Sun StorEdge™ T3+ Array Release Notes

Version 3.1.X Controller Firmware

Sun Microsystems, Inc.
www.sun.com

Part No. 817-4676-14
March 2005, Revision A

Submit comments about this document at: `http://www.sun.com/hwdocs/feedback`

Please
Recycle

Adobe PostScript

Sun StorEdge T3+ Array Release Notes

Version 3.1.X 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:

Typographic Conventions

Typeface*	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

* The settings on your browser might differ from these settings.

Related Documentation

Title	Part Number
Sun StorEdge T3+ Array Installation and Configuration Manual, Version 2.1 Controller Firmware	816-4769
Sun StorEdge T3+ Array Administrator's Manual, Version 2.1 Controller Firmware	816-4770

Note – Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Controller Firmware 3.1.X Features

The following new features are included in this release:

- Background RAID Scrubbing (Disk Scrubber)
- Backend Fault Isolation Task (BEFIT)
- Input/Output (I/O) Queue Depth Management
- Explicit LUN Failover for multi-pathing, version 2.4
- Core dump analysis
- Support for Sun StorEdge Traffic Manager Software for the Solaris Operating System or MP3.0 fail-over drivers
- Support for VERITAS VxDMP

The following topics are discussed in this section:

- "Background RAID Scrubbing (Disk Scrubber)" on page 3
- "Backend Fault Isolation Task (BEFIT)" on page 5

Background RAID Scrubbing (Disk Scrubber)

The disk scrubber feature provides a proactive way to perform RAID volume consistency checks. The disk scrubber runs in the background as a low-priority operation and detects inconsistencies in a user's RAID volumes. By default, the disk scrubber is enabled when you boot your system. You can enable or disable the disk scrubber feature.

When enabled, disk scrubber launches two scrubbing tasks immediately after system boot. One task verifies all of the volumes owned by the master controller, and the other task verifies all volumes owned by the alternate controller. If any inconsistencies are found during verification, messages are sent to the Sun StorEdge T3 service `syslog` file. Service `syslog` error messages can include volume or stripe verification messages. For example:

- With computed parity and read parity mismatch (RAID 5)

```
Sep 22 18:06:17 psc0[1]: N: Vol verify (m1) started
Sep 22 18:06:18 WXFT[1]: E: u1ctr: vol (m1), Slice Name:(m1slice) vol verify
detected data parity mismatch on Stripe: 7, Lun:0
Sep 22 18:06:18 WXFT[1]: N: u1ctr Parity on stripe 7 is fixed in vol (m1)
Sep 22 18:06:20 psc0[1]: N: Vol verify (m1) ended
```

- With Data and Mirror copy mismatch (RAID 1)

```
Sep 22 18:06:17 psc0[1]: N: Vol verify (m1) started
Sep 22 18:06:18 WXFT[1]: E: u1ctr: vol (m1), Slice Name:(m1slice) vol verify
detected data and mirror mismatch on block: 31, Lun:0
Sep 22 18:12:46 WXFT[1]: N: u1ctr Mirror block 31 is fixed in vol (m1)
Sep 22 18:12:56 psc0[1]: N: Vol verify (m1) ended
```

Note – The disk scrubber constantly reviews the volumes for consistency. As a result, you will see the disk LEDs flash green regardless of any I/O rate.

▼ To Enable or Disable the Disk Scrubber

Caution – The disk scrubber is enabled by default. Be aware that disabling the disk scrubber may lead to latent disk block errors, which could cause multiple disk failures and loss of data.

Perform a complete volume initialization before mounting the volume and enabling disk scrubber.

- **To enable disk scrubber from the command line, type the following:**

```
:/:<1> sys disk_scrubber on
```

- **To disable disk scrubber from the command line, type the following:**

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

Backend Fault Isolation Task (BEFIT)

The BEFIT feature, also known as online loop diagnostic mode, maintains the availability of backend drives at all times by detecting, isolating, and correcting faulty field-replaceable units (FRUs).

