Sun StorEdge™ T3 Disk Tray Release Notes

Note - Users should be aware that both the Sun StorEdge T3 and StorEdge T300 names refer to the same product and are equivalent in terms of product features and functionality. The Sun StorEdge T3 disk tray was previously known as the Sun StorEdge T300 prior to product shipment. Most user documentation has been updated to reflect the new name; however, there are some software components and other related documentation that still reference this product as the Sun StorEdge T300.

Note – This document pertains to controller firmware level 1.16.

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Sun StorEdge T3 Disk Tray Release Notes

Introduction

This document contains important information about the Sun StorEdge™ T3 disk tray that was not available at the time the product documentation was published.

Review this document so that you are aware of issues or requirements that can impact the installation and operation of the disk tray. The information in this document supplements the information contained in the *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual* and the *Sun StorEdge T3 Disk Tray Administrator's Guide*.

Use this release note in conjunction with other release notes and `README` files that you may have received with other software products related to the Sun StorEdge T3 disk tray, such as Sun StorEdge Component Manager software and VERITAS Volume Manager.

These release notes are organized as follows:

Required Patches

Install all the required patches listed below before installing the Sun StorEdge T3 disk tray. These patches are available on the SunSolve™ web site:

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

From the SunSolve web site, select Patches under the SunSolve Online column, then select the Storage Products option from the Patches web page. Refer to the `README` file on the web page for specific details on upgrading the firmware.

Note – You may need other patches not listed below for related software products such as Component Manager or VERITAS Volume Manager. Refer to the SunSolve web site and to the release notes of these products for their required patches.

System Type	Solaris™ 2.6 Operating Environment	Solaris 7 Operating Environment	Solaris 8 Operating Environment
All	105356-16 or later (ssd driver)	107458-10 or later (ssd driver)	109524-02 or later (ssd driver)
	106226-01 or later (format patch)	107473-06 or later (luxadm patch)	
	105181-23 or later (kernel update patch)	107834-03 or later (DKIO Extensions Patch)	
		106541-12 or later (Kernel Update Patch)	
Sun StorEdge T3 disk tray	109115-04 firmware patch	109115-04 firmware patch	109115-04 firmware patch
VERITAS 3.0.4	110257-01	110258-01	110259-01
VERITAS 3.1	110034-01	110035-01	110036-01
PCI (ifp) Only	107280-07 or later (ifp / PCI driver / PCI Systems only)	107292-07 or later (ifp / PCI driver / PCI Systems only)	109189-02 or later (ifp / PCI driver / PCI Systems only)
	109399-02 or later (PCI Host Adapter Firmware Fcode)	109399-02 or later (PCI Host Adapter Firmware Fcode)	109399-02 or later (PCI Host Adapter Firmware Fcode)

System Type	Solaris™ 2.6 Operating Environment	Solaris 7 Operating Environment	Solaris 8 Operating Environment
SBus/sf-socal Only	105375-25 or later (sf/socal driver/SBus systems only) 109400-03 or later (SBus Host Adapter Firmware Fcode)	107469-08 or later (sf/socal driver/SBus systems only) 109400-03 or later (SBus Host Adapter Firmware Fcode)	109460-03 or later (sf/socal driver/SBus systems only) 109400-03 or later (SBus Host Adapter Firmware Fcode)

Required Firmware

The latest controller firmware level is available on the SunSolve web site. You can check the controller firmware level on the disk tray using the `ver` command, as described in the *Sun StorEdge T3 Disk Tray Administrator's Guide*.

If the disk tray is configured with prerelease controller firmware, in addition to upgrading controller firmware, you must upgrade the `*.htm` files located in the disk tray `/web` directory along with other disk tray firmware as described in the *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual*.

Note – Refer to the `README` file associated with the firmware upgrade patch for details on verifying the currently installed firmware level.

The latest `*.htm` files and all other disk tray firmware can be copied from the SunSolve web site:

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

Or contact your Sun representative to obtain the latest firmware releases.

