Sun™ QFS, Sun™ SAM-FS, and Sun™ SAM-QFS 4.0.1 Release Notes

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Contents

Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0.1 Release Notes

The Sun QFS, Sun SAM-FS, and Sun SAM-QFS v4.0.1 release consolidates product modifications made to the base 4.0 release and patches 01, 02, 03, 04, and 05. System administrators who install the v4.0.1 release need not install patches 01 through 05; these modifications are included in the v4.0.1 release.

The Sun QFS, Sun SAM-FS, and Sun SAM-QFS v4.0.1 release has design and feature changes, function enhancements, and bugfixes over previous releases. System administrators and programmers familiar with this software will see changes that can affect their daily operations and automated scripts written to co-exist with Sun QFS, Sun SAM-FS, and Sun SAM-QFS software.

For these reasons, Sun Microsystems, Inc. recommends that you study this release note prior to upgrading to the 4.0.1 software release.

This document describes modifications made to Sun QFS, Sun SAM-FS, and Sun SAM-QFS in the initial 4.0 release and in the subsequent releases of Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 patches 01 through 05. This document also provides some information regarding installing and configuring the 4.0.1 release. It also covers some topics relating to upgrading from Sun QFS, Sun SAM-FS, and Sun SAM-QFS releases that precede the initial 4.0 release to the 4.0.1 release as well as downgrading from 4.0.1 to versions that precede the initial release of 4.0.

The Sun QFS, Sun SAM-QFS, and Sun SAM-QFS software is distributed through Sun Microsystems, your reseller, or your Authorized Service Provider. It is also available for download.

Note – If you find discrepancies between the `README` file contained in `/opt/SUNWsamfs/doc/README` and this release note, you can assume that `/opt/SUNWsamfs/doc/README` is the most current version of this information.

Features in this Release (From 4.0)

The following sections describe features that were added to the Sun QFS, Sun SAM-FS, and Sun SAM-QFS software in the initial 4.0 base release.

Support for Sun QFS and Sun SAM-QFS Shared File System Environments in 4.0

SUPPORTED ENVIRONMENTS: Sun QFS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.8 and 2.9.

FOR MORE INFORMATION: See the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide.*

4.0 Release is the First Release to Include the Shared File System Feature

JUSTIFICATION: This change implements a distributed reader/writer file system mounted on Solaris host systems. In a Sun QFS shared file system environment, one Solaris host acts as the metadata server, and additional hosts can be configured as clients.

The Sun QFS shared file system can be configured in either a Sun QFS or a Sun SAM-QFS environment. If configured in a Sun SAM-QFS environment, the active metadata server is the only host upon which the staging (`sam-stagerd`) and archiving (`sam-archiverd`) daemons are active.

Use of the Shared File System Feature Requires Solaris 8 or Solaris 9

Note that the shared file system feature runs in Solaris 8 and Solaris 9 operating environments, but not in Solaris 7. See the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide* for further details.

USER IMPACT: When the `sam-fsd` daemon recognizes a Sun QFS shared file system, it starts a shared file system daemon (`sam-sharefsd`).

BSD sockets are used to communicate between the server and client hosts. IPv4 and IPv6 are supported. You must configure a unique port associated with each shared file system with the name of `samsock.`*fs_name*. You can define this port in `/etc/services`, or if you have configured NIS, you can define this port in `/etc/yp/src/services`.

A trace file records connection and shut down. It is located in `/var/opt/SUNWsamfs/trace/sam-sharefsd`.

For the Sun QFS and Sun SAM-QFS shared file system, the stripe width is set by default to `stripe=0`, which is round robin.

For the Sun QFS and Sun SAM-QFS shared file system, the minimum allocation size is set by default to 8*DAU. If you have only small files, this size should be set to your average file size.

For the Sun QFS and Sun SAM-QFS shared file system, the maximum allocation size is set by default to 32*DAU. This size should be set 2-4 times larger than the minimum allocation size if your site has a mixture of large and small files.

For the Sun QFS and Sun SAM-QFS shared file system, the `stage_n_window` is set by default minimum allocation size. A small `stage_n_window` causes too much meta traffic over the wire.

The shared mount option is required to be specified in the `/etc/vfstab` file for the Sun QFS shared file system.

Executing the `mountall`(1M) script does not mount shared file systems, however, it does mount local `samfs` file systems.

KNOWN SIDE EFFECTS: The `samfsrestore`(1M) command does not work properly on a Sun QFS shared file system client. Administrators should not attempt to issue the `samfsrestore`(1M) command on clients.

The Sun QFS Shared File System Uses More Extensive Configuration Information

Early versions of the system hosts file can be updated by issuing the `samsharefs`(1M) command with its `-Ru` option.

See the `samsharefs`(1M) man page, the `/opt/SUNWsamfs/examples/hosts.*.local.*` files, and the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide*.

JUSTIFICATION: This is required in order to specify and use private network connections for Sun QFS shared file system communication and in order to restrict incoming connections in many environments.

The `mount`(1M) Command Accepts Options that Pertain to File Leases in a Sun QFS Shared File System

The options are as follows:

- `-o rdlease=`*n* (read lease)
- `-o wrlease=`*n* (write lease)
- `-o aplease=`*n* (append lease)

JUSTIFICATION: The preceding options are pertinent to the implementation of the Sun QFS shared file system.

USER IMPACT: None.

WHO SHOULD USE THIS: Shared file system sites.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: The `mount_samfs`(1M) man page has been updated.

The `mount`(1M) Command's `shared_reader` and `shared_writer` Options Have Been Changed to `reader` and `writer`

The `shared_` prefix has been removed. File systems mounted with a single writer and multiple readers are now referred to as *multireader file systems*.

The main difference between a multireader file system and a Sun QFS shared file system is that the multireader host reads metadata from the disk, and the client hosts of a Sun QFS shared file system read metadata over the network.

The `shared_reader` and `shared_writer` mount option syntax has been retained for backward compatibility.

JUSTIFICATION: These options were renamed in an effort to reduce confusion between the Sun QFS shared file system and file systems with multiple readers and single writers.

USER IMPACT: None. The old syntax is retained for backward compatibility.

WHO SHOULD USE THIS: Multireader file system sites.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: The `mount_samfs`(1M) man page has been updated.

Support for Disk Archiving in Sun SAM-FS and Sun SAM-QFS File Systems in 4.0

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

FOR MORE INFORMATION: See the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* and the following man pages: `diskvols.conf`(4) and `archiver.cmd`(4).

Added Disk Archiving Capabilities

Archiving is the process of copying a file from SAM-FS file system to an archive volume. Archive volumes can reside on removable media cartridges in a library, or they can reside in a file on a mounted file system.

When disk archiving is implemented, each volume on a disk must be identified by a unique VSN identifier. The `/etc/opt/SUNWsamfs/diskvols.conf` file describes volumes for disk archiving. Disk archiving can be configured to archive files to a file system on a remote machine. If disk archiving to a remote system, a host name must be specified when defining the disk VSN, and the host system must have at least one Sun SAM-FS or Sun SAM-QFS file system installed upon it.

The `-disk_archive` directive is an archive set processing directive in the `params` subsection of the `archiver.cmd` file. This is the directive that defines a disk archive set.

JUSTIFICATION: User requests.

USER IMPACT: None.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: For more information, see the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* and the following man pages: `diskvols.conf`(4) and `archiver.cmd`(4).

EXAMPLE: If file `/sam2/my_proj/filea` is in the archive set for `arset0.1`, the archiver archives the content of this file to the destination path named `/sam_arch1` on the remote server `mars`.

File `diskvols.conf` contains:

```
disk01   mars:/sam_arch1
```

The `params` subsection of the `archiver.cmd` file contains the following:

```
params
arset0.1 -disk_archive disk01
endparams
```

Addition of the System Error Facility (SEF) Reporting Mechanism

This feature allows you to capture and compile a report from the log sense pages of peripheral tape devices in Sun SAM-FS and Sun SAM-QFS environments. When this feature is enabled, log sense data is written to a log file (`/var/opt/SUNWsamfs/sef/sefdata` by default) for eventual inclusion in a report. The `sefreport`(1M) command allows you to customize the log sense data in your report. For more information on using this feature, see the `sefreport`(1M) man page, the `sefdata`(4) man page, and the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide*.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: With the data found in the log sense pages, administrators can track errors occurring in tape device operation and in volume use. This allows administrators to identify a problem device or a faulty volume. The administrator could possibly predict device or volume failure before a critical situation develops.

USER IMPACT: None.

WHO SHOULD USE THIS: System administrators who want more information about the errors occurring on tape devices and with specific volumes used with their Sun SAM-FS and Sun SAM-QFS systems.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: Added the `sefreport`(1M) and `sefdata`(4) man pages. Added information to the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide*.

Renamed the `sam_trace`(1M) Command to `samtrace`(1M)

Changed the `sam_trace`(1M) command name to `samtrace`(1M). The associated man page has also been changed. This has been done for command and man page naming consistency reasons.

JUSTIFICATION: Consistency with other command names prefixed with `sam`.

USER IMPACT: The command and man page have now changed to `samtrace`(1M). The underscore character has been removed.

WHO SHOULD USE THIS: All.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: The `sam_trace`(1M) man page is now the `samtrace`(1M) man page.

Removed the Undocumented Archiver Directive `reserve =`

Removed the undocumented archiver directive `reserve =`. This directive was in releases previous to 3.5.0. It was not documented in 3.5.0, but it was processed in the `archiver.cmd` file. The functionality was replaced by the use of the `-reserve` parameter in an `allsets` definition.

Changed the `-c` Option of the `archive`(1) Command to `-C`

Changed the `-c` option of the `archive`(1) command to `-C`. The `-C` option specifies concurrent archiving. The `sls`(1) command has also been changed to reflect this change.

JUSTIFICATION: Consistency with other commands that specify an archive copy.

USER IMPACT: The command and man page have been changed.

WHO SHOULD USE THIS: All.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: `archive`(1), `sls`(1), and `sam_archive`(3) man pages.

Removed the `sam-notifyd` Daemon and its Associated `fifo`

Removed the `sam-notifyd` daemon and its associated `fifo`. The notify functionality is performed by the `sam-fsd` daemon using a UNIX Domain Socket.

JUSTIFICATION: Reduce number of daemons.

USER IMPACT: None.

WHO SHOULD USE THIS: All.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: Removed notify daemon man pages.

Removed Documentation of `sam-clientd` and `sam-serverd` Daemons from `sam-robotsd`(1M) Man Page

The documentation for the `sam-clientd` and `sam-serverd` daemons has been removed from the `sam-robotsd`(1M) man page and is now included on the new `sam-remote`(7) man page.

JUSTIFICATION: Documentation for these daemons was more appropriate on a man page for Sun SAM-Remote.

USER IMPACT: New man page added.

WHO SHOULD USE THIS: Sun SAM-Remote users.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: New man page, `sam-remote`(7).

Archival Drive Equipment Ordinal Added to the Archive Log Information

Added the Equipment Ordinal of the drive on which the file was archived to the archive log information. This allows system administrators to correlate archive media errors with specific drives.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This change was requested by customers.

USER IMPACT: Scripts that process the archiver log should be examined. Since the new field is the last one, it's unlikely changes are needed.

WHO SHOULD USE THIS: Sites that need to correlate media errors with specific drives.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: See `sam-archiverd`(1M).

