Sun StorEdge™ N8400 and N8600 Filer Administrator's Guide

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Contents

Figures

Tables

Preface

The *Sun StorEdge N8400 and N8600 Filer Administrator's Guide* describes how to perform administration tasks with hosts on the network using a graphical user interface (GUI) tool. This tool is called the Filer Administration Tool.

This guide is intended for system administrators who are experienced with typical system administration tasks.

Before You Read this Book

Before using the procedures in this book, you should have already installed and configured the Sun StorEdge N8x00 filer on the network by following the instructions in the *Sun StorEdge N8x00 Filer Installation, Configuration, and Service Guide*.

How This Book Is Organized

Chapter 1 provides a product overview.

Chapter 2 describes the Filer Administration Tool.

Chapter 3 gives a business example of how you might use the Filer Administration Tool.

Chapter 4 provides a description of the system administration commands available on the command-line interface (CLI).

Chapter 5 provides troubleshooting information.

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.*

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

Document TItle	Part Number
Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual	806-1062
Sun StorEdge T3 Disk Tray Administrator's Guide	806-1063
Sun StorEdge T3 Disk Tray Release Notes	806-1497
Sun StorEdge N8400 Filer Installation, Configuration, and Service Guide	806-6885
Sun StorEdge N8600 Filer Installation, Configuration, and Service Guide	806-6889
Sun StorEdge N8400 Filer Release Notes	806-6888
Sun StorEdge N8600 Filer Release Notes	806-6892
Sun StorEdge N8400 and N8600 Filer Business Example	806-5941

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1. **Access Sun StorEdge N8400 and N8600 Filer product documentation on your browser.**

   `http://www.sun.com`

2. **Select Products & Solutions.**
3. **Under Hardware, select Documentation.**
4. **Under Product Documentation, select Network Storage Solutions.**
5. **Under Product Documentation, select Network-Attached Storage (NAS).**

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CHAPTER 1

Filer Overview

A network attached storage (NAS) device is an appliance that supplies disk storage to users over a network. Moving storage from the user's desktop to the network maximizes data availability and security. The Sun StorEdge N8*x*00 Filer (hereafter referred to as "the filer") is a NAS appliance that consists of a Sun Enterprise™ 420R or 4500 Server and one or more partner groups of Sun StorEdge T3 Disk Trays (hereafter referred to as "disk trays").

The filer contains features that are designed to minimize down time, including:

- Mirrored system disks in the 420R/4500 Server
- Hardware redundant array of independent disks (RAID)-5 storage system
- Redundant power supplies in both the 420R/4500 Server and the disk trays

Access to the filer's disk storage is through the following industry standard file access protocols:

- NFS™ file system
- Common Internet File System (CIFS)

The filer includes a web-based administration tool that provides an easy-to-use graphical user interface (GUI).

FIGURE 1-1 and FIGURE 1-3 illustrate how a filer can interact in a common network environment.

