



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

Release 4.3

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Sun StorEdge™ QFS and Sun StorEdge SAM-FS 4.3 Release Notes

This document contains important information about the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.3 releases. These releases incorporate design changes, feature changes, and function enhancements. These releases also include fixes to the software. System administrators and programmers who are familiar with these software products will see changes that can affect daily operations and automated scripts that were written to co-exist with previous releases of this software. Study these release notes before upgrading to the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.3 releases.

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

You can obtain a copy of the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.3 software through Sun Microsystems or through your authorized service provider.

This document contains the following sections:

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Features in This Release

The following sections describe the new features in this release:

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Linux Client for Shared Sun StorEdge QFS Software

The major change in the 4.3 code base is the addition of support for a Linux client with shared Sun StorEdge QFS software.

The new Linux client is compatible with Red Hat Enterprise 3.0 AS, ES for 32-bit x86 (IA32) architectures. It runs with the Solaris shared Sun StorEdge QFS metadata server (MDS) and provides heterogeneous data sharing on the storage area network (SAN). The Linux client supports Sun Opteron systems, as well as Intel 32-bit systems.

For more information about the new Linux client, see the *Sun StorEdge QFS Linux Client Guide*.

Solaris 10 Support

This version of the Sun StorEdge QFS and Sun StorEdge SAM-FS software can run on the Solaris 10 operating system. The only limitation to Solaris 10 OS support is that Sun StorEdge QFS and Sun StorEdge SAM-FS are only supported in the Global Zone. Operation in isolated zones is not supported for servers or clients.

Enhanced SAM-QFS Manager Features

The SAM-QFS Manager software has the following new and updated features.

Shared File System

A new wizard interface facilitates provisioning of shared Sun StorEdge QFS file systems, including the addition and removal of participating hosts for a shared file system and changing of mount options for a shared file system.

Archive-Management Enhancements

Support has been added for configuring default archive sets for each file system and for setting per-file-system archiver directives.

Archive policies have been extended so that multiple sets of file-match criteria can be assigned to a policy and archive copies can be added and removed.

The `allsets` pseudo set is supported for setting copy parameters and `vsu` assignments for all archive policy copies.

Security Control

Remote access to SAM-QFS Manager is now restricted by hostname or IP address. The `samadm` command on the Sun StorEdge SAM-FS or Sun StorEdge QFS server has been extended to add administration of the clients that can communicate with the server. Requests from other clients are denied access to the server.

Note – No such restriction exists on management of servers that have Sun StorEdge SAM-FS or Sun StorEdge QFS 4.1 or 4.2 software.

Use of Sun Java™ Web Console Version 2.2.1

SAM-QFS Manager Version 1.2 is now built on the Sun Java Web Console Version 2.2.1. The new console provides a look and feel that enhances the user experience.

Role-Based Access Control (RBAC) support enhancement

A user can now log in as `root` and select `SAMadmin` on the role selection page to become the administrator of SAM-QFS Manager.

Backward Compatibility

SAM-QFS Manager controls and configures multiple Sun StorEdge SAM-FS and Sun StorEdge QFS servers. This release of SAM-QFS Manager (1.2) is compatible with any Sun StorEdge SAM-FS or Sun StorEdge QFS server that has version 4.1, 4.2, or 4.3 software installed.

Asynchronous I/O Driver for Shared Sun StorEdge QFS

Version 4.3 of the software includes a character driver interface for asynchronous applications, such as high performance computing (HPC) and Oracle Real Application Clusters (RAC). The interface provides application performance enhancements through asynchronous input/output (I/O) and is a file system adjunct to the Solaris AIO framework. The `samaio` pseudo-driver enables you to attach a Sun StorEdge QFS file to a character device, which can then be accessed through that device. This results in increased speed, because raw device I/O is faster than traditional file-system asynchronous I/O.

Removal of License Keys

Version 4.3 of the software has removed dependency on the `LICENSE.4.x` file for all Sun StorEdge SAM-FS and Sun StorEdge QFS servers and clients so that there can be no denial of service. Keys are no longer required, even for demo software.

