determine when to unarchive a file copy.

For more information, see the `archiver.cmd`(4) man page.

Separate Scheduling for New, Versus Rearchive, Operations

This release separates archival of new and recycled copies. If an archive copy of a file is being rearchived, an internal archive set copy is used for scheduling the archive operation. It is called a rearchive set copy, and it uses the archive parameters from the actual archive set copy. If desired, you can set the archive set parameters and

VSN associations by using the archive set copy name followed by the character `R`. The rearchive set copy allows users to differentiate new and rearchive operations. It also allows them to use different parameters and VSNs for each operation.

For more information, see the `archiver.cmd`(4) man page.

Limiting Archiver Drive Work

This release enables you to direct the archiver to balance multiple drive usage.

In the SAM-FS 3.5.0 release, you could limit the amount of work that a drive could do by setting the number of drives to use for an archive set to several times the number of physical drives. This had the effect of dividing the load into smaller chunks.

In the Sun SAM-FS 4.0 release, the archiver strictly scheduled only the drives available.

In the Sun StorEdge SAM-FS 4.1 release, to get the effect of the SAM-FS 3.5.0 feature, you can use the `-drivemax` archive set parameter to limit the amount of data that each `arcopy` operation writes. This allows you to balance the drive work.

For example, assume that there are 300 gigabytes of data to archive in the archive request. You can use the following parameters to specify that 5 drives be used and that 10 gigabytes of file data be archived at a time on each drive:

- `-drives 5`
- `-drivemax 10G`

This is equivalent to specifying `-drives 30` in SAM-FS 3.5.0.

For more information, see the `archiver.cmd`(4) man page.

Limiting Messages for Archiving Problems

This release retains archive requests for files that cannot be archived imminently. The archiver keeps archive requests for files that have persistent archiving problems in a wait queue. The archiver also uses the wait queue for archive requests that are awaiting restart of idled or stopped archiving.

The archiver maintains a record of which messages for the archive request have been sent to the SAM log file and to the archiver notify script. Such messages are sent only once for each unschedulable archive request.

The messages written to the archive request show the waiting condition. You can use the `showqueue`(1M) command to view them. You can also view the wait conditions in the `samu`(1M) utility's `sam-archiverd` display.

The archiver examines the wait queue and reschedules archive requests in the following situations:

- When the `sam-archiverd` daemon receives an `arrun` command, `SIGHUP`, `SIGALRM`, or `CatalogChange` message.
- When a file system is mounted or unmounted.
- When the archive *interval* elapses.

Sorting Files to be Archived

This release allows you to direct the archiver to sort files in reverse order. The `-rsort` archive set parameter performs a sort in the reverse order of the `-sort` parameter.

Command to Remove Archiver Queue Files (Archive Requests)

The `samu`(1M) utility's `arrmarchreq fsname.[* | arname]` command allows an operator to remove one or more archive requests. TABLE 1 shows the `samu`(1M) commands to use to remove archive requests.

TABLE 1 Commands for Removing Archive Requests

`samu`**(1M) Command**	**Archive Request Removed**
`arrmarchreq` *fsname*`.*`	All archive requests for file system *fsname*.
`arrmarchreq` *fsname*`.`*arname*	The archive request *arname*. For example, `samfs1.1.145`.
`arrmarchreq` *fsname*`.`*asname*`.`*n*`.*`	All archive requests for archive set *asname*`.`*n*.

Provision to Use File Access Time as Archive Set Specifier

This release allows you to direct the archiver to use file access time as the archive set specifier. You can use the `-access` specifier on the archive set directive to include files whose access time is older than *age*. This allows files that have not been accessed for a long time to be rearchived to cheaper media.

Additions to the `samu`(1M) Operator Utility

The `K` display shows the kernel statistics accumulated by the Sun StorEdge SAM-FS software.

This release added an additional priority command to `samu`(1M). The `priority` *pid newpri* command sets the load priority for a volume in the preview queue.

The `samu`(1M) commands now include additional mount point specifications. The new commands are as follows:

- `forcedirectio`, `noforcedirectio`
- `sw_raid`, `nosw_raid`
- `hwm_archive`, `nohwm_archive`
- `mh_write`, `nomh_write`
- `suid`, `nosuid`
- `qwrite`, `noqwrite`
- `sync_meta` *eq value*
- `stripe` *eq value*
- `mm_stripe` *eq value*
- `wr_throttle` *eq value*
- `invalid` *eq value*
- `minalloc` *eq value*
- `maxalloc` *eq value*
- `aplease` *eq interval*
- `rdlease` *eq interval*
- `wrlease` *eq interval*
- `maxpartial` *eq value*
- `partial_stage` *eq value*
- `flush_behind` *eq value*

- `stage_flush_behind` *eq value*
- `stage_n_window` *eq value*
- `stage_retries` *eq value*
- `dio_rd_consec` *eq value*
- `dio_rd_form_min` *eq value*
- `dio_rd_ill_min` *eq value*
- `dio_wr_consec` *eq value*
- `dio_wr_form_min` *eq value*
- `dio_wr_ill_min` *eq value*

Support for Devices up to 16 Terabytes

This release enables you to include disk devices with sizes of up to 16 terabytes in Sun StorEdge QFS and Sun StorEdge SAM-FS file systems. File systems created on these large devices cannot be used with earlier versions of Sun StorEdge QFS or Sun StorEdge SAM-FS software. This large device support is only available when running a 64-bit kernel.

New `samfsdump`(1M) Options

This release added the following `samfsdump`(1M) options:

- The `-U` option for dumping data for online files and metadata for all files. Note that this can make the dump file very large. Take care to manage the increased size of the dump.
- The `-P` option to dump partial data for offline files that have the partial release option set. Using this option can make the dump file very large. Take care to manage the increased size of the dump.

