

Diagnosing Problems

This chapter provides the qualified service provider with troubleshooting techniques for the Sun StorEdge T3 array and contains the following sections:

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3.1 Diagnostic Information Sources

TABLE 3-1 summarizes the diagnostic tools available to you.

TABLE 3-1 Diagnostic Functions and Tools

Function	Tools That Can Be Used
Array boot monitoring	LEDs, CLI(S),
Array boot PROM commands	CLI(S)
Host data path diagnosis	StorTools(A) application
Internal monitoring	LEDs, CM, CLI (E), CLI(S), SNMP, StorTools (M) application, syslog, SRS
Configuration	LEDs, CM, CLI (E), CLI(S)

TABLE 3-1 Diagnostic Functions and Tools (Continued)

Function	Tools That Can Be Used
System (admin domain) configuration	CM, CLI(E), CLI(S)
System (admin domain) monitoring	CM, CLI(E), CLI(S), SRS, SNMP(CA), syslog(CA)
Version level check	CM, CLI(E), CLI(S)
LUN configuration	CM, CLI(E), CLI(S)
FRU failure monitoring	LED, CM, CLI(E), CLI(S), SRS, SNMP(CA), syslog(CA)
Performance monitoring	CM, CLI(E), CLI(S), SNMP(CA), syslog(CA)
Firmware download	CLI(E)
Syslog access (mgmt host)	CLI(E), CLI(S), syslog(CA and StorTools(M) with 2nd copy of StorTools running on management host with ethernet connection to disk tray
Loop resiliency check (manual)	OFDG, CLI(E), CLI(S)
Manual loop resiliency check	OFDG, CLI(E), CLI(S)
Clear supervisor password	CLI(S)
Host data path diagnosis	StorTools(A) application
Statistics logging	syslog(CA) and StorTools(M) application with 2nd copy of StorTools application running on management host with Ethernet connection to disk tray
Service commands	CLI(E), CLI(S)
Mfg/repair commands	CLI(E), CLI(S)

- LED = Light emitting diodes on the array.
- CM = Component Manager.
- CLI(E) = Command-line utilities run via ethernet connection as described in *Sun StorEdge T3 and T3+ Array Administrator's Guide*.
- CLI(S) = Command-line utilities run via a serial connection as described in Section 2.1, "Establishing a Serial Port Connection" on page 2-1.
- OFDG = Off-line Drive Diagnostic utility as described in Section 8.3.8, "Using the ofdg Diagnostic Utility" on page 8-16.
- SNMP = Simple Network Monitoring Protocol as described in *Sun StorEdge T3 and T3+ Array Administrator's Guide*.
- SNMP(CA) = Simple Network Monitoring Protocol used with a customer-written application as described in *Sun StorEdge T3 and T3+ Array Administrator's Guide*.

- StorTools(A) = The StorTools application runs on an application host as described in *Sun StorEdge StorTools Users Guide*.
- StorTools(M) = The StorTools application runs on a management host as described in *Sun StorEdge StorTools Users Guide*.
- syslog = Sun StorEdge T3 and T3+ array `syslog` file.
- syslog(CA) = Sun StorEdge T3 and T3+ array `syslog` with customer-written application.
- SRS = Sun Remote Service.

3.2 Troubleshooting Flow Charts

The following three charts illustrate typical diagnostic procedures.

