Sun StorEdge™ Traffic Manager 4.5 Software Installation Guide

For the Hewlett-Packard HP-UX 11.0 and 11i Operating System

Sun Microsystems, Inc.
www.sun.com

Part No. 817-7037-10
June 2004

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Preface

The *Sun StorEdge™ Traffic Manager 4.5 Software Installation Guide - HP-UX for the Hewlett-Packard HP-UX 11.0 and 11i Operating Systems* provides instructions for installing the Sun StorEdge™ Traffic Manager software on the host system.

This guide is designed for use with Sun™ storage devices and is written for experienced system administrators of the HP-UX operating environment and related disk storage systems.

Throughout this guide, *storage device* is used to designate the storage devices supported in this release. The supported devices are:

- Sun StorEdge T3B array
- Sun StorEdge 3510 FC array
- Sun StorEdge 6120 array
- Sun StorEdge 6320 system
- Sun StorEdge 6910/6960 systems
- Sun StorEdge 6920 system
- Sun StorEdge 9900 series

Before You Read This Guide

Read the documentation that came with your storage device and have an experienced system administrator's knowledge of the supported Hewlett Packard operating environment in which you are installing the Sun StorEdge™ Traffic Manager software.

How This Guide Is Organized

This guide is organized as follows:

Chapter 1 provides an overview of the Sun StorEdge Traffic Manager software .

Chapter 2 describes how to install and uninstall the software for the driver.

Chapter 3 contains information about accessing the log files and explains the information contained in them.

Chapter 4 provides troubleshooting information.

Glossary contains a list of words and phrases and their definitions.

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	Read Chapter 6 in the *User's Guide.* These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type `rm` *filename.*

Related Documentation

Application	Title	Part Number
Late-breaking information	*Sun StorEdge™ Traffic Manager 4.5 Software Release Notes for IBM AIX, Hewlett-Packard HP-UX, and Microsoft Windows 2000 and 2003 Operating Systems*	817-7038-10
Using	*Sun StorEdge™ Traffic Manager 4.5 Software User's Guide*	817-7033-10
SAN Configuration	*Sun StorEdge SAN Foundation Configuration Guide*	817-3672-10

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CHAPTER 1

Sun StorEdge™ Traffic Manager Software Overview

This chapter contains the following topics:

- "About the Sun StorEdge™ Traffic Manager Software" on page 1
- "Switch Configurations" on page 4

About the Sun StorEdge™ Traffic Manager Software

The Sun StorEdge™ Traffic Manager is a system for managing multiple paths to storage devices. The Sun StorEdge™ Traffic Manager software is comprised of a graphical user interface (GUI) application, a command line interface application (CLI), and system device drivers that enable you to manage the multiple paths. If a failure occurs in one host data path, the Sun StorEdge™ Traffic Manager software automatically detects the failure, reroutes the data, and balances the I/O across active paths.

Refer to Chapter 2 of this guide for information about starting the software and *Sun StorEdge™ Traffic Manager 4.5 Software User's Guide* for a description of using the GUI and CLI interfaces. From the GUI, the User's Guide can be accessed by clicking on HELP -> User's Guide. The UsersGuide.pdf can also be accessed directly from the `/opt/SunTrafficManager/docs` subdirectory using Adobe Acrobat Reader.

System Configuration

The Sun StorEdge™ Traffic Manager system maintains and presents storage system configuration information. FIGURE 1-1 shows an example of using the Sun StorEdge™ Traffic Manager GUI application to access the Sun StorEdge™ Traffic Manager system.

In FIGURE 1-1, each storage device and the LUNs associated with it are shown on the left side of the screen and the paths and host bus adapters (HBA) system names are shown on the right.

