Sun StorEdge™ T3+ Array Release Notes

Version 3.2.4 Controller Firmware

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Sun StorEdge T3+ Array Release Notes

Version 3.2.4 Controller Firmware

This document contains late-breaking product information and known issues that are specific to the Sun StorEdge™ T3+ array (also known as Sun StorEdge T3 array with 1GB Cache Controller). Issues documented previously for the Sun StorEdge T3 array that do not appear in these release notes have either been resolved or do not apply to the Sun StorEdge T3+ array.

Review this document so that you are aware of issues or requirements that can impact the installation and operation of the Sun StorEdge T3+ array. The information in this document supplements the information contained in the *Sun StorEdge T3+ Array Installation and Configuration Manua*l and the *Sun StorEdge T3+ Array Administrator's Manual*.

Use these release notes in conjunction with other release notes and README files that you have received with other software products related to the Sun StorEdge T3+ array, such as VERITAS Volume Manager.

These Release Notes are organized as follows:

- "Controller Firmware 3.2.4 Features" on page 2
- "Required Patches" on page 2
- "Upgrading and Downgrading the Controller Firmware" on page 4
- "Sun StorEdge T3+ Array Controller Hot Swap" on page 9
- "Known Issues and Bugs" on page 10
- "Release Documentation" on page 14
- "Contacting Sun Technical Support" on page 14

Controller Firmware 3.2.4 Features

There are no new features in this release.

Note – This release provides bug fixes to enhance availability and reliability of the array firmware.

Required Patches

Install all the required patches listed in TABLE 1 before installing the software for the 3.2.4 controller firmware.

Prerequisite Patches

TABLE 1 Minimum Version of Patches Required for the Version 3.2.4 Controller Firmware

System Type	Solaris 2.6 OS	Solaris 8 OS	Solaris 9 OS
All	105356-23 (ssd driver) 106226-03 (format patch) 105181-35 (kernel update patch)	108974-33 (ssd driver)	113277-*xx* (ssd driver)
VERITAS VM 3.1	110253-04	110255-04	none
VERITAS VM 3.1.1	110451-09	111118-10	none

TABLE 1 Minimum Version of Patches Required for the Version 3.2.4 Controller Firmware *(Continued)*

System Type	Solaris 2.6 OS	Solaris 8 OS	Solaris 9 OS
VERITAS VM 3.2	113201-04	113201-04	113201-04
VERITAS VM 3.5	none	none	112392-*xx*
Sun StorEdge SAN Foundation Software HBAs*	none	111095-15	113040-07
		111096-08	113041-05
		111097-14	113042-06
		111412-13	113039-05
		111413-12	113043-06
		111846-08	113044-05
		113767-04	114478-03

* These HBAs apply to the Sun StorEdge SAN Foundation software:
- Sun StorEdge 1 Gb PCI Single Fibre Channel Network Adapter, part number X6799A
- Sun StorEdge 1 Gb PCI Dual Fibre Channel Network Adapter, part number X6727A
- Sun StorEdge 1 Gb cPCI Dual Fibre Channel Network Adapter, part number X6748A
- Sun StorEdge 1 Gb SBus Dual Fibre Channel Host Bus adapter, part number X6757A
- Sun StorEdge 2 Gb FC PCI Single Channel Network Adapter, part number SG-XPCI1FC-QF2 (formerly X6767A)
- Sun StorEdge 2 Gb FC PCI Dual Channel Network Adapter, part number SG-XPCI2FC-QF2 (formerly X6768A)
- Sun StorEdge 2 Gb PCI Single Port Fibre Channel Host Bus Adapter, part number SG-XPCI1FC-JF2
- Sun StorEdge 2 Gb PCI Dual Port Fibre Channel Host Bus Adapter, part number SG-XPCI2FC-JF2

3.2.4 Controller Firmware Patch

The patch ID for the 3.2.4 firmware is 116930-05.