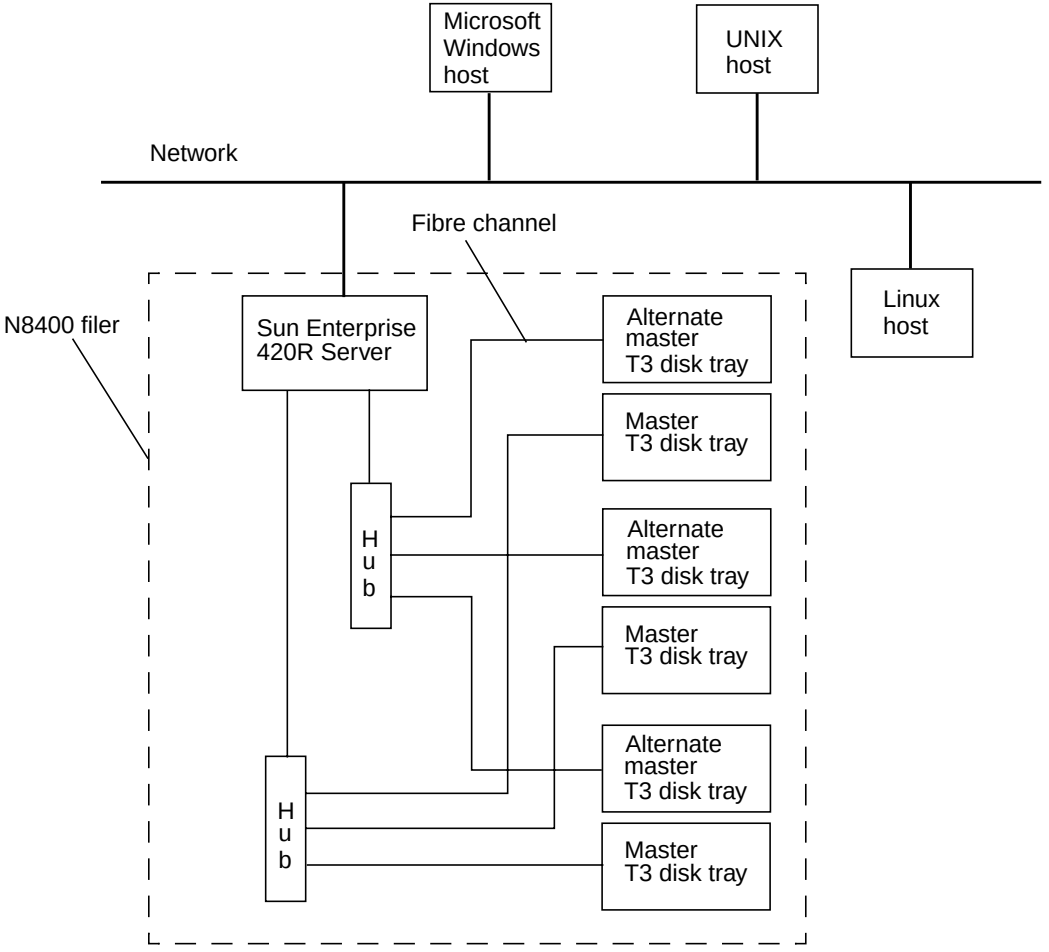

FIGURE 1-1 Sun StorEdge N8400 Filer (3-Tbyte Storage Configuration) System Example

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Note – The N8400 filer system storage can be expanded in 1.0-Tbyte increments to a maximum of 4 Tbytes. This is done by adding Sun StorEdge T3 Disk Tray partner groups for a maximum of eight individual disk trays. Contact your local Sun sales representative for more information.