It is the responsibility of customers, resellers, and users to ensure that they adhere to the Sun Microsystems licensing guidelines when using the product. These guidelines are provided when you download and install the product.

Note – Licenses for versions 4.1, and 4.2 are still necessary and are available through the Sun support organization and resellers.

Version 4.3 of the software has also updated the `samu` license (-1) display and the SAM-QFS Manager license screen. Rather than displaying license information, these screens now display usage statistics for the file system.

WORM File Systems

Write Once Read Many (WORM) technology is used in many applications that require data integrity and legally admissible files. A WORM feature is now available as an add-on package to Sun StorEdge QFS. The package is called SUNWsamfswm.

The WORM feature offers default and modifiable file-retention periods, data and path immutability, and subdirectory inheritance of the WORM setting.

To set up a WORM file system or file, use the new `ssum -w` option. The file-retention period can be set in one of three ways:

- On the command line with the `ssum -e` option
- As a mount option
- With a system-wide default (30 days)

Note – The `ssum` man page in this release does not contain instructions for setting permanent retention on a WORM file. To permanently retain a file, use an argument of zero minutes with the `ssum -e` option.

After a file has been set up as a WORM file, both its data and its path are unchangeable, even after the retention period has expired. The `sls` command has been modified to show the file's current WORM retention state and retention period.

A WORM-capable file system is mounted through the `worm_capable` mount option. An additional mount option, `def_retention=x`, sets the default file-retention period in minutes.

Six new options were also added to the `sfind` command to support WORM file systems.

- `-ractive` finds all files that have active retention periods.
- `-rover` finds all files that have expired retention periods.
- `-rremain` finds all files that have retention periods that contain at least the specified amount of time remaining before expiration.
- `-rafter` finds all files whose retention periods will expire after a given date.
- `-rlonger` finds all files that have retention periods that are longer than a specified time.
- `-rpermanent` finds all files that are retained permanently.

The WORM feature is licensed separately from the Sun StorEdge QFS file system. Contact your local Sun sales representative for information about obtaining the WORM package.

For more information about the WORM feature, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS File System Administration Guide*.

Optional Management Scripts

Version 4.3 of the software introduces `SUNWsamprn`, an optional Sun StorEdge SAM-FS health-monitoring package. This package is useful for monitoring the system and automating system administration, including metadata backups, email notifications of important system events, and trace and log-file maintenance.

Installation

The `SUNWsamprn` package is installed with the normal Solaris `pkgadd` command, which installs into the `/etc/opt/SUNWsamfs/samprn` directory. The `activate` script enables default health monitoring, and the `de-activate` script disables health monitoring. The package can also be removed with the normal Solaris `pkgrm` command.

Script Details

The health-monitoring scripts are periodically run through `cron` jobs. Site-specific settings are accepted. For example, you can customize the times at which scripts are to be run for a site by editing the `sys` and `root` crontabs after the `activate` script is run.

The `site-tools-PARAMS` script is used to define the thresholds and the file system that the scripts use to archive their information.

The following health-monitoring scripts are available:

- `proc-csd` takes daily snapshots of all `samfs` file systems defined in `/etc/vfstab` by using the `samfsdump` command.
- `proc-csd-hour` takes hourly snapshots of all `samfs` file systems defined in `/etc/vfstab` by using the `samfsdump` command.
- `proc-logs` saves all Sun StorEdge SAM-FS and Sun StorEdge QFS logs.
- `watch` sends an email notification if an outstanding tape request exceeds a designated wait time, or if a file system exceeds its high-water mark.
- `system_report` gathers system information about user, system, and wait I/O time and compares this information against a threshold. If the threshold is exceeded, the script sends an email notification.

Newly Qualified Robots

The following new robots are qualified for version 4.3 of the software:

- Qualstar TLS series
- Sun StorEdge L8500 Tape Library
- Plasmon G-Enterprise UDO/MO library
 - The device type for this library is `pg`. The library must be configured to the G-Enterprise mode, element address scheme 1, and barcode type 2 or 3.
- Plasmon UDO/MO drive
 - The device type for this drive is `pu`.
- HP LTO-3 tape drive
 - The WORM media feature is supported for this drive.