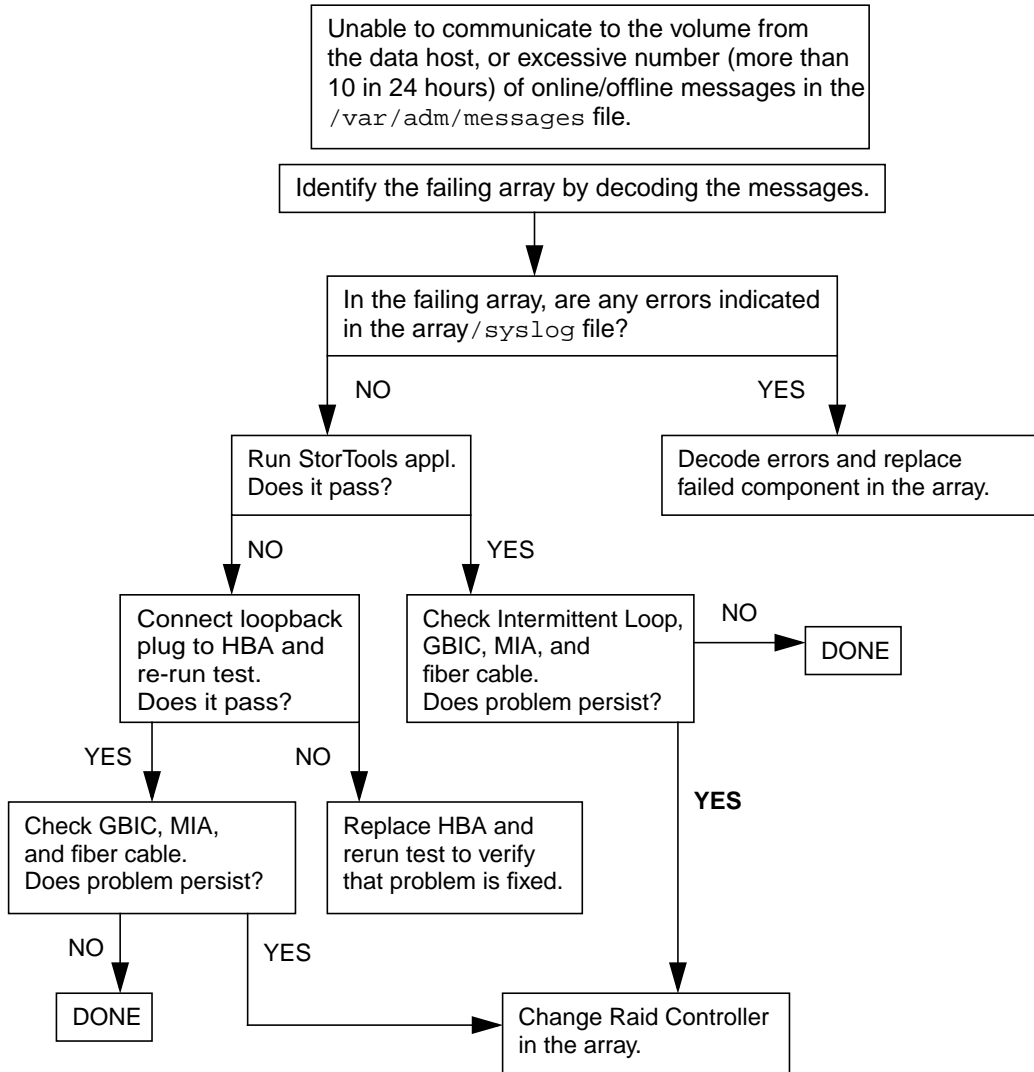


FIGURE 3-1 Data Connection Troubleshooting Flow Chart

Note that only SBus systems can test with a loopback plug. You cannot use a loopback cable with a PCI card.