Note – Ensure that you have installed all the required patches listed in TABLE 1 before installing the 3.2.4 firmware patch.

▼ To Download the Required Patches

The latest patches are available on the SunSolve^{SM} web site with the use of PatchFinder. Use the following procedure to retrieve the patches for your Solaris Operating System and the patch for the 3.2.4 controller firmware.

1. **Access the SunSolve web site at:**

   `http://sunsolve.sun.com`

2. **Under SunSolve Patch Contents, click Patch Portal.**

3. **For each patch that you want to download, follow these steps:**

   a. **Under PatchFinder, type the patch ID (refer to** TABLE 1**), and click Find Patch.**

      Do not type the *-xx* revision number. PatchFinder automatically finds the latest patch.

   b. **Verify the correct patch.**

   c. **Print the page.**

Note – Printing this page also prints the patch README file, which contains the installation instructions, special instructions, special guidelines, and notes.

---

   d. **Download the patch by clicking on either HTTP or FTP in the following line:**

      Download Patch (*nn*,*nnn*,*nnn* bytes) HTTP FTP.

4. **When finished downloading all the patches, install the operating system patches by following the instructions in each patch README file.**

Note – To install the 3.2.4 controller firmware patch, see "Upgrading and Downgrading the Controller Firmware" on page 4.

Upgrading and Downgrading the Controller Firmware

To upgrade to, and downgrade from, the 3.2.4 firmware release, follow the instructions provided in this section. Online upgrading and downgrading is not supported.

Note – Make sure that the hardware in the system has no faults and is fully functional before upgrading or downgrading the software on the system.

This section contains the following topics:

- "To Perform an Offline Upgrade From 3.1.6 to 3.2.4" on page 5
- "To Perform an Offline Downgrade From 3.2.4 to 3.1.6" on page 7

▼ To Perform an Offline Upgrade From 3.1.6 to 3.2.4

Note – Upgrading to firmware 3.1.6 can be done directly from any level of 3.1.*x*.

---

1. **Confirm the current firmware version by issuing the** `ver` **command.**

```
:/:<1> ver
T3B Release 3.1.6 Fri Mar 19 xx:xx:xx PST 2005 {xxx.xxx.xx.xxx}
Copyright (C) 1997-2005 Sun Microsystems, Inc.
All Rights Reserved.
```

2. **Download the 116930-*xx* patch from the SunSolve web site with the use of PatchFinder.**

   See "To Download the Required Patches" on page 3.

3. **To verify that the system is in good working order, type the following:**

```
:/:<2> fru stat
```

4. **Perform a backup of all the Sun StorEdge T3+ array data.**

5. **Run the** `vol verify` **command on all volumes to check their status.**

```
:/:<3> vol verify volume_name fix
```

Note – The `vol verify` operation can take up to several hours to run, depending on system activity and the verification rate selected.

---

6. **Set the system for auto-boot mode by typing:**

```
:/:<4> set bootmode auto
```

7. **Verify that the system is configured for auto-boot mode by typing:**

```
:/:<5> set
bootmode  auto
bootdelay 3
ip        10.4.32.112
netmask   255.255.255.0
gateway   10.4.32.1
tftphost  10.4.31.83
tftpfile  liz/new2.bin
hostname  qatest
timezone
logto     /syslog
loglevel  4
rarp      on
mac       00:03:ba:27:d4:cf
```

8. **Read the patch README instructions that were downloaded with the patch.**

9. **Use the `t3.sh` script to install the 3.2.4 firmware patch.**

   See the README that comes with the patch for more information.

10. **To download the firmware code to the array, type the following:**

```
:/:<6> ep download t313_t324.bin
```

Note – The "**`l`**" after the first "**`t3`**" above is the lower-case letter L.

11. **To reboot the array, type the following:**

```
:/:<7> reset
```

    The system prompts for a confirmation that you want to reset the Sun StorEdge T3+ array. It then reboots your controller to the new firmware.