SEF Changes

The tape-drive System Error Facility (SEF) has been improved with support for sample rate reading of log sense error-counter pages, run-time configuration, and system events. These improvements do not change legacy SEF access or operation.

Use `samset(1M)` and `defaults.conf(4)` to enable this functionality. For example:

```
samset sef 100 default 1000
```

Other Changes

Daemon tracing is now enabled by default. General tracing is the same as it is with a `defaults.conf` setting of `all=on`. Log-file rotation is enabled by default on a file size of 10 megabytes.

System Requirements

This section describes some of the system requirements that must be met before you can use the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.3 releases.

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

Operating-System Requirements

The Sun StorEdge QFS and Sun StorEdge SAM-FS 4.3 releases require the following minimum operating-system levels:

- Solaris 8 OS 7/01
- Solaris 9 OS 4/03
- Solaris 10 OS
- Red Hat Enterprise 3.0 AS, ES for 32-bit x86 (IA32) architectures for the Linux client

Some features might require operating-system support levels that are higher than these. For information, see the feature descriptions.

Sun Cluster Requirements

The Sun Cluster 3.1 4/04 release supports configuration of Sun StorEdge QFS shared and highly available file systems. This capability requires a minimum operating system level of Solaris 8 OS 2/02 or Solaris 9 OS 4/03.

The Sun StorEdge QFS software supports ORACLE® Real Application Cluster (RAC) software at the ORACLE 9i Release 2 (9.2.0.1), Patchset 5 (9.2.0.5), and patch 3566420 release level.

SAM-QFS Manager Requirements

SAM-QFS Manager is tested only with the Sun Java Web Console version 2.2.1 applications. Installing this product with any older Sun Java Web Console version breaks both applications. This product may work on newer Sun Java Web Console versions, but this has not been tested.

Tivoli SANergy Requirements

If you plan to enable the SAN-QFS file system, verify that you have Tivoli SANergy File Sharing software at release level 3.2.5.0 or later. For more information about the SAN-QFS file system, see the *Sun StorEdge QFS and Sun StorEdge SAM-FS File System Administration Guide*.

Installing Packages and Patches

The *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide* includes information about installing the version 4.2 of the software. If you are installing a patch release, see the README file that is distributed with the patch.

This section contains information about installation packages.

Upgrading SAM-QFS Manager 1.0 or 1.1 to SAM-QFS Manager 1.2

SAM-QFS Manager 1.2 supports the Sun StorEdge QFS and Sun StorEdge SAM-FS 4.1, 4.2, and 4.3 releases. To upgrade from SAM-QFS Manager 1.0 or 1.1 to SAM-QFS Manager 1.2, run the `samqfsmgr_setup(1M)` command. The *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide* includes instructions for using this command.

The `samqfsmgr_setup(1M)` command removes all the packages that pertain to the previous release and installs the new versions of the packages. If you are upgrading from 1.1 to 1.2 and if you have turned tracing on in 1.1, the `samqfsmgr_setup` script will automatically preserve the trace settings and return tracing to the same level in 1.2. If you are upgrading from 1.0 to 1.2 and you have tracing turned on in 1.0, you need to re-enable tracing in 1.2 by following the instructions in the *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide*.