Diagnostics Issue

Caution – Sun StorEdge T3 disk tray `ofdg` utility is for service use only. Use of this feature will make data unavailable.

The disk tray firmware provides a command-line and graphical user interface to a diagnostics tab provided by Sun StorEdge Component Manager 2.1. The `ofdg` utility is used to perform offline diagnostic testing. This tool should be used *only* by qualified Sun service providers at this time. The `ofdg` utility is limited in its test capabilities and must be run while the system is offline to avoid problems.

VERITAS Issues

Note – The following VERITAS issues have been resolved: 4241652 and 4282809.

4264118: DMP failback is not automatically enabled (VERITAS Volume Manager 3.0.4 only).

After installing the VERITAS software, to ensure correct operation of VERITAS Dynamic Multipathing (DMP) auto failback operations, type the following command (as root) on host systems connected to Sun StorEdge T3 disk trays:

```
# vxdmpadm start restore interval=60  policy=check_all
```

Note – You must run this command after every system reboot.

4282806: `vxinstall` only displays the first disk tray controller for the configuration.

During the `vxinstall` procedure, only the first connected host bus adapter in a Sun StorEdge T3 disk tray partner group is displayed. This occurs because `vxinstall` displays only the first path to a disk tray partner group, even though other paths to the partner group have also been detected. This can be misleading since in disk tray configurations, volumes can also exist through second controller data paths.

You do not need to take any special action to correct this. Allow `vxinstall` to proceed to completion. Once the host system has rebooted from the VERITAS installation, all paths to the disk tray are properly recognized by the Volume Manager software.

4313336: Enable DMP support for a Sun StorEdge T3 disk tray and StorEdge A3500 configuration.

DMP support is necessary to obtain full redundancy between interconnected disk tray controller units. If you are connecting redundant Sun StorEdge T3 disk trays to a host running DMP that also has StorEdge A3500 storage devices connected to it, you must remove the alternate pathing (AP) file to make sure that both types of storage devices co-exist properly.

To perform the following procedure, you must be logged in as `root`.

1. **On the data host, type:**

```
# ls -l /kernel/drv/ap
```

2. **If the** `/kernel/drv/ap` **file is of 0 length, remove** `/kernel/drv/ap` **by typing:**

```
# rm /kernel/drv/ap
```

3. **Reboot the system.**

```
# reboot
```

If the `/kernel/drv/ap` file is *not* of 0 length, AP is installed and you cannot enable DMP because AP and DMP cannot co-exist. Sun Microsystems, Inc. recommends that you remove the AP product entirely using `pkgrm` (1m). Refer to the AP product documentation for further details.

4253044: Volume usage does not refresh.

Within the Volume Manager Storage Administrator (VMSA) product, volume usage information might not be refreshed correctly. If this problem is encountered, restart the VMSA application to update the volume usage statistics.

Service Issues

Note – The following Service issues have been resolved: 4349602, 4304266, and 4341342.

FRU removal for longer than 30 minutes will initiate a partner group shutdown.

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 disk tray is designed so that an orderly shutdown occurs when a component is removed for longer than 30 minutes. Therefore, a replacement part must be immediately available before starting a FRU replacement procedure. You must replace a FRU that has been removed within 30 minutes or the disk tray, and all attached disk trays in that partner group, will shut down and power off.

4374724: Multiple non-adjacent disk failures in a RAID 1 stripe.

In the event of multiple non-adjacent drive failures in a RAID 1 volume on a Sun StorEdge T3 disk tray, the volume can be unmounted. Single drive failures within the RAID 1 volume are handled correctly and, in those cases, the RAID 1 volume remains mounted and accessible from the host.

4374280 RAID 0 volumes not recommended with host-based mirroring.

In the event of an individual drive failure within a RAID 0 volume on a Sun StorEdge T3 disk tray, that volume remains mounted and accessible from the host. Data errors and other information are reported to the host for I/Os that are unsuccessful due to the failed drive. When RAID 0 volumes are used in conjunction with host-based mirroring software (such as VERITAS Volume Manager), a failed drive can trigger extensive host-side retries. Therefore, if you are configuring a host-based mirroring solution, use RAID 1 or RAID 5 volumes on the Sun StorEdge T3 disk tray.