The online loop diagnostic controls the monitoring of Loop Initialization Protocol (LIP) storms and backend fault detection. This feature should always be on. It is not recommended that BEFIT be turned off.

BEFIT is enabled by default during system boot and automatically completes diagnostics on the system. If a faulty FRU is detected during system boot, it is isolated and corrective action is applied. Corrective action might include bypassing the faulty FRU. After the system is booted, BEFIT checks system health every 5 seconds.

When a fault is detected, BEFIT halts data I/O and executes diagnostics. When BEFIT is completed, host I/O is resumed. If a faulty FRU is disabled, LEDs on the FRU are illuminated. BEFIT messages are also sent to the array `syslog` file. View the array `syslog` from the Storage Automated Diagnostic Environment software. Messages can include information on the fault detection, faulty FRU, and BEFIT completion. For example:

- When a fault is detected, messages similar to the following are displayed:

  Console:
  ```
  RAS: Backend Loop fault detected, initiating
   diagnostics
  ```

  Syslog:
  ```
  RASE[2]: Backend Loop fault detected, initiating
  diagnostics
  ```

- When a drive is identified as the faulty FRU, messages similar to the following are displayed:

  Console:
  ```
  Faulty Drive Port(s):
              u1d09: port 1 port 2
  ```

  Syslog:
  ```
  BFIT[2]: E: [BFIT] u1d09 - Has bad port on Loop 1
  BFIT[2]: E: [BFIT] u1d09 - Has bad port on Loop 2
  BFIT[2]: E: u1d09 has faulty ports, drive bypassed.
  ```

- When a loop card is identified as a fault FRU, messages similar to the following are displayed:

  Console:
  ```
  Fault detected on Loop 1: u211 disabled
  ```

Syslog: `BFIT[2]: E: Fault detected on Loop 1`
`BFIT[2]: E: Diagnosed u211 faulty, disabled.`

- When BEFIT completes diagnostics without finding a fault, the following messages are displayed:

  Console: `RAS: Backend Loop fault diagnostics completed - No fault found.`

  Syslog: `RASE[2]: N: Backend Loop fault diagnostics completed - No fault found.`

Note – It is possible for some errors that are not hard faults to occur on Fibre Channel loops. These might cause BEFIT to trigger. It is normal to see BEFIT initiate a test and then to indicate that no fault was found. If there was a hardware problem, BEFIT would isolate the FRU and send the appropriate notice to the `syslog` file.

You can enable or turn off the BEFIT feature by using the `ondg` command.

▼ To Enable or Disable BEFIT

Note – BEFIT is enabled by default.

- **To enable BEFIT from the command line, type the following:**

```
:/:<1> sys ondg befit
```

- **To disable BEFIT from the command line, type the following:**

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

Patches

Install all the required patches listed in TABLE 1 before installing the software for the 3.1.*x* controller firmware.

Prerequisite Patches

TABLE 1 Minimum Version of Patches Required for the Version 3.1.*x* 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
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 111096-08 111097-14 111412-13 111413-12 111846-08 113767-04	113040-07 113041-05 113042-06 113039-05 113043-06 113044-05 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

3.1.*x* Controller Firmware Patch

The patch ID for the 3.1.*x* firmware is 115180-*xx*.

Note – Ensure that you have installed all the required patches listed in TABLE 1 before installing the 3.1.*x* 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 3.1.*x* 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 3.1.*x* controller firmware patch, see "Upgrading and Downgrading the Controller Firmware" on page 9.

Upgrading and Downgrading the Controller Firmware

To upgrade to, and downgrade from, the 3.1.*x* firmware release, follow the instructions provided in this section. Online upgrading and downgrading is not supported.

Note –

• To upgrade from firmware 2.0.*x* to firmware 3.1.*x*, where *x* is 0 through 3, you must firstupgrade to a firmware level of at least 2.1.*x*.
• Upgrading to firmware 3.1.4 can be done directly from any level of 2.1.*x*.
• Upgrading to firmware 3.1.6 can be done directly from any level of 3.1.*x*.