Added Support for Metadata Only Devices (`md` Devices) Within a Sun QFS or a Sun SAM-QFS File System

This performance feature adds support for `md` devices to the Sun QFS file system. System Administrators can now optimize their I/O performance by placing Sun QFS and Sun SAM-QFS file system metadata on separate devices.

SUPPORTED ENVIRONMENTS: Sun QFS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

DOCUMENTATION CHANGES: See the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide.* Also see the `mcf`(4) man page.

Added the `w` Display to the `samu`(1M) Terminal-based User Interface to Display Stage Requests Waiting for Media

Added the `w` display to `samu`(1M) to show stage requests waiting for media.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

FOR MORE INFORMATION: See "Added the `w` Display to the `samu`(1M) Terminal-based User Interface to Display Stage Requests Waiting for Media" on page 9 and the `sam-archiverd`(1M) man page.

Changed the Method Sun SAM-FS and Sun SAM-QFS Administrators Use to Reserve VSNs

The volume reservation capability is moved from the ReservedVSNs file to the library catalog. The ReservedVSNs file is no longer used. The archiver will initially use its contents to make volume reservations in the catalog. Two commands, reserve(1M) and unreserve(1M), are provided to alter the catalog entries. The dump_cat(1M) command can produce text output that can be used to build a ReservedVSNs file if necessary.

JUSTIFICATION: Simplify management of reserved archive volumes.

USER IMPACT: If a site wishes to downgrade from the 4.0 release to a prior release, the backto350.sh(1M) script must be run to recreate the reserved VSNs information that is now stored in the 4.0 catalog. This script creates the ReservedVSNs file using catalog information available from the dump_cat(1M) command.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: The *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* has been updated to reflect this change. In addition, the ReservedVSNs(4) man page has been removed. The reserve(1M) and unreserve(1M) man pages have been added.

Added hwm_archive Option to the Sun SAM-FS and Sun SAM-QFS mount(1M) Commands to Permit File System Administrators to Select HSM-style Archiving

The hwm_archive option has been added to the mount(1M) command. This option directs the file system to start the archiver when the high threshold is reached. By default, the archiver does NOT start when the high threshold is reached.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9

JUSTIFICATION: This change was requested by tech support.

USER IMPACT: None.

WHO SHOULD USE THIS: Sites that have a lot of incoming files into a file system. It is possible that the archive interval is set to too long a duration, and the file system could fill up before the archiver runs.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: See `mount_samfs`(1M).

Added `newer_than_existing` Option to `star`(1M) Command to Improve Ease-of-use When Performing a Disaster Recovery

The `-n` and `--newer_than_existing` options have been added to the `star`(1M) command. These options extract only those files from the archive image that have newer modification times than the corresponding files in the file system. This allows reloading files from a series of archive tapes without the possibility of extracting older files after newer.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This change was requested by technical support.

USER IMPACT: None.

WHO SHOULD USE THIS: Sites that need to restore files using `star`(1M) for disaster recovery of a lost file system.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: See `star`(1M).

EXAMPLE: The following example commands extract all files newer than those existing from the archive images at position 0x286 on VSN `YYY`:

```
request -p 0x286 -m lt -v YYY xxx
star xvnf xxx
```

Added the -g *logfile* Option to samfsrestore(1M) to List all Files Presently Online to Permit Sun SAM-FS and Sun SAM-QFS Administrators to Stage Those Files Back Online After a samfsrestore(1M) Operation

The -g *logfile* option has been added to the samfsrestore(1M) command. This option generates a log file that lists files that were fully or partially online before the samfsdump(1M) command was issued. This file can be used as input to the restore.sh(1M) script to stage back those files after a restore operation.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This change was requested by technical support.

USER IMPACT: None.

WHO SHOULD USE THIS: Sites that need to restore the previous state of a file system after issuing a samfsrestore(1M) command.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: See the sammkfs(1M) and samfsdump(1M) man pages.

Default DAU Sizes on Sun QFS and Sun SAM-QFS Systems Have Changed

The default DAU sizes on Sun QFS and Sun SAM-QFS systems have changed. The default DAU sizes for Sun SAM-FS file systems did not change. The DAU sizes are specified on the -a *allocation_unit* option of the sammkfs(1M) command. For Sun QFS and Sun SAM-QFS file systems, TABLE 1 shows the 4.0 defaults.

TABLE 1   Default DAU Sizes

File System Type	Default
ms file system	16k
ma file system without striped groups	64k
ma file system with striped groups	256k

JUSTIFICATION: This change was requested by technical support. These defaults can cause more efficient I/O resulting in higher I/O rates than with the previous defaults. The `sammkfs`(1M) command continues to process the `-a` *allocation_unit* argument, where the DAU can be specified. File systems that contain predominantly large files with greater I/O rate requirements will benefit most from the larger defaults.

USER IMPACT: `ma` file system users with small files will want to set the DAU smaller than the default.

For `ma` file systems with striped groups, more disk space is likely to be unusable since the minimum allocation unit is larger. Striped groups are generally used with large files with greater I/O rate requirements.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: The `sammkfs`(1M) man page and the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide*.

Options `-copy_r` *n* and `-any_copy_r` Have Been Added to the `sfind`(1) Command

The `-copy_r` *n* and `-any_copy_r` options have been added to the `sfind`(1) command.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: Consistency within the `sfind`(1) command.

USER IMPACT: None.

WHO SHOULD USE THIS: Any end user.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: `sfind`(1) man page.

Eliminated Requirement to Include a Space Character on Either Side of the Equal-to Signs (=) in Command Files

It is no longer necessary to include a white space character on either side of the equal-to signs (=) in command files.

Added the `min_residence_age` Directive to the `releaser.cmd` File

The `min_residence_age = ` *time* directive has been added to the `releaser.cmd` file. This allows you to adjust the minimum residency age for the releaser.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This change was requested by customers.

USER IMPACT: None.

WHO SHOULD USE THIS: Sites that want the minimum residence age for files to be released to be other than the 10 minute default.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: See the `sam-releaser`(1M) and `releaser.cmd`(4) man pages.

EXAMPLE: The following example directive line sets the minimum residency age to 1 hour in the `releaser.cmd` file:

```
min_residence_age = 3600
```

Added the `load_notify.sh` Script to Provide a Mechanism for Notifying the Operator When Exported or Manually Mounted Media is Requested

The `load_notify.sh`(1M) shell script has been added. This script provides a mechanism for notifying the operator when exported or manually mounted media is requested. It is run when there is a load request for an available volume that is not in an automated library, and the operator state is `attended`. The default script sends email to root showing the VSN.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This change was requested by customers.

USER IMPACT: None.

WHO SHOULD USE THIS: Sites that want operator notification when a request for manually mounted or exported media occurs.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: See the `load_notify.sh`(1M) man page.

EXAMPLE: To enable the feature, issue the following command:

```
cp /opt/SUNWsamfs/examples/load_notify.sh /opt/SUNWsamfs/sbin
```

And then modify the script as desired.

Added `samfsconfig`(1M) Command to Analyze the Superblock and Assist in Reconstruction of the `mcf` File

The `samfsconfig`(1M) command and man pages have been added. This command analyzes the superblock and assists in the reconstruction of the `mcf` file if controller numbers are reassigned or disks are moved between controllers.

SUPPORTED ENVIRONMENTS: Sun QFS, Sun SAM-FS, and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This is a disaster recovery feature.

USER IMPACT: None.

WHO SHOULD USE THIS: System administrators.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: New `samfsconfig`(1M) man page.

EXAMPLE: See the `samfsconfig`(1M) man page.

Added Metadata Archiving Support to the Archive Copy Commands

The archive copy commands now support the `-M` option, which specifies metadata only. If the `-M` is not specified, the command acts upon only regular files. If the `-M` is specified, the command acts upon only metadata files (directories, symlinks, removable media file, segment index), will have the operation performed.

The archive copy commands that now support the `-M` option are as follows: `damage`(1M), `exarchive`(1M), `rearch`(1M), `unarchive`(1M), `undamage`(1M), `unrearch`(1M).

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This allows a system administrator to manipulate metadata archives without affecting data archives.

USER IMPACT: None.

WHO SHOULD USE THIS: System administrators.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: The `-M` option has been added to the man pages for each of these commands.

Added the Stager Daemon, `sam-stagerd`(1M)

Added the stager daemon, `sam-stagerd`. In addition to the new stager daemon, several other capabilities were added. These new capabilities include a more sophisticated stage log facility and a stager daemon configuration file.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9

JUSTIFICATION: This feature improves the supportability and usability of the stager.

USER IMPACT: The following commands in `defaults.conf`(4) have been obsoleted: `lock_stage_buffer`, `stage_retries`, `stages`, and `tp_stage_buffer_size`. See the `stager.cmd`(4) man page for equivalent functionality.

WHO SHOULD USE THIS: Sites wishing to customize file stage activities.

KNOWN SIDE EFFECTS: `sammkfs`(1M) `-r` was removed as a means of disaster recovery.

DOCUMENTATION CHANGES: New text has been added to the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* to describe the new daemon. The following new man pages have been added: `sam-stagerd`(1M), `sam-stagerd_copy`(1M), and `stager.cmd`(4). The following man page has been obsoleted: `sam-logd`(1M).

Added `sambcheck`(1M) Command to Report the Current Usage of a Block on One or More Partitions of a File System

The `sambcheck`(1M) command and man pages have been added to the Sun SAM-FS and Sun QFS packages. This command is a file system block usage identifier that reports the current usage of a block on one or more partitions of a file system.

SUPPORTED ENVIRONMENTS: Sun QFS, Sun SAM-FS, and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: This change was requested by customers.

USER IMPACT: None.

WHO SHOULD USE THIS: System administrators attempting to identify usage of block numbers found in `/var/adm/messages` or output from various utilities such as `samfsck`(1M).

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: New `sambcheck`(1M) man page.

New Enhanced Superblock Supported in Sun QFS, Sun SAM-FS, and Sun SAM-QFS File Systems

The Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems now support an enhanced superblock. The version 2 superblock supports the following new features:

- Access Control Lists (ACLs)
- The Sun QFS shared file system
- A dual allocation scheme for `mm` devices in Sun QFS and Sun SAM-QFS file systems
- The ability to define `md` devices in Sun QFS and Sun SAM-QFS file systems

Not all 4.0 features depend on the version 2 superblock for their support, but the features in the preceding list do depend on the version 2 superblock for their functionality. It is not possible to use these features in a file system initialized with a version 1 superblock. To use these features, you need to reinitialize your file system using the 4.0 `sammkfs`(1M) command.

SUPPORTED ENVIRONMENTS: Sun QFS, Sun SAM-FS, and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: The version 2 superblock design is needed to support some release 4.0 features.

USER IMPACT: At the time a file system is initialized, the site must decide whether the file system should use the new version 2 superblock or whether it should remain backward compatible with the pre-4.0 software and use the version 1 superblock.

If you are using 4.0 software and you want to initialize a file system with a version 1 superblock, you must specify the `-P` option on the `sammkfs`(1M) command.

The software detects the superblock used in the file system and supports features that can be enabled in the superblock that is present in the mounted file system. It is not possible to mount a file system with a version 2 superblock using pre-4.0 Sun QFS, Sun SAM-FS, or Sun SAM-QFS software.

For disaster recovery purposes, a `samfsdump`(1M) or `qfsdump`(1M) file created using 4.0 software can be used to restore file systems to either a version 1 superblock or a version 2 superblock, as follows:

- To restore the file system using a version 2 superblock, reinitialize the file system using the `sammkfs`(1M) command before issuing the `samfsrestore`(1M) or `qfsrestore`(1M) command.