4283199: Creating a volume with lower numbered disk drives is disallowed if a volume with higher numbered disk drives exists.

If you want to reconfigure the default volumes on the disk tray, you must create volumes with lower numbered disk drives first. Disk drives in a tray are numbered sequentially from one to nine. When you create a new volume, use the lower numbered disks first (disks one, two, three...) and work sequentially to the higher numbered disks (disks...seven, eight, nine). If you create a volume using the higher numbered disks first and then try to add a volume using the lower numbered disks, you will receive the following error message:

```
VN_VOLEXISTS: volume already in use
```

If this occurs, you must remove the existing volumes and then add them in the correct order.

Note – Note: If you assign a hot spare drive to the configuration, you must use disk nine (`d9`). Make sure you add the hot spare to the last volume you create in the configuration to avoid the situation above.

4348664: `fru list` command should display new drive firmware versions automatically.

After upgrading the Sun StorEdge T3 disk tray internal drive firmware, perform a `disk version u`*n*`d1-9` operation on the upgraded drives. This disk tray command ensures that correct drive firmware version information gets updated correctly in internal databases. If you do not do this after a drive firmware upgrade, it is possible that stale drive firmware version information can be displayed when using the `fru list` command.

For more information on using the `disk version` and `fru list` commands, refer to the *Sun StorEdge T3 Disk Tray Administrator's Guide*.

System Level Issues

Bootability

The Sun StorEdge T3 disk tray can be used as a bootable device for hosts running the Solaris operating environment, if configured correctly. To use the disk tray as a bootable device, you must install the correct host-bus adapter FCode patches on the host system that will be booting from Sun StorEdge T3 disk tray. See "Required Patches" on page 2 for the patch list.

After installing these patches, make sure there is a large enough volume configured on the disk tray to handle a Solaris operating environment image. When set up correctly, the Solaris host should recognize the disk tray volume.

Bootability is supported by Solaris 7 (Release 11/99) and later. Bootability for the Solaris 2.6 environment is not currently supported.

Note – See issue 4253419 that follows. The delayed time required for a Sun StorEdge T3 disk tray to become fully available to host I/O operations may cause issues, especially if the disk tray is used as a boot device. If you have encountered this situation, contact an authorized Sun Service Provider or Sun Service at 1-800-USA-4SUN for an evaluation.

4253419: Sun StorEdge T3 disk tray controller extended boot times.

In some cases, Solaris host systems can boot faster than Sun StorEdge T3 disk trays. This results in a host configuration that might not be able to detect all available disk tray storage during a full AC power-loss boot cycle. This can occur when the host system has minimal amounts of memory (or memory power-on self-test operations have been disabled).

When powering up a configuration, always power on Sun StorEdge T3 disk trays *before* the host server.

If this scenario still occurs, contact an authorized Sun Service provider or Sun Service at 1-800-USA-4SUN for an evaluation and suggested workaround.

Note – Any modification to the system nonvolatile random access memory (NVRAM) configuration should be avoided as errors can result in extensive system down time. Before making modifications to NVRAM, contact Sun Service.

4292162: Permanent serial cable connections to the disk tray are not recommended.

Caution – The serial port cable must be disconnected from the disk tray to meet regulatory emissions requirements. Do not leave it connected after performing a procedure.

Note – The serial cable is used for special service procedures only and should not be used by anyone except authorized, qualified service personnel. The serial cable must be removed when the service procedure has been completed.

Because the Sun StorEdge T3 disk tray serial port provides diagnostic and EPROM access to the system during the boot cycle, there is a risk of a security breach if the serial cable is left connected to the disk tray. To avoid this risk, remove the serial cable connection from the disk tray to external host systems after use.

EPROM Issues

Note – Changes to settings at the erasable programmable read-only memory (EPROM) level can be done only through a serial cable connection with the disk tray. Use of the serial cable is reserved for special field service procedures only.

4293509: System bootmode setting at the EPROM level can be overwritten at the application level.