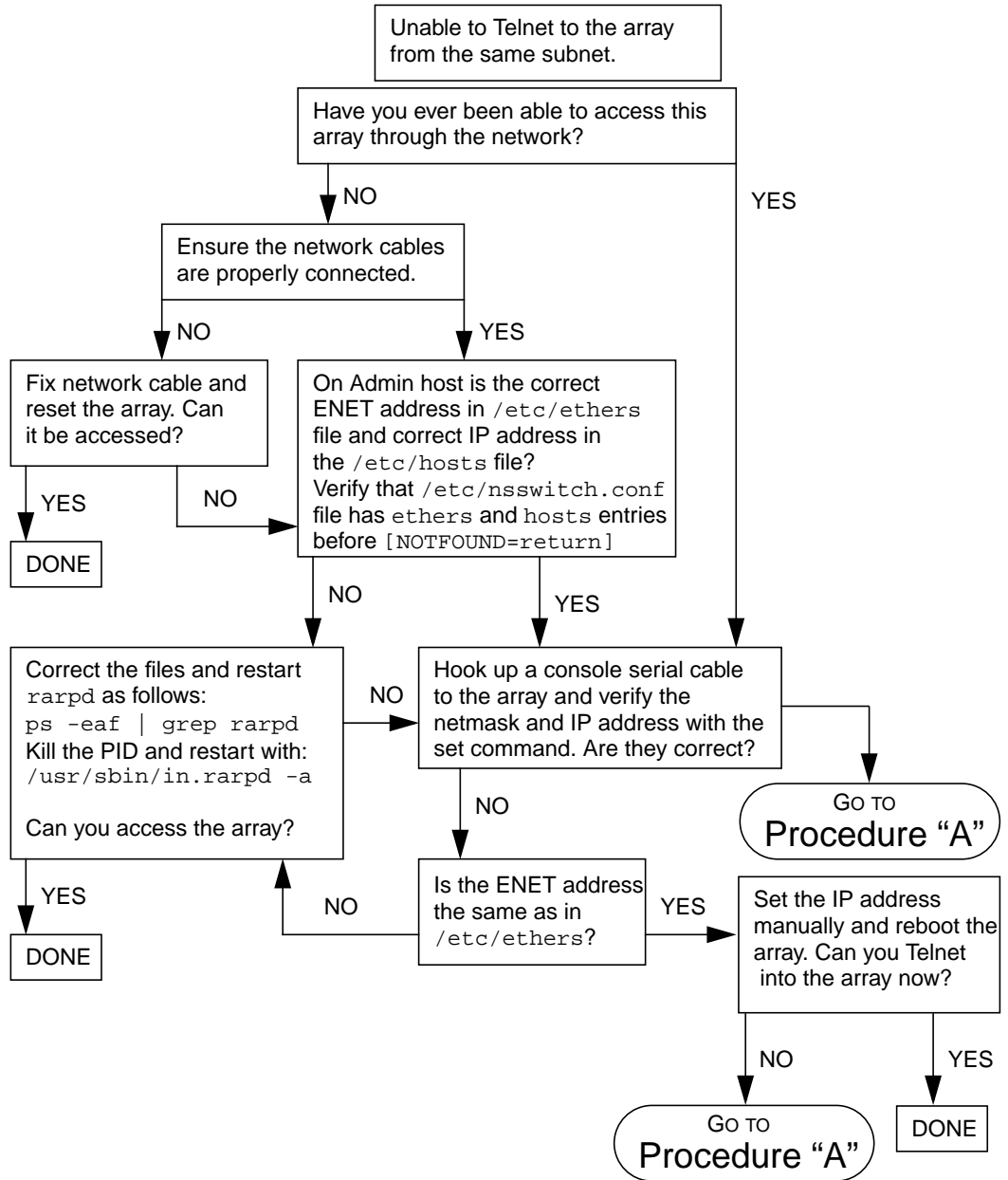


FIGURE 3-2 Ethernet Troubleshooting Flow Chart

Note--Ensure that the host and the array are on the same subnet.

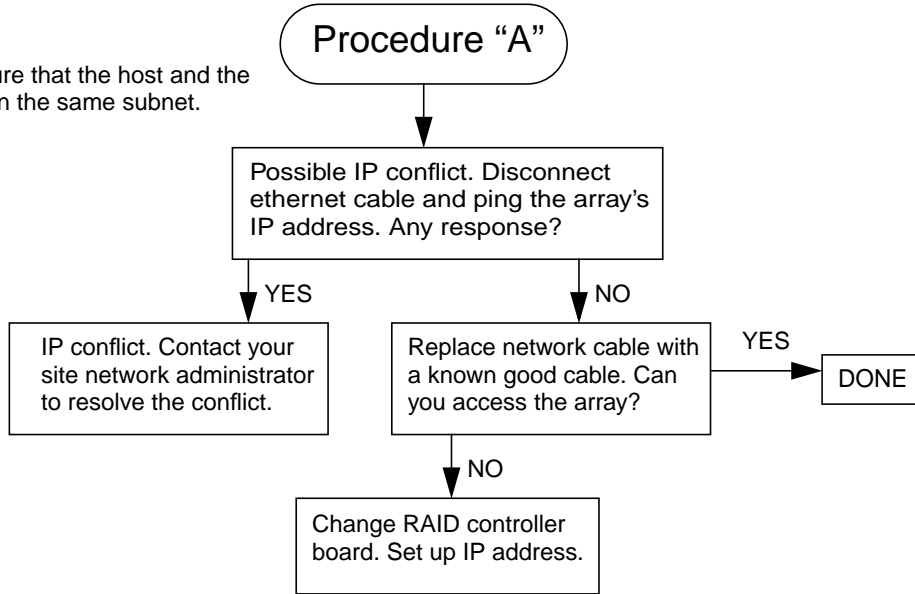


FIGURE 3-3 Procedure "A"

3.3 Initial Troubleshooting Guidelines

To begin a problem analysis, check one or more of the following information sources for troubleshooting and/or perform one or more of the following checks.

3.3.1 Troubleshooting Sources

1. **The array LEDs, which provide a visual status as described in *Sun StorEdge T3 and T3+ Array Installation, Operation, and Service Manual*.**
2. **Sun StorEdge T3 array generated messages, found in a log file, indicating a problem or system status with the array. See Section 1.2.1, “Sun StorEdge T3 Array Generated Messages” on page 1-2 for more information about array generated messages.**
3. **Host-generated message, found in the `/var/adm/messages` file, indicating a problem with the host channel connection to the array unit. See Section 1.2.2, “Host-Generated Message” on page 1-2 for more information about host generated messages.**
4. **Messages generated by the Sun StorEdge Component Manager software indicating a problem. See Section 1.3, “Sun StorEdge Component Manager” on page 1-4 for more information about Component Manager.**

3.3.2 Troubleshooting Checks

1. **The connection between the host and the Sun StorEdge T3 array as described in Section 3.5, “StorTools Connectivity Tests” on page 3-8.**
2. **The array boot status as described in Section 3.6, “Checking Array Boot Status” on page 3-11.**
3. **FRU status as described in the *Sun StorEdge T3 and T3+ Array Administrator’s Guide*.**
4. **Array status as described in Section 3.7, “Telnet Connection Status Checks” on page 3-14.**
5. **Array operation as described in Section 3.7.4, “Testing the Array With StorTools” on page 3-20.**
6. **Miscabled partner groups as described in Section 3.8, “Identifying Miscabled Partner Groups” on page 3-20.**