- To restore the file system using a version 1 superblock, reinitialize the file system using the `sammkfs`(1M) command with its `-P` option before issuing the `samfsrestore`(1M) or `qfsrestore`(1M) commands. When restored, unsupported functionality is omitted.

WHO SHOULD USE THIS: Sites needing the features supported only with the version 2 superblock.

KNOWN SIDE EFFECTS: If you initialize a new file system with a version 2 superblock, you cannot mount such a file system if you back up your software level to a pre-4.0 release using the `backto350.sh`(1M) script.

DOCUMENTATION CHANGES: `sammkfs`(1M) man page, the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide*, and the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS Installation and Configuration Guide*. The `samu`(1M) file system displays and the `samfsinfo`(1M) output files contain a version number in the output examples.

Superblock Version Detection is Added in Release 4.0.

The software can detect the superblock version used in a mounted file system and can control the use of release-specific features. The Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems now support both version 1 and version 2 superblocks.

JUSTIFICATION: Some features introduce on-disk data structures that are not supported in previous releases. In the past, data corruption has occurred when a file system containing new structures is inadvertently used under an older release. This change can prevent such corruption.

USER IMPACT: The new features available with the version 2 superblock.

Support for Configuring the Archive Buffer Size

You can now specify the size of the buffer to be used when copying a file from disk cache to the archive media. This size can be specified in the `archiver.cmd`(4) file on a global basis or on an archive set basis. In addition, you can also specify whether or not the file system or the archiver should control the buffer lock. The directives to control these actions are as follows:

- `bufsize=`*media_type buffer_size* [`lock`]
- `-bufsize=`*buffer_size*
- `-lock`

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: Performance.

USER IMPACT: None.

WHO SHOULD USE THIS: Sites wishing to improve their archiving performance should experiment with the values on these directives.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: For more information, see the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* or see the `archiver.cmd`(4) man page.

Support for Sharing of Removable Media Drives by More Than One Sun SAM-FS or Sun SAM-QFS Host System

The Sun SAM-FS and SAM-QFS software supports the sharing of drives by more than one Sun SAM-FS or Sun SAM-QFS host system for drives in certain network-attached libraries. A *shared drive* is a drive that can be used by multiple Sun SAM-FS or Sun SAM-QFS processes on multiple servers. These network-attached libraries include all StorageTek network-attached libraries, all Sony network-attached libraries, and the IBM 3494 network-attached library.

SUPPORTED ENVIRONMENTS: Sun SAM-FS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.7, 2.8, and 2.9.

JUSTIFICATION: User requests.

USER IMPACT: None.

WHO SHOULD USE THIS: Sites wishing to share a single network-attached library and its drives with more than one copy of Sun SAM-FS or Sun SAM-QFS software.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: Documentation for the shared drives feature can be found in the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* and in the appropriate man pages.

EXAMPLE: Examples are provided in the `stk`(7), `sony`(7), and `ibm3494`(7) man pages.

Added the `samunhold`(1M) Command to Enable Releasing of SANergy File Holds

The `samunhold`(1M) command has been added to release SANergy file holds.

This command is intended to assist system administrators with SANergy File Sharing running on Sun QFS file systems.

SUPPORTED ENVIRONMENTS: Sun QFS and Sun SAM-QFS.

SUPPORTED SOLARIS OPERATING ENVIRONMENTS: 2.8 and 2.9.

JUSTIFICATION: This allows an administrator to release SANergy holds in an emergency.

USER IMPACT: None.

WHO SHOULD USE THIS: SANergy system administrators.

KNOWN SIDE EFFECTS: This command releases all held files in the specified file system.

DOCUMENTATION CHANGES: `samunhold`(1M) man page.

Added the `rearch_no_release` Directive to the Releaser Command File

Added the `rearch_no_release` directive to the releaser command file.

JUSTIFICATION: Needed to prevent files from being released before they have had a chance to rearchive.

WHO SHOULD USE THIS: Sites using the migration toolkit and sites that recycle.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: The `sam_releaser`(1M) and `releaser.cmd`(4) man pages, and the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide.*

Features in this Release (From Patches to 4.0)

Several modifications, bugfixes, and enhancements were added to the Sun QFS, Sun SAM-FS, and Sun SAM-QFS software in the patch releases that followed the base 4.0 release. The following subsections describe the features added to the software in 4.0 patch 01 through 4.0 patch 05.

Note – The Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0.1 release consolidates all modifications made to this product in 4.0 and in patch 01 through patch 05.

All bugs fixed in patches 01 through 05 are fixed in this release, the v4.0.1 release.

Support for `flock`(3UCB) capabilities in a Sun QFS Shared File System After the Metadata Server is Changed

The initial 4.0 release did not support `flock`(3UCB) in a Sun QFS shared file system when the metadata server is changed. Change of the metadata server in this environment resulted in loss of all `flock`(3UCB) locks.

Support for `flock`(3UCB) capabilities in a Sun QFS shared file system after change of the metadata server was added to 4.0 in the 02 patch.

FIXED IN BUILD: 4.0.12 on September 19, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Support `flock`(3UCB) in a Sun QFS shared file system after the metadata server is changed.

USER IMPACT: Users can execute `flock`(3UCB) in a Sun QFS shared file system environment after the metadata server is changed.

USERS WHO SHOULD USE THIS: Sites that have a Sun QFS shared file system that are configured for metadata failover and which to use `flock`(3UCB) file locking.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the Solaris `flock`(3ucb) man page.

Increased Speed of Media Catalog Startup on Sun SAM-FS and Sun SAM-QFS Servers that have Large Media Catalogs

Eliminated redundant catalog query for each catalog entry performed during startup. This modification was incorporated into 4.0 in patch 02.

FIXED IN BUILD: 4.0.10 on September 5, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Increased speed of media catalog startup on Sun SAM-FS and Sun SAM-QFS servers that have large media catalogs (media catalogs that contain many volumes).

USER IMPACT: Increased speed of catalog start up in Sun SAM-FS and Sun SAM-QFS configurations that have media catalogs that contain many volumes.

USERS WHO SHOULD USE THIS: System administrators and users whose Sun SAM-FS or Sun SAM-QFS configurations have media catalogs that contain many volumes should notice a substantial improvement in operations that utilize the media catalog server.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* for more information regarding the catalog server daemon (`sam-catserverd`).

Allow System Administrators to Configure Archiving in Sun SAM-FS and Sun SAM-QFS File Systems to Sort Files by Size for Archiving

FIXED IN BUILD: 4.0.23 on December 6, 2002.

RELEASED IN PATCH: 03.

JUSTIFICATION: Support documented product feature.

USER IMPACT: System administrators can configure the archiver to sort files by size for archiving.

USERS WHO SHOULD USE THIS: System administrators who wish to have the archiver sort files by size for archiving in a Sun SAM-FS or a Sun SAM-QFS file system.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the `archiver.cmd`(4) man page. Also see the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide* for more information on configuring archiving within a Sun SAM-FS or a Sun SAM-QFS file system to increase performance.

Support for Direct Access to Tape (Stage Never, `stage -n`) in a Shared Sun SAM-QFS File System

The initial 4.0 release did not support use of SAM's direct access to tape, the `stage -n` feature, in conjunction with use of Sun QFS's shared file system feature. Support for use of `stage -n` in a shared Sun SAM-QFS environment was added to 4.0 in patch 02.

FIXED IN BUILD: 4.0.8 on August 22, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Support use of stage never in a shared Sun SAM-QFS environment.

USER IMPACT: Sun SAM-QFS file system administrators can use `stage -n` in a Sun SAM-QFS shared environment.

USERS WHO SHOULD USE THIS: Sites that have a Sun SAM-QFS shared file system who wish to use `stage -n` to achieve direct access to tape.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the Sun SAM-QFS `stage`(1) man page.

Support for the DNLC `purge vp` Operation in Shared Sun QFS and Shared Sun SAM-QFS Environments Running with the Multireader (Shared Reader) Option

The initial 4.0 release did not fully support DNLC `purge vp` operations. As a result, file system administrators running with this configuration consistently experienced very substantial performance penalties. Under this configuration, Sun QFS file systems performed ten times slower than NFS and 300 times slower than when Sun QFS software was run with the shared writer option instead of the shared reader option.

Full support of the DNLC `purge vp` operation was added to 4.0 in patch 02.

FIXED IN BUILD: 4.0.8 on August 22, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Substantial performance improvement for users using Sun SAM-QFS or Sun QFS software in a shared environment with the multireader (shared reader) option.

USER IMPACT: None; users should see a substantial performance boost when using Sun SAM-QFS or Sun QFS software in a shared environment with the multireader (shared reader) option.

USERS WHO SHOULD USE THIS: This performance enhancement is applicable to configurations of Sun SAM-QFS or Sun QFS software in a shared environment with the multireader (shared reader) option.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide.*

Support for Multibyte Character Set Environments Such as `ko`, `zh`, and `ja` Locales

The initial 4.0 release did not support localization of the Sun QFS, Sun SAM-FS, and Sun SAM-QFS products into languages that use multibyte character sets.

Support of multibyte character sets was added to 4.0 in patch 01.

FIXED IN BUILD: 4.0.4 on July 25, 2002.

RELEASED IN PATCH: 01.

JUSTIFICATION: Support localization of the product in languages that use multibyte character sets.

USER IMPACT: None; portions of the product which are internationalized can be localized to languages which use multibyte character sets.

USERS WHO SHOULD USE THIS: This product feature is applicable to users who use Sun QFS, Sun SAM-FS, or Sun SAM-QFS in languages that use multibyte character sets.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the *Sun QFS, Sun SAM-FS, or Sun SAM-QFS File System Administrator's Guide* and the *Sun QFS, Sun SAM-FS, or Sun SAM-QFS Storage and Archive Management Guide* with regards to language localization in non-English (US) languages.

Support Write and Allocate Operations in a Shared Sun SAM-QFS or a Shared Sun QFS Environment During a Metadata Server Changeover

The initial 4.0 release did not support use of write and allocate operations in a shared Sun SAM-QFS or a shared Sun QFS environment during metadata server changeover. Use of these operations in the initial 4.0 release during metadata server changeover could result in data corruption in these environments which was able to cause a panic at a later time.

Support of these operations in these environments was added to 4.0 in patch 02.

FIXED IN BUILD: 4.0.10 on September 5, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Support write and allocate operations in shared Sun SAM-QFS and shared Sun QFS environments during metadata server changeover. Fix data corruption problem caused when these operations were performed in these environments during metadata server changeover. Prevent system panics.

USER IMPACT: None. Write and allocate are now supported in these environments during metadata server changeover.

USERS WHO SHOULD USE THIS: Write and allocate operations can now be performed in these environments during metadata server changeover.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the *Sun QFS, Sun SAM-FS and Sun SAM-QFS File System Administrator's Guide.*

Addition of `-partial_on` Test to the `sfind`(1) Command

This test helps users and file system administrators find files based on whether the file's partial portion is online or offline.

FIXED IN BUILD: 4.0.14 on October 7, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Customer request.

USER IMPACT: None. Users may now use the -partial_on test in sfind(1) to find files whose partial portion is online. ! -partial_on can be used to find files whose partial portion is offline.