New `samfsrestore`(1M) Option

This release added the `-r` option to the `samfsrestore`(1M) command. Using this option specifies that the software replace existing files for cases in which the existing files have an older modification time than the dumped files. If the existing files are newer, they are not restored.

New `releaser.cmd` Directive

The `list_size` directive allows you to increase the number of releaser candidates above the default number of 10000 for file systems containing small files.

For more information, see `releaser.cmd`(4).

New `sfind`(1) Option

The `partial_on` test yields true if the file has the partial release attribute set and the partially retained portion of the file is online.

Single Port Multiplexing (SPM)

This release added infrastructure to Sun StorEdge QFS and Sun StorEdge SAM-FS software so that each uses only one listener port on a host for all product daemons. This contrasts with the practice of the daemons using one port per daemon. The list of daemons using SPM is:

- `sam-rftd`
- `sam-amld`

The `samu`(1M) `P` display shows which services are available for connection. The `samsock` entries required in `/etc/services` for the 4.0 release are no longer needed for the 4.1 release. If you do not anticipate falling back to the 4.0 release, you can remove the entries.

Stager Daemon Log File Enhancements

This release standardizes the date and time stamps of daemon log files and adds the year to the time stamp in the stager daemon's log file. The new format is *yyyy*/*mm*/*dd hh*:*mm*:*ss*. This change also added the staged file's copy number, user ID, group ID, requestor's user ID, and Equipment Ordinal of the drive upon which the file was staged to the log file.

This release adds a start event record in the stager daemon's log file. A customer can currently request that the stage daemon collect staging event information and write a log file. This feature allows a start event to be recorded in the log file. In the `stager.cmd` file, the customer can specify the following directive to specify the staging activities that are to be logged:

`logfile =` *filename* [*event*]

For *event*, specify `start`, `finish`, `cancel`, `error`, or `all`. The default is `finish`, `cancel`, and `error`.

These events are logged in the first column of the log entry as `S` (`start`), `F` (`finish`), `C` (`cancel`), or `E` (`error`). This change also adds the Equipment Ordinal of the drive upon which the file was staged to the log file.

Disk Archiving Enhancements

The disk archiving capability can now write multiple files in `tar`(1) format to a single disk archive file.

This release addresses the disk archiving performance problems that had been observed when transferring very large files across a wide area network. You can specify the following configuration parameters in the `/etc/opt/SUNWsamfs/rft.cmd` file to accommodate large files:

- The `tcpwindow` parameter, which sets the socket buffer size.
- The `blksize` parameter, which sets the amount of data sent down the socket at a time. The default block size is 1 megabyte.

  For more information about these parameters, see `rft.cmd`(4).

In the archiver log file, the system now appends the archive `tar`(1) file path to the disk volume name disk for disk archive entries.

Total Quotas

Sun StorEdge SAM-FS file systems now implement the capability to keep and enforce both total and online block quotas.

Because metadata is not released, the values for files online and total limits are the same. The new defaults for the `quota`(1M) and `samquota`(1M) commands show the total values and limits as well as the online values and limits. For sparse files, the total block count reflects the number of blocks used if the file is online; the total block count reflects the actual size of the file if the file is offline.

SAM-Remote Daemon Trace Files

This release implements daemon trace files for `sam-serverd` and `sam-clientd`. You can control the daemon trace files by putting directives in the trace file section of the `defaults.conf`(4) configuration file. The `samset`(1M) debug flag, `remote`, has been removed.

Catalog Field to Display Volume Information

You can use the chmod(1M) command's -I option to add a field to the catalog that displays information for a volume. This field can contain up to 128 characters. You can use this field, for example, to display information such as the location of exported media or archive sets on a volume.

New Mount Options

This release adds the following new mount options:

- The force_nfs_async mount option causes the file system to cache NFS data written to the server even if NFS has requested that the data be written synchronously through to disk. The samu(1M) utility includes the force_nfs_async and noforce_nfs_async commands, and samu(1M) includes the corresponding flags in the samu(1M) N display.
- For file systems mounted as multireader file systems, a new mount option, refresh_at_eof, causes the current file size to be refreshed when the read buffer exceeds the end of file. The samu(1M) operator utility also supports the refresh_at_eof and norefresh_at_eof commands. The samu(1M) N display includes the corresponding flags.
- The noscan mount option disables the Sun StorEdge SAM-FS file system scans that the sam-arfind daemon typically performs. These scans find archive candidates on a mounted file system. This mount option can be useful for file systems in which new files are no longer being created, but you still want the staging and releasing capabilities.
- The nosam mount option mounts the Sun StorEdge SAM-FS software with only the file system functionality enabled. ENOSPC is returned when the file system reaches 100% capacity. This mount option disables archiving, staging, and releasing.

For more information, see the mount_samfs(1M) man page.

Standard Network Management Protocol (SNMP) Trap Support

You can configure the Sun StorEdge QFS and Sun StorEdge SAM-FS software to notify you when potential problems occur in its environment by using SNMP traps.

This feature allows you to monitor a Sun StorEdge SAM-FS system remotely from a network management console. Supported management consoles include the following:

- The Storage Automated Diagnostic Environment (StorADE)
- The Sun Management Center (Sun MC)
- The Sun Remote Server (SRS)
- The Sun Remote Server NetConnect

Active fault determination and enhanced diagnostic support of Sun StorEdge SAM-FS systems is achieved with an asynchronous notification. You can enable and disable this feature through the `alerts=on|off` directive in the `defaults.conf`(4) file.