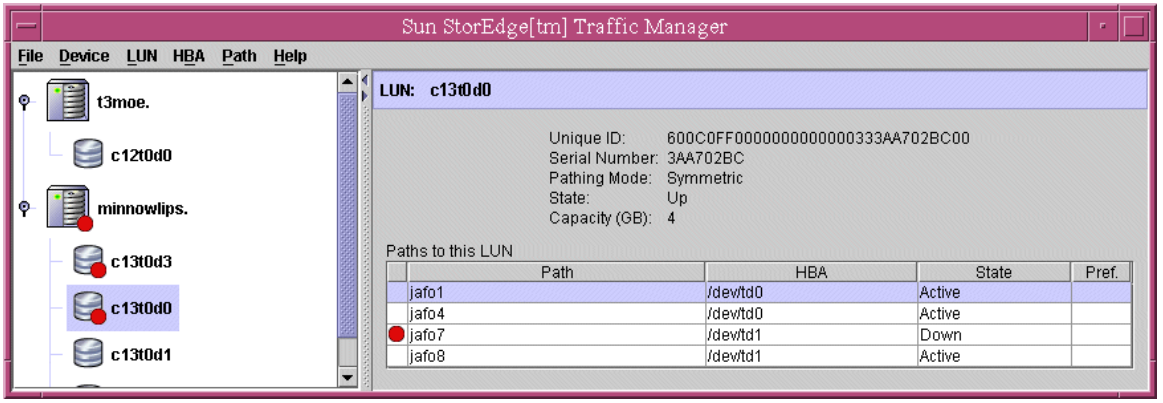

FIGURE 1-1 Host Data Paths Between HBAs and the Storage Devices

Asymmetric Device Path Management Description

For Asymmetric devices, the following description of failover and failback operations apply.

Failover

A LUN on a asymmetric device can only have one active controller at a time. The remaining controller is known as the passive controller. Paths to the active controller are known as active paths. Paths to the passive controller are known as passive paths. The process by which a LUN may force a passive controller to become its active controller is known as LUN failover. Upon successful LUN failover, passive paths to a controller become active and previous active paths become passive. On the Sun StorEdge 39xx and Sun StorEdge 6120 arrays, failover is implemented per

device volume. Therefore, if volume slicing is enabled, there may be multiple LUNs on the volume affected by a failover. Also in a multi-initiator environment, a LUN failover on one host is detected by all other hosts using LUNs on the same volume.

LUN failover can be initiated by both automatic and manual means.

Automatic Failover by Error Detection

If a path receives errors and fails, it is marked as Down or Removed. If all the active paths for a LUN are marked down and there are remaining passive paths, the driver automatically causes a LUN failover to activate the passive paths.

Manual Failover Initiated by the User *`activate`* Command

The user may use the `activate` command to manually initiate a LUN failover by activating a passive path. Previously active paths will become passive. If the LUN is a slice on a volume, all LUNs on that volume will failover for all hosts.

Manual Failover Initiated by User *`restore`* Command

On some devices, a LUN may have a default active controller. This is known as the preferred controller. A `restore` command will attempt to cause a failover of all LUNs that do not currently have active paths to their preferred controller.

Automatic Failback Initiated by an Automatic Restore

If the driver recognizes that a down path becomes passive, an automatic `restore` command may occur. This is currently known as autofailback. The autofailback parameter must be set to `enabled` in order for this to occur.

Note – Autofailback is not supported in a multi-host environment.

To learn how to perform failback, see the *Sun StorEdge™ Traffic Manager 4.5 User's Guide*. From the GUI, the User's Guide can be accessed by clicking on HELP -> User's Guide. From the CLI, the UsersGuide.pdf can be accessed directly from the `/opt/SunTrafficManager/docs` subdirectory using Adobe Acrobat Reader.

Symmetric Device Path Management Description

For symmetric devices, all paths are active unless a path is unhealthy and in which case, it is down. There is no failover or failback, an unhealthy path is just not used. Load balancing occurs across all active paths to improve performance by using all available paths to a storage device.