USERS WHO SHOULD USE THIS: File system administrators who configure their Sun SAM-FS or Sun SAM-QFS file systems to use the release partial file attribute. Users that have files that reside in a Sun SAM-FS or a Sun SAM-QFS file system on which the file system administrator has enabled the release partial attribute.

DOCUMENTATION CHANGES: sfind(1) man page.

FOR MORE INFORMATION: See the sfind(1) man page and the release(1) man page for more information on sfind(1) and a file's partial attribute, respectively.

Support Sparse File Allocation in Shared Sun QFS and Shared Sun SAM-QFS File Systems When Running with Multiwriter (Shared Writer) Enabled

In the initial release of the Sun QFS and Sun SAM-QFS file systems, it was possible to cause a system panic when performing sparse file allocation in a shared Sun QFS or a shared Sun SAM-QFS file system. This bug was fixed in patch 02.

FIXED IN BUILD: 4.0.10 September 5, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Use of sparse file writes in a shared Sun QFS or a shared Sun SAM-QFS file system can cause system panic.

USER IMPACT: Users can now write sparse files in shared Sun QFS and shared Sun SAM-QFS file system.

USERS WHO SHOULD USE THIS: This product feature is applicable to users who write sparse files (have applications that write sparse files) into a shared Sun QFS or a shared Sun SAM-QFS file system.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: NA.

Fix the Data Allocation Scheme in Sun QFS, Sun SAM-FS, and Sun SAM-QFS File Systems

The fixed scheme initiates the next allocation request at the end of the last allocation request instead of at the buffer offset. This avoids allocating over space that has already been allocated but has not yet been used. This fix eliminated a redundant and therefore inefficient allocation scheme. This allocation fix applies to users using a shared Sun QFS or a shared Sun SAM-QFS file system with append leases enabled.

FIXED IN BUILD: 4.0.8 on August 22, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Substantial performance improvement for system administrators who use the Legato NetWorker product or Sun StorEdge Enterprise Backup Software (EBS) to backup client computers into a Sun SAM-QFS file system. Speed observed doubled after this modification was incorporated into the Sun QFS and Sun SAM-QFS software.

USER IMPACT: Administrators and users should observe twice the speed when running Legato NetWorker or Sun StorEdge EBS to back up data into a Sun SAM-QFS file system.

USERS WHO SHOULD USE THIS: Administrators and users should observe twice the speed when running Legato NetWorker or Sun StorEdge EBS to back up data into a Sun SAM-QFS file system.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Not available.

Support Quotas With Users Whose User ID is Larger Than `65535` in `samfsck`(1M)

In the initial 4.0 release of the Sun QFS, Sun SAM-FS, and Sun SAM-QFS software, when quotas were used in conjunction with user IDs that were larger than `65535`, `samfsck`(1M) would core dump when run.

This bug was fixed in the 02 patch.

FIXED IN BUILD: 4.0.11 on September 12, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Customer request; resolve field escalation.

USER IMPACT: System administrators can use the online disk quotas in Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems in conjunction with user IDs that are greater than 65535.

USERS WHO SHOULD USE THIS: This fix is applicable to file system administrators that use the online disk quota feature in Sun QFS, Sun SAM-FS, or Sun SAM-QFS file systems and have user IDs that are greater than 65535.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the squota(1) and samquota(1M) man pages and the file named README for more information regarding the online disk quota feature in the Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems.

Support for dtmail(1X) Data Files in Shared Sun QFS and Shared Sun SAM-QFS File Systems

The initial 4.0 release of shared Sun QFS and shared Sun SAM-QFS did not support running dtmail(1X) in a shared Sun QFS or a shared Sun SAM-QFS file system. It was possible to get dtmail(1X) to core dump when opening certain kinds of files in dtmail(1X) on a shared file system client.

Support for dtmail(1X) data files was added to the 4.0 release in the 02 patch.

FIXED IN BUILD: 4.0.12 on September 19, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Support dtmail(1X) in shared Sun QFS and shared Sun SAM-QFS environments.

USER IMPACT: System administrators who wish to configure dtmail(1X) to run in a shared Sun QFS or a shared Sun SAM-QFS environment.

USERS WHO SHOULD USE THIS: This fix is applicable to administrators who wish to run dtmail(1X) in a shared Sun QFS or a shared Sun SAM-QFS file system.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Not available.

Support Use of `samgrowfs`(1M) to Add a Stripe Group in a Sun QFS or Sun SAM-QFS File System

The initial 4.0 release of Sun QFS and Sun SAM-QFS software did not support the use of `samgrowfs`(1M) to add a stripe group to a Sun QFS or a Sun SAM-QFS file system.

Attempting to add a stripe group to a Sun QFS or a Sun SAM-QFS file system by using `samgrowfs`(1M) in the initial 4.0 release of this product caused the file system to become unmountable by incorrectly modifying part of the file system's superblock.

Support for use of `samgrowfs`(1M) to add a stripe group was added to the 4.0 release of the Sun QFS and Sun SAM-QFS software in patch 02.

FIXED IN BUILD: 4.0.16c on November 4, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Use of `samgrowfs`(1M) to add a stripe group to a Sun QFS or a Sun SAM-QFS file system caused the file system to become unmountable due to an incorrect modification to the file system's superblock.

USER IMPACT: System administrators can use `samgrowfs`(1M) to add a stripe group to a Sun QFS or a Sun SAM-QFS file system as of 4.0-patch 02.

USERS WHO SHOULD USE THIS: System administrators who wish to grow a Sun QFS or a Sun SAM-QFS file system and wish to add a stripe group.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the `samgrowfs`(1M) man page for more information regarding using the `samgrowfs`(1M) command to increase the number of metadata or data devices in your Sun QFS or Sun SAM-QFS file system.

Performance Improvement in Appending to a Large File on a Shared Sun QFS File System Client or a Shared Sun SAM-QFS File System Client

Customer experienced substantial degradation in performance when writing a large file from a shared Sun QFS file system or a shared Sun SAM-QFS file system.

This performance degradation was fixed in 4.0-patch 03.

FIXED IN BUILD: 4.0.26 on January 9, 2003.

RELEASED IN PATCH: 03.

JUSTIFICATION: Customer request.

USER IMPACT: Users should experience substantial increase in performance when writing large files from shared Sun QFS or shared Sun SAM-QFS file system clients.

USERS WHO SHOULD USE THIS: This fix will affect users who write large files from shared Sun QFS or shared Sun SAM-QFS file system clients.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide* for more information on configuring your shared file system environment to increase performance for your I/O characteristics.

Support Use of the `samgrowfs`(1M) Command to Increase the Size of the Metadata Partition in a Sun QFS File System

In the initial 4.0 release of QFS, the `samgrowfs`(1M) command could not be used to increase the size of the metadata partition in a Sun QFS file system.

Support for use of `samgrowfs`(1M) to increase the size of the metadata partition in a Sun QFS file system was added to the Sun QFS and Sun SAM-QFS software in the 4.0 -02 patch.

FIXED IN BUILD: 4.0.16c.

RELEASED IN PATCH: 02.

JUSTIFICATION: This bug was escalated in the field by a customer; bug fix requested by customer.

USER IMPACT: System administrators can use the `samgrowfs`(1M) command to increase the size of the metadata partition in a Sun QFS file system as of the 4.0-patch 02 release.

USERS WHO SHOULD USE THIS: This fix affects system administrators who wish to increase the size of their metadata partition in a Sun QFS file system.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: For more information on increasing your metadata or data partitions in a Sun QFS or Sun SAM-QFS file system, see the `samgrowfs`(1M) man page.

Support Direct I/O in Sun QFS, Sun SAM-FS, and Sun SAM-QFS File Systems

Direct I/O can be enabled within a file system. Direct I/O is recommended to increase performance in these file systems when performing large, block-aligned sequential I/O operations. The setfa(1) command's -D option is used in Sun QFS, Sun SAM-FS, and Sun SAM-QFS to enable 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.

A bug in direct I/O was found in the 4.0 release; this bug caused resources to be passed to device drivers without acquiring locks on the file page memory resulting in possible failure of the DMA operation.

This bug was fixed in 4.0-patch 03.

FIXED IN BUILD: 4.0.20 on November 14, 2002.

RELEASED IN PATCH: 03.

JUSTIFICATION: Fix field escalation reported by customer; customer request.

USER IMPACT: Fixed bug in direct I/O in Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems. System administrators can enable direct I/O in these file systems. Users can use direct I/O in these file system types.

USERS WHO SHOULD USE THIS: This fix is applicable for system administrators and users who wish to use the direct I/O feature in Sun QFS, Sun SAM-FS, or Sun SAM-QFS file systems.

This feature is recommended in environments and for applications that perform large, block-aligned sequential I/O.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the setfa(1) man page for more information on direct I/O in these file system types. Also see the *Sun QFS, Sun SAM-FS, and SUN SAM-QFS File System Administrator's Guide* for more information on direct I/O in these file system types.

Support samgrowfs(1M) in Shared Sun QFS and Sun SAM-QFS File Systems

The samgrowfs(1M) feature is used in Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems to increase the size of the metadata and data partitions by adding more disk devices to these partitions within the file system.

In the 4.0 release it was not possible to use samgrowfs(1M) to grow a shared file system.

This bug was fixed in 4.0-patch 03.

FIXED IN BUILD: 4.0.20 on November 14, 2002.

RELEASED IN PATCH: 03.

JUSTIFICATION: Resolve customer field escalation; requested by customer.

USER IMPACT: System administrators can use the samgrowfs(1M) command to increase the size of the metadata and data partitions in Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems by adding more disk devices to these partitions.

USERS WHO SHOULD USE THIS: System administrators who wish to increase the size of their metadata and data partitions in a Sun QFS, Sun SAM-FS, or Sun SAM-QFS file system by adding more disk devices to these partitions.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the samgrowfs(1M) man page for more information.

Support for Mismatched Stripe Groups in a Sun QFS or a Sun SAM-QFS File System

The Sun QFS and Sun SAM-QFS products support the creation of stripe groups within a Sun QFS file system and within a Sun SAM-QFS file system. A stripe group is a collection of one or more disk devices to which file data can be written. This collection of devices is identified within the Sun QFS or Sun SAM-QFS file system by an identification number known as the stripe group number.

Stripe groups within a Sun QFS or a Sun SAM-QFS file system are referred to as *mismatched* when the number of devices or the size of the devices within one collection, one stripe group, differs from the number of devices or the size of the devices within another collection, another stripe group.

When a Sun QFS or a Sun SAM-QFS file system contains mismatched stripe groups, then the file system automatically allocates all of one file's data to within one stripe group instead of striping the file's data across multiple stripe groups (this is referred to as the file system's *allocation* or *striping method*).

In the initial 4.0 release of the Sun QFS and Sun SAM-QFS software, the file systems incorrectly allocated data for a file across more than one stripe group even when the stripe groups were mismatched. This resulted in multiple file I/O errors.

This file data allocation error in Sun QFS and Sun SAM-QFS file systems that contain mismatched stripe groups was corrected in the 4.0-patch 02.

FIXED IN BUILD: 4.0.16e on December 4, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: Customer request; file allocation error resulted in multiple file I/O errors.

USER IMPACT: File system administrators can construct Sun QFS and Sun SAM-QFS file systems that contain mismatched stripe groups. File data is allocated correctly in Sun QFS and Sun SAM-QFS file systems that contain mismatched stripe groups.