SAM-QFS Manager 1.0 Release

The SAM-QFS Manager 1.0 is a web-based graphical user interface tool for configuring and monitoring a Sun StorEdge QFS or Sun StorEdge SAM-FS environment. The software consists of two components:

- The first component is the Sun StorEdge QFS or Sun StorEdge SAM-FS server software. It is installed when you install the `SUNWsamfsr` and `SUNWsamfsu` packages or the `SUNWqfsr` and `SUNWqfsu` packages.
- The second component is the SAM-QFS Manager 1.0 application. It consists of the `SUNWsamqfsuir` and `SUNWsamqfsuiu` packages. You must install this component on the management station.

SAM-QFS Manager Installation

The *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide* includes instructions for installing the SAM-QFS Manager. You can install and configure SAM-QFS Manager along with the file systems, or you can install it later. If you install it later, use the instructions in the installation guide.

The SAM-QFS Manager software package has hardware and software requirements beyond that of the Sun StorEdge QFS and Sun StorEdge SAM-FS software. Refer to the *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide* for information about these requirements.

Security

For security reasons, the management console ends your `https` session after 15 minutes. You have to log in again to resume.

You must secure the management station and the Sun StorEdge QFS and Sun StorEdge SAM-FS servers that are managed. Place it inside the firewall.

Using the SAM-QFS Manager in Existing Sun StorEdge QFS or Sun StorEdge SAM-FS Environments

If you install the SAM-QFS Manager in an environment that already includes Sun StorEdge QFS or Sun StorEdge SAM-FS file systems, the software reads the existing configuration information and presents this information to you for modification and/or viewing. For more information about using SAM-QFS Manager in existing configurations, see "Using SAM-QFS Manager With pre-4.1 Configuration Files" on page 22.

Propagating Configuration File Changes

If you change any configuration files manually, you are responsible for the correctness of the files you change. Such configuration files include `/etc/opt/SUNWsamfs/mcf`, `/etc/opt/SUNWsamfs/archiver.cmd`, and others. You can use the `/opt/SUNWsamfs/sbin/archiver -lv` command to check the correctness of the `archiver.cmd` file. For information about propagating configuration file changes, see *Sun StorEdge QFS and Sun StorEdge SAM-FS File System Administration Guide*.

Limitations

The SAM-QFS Manager 1.0 does not interoperate with all Sun StorEdge QFS and Sun StorEdge SAM-FS features. Depending on your equipment, configuration, and environment, it can simplify Sun StorEdge QFS and Sun StorEdge SAM-FS configuration and control.

Specifically, the SAM-QFS Manager does not support the following features:

- Sun Cluster software.
- Sun SAM-Remote software.
- Optical media.
- EFI disk labels.
- Fibre Channel bridge cards. You cannot use the SAM-QFS Manager to configure an L25 or L100 tape library that contains a Fiber Channel bridge card (SCSI-to-FC bridge, SG-XFC420CARD-MOD).
- Sun StorEdge QFS Shared File System. You cannot configure a Sun StorEdge QFS shared file system, but the SAM-QFS Manager displays information for existing Sun StorEdge QFS shared file systems. Depending on how you have your environment configured, you might have to configure a new server in the SAM-QFS Manager if you use SAM-QFS Manager to monitor a Sun StorEdge QFS shared file system and you want to change the metadata server.

The Sun StorEdge QFS and Sun StorEdge SAM-FS software includes a complete command line interface that allows you to configure and monitor the features that the SAM-QFS Manager does not support.

Single-user Administration

You can administer any Sun StorEdge QFS or Sun StorEdge SAM-FS server through a single instance of the Sun Web Console. You can configure any server to be administered by a single user name with `SAMadmin` privileges at any time.

The SAM-QFS Manager 1.0 release does not support multiple instances of the `SAMadmin` role managing the same server or multiple instances of Sun Web Console managing the same server. It is important to note that this includes opening another browser window and manipulating the Sun StorEdge QFS and Sun StorEdge SAM-FS configuration. It is the responsibility of the site administrator(s) to comply with this policy.

The administrator should log on as `samadmin` and choose `SAMadmin` on the Role selection page. All other users should log on as `samuser`. If you want to create additional administrator or user roles, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide*.

Sun Cluster 3.1 4/04 Interoperability With Sun StorEdge QFS Software

Sun Cluster 3.1 4/04 supports failover of standalone (nonshared) Sun StorEdge QFS file systems via the HAStoragePlus resource type implementation with the Sun StorEdge QFS 4.1 release.

The ability to configure Sun StorEdge QFS software as a highly available local file system is supported on Solaris 9 OS platforms only. This capability is not supported on Solaris 8 OS platforms.

`/etc/vfstab` Requirements

To configure Sun StorEdge QFS for failover with HAStoragePlus, configure the `/etc/vfstab` files on all applicable cluster nodes in the usual way with the following information:

- The block special file in `/etc/vfstab` must be the Sun StorEdge QFS Family Set name.
- The `vfstype` field must contain `samfs`.
- The Mount At Boot field must be set to `no`.

- The `vfstab` entry must be identical on all cluster nodes that can mount the file system.
- Specify the entry `sync_meta=1` in either `/etc/vfstab` or `/etc/opt/SUNWsamfs/samfs.cmd`.

The following is an example `/etc/vfstab` entry:

```
qfs1 - /local/qfs1 samfs 3 no sync_meta=1
```

In this example, observe the following:

- `qfs1` is the SAM-QFS Manager Family Set name
- `/local/qfs1` is the mount point. Must exist on all nodes.
- `samfs` is the type of the file system.
- The Mount At Boot field is set to `no`.
- The `sync_meta=1` mount option is used here, as recommended, in order for metadata operations to survive a failover.

