



# Sun StorEdge™ Traffic Manager Software Release Notes

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For the Solaris Operating Environment

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# Sun StorEdge Traffic Manager Software Release Notes

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The purpose of these release notes is to provide updates on the Sun StorEdge Traffic Manager Software (STMS). The new functionality described in these notes can be used in a SAN environment or in systems where storage devices are directly connected to hosts. Topics include:

- “Software Requirements” on page 2
- “Known Issues” on page 8
- “Bugs” on page 13
- “Release Documentation” on page 13
- “Getting Help” on page 14

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# Software Requirements

The Sun StorEdge Traffic Manager software supports various servers, adapters, and storage devices. This section contains the following topics:

- “Supported Hardware” on page 2
- “Operating Environment and Firmware Requirements” on page 5
- “Supported Software” on page 7

## Supported Hardware

This section contains the following topics on hardware supported in the Sun StorEdge Traffic Manager software:

- “Storage Devices” on page 2
- “Server Configurations” on page 4

## Storage Devices

The switches and drivers in the STMS function with the following fabric-capable storage devices:

- Sun StorEdge T3 and T3+ arrays
- Sun StorEdge 3510 arrays
- Sun StorEdge 39x0 series
- Sun StorEdge 6120 and 6320 arrays
- Sun StorEdge 69x0 series
- Sun StorEdge 99x0 series

Hardware components and the part numbers on the Sun price list that the switch supports are listed in TABLE 1. Check with your service representative for updates to this list.

**TABLE 1** Sun StorEdge Traffic Manager Software Supported Hardware Matrix

Model, Part Number or System Code	Description
T3BES, T3BWG	Sun StorEdge T3 and T3+ arrays
3510	Sun StorEdge 3510 arrays
3910, 3960	Sun StorEdge 39x0 storage series
6120, 6320	Sun StorEdge 6120 and 6320 arrays

**TABLE 1** Sun StorEdge Traffic Manager Software Supported Hardware Matrix *(Continued)*

<b>Model, Part Number or System Code</b>	<b>Description</b>
6910, 6960	Sun StorEdge 69x0 storage series
9910, 9960, 9970, 9980	Sun StorEdge 99x0 storage series
X6799A	Sun StorEdge PCI Single Fibre Channel Network Adapter
X6727A	Sun StorEdge PCI Dual Fibre Channel Network Adapter
X6748A	Sun StorEdge CPCI Dual Fibre Channel Network Adapter
X6757A	Sun StorEdge SBus Dual Fibre Channel Host Bus adapter
X6767A	Sun StorEdge 2G FC PCI Single Channel Network Adapter
X6768A	Sun StorEdge 2G FC PCI Dual Channel Network Adapter

## Server Configurations

TABLE 2 outlines which servers, bus types, HBAs, physical connections and software patches and packages are required for the STMS.