Required Solaris OS Patches

Sun Microsystems provides patches for the Sun products that are described in this section. Go to the following web site for a list of recommended patches:

<http://sunsolve.sun.com>

All testing was done with the patches at the following revision levels:

This Product	Running With	Patch Requirement
Sun StorEdge QFS Sun StorEdge SAM-FS	Solaris 8 OS and the Sun StorEdge QFS shared file system feature	Solaris 8 OS 07/01
Sun StorEdge SAM-FS with hot-swappable hardware support	Solaris 8 OS	108528-02 kernel update patch
Sun StorEdge SAM-FS	Solstice DiskSuite 4.1	104172-24 Solstice DiskSuite 4.1 product patch
Sun StorEdge SAM-FS	Solstice DiskSuite 4.2	106627-11 Solstice DiskSuite 4.2 product patch
Sun StorEdge SAM-FS	Fibre Channel tape drives	111095-06 SunOS™ 5.8: fctl/fp/fcp/usoc driver patch
Sun StorEdge SAM-FS	The X6757A SBus Fibre Channel HBA, used to access either tape drives or libraries	112244-02 SunOS 5.8: Hardware/FCode: SBus Dual Fibre Channel Host Adapter patch

Known Problems

This section contains information about known software problems.

SAM-QFS Manager Limitations

The Sun StorEdge QFS and Sun StorEdge SAM-FS 4.3 releases include the SAM-QFS Manager 1.2. SAM-QFS Manager 1.2 does not interoperate with all Sun StorEdge QFS and Sun StorEdge SAM-FS 4.3 features. Specifically, SAM-QFS Manager does not support the following features:

- Sun Cluster software.
- Sun SAM-Remote software.
- Linux clients.

- Optical media.
- WORM file system.
- Fibre Channel bridge cards. You cannot use SAM-QFS Manager to configure a Sun StorEdge L25 or Sun StorEdge L100 tape library that contains a Fibre Channel bridge card (SCSI-to-FC bridge, SG-XFC420CARD-MOD).

In addition, SAM-QFS Manager has the following limitations:

- In localized environments, SAM-QFS Manager limits input text to ASCII text only.
- SAM-QFS Manager supports Sun StorEdge QFS shared file systems with the following restrictions:
 - Before SAM-QFS Manager can configure a new shared file system or collect information about an existing one, the participating hosts must be added on the SAM-FS/QFS Servers Page.
 - You cannot create a shared file system that uses devices that are not SCSI compliant. SAM-QFS Manager cannot identify these devices as available on multiple hosts.
 - You cannot configure archiving for a Sun StorEdge SAM-QFS shared file system through SAM-QFS Manager. When you create a shared file system through SAM-QFS Manager, the `nosam` mount option is enabled in the file system.
 - The number of clients (and potential metadata servers) that may be specified when the shared file system is created is limited to four. If more hosts are needed, they can be added at any time after the file system is created.

Note – You can use the Sun StorEdge QFS and Sun StorEdge SAM-FS command line interface (CLI) to configure and monitor the features that SAM-QFS Manager does not support.

SAM-QFS Manager Problems

The following known problems exist in SAM-QFS Manager:

- Do not close the pop-up window by clicking the X button in the upper left corner of the wizard screen in Internet Explorer or by clicking the hyphen (-) button in Netscape™ or Mozilla™. Always click the Cancel button to exit.
- The wizard button is sometimes incorrectly disabled. When this happens, click another tab in the application and then click the tab for the action that you want to perform. The wizard button should then be enabled.

- Each archiving file system on a Sun StorEdge SAM-FS server has a default archive copy that archives all files that are not explicitly members of an archive policy. If an `archiver.cmd(4)` file exists on the server, a volume serial name (VSN) must be associated with each file system's default archive copy.

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

When you create a file system and an `archiver.cmd(4)` file does not exist on the server, the system does not explicitly create the VSN association, and the default archiving behavior is retained. The Default Policy Copy details page may show incorrect information. In this situation, you can create an archive policy from the Archive Management tab and apply the policy to the file system. This action creates an `archiver.cmd` file and creates the necessary VSN association for the file system's default archive copy.

To change these default copy definitions, go to the Archive Policies Summary page and click the link for the default archive policy for the file system (the default policy has the same name as the file system). Select copy 1 from the copy information table and configure disk archiving or VSNs for the copy.