12. **See the controller firmware patch README to determine whether the latest disk drive firmware (which comes with the patch) needs to be loaded.**

▼ To Perform an Offline Downgrade From 3.2.4 to 3.1.6

Use the same password you used with the controller firmware 3.1.6 to gain access to the upgraded system. For example, if `old` is the 3.1.6 password and you set the password to `new` when you upgrade to 3.2.4, the password reverts back to `old` when you downgrade to 3.1.6.

If you upgrade, downgrade, and then upgrade again, you might lose your password. If so, you must reset the password.

Caution – Ensure that all I/O activity is stopped, and all processing tasks are complete.

Not following the specified steps may result in unexpected behavior including loss of data or system hang.

1. **Run the `sys list` command and note the current values for `disk_scrubber` and `ondg`.**

```
:/:<1> sys list
Controller         : 2.0
blocksize          : 1.6k
cache              : auto
mirror             : auto
mp_support         : none
naca               : off
rd_ahead           : off
recon_rate         : med
sys memsize        : 128 MBytes
cache memsize      : 1024 MBytes
enable_volslice    : on
fc_topology        : auto
fc_speed           : 1 Gb
disk_scrubber      : on <-----
ondg               : befit <-----
```

2. **Disable disk_scrubber using the following command:**

```
:/:<2> sys disk_scrubber off
```

3. **Disable** `ondg` **using the following command:**

```
:/:<3> sys ondg off
```

4. **Use the** `proc list` **command to verify that there are no background processes running on the array.**

   Note that all running background processes must be completed first, before the downgrade can be performed.

```
:/:<4> proc list
VOLUME          CMD_REF PERCENT    TIME COMMAND
v1                44097       4    9:40 vol verify
v2                46144       4    9:42 vol verify
```

5. **To verify that the system is in good working order, type the following:**

```
:/:<5> fru stat
```

6. **Set the system for auto-boot mode by typing:**

```
:/:<6> set bootmode auto
```

7. **Back up all the data on your system in case of a failure.**

8. **Use the** `t3.sh` **script to install the 3.1.6 firmware patch.**

   See the README file that comes with the patch for more information about how to complete the installation of this patch, for example, the loopcard firmware downgrade.

9. **To download the level 3 image to the master and alternate master controller, type the following:**

```
:/:<5> ep download t313_t316.bin
```

10. **To reboot the array, type the following:**

```
:/:<6> reset
```

The system prompts for a confirmation that you want to reset the Sun StorEdge T3+ array. It then reboots your controller to the new firmware.

11. **After a successful reboot, restore the** `disk_scrubber` **and** `ondg` **options.**

Sun StorEdge T3+ Array Controller Hot Swap

To replace a Sun StorEdge T3+ array controller in your system using the hot-swap method, follow the instructions provided in this section.

Caution – An online controller swap requires that the host be running a multipathing driver such as Sun StorEdge Traffic Manager software or VERITAS DMP.

▼ To Replace a Sun StorEdge T3+ Array Controller

1. **To disable the controller (in this example, U1 is the controller that you are replacing), type the following:**

```
:/:<1> disable u1
```

This causes the controller to disable itself and the alternate controller to take control.

2. **Remove the disabled controller from the system.**
3. **Insert the replacement controller into the system.**

4. **After the alternate controller has taken control, enable the replacement controller (U1 in this example) by typing the following from the alternate controller:**

```
:/:<2> enable u1
```

This causes the replacement controller to reboot.

Known Issues and Bugs

Caution – Do not connect Sun StorEdge T3 and T3+ arrays to a public Ethernet network. Connect them only to a secure network.