**TABLE 2** Sun StorEdge Traffic Manager Software Server Compatibility Matrix

Server	Bus Architecture	HBAs	Physical Connection	Required Sun Software Packages and Patches
Sun Enterprise 3x00 - 6x00, and 10000 servers	SBus	X6757A*	1-Gbit FC	Sun StorEdge SAN Foundation Software 4.2 or later with the following unbundled packages: <ul style="list-style-type: none"> <li>• SUNWsan</li> <li>• SUNWcfpl</li> <li>• SUNWcfplx</li> <li>• SUNWcfclr</li> <li>• SUNWcfcl</li> <li>• SUNWfcfx</li> <li>• SUNWfchbr</li> <li>• SUNWfchba</li> <li>• SUNWfchbx</li> <li>• SUNWfcsmx</li> <li>• SUNWfcsmx</li> </ul> found at the Download Center: <a href="http://www.sun.com/storage">http://www.sun.com/storage</a> To find all required patches: <a href="http://sunsolve.Sun.COM/">http://sunsolve.Sun.COM/</a> → Product Patches → PatchPro: <ul style="list-style-type: none"> <li>• → Network Storage Products and</li> <li>• → Solaris Recommended Patch Cluster</li> </ul> Describe your system, then click Generate Patch List.
	PCI	X6799A† X6727A‡	1-Gbit FC	
	PCI	X6767A§ X6768A**	2-Gbit FC	
Sun Fire 3800 server	cPCI	X6748A††	1-Gbit FC	Sun StorEdge SAN Foundation Software 4.2 or later with the following unbundled packages: <ul style="list-style-type: none"> <li>• SUNWsan</li> <li>• SUNWcfpl</li> <li>• SUNWcfplx</li> <li>• SUNWcfclr</li> <li>• SUNWcfcl</li> <li>• SUNWfcfx</li> <li>• SUNWfchbr</li> <li>• SUNWfchba</li> <li>• SUNWfchbx</li> <li>• SUNWfcsmx</li> <li>• SUNWfcsmx</li> </ul> found at the Download Center: <a href="http://www.sun.com/storage">http://www.sun.com/storage</a> To find all required patches: <a href="http://sunsolve.Sun.COM/">http://sunsolve.Sun.COM/</a> → Product Patches → PatchPro: <ul style="list-style-type: none"> <li>• → Network Storage Products and</li> <li>• → Solaris Recommended Patch Cluster</li> </ul> Describe your system, then click Generate Patch List.
Sun Fire 4800—6800 server	cPCI	X6748A	1-Gbit FC	
	PCI	X6799A X6727A  X6767A X6768A	1-Gbit FC  2-Gbit FC	
<ul style="list-style-type: none"> <li>• SunBlade 1000 and 2000 servers</li> <li>• Sun Enterprise 250, 450, 220, 420 servers</li> <li>• Sun Fire V210, V240, 280R, 480, V880, V1280, 15000 and 12000 servers</li> <li>• Sun Netra 1125 and 140X servers</li> <li>• Sun Ultra 60/80 servers</li> </ul>	PCI	X6799A X6727A	1-Gbit FC	
		X6767A X6768A	2-Gbit FC	

\* Sun StorEdge SBus Dual Fibre Channel Host Bus Adapter

† Sun StorEdge PCI Single Fibre Channel Network Adapter

‡ Sun StorEdge PCI Dual Fibre Channel Network Adapter+

§ Sun StorEdge 2G FC PCI Single Channel Network Adapter

\*\* Sun StorEdge 2G FC PCI Dual Channel Network Adapter

†† Sun StorEdge cPCI Dual Fibre Channel Network Adapter



# Operating Environment and Firmware Requirements

This section outlines operating environments and host configurations for STMS.

- “Operating Environments Supported” on page 5
- “Host Bus Adapter Firmware Requirements” on page 6
- “Storage Device Firmware Levels” on page 6
- “Qlogic 2200/2300 Controller FCode Requirement” on page 7

## Operating Environments Supported

TABLE 3 lists which versions of the Solaris operating environments STMS runs on.

**TABLE 3** Sun StorEdge Traffic Manager Software Operating Environment Compatibility Matrix

Operating Environment	Notes
Sun Solaris 8	Supported
Sun Solaris 9	Supported

All Solaris hosts in a zone must be running the Solaris 8 update 04/01 operating environment, or later, with all appropriate patches installed. You can download the patches from the following web site:

<http://sunsolve.Sun.COM/pub-cgi/show.pl?target=patches/patch-access>

## Host Bus Adapter Firmware Requirements

TABLE 4 lists the firmware versions required for various HBAs and I/O boards. Use the patch id's below to ensure fabric boot support with a switch port set to F-port.

**TABLE 4** Sun StorEdge Traffic Manager Software HBA Firmware Matrix

<b>FW-Code Levels for HBAs and I/O Boards</b>	<b>Version</b>	<b>Patch</b>
X6757A, Sun StorEdge SBus Dual Fibre Channel Host Bus Adapter	1.14 or higher	112244-03
X6799A, Sun StorEdge PCI Single Fibre Channel Network Adapter	1.14 or higher	111853-02
X6727A, Sun StorEdge PCI Dual Fibre Channel Network Adapter+	1.14 or higher	111853-02
X6767A, Sun StorEdge 2G FC PCI Single Channel Network Adapter	1.14.01 or higher	114873-01
X6768A, Sun StorEdge 2G FC PCI Dual Channel Network Adapter	1.14.01 or higher	114874-01
X6748A, Sun StorEdge cPCI Dual Fibre Channel Network Adapter	1.14 or higher	111853-02

## Storage Device Firmware Levels

TABLE 5 lists firmware levels requirements for supported storage devices.