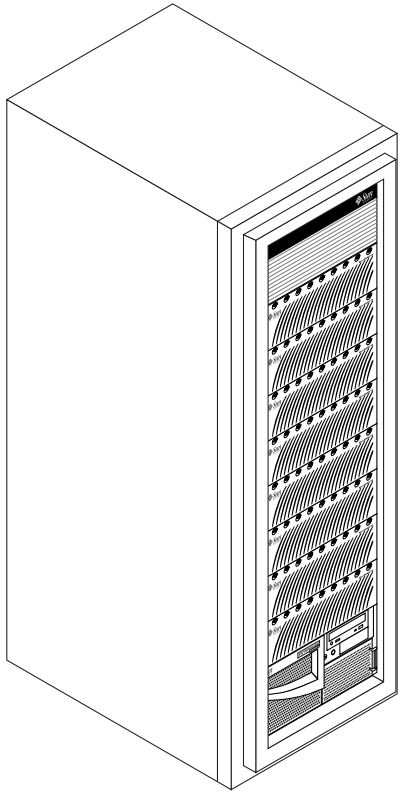

FIGURE 1-2 Sun StorEdge N8400 Filer with Maximum Storage Configuration

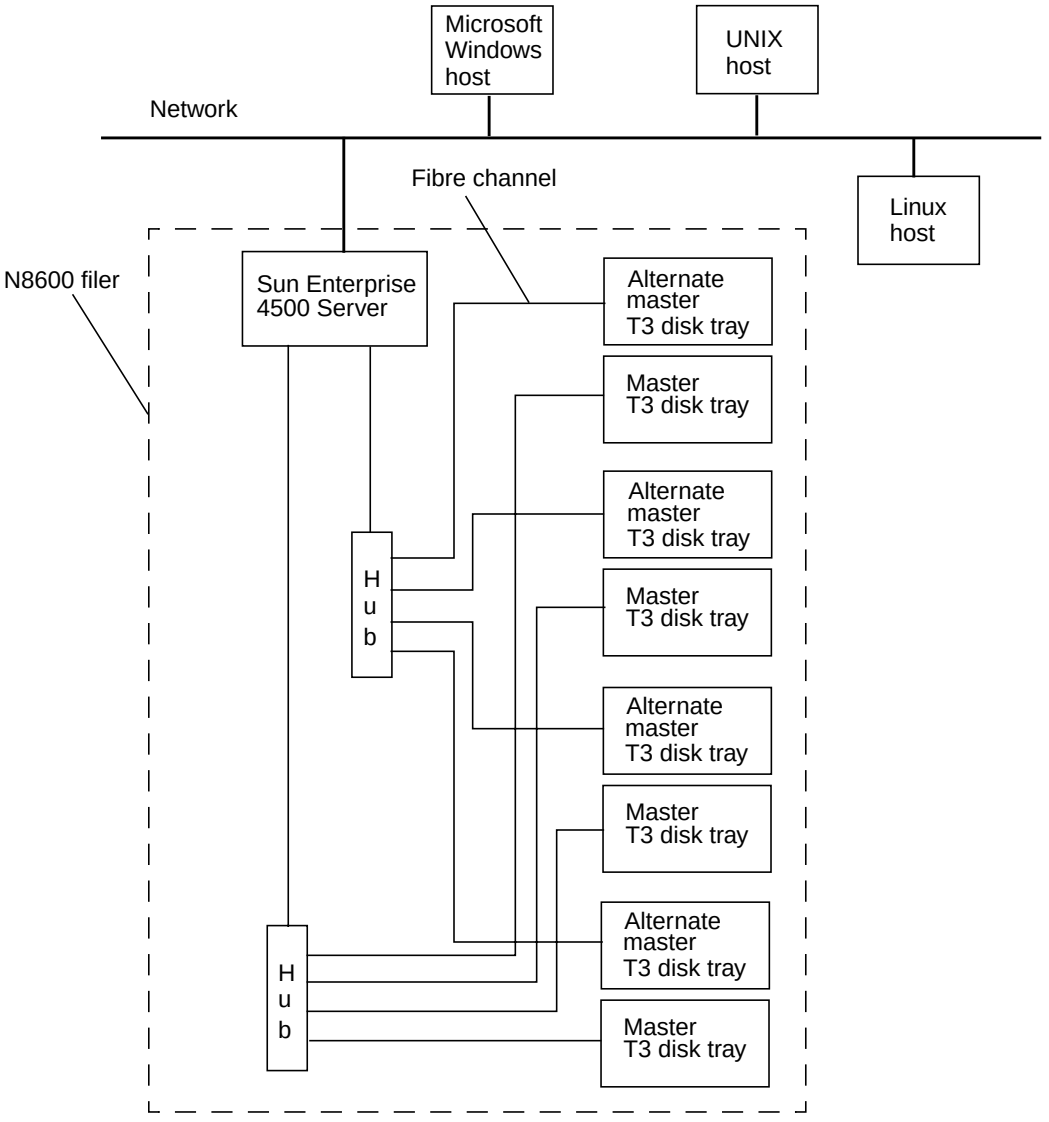

FIGURE 1-3 Sun StorEdge N8600 Filer (Minimum Storage Configuration) System Example

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Note – The N8600 filer system storage can be expanded in 1.0-Tbyte increments to a maximum of 10 Tbytes. This is done by adding Sun StorEdge T3 Disk Tray partner groups for a maximum of 20 individual disk trays. Contact your local Sun sales representative for more information.

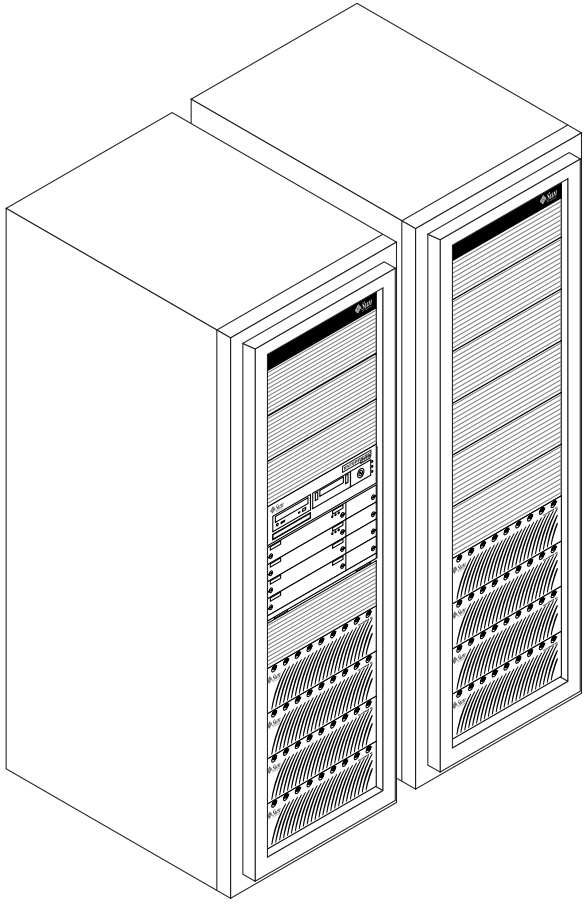

FIGURE 1-4 Sun StorEdge N8600 Filer with Minimum Storage Configuration

CHAPTER 2

The Filer Administration Tool

This chapter describes the Filer Administration Tool functions that are used to administer hosts on the network. The Filer Administration Tool main window has a tab for each of the six administration functions. This chapter provides a description of these functions, and is organized as follows:

Getting Started

Use this procedure to start the Filer Administration Tool after installing the filer or after restarting the system from a shutdown.