If changes are made to disk tray settings at the EPROM level, they may not be persistent after the partner group has booted. This is important specifically when changing the bootmode. For example, if the disk tray has been set to the `tftpboot` mode at the application level and later is set back to the default `autoboot` mode at the EPROM level, the `autoboot` setting will be overwritten with the `tftpboot` setting. As a result, you will not be able to boot without a tftpboot server. To avoid this, check the disk tray settings at the application level before rebooting and make sure the bootmode is set to `autoboot`.

4300136: A disk tray in a partner group configuration that sits idle at the EPROM level for more than five minutes can be disabled by its partnered controller.

One controller in a partner group can disable the other controller being held at the EPROM level. This happens when using the serial cable interface to a controller in a partner group if the boot process is interrupted leaving the system at the EPROM level for more than five minutes. If this happens, the disabled controller will continuously output `St` to the console. To recover access to that controller, telnet into the partner group and use the `sys stat` command to determine which controller

needs to be enabled. Re-enable the disabled controller with the `enable u?` command. The controller that was previously held at the EPROM level resets and boots as the alternate.

Hardware Updates

The rackmount kit that is available for mounting a Sun StorEdge T3 disk tray in an expansion cabinet now contains extension plates, which extend the length of the rails to fit in some larger cabinets.

Note – Note that even if the rail with extension plate fits in the cabinet, the cabinet must meet certain specifications to use the Sun StorEdge T3 disk tray in it. Contact your Sun representative for more information.

To install the extension plate:

1. **Attach the side rails in the cabinet, as described in Chapter 2 of the** *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual***.**
2. **Align the extension plate with the side rail at the back of the cabinet as shown in** FIGURE 1**, and secure the extension plate with the four screws provided.**

   After the side rails and extension plates are firmly in place, proceed with installing the disk tray as described in the *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual.*