7. Data channel as described in Section 3.9, “Identifying Data Channel Failures” on page 3-24.

3.4 Verifying the Data Host Connection

To verify the physical connection between the host and the array, use a utility such as the `format` command in the Solaris environment. The output of the command confirms whether a volume is on the array. For example:

- On the application host, enter `format` at the supervisor prompt.

```
# format
Searching for disks...done

clt1d0: configured with capacity of 133.38GB

AVAILABLE DISK SELECTIONS:
  0. c0t2d0 <drive type unknown>
     /sbus@1f,0/SUNW,fas@e,8800000/sd@2,0
  1. c0t3d0 <SUN2.1G cyl 2733 alt 2 hd 19 sec 80>
     /sbus@1f,0/SUNW,fas@e,8800000/sd@3,0
  2. clt1d0 <SUN-T3-0100 cyl 34145 alt 2 hd 64 sec 128>
     /sbus@1f,0/SUNW,socal@1,0/sf@0,0/ssd@w50020f2300000121,0
Specify disk (enter its number):
```

In this example, device number 2 is a volume on the array, as identified by the SUN-T3-0100 label.

3.5 StorTools Connectivity Tests

Use StorTools to verify the physical connection between the host and the array and to determine the primary and alternate paths.

3.5.1 Primary Path Verification by the Host

To determine a Sun StorEdge T3 array’s primary and alternate paths, from the host console, do the following:

1. On the application host, enter `format -e` at the supervisor prompt.

Specify the disk number when prompted.

```
# format -e
Searching for disks...done

AVAILABLE DISK SELECTIONS:
  0. c0t2d0 <drive type unknown>
     /sbus@1f,0/SUNW,fas@e,8800000/sd@2,0
  1. c0t3d0 <SUN2.1G cyl 2733 alt 2 hd 19 sec 80>
     /sbus@1f,0/SUNW,fas@e,8800000/sd@3,0
  2. c1t1d0 <SUN-T3-0100 cyl 34145 alt 2 hd 32 sec 128>
     /sbus@1f,0/SUNW,socal@1,0/sf@0,0/ssd@w50020f2300000172,0
  3. c1t1d1 <SUN-T3-0100 cyl 34145 alt 2 hd 32 sec 128>
     /sbus@1f,0/SUNW,socal@1,0/sf@0,0/ssd@w50020f230000015a,0
  4. c2t2d0 <SUN-T3-0100 cyl 34145 alt 2 hd 64 sec 128>
     /sbus@e,0/SUNW,socal@d,0/sf@0,0/ssd@w50020f2300000172,1
  5. c2t2d1 <SUN-T3-0100 cyl 34145 alt 2 hd 32 sec 128>
     /sbus@e,0/SUNW,socal@d,0/sf@0,0/ssd@w50020f230000015a,1
Specify disk (enter its number): 2
selecting c1t1d0
[disk formatted]
```

In this example, four Sun StorEdge T3 disk devices are shown as disk numbers 2 through 5. They are identified by the SUN-T3-0100 label.

Note – To view device paths using the `format` command, the `mp_support` setting on the array must be set to `rw`. For more information on the `mp_support` setting, refer to the *Sun StorEdge T3 and T3+ Array Administrator's Guide*.

In this example, selection 2 (`c1t1d0`) is the primary path, while selection 4 (`c2t2d0`) is the alternate path in the partner group. Since both these paths have the same number (`50020f2300000172`) they point to the same volume. The following step determines whether selection 2 is the primary or alternate path to the logical volume.

2. Enter `scsi` to select SCSI menu.

```
FORMAT MENU:
  disk      - select a disk
  type      - select (define) a disk type
  partition - select (define) a partition table
  current   - describe the current disk
  format    - format and analyze the disk
  repair    - repair a defective sector
  label     - write label to the disk
  analyze   - surface analysis
  defect    - defect list management
  backup    - search for backup labels
  verify    - read and display labels
  save      - save new disk/partition definitions
  inquiry   - show vendor, product and revision
  scsi      - independent SCSI mode selects
  volname   - set 8-character volume name
  !<cmd>    - execute <cmd>, then return0
  quit
format> scsi
```

3. Enter `inquiry` at the prompt.

```
SCSI MENU:
  disk      - select a disk
  type      - select (define) a disk type
  partition - select (define) a partition table
  current   - describe the current disk
  format    - format and analyze the disk
  repair    - repair a defective sector
  label     - write label to the disk
  analyze   - surface analysis
  defect    - defect list management
  backup    - search for backup labels
  verify    - read and display labels
  save      - save new disk/partition definitions
  inquiry   - show vendor, product and revision
  scsi      - independent SCSI mode selects
  volname   - set 8-character volume name
  !<cmd>    - execute <cmd>, then return0
  quit
scsi> inquiry
```

The output of the `inquiry` command is as follows (the sample output below assumes that `mp_support` is set to `rw` (otherwise there is only one path to each volume)):

```

Inquiry:
00 00 03 12 5b 00 10 02 53 55 4e 20 20 20 20 20 20  ....[...SUN
54 33 30 30 20 20 20 20 20 20 20 20 20 20 20 20 20  T3
30 30 39 36 30 30 30 30 30 32 35 38 31 30 00 00  01000000025810..
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....

Vendor:                SUN
Product:               T3
Revision:              0100
Removable media:      no
Device type:           0

```

The seventh byte in the inquiry screen (bold for this example) indicates whether the LUN is the primary or alternate path. **10** indicates primary path, **30** indicates alternate path.