Switch Configurations

The Sun StorEdge™ Traffic Manager software also works with storage device configurations that include switches. For information about configuring a storage device with switches, refer to the documentation for the switch you are using.

Note – Do not configure switches with a Domain ID of 8. Hewlett-Packard HP-UX systems reserve Domain 8 for private loop devices.

CHAPTER 2

Installing, Removing, and Starting the Sun StorEdge™ Traffic Manager

This chapter contains the following topics:

- "Installing the Software on the Hewlett-Packard HP-UX Operating System" on page 5
- "Preparing for Installation" on page 6
- "Preparing to Uninstall the Sun StorEdge™ Traffic Manager Software" on page 8
- "Starting the Sun StorEdge™ Traffic Manager GUI" on page 10
- "Starting the Sun StorEdge™ Traffic Manager CLI" on page 11

Installing the Software on the Hewlett-Packard HP-UX Operating System

The installation file for HP-UX is named `SunTrafficMgr`*`x.x.x_y.y`*`.depot` (where *x.x.x* is the build number and *y.y* is the operating system version).

- `SunTrafficMgr4.5.x.x.depot` is the installation file for HP-UX version 11i
- `SunTrafficMgr4.5.x.x.depot` is the installation file for HP-UX version 11.0

You can install the driver with the `swinstall` command-line interface or with the GUI. The following steps use the GUI.

Note – If you have installed a previous version of the driver earlier than version 3.1, you must uninstall that driver before installing the new version. See "Uninstalling the Sun StorEdge™ Traffic Manager Software" on page 9.

▼ Preparing for Installation

1. **Before you install the driver, make sure you have the correct versions of the hardware and software.**

   For the most up-to-date information, see:

   `http://www.sun.com/storage/san/multiplatform_support.html`

2. **Ensure that you have downloaded the valid SSTM 4.5 software binary package from the Sun Download Center (SDLC).**

▼ Preparing the Host For the Installation

1. **Start the software installation utility:**

```
# swinstall
```

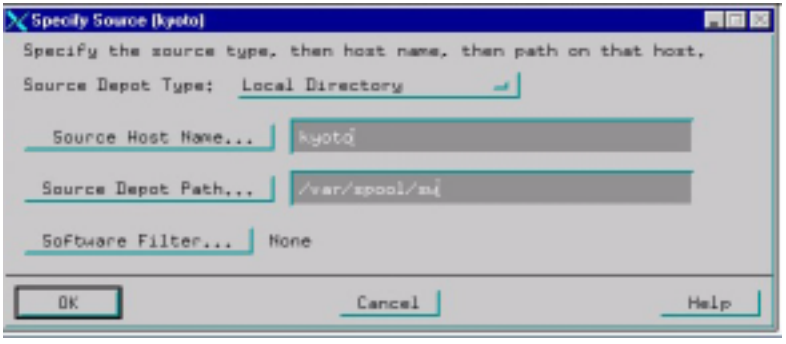

FIGURE 2-1 Driver Installation Screen for HP-UX

2. **Ensure that the Source Depot Type selection points to the depot files. For example, Local Directory.**

3. **Type the host system name in the Source Host Name field.**

   The field might be filled in automatically.

4. **Type the full path to the location of the installation file in the Source Depot Path field.**

   For example:

   ```
   /tmp/SunTrafficMgr4.5.x.x.depot
   ```

   You must include the name of the installation file in the path.

5. **Click OK.**

6. **Select the driver name** `SunTrafficManage`**.**

   Due to character limit, the driver name is shown as “SunTrafficManage” without the final r.

7. **Choose Actions -> Mark for Install.**

8. **Choose Actions -> Install (analysis).**

9. **When the analysis is complete, click Log file to see the results of the analysis and whether there will be any problems with the installation.**

   If there are problems with the analysis, you must resolve them before you can install the driver. Refer to your operating system documentation.