This section contains the following topics:

▼ To Perform an Offline Upgrade From 2.0.*x* or 2.1.*x* to 2.1.6

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

```
:/:<1> ver
T3B Release 2.1.4 Fri Dec 19 xx:xx:xx PST 2003 {xxx.xxx.xx.xxx}
Copyright (C) 1997-2003 Sun Microsystems, Inc.
All Rights Reserved.
```

2. **Download the 112276-*xx* patch from the SunSolve web site with the use of PatchFinder.**

   See "To Download the Required Patches" on page 8.

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
```

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  xxxxxxxx.bin
hostname  qatest
timezone
logto     /syslog
loglevel  4
rarp      on
mac       00:03:ba:27:d4:cf
```

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

9. **Use the** `t3.sh` **script to install the 2.1.6 firmware patch.**

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

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

```
:/:<6> ep download nb216.bin
```

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

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

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

▼ To Perform an Offline Upgrade From 2.1.6 to 3.1.*x*

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

```
:/:<1> ver
T3B Release 2.1.6 Fri Dec 19 xx:xx:xx PST 2003 {xxx.xxx.xx.xxx}
Copyright (C) 1997-2003 Sun Microsystems, Inc.
All Rights Reserved.
```

2. **Download the 115180-*xx* patch from the SunSolve web site with the use of PatchFinder.**

See "To Download the Required Patches" on page 8.

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
```

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 3.1.*x* 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 t3l3_t31x.bin
```

Note – The "**`1`**" after the first "**`t3`**" above is the lower-case letter L. The "**`1`**" after the the second "**`t3`**" above is a number. The *x* refers to the firmware version, for example 3.1.2 or 3.1.3.

---

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 3.1.*x* to 2.1.6

Use the same password you used with the controller firmware 2.1.*x* to gain access to the upgraded system. For example, if you used `old` as the password when the system had 2.1.5 installed, then upgraded to 3.1.*x* and set the password to `new`, then downgrade the software once again to 2.1.5, the password reverts back to `old`.

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

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

```
:/:<1> ver
T3B Release 3.1.3 Fri Dec 19 xx:xx:xx PST 2003 {xxx.xxx.xx.xxx}
Copyright (C) 1997-2003 Sun Microsystems, Inc.
All Rights Reserved.
```

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

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

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

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

```
:/:<3> set bootmode auto
```

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

```
:/:<4> 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
```

6. **Use the `t3.sh` script to install the 2.1.6 firmware patch.**

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

7. **To download the firmware to the master controller, type the following:**

```
:/:<5> ep download nb216.bin
```

8. **Disable the disk scrubber by typing:**

```
:/:<6> sys disk_scrubber off
```

9. **Verify that the system parameter** `enable_volslice` **is set to** `on` **by using the** `sys list` **command.**

```
:/:<7> sys list
controller          : 2.0
blocksize           : 16k
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            : 1Gb
disk_scrubber       : on
ondg                : befit
```

10. **Check whether any LUNs have permissions set to** `none` **using the** `lun perm list` **command.**

```
:/:<8> lun perm list
lun     slice   WWN         Group Name    Group Perm     WWN Perm      Eft Perm
-------------------------------------------------------------------------------
0       0       default     --            --             none          none
1       1       default     --            --             none          none
-------------------------------------------------------------------------------
```

If so:

a. **Note the LUN permissions so they can be reset at the end of this procedure.**

b. **set all LUN permissions to read/write (rw) using the** `lun perm` **command.**

```
:/:<9> lun perm all_lun rw all_wwn
```

c. Verify the LUN permissions.

```
:/:<10> lun perm list
lun     slice   WWN         Group Name    Group Perm     WWN Perm      Eft Perm
-------------------------------------------------------------------------------
0       0       default     --            --             rw            rw
1       1       default     --            --             rw            rw
-------------------------------------------------------------------------------
```