USERS WHO SHOULD USE THIS: This fix is applicable to environments that have a Sun QFS or a Sun SAM-QFS file system that contains mismatched stripe groups.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: For more information regarding stripe groups, mismatched stripe groups, striping methods and allocation within a Sun QFS or a Sun SAM-QFS file system that has one or more stripe groups, see the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide* and also see the *Sun SAM-FS and Sun SAM-QFS Storage And Archive Management Guide.*

Documentation of Online Disk Quotas Support

The Sun QFS environment supports disk quotas. Quotas can be set for disk file and block counts on per-user, per-group, and per administrative ID bases.

The squota(1), samquota(1M), and samquotastat(1M) commands are installed by default in all Sun QFS, Sun SAM-FS, and Sun SAM-QFS environments, but they are supported on Sun QFS file systems only. For more information, see the AVAILABILITY fields of these man pages.

FIXED IN BUILD: 4.0.16A on December 4, 2002.

RELEASED IN PATCH: 02.

JUSTIFICATION: The 4.0 release supports online disk quotas, but documentation incorrectly stated that this feature had been deferred to a future product release.

USER IMPACT: As of release 4.0, file system administrators can set online quotas. File system administrators should inform users if they are subject to these quotas. File system administrators and users can view the squota(1) and samquota(1M) man pages for information regarding the online disk quota feature.

USERS WHO SHOULD USE THIS: File system administrators who wish to configure online disk quotas for their users. Users should refer to man pages for information regarding these quotas.

DOCUMENTATION CHANGES: The `squota`(1) and `samquota`(1M) man pages were updated to reflect information regarding the online disk quota feature.

FOR MORE INFORMATION: See the `squota`(1) and `samquota`(1M) man pages and the file named `README`.

Support Failover of the Sun SAM-QFS Catalog Server Daemon Across Sun SAM-QFS System Servers

In a Sun SAM-QFS environment, procedures have been created to allow the Sun SAM-QFS catalog to failover across servers. Automated scripts and documentation for these procedures are available via Sun Professional Services. Contact your local Sun sales office for more information.

Support of failover of the Sun SAM-QFS media catalog server daemon across Sun SAM-QFS system servers was released to the Sun SAM-QFS customer base as of Sun SAM-QFS release 4.0-patch 03.

FIXED IN BUILD: Not applicable.

RELEASED IN PATCH: Support of failover of the Sun SAM-QFS media catalog server was released in patch 03.

JUSTIFICATION: Extend failover support to the Storage and Archive Management (SAM) media catalog services. Enhance the failover feature in the Sun SAM-QFS software. Service failover is a part of the architecture roadmap to support distributive services in the Sun SAM-QFS product.

USER IMPACT: System administrators who use Sun SAM-QFS in conjunction with the product's failover feature can failover the media catalog from one Sun SAM-QFS system server to another Sun SAM-QFS system server.

USERS WHO SHOULD USE THIS: System administrators who use Sun SAM-QFS software in conjunction with the product's failover feature can failover the media catalog from one Sun SAM-QFS system server to another Sun SAM-QFS system server.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Automated scripts and documentation for these procedures are available via Sun Professional Services. Contact your local Sun sales office for more information.

Equipment Identifier Restrictions for Removable Media Drives Relaxed

Removable media drive Equipment Identifiers no longer need to be symbolic links in the `/dev/rmt` directory.

In Sun SAM-FS and Sun SAM-QFS software releases before 4.0 patch 03, removable media drive Equipment Identifiers had to be symbolic links in the `/dev/rmt` directory. This restriction was eliminated in 4.0 patch 03.

FIXED IN BUILD: 4.0.26h on March 17, 2003.

RELEASED IN PATCH: 03.

JUSTIFICATION: Not all removable media drives set up symbolic links in the `/dev/rmt` directory, so this is not an appropriate configuration for environments in which one server has many removable devices attached to it.

USER IMPACT: Supports system configurations where removable media devices do not have symbolic links in the `/dev/rmt` directory. This is especially important for systems where one server has many removable devices attached to it.

USERS WHO SHOULD USE THIS: System administrators with devices that do not have symbolic links created for them in the `dev/rmt` directory. System administrators who have one server that has many removable devices attached to it.

DOCUMENTATION CHANGES: Updated the `mcf`(4) man page to reflect this change.

FOR MORE INFORMATION: See the `mcf`(4) man page for details.

Support Failover of Active Staging When a Sun SAM-QFS Server is Failed Over From One Server to Another

FIXED IN BUILD: 4.0.26g on March 5, 2003 and 4.0.26j on March 21, 2003

RELEASED IN PATCH: 03.

JUSTIFICATION: Support failover of active stage requests when a Sun SAM-QFS server is failed over from one server to another. Enhance support of failover in the Sun SAM-QFS software. Service failover is a part of the architecture roadmap to support distributive services in the Sun SAM-QFS product.

USER IMPACT: Staging will be automatically restarted after performing a Sun SAM-QFS failover. Stages initiated on a Sun SAM-QFS file system client will automatically restart on the new Sun SAM-QFS file system server after performing a Sun SAM-QFS failover.

USERS WHO SHOULD USE THIS: This bugfix will affect users who use the failover feature in a Sun SAM-QFS file system.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Documentation of the Sun SAM-QFS failover feature and automated scripts are available via Sun Professional Services. Contact your local Sun sales office for more information.

Increase Performance When Allocating Sparse Blocks on a Shared Sun QFS or a Shared Sun SAM-QFS File System When Sparse Block Writes are Performed From a Sun QFS or a Sun SAM-QFS File System Client

In a shared Sun QFS or a shared Sun SAM-QFS file system, if a file system client discovers a sparse file, no underlying blocks, then the client requests the server to allocate blocks. The server allocates blocks in DAU size increments. This is very slow if the DAU is relatively small.

To increase performance, the allocation size requested by the file system client to the server has been changed from DAU size increments to `maxallocsz` increments.

FIXED IN BUILD: 4.0.26j on March 21, 2003.

RELEASED IN PATCH: 03.

JUSTIFICATION: Resolve field escalation reported by customer; customer request.

USER IMPACT: Users will notice increased performance when writing sparse files into a shared Sun QFS or a shared Sun SAM-FS file system from a file system client.

USERS WHO SHOULD USE THIS: Users will notice increased performance when writing sparse files into a shared Sun QFS or a shared Sun SAM-FS file system from a file system client.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: For more information on shared file system configurations and configuring and using file system clients, see the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide*.

Fix Bug: File System Corruption Can Occur If Customers Execute `samfsck`(1M) `-F` on a File System that Contains More Than 8 Million Inodes

This bug was a regression that was introduced in Sun QFS, Sun SAM-FS, and Sun SAM-QFS software in the release of 4.0 patch 03. It was fixed in the release of 4.0 patch 04.

FIXED IN BUILD: 4.0.26m on May 29, 2003.

RELEASED IN PATCH: 04.

JUSTIFICATION: Fix product regression that causes data corruption.

USER IMPACT: This modification fixes a product bug; permits use of `samfsck`(1M) `-F` by system administrators on file systems that contain more than 8 million inodes.

USERS WHO SHOULD USE THIS: Not applicable.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: None.

Fix Bug: Data Corruption Can Occur If Customers Trigger Staging of File Data From a Shared File System Client

This corruption only occurs if the stage is triggered from a client and the process that triggers the stage is either interrupted or requires only a portion of the file to be retrieved. In both cases, the file is truncated to the length of data requested.

This bug was a regression that was introduced in Sun QFS, Sun SAM-FS, and Sun SAM-QFS software in the release of 4.0 patch 03. It was fixed in the release of 4.0 patch 04.

FIXED IN BUILD: 4.0.26m on May 29, 2003.

RELEASED IN PATCH: 04.

JUSTIFICATION: Fix product regression that causes data corruption.

USER IMPACT: This modification fixes a product bug. The Sun SAM-QFS software was truncating file size when a stage triggered by a file system client is interrupted or when a request from a file system client only requires a portion of the file to be retrieved. This modification fixes this bug.

The bug fixed by this modification potentially affected users of shared Sun SAM-QFS software who used the SAM stage feature from a shared Sun SAM-QFS client. This bug would not affect any other users using any other configurations of the product.

USERS WHO SHOULD USE THIS: Not applicable.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: For more information regarding use of the shared file system feature or configuring shared file system clients in Sun QFS or Sun SAM-QFS environments, see the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide.*

Fix Bug: Data Inaccessibility Can Occur If Customers Use Disk Archiving to Protect Files that Have Path Names That are Equal to or Greater Than 100 Characters

The file disk archive copies are not corrupt, but they cannot be staged successfully.

In Sun SAM-FS and Sun SAM-QFS release 4.0, prior to patch 04, if users archived files that had path names of 100 or more characters, then these files could not be staged back into the physical disk cache from the disk archive. The disk archive copies of the affected files were not corrupted, but they could not be staged successfully. This situation could result in the user's data becoming inaccessible if all archive copies were in disk archive and the file went offline.

This bug was fixed in 4.0 patch 04.

FIXED IN BUILD: 4.0.26m on May 29, 2003.

RELEASED IN PATCH: 04.

JUSTIFICATION: Fix product defect that causes data to become inaccessible.

USER IMPACT: This modification fixes a product bug. It permits staging of files archived via disk archiving whose pathnames are equal to or greater than 100 characters. The product bug fixed by this modification potentially affected users of Sun SAM-FS of Sun SAM-QFS file systems who used file disk archiving and who archived files whose path names are equal to or greater than 100 characters to disk archives. This bug would not affect any other users using any other configurations of the product.

USERS WHO SHOULD USE THIS: Not applicable.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: For more information on configuring and using disk archiving in a Sun SAM-FS or Sun SAM-QFS file system environment, see the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide*.

The Sun QFS Metadata Server Changeover Feature Released in the 4.0 version of the Product is Now Fully Supported as of Patch 04

Multiple bugs were reported against the changeover feature. These bugs have been resolved as of release 4.0 patch 04.

Support Use of `chown`(1) on Files in Conjunction With Access Control Lists (ACLs)

In the 4.0 release, it was possible for a user with root access to execute `chown`(1) and have the new ownership of the file not take effect if the file had an ACL.

This was fixed in 4.0 patch 05.

FIXED IN BUILD: 4.0.30 on February 6, 2003.

RELEASED IN PATCH: 05.

JUSTIFICATION: Fix product defect. File ownership should still be changeable in Sun QFS, Sun SAM-FS, and Sun SAM-QFS file systems even when a file has an ACL.

USER IMPACT: This modification permits users who have root access to use `chown`(1M) to change the file ownership of a file even if the file has an ACL.

USERS WHO SHOULD USE THIS: As of the 4.0 patch 05 release, users with root access may use chown to change the file ownership of files even if the have ACLs.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: See the Solaris documentation regarding ACLs. ACLs are supported in Sun QFS, Sun SAM-FS, and Sun SAM-QFS as of the initial release of 4.0. See the `chown`(1) man page for more information regarding using `chown`(1) to change the ownership of a file.

Support for Shared Sun QFS on Cluster

In a bug reported against the Sun QFS 4.0 release, a panic occurred in a shared Sun QFS environment running on top of a two-node Sun Cluster when trying to access a stale inode.

FIXED IN BUILD: 4.0.44 May 22, 2003.

RELEASED IN PATCH: 05.

JUSTIFICATION: Enhance the shared file system feature to support shared Sun QFS on a Sun Cluster.