▼ To Start the Filer Administration Tool

1. **Start the Netscape™ web browser.**

Note – The Filer Administration Tool has been optimized for the Netscape 4.*x* browser.

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2. **Type the following in the URL location field:**

```
http://hostname:port
```

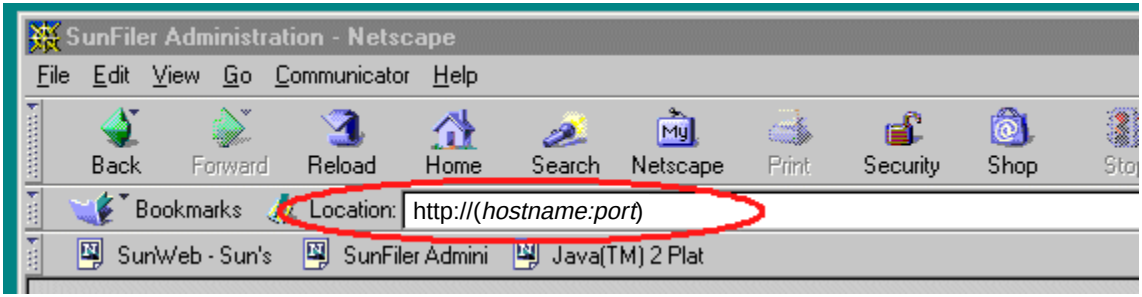

FIGURE 2-1 Typing the Filer URL

The Password dialog box is displayed.

3. **Type the password you specified during installation.**

   The Filer Administration Tool is displayed and is ready to use as shown in FIGURE 2-2.

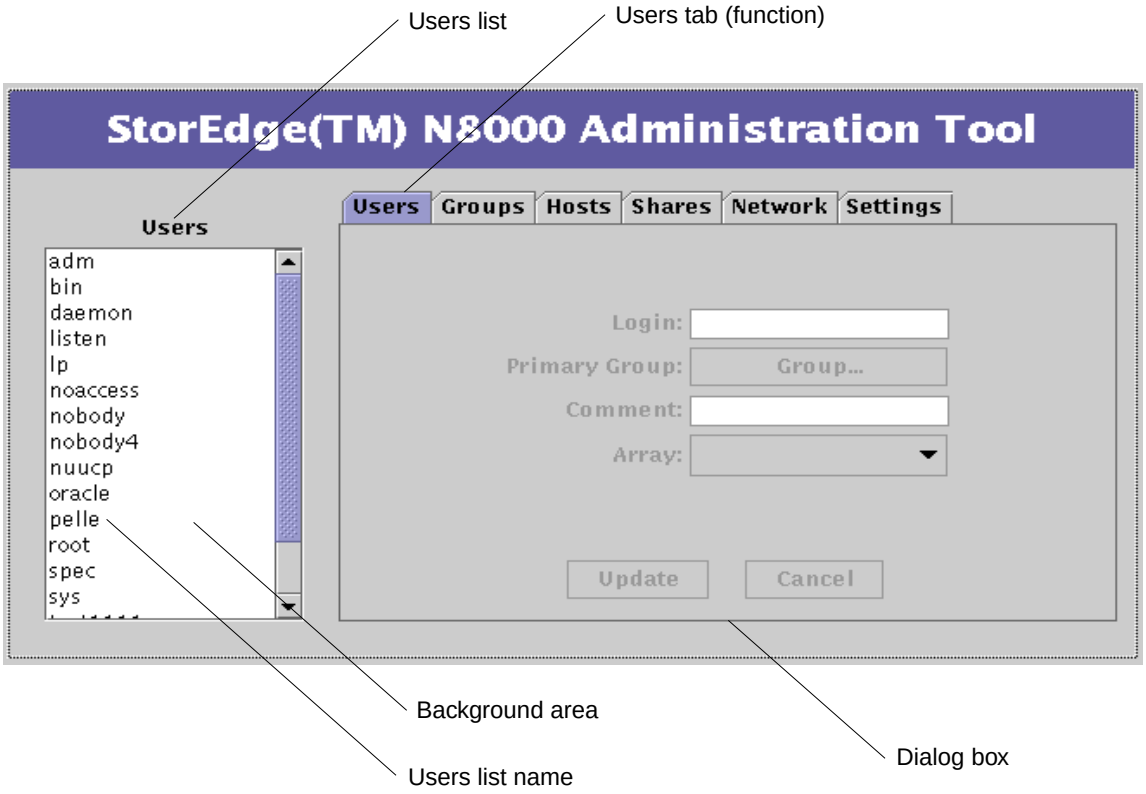

FIGURE 2-2 Filer Administration Tool Main Window

The Filer Administration Tool consists of a menu with a list box on the left and a dialog box on the right. The dialog box has a tab for each of the six administration functions:

- Users
- Groups
- Hosts
- Shares
- Network
- Settings

These functions are described in this chapter, and a business example that demonstrates using the Filer Administration Tool is provided in Chapter 3.