`/etc/opt/SUNWsamfs/mcf` Requirements

The Sun StorEdge QFS Family Set name specified in `/etc/vfstab` must be a valid Sun StorEdge QFS Family Set that is present in the `mcf` file.

The `mcf` file entry can contain following types of Sun Cluster device names:

- `/dev/md/*`: A Solaris Volume Manager device path name.
- `/dev/vx/*`: A VxVM device pathname. Note that Veritas devices must be registered with the Sun Cluster framework using `scsetup`(1M) before they can be used.
- `/dev/global/*`: Raw global devices.

Note – Use of `did` devices of the form `/dev/did/*` is not supported.

Example 1. CODE EXAMPLE 1 is an example `mcf` file entry for use with HAStoragePlus that uses raw devices.

CODE EXAMPLE 1 `mcf` File that Specifies Raw Devices

```
qfs1                    1   ma    qfs1     on
/dev/global/dsk/d4s0   11   mm    qfs1
/dev/global/dsk/d5s0   12   mr    qfs1
/dev/global/dsk/d6s0   13   mr    qfs1
/dev/global/dsk/d7s0   14   mr    qfs1
```

Example 2. CODE EXAMPLE 2 is an example `mcf` file entry for use with HAStoragePlus that uses Solaris Volume Manager metadevices. The example assumes that the Solaris Volume Manager metaset in use is named `red`.

CODE EXAMPLE 2 `mcf` File that Specifies Solaris Volume Manager Devices

```
qfs1                    1   ma    qfs1     on
/dev/md/red/dsk/d0s0   11   mm    qfs1
/dev/md/red/dsk/d1s0   12   mr    qfs1
```

Example 3. CODE EXAMPLE 3 is an example `mcf` file entry for use with HAStoragePlus that uses VxVm devices.

CODE EXAMPLE 3 `mcf` File that Specifies VxVM Devices

```
qfs1                    1   ma    qfs1     on
/dev/vx/rdsk/oradg/m1  11   mm    qfs1
/dev/vx/rdsk/oradg/m2  12   mr    qfs1
```

The `mcf` file entry must be identical on all cluster nodes that are possible masters of the Sun StorEdge QFS file system.

Configuring the HAStoragePlus Resource

While using HAStoragePlus to configure a Sun StorEdge QFS file system for failover, the FilesystemCheckCommand property of HAStoragePlus must be set to `/bin/true`. All other resource properties for HAStoragePlus apply as specified in `SUNW.HAStoragePlus`(5).

The following example command shows how to use the `scrgadm`(1M) command to configure an HAStoragePlus resource:

```
# scrgadm -a -g qfs-rg -j ha-qfs -t SUNW.HAStoragePlus \
        -x FilesystemMountPoints=/local/qfs1 \
        -x FilesystemCheckCommand=/bin/true
```

Notes

- Sun StorEdge SAM-FS software is not supported. That is, use of storage and archive management software (SAM) configurations with Sun StorEdge QFS is not supported.
- Using a Sun StorEdge QFS file system as the underlying native file system for use with cluster file system is not supported.

- Any failover application that is supported with Sun Cluster software is supported with Sun StorEdge QFS software as a highly available local file system. Support is not limited to specific applications.

Product Changes

The following sections describe the product changes in this release.

Packaging Changes

The `SUNWsamfs` and `SUNWqfs` packages have been split into `root` and `usr` packages. `SUNWsamfs` is replaced by `SUNWsamfsr` (`root`) and `SUNWsamfsu` (`usr`). `SUNWqfs` is replaced by `SUNWqfsr` (`root`) and `SUNWqfsu` (`usr`).

You must install the `root` package before the `usr` package, or `pkgadd`(1M) reports an error.

Packages are delivered in directory format rather than datastream format. For information about installing the software, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide*.

Script Changes

This release changed several command names and example script installation directories. This section describes the command name changes and example script install directory changes that have been made.

The 4.1 releases renamed some of the `.sh` commands. Specifically, it eliminated the use of the `.sh` suffix from within the `/opt/SUNWsamfs/sbin` directory. TABLE 2 shows the script commands that were affected.

TABLE 2 New Script Names, Including Path

Pre 4.1 Name	4.1 Name
`/opt/SUNWsamfs/sbin/info.sh`	`/opt/SUNWsamfs/sbin/samexplorer`
`/opt/SUNWsamfs/sbin/set_admin.sh`	`/opt/SUNWsamfs/sbin/set_admin`
`/opt/SUNWsamfs/sbin/trace_rotate.sh`	`/opt/SUNWsamfs/sbin/trace_rotate`

The following 4.1 man pages describe the commands in TABLE 2:

- samexplorer(1M)
- set_admin(1M)
- trace_rotate(1M)

The target installation directory changed for some of the example scripts found in the /opt/SUNWsamfs/examples directory. The software automatically copies these scripts from the old location to the new location at installation time. It is your responsibility to update these scripts with any changes that might have been made to the default versions. The system displays a message at installation time if they need to be updated. You might want to add /etc/opt/SUNWsamfs/scripts to your PATH environment if you run the scripts manually. However, this is unlikely. TABLE 3 shows the directories into which the default versions of the site-customizable scripts are installed automatically when the package or patch is installed.