In this example, `c1t1d0` is the primary path.

3.5.2 Verifying Hub Connectivity

The StorTools application tests include testing any hubs in the data path.

If you suspect a hub-related problem, use the StorTools A5x00 FRU Isolation tool (`filter`) in manual mode and the disk tray FRU Isolation tool (`sedr`) in verbose mode as described in the *Sun StorEdge StorTools User Guide*.

Note – Running the StorTools application affects performance.

3.6 Checking Array Boot Status

1. Establish a serial connection with the array as described in Section 2.1, “Establishing a Serial Port Connection” on page 2-1.

2. Boot the array.

There are several ways to initiate a boot cycle:

- Power off the Sun StorEdge T3 disk tray and power on again.
- Log into a disk tray and issue a `reset` command.
- Log into a disk tray and issue a `shutdown` command (this requires a power cycle to get the system to start booting).
- If the disk tray is already running, you can reboot by issuing a `boot` command with options.

Screen messages similar to the following appear:

```
:/> tip -9600 /dev/ttyb

Connected.

T3-EP Release 2.10 1999/11/24 13:05:27 (IP Address of tray)
Copyright (c) 1997-1999 Sun Microsystems, Inc.
All Rights Reserved
Found units:  u1-ctrl  [u2-ctrl]
auto boot is enabled
hit the RETURN key within 3 seconds to cancel...
Default master is 1
Default alternate master is 2
Initializing System Drives...
Initializing XPT Components...
Initializing QLCF Components
Initializing Loop 1 ISP2100...firmware status 3
Detecting 20 FC-AL ports on loop 1
Initializing Loop 2 ISP2100...firmware status 3
Detecting 20 FC-AL ports on loop 2
Initializing SVD Services...
Found (18) disks in the system
Found 9 disks in U1...
Found 9 disks in U2...
Trying to boot from encid 1...
Booting from U1D1...
Executing...
Starting...

Login: root
password: root-password
```

Once the array starts a full boot, any system problems detected by the system are displayed. `pSOSystem` also identifies any controllers not responding, or if the master has failed over to the alternate master, in the boot messages.

Firmware status codes are good indicators of internally detected system and configuration problems. In the previous `boot` message example, a firmware status of 3 is displayed. This status implies the array is ready for operation. TABLE 3-2 lists other firmware status codes that can be reported through the serial-port console during a array `boot` cycle.

TABLE 3-2 Firmware Status Indicators

Status	Definition
0	ISP is waiting for configuration process to complete
1	ISP is waiting for ALPA assignment
2	ISP is waiting for port login
3	ISP is ready and optimal
4	ISP has lost loop synchronization
5	ISP has experienced an unrecoverable error
6	Reserved
7	ISP is not participating on the loop

Once the array has fully booted, all the commands available through the CLI are accessible.

Note – If you make configuration changes at the EPROM prompt, they can be overwritten when the array boots completely. Check the array settings after the array has booted to ensure that they are correct.

A message such as the following might appear after you log in:

```
6.1/:: device not mounted
```

It is possible that the serial cable is connected to the alternate master unit instead of the master unit. To determine if this is true, enter `fru myuid`.

```
::: fru myuid
u1
```

If you are connected the master, `u1` is returned. If you are connected to the alternate, `u2` is returned. If you are connected the alternate, stop the tip session, reconnect the serial cable to the master unit, and start the session again.

3.7 Telnet Connection Status Checks

Check array status using a variety of CLI commands. This section contains the following topics:

- Section 3.6, “Checking Array Boot Status” on page 3-11
- Section 3.7.1, “Determining Failover” on page 3-14
- Section 3.7.2, “Verifying the Firmware Level and Configuration” on page 3-16
- Section 3.7.3, “Checking FRU Status” on page 3-19

3.7.1 Determining Failover

1. **On the host, use the `telnet` command with the array name (or IP address) to connect to the array.**

```
mngt_host# telnet disk-tray-name
Trying 123.123.123.3...
Connected to 123.123.123.3.
Escape character is '^]'.

pSOSystem (123.123.123.3)
```

2. **Log in to the array by typing `root` and the supervisor password at the prompts.**

3. To determine which unit is the master or alternate master unit, enter `sys stat`.

The following example shows a partner group in a normal state:

```
:/:<2>sys stat
Unit   State      Role      Partner
-----
 1     ONLINE    Master    2
 2     ONLINE    AlterM    1
```