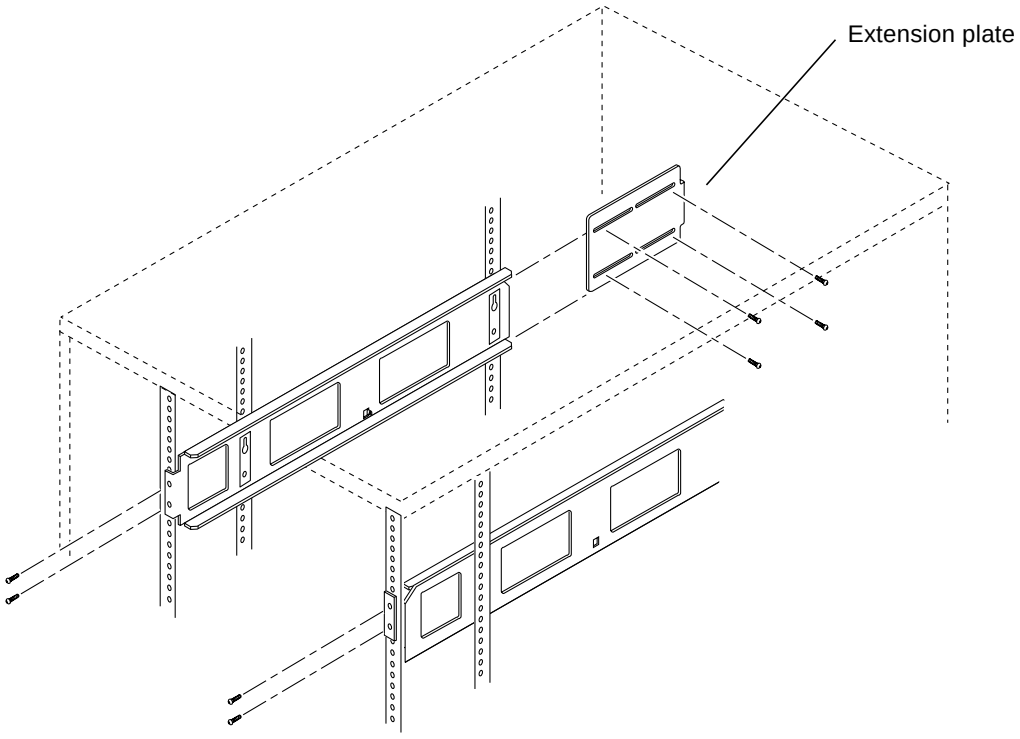

FIGURE 1 Attaching the Extension Plate

Command-Line Error Messages

Types of Error Messages

The Sun StorEdge T3 disk tray issues a variety of error messages to the command line, indicating an incorrectly entered command or invalid operation. When you enter a command by itself, or the error is purely syntactic (for example, missing an argument or using the wrong format), the disk tray displays the command synopsis. Otherwise, the disk tray displays an error message consisting of a name in capital letters, a numerical code in hexidecimal digits, and a text message.

The following tables list the errors that Sun StorEdge T3 disk tray displays. TABLE-1 lists the types of errors and the numerical range associated with each.

TABLE-1 Error Message Types

Type of Error	Numerical Range	Description
Logical volume manager (LVM) driver error codes	0x10001-0x1000A	Disk drive-related errors
Virtual Node ("VN") error codes	0x200000-0x200025	Errors related to `vol` and other command-line operations.
Port error codes	0x300000-0x300006	Errors related to the `port` command.
Sys error codes	0x400000	Only one error, indicating a bad value.
FRU error codes	0x500001-0x500076	Errors related to field replaceable units (FRUs).
pSOS operating system errors	00000001-C000FFFF	pSOS errors (embedded operating system).

RAID Errors and Other Common Errors

VN_ERRORs are the most common error messages displayed. The following table lists names and values of these errors.

TABLE-2 Volume-Related (VN) Errors

Error Name	Numerical Value	Message
VN_BADUNIT	0x200000	bad unit number
VN_BADDRIVE	0x200001	bad drive number
VN_BADPART	0x200002	bad partition id
VN_VOLEXISTS	0x200003	volume already in use
VN_VOLNOTFOUND	0x200004	volume name not found
VN_PARTHASFS	0x200005	partition already has file system
VN_FACLOCKED	0x200006	facility locked by other command
VN_BADATTR	0x200007	unable to read attributes
VN_MOUNTED	0x200008	volume already mounted
VN_UNMOUNTED	0x200009	volume not mounted

TABLE-2 Volume-Related (VN) Errors *(Continued)*

Error Name	Numerical Value	Message
VN_MNTINUSE	0x20000A	mount point in use
VN_NOMEMORY	0x20000B	could not allocate memory for operation
VN_ALREADYDSBL	0x20000C	there's already a disabled drive
VN_NODSBL	0x20000D	no drives are disabled
VN_ABORTED	0x20000E	operation aborted
VN_NOTSUP	0x20000F	operation not supported
VN_UNKVOL	0x200010	unknown volume
VN_RAIDERR	0x200015	RAID error
VN_NOPART	0x200016	partition has size 0
VN_PARTSMALL	0x200017	partition too small
VN_UNKVIF	0x200019	unknown interface
VN_UNKVIFTYP	0x20001A	unknown interface type
VN_BADVOLNAME	0x20001B	bad volume name
VN_BADVOLNAMELEN	0x20001C	bad volume name too long
VN_CFGNOTSUPPORTED	0x20001D	unsupported volume configuration
VN_BADSTANDBYUNIT	0x20001E	standby unit number is wrong
VN_DEVINVALID	0x20001F	invalid drive specified
VN_LOCVOLBAD	0x200020	local volume bad
VN_PORTMAPRM	0x200021	volume still mapped to a port
VN_UNINITIALIZED	0x200022	volume is uninitialized
VN_PENDING	0x200023	operation is pending
VN_BADMODE	0x200024	cache mode must be set to auto for mirroring
VN_MIRRORON	0x200025	cannot change cache mode when mirroring is on