TABLE 3 Script Directories for Scripts that the System Copies Automatically

Source Directory	Install Directory
/opt/SUNWsamfs/examples/archiver.sh	/etc/opt/SUNWsamfs/scripts/archiver.sh
/opt/SUNWsamfs/examples/recycler.sh	/etc/opt/SUNWsamfs/scripts/recycler.sh
/opt/SUNWsamfs/examples/save_core.sh	/etc/opt/SUNWsamfs/scripts/save_core.sh
/opt/SUNWsamfs/examples/ssi.sh	/etc/opt/SUNWsamfs/scripts/ssi.sh

TABLE 4 shows other scripts that you might use. The installation process does not copy these into /etc/opt/SUNWsamfs/scripts automatically. You can copy the default versions of these optional site-customizable scripts after the package or patch is installed.

TABLE 4 Script Directories for Scripts that Sites Must Copy Manually

Source Directory	Install Directory
/opt/SUNWsamfs/examples/dev_down.sh	/etc/opt/SUNWsamfs/scripts/dev_down.sh
/opt/SUNWsamfs/examples/load_notify.sh	/etc/opt/SUNWsamfs/scripts/load_notify.sh
/opt/SUNWsamfs/examples/log_rotate.sh	/etc/opt/SUNWsamfs/scripts/log_rotate.sh

Archiver Notification Script Changes

The archiver now maintains its own record of the messages pertaining to conditions that prevent archiving, such as no space and no volumes. The directories /var/opt/SUNWsamfs/archiver/NoSpace and /var/opt/SUNWsamfs/archiver/NoVsns are no longer used.

Archiver Command File Reading

As of this release, the system no longer automatically rereads a changed `archiver.cmd`(4) file. Previously, the system reread the archiver command file within 60 seconds after it was changed. When reconfiguring Sun StorEdge SAM-FS software, it is often necessary to change the archiver command file. At some time in the process, the configuration files are no longer synchronized. If you changed the `archiver.cmd` file before the others, the archiver automatically reread the changed file and found errors in it.

Now, the archiver only rereads the archiver command file when it receives a SIGHUP. This occurs automatically when the `sam-fsd`(1M) daemon receives a SIGHUP. For information about propagating changes to configuration files, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS File System Administration Guide*.

Archiving Metadata

This release changes the way metadata is archived, as follows:

- At the 4.0 release level, if you had a version 1 file system, the archiver archived directories, removable media files, segment index inodes, and symbolic links as metadata. If you had a version 2 file system, the removable media files and symbolic links were stored in inodes rather than data blocks; they were not archived.
- At the 4.1 release level, if you have a version 1 file system, the previous metadata archiving is preserved. If you have a version 2 file system, the software archives only directories as metadata. It archives symbolic links as files in user-defined archive sets. This change provides consistent behavior with the `tar`(1) command.

You can suppress metadata archiving by using the `archivemeta=[on|off]` directive in the archiver command file. For more information, see the `archiver.cmd`(4) man page.

Changes to the `samu`(1M) Operator Utility

The `samu`(1M) help display has been reorganized to make the command and media help screens smaller. The stager commands have been put in a separate help screen.

Removed the chmed(1M) Command's -i Option

This change removes the ability to use the chmed(1M) -i command to set or clear the catalog slot in use (i) flag. This option has not been useful since the library catalog was redesigned in release 3.5.0. It is being removed.

Renamed the sam-ftpd Daemon

The sam-ftpd daemon was included in releases prior to 4.1. This daemon has been renamed sam-rftd (remote file transfer daemon). The configuration file is /etc/opt/SUNWsamfs/rft.cmd. The /etc/opt/SUNWsamfs/ftp.cmd file is copied to /etc/opt/SUNWsamfs/rft.cmd automatically when upgrading from a 4.0 system.

When upgrading to 4.1, you need to change your daemon tracing commands in /etc/opt/SUNWsamfs/defaults.conf from sam-ftpd to sam-rftd.

Quota Mount Option Enabled by Default

The quota mount option is enabled by default when you mount a file system if any quota files (.quota_a, .quota_g, or .quota_u) are present. Depending on your configuration, this has the following effects:

- If quota files are present, then by default, the file system is mounted with quotas enabled.
- If quota files are present, but you want to operate with quotas disabled, then you can specify the noquota mount option. If you allocate or free blocks or files when a file system is mounted with noquota, the quota files become stale, so this is not recommended.
- If quota files are not present, there is no apparent change in behavior.

Changes to archive_audit(1M) Exit Codes

This release added new exit codes to archive_audit(1M). In previous releases, the software sometimes returned success for nonfatal errors. It now returnes a nonzero result code. User scripts that use archive_audit(1M) might need to be modified.

For more information about error codes, see the archive_audit(1M) man page.

Graphical User Interface Tools Removed

The `libmgr`(1M), `samtool`(1M), `robottool`(1M), `devicetool`(1M), and `previewtool`(1M) graphical user interfaces have been removed. The SAM-QFS Manager replaces the functionality formerly found in these tools.

Using SAM-QFS Manager With pre-4.1 Configuration Files

The following are some of the product changes that might affect you if you use SAM-QFS Manager:

- If you upgrade your Sun StorEdge QFS and Sun StorEdge SAM-FS software from a release prior to 4.1 and you use SAM-QFS Manager to make configuration changes, the system creates new versions of the `mcf`, `archiver.cmd`, and other configuration files.
- If you had comments in your pre-4.1 files, they are removed in the new files that result. SAM-QFS Manager maintains a set of backup copies for the configuration files at `/etc/opt/SUNWsamfs/.cfg_back`. It retains the most recent 25 versions of each configuration file.
- If you use the SAM-QFS Manager to rename and save an existing legacy policy (archive set) by using the `Archive Management` tab in the SAM-QFS Manager, the content of the `archiver.cmd` file could be substantially different from what you had prior to the save.
- SAM-QFS Manager is compatible only with Sun Web Console version 2.0.2 applications, for example Sun StorEdge Enterprise Storage Manager 2.1. Installing this product over any other Sun Web Console version breaks both applications.