10. **Click OK to exit the log file.**

▼ Completing the Installation of the Sun StorEdge™ Traffic Manager Software

1. **If there are no problems with the analysis, click OK on the Software Installation Screen to begin the installation.**

   The system tells you that the kernel will be rebuilt and that you must reboot the computer after installation.

   The system confirms that you want to proceed.

2. **Click Yes.**

   The status changes to Ready and the Done button becomes active when the installation is complete.

3. **Click Done.**

   The system notifies you that the computer will now be rebooted. You must reboot the computer before you can use the driver.

4. **Click OK.**

▼ Verifying the Installation

- **Use the** `swlist` **command to verify the installation as shown in the following example:**

```
> swlist SunTrafficManager
# Initializing ...
# Contacting target “hp2”...
#
# target:  hp2:/
```

If the driver is installed properly, a response similar to the following is displayed:

```
# SunTrafficManager          A.4.5.x.x     SunTrafficManager Multi-Path Driver
  SunTrafficManager.docs      4.5.x.x     Sun Documentation
  SunTrafficManager.driver    4.5.x.x     SunTrafficManager Driver
  SunTrafficManager.gui       4.5.x.x     SunTrafficManager GUI
  SunTrafficManager.sssm      4.5.x.x     SSESM Host Agent
  SunTrafficManager.utilities 4.5.x.x     SunTrafficManager utilities
root@hp2:/
```

Preparing to Uninstall the Sun StorEdge™ Traffic Manager Software

Before you uninstall the driver:

- Make sure that the operating system is not accessing the storage device.
- Unmount the file system on each storage device array.
- Take the volume group offline from each storage device array.

Refer to your operating system documentation for more information about these functions.

Caution – Do not use the arrays in a partner group configuration with two HBAs without the driver installed. Uninstalling the driver causes the operating system to see two paths to each LUN, which can result in data corruption.

Uninstall the driver the same way you uninstall most HP-UX software. Use either the GUI or command-line version of `swremove` to uninstall the driver. The steps that follow use the GUI version.

▼ Uninstalling the Sun StorEdge™ Traffic Manager Software

1. **Start the software removal utility.**

```
# swremove
```

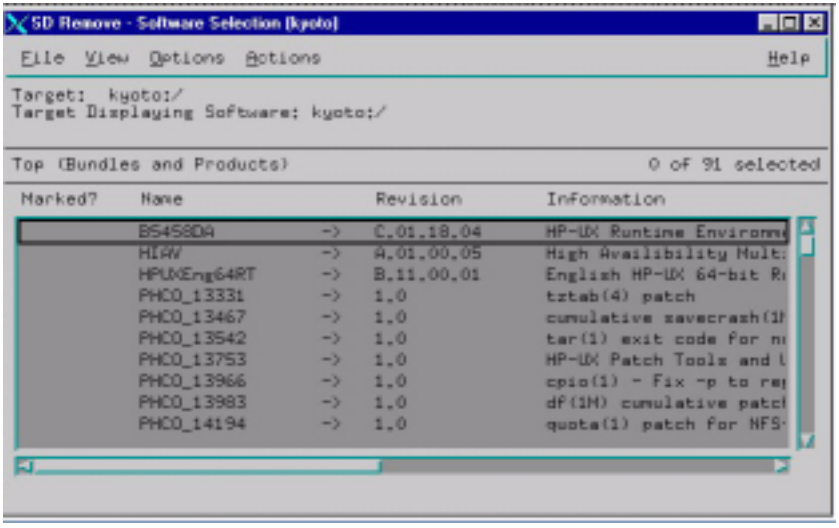

FIGURE 2-2 Software Removal Window for HP-UX

2. **Select the line that starts with** `SunTrafficManager`**.**
3. **Run an analysis to ensure that the host is ready for software removal.**
   a. **Choose Actions -> Mark for Remove.**
   b. **Choose Actions -> Remove (analysis).**

c. **When the analysis is complete, click Log file to see the results of the analysis and whether there will be any problems with uninstalling the driver.**

   If there are problems with the analysis, you must resolve them before you can uninstall the driver. Refer to your operating system documentation.