**TABLE 5** Sun StorEdge Traffic Manager Software Storage Device Firmware Matrix

<b>Storage Devices</b>	<b>Firmware Version</b>
Sun StorEdge T3 array	1.18.02 or later controller firmware
Sun StorEdge T3+ array	2.01.04 or later controller firmware
Sun StorEdge 3510 arrays	3.27M or later
Sun StorEdge 39x0 array	2.01.04 or later controller firmware
Sun StorEdge 6120 & 6320 arrays	3.0.5 or later
Sun StorEdge 69x0 array	service processor 2.3.1 or later
Sun StorEdge 9960 & 9910 arrays	01-18-09-00/00 or later
Sun StorEdge 9980 & 9970 arrays	21-04-32-00/00 or later

## Qlogic 2200/2300 Controller FCode Requirement

The Qlogic 2200/2300 controller version should be at least revision 1.13. The version of Qlogic Controller FCode on the system can be obtained by running the following command:

```
% luxadm qlgc_s_download
```

If you do not have the latest FCode software, please apply patch 111853-01 or later and follow the interactive steps outlined in the README of the patch for new FCode installation. This patch is available at <http://www.sun.com/sunsolve>.

## Supported Software

Sun StorEdge Traffic Manager supports the following software:

- “Veritas Volume Manager 3.2” on page 7
- “Configuring Alternate Pathing (AP)” on page 7
- “Migrating From AP to STMS” on page 7

## Veritas Volume Manager 3.2

Veritas Volume Manager 3.2 and later versions are supported by STMS. Veritas Volume Manager 3.1.2 and earlier are not supported in this release of STMS. You need to explicitly disable STMS on a per-port basis using `qlc.conf` with Veritas Volume Manager versions that do not work with STMS paths. See *Configuring STMS on a Per Port (pHCI) Basis* for these instructions in *Sun StorEdge Traffic Manager Installation and Configuration Guide*.

## Configuring Alternate Pathing (AP)

To run STMS and Alternate Pathing simultaneously in a Solaris 8 environment, selectively disable STMS on a per-port basis using `qlc.conf`, and utilize AP for control of the STMS disabled devices. You might choose this option in order to get multipathing capabilities for non-STMS supported devices that are supported by AP.

## Migrating From AP to STMS

No special tools are required for you to migrate from AP to STMS. Simple deconfiguration of the AP software, as described in your AP documentation will be sufficient.

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# Known Issues

The following topics are covered in this section:

- “Disabling STMS Before Using Fabric Boot” on page 8
- “Dynamic Reconfiguration in the Solaris 8 Operating Environment” on page 9
- “Considerations When Upgrading the Solaris Operating Environment” on page 8
- “Booting From Disk Controllers” on page 9
- “Multipathing with Sun StorEdge A3500FC Arrays” on page 10
- “Changes to iostat, prtconf and libdevinfo” on page 10
- “Volume Manager Support” on page 10
- “Adaptive Traffic Handling Issues” on page 10
- “Automatic Failback Issues” on page 11
- “Third-Party Storage Device Support Limitation” on page 11

## Disabling STMS Before Using Fabric Boot

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**Caution** – Before using Fabric boot, you must disable STMS.

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### ▼ To Disable STMS

1. **Edit the** `/kernel/drv/scsi_vhci.conf` **file:**

```
# mpxio global enable/disable switch: setting mpxio-disable="no" will activate
# I/O multipathing; setting mpxio-disable="yes" disables this feature (do
# not remove this property).
#
mpxio-disable="yes";
```

Make sure the `mpxio-disable` variable is set to “yes”.