This section discusses issues and bugs present in firmware release 3.2.4. It contains the following topics:

- "Fujitsu Disk Drives" on page 10
- "A Shutdown Occurs if a FRU is Not Replaced in 30 Minutes" on page 11
- "Data Transfer Block Sizes of 4 and 8 Kilobytes Are Not Supported" on page 12
- "Boot Options" on page 12
- "Bugs" on page 13

Fujitsu Disk Drives

Note – The following information has been superseded as of firmware release 3.1.5 in patch 115180-07 and above. The disk firmware level is now B704. This resolves an additional ELS drive firmware bug. ELS commands are used by 3.1.x controller firmware and disk scrubber as a runtime diagnostic check. Fujitsu disk drive firmware version B704 fixes the issue described in SunAlert 57681, and in bug 5065023, as discussed in "Bugs" on page 13.

Disk drives from Fujitsu Computer Products of America, Inc., disk drive models MAN3367FC and MAN3735FC running firmware earlier than version 1504, may interact with the Sun StorEdge T3+ array controller and array controller firmware 3.1.*x*. This interaction could lead to data loss in certain cases. The problem is caused by a race condition resulting from the Fujitsu disk drive firmware reordering the sequential read commands and Read Link Status (RLS) commands during the

sequential read command data transfer setup process. RLS commands are used by 3.1.*x* controller firmware and Storage Automated Diagnostic Environment as a runtime diagnostic check. Fujitsu disk drive firmware version 1504 fixes the issue described in SunAlert 57537 and in bug 5020631, as discussed in "Bugs" on page 13.

Sun StorEdge T3+ array controller firmware version 3.1.3 has been modified to detect the specific disk drive firmware revisions of the MAN3367FC and MAN3735FC disk drives that have been the issue. On systems with Fujitsu Allegro 7 disk drives, and the affected drive firmware levels, the system will not allow the volumes to be mounted until the drive firmware level is updated to drive firmware version 1504.

If your system has MAN3367FC or MAN3735FC Fujitsu disk drives, please upgrade them with drive firmware version 1504 (included in this release) prior to installing 3.1.*x* array controller firmware.

If you should install array controller firmware 3.1.*x* without the Fujitsu disk drive firmware 1504, your system will not allow the volumes to be mounted. To remedy this situation, install the Fujitsu disk drives firmware 1504 and reboot the Sun StorEdge T3+ array controller.

Note – Fujitsu disk drive model MAP3735FC running firmware other than factory-installed 0801 or 1201 could lead to data loss in certain cases. The disk firmware should not be upgraded or downgraded at this time. If the disk firmware is downloaded, refer to SunAlert 57620 and bug 5077820 (as discussed in "Bugs" on page 13) for a resolution.

A Shutdown Occurs if a FRU is Not Replaced in 30 Minutes

If any field-replaceable unit (FRU) is removed for an extended period of time, thermal complications might result. To prevent this, the Sun StorEdge T3+ array is designed so that an orderly shutdown occurs.

If any FRU, except a disk drive, is removed, a shutdown is initiated after 30 minutes. You must replace a FRU within 30 minutes or the Sun StorEdge T3+ array, and all attached Sun StorEdge T3+ arrays in that partner group, will shut down and power off.

Removing a disk drive FRU will not result in a shutdown.

Note – Make sure that a replacement FRU is on-hand before starting a remove and replace procedure.

Data Transfer Block Sizes of 4 and 8 Kilobytes Are Not Supported

The 4- and 8-kilobyte block sizes are not supported on the Sun StorEdge T3+ array. They will also be disabled by controller firmware release 3.1.4 and above. Do not use these settings.

Boot Options

Warm boot the Sun StorEdge T3+ array for hosts that are running the Solaris OS and are connected to the system with certain Sun StorEdge Fibre Channel host bus adapters (HBAs). Warm booting means that the Sun StorEdge T3+ array must be completely booted before attempting to boot the host from the Sun StorEdge T3+ array. Warm booting is supported beginning with the Solaris 7 11/99 OS. Booting for the Solaris 2.6 OS or earlier is not currently supported.