Important Information

Filer Administration Tool Protocols

1. When the Filer Administration Tool opens, the Users list on the left shows all the user account names currently configured on the filer. Some of the account names displayed in this list are system-supplied account names and should not be changed or deleted.

2. Whenever you start to edit a function, you must either enable the changes by using Update or cancel by using Cancel.

3. If you right-click on either a name or the background area of a function menu dialog box list, a *context-sensitive* menu is displayed.

   Context-sensitive means that only those functions that are applicable at that time are displayed. For example, if you right-click on a user name, the full range of options are displayed; but if you right-click on the background, only the Add option is displayed.

4. If the filer has been configured to use the Network Information Service (NIS), and View User is selected, the Array button does not show the associated array (it goes blank) unless the user's home directory corresponds to one of the existing storage devices with the filer.

If the Filer is Configured for NIS

The Network Information Service (NIS) provides a method to easily administer multiple machines by maintaining a centralized database of critical system information about such things as user accounts, groups, and hosts. When the filer is configured to use NIS, the filer Administration Tool does not allow updates to the information being provided by NIS. Access to this information is limited to viewing and reference in other Administration Tool functions.

Name Services

Caution – The CLI is a collection of filer commands to be used by the system administrator. This administrator (admin user) has limited access to the filer CLI commands. The admin user is, in effect, within a restricted shell, and can not perform any task other than those that are provided with the CLI command set.

However, the root user (super user) has unlimited access to all areas of the filer. Therefore, when logged in as the root user, any changes made to these or other commands, either in configuration or in the code, can severely impact the filer's functionality, or prevent proper and predictable results.

Currently the Filer Administration Tool and command-line interface (CLI) support only NIS. Although it is possible to manually configure a filer to use name services other than NIS, the Filer Administration Tool and CLI should not be used for user account management in such configurations.

Some examples of Name Services are NIS, NIS+, DNS, and LDAP.

Access Restrictions

In order to limit access to the CLI, it is necessary to always use the supplied management tools to manage user accounts.

Not using these tools can result in a situation where non-administration users can log into the filer and use it for purposes it was not intended. Doing this would compromise performance because the filer is specifically tuned for file serving.

User Authentication

Each filer is dependent on its own internal databases for user account authentication. This is done to address the need for restricted access as described above.

In a name service environment it is necessary to use the download function in either the Filer Administration Tool and the CLI.

The download function copies the user information from a name server to the local databases of the filer. This eliminates the need to manually re-enter information about an account on each filer.

File Locking

File locking must be considered in an environment where data is accessed for update (read / write) from multiple locations simultaneously. If the filer is operating in an environment where data is not updated simultaneously, or updates are made only through the clients connected via CIFS, no special precautions are required. However, if the filer is operating in an environment where data is updated simultaneously through both the NFS and CIFS protocols, the following precaution must be observed. For all applications that use NFS to access data, ensure that the application establishes a “UNIX advisory lock” on all data being updated.

Caution – If an application uses both NFS and CIFS protocols to access data and does not have a “UNIX advisory lock” established, simultaneous updates can result in corrupted data.

Users Tab

Use this tab (function) is used to assign account names to users so they can access data on the filer.

When the Filer Administration Tool opens, the Users tab is highlighted by default as shown in FIGURE 2-3. The Users list on the left shows all the user account names currently configured on the filer. Some of the account names displayed in this list are system-supplied account names and should not be changed or deleted.

Caution – Never delete or modify a system-supplied account name.