2. **Reboot the system.**

```
# boot -r
```

# Dynamic Reconfiguration in the Solaris 8 Operating Environment

---

**Caution** – Due to a known issue in Solaris 8 (Bug # 4372378), if some ports in system board have STMS enabled and other ports have STMS disabled, upon detach and reattach action of the system board, all the ports comes under STMS control regardless of whether the ports are STMS enabled or disabled. Therefore, either enable or disable STMS globally. When the system is rebooted, all paths will be properly configured. This has been resolved in the Solaris 9 operating environment.

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## Considerations When Upgrading the Solaris Operating Environment

The Sun StorEdge Traffic Manager software are packages and patches added to the operating environment. When upgrading the Solaris operating environment, save your new Sun StorEdge Traffic Manager software configuration files with your specific configuration information.

### ▼ To Backup STMS files for Operating Environment Upgrade

1. Copy your STMS configuration files.

```
# cp /kernel/drv/scsi_vhci.conf /kernel/drv/scsi_vhci.conf.sav
# cp /kernel/drv/qlc.conf /kernel/drv/qlc.conf.sav
```

2. Perform the operating environment upgrade and install any patches as needed.
3. Add your configuration to the new configuration files.

Once the upgrade has been completed, copy any configuration changes you saved in the `.sav` files into the new `.conf` files.

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**Note** – If you had configured STMS to control only certain ports by modifying the `qlc.conf` file, copy those modifications from the `qlc.conf.sav` file to the new `qlc.conf` file.

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## Booting From Disk Controllers

The current release of STMS does not support booting from a disk controller. If the host does boot from a Sun StorEdge A5x00 class disk, (booting from StorEdge T3 array is not supported), none of the devices under the pHCI with the boot device get enumerated under `scsi_vhci`.

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**Note** – If there are other pHCIs connected to A5x00, those paths will be seen as STMS paths. To prevent the boot device being seen as both STMS and not-STMS paths for the current implementation of STMS, disable STMS for the pHCIs that are connected to the Sun StorEdge A5x00 array via `qlc.conf` as explained in Configuring STMS on a per port (pHCI) basis, in Chapter “Configuring the Sun StorEdge Traffic Manager Software” in *Sun StorEdge Traffic Manager Installation and Configuration Guide*.

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## Seamless Failover and Sun StorEdge T3, T3+, and T4 arrays

The lag time caused when the system loses an active path and I/O is transferred to another available active path is now seamless for most supported storage devices. When the system detects that an active path goes OFFLINE, it diverts I/O continuously so that there is no apparent interruption in data flow. STMS provides Seamless Failover for all of its supported storage devices except the Sun StorEdge T3, T3+, and T4 arrays.

## Multipathing with Sun StorEdge A3500FC Arrays

The current release of STMS does not support multipathing to a Sun StorEdge A3500FC array. The paths to a A3500FC array will not be enumerated under `scsi_vhci`. These paths will appear the same as if STMS had not been installed.

## Changes to `iostat`, `prtconf` and `libdevinfo`

This release of STMS does not include any changes to `iostat`, `prtconf` or `libdevinfo`.

# Volume Manager Support

STMS can be present with all Volume Manager software. There might be issues with volume managers running on the system prior to installing STMS.

STMS combines a set of device paths to the same device under the virtual device path. An existing volume manager may not be able to find its pre-STMS devices since the device paths have been changed. Therefore, paths used by volume managers needs to be reconfigured with STMS paths for the volume manager to recognize the new paths. Care must be taken to prevent losing the data.

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**Note** – You will notice a reduction in the number of controllers under STMS since each path to the same LUN will be represented by a single virtual controller.

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See “Configuring Sun StorEdge Traffic Manager Software” in *Sun StorEdge Traffic Manager Installation and Configuration Guide* for an example of the Solstice DiskSuite volume manager.

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**Note** – Be sure to save the device path names used by Solstice DiskSuite prior to enabling STMS. This information will be used to configure Solstice DiskSuite after Sun StorEdge Traffic Manager is enabled.