Some of these errors are generated more often than others, such as VN_MOUNTED, VN_UNMOUNTED, VN_MNTINUSE, VN_CFGNOTSUPPORTED, VN_DEVINVALID, VN_LOCVOLBAD, VN_UNITIALIZED, VN_BADMODE, and VN_MIRRORON. In particular, VN_RAIDERR, code 0x200015, can result from a variety of scenarios and these warrant attention. The disk tray uses a specific protocol for carrying out commands,

and this protocol uses the RAID error as a general error message to be sent to the user. As such, the `RAIDERR` may result from any of a number of software or hardware conditions. Some cases involve problems related to the user configuration, which can be remedied easily. Other cases are more subtle and are related to the function of the disk tray's internal software. Detailed information for specific instances of the RAID error can be found in the `syslog`; an overview of the scenarios are provided here.

The following is a list of the categories that the disk tray's embedded protocol uses for RAID errors and a few of the cases within each category. Each category code, which can be useful in reference to the `syslog`, is included. Though not exhaustive, this list provides a general breakdown of common RAID error generators:

1. Command Incomplete (0x1A): The command was not executed correctly internally. The software responded to the command with too much or too little information. In certain cases, the command may simply be paused and will resume.

2. Partial (conditional) Success (0x19): This category includes the following cases:

    a. Aborting a non-existent command: A user has issued a command, then tried to abort it after the command is executed.

    b. Retry error: The command was retried one or more times.

    c. Target error: A volume is offline or disabled.

3. Invalid Response (part of the category above; 0x19): The software did not provide a valid response to the user command. These cases are more specific than the Command Incomplete category.

    a. Invalid information type (parameter): The software responded with the wrong type of information.

    b. Error in information returned: The information returned in response to the command is erroneous. This case implies an embedded software error.

    c. Function failed: The command failed to retrieve the appropriate information.

    d. Zero size: The command accessed a volume with zero size.

4. Command Aborted(0x18): The command is aborted, often because of a time-out. A command aborts when a component in the system freezes or if a connection is defective.

5. Command Exception (0x17): This category includes cases where the command cannot be executed. This error type is generated when a disabled, unavailable, or invalid drive or volume is specified. For example, after using a hot spare (standby) to reconstruct the data on a drive, you cannot refer to it again as a hot spare.

a. Invalid name / address: Either the user or the internal software used a volume or disk drive name that is invalid or does not match the current configuration.

b. Invalid command fields: The command is no longer supported or the internal software used a command opcode that is unsupported.

c. Missing fields: The user or the internal software issued a command with missing information.

d. Drive (module) errors: The disk drive referenced may be unattached, disabled, substituted, or in the process of being reconstructed.

6. Machine Exception (0x16): This category includes cases where there is a hardware error, or where other commands are being executed, thereby giving a busy response.

   a. Drive fatal error: There is an error internal to a referenced drive.

   b. Autoreconstruct or disable attempted: A drive that is being reconstructed or disabled is specified.

   c. Queue full or busy response: The command cannot be executed because the system is busy processing other commands.

   d. Unknown host: The specified host address is invalid or unreachable.

   e. Single Drive errors: A drive referenced by the command was not detected, the connection could not be opened, or the sysarea on the drive could not be created. This case implies that the drive or the connection to it, is faulty. Alternatively, a retry of a command accessing a disk could fail to execute.

   f. Multiple disk failure: An error occurred involving more than one drive.

   g. Standby already in use: (This error resembles the one in the Command Exception category). In this case, the drive is busy processing a previous command. This case applies when the command is complete and if the drive configuration has changed as a result.

   h. Volume (LUN) errors: A volume may be inaccessible, or its configuration may be corrupted and represented as nonvalid.

7. Intervention Required (0x14): Here, an error results when a volume is mounted or unmounted, in contrast to what is expected. Alternatively, a physical connection may be broken and should be reinstated (by replacing the appropriate FRUs).

`RAIDERRs` can result from invalid command arguments or from a system problem. The error may refer to the configuration of a volume or an individual drive. For example, you can encounter the error while reconfiguring the disk tray with volumes that have been added but not mounted, or the problem may be related to the hardware or an embedded component.