11. To reboot the array, type the following:

```
:/:<11> 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. Reset the LUN(s) to the original permissions noted in Step 10 above.

▼ To Perform an Offline Upgrade of a T3 Array (1.18.xx FW) to a T3+ Array (3.1.3 or 3.1.4 FW)

This procedure upgrades a Sun StorEdge T3 array partner group having controller firmware version 1.18.*xx* to a T3+ array partner group with controller firmware version 3.1.3 or 3.1.4. This is a special upgrade procedure in that two new controller cards are required before you start. It is recommended that the T3 system be in optimal state and that you make a backup of the existing data be made before proceeding.

Caution – Failure to follow this procedure can result in a loss of data.

Before You Begin

1. Have two T3+ controller cards available for replacement, each with:

- Controller firmware version 2.1.6 installed. The best way to do this is to order two new controller cards with 2.1.6 firmware from your Sun service center.

  If you want to verify the firmware version, you must install each controller card in an available T3 and run the `ver` command.

- The bootmode set to `auto`.

If you want to verify that auto bootmode is set, you must install each controller card in an available T3 and run the `set` command.

2. **Run the `vol verify` command on all existing T3 volumes to check their status.**

```
:/:<1> vol verify volume_name
```

Ensure that no errors are found. If there are errors, correct them.

Performing the Upgrade

1. **Stop all host applications and I/O running on the T3 array and unmount the file systems on the host.**
2. **Record the current root password.**

   The password becomes `NULL` after this firmware upgrade procedure.
3. **Shut down your T3 by issuing the `shutdown` command.**

```
:/:<2> shutdown
```

4. **Toggle off all T3 power supplies.**
5. **Disconnect the following cables:**
   - Ethernet connection
   - Serial connection (if applicable)
   - FC-AL connection
6. **Remove both T3 array controller cards from the partner group.**

   See *Sun StorEdge T3 and T3+ Array Field Service Manual*, 816-4774.
7. **Install the two new T3+ controller cards (specified in "Before You Begin" on page 16).**

   See *Sun StorEdge T3 and T3+ Array Field Service Manual*, 816-4774.
8. **Reconnect the following cables:**
   - Ethernet connection
   - Serial connection (if applicable)
   - FC-AL connection
9. **Toggle on all T3 power supplies and wait for bootup to complete.**

10. **Access the T3 in a terminal window.**

    a. **Establish an FTP session.**

       See *Sun StorEdge T3+ Array Field Service Manual, Version 2.1 Controller Firmware*, 816-4774.

    b. **Establish a Telnet session.**

       See *Sun StorEdge T3+ Array Field Service Manual, Version 2.1 Controller Firmware*, 816-4774.

11. **Verify the 2.1.6 firmware version by issuing the `ver` command.**