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## Adaptive Traffic Handling Issues

The effectiveness of the adaptive traffic handling depends on how fast storage devices clear up the I/O queue. When multiple initiators are connected to a Sun StorEdge T3 or T3+ array with a switch and one host cable is pulled, the commands for all the other initiators are stuck at the array side. Until the commands time out, no I/O can be sent on any of the other paths. The interruptions might last about 70 seconds.

The adaptive traffic handling feature is also not applicable to one online and one or more standby paths. Failover time is not affected if an online path is pulled.

## Automatic Failback Issues

Automatic failback is a feature that can be either enabled or disabled by setting auto-failback property in `scsi_vhci.conf`. If a primary path to a LUN fails on one node and a secondary path for the same LUN fails on another node, each host tries to failover forever, causing a ping-pong effect. To prevent the ping-pong effect, automatic failback is tried once when the primary path is being brought up to a

STANDBY state. If the attempt fails, it does not try to initiate failover again to bring the primary path to the ONLINE state. Automatic failback is not applicable in certain conditions. During boot or dynamic reconfiguration of a new controller, if the primary path is in STANDBY state, then automatic failover is not triggered. Only when the primary path goes through a OFFLINE state and is restored to come up as STANDBY, the automatic failover is triggered to make the primary path ONLINE.

The Sun StorEdge T3+ arrays have no failover capability and do not support LUN reset during failover. However, the arrays do permit reset at the target level for the whole array. Consider the number of hosts and the effect of the failovers before you enable automatic failback on each host.

The automatic failback feature does not have any effect on any symmetric storage devices, such as the Sun StorEdge 99x0 series, since all data paths are considered to be primary paths. If a path fails, I/O is routed on another path and automatically resumes on the original path when the original path is repaired.

## Third-Party Storage Device Support Limitation

For third-party storage devices, STMS only supports symmetric third-party storage devices. STMS does not support asymmetric devices. On symmetric devices, all the paths to the devices are active and capable of accepting any command at any time.

As with Sun storage devices, the automatic failback feature does not work on third-party symmetric storage devices. The storage device must support the SCSI Device Identification VPD page (page code 0x83). At least one identification descriptor should contain 0x2 or 0x3 in the identifier field type.

### ▼ To Verify Third-Party Storage Devices Are Under STMS Control

1. After you configure the `scsi_vhci.conf` file, confirm that the devices nodes are created under the `/devices/scsi_vhci` file:

```
# format
```

2. If the devices are not created, confirm the `vendor_id` and `product_id` fields in the `scsi_vhci.conf` file.



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## Bugs

- **Bug 4809257:** I/O error and system hangs after disabling an already down path. There is a low probability of encountering this error.  
Workaround: Repair the broken paths and reboot the system.
- **Bug 4813383:** GUI incorrectly updates storage device name in AIX.  
Workaround: use the CLI.
- **Bug 4813756:** AIX 4.3.3: Host hangs when switching between auto and manual failback.  
Workaround: reboot the server.
- **Bug 4814660:** The disk device name doesn't show up in the left GUI subpane.  
Workaround: use the CLI.
- **Bug 4815527:** Adding storage to the AIX machine can cause the host to hang.  
Workaround: reboot the system and the storage will be automatically added.
- **Bug 4815584:** After the loss of one path, the GUI does not display supported devices and the system hangs.  
Workaround: Repair the broken paths and reboot the system.
- **Bug 4816983:** Catastrophic storage device failure can cause dual path failures.  
Workaround: reboot the system.
- **Bug 4819880:** I/O error and system hangs after disabling an already down path. There is a low probability of encountering this error.  
Workaround: Repair the broken paths and reboot the system.

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## Release Documentation

For a more thorough understanding of the STMS product, please see the *Sun StorEdge Traffic Manager Installation and Configuration Guide* (part number 816-1420) at:

[http://www.sun.com/products-n-solutions/hardware/docs/Software/Storage\\_Software/Sun\\_StorEdge\\_Traffic\\_Manager/index.html](http://www.sun.com/products-n-solutions/hardware/docs/Software/Storage_Software/Sun_StorEdge_Traffic_Manager/index.html)

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# Getting Help

If you need help installing or using this product, contact your service provider. If you have a support contract with Sun, call 1-800-USA-4SUN, or go to:

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