USER IMPACT: Bug fixes product defect found when trying to access a stale inode in a shared Sun QFS running on a Sun Cluster.

USERS WHO SHOULD USE THIS: Not Applicable.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Not available.

Support Read of Sparse Areas of a Sparse File in Shared Sun QFS and Shared Sun SAM-QFS File Systems Even When the Sparse File is Memory-mapped with Write Permissions Enabled

In the 4.0 release, reads of sparse areas of a sparse file in a shared Sun QFS or a shared Sun SAM-QFS file system would result in the file reads of the sparse sections not being read as all zeros. Note this product defect did not occur when the sparse file was memory-mapped with read-only permissions enabled.

In the 4.0-patch 05 release, the Sun QFS and Sun SAM-QFS file systems were modified so that zeros would always be read when sparse sections of a sparse file were read.

FIXED IN BUILD: 4.0.48 on June 26, 2003.

RELEASED IN PATCH: 05.

JUSTIFICATION: Fixes field escalation reported by customer; customer request.

USER IMPACT: Read of sparse sections of a sparse file will read as all zeros.

USERS WHO SHOULD USE THIS: This product bug fix results in reads of sparse sections of a sparse file being read as all zeros.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Not available.

Suppress the Release of a File in a Sun SAM-QFS File System Running in Conjunction With SANergy When the File is Being Accelerated By SANergy and is Active

Releasing the file causes its data to be deallocated by Sun SAM-QFS and its file size to be set to zero.

In a Sun SAM-FS 4.0 release system running in conjunction with SANergy, a file that had at least one archive copy was considered eligible for release even when it was being accelerated by SANergy and was active. Therefore, in Sun SAM-QFS 4.0 it was possible for the releaser to release a file that was being accelerated by SANergy and was active. Releasing a file under these circumstances caused the file's data to be lost.

This product defect was fixed in Sun SAM-QFS 4.0 patch 05. The Sun SAM-QFS releaser no longer considers a file eligible for release when it is being accelerated by SANergy and is active as of SAM-QFS 4.0-patch 05.

FIXED IN BUILD: 4.0.48 on June 26, 2003.

RELEASED IN PATCH: 05.

JUSTIFICATION: Customer request. Support use of Sun SAM-QFS in conjunction with SANergy.

USER IMPACT: Users can use Sun SAM-QFS in conjunction with SANergy. The Sun SAM-QFS releaser will not release files that are being accelerated by SANergy and are active.

USERS WHO SHOULD USE THIS: Not applicable.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Not available.

Performance Improvement in Inode Version Check in File System Kernel When Processing Remove Name Operation

In the Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 release, the file system kernel performs an unnecessary, extra, redundant check of the inode's version check in the file system kernel.

Eliminating this extra check of the inode's version number when processing the remove name operation increases both efficiency and performance of this operation.

This extra check of the inode's version number was removed from Sun QFS, Sun SAM-FS, and Sun SAM-QFS in 4.0-patch 05.

FIXED IN BUILD: 4.0.48 on June 26, 2003.

RELEASED IN PATCH: 05.

JUSTIFICATION: Increase efficiency in processing file system requests in the product's kernel.

USER IMPACT: Increases efficiency of file system operations that perform the remove name operation by eliminating inefficient second check of the inode's version number.

USERS WHO SHOULD USE THIS: Not applicable.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: Not available.

Increase Performance of `samfsrestore`(1M) in Shared Writer Sun SAM-QFS File Systems

After Sun SAM-QFS release 4.0 patch 02, there was a noticeable degradation of performance of the `samfsrestore`(1M) functionality.

It turns out that the cause of this bug was that in a shared Sun SAM-QFS file system, symlinks and removable media files are opened as regular files. The open of a regular file sets an open lease on the file. Then, `samfsrestore`(1M) code in the file system switches the regular file to a symlink/removable media file. At close, the open lease is only removed if the file is regular. This is a problem because the open lease is never removed. As these leases build up, the overhead to process these leases increases.

The fix for the performance degradation of samfsrestore(1M) was incorporated into the Sun SAM-QFS softwre in release 4.0 patch 05.

FIXED IN BUILD: 4.0.49 on July 10, 2003.

RELEASED IN PATCH: 05.

JUSTIFICATION: Resolve field escalation reported by customer. Fix requested by customer.

USER IMPACT: File system administrators who use samfsrestore(1M) to restore file system metadata in a shared Sun SAM-QFS environment should notice a substantial increase in performance of samfsrestore(1M) now that this defect has been eliminated.

USERS WHO SHOULD USE THIS: samfsrestore(1M) is used by file system administrators in a Sun SAM-FS or a Sun SAM-QFS file system to restore file system metadata from a dump file.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: For more information regarding the samfsrestore(1M) command, see the samfsdump(1M) man page.

Increase Sun QFS and Sun SAM-QFS Stripe Group Write Performance

After Sun SAM-QFS release 4.0 patch 02, there was a noticeable degradation of performance of the Sun QFS and Sun SAM-QFS stripe group write performance.

To increase the performance of Sun QFS and Sun SAM-QFS stripe group write performance, the product was modified to refresh only the portions of the file memory map that had become stale. Prior to this modification the entire file memory map was being refreshed when only a portion of it had become stale.

This performance enhancement was fixed in the 4.0 patch 05 release of Sun QFS and Sun SAM-QFS software. Devices in stripe groups should run at rated speeds during write operations in 4.0-patch 05.

FIXED IN BUILD: 4.0.51 on August 7, 2003.

RELEASED IN PATCH: 05.

JUSTIFICATION: Cause disk devices within a Sun QFS and Sun SAM-QFS stripe group to run at rated speeds.

USER IMPACT: Users who use Sun QFS or Sun SAM-QFS file systems that contain stripe groups should notice a substantial increase in speed during write operations. Disk devices within stripe groups should run at rated speeds.

USERS WHO SHOULD USE THIS: Not applicable.

DOCUMENTATION CHANGES: None.

FOR MORE INFORMATION: For more information on configuring stripe groups with in a Sun QFS or a Sun SAM-QFS file system, see the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide* and also see the *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide.*

Product Changes

The following sections describe non-feature changes.

Files

No new files have been added.

Software Changes

The software changes include:

■ The package names have changed as follows:

TABLE 2   Package Name Changes

Old Name	New Name
LSCsamfs	SUNWsamfs
LSCqfs	SUNWqfs
LSCtools	SUNWsamtp

The SUNWsamfs package now includes the content that was formerly in the LSCdst, LSCibm, LSCsony, LSCstk, LSCremote, and LSCmig.

■ The directory path components have changed from LSCsamfs to SUNWsamfs. For example, /var/opt/LSCsamfs has changed to /var/opt/SUNWsamfs.

- The default message catalog has been moved from
  `/var/opt/SUNWsamfs/nl_messages.cat` to
  `/usr/lib/locale/C/LC_MESSAGES/SUNWsamfs` to allow localization.

- After the 4.0 release, upgrade patches are available from the following URL:

```
http://www.sunsolve.sun.com
```

- The `sammkfs`(1M) `-r` option has been removed. The ability to copy the `.inodes`
  file in each Sun SAM-FS root directory has also been disabled. This eliminates one
  form of disaster recovery (using `sammkfs`(1M) `-r`). These items were disabled
  due to constraints imposed by the implementation of a stager daemon. Customers
  who used this method of backup are encouraged to back up regularly using
  `samfsdump`(1M).

- The Sun SAM-FS Java runtime environment, package `LSCjre`, is no longer
  released with the Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 releases. The
  SAM GUI tools still require the Java Runtime Environment (JRE) to be installed.
  You must download and install the JRE software yourself. Our recommendation
  is to install the Java Runtime Environment v 1.2.2 (JRE) from `java.sun.com`.
  After you install JRE, you must define a symbolic link in `/opt/SUNWsamfs`. For
  example:

```
ln -s /usr/local/jre /opt/SUNWsamfs/jre
```

- Added support for the DAS/ACI 3.02 through 3.10 software levels. The Sun
  SAM-FS and Sun SAM-QFS software interoperates with the DAS/ACI software
  only at the 3.02 through 3.10 release levels.

- Added support for the StorageTek ACSLS 6.0 release.

  The Sun SAM-FS and Sun SAM-QFS environments now support the StorageTek
  ACSLS 6.0 release for network-attached StorageTek automated libraries.

  JUSTIFICATION: The ACSLS 6.0 release supports Solaris 2.7 and Solaris 2.8.

  WHO SHOULD USE THIS: Solaris 2.8 sites.

  KNOWN SIDE EFFECTS: None.

  DOCUMENTATION CHANGES: None.

- Changed the drive selection algorithm for StorageTek Passthru environments.

  The drive selection algorithm for StorageTek Passthru environments no longer
  chooses a drive for mounting tapes based on a simple round-robin mechanism.
  The new selection algorithm first looks for an empty drive in the library in which
  the requested volume resides. Then it searches for an idle drive in the local library
  if no empty drives are available. Finally, if neither an empty drive nor an idle

drive are available in the local library of the requested volume, the algorithm looks for any empty drive, and then any idle drive, in order to satisfy the mount request.

JUSTIFICATION: The simple round-robin method of drive selection is not efficient in a StorageTek Passthru environment.

WHO SHOULD USE THIS: All users in a StorageTek Passthru environment.

KNOWN SIDE EFFECTS: None.

DOCUMENTATION CHANGES: None.

- A new license scheme has been implemented. Sites upgrading to Sun SAM-FS 4.0 from 3.5.0 or older releases must have a set of new license keys supplied by their Authorized Service Provider (ASP) or Sun Microsystems, Inc. These keys should be placed in `/etc/opt/SUNWsamfs/LICENSE.4.0`.

  The license *l* display in `samu`(1M) allows you to view the products for which the system is licensed. Some notes about licensing:

  - The license is divided into two logical sections: system and media. The system license licenses the host, expiration date, and the features. The media license licenses a library type and media type pair. This is tied to the system license by hostid.

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

    If the number of slots in use exceeds the licensed amount, the license is regarded as suspended. This means that the system will no longer allow media mounts, labeling new media, staging, or importing media. Relabeling of old media is still allowed if the license is suspended.

    Since exporting is still allowed in the suspended condition, you can export enough media to bring the number of slots in use back into conformance with the license to clear the suspended condition.

  The Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 releases will not run with old (pre-4.0) licenses. New license keys must be obtained in order to run release 4.0, and these keys must be put into a license file named `LICENSE.4.0` (instead of `LICENSE.3.5`, `LICENSE.3.3`, etc.).

  Attempting to run without a `LICENSE.4.0` file causes the software to write the following message to the `sam-log`:

```
Fatal error - License has expired or is corrupted; initialization
failed.: No such file or directory
```

Attempting to run with a pre-4.0-generated license in the `LICENSE.4.0` file causes the software to write the following message to the `sam-log`:

```
Fatal error - License has expired or is corrupted; initialization
failed.
```

- The `mount_samfs`(1M) `wr_throttle` parameter, which is used to limit the number of outstanding bytes to be written (on a per-file basis), has its default value changed to 16 megabytes. Previously, the default was calculated based on physical memory size. The rapid increase in memory sizes and dynamic reconfiguration capabilities make the former default unrealistic. The file system administrator is still allowed to modify `wr_throttle`; only the default has changed.

  JUSTIFICATION: This change was requested by an architecture committee.

  USER IMPACT: none.

  KNOWN SIDE EFFECTS: none.