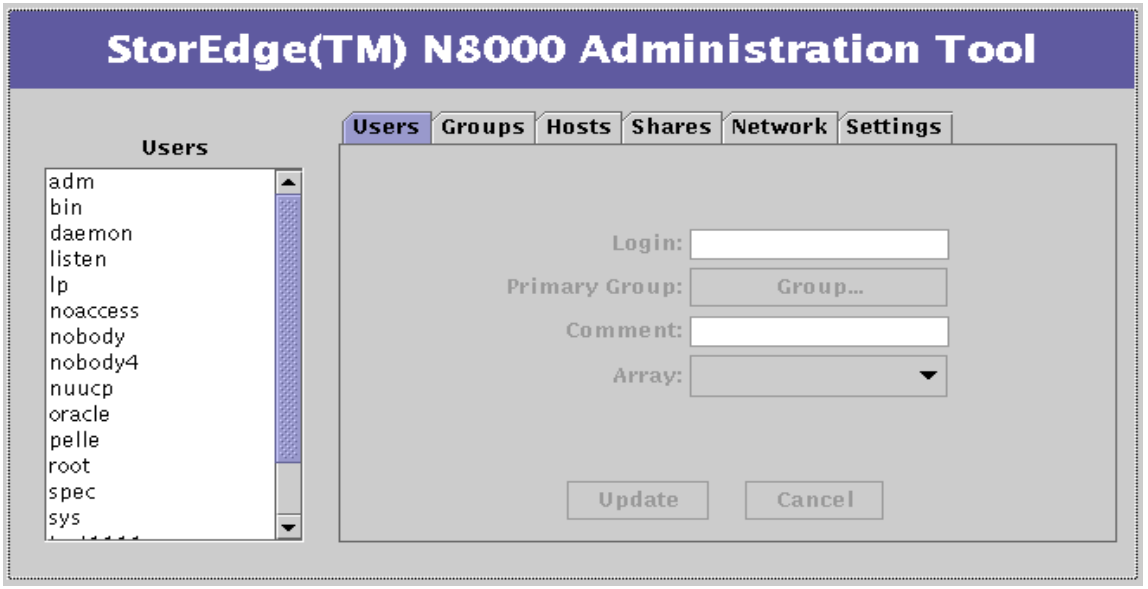

FIGURE 2-3 Filer Administration Tool Main Window

Users Options for a Filer Not Configured for NIS

When you right-click a name in the Users list with a non-NIS configured filer, a menu is displayed with the following four options, as shown in FIGURE 2-4.

- View User
- Add User
- Change User
- Remove User

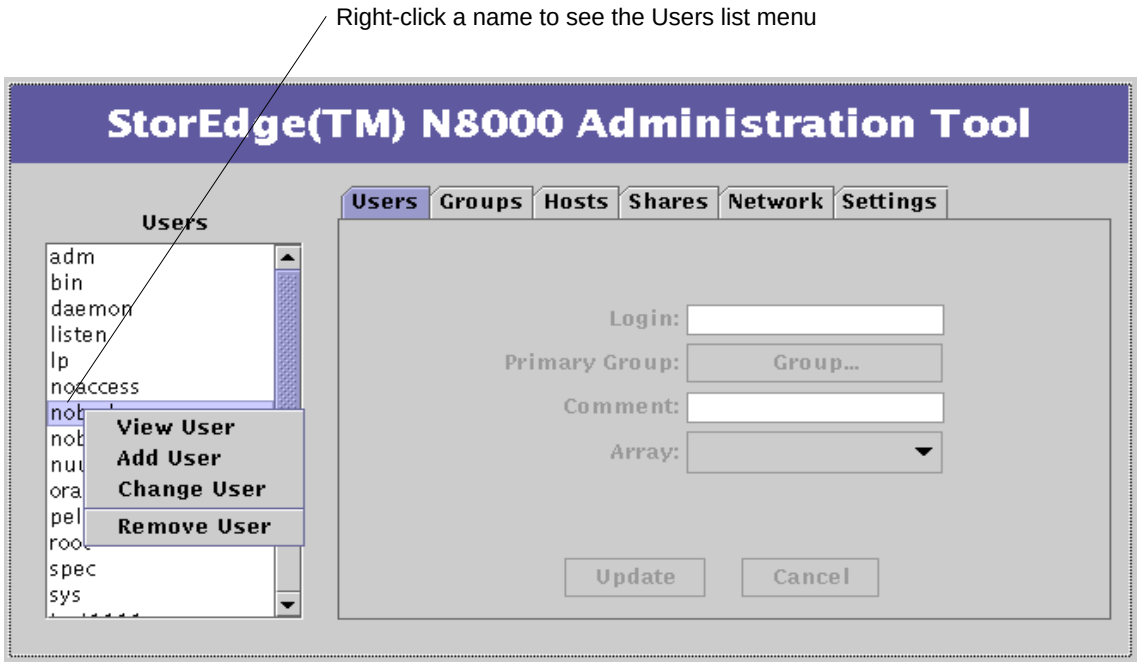

FIGURE 2-4 Users List Menu for a Non-NIS Environment

Users Options for a Filer Configured for NIS

When you right-click a name in the Users list with an NIS configured filer, a menu is displayed with the following three options, as shown in FIGURE 2-5.