For more information about SAM-QFS Manager known issues, see "SAM-QFS Manager Issues" on page 28.

Changes to `/etc/name_to_sysnum`

Some of the Solaris patches may inadvertently remove the `samsys` line from the `/etc/name_to_sysnum` file when they are installed. One indication of the problem is the appearance of the following message in the `/var/adm/messages` file:

```
WARNING: system call missing from bind file
```

Beginning with Solaris 9 patch 112233-11, the Solaris OS uses system call number 181 to get information about resource utilization (`SYS_rusagesys`). The default Sun StorEdge QFS and Sun StorEdge SAM-FS configuration was changed in 4.1 to use system call number 182. You might have a different system call number configured if you upgraded from a previous release. In order for the Sun StorEdge QFS and Sun StorEdge SAM-FS software to be operational after installing this, or a subsequent, Solaris 9 patch, change the default Sun StorEdge QFS and Sun StorEdge SAM-FS entry in `/etc/name_to_sysnum` from `samsys 181` to an alternate entry, such as `samsys 182` or `samsys 183`, based on the following guidelines:

- The `/etc/name_to_sysnum` file must contain a `samsys` entry.
- The `samsys` system call number must be unique in `/etc/name_to_sysnum` and not assigned in `/usr/include/sys/syscall.h`. Note: entries named `SYS_reserved_#` are considered available.
- After changing `/etc/name_to_sysnum`, you must reboot.

For more information about how to correct this situation, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide*.

Falling Back to a Previous Release

If you create a new file system with the Sun StorEdge QFS 4.1 or Sun StorEdge SAM-FS 4.1 software and you want to revert to a 4.0 version, install Sun StorEdge QFS or Sun StorEdge SAM-FS 4.0 patch -06 or later. If you do not install Sun StorEdge QFS or Sun StorEdge SAM-FS 4.0 patch -06 or later, you might damage the new file system.

The Sun QFS and Sun SAM-FS 3.5.0 and earlier systems do not support file systems created by the Sun StorEdge QFS or Sun StorEdge SAM-FS 4.1 releases.

Specific Information About Upgrading from the 4.0 to 4.1 Releases

When upgrading from a 4.0 release to 4.1, `pkgadd`(1M) checks for the presence of the `/etc/opt/SUNWsamfs/LICENSE.4.0` file and the absence of the `/etc/opt/SUNWsamfs/LICENSE.4.1` file. If this tests true, the system performs the following copies:

- It copies the script files in `/etc/opt/SUNWsamfs` and `/opt/SUNWsamfs/sbin` that might have been modified to `/etc/opt/SUNWsamfs/scripts`.
- It copies `/etc/opt/SUNWsamfs/ftp.cmd` to `/etc/opt/SUNWsamfs/rft.cmd`.

Conversely, just before a 4.1 package is removed, you can move these files back to their pre-4.1 locations by running the `/opt/SUNWsamfs/sbin/backto40` script.

If you fall back from 4.1 to 4.0, you must fall back to a 4.0.62 (patch -06 or later) system. This is necessary in order for catalog conversion to occur.

You can avoid the conversion from 4.0 to 4.1 by creating the `/etc/opt/SUNWsamfs/LICENSE.4.1` file or by moving the `/etc/opt/SUNWsamfs/LICENSE.4.0` file. The conversion from 4.1 does not occur unless the `/opt/SUNWsamfs/sbin/backto40` script is run manually.

The Sun StorEdge QFS 4.1 shared filesystem uses a different version number for the shared hosts file (4 versus 3). Rolling forward is automatic, but rolling back is not. You need to run the `/opt/SUNWsamfs/sbin/backto40` script in Sun StorEdge QFS standalone environments or in Sun SAM-QFS environments if Sun StorEdge QFS shared file systems exist. This script saves the `.hosts` file for each shared file system so that it can be converted to a version 3 `.hosts` file prior to running 4.0. The script only needs to be run on the server that is designated as the metadata server for the Sun StorEdge QFS shared file system. It does not need to be run on the clients. After you have executed the `/opt/SUNWsamfs/sbin/backto40` script, you can remove the 4.1 packages and install the 4.0 packages. After you install the 4.0 package, issue a `samd`(1M) `config` command and then issue `/opt/SUNWsamfs/sbin/hosts41to40shared` on the server for the Sun StorEdge QFS shared file system. This script converts the `.hosts` file for each Sun StorEdge QFS shared file system from a version 4 to a version 3. After this has been completed, issue the `samd`(1M) `config` command to make sure that the conversion completed and continue with normal system startup for 4.0.

Specific Information About Upgrading from the 3.5.0 to 4.1 Releases

When upgrading from a 3.5.0 release to 4.1, `pkgadd`(1M) checks for the presence of the `/etc/opt/LSCsamfs/mcf` file and the absence of the `/etc/opt/SUNWsamfs/mcf` file. If this is true, the system performs the following copies:

- It copies the configuration files in `/etc/opt/LSCsamfs` to `/etc/opt/SUNWsamfs`.
- It copies scripts that might have been modified to `/etc/opt/SUNWsamfs/scripts` for comparison with the new versions.

Conversely, just before a 4.1 package is removed, you can use the `/opt/SUNWsamfs/sbin/backto350` script to move the files in `/etc/opt/SUNWsamfs` and `/var/opt/SUNWsamfs` back to `/etc/opt/LSCsamfs` and `/var/opt/LSCsamfs`.

If you fall back from 4.1 to 3.5.0, you must fall back to a 3.5.0.81 or later system. This is necessary in order for catalog conversion to occur.