  DOCUMENTATION CHANGES: `mount_samfs`(1M) man page.

- The `samsys64` system call has been removed. The only system call in effect for the 4.0 release is `samsys`. Its number is `181`.

Hardware Changes

The following sections describe hardware support changes .

Hardware Support in the Initial 4.0 Release

The following lists indicate the hardware support added in the initial release of 4.0.

Libraries:

- ADIC Scalar 100 AIT library.
- ADIC Scalar 1000 AIT library.
- Exabyte X80 tape library.
- IBM 3584 UltraScalable tape library. For information on configuring cleaning, see the `ibm3584`(7) man page.
- StorageTek L20, L40, and L80 tape libraries.
- Qualstar 82xx series of tape libraries.

Drives:

- IBM 3580 (LTO) tape drive.

- Quantum SDLT220 (SuperDLT) tape drive.
- Seagate Viper 200 (LTO) tape drive.
- Sony AIT drives in ADIC libraries using the DAS/ACI interface.
- StorageTek T9940B tape drive.

Media:

- STK 9840 VolSafe write-once tape.

Additional information regarding these devices can be found in the `mcf`(4), `inquiry.conf`(4), and `intro_devices`(7) man pages.

All of these devices have been added because of vendor requests or because of Sun Microsystems business decisions.

Hardware Support in Patch 01

No hardware changes were made in the patch 01 release of Sun QFS, Sun SAM-FS, or Sun SAM-QFS software.

Hardware Support in Patch 02

The following list indicates the hardware support added in the patch 02 release of 4.0:

- Sun StorEdge L25 and L100 (ATL M1500 and M2500) libraries.
- ATL M1500 and M2500 libraries.
- Added Grau Infinistore to the Sun SAM-FS and Sun SAM-QFS `inquiry.conf` file.
- ADIC Scalar 10K.
- ATL P4000 and P7000 libraries.
- LTO tape drives.
- Improved support for error states reported to Sun SAM-FS and Sun SAM-QFS software from IBM LTO tape drives.

Hardware Support in Patch 03

The following list indicates the hardware support added in the patch 03 release of 4.0:

- Network-attached Scalar 1000 and Scalar 10000 libraries.
- DAS 3.10E.

- Scalar 1K and 10K with SDLC software
- Correctly track capacity of tape volumes accessed with Storage Tek T9940B tape drives.
- Modify `info.sh` to correctly identify the network-attached library type SONY PSC, equipment type, `pe`, in diagnostic SAMreports.
- Support import of VSNs in SONY PSC network-attached libraries using the import `-v` command. (This was a regression in the initial 4.0 release.)
- Support use of import by ACSLS pools in Sun SAM-FS and Sun SAM-QFS 4.0. (This was a regression in the initial 4.0 release.)

Modified the `ibm3494`(1M) man page. The `ibm3494`(1M) daemon has a hard limit on importing VSNs of 100 VSNs. The `ibm3494`(1M) man page was updated to document this hard limit of importing 100 VSNs.

Hardware Support in Patch 04

The following list indicates the hardware support added in the patch 04 release of 4.0:

- Support for ACSLS 6.1.
- Sun and Quantum SDLT320 tape drives.
- Sun StorEdge L7 and L8 autoloaders added in patch.

Hardware Support in Patch 05

The following list indicates the hardware support added in the patch 05 release of 4.0:

- Overland Data Inc. Neo Series Tape Libraries.
- Plasmon Optical library with barcode reader.
- Added Sony 9 Gigabyte tape drive to `inquiry.conf` file.
- Fixed `inquiry.conf` to refer to `exbm2` as a tape drive. `inquiry.conf` had listed `exbm2` as a library in some places and as a tape drive in others. `exbm2` is a type of tape drive.
- Added information to the Sun SAM-FS and Sun SAM-QFS license generator to support creation of licenses for Sun SAM-FS and Sun SAM-QFS software for use with a Spectralogic 2000 (Treefrog) library. In the 4.0 release, licenses created for use in a Sun SAM-FS or a Sun SAM-QFS environment would not properly recognize the Spectralogic 2000 (Treefrog) library in a Sun SAM-FS or a Sun SAM-QFS environment, and the product would refuse to run due to attempt to use software support for library without a license.
- HP LTO-2 tape drives.

- HP Ultrium-1 tape drive.
- Support the audit and auditslot functions in STK libraries that have more than 32 slots.
- Support 7-character barcodes in a Grau library.

Tape and Robot Install Issues With Sun StorEdge SAN 4.0 and 4.1

Installation difficulties have been reported to Sun Microsystem's Professional Services (Customer Support) when system administrators have configured devices in Sun SAM-FS or Sun SAM-QFS environments through Fibre Channel connections.

It turns out that the `cfgadm` binary in the Sun SAN foundation kit is responsible for this bug. To avoid or fix this bug in your environment, make sure you are running SAN software that is supported for use with Sun SAM-FS or Sun SAM-QFS software and that you have applied the latest patches available from Sun to your SAN software. See the Sun Support website or contact Sun's Customer Support if you are running SAM-FS or SAM-QFS software with SAN 4.0 or 4.1; refer to bug number 4752477.

If you are unable to patch your SAN software at this time, you can use the workaround for this bug described in this subsection, although patching your SAN software is STRONGLY recommended. As a workaround for this bug, an additional step needs to be added to the installation instructions. Pages 70 and 71 of the 'Sun QFS, Sun SAM-FS, and Sun SAM-QFS Installation and Configuration Guide', part number 816-2543-10, explain how 'To Add a Target Device or LUN'. Step 6, as it appears on page 71, needs to change. It becomes steps 6 and 7, as follows:

- New Step 6. Issue a `cfgadm`(1M) command for each automated library or drive included in the Sun SAM-FS or Sun SAM-QFS environment through a Fibre Channel interface. (Optional)

  You must perform this step if you are running Sun StorEdge 4.0 or 4.1 software and you have not yet configured the Fibre Channel automated libraries or drives.

  Because of a bug in the `cfgadm`(1) command, you should expect a device busy error. However, the command *does* completely process the request. For example:

```
# cfgadm -c configure -o force_update c4::500104f000489fe3
cfgadm: Library error: failed to create device node:
500104f00043abfc: Device busy
```

- New Step 7. If you have added new devices since running `pkgadd`(1M), run the `samdev`(1M) or `devfsadm`(1M) command to create the device entries in `/dev/samst`.

In a Sun Solaris 7 OE, enter the following command:

```
# /opt/SUNWsamfs/sbin/samdev
```

In a Sun Solaris 8 or 9 OE, enter the following command:

```
# /usr/sbin/devfsadm -i samst
```

SBus Configurations Might Require Patch 112244-02

If an X6757A SBus Fibre Channel HBA is used to access either libraries or tape drives used by Sun SAM-FS, patch 112244-02 must be installed.

This issue was reported to Sun SAM-FS and Sun SAM-QFS customers in the 4.0 patch 03 release.

System Requirements

Operating Environment Support

The Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 software is supported on the Solaris 7, 8, and 9 operating environment platforms. For more information, see the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS Installation and Configuration Guide.*

Required Solaris Patches

Some of the Solaris patches can inadvertently remove the samsys entry from the /etc/name_to_sysnum file when the patch is installed. One indication of the problem is the following message appearing in the /var/adm/messages file:

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

For a procedure that describes the preventative measures you can take to avoid receiving this message after installing Sun Solaris patches, see the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS Installation and Configuration Guide.*

The patches listed below can be obtained from Sun. Refer to the following Sun Microsystems web page for a list of recommended patches:

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

All Sun QFS, Sun SAM-FS, and Sun SAM-QFS testing was done with the patches at the revision level shown:

- Sun SAM-FS and Sun SAM-QFS software needs the following patches installed when running with Solaris 2.7:
  - 106541-04 kernel update patch
  - 106541-12 kernel update patch for hot swappable hardware support only
- Sun SAM-FS and Sun SAM-QFS software needs the following patches installed when running with Solaris 2.8:
  - 108528-02 kernel update patch for hot swappable hardware support only
- Sun SAM-FS and Sun SAM-QFS software needs the following patches installed when running with Solstice DiskSuite 4.1:
  - 104172-24 Solstice DiskSuite 4.1 product patch
- Sun SAM-FS and Sun SAM-QFS software needs the following patches installed when running with Solstice DiskSuite 4.2:
  - 106627-11 Solstice DiskSuite 4.2 product patch
- Sun SAM-FS software needs the following patches installed when running with Fibre Channel tape drives:
  - 111095-06 SunOS 5.8: `fctl/fp/fcp/usoc` driver patch

Build/Patch ID Cross-reference Table

TABLE 3 shows build levels and patch IDs.

TABLE 3 Build/Patch ID Cross-Reference Table

Product	2.7	2.8	2.9	Build Level
SUNWsamfs	113170-01	113171-01	113172-01	4.0.7 (L10N Only)
SUNWqfs	113173-01	113174-01	113175-01	4.0.7 (L10N Only)
SUNWsamfs	113170-02	113171-02	113172-02	4.0.16E
SUNWqfs	113173-02	113174-02	113175-02	4.0.16E
SUNWsamfs	113170-03	113171-03	113172-03	4.0.26L

TABLE 3   Build/Patch ID Cross-Reference Table   *(Continued)*

Product	2.7	2.8	2.9	Build Level
SUNWqfs	113173-03	113174-03	113175-03	4.0.26L
SUNWsamfs	113170-04	113171-04	113172-04	4.0.26M
SUNWqfs	113173-04	113174-04	113175-04	4.0.26M
SUNWsamfs	113170-05	113171-05	113172-05	4.0.55
SUNWqfs	113173-05	113174-05	113175-05	4.0.55

Product Support and Compatibility Issues

Compatibility Issues

Use of the Sun SAN-QFS File System and Tivoli SANergy File Sharing Version Compatibility Issues

If you plan to enable the Sun SAN-QFS file system, verify that you have Tivoli SANergy File Sharing API software at release level 2.2.3; this release level is also known as 2.3 and 3.1.

For more information about the Sun SAN-QFS file system, see the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide.*

Previous SANergy File Sharing software does not support the new SANergy API.

This feature is also included in the SANergy documentation.

Elimination of the `queuedir =` and `datadir =` Directives from the `archiver.cmd` File

The `queuedir =` and `datadir =` directives are no longer supported in the `archiver.cmd`(4) file.

These directives must be removed. If these directives are not removed, an error message is generated and the archiver does not run.

The archiver queue files are written to the following directory:

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

The archiver data directory is as follows:

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

`ssum`(1) Command's `-a` Option is Removed and is no Longer Supported

The `ssum`(1) command's -a option has been removed and is no longer supported.

Elimination of Support for DAS 3.1

Sun SAM-FS and Sun SAM-QFS support of DAS 3.1 was discontinued as of the Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 patch 03 release.

Changes in Versions of Solaris Supported in Sun QFS, Sun SAM-FS, and Sun SAM-QFS as of v4.0

Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 do not support Solaris 2.5 or Solaris 2.6.

Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0 support Solaris 2.7, Solaris 2.8 and Solaris 2.9.

Changes to the Sun QFS, Sun SAM-FS, and Sun SAM-QFS Product Support

SAM-FS 3.1.0 is no longer supported as of May 31, 1998.

SAM-FS 3.2.0 is no longer supported as of April 13, 1999.

SAM-FS 3.3.1 is no longer supported as of June 26, 2001.