- If `/opt` is not a part of the root filesystem, when the Sun StorEdge SAM-QFS server is rebooted the Solaris `sysevent` daemon (`syseventd`) starts up before `/opt` is available and does not find some of the `SUNWsamfs` binaries required for the SAM-QFS Manager to report any recent fault conditions for that server. To overcome this, restart the Solaris `sysevent` daemon (`syseventd`) on the Sun StorEdge SAM-QFS server after reboot by issuing a `pkill -HUP syseventd` command.
- The SAM-QFS Manager does not display complete device information for a stripe group.
- An application error is displayed after trying to open the Add Criteria wizard in Internet Explorer under the following conditions:
 - If the user opens the Add Criteria wizard and then tries to open it again.
 - If the user opens the Preferences/Add Copy wizard and then tries to open the Add Criteria wizard.
- The following messages sometimes appear if you try to open the SAM-QFS Manager in a browser:

```
Connect to hostname.domain:6789 failed (connection refused)
The connection was refused when attempting to contact
hostname.domain:6789
```

The system generates these messages under the following conditions:

- You typed the wrong URL (such as the wrong host name, domain, or port).
- The web server is not running on the specified host.

- The Java Virtual Machine running the web server has become unavailable for some unexpected reason. When this happens, the `/var/log/webconsole/console_debug_log` file on the host that is running the web server (as specified by *hostname*) contains lines that are similar to the following.

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

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

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

- Running software that blocks Internet pop-up windows while you are using SAM-QFS Manager causes unpredictable and unexpected results. Disable such software.
- If you upgrade your Sun StorEdge QFS and Sun StorEdge SAM-FS software from a 4.0 release and you use SAM-QFS Manager to make configuration changes, the software creates new versions of the `mcf`, `archiver.cmd`, and other configuration files. If you had comments in your existing files, they are removed in the new files. To retrieve these comments, see the configuration file backup copy in `/etc/opt/SUNWsamfs/.cfg_back`. The system retains the most recent 25 versions of each configuration file.
- To prevent script errors from popping up on your screen, if you use the Internet Explorer browser, go to the Tools menu, select Internet Options, and then select Advanced. Turn off “Display a notification about every script error” and then click OK.
- If SAM-QFS Manager runs extremely slowly, check whether two instances of the web server are running. To do this, run `ps -ef |grep noaccess`:

```
# ps -ef |grep noaccess
noaccess 21449      1  0 11:38:17 pts/1      2:31
/usr/j2se/bin/java -server -XX:+BackgroundCompilation
-Djava.security.manager -
```

If the system output shows more than one process, run `kill -9 <PID>` to kill all processes that are running by user `noaccess`. Then issue the command `smcwebserver start`.

Segmented File Problems

Segmented files are not supported on Sun StorEdge QFS shared file systems.

stage(1) -n Command Problems

Sun StorEdge QFS shared file system clients do not support the `stage(1) -n` command. The entire file is staged back to the disk cache.

Interoperability Problems With Sun Storage Automated Diagnostic Environment

If you use Sun Storage Automated Diagnostic Environment to collect diagnostic information in Sun StorEdge SAM-FS environments, be aware that either you or the Sun StorEdge SAM-FS software can make a device unavailable. Sun Storage Automated Diagnostic Environment initiates an alarm for devices that become unavailable regardless of whether a user or the software made the device unavailable.

Tivoli SANergy File Sharing Problems

The following problems can arise with SANergy:

- System panics can occur when you do either of the following:
 - Uninstall SANergy while using a fused mountpoint
 - Stop SANergy services while SANergy is in use
- Read operations on files that are marked with the `stage(1) -n` staging attribute, which suppresses staging, sometimes hang.
- During writes from a SANergy client, the software does not adhere to the `segment(1)` file attribute.
- Read operations on files that are marked with `release(1) -p`, which specifies partial staging, sometimes fail.

- An `ftruncate(3C)` operation does not always properly extend a file when issued from a SANergy client.
- An `mmap(2)` system call, if issued over SANergy during the use of the LAN option, sometimes aborts.

Localization Problems

In localized environments, be aware of the following product limitations:

- Sun StorEdge QFS and Sun StorEdge SAM-FS software does not support message displays in more than one language.
- Configuration files do not accept non-ASCII names or descriptions.