In general, RAID errors can be diagnosed by checking the status of the volumes mounted on the disk tray. Often, an existing but unmounted volume can trigger the error. Other times, a conflict occurs when a new version of the binary is downloaded while previous volumes are still being used.

Here are some guidelines for investigating RAID errors:

1. **Check the state of the current volumes with the `vol stat` command.**
   - If the volumes are unmounted, try re-mounting them and then resetting the system using the T3 `reset` command.
   - If you are unable to re-mount the volumes, try removing all the volumes, resetting the system, then adding them back before re-mounting them.
2. **Check the host connection to the disk tray.**

   On hosts running the Solaris software environment, the `format` command should match the number of volumes present on the disk tray. If the number of volumes listed do not match, refer to chapter 5 of the *Sun StorEdge T3 Disk Tray Administrator's Guide* for troubleshooting instructions. Specifically, the `T300` entries listed by the `format` command should be recognized and labeled, and the number of these entries should equal the number of volumes mounted on the disk tray.
3. **If you suspect that a hardware problem may be causing the RAID error, use the `fru list` and `fru stat` commands to check the status of the components.**

   It may also be worthwhile to check the cables and connections between partner-group units and between the host and the disk tray units.

   More detail regarding the error may be available in the `syslog`, in which case note the date and time of the error for lookup. However, most common cases can be handled as described above.

Port Errors

The following table lists the port error messages that can be displayed.

TABLE-3 Port Errors

Error Name	Numerical Value	Message
PRT_UNKNOWPORT	0x300000	bad port number
PRT_ALREADYMAPPED	0x300001	port is already mapped unmap first
PRT_INVALIDNAME	0x300002	volume name is not correct
PRT_VOLNOTFOUND	0x300003	volume name not found

TABLE-3 Port Errors

Error Name	Numerical Value	Message
PRT_INVALID	0x300004	port number is incorrect
PRT_LUNNOTMAPPED	0x300005	this lun is not mapped
PRT_ACCESSINVALID	0x300006	need to specify the access mode

Interconnect Card and Other FRU Errors

The following table lists the various FRU-related errors that you can encounter. These include various power and cooling unit fault conditions, missing disks, and interconnect card errors.

TABLE-4 Unit-Related Errors (Interconnect Card and Other FRUs)

Error Name	Numerical Value	Message
PS1_ONBATT	0x500021	Power Supply 1 On Battery
PS2_ONBATT	0x500022	Power Supply 2 On Battery
PS1_FANHIGH	0x500023	Power Supply 1 Fan High
PS2_FANHIGH	0x500024	Power Supply 2 Fan High
PS1_REFBATT	0x500025	Power Supply 1 Refresh Battery
PS2_REFBATT	0x500026	Power Supply 2 Refresh Battery
DK1_NOTEXIST	0x500031	Disk 1 Not Present
DK2_NOTEXIST	0x500032	Disk 2 Not Present
DK3_NOTEXIST	0x500033	Disk 3 Not Present
DK4_NOTEXIST	0x500034	Disk 4 Not Present
DK5_NOTEXIST	0x500035	Disk 5 Not Present
DK6_NOTEXIST	0x500036	Disk 6 Not Present
DK7_NOTEXIST	0x500037	Disk 7 Not Present
DK8_NOTEXIST	0x500038	Disk 8 Not Present
DK9_NOTEXIST	0x500039	Disk 9 Not Present
DK_NONE	0x50003A	No Disk Present
DK1_BYPASSED	0x500041	Disk 1 Bypassed
DK2_BYPASSED	0x500042	Disk 2 Bypassed
DK3_BYPASSED	0x500043	Disk 3 Bypassed