4. **Click OK to exit the log file.**

5. **If there are no problems with the analysis, click OK.**

   The system tells you that the kernel will be rebuilt and that you must reboot the computer after uninstallation.

   The system confirms that you want to proceed.

6. **Click Yes.**

   The Done button becomes active when the removal is complete.

7. **Click Done.**

   The system notifies you that the computer will now be rebooted. You must reboot the computer.

8. **Click OK.**

   The software removal is complete after the reboot.

Starting the Sun StorEdge™ Traffic Manager Software

This section describes how to start the Sun StorEdge™ Traffic Manager application software GUI and the Sun StorEdge™ Traffic Manager application software CLI.

Starting the Sun StorEdge™ Traffic Manager GUI

To start the Sun StorEdge™ Traffic Manager application software GUI in HP-UX, type the following:

```
trafficmgr
```

The Sun StorEdge™ Traffic Manager software window is displayed.

The Sun StorEdge™ Traffic Manager multipathing driver is started automatically at system boot or when supported devices are recognized.

To learn more about using the Sun StorEdge™ Traffic Manager application software, click Help on the Sun StorEdge™ Traffic Manager window and select User's Guide from the pull-down menu. The User's Guide is a PDF file accessed by Adobe Acrobat Reader.

Starting the Sun StorEdge™ Traffic Manager CLI

Entering the `sstm` command with any option on the command line starts the Sun StorEdge™ Traffic Manager application software CLI if you are in the `sstm directory` or the `sstm` directory is in your path.

The Sun StorEdge™ Traffic Manager multipathing driver is started automatically at system boot or when supported devices are recognized.

To learn more about the Sun StorEdge™ Traffic Manager software, use Adobe Acrobat Reader to open the UserGuide.PDF file found at:

```
/opt/SunTrafficManager/docs
```

CHAPTER 3

Log File Information

This chapter describes the log files for the HP-UX operating environment and the log levels logged in the system log file. See the Sun StorEdge™ Traffic Manager 4.5 User's Guide for a description of setting the log levels.

Topics in this section include:

- "Accessing the Log Files" on page 13
- "Log Level" on page 14

Accessing the Log Files

Accessing the Log Files for the HP-UX Platform

The log files are contained in the following file:

```
/var/adm/syslog/syslog.log
```

Use a text editor to look through this file.

Log Level

This section describes the various log messages at the various logging levels as configured by the GUI or CLI. See the Sun StorEdge™ Traffic Manager 4.5 Software User's Guide for a description of setting the logging level for all devices attached to the current host. The Sun StorEdge™ Traffic Manager 4.5 Software User's Guide is displayed by selecting `Help` from the Sun StorEdge™ Traffic Manager window and selecting `User's Guide` from the drop down list.

You can configure the following logging levels:

- Informational messages - these include all critical error messages as well as non-critical alerts. Non-critical alerts are usually when something has changed but no functionality is lost.
- Data path change messages - changes to the state of a host data path.
- Critical error messages - Unrecoverable errors, such as when the Sun StorEdge™ Traffic Manager software loses access to a LUN or is out of memory.
- Caution and internal error messages - Errors the Sun StorEdge™ Traffic Manager software encounters but does not handle.

If logging level Data Path Changes is not set, data path change messages are not shown.

If logging levels Data Path Changes and Critical Error messages are set, only critical information is shown.

If logging levels Data Path Changes and Internal Errors are set, only non-critical information is shown.