In a failover state, unit 2 assumes the role of master controller and unit 1 is disabled, as shown in the following example:

```
:/:<3>sys stat
Unit   State      Role      Partner
-----
 1     DISABLED  Slave
 2     ONLINE    Master
```

4. Use the `port list` command to display how paths are mapped from the host ports to the volume.

This displays World Wide Names (WWNs) that can be compared to the WWNs displayed by the Solaris command `format(1M)`.

```
:/:<5>port list

port   targetid  addr_type  status  host  wwn
ulp1   1         hard      online  sun   50020f23000002ba

mgmt-host# format
        Searching for disks...done

AVAILABLE DISK SELECTIONS:
0. c0t0d0 <SUN4.2G cyl 3880 alt 2 hd 16 sec 135>
   /pci@1f,4000/scsi@3/sd@0,0
1. c2t1d0 <SUN-T300-0101 cyl 34145 alt 2 hd 64 sec 128>
   /pci@6,2000/SUNW,ifp@1/ssd@w50020f23000002ba,0
Specify disk (enter its number):
```

In the example above, the WWN of 50020f23000002ba identifies the port and volume match.

3.7.2 Verifying the Firmware Level and Configuration

The Sun StorEdge T3 array has four different types of firmware:

- Controller firmware. See Section 4.3, “Upgrading Controller Firmware” on page 4-5”.
- Controller electrically erasable programmable read-only memory (EPROM) firmware. See Section 4.3.1.2, “Controller EPROM Firmware” on page 4-6”.
- Disk drive firmware. See Section 5.4, “Upgrading Disk Drive Firmware” on page 5-13”.
- Interconnect card firmware. See Section 6.3, “Upgrading Interconnect Card Firmware” on page 6-5”.

The firmware upgrade procedures must be done through the Ethernet connection. The latest firmware versions are located on the SunSolveSM web site:

`http://sunsolve.sun.com`

Firmware file naming restrictions are as follows:

- The name consists of a string of 1 to 12 characters.
- The name must start with an alphabetic character and not a numeral. For example:
 - `file1.bin` is acceptable
 - `1file.bin` is not acceptable
- The characters can be a combination of the following:
 - alphabetic letters
 - digits (0 through 9)
- Special characters such as:
 - `_` (underscore)
 - `.` (period)
 - `$` (dollar symbol)
 - `-` (dash).
- Names are case-sensitive. (For example, `ABC` and `abc` are different files.)

Make sure the latest firmware versions are installed and that the array configuration information indicates that the unit is ready for operation.

Check the firmware versions and array information in a telnet session with the array.

1. On the host, use the `telnet` command with the array name (or IP address) to connect to the array.

For example:

```
# telnet array-name
Trying 23.123.123.3...
Connected to 123.123.123.3.
Escape character is '^]'.

pSOSystem (123.123.123.3)
```

2. Log in to the array by typing `root` and the supervisor password at the prompts.

The array prompt is displayed.

3. Enter `ver` to identify the controller firmware.

For example:

```
:/:<5>ver

T3 Release 1.13 2000/05/17 16:15:41 (129.150.47.104)
Copyright (C) 1997-2000 Sun Microsystems, Inc.
All Rights Reserved.
```

The `ver` command displays the header information. In the example above, the controller firmware is listed as `Release 1.13`.

4. Enter fru list to display the firmware for the disk drives, interconnect card, and EPROM level.

In the event of a FRU failure, fru list output contains the serial numbers helpful in verifying correct FRU replacement.

```
:/:<7>fru list
```

ID	TYPE	VENDOR	MODEL	REVISION	SERIAL
ulctr	controller card	SUN	0082f-f0	0210	000596
uld1	disk drive	SEAGATE	ST118202FSUN	EA29	LKG88867
uld2	disk drive	SEAGATE	ST118202FSUN	EA29	LKG89225
uld3	disk drive	SEAGATE	ST118202FSUN	EA29	LKG88938
uld4	disk drive	SEAGATE	ST118202FSUN	EA29	LKG89528
uld5	disk drive	SEAGATE	ST118202FSUN	EA29	LKG89846
uld6	disk drive	SEAGATE	ST118202FSUN	EA29	LKG90455
uld7	disk drive	SEAGATE	ST118202FSUN	EA29	LKG89362
uld8	disk drive	SEAGATE	ST118202FSUN	EA29	LKG55303
uld9	disk drive	SEAGATE	ST118202FSUN	EA29	LKG78649
ull1	loop card	SCI-SJ	375-0085-01-	5.01 Flash	000867
ull2	loop card	SCI-SJ	375-0085-01-	5.01 Flash	001491
ulpcu1	power/cooling unit	TECTROL-CAN	300-1454-01(0000	002469
ulpcu2	power/cooling unit	TECTROL-CAN	300-1454-01(0000	003134
ulmpn	mid plane	SCI-SJ	370-3990-01-	0000	000698

In this example:

- EPROM firmware version is Controller card, Revision 0210
- Disk drive firmware version is Revision EA29
- Interconnect card (loop card) firmware version is Revision 5.01 Flash

3.7.3 Checking FRU Status

Use the `fru stat` command to provide a status of each FRU, including temperatures.

```

:/:<43>fru stat
CTRLR      STATUS  STATE      ROLE        PARTNER     TEMP
-----
ulctr      ready   enabled    master      u2ctr       34.5
u2ctr      ready   enabled    alt master  ulctr       35.5

DISK       STATUS  STATE      ROLE        PORT1       PORT2       TEMP  VOLUME
-----
uld1       ready   enabled    data disk   ready       ready       33    v0
uld2       ready   enabled    data disk   ready       ready       30    v0
uld3       ready   enabled    data disk   ready       ready       29    v0
uld4       ready   enabled    data disk   ready       ready       27    v0
uld5       ready   enabled    data disk   ready       ready       24    v0
uld6       ready   enabled    data disk   ready       ready       26    v0
uld7       ready   enabled    data disk   ready       ready       25    v0
uld8       ready   enabled    data disk   ready       ready       31    v0
uld9       ready   enabled    data disk   ready       ready       34    v0
u2d1       ready   enabled    data disk   ready       ready       31    v1
u2d2       ready   enabled    data disk   ready       ready       31    v1
u2d3       ready   enabled    data disk   ready       ready       30    v1
u2d4       ready   enabled    data disk   ready       ready       26    v1
u2d5       ready   enabled    data disk   ready       ready       34    v1
u2d6       ready   enabled    data disk   ready       ready       26    v1
u2d7       ready   enabled    data disk   ready       ready       28    v1
u2d8       ready   enabled    data disk   ready       ready       32    v1
u2d9       ready   enabled    data disk   ready       ready       27    v1

LOOP       STATUS  STATE      MODE        CABLE1      CABLE2      TEMP
-----
u2l1       ready   enabled    master      installed    -           31.5
u2l2       ready   enabled    slave       installed    -           35.0
u1l1       ready   enabled    master      -           installed    31.5
u1l2       ready   enabled    slave       -           installed    35.0

POWER      STATUS  STATE      SOURCE      OUTPUT      BATTERY     TEMP  FAN1  FAN2
-----
ulpcu1     ready   enabled    line        normal      normal      normal  normal  normal
ulpcu2     ready   enabled    line        normal      normal      normal  normal  normal
u2pcu1     ready   enabled    line        normal      normal      normal  normal  normal
u2pcu2     ready   enabled    line        normal      normal      normal  normal  normal

```

Note – The `fru stat` command reports temperature readings on the interconnect cards, controller board, disk drives, and PCUs. For the PCU, the `fru stat` output does not display a temperature value, but reports a normal value. For all other FRUs, `fru stat` reports a numerical temperature.

System firmware monitors only the temperature state reported by the PCUs. This means a high temperature reading on an interconnect card, for example, will not cause the firmware to take evasive action (such as powering off the array).

3.7.4 Testing the Array With StorTools

Access the StorTools main menu through the `stormenu` command. Once executed, this command runs the `initcheck` program to identify any failing loops that could cause a program to hang. `initcheck` runs a quick loop back frame (`lbf`) test and performs disk inquiries.

Note – Since `lbf` is not supported on PCI FC-100 host board adapters, `initcheck` performs disk inquiries only on those systems.

Consult your StorTools documentation for information on how to perform StorTools diagnostic tests.

Note – The StorTools diagnostic package expects the software and firmware files to be at certain minimum revision levels to run the tools. Always use the `Check Revisions` selection and ensure that the system is up to the minimum revision requirements before using any of the other main menu selections.

3.8 Identifying Miscabled Partner Groups

If a partner group has booted successfully but is unable to establish a Telnet connection with the management host, the partner group might be cabled together incorrectly.

The interconnect cable connections between dual controller units are critical for determining which unit is the master controller and which is the alternate master. If the interconnect cables are not properly installed on the interconnect cards, the top

unit could boot as the master controller, and the bottom unit would assume alternate master status. Because the host has been configured to use the MAC address of the bottom unit, this alternate configuration can cause the units to malfunction.

If the bottom unit is incorrectly cabled, making the bottom unit the alternate master, the bottom unit's Ethernet port will be inactive unless a fail over situation occurs. In that event, the IP and MAC address of the bottom unit will take over the values of the master (top) unit.

If the partner group has been cabled together incorrectly, the following procedure can help determine if the top unit is acting as the master controller.

1. Determine the MAC address of the top unit.

The MAC address is located on a pull-out tab at the front of the unit, to the left of the first disk drive. (FIGURE 3-4).