You can avoid the conversion to 4.1 from 3.5.0 by moving the `/etc/opt/LSCsamfs/mcf` file. The conversion from 4.1 does not occur unless the `/opt/SUNWsamfs/sbin/backto350` script is run manually.

The staging code in 3.5.0 was replaced by a new stager daemon in release 4.0. If you had stage logging directives in `/etc/opt/LSCsamfs/samlogd.cmd`, add the equivalent directives to `/etc/opt/SUNWsamfs/stager.cmd` to have the same logging functionality under the Sun StorEdge SAM-FS 4.1 release. If your `/etc/opt/LSCsamfs/samlogd.cmd` file looked like this, for example:

```
stage=/var/opt/SUNWsamfs/log/stager start
```

You should have the following in `/etc/opt/SUNWsamfs/stager.cmd`:

```
logfile = /var/opt/SUNWsamfs/log/stager
```

For more information, see the `stager.cmd`(4) man page.

Directives Removed From `archiver.cmd`

The `queuedir=` and `datadir=` directives are no longer supported in the `archiver.cmd` file. You must remove these directives manually. If these directives are not removed, the archiver generates an error message and does not run.

The archiver writes its queue files to the following directory:

```
/var/opt/SUNWsamfs/archiver/Queues
```

The archiver data directory is as follows:

```
/var/opt/SUNWsamfs/archiver
```

Sun SAM-Remote Compatibility

Sun SAM-Remote 4.1 is incompatible with SAM-Remote 3.3.1 and SAM-Remote 3.3.0. This is because of the SAM-FS 3.5.0 catalog re-design. The same version of SAM-Remote must be installed on SAM-Remote clients and servers.

Ampex Support Dropped

The Sun StorEdge SAM-FS 4.1 release removes support for Ampex 410, 810, and 914 tape libraries and for Ampex tapes and the Ampex DST driver.

Licensing Changes

For the 4.1 release, the license file is `/etc/opt/SUNWsamfs/LICENSE.4.1`. Licenses generated for Sun StorEdge QFS and Sun StorEdge SAM-FS 4.0 software work with 4.1.

A new license scheme was implemented in the 4.0 releases. Both the 4.0 and 4.1 releases follow the new license scheme, which is as follows:

- Sites upgrading from 3.5.0 (or earlier releases) to 4.1 must have a set of new license keys supplied by their Authorized Service Provider (ASP) or Sun Microsystems, Inc. Put the keys in the `/etc/opt/SUNWsamfs/LICENSE.4.1` file. You can enter the `samcmd`(1M) `l` command to display license information.
- Sites upgrading from 4.0 to 4.1 do not need a new set of license keys. The upgrade process automatically copies the `LICENSE.4.0` file to the `LICENSE.4.1` file. The 4.0 license is valid with the 4.1 release.

Note – If you made changes to your site's configuration during the upgrade procedure, you might need a new license in order for the configuration changes to work correctly.

To get a temporary license, go to the following web site:

`www.lsci.com/licensestart.sun`

A Sun StorEdge SAM-FS license is divided into two logical sections: system and media. The system license licenses the host, expiration date, and the Sun StorEdge SAM-FS features. The media licenses an automated library type and media type pair. This is tied to the system license by the hostid. The number of media slots for the media type and automated library type are kept here.

A Sun StorEdge QFS license is a system license that licenses the host, the expiration date, and the Sun StorEdge QFS features.

If the license is missing, is corrupted, has an incorrect hostid, or has expired, the license is regarded as expired or corrupt. The system no longer allows file system mounts, media mounts, or staging.

In a Sun StorEdge SAM-FS environment, if the number of slots in use exceeds the licensed number, the license is regarded as suspended. The system no longer allows media mounts, labelling new media, staging, or importing media. Relabeling of old media is still allowed if the license is suspended. Because exporting is still allowed in the suspended condition, exporting enough media to bring the number of slots in use back into conformance with the license clears the suspended condition.

System Requirements

The following sections describe some of the system requirements that must be met in order to use the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 releases.

Note – For more information about system requirements, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide*.

Operating System Support

The Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 releases support the following Sun Solaris™ operating system (OS) levels:

- Solaris OS 8 update 5 (07/01)
- Solaris OS 9 update 3 (04/03)

Required Solaris Patches

You can obtain the patches mentioned in this section from Sun. The following patches are recommended, depending on your environment:

- The Sun StorEdge SAM-FS software needs patch 108528-02 (kernel update patch for hot swappable hardware support only) when running with Solaris 8 Update 5 (Solaris 8 07/01).
- The Sun StorEdge SAM-FS software needs Solstice DiskSuite 4.1 product patch 104172-24 installed when running with Solstice DiskSuite 4.1.
- The Sun StorEdge SAM-FS software needs Solstice DiskSuite 4.2 product patch 106627-11 when running with Solstice DiskSuite 4.2.
- The Sun StorEdge SAM-FS software needs patch 111095-06 (SunOS 5.8: fctl/fp/fcp/usoc driver patch) installed when running with Fibre Channel tape drives.

- The Sun StorEdge SAM-FS software needs patch 112244-02 (SunOS 5.8: Hardware/FCode: SBus Dual Fibre Channel Host Adapter) installed when the X6757A SBus Fibre Channel HBA is used to access either tape drives or libraries.

Refer to the Sun Microsystems web page for a list of recommended patches:

http://sunsolve.Sun.COM/pub-cgi/show.pl

Sun SAN-QFS File System Compatibility

Verify that you have Tivoli SANergy File Sharing software at release level 2.2.3 if you plan to use the Sun SAN-QFS file system. For more information about the SAN-QFS file system, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS File System Administration Guide*.