The following Sun StorEdge Fibre Channel HBAs support booting from the Sun StorEdge T3+ array:

- Sun StorEdge 1 Gb PCI Single Fibre Channel Network Adapter, part number X6799A
- Sun StorEdge 1 Gb PCI Dual Fibre Channel Network Adapter, part number X6727A
- Sun StorEdge 1 Gb cPCI Dual Fibre Channel Network Adapter, part number X6748A
- Sun StorEdge 1 Gb SBus Dual Fibre Channel Host Bus adapter, part number X6757A
- Sun StorEdge 2 Gb FC PCI Single Channel Network Adapter, part number SG-XPCI1FC-QF2 (formerly X6767A)
- Sun StorEdge 2 Gb FC PCI Dual Channel Network Adapter, part number SG-XPCI2FC-QF2 (formerly X6768A)
- Sun StorEdge 2 Gb PCI Single Port Fibre Channel Host Bus Adapter, part number SG-XPCI1FC-JF2
- Sun StorEdge 2 Gb PCI Dual Port Fibre Channel Host Bus Adapter, part number SG-XPCI2FC-JF2

Cold booting, or booting a Sun StorEdge T3+ array and the host at the same time, requires the host boot process to wait until the Sun StorEdge T3+ array boot process is completed. The `maxwait` boot time directive can be used to cause hosts running the Solaris OS to wait for the Sun StorEdge T3+ array to become ready. The recommended maximum wait time is 10 minutes. If the array finishes booting before

the specified wait time, the system stops waiting automatically and continues. An example of a boot time directive with a `maxwait` time of 10 minutes is provided below.

```
ok boot /pci@1f,0/pci@5/pci@0/SUNW,qlc@4:maxwait=
10/fp/disk@w21000020371b80ef,0
```

Bugs

The following bugs are listed in order of priority (P) first, and then severity (S).

- **Bug 5077820 (P1/S3):** Upgrading or downgrading the drive firmware on the MAP3735FC drives between firmware versions 0801 and 1201 causes all the drives of this type to appear as if they are replaced. See "Fujitsu Disk Drives" on page 10.

  Workaround: See SunAlert 57620 for details.

- **Bug 4950101 (P3/S4):** After a disk drive reconfiguration with the disk scrubber enabled, the `proc list` command continually shows 0% completion for the `auto vol verify` command. This happens only if the I/O rate is very low.

  Workaround: This is expected behavior. Be aware that when the I/O rate is low, the volume verification process can execute only one verify stripe for every 512 host I/O commands, causing the process to operate slowly.

- **Bug 4962409 (P3/S4):** A switch port connected to a Sun StorEdge T3+ array can gray out after the switch is powered on.

  This only happens every 36th or 37th time a switch is reset with an interval of five minutes between each reset. The link initialization between the switch and the Sun StorEdge T3+ array is the problem.

  Workaround: To recover, disconnect the cable between Sun StorEdge T3+ array and the switch, and then reconnect them.

- **Bug 4968642 (P3/S4):** Loop 1 remains healed after a master controller U1 failure and replacement. The Sun StorEdge T3+ array performance is limited by the total bandwidth of the backend loops decreasing from three loops to two.

  This is normal behavior to allow the current master controller U2 to have access the system area that is on controller U1. A loop will split only if U1 is the master, and all other conditions are favorable.

Release Documentation

The table below lists the documentation for the Product Name array. The suffix nn in a part number indicates that you should use the most current version. This documentation is available online at:

- `http://www.sun.com/products-n-solutions/hardware/docs/Network_Storage_Solutions/Midrange/T3ES/index.html`
- `http://www.sun.com/documentation`

Title	Part Number
Sun StorEdge T3+ Array Installation and Configuration Manual	816-4769-nn
Sun StorEdge T3+ Array Administrator's Manual	816-4770-nn

Contacting Sun Technical Support

If you have technical questions about this product that are not answered in this document, go to:

`http://www.sun.com/service/contacting`