```
:/:<3> ver
T3B Release 2.1.6 Fri Dec 19 xx:xx:xx PST 2003 {xxx.xxx.xx.xxx}
Copyright (C) 1997-2003 Sun Microsystems, Inc.
All Rights Reserved.
```

12. **Download the Sun StorEdge T3+ array 3.1.*x* firmware patch 115180-*xx* from SunSolve.**

    See "Patches" on page 7.

13. **Install the 3.1.*x* firmware patch 115180-*xx* as directed in the patch README file.**

14. **Restore the password that was recorded in Step 2.**

    The Sun StorEdge T3+ array firmware version 3.1.*3* and later has a disk scrubber feature that is enabled by default.

    You will see the T3+ disk drive LEDs blinking when the volume(s) are mounted. You can verify this with the `proc list` command.

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

15. **Verify that your T3+ is in an optimal state.**

    Issue the `vol stat`, `sys stat`, and `fru stat` commands.

16. **Mount your T3+ file systems and verify the configuration of the T3+ volumes and LUNs.**

17. **Check the integrity of your data.**

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 3.1.6. It contains the following topics:

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 addition 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, discussed in "Bugs" on page 23.

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, discussed in "Bugs" on page 23.

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, you 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 MAP3735FCrunning 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 23) 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. Do not use these settings.

Boot Options

The Sun StorEdge T3+ array warm boot is recommended 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 bootability means that the Sun StorEdge T3+ array must be completely booted before an attempt 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 bootability, 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 wait time specified, the system stops waiting automatically and continues. An example of a boot time directive with a `maxwait` time of 10 minutes is given 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 5020631 (P1/S1):** A loss of data can be experienced with Fujitsu Computer Products of America, Inc., Allegro 7 disk drives models MAN3367FC and MAN3735FC running firmware earlier than version 1504. See "Fujitsu Disk Drives" on page 20.

  Workaround: Load patch 115180-04 or later. See "To Download the Required Patches" on page 8. This patch contains the disk drive firmware version 1504.

- **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 look as if they are replaced. See "Fujitsu Disk Drives" on page 20.

  Workaround: See SunAlert 57620 for details.

- **Bug 4927796 (P2/S2):** When you upgrade the controller firmware from 2.1.5 to 3.1.x, the password is changed to an encrypted format. If you then downgrade to 2.1.*x*, the password is effectively lost.

  Workaround: Reset the password.

- **Bug 5065023 (P2/S3):** The Fujitsu Allegro 7 drive fails in slot 7 of a T3B storage array. Allegro 7 disk drives models MAN3367FC and MAN3735FC running firmware version 1504 and T3B firmware 3.1.4 can go offline. See "Fujitsu Disk Drives" on page 20.

  Workaround: Load patch 115180-07 or higher. This patch contains the disk drive firmware version B704. See "To Download the Required Patches" on page 8.

- **Bug 4990291 (P2/S3):** When the Reset button on the controller card of a Sun StorEdge T3+ array is pressed in a partner pair with 3.1.3 firmware, the controller reboots successfully, but the heartbeats timeout and the rebooted controller is disabled.

  When the controller is enabled, the diagnostic software detects an I2C error and stops booting. The I2C error is the result of an outstanding transaction and not a true I2C bus failure.

Workaround: Issue the `disable` *controller_number* (u1 or u2) command to the controller. Then issue the `enable` *controller_number* command.

- **Bug 4942013 (P2/S4):** The `fru list` command elicits the hardware revision instead of the software revision of the interconnect card (loop card) in the Revision field of the output.

  Workaround: To determine the interconnect card (loop card) software revision, issue the `lpc version` command.

- **Bug 4936741 (P3/S2):** The alternate master controller unit of a Sun StorEdge T3+ array partner group becomes disabled and the master controller unit asserts itself. The following line appears in the `syslog` file.

  ```
  xf_util.c line 907, scbP->next => 13608696 != 0 assert on
  cntrl
  ```

  Workaround: The master controller unit should boot up after asserting. When it does, re-enable it.

- **Bug 5034830 (P3/S2):** The LUN permissions can be set improperly through the `lun default` command.

  Workaround: Add the host WWNs to different groups and assign the LUN permissions to groups instead of WWNs.

- **Bug 4945579 (P3/S3):** When a `fru stat` command is used to troubleshoot a Sun StorEdge T3+ array, a disk drive can be reported as faulty and disabled even though the amber LED on the disk drive does not go bright.

  Workaround: Be aware that this condition exists.

- **Bug 4950101 (P3/S4):** After a disk drive reconfiguration with the disk scrubber enabled, the `proc list` command continually show 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 be slow.

- **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.

- **Bug 4990583 (P3/S4):** An error message can appear during a normal booting cycle.

  ```
  LPC failed to set SCSI address for u1. Retry.
  ```

  Workaround: Ignore the message.

- **Bug 4951817 (P3/S5):** The Backend Fault Isolation Task (BEFIT) can inadvertently activate, and does so without finding a fault.

  This is most likely to happen in a test environment. The diagnostics triggered will complete quickly, and have no affect except for a notification message appearing in the `syslog` file.

  Workaround: None required.

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`