- View User
- Download
- Remove User

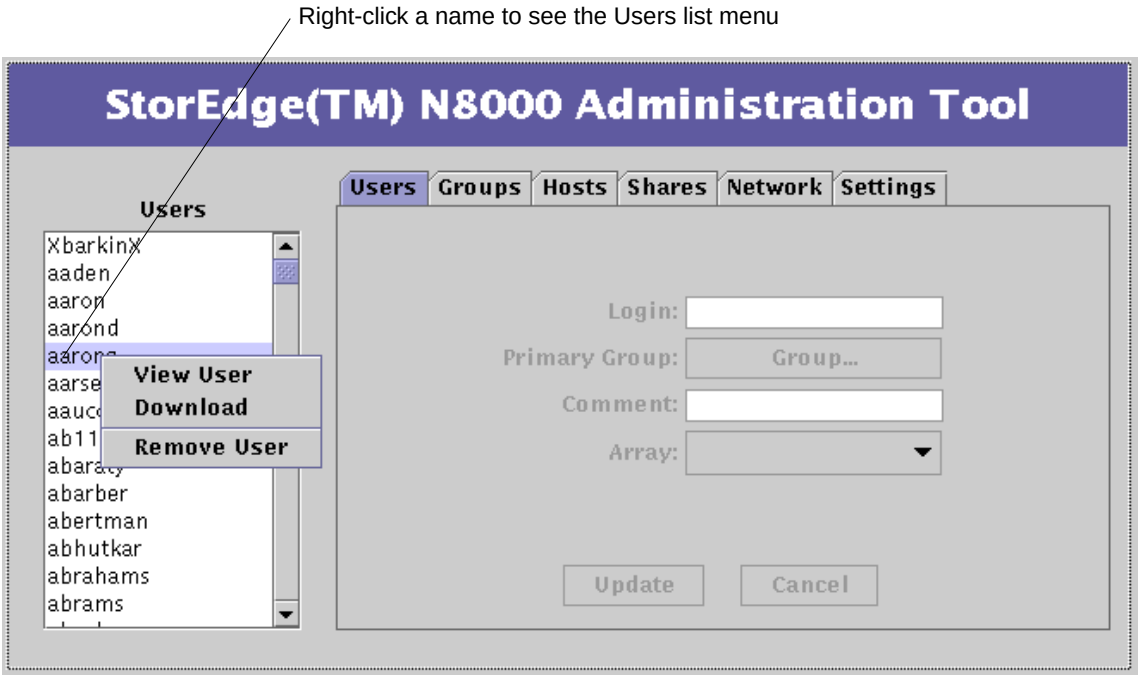

FIGURE 2-5 Users List Menu for a NIS Environment

Users Tab Dialog Box

The Users tab dialog box is shown in FIGURE 2-6. A description of the dialog box features and data entry fields appears below the figure.