Known Issues and Bugs

The following sections contain information about known issues and on software bugs.

Known Issues

SAM-QFS Manager Issues

The following are the known issues surrounding SAM-QFS Manager use:

- If you are using Internet Explorer 6.0, click the `login` button to log in. A known problem exists regarding pressing the `Enter` key after typing the password when logging in.
- While adding a Sun StorEdge QFS or Sun StorEdge SAM-FS host by using the `Add` button from the Sun StorEdge SAM-FS or Sun StorEdge QFS Servers page, use either the hostname or the IP address. Do not add the same host using both the hostname and the IP address.
- Do not close the pop-up window by clicking the `X` button on the left top corner of the wizard screen in Internet Explorer or by clicking the – button in Netscape or Mozilla. Always click on the `Cancel` button to exit.

- If the wizard button is disabled, click on the other Tab in the application and click on the Tab for the action you want to perform. The wizard button should then be enabled. The wizards include:
  - Add Filesystem Wizard
  - Grow Filesystem Wizard
  - New Archive Policy Wizard
  - Apply Archive Policy to Filesystem Wizard
  - Add Tape Library Wizard
  - Add Stand Alone Tape Drive Wizard
  - VSN Reservation Wizard
- In a wizard, the user input values are lost if the user navigates between the `STEPS` tab and the `HELP` tab inside a wizard. Likewise, input values are also lost if the user navigates between `STEP LINK` on the left hand side on the wizard.
- Each archiving file system on a Sun StorEdge QFS or Sun StorEdge SAM-FS server has a default archive copy that archives all files that are not explicitly members of an archive policy. If an `archiver.cmd`(4) file exists on the server, there must be a VSN association for each file system's default archive copy.

  If you create a file system using SAM-QFS Manager and an `archiver.cmd`(4) file already exists on the server, the SAM-QFS Manager automatically creates a VSN association to an available or valid media type for the default archive copy.

  If you create a file system using SAM-QFS Manager and an `archiver.cmd`(4) file does not exist on the server, the VSN association is not explicitly created and the default archiving behavior is retained. In this situation, you can create an archive policy from the `Archive Management` tab and apply the policy to the file system. This action creates the `archiver.cmd` file and creates the necessary VSN association for the file system's default archive copy.

  To change these default copy definitions, you can edit the `archiver.cmd`(4) manually at a later time.
- The following messages sometimes appear when a user tries to bring up SAM-QFS Manager in a browser:

```
Connect to <hostname.domain>:6789 failed (connection refused)

The connection was refused when attempting to contact
<hostname.domain>:6789
```

  The system generates these messages under the following conditions
  - The user typed in wrong URL (wrong hostname, domain, port, etc.).
  - The web server is not running at the hostname specified.

- The Java Virtual Machine running the web server has crashed due to some unexpected reason. CODE EXAMPLE 4 shows the messages written to the `/var/log/webconsole/console_debug_log` file on the host running the web server (as specified by hostname) when this occurs.

CODE EXAMPLE 4 Messages Written to `/var/log/webconsole/console_debug_log`

```
#
# The exception above was detected in native code outside the VM
#
# Java VM: Java HotSpot(TM) Server VM (1.4.1_03-b02 mixed mode)
#
# An error report file has been saved as /tmp/hs_err_pid24360.log.
# Please refer to the file for further information.
#
```

To remedy this, become superuser on the host that was supposed to run the web server (as mentioned in hostname) and issue the following command:

```
# /usr/sbin/smcwebserver restart
```

Sun StorEdge QFS Shared File System Issues

The following are known issues that pertain to Sun StorEdge QFS shared file system use:

- The Sun StorEdge QFS shared file system does not support segmented files.
- The Sun StorEdge QFS shared file system does not support the `stage`(1M) `-n` option clients. The entire file is staged back to the disk cache.

Bugs

TABLE 5 shows the bugs that are known to exist in the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 software.

TABLE 5 Known Bugs in Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 Software

Bug Number	Description
4953265	Free inode warning when creating/removing directories
4958281	Large filenames cause EDNLC to be frequently purged
5007267	SAM GUI does not report meaningful error message for licensing problems
5022851	`samfsck`(1M) reports fewer blocks without `-F` than are reclaimed with `-F`

TABLE 5 Known Bugs in Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 Software

Bug Number	Description
5026130	Direct-attached L700 library downed if single drive powered off
5029547	`samfsck`(1M) `-F` command on a file system with 120 million files core dumps
5032918	ACL count too small error after creating file in dirirectory with default ACL
5044512	PANIC: kernel heap corruption detected when running ACL tests
5051275	SAM-QFS read-only and multireader capabilities are broken in 4.1.1

Release Documentation

The Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 documentation is available on the web at the following URLs:

- `docs.sun.com`
- `www.sun.com/products-n-solutions/hardware/docs/Software/Storage_Software`

TABLE 6 shows the complete release 4.1 documentation set for these products.

TABLE 6 Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 Documentation

Title	Part Number
Sun SAM-Remote Administration Guide	816-2094-11
Sun QFS, Sun SAM-FS, and Sun SAM-QFS Disaster Recovery Guide	816-2540-10
Sun StorEdge QFS and Sun StorEdge SAM-FS File System Administration Guide	817-4091-10
Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide	817-4092-10
Sun StorEdge SAM-FS Storage and Archive Management Guide	817-4093-10
Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1 Release Notes	817-4094-10

You can obtain hard copy manuals from the following website:

`www.iuniverse.com`

Note – The README file will not be distributed in future major releases of the Sun StorEdge QFS and Sun StorEdge SAM-FS software.