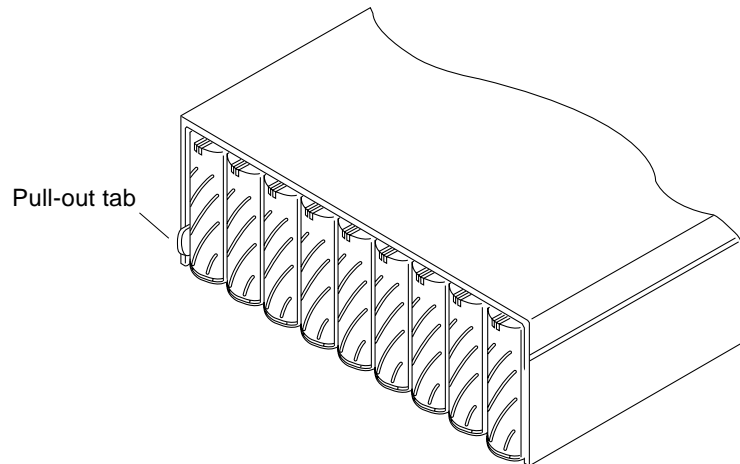


FIGURE 3-4 MAC Address on the Pull-Out Tab

2. Edit the files on the RARP server to include the MAC address of the top unit.

a. Edit the `/etc/ethers` file by adding the MAC address and array name.

For example:

```
8:0:20:7d:93:7e array name
```

In this example:

- `8:0:20:7d:93:7e` is the MAC address
- `array name` is the name of the master controller unit.

b. Edit the `/etc/hosts` file with the IP address and array name.

For example:

```
123.123.123.111 array name
```

In this example, 123.123.123.111 is the assigned IP address.

c. Edit the `/etc/nsswitch.conf` file to reference the local system files.

To ensure the Solaris software environment uses the changes made to `/etc/ethers` and `/etc/hosts` files, edit the `host` and `ethers` entries in the `/etc/nsswitch.conf` file so that the `files` parameter appears before the `[NOTFOUND=return]` statements as shown:

```
hosts:      nis files [NOTFOUND=return]
ethers:     nis files [NOTFOUND=return]
```

d. Determine if the RARP daemon is running by typing:

```
# ps -eaf | grep rarpd
```

- If the RARP daemon is running, proceed to Step 3.
- If the RARP daemon is not running, continue to Step e.

e. Start the RARP daemon in the Solaris environment by typing:

```
# /usr/sbin/in.rarpd -a &
```

3. Ensure that there is an Ethernet connection to the 10BASE-T port of the top unit.

4. Press the power switch on the power and cooling units on both arrays to remove AC power (FIGURE 3-5).

It may take some time for the units to power off while shutdown procedures are performed. Wait until the units have powered off completely.

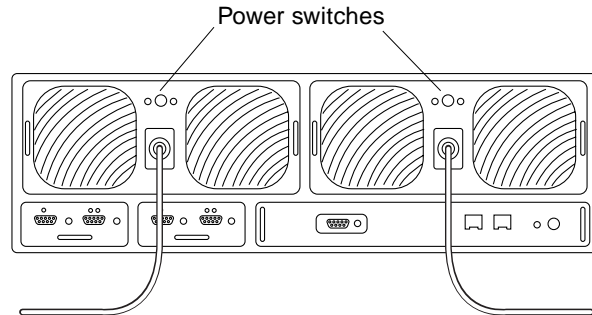


FIGURE 3-5 Power Switch Locations

5. After both units have powered off, press the power switch on the power and cooling units again to restore power to and reset the arrays.

It may take up to several minutes for the arrays to power on and come back online. All LEDs will be green when the unit is fully powered on.

6. After the units are fully powered on, start a Telnet session.

The Telnet session will connect to the top unit.

If the host cannot telnet to the array, investigate the following other possible causes:

- **RARP server not responding.** To determine if this is the problem:
 - Verify that the RARP daemon is running on the host system.
 - Verify that the `/etc/nsswitch.conf` file is properly configured on the RARP server.
 - In the Solaris environment, use the `snoop` command to verify that the array is attempting to establish RARP communication with the Solaris server.
- **MAC address is incorrect.** In the Solaris environment, use the `snoop` command to specify the MAC address of the array and to determine if any RARP packets are transmitted. If you observe no transmissions during a reboot of the array, verify that the MAC address on the array label matches the MAC address configured on the RARP server.
- **Netmask is incorrect.** The default netmask address used on the array is 255.255.255.0. If the local subnet uses a different netmask, the RARP operation might not work.
- **Inoperable network connections.** If using hubs to connect to the network, try eliminating or replacing the hub.
- **Incorrect IP address.** Connect to the array through the serial port, and verify that the IP address is correct.

3.9 Identifying Data Channel Failures

The data channel encompasses the host data path that extends from the host bus adapter to the media interface adapter (MIA) attached to the array. Errors in the host data channel are outside of the scope of the Sun StorEdge T3 array. To determine failures in the data path, use host-based application diagnostics, such as the StorTools product for the Solaris operating environment.

Refer to the documentation of the selected diagnostics tool for information on identifying data channel failures.