Issues in upgrading to and downgrading from Sun QFS, Sun SAM-FS and Sun SAM-QFS 4.0

Notes on Upgrading to 4.0.1 or Downgrading from 4.0.1

When upgrading from a pre-3.5.0 SAM-FS release to 4.0.1 (for instance, 3.3.0 or 3.3.1), `pkgadd`(1M) checks for any files remaining in the `/etc/fs/samfs` directory. If files exist in `/etc/fs/samfs`, they will be moved to `/etc/opt/SUNWsamfs/samfs.old` for future reference. If the directory `/etc/opt/SUNWsamfs/samfs.old` is already present (presumably from a previous update), a directory with the current date/time appended will be created and used instead.

Additionally, the pre-3.5.0 catalogs will be converted to the 4.0 catalog format when the catalog server starts.

When upgrading from a 3.5.0 SAM-FS release to 4.0, `pkgadd`(1M) checks for the presence of the file `/etc/opt/LSCsamfs/mcf` and the absence of the file `/etc/opt/SUNWsamfs/mcf`. If this is true, the configuration files in `/etc/opt/LSCsamfs` are copied to `/etc/opt/SUNWsamfs`. Scripts which may have been modified will be copied to `/opt/SUNWsamfs/sbin` with `.350` appended to the name for comparison with the new versions.

Conversely, just before a 4.0 package is removed, appropriate files in `/etc/opt/SUNWsamfs` and `/var/opt/SUNWsamfs` can be moved to `/etc/fs/samfs` by running the script `/opt/SUNWsamfs/sbin/backto331.sh`, or to `/etc/opt/LSCsamfs` and `/var/opt/LSCsamfs` by running the script `/opt/SUNWsamfs/sbin/backto350.sh`. Running these scripts will also convert the catalogs to the older format. Although most cases of catalog conversion are handled, if either conversion should fail, the appropriate catalog will be converted to a text format if possible. The location and name of the text file will be emitted at the time of the conversion during installation or removal of the package.

The conversion to 4.0 from 3.3.x can be avoided by moving (or removing) the `/etc/fs/samfs` directory before installing 4.0. The conversion to 4.0 from 3.5.0 can be avoided by moving the `/etc/opt/LSCsamfs/mcf` file. The conversion from 4.0 will not occur unless the `backto331.sh`(1M) or `backto350.sh`(1M) script is run.

If you have initialized any file systems using the 4.0 version of the `sammkfs`(1M) command without the `-P` option, these file systems use a version 2 superblock. A file system that uses a version 2 superblock cannot be mounted using 3.5.0 or earlier software.

See the other notes in this section concerning the directory reorganization and catalog re-design for more details.

Compatibility Issue in Directory Structure Made to QFS, SAM-FS, and SAM-QFS at v3.5.0

A compatibility issue in the directory structure, directory entry hash, was made to QFS, SAM-FS and SAM-QFS at v3.5.0. When upgrading from 3.0.X to 3.5.0, your environment might identify some existing files or directories as non existent.

A change in directory structure, directory entry hash, was made to QFS, SAM-FS, SAM-QFS at SAM-FS 3.5.0. A 16-bit hash value was implemented in a previously unused field within the directory structure. However, testing discovered that in early SAM-FS file systems (version 3.0.X and previous), this field was already used.

When upgrading from one of these early file systems to 3.5.0, this problem could manifest itself in a message such as the following when using sfind(1) or sls(1):

```
No such file or directory entry
```

Because of this problem, and for general performance enhancement reasons, it is strongly recommended that a site upgrading to 3.5.0 or higher run the following:

```
samfsck -F -G family_set_name
```

This should be performed on each upgraded file system.

Conversion of /etc/opt/LSCsamfs/samlogd.cmd When Upgrading From 3.5.0

The staging code in 3.5.0 has been replaced by a new stager daemon in release 4.0. If you had stage logging directives in /etc/opt/LSCsamfs/samlogd.cmd, you must add the equivalent directives to /etc/opt/SUNWsamfs/stager.cmd to have the same logging functionality under Sun SAM-FS 4.0.

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
```

See the stager.cmd(4) man page for more details.

Known Product Limitations

Cannot Run Two `samfsrestore`(1M) Commands at the Same Time

When running multiple `samfsrestore`(1M) commands in a Sun SAM-QFS shared file system, a page lock deadlock can occur in that file system and the file system in question can hang. Only the file system for which two `samfsrestore`(1M) commands has been entered is affected.

To avoid this problem, do not attempt to run two `samfsrestore`(1M) commands at the same time. To recover from the problem, schedule a reboot for the server.

The problem has never been seen when running a single `samfsrestore`(1M) command in a Sun SAM-QFS environment, nor has it been seen in an unshared Sun SAM-QFS file system.

Sun QFS File System Identifies Metadata Device Failure as Data Corruption

When a metadata device fails (whether because the disk was put offline; because Fibre Channel attachment was pulled, etc.), the Sun QFS file system recognizes the failed I/O, but it can leave data in the page and/or buffer cache. This leftover data can be interpreted as a data corruption (ENOCSI) or a page panic. Since the timing of such failures is random, several different results, one of which is a panic, can occur.

To avoid this situation, configure a mirror device for the metadata partition and/or fix the failing device. Avoid offlining an active metadata device.

Sun SAM-QFS Involuntary Failover Problem

When performing an involuntary failover in a Sun SAM-QFS environment, explicit stage requests initiated by the stage command or by user applications are lost if the stage is in progress. Since the failover process can take a few minutes to complete, subsequent stage requests will get processed by the new server. If an involuntary failover occurs, it is important to check the results of mass staging to ensure all files were staged correctly.

If you issue the stage command without the -w option, it could take up to five minutes from the time SAM gets restarted on the new server for the staging to actually get restarted. If the -w option is specified on the stage(1) command, it takes about one minute for the actual staging to get restarted once SAM is restarted on the new server after the failover.

Release Documentation

The following Sun Microsystems documentation is available in PDF format:

- *SAM-Remote Administrator's Guide*, part number 816-2094-10 (816-2094-10.pdf)
- *Sun QFS, Sun SAM-FS, and Sun SAM-QFS Disaster Recovery Guide*, part number 816-2540-10 (816-2540-10.pdf)
- *Sun QFS, Sun SAM-FS, and Sun SAM-QFS File System Administrator's Guide*, part number 816-2542-10 (816-2542-10.pdf)
- *Sun QFS, Sun SAM-FS, and Sun SAM-QFS Installation and Configuration Guide*, part number 816-2543-10 (816-2543-10.pdf)
- *Sun SAM-FS and Sun SAM-QFS Storage and Archive Management Guide*, part number 816-2544-10 (816-2544-10.pdf)
- *Sun QFS, Sun SAM-FS, and Sun SAM-QFS README File*. The part number for this file for the base 4.0 release is 816-7675-10 (816-7675-10.pdf). This is outmoded. It has been superseded by the *Sun QFS, Sun SAM-FS, and Sun SAM-QFS 4.0.1 Release Notes*, which is this document. This document's part number is 817-4993-10.

  NOTE: If you find discrepancies between the README file contained in /opt/SUNWsamfs/doc/README and this release note, you can assume that /opt/SUNWsamfs/doc/README is the most current version of this information.

If you have obtained a CD-ROM distribution of the software, manuals are available on the CD-ROM in the /cdrom/cdrom0/admin directory. These manuals are in PDF format.

All Sun QFS, Sun SAM-FS, and Sun SAM-QFS publications are available in PDF format from one or both of the following public websites:

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

Future Changes to the Sun QFS, Sun SAM-FS, and Sun SAM-QFS in the Next Significant Release, v4.1

This section is intended to alert you to changes planned in Sun QFS, Sun SAM-FS, and Sun SAM-QFS in the next significant release. The items listed here are by no means exhaustive. Changes to Sun QFS, Sun SAM-FS, and Sun SAM-QFS will occur that are not listed in this section of this document. 4.1 is the product version number currently selected to identify the version of the next significant release.

Replacement of Current Graphical User Interfaces in v4.1.

This is an end-of-life announcement for `libmgr`(1M) and `samtool`(1M) in Sun StorEdge SAM-FS and Sun StorEdge SAM-QFS v4.1.

The graphical user interface (GUI) tools invoked through `libmgr`(1M) and `samtool`(1M) commands will no longer be included in the Sun StorEdge SAM-FS software packages beginning with the 4.1 release. The `samtool`(1M) GUI includes `robottool`(1M), `devicetool`(1M), and `previewtool`(1M).

When the Sun StorEdge SAM-FS software package v4.1 is released, a new package will be available that will provide a new browser-based GUI tool. This new tool will include all the features formerly found in `libmgr`(1M) and `samtool`(1M). In addition, this tool will include features to assist in configuration.

The terminal-based `samu`(1M) administrator utility will be unaffected by these modifications. `samu`(1M) will continue to be supported in the 4.1 release.

All Sun StorEdge SAM-FS functionality provided in `libmgr`(1M) and `samtool`(1M) will continue to be supported in this product in the command line interface or in the `samu`(1M) terminal-based administrator utility.

Changes to Sun QFS, Sun SAM-FS, and Sun SAM-QFS Application Programmer's Interface (API) Require Recompilation of any Customized Software that Uses this API in v4.1

An API is an interface which allows programmers to create software that uses product features directly. The Sun QFS, Sun SAM-FS, and Sun SAM-QFS software has an API. This API is most commonly used to program custom migration environments that permit file system administrators to migrate their data from other storage products to a Sun SAM-QFS or a Sun SAM-FS environments. The Sun QFS, Sun SAM-FS, and Sun SAM-QFS API will have changes to its API in the next significant release. Some APIs will be eliminated; new APIs will be added; and the implementation of some existing APIs will be modified in ways that WILL DIRECTLY impact the software that programmers create using this API. Therefore, if you have software that uses the Sun QFS, Sun SAM-FS, and Sun SAM-QFS API, you must have access to the software's original source code and you must recompile your software's executable binaries using this source code after installing the next significant release of the Sun QFS, Sun SAM-FS, and Sun SAM-QFS software but before using your customized software. After you recompile your customized software that uses this product's API, you must reinstall your customized software.

Plan on having access to the source code of any software you have that has been written to use the Sun QFS, Sun SAM-FS, and Sun SAM-QFS API BEFORE installing the next significant release of the Sun QFS, Sun SAM-FS, and Sun SAM-QFS product.

When upgrading to the next significant release of Sun QFS, Sun SAM-FS, or Sun SAM-QFS, read the accompanying README file and contact Sun's Customer Support for additional information regarding new APIs, eliminated APIs and changes to existing APIs if you have customized software applications that use the Sun QFS, Sun SAM-FS, and Sun SAM-QFS API.

Elimination of Solaris 2.7 Support in v4.1

Currently, we are scheduled to eliminate support for Solaris 2.7 in the 4.1 release of Sun QFS, Sun SAM-FS, and Sun SAM-QFS software.

Thus, if you intend to upgrade your installation of Sun QFS, Sun SAM-FS, or Sun SAM-QFS software to v4.1 when it is released and you are currently running Sun QFS, Sun SAM-FS, or Sun SAM-QFS software in a Solaris 2.7 environment, then plan on upgrading your version of Solaris to a version supported by Sun QFS, Sun SAM-FS, and Sun SAM-QFS v4.1 before you install the v4.1 release.

Sun QFS, Sun SAM-FS, and Sun SAM-QFS v4.1 will support Solaris 2.8 and Solaris 2.9.

Legal Notices