Note – No localized packages are available for the 4.3 release.

Bugs

TABLE 1 shows the bugs that are known to exist in the Sun StorEdge QFS and Sun StorEdge SAM-FS software.

TABLE 1 Known Bugs

Bug Number	Description
5048469	In a shared Sun StorEdge QFS file system, an involuntary fail-over test aborted with an <code>ENOSPC</code> error.
5101891	When building an NFS-exported shared client, the process does not complete correctly. Workaround: Build on the MDS rather than on the client.
5072978	An unmount needs to wait until all append lease times have expired. Workaround: Wait until the lease has expired.
6176390	The archive position does not match the actual position on the tape. Workaround: Create multiple archive copies on physically different archive media. Save <code>samfsdumps</code> to recreate the data.
6195617	The <code>setfa -dr</code> command changes directories into files, making the data contained in the directories inaccessible. Workaround: Do not use the <code>setfa</code> command recursively on a directory. If the command is used, the issue can be cleared by unmounting the file system or flushing the incore inode.

TABLE 1 Known Bugs *(Continued)*

Bug Number	Description
6201283	When a samfs file system cannot be mounted on boot with Solaris 10, automounter and other services do not start. Workaround: The problem is due to errors in the <code>/etc/vfstab</code> file. Correct the errors and mount the file system.
6204029	The Default Policy Copy details shows incorrect information.
6209718	SAM can write to tape even if an EOD is not found. Workaround: Create multiple archive copies on physically different archive media. Save <code>samfsdumps</code> to recreate data.
6210094	SAM continues writing after an I/O error on an EOD write. Workaround: Create multiple archive copies on physically different archive media. Save <code>samfsdumps</code> to recreate data.
6211259	An application error is displayed in certain circumstances when trying to open the Add Criteria Wizard.
6211410	The <code>qfsrestore</code> command outputs <code>ioctl(F_IDRESTORE): Operation not supported</code> errors on an <code>sc-qfs</code> file system client. Workaround: This operation is not supported on the client. Perform the restore on the MDS.
6212231	The Linux client <code>ls</code> command stops working when there is activity in the target directory. Workaround: This is a performance issue. Wait for the activity to stop in the target directory.
6213190	A <code>samfsdump</code> taken with a version before 4.1 cannot be restored to a 4.1, 4.2 or 4.3 system.
6214399	ELNRNG errors occur when running <code>fstest</code> on a shared Sun StorEdge QFS file system.
6214727	The Linux client fails to properly handle an MDS switch-over on a shared file system. Workaround: Idle the I/O on the Linux client. If the client fails to connect, reboot the client.
6215478	The <code>df -k</code> command is inconsistent between MDS and MDC.
6216295	Growing a SAM-QFS striped group file system fails.

Release Documentation

Information on the 4.3 release is available from the following sources, in addition to these Release Notes:

- 4.3 README file
 - *Sun StorEdge QFS Linux Client Guide* (Part Number 819-1139-10)
 - *Sun StorEdge QFS and Sun StorEdge SAM-FS File System Administration Guide* (Part Number 819-1550-10)
 - *Sun QFS, Sun SAM-FS, and Sun SAM-QFS Disaster Recovery Guide* (Part Number 817-4090-10)
 - The following Sun StorEdge SAM-FS and Sun StorEdge QFS 4.2 documentation:
 - *Sun SAM-Remote Administrator's Guide* (Part Number 816-2094-11)
 - *Sun StorEdge QFS and Sun StorEdge SAM-FS Software Installation and Configuration Guide* (Part Number 817-7722-10)
 - *Sun StorEdge SAM-FS Storage and Archive Management Guide* (Part Number 817-4093-10)
 - Sun technical support
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Service Contact Information

To contact Sun technical support, go to the following web site:

<http://www.sun.com/service/contacting>

For installation and configuration services, please contact Sun Global Customer Service at 1-800-USA4SUN, or contact your local Sun sales representative.