TABLE-4 Unit-Related Errors (Interconnect Card and Other FRUs) *(Continued)*

Error Name	Numerical Value	Message
DK4_BYPASSED	0x500044	Disk 4 Bypassed
DK5_BYPASSED	0x500045	Disk 5 Bypassed
DK6_BYPASSED	0x500046	Disk 6 Bypassed
DK7_BYPASSED	0x500047	Disk 7 Bypassed
DK8_BYPASSED	0x500048	Disk 8 Bypassed
DK9_BYPASSED	0x500049	Disk 9 Bypassed
DK1_NOTREADY	0x500051	Disk 1 Not Ready
DK2_NOTREADY	0x500052	Disk 2 Not Ready
DK3_NOTREADY	0x500053	Disk 3 Not Ready
DK4_NOTREADY	0x500054	Disk 4 Not Ready
DK5_NOTREADY	0x500055	Disk 5 Not Ready
DK6_NOTREADY	0x500056	Disk 6 Not Ready
DK7_NOTREADY	0x500057	Disk 7 Not Ready
DK8_NOTREADY	0x500058	Disk 8 Not Ready
DK9_NOTREADY	0x500059	Disk 9 Not Ready
CT_NOTEXIST	0x500061	Controller Not Present
CT_QLOGNRDY	0x500062	Qlogic Chip Not Ready
CT_SEL_ID	0x500063	Select ID Changed
LP_VSC_ERR	0x500064	VSC7120 Loop Failed
LC1_OFFLINE	0x500065	Loop Card 1 Offline
LC2_OFFLINE	0x500066	Loop Card 2 Offline
LP_CABLE1	0x500067	Cable 1 Not Present
LP_CABLE2	0x500068	Cable 2 Not Present
LC1_NSTART	0x500069	Loop Card 1 Failed to Start
LC2_NSTART	0x50006A	Loop Card 2 Failed to Start
CT_NOALTLP	0x50006B	No Alternate Loop
LP_SWITCH1	0x500071	Switch to Loop 1
LP_SWITCH2	0x500072	Switch to Loop 2
LP_MUX_ISO	0x500073	Loop Mux Changed to Isolated

TABLE-4 Unit-Related Errors (Interconnect Card and Other FRUs) *(Continued)*

Error Name	Numerical Value	Message
LP_MUX_TOP	0x500074	Loop Mux Changed to Top
LP_MUX_MID	0x500075	Loop Mux Changed to Middle
LP_MUX_BOT	0x500076	Loop Mux Changed to Bottom

Other Errors

You will rarely see other types of errors, such as logical volume manager (LVM) errors (range 0x10001-0x1000A) and operating system errors (range 00000001-C000FFFF). The `tftp error` (numerical values 10060001-10060005) is an exception that you can see when you try to download a new binary. The `tftp errors` are usually generated by one of the following:

- The permissions for the file to be downloaded are too restrictive. In general, binaries should be world readable and executable.
- The checksum for the binary file to be downloaded is erroneous.
- The disk tray units have not been recognized by the network. In this case, a system administrator should make sure that the IP addresses of the disk trays are entered in the network database.

The following table lists pSOS errors:

TABLE-5 Embedded Operating System and Driver Errors

Error Type	Numerical Value
pSOS+	0000’0001 0000’0FFF
(reserved)	0000’1000 0000’1FFF
embedded file system	0000’2000 0000’2FFF
pREPC+	0000’3000 0000’3FFF
(reserved)	0000’4000 0000’4FFF
pNA+, pRPC+, pX11+	0000’5000 0000’5FFF
(reserved)	0000’6000 0000’FFFF
device driver errors	0001’0000 0FFF’FFFF
(reserved)	1000’0000 1000’FFFF
serial driver	1001’0000 1001’FFFF
tick timer driver	1002’0000 1002’FFFF

TABLE-5 Embedded Operating System and Driver Errors *(Continued)*

Error Type	Numerical Value
(reserved)	1003’0000 1003’FFFF
RAM disk driver	1004’0000 1004’FFFF
(reserved)	1005’0000 1005’FFFF
TFTP driver	1006’0000 1006’FFFF
SLIP driver	1007’0000 1007’FFFF
MMUlib	1008’0000 1008’FFFF
(reserved)	1009’0000 104F’FFFF
SCSI driver	1050’0000 105F’FFFF
(reserved)	1060’0000 BFFF’FFFF
Shared memory	C000’0000 C000’FFFF
(reserved)	C001’0000 FFFF’FFFF