TABLE 3-1 Log Informational

Message	Message Explanation	Information in the Message
Driver loaded.	The operating system has loaded the Sun StorEdge Traffic Manager software.	• Major version • Minor version • Point version • Release version

TABLE 3-2 Log Data Path Changes and Log Critical Errors

Message	Message Explanation	Information in the Message
Path state change.	This message is logged when the state of any path changes for critical reasons.	1. Old state and new state. Valid values are: • Active • Passive • Down 2. Path name 3. Unique LUN ID 4. Reason string, valid values are: • I/O status—state change as a result of I/O status. There will also be detail data consisting of operating system specific SCSI status. • User initiated—state change as a result of user initiated action, for example, activate or disable • AutoFailback initiated—state change as a result of auto failback action • Failover initiated—state change due to the need for passive to active action

TABLE 3-3 Log Critical Messages

Message	Message Explanation	Information in the Message
Failover command sent to:	This message is logged when the state of any path changes for critical reasons and the logging levels Log Data Path Changes is set in addition to Log Critical Error.	1. Path name on which the failover command was sent 2. Unique LUN ID 3. Unique array ID 4. Controller ID 5. Reason string, valid values are: • User initiated—failover command sent as a result of user initiated action. For example, activate or disable. • AutoFailBack initiated—failover command sent as a result of auto restore failback action • Failover initiated—failover command sent due to the need for passive to active action

TABLE 3-4 Log Data Path Changes and Log Internal Errors

Message	Message Explanation	Information in the Message
Path state changed to:	This message is logged when the state of any path changes for critical or non-critical reasons and the logging levels Log Data Path Changes and Log Internal Errors are set.	1. Old state and new state. Valid values are: • Unknown • Active • Passive • Transition • Down • Admin • Removed 2. Path name 3. Unique LUN ID 4. Reason string, valid values are: • IO status—state change as a result of I/O status. There will also be detail data consisting of operating system specific SCSI status. • Device added—state change as a result of a new path • Device removed—state change as a result of a path removed • User initiated—state change as a result of a user initiated action. For example, activate or disable. • AutoFailBack initiated—state change as a result of auto failback action • Failover initiated—state change due to a need for passive to active action

TABLE 3-5 Log Internal Messages

Message	Message Explanation	Information in the Message
LUN state changed.	This message is logged when any noncritical LUN state changes occur.	1. Old LUN state and new LUN state. Valid values are: • Unknown • Up • Transition • Down_Grace • Down • Removed 2. LUN unique ID

CHAPTER 4

Troubleshooting

TABLE 4-1 provides HP-UX operating system troubleshooting information.

TABLE 4-1 Troubleshooting Tips for the HP-UX Operating system

Problem	Solution
The physical connection between the host and arrays is correct, but the host still does not see the array devices.	Check the `syslog`. Look for messages logged by the driver named `Jafo`. or Run the ioscan command to discover storage devices.
You used to see all the existing LUNs on both arrays in a partner pair over a single active path. Now you see two active paths for each array and each array's LUNs are only visible on its own path. You no longer see all the LUNs on a single path.	Set the `mp_support` parameter from `none` to `mpxio`. At the Telnet interface to the array, type: `sys mp_support mpxio` for Sun StorEdge 3900, 6900, and 6320 Series storage systems.

Glossary

active path	A path that is healthy and ready for I/O.
array	A Sun StorEdge array that contains an internal RAID controller and disk drives with Fibre Channel connectivity to the data host.
failback	The process of making a LUN's preferred controller the active controller. Also known as restore.
failover	The process of sending a failover command down a passive path to change the active controller for a LUN.
host bus adapter (HBA)	A controller board that connects the host computer bus and the FC-AL that manages the transfer of information between the two channels.
logical unit number (LUN)	A piece of logical storage presented by the device to the host.
passive path	For an asymmetric device, a path to a passive controller. Can be made active by sending a failover command.
preferred controller	On an asymmetric device, the default active controller for a LUN.
restore	The process of making a LUN's preferred controller the active controller. Also known as failback.
volume	One or more drives configured into a RAID group. May be sliced into smaller LUNs to be presented to the host.
worldwide name (WWN)	Unique number assigned to each device on a Fibre Channel loop.

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