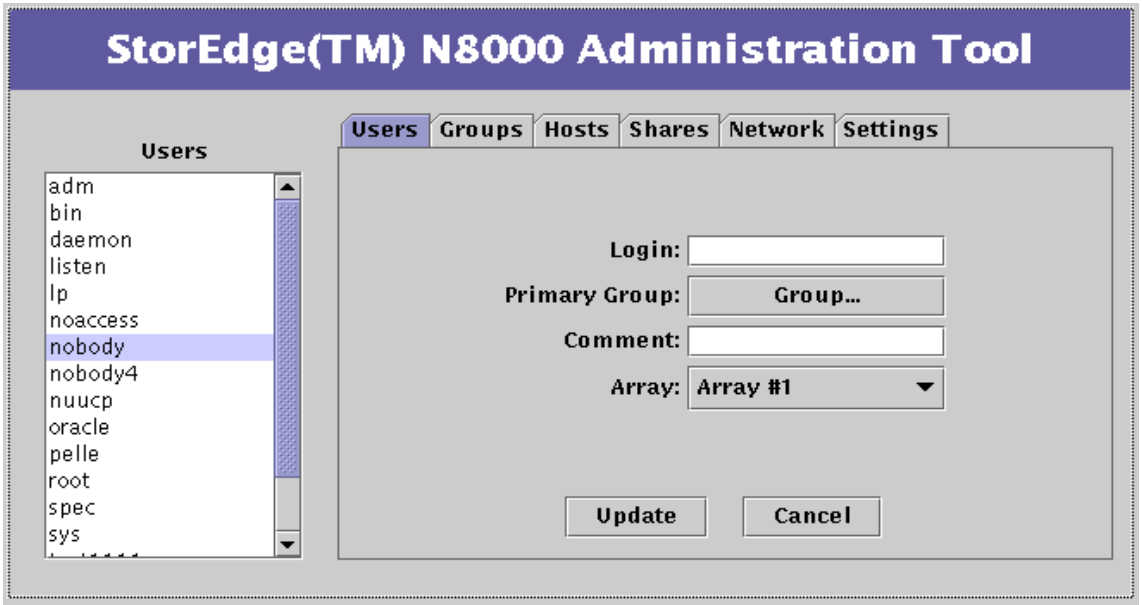

FIGURE 2-6 Users Tab Dialog Box for Non-NIS Configured Filer

- **Login**. This field is used to assign a short name (no more than eight alphanumerics) to identify a user to the system.
- **Primary Group**. This field is used to assign a group name. Every user must be assigned to a primary group. A user can be a member of more than one group. Groups are used to manage permissions within the filer system. A group can have access only to specified files and directories.
- **Comment**. This field is typically used to associate a full name to an account user name.
- **Array**. This field is used to assign a the user to an array in a multi-array environment. There might be more than one array within a filer; this allows an administrator to balance the load and manage capacity more efficiently.

- **Update**. Click Update to:
  - Create a new user account.
  - Create a new home directory for the user account on the indicated array.
  - Make the user account home directory available through the NFS and CIFS protocols.
- **Cancel**. Cancels the immediate transaction.

Users Tab Options

View User

View User populates the data entry fields with information about the highlighted user name. The information shown in the data entry fields is light gray to indicate that the fields are inactive.

Add User

Add User activates the dialog box (see FIGURE 2-6) so you can add a user account to the filer system.

Change User

Change User enables you to change the following fields for an existing user.

- Primary Group
- Comment

Click Update to make the changes effective.

Download User

Copies information required to authenticate the user from the NIS database to the filer's local database. This function must be executed for each user that will access files stored on the filer.

Remove User

Remove User removes the selected user account from the filer.

This function does not remove the user's home directory on the filer; thus minimizing the chance of permanently removing important data. Removal of a user's home directory must be done using operating system commands.

Groups Tab

This tab (function) enables you to combine multiple users into a logical unit for the purpose of controlling access to files and directories. The Groups function works in a similar fashion to the Users function.

When you right-click a name in the Groups list, a menu is displayed with four options as shown in FIGURE 2-7.

- View Group
- Add Group
- Change Group
- Remove Group

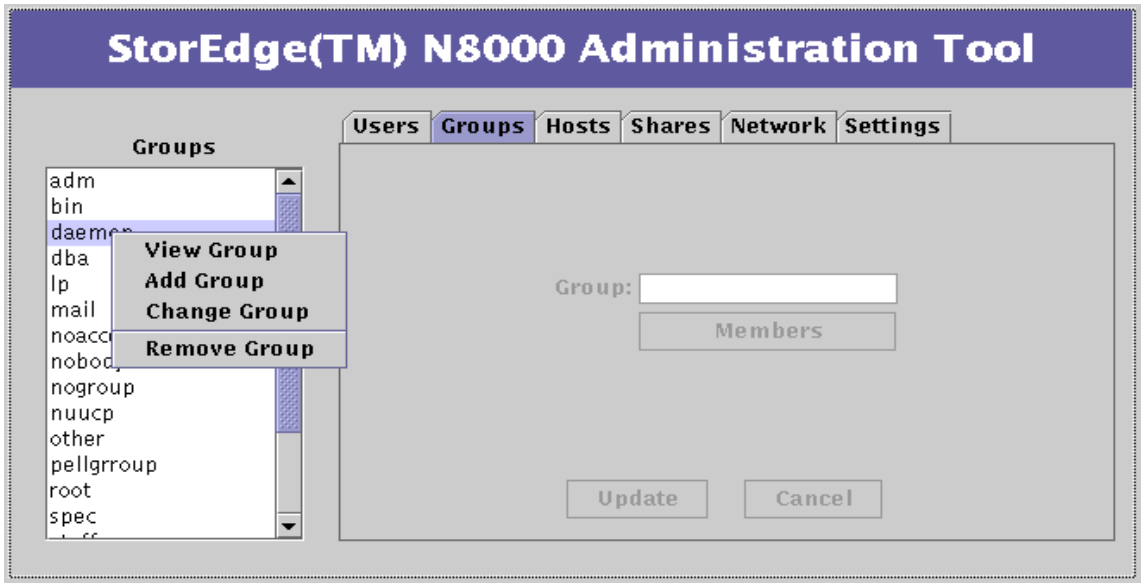

FIGURE 2-7 Groups Tab List Menu

Groups Tab Dialog Box

The Groups tab dialog box is shown in FIGURE 2-8. A description of the dialog box features and data entry fields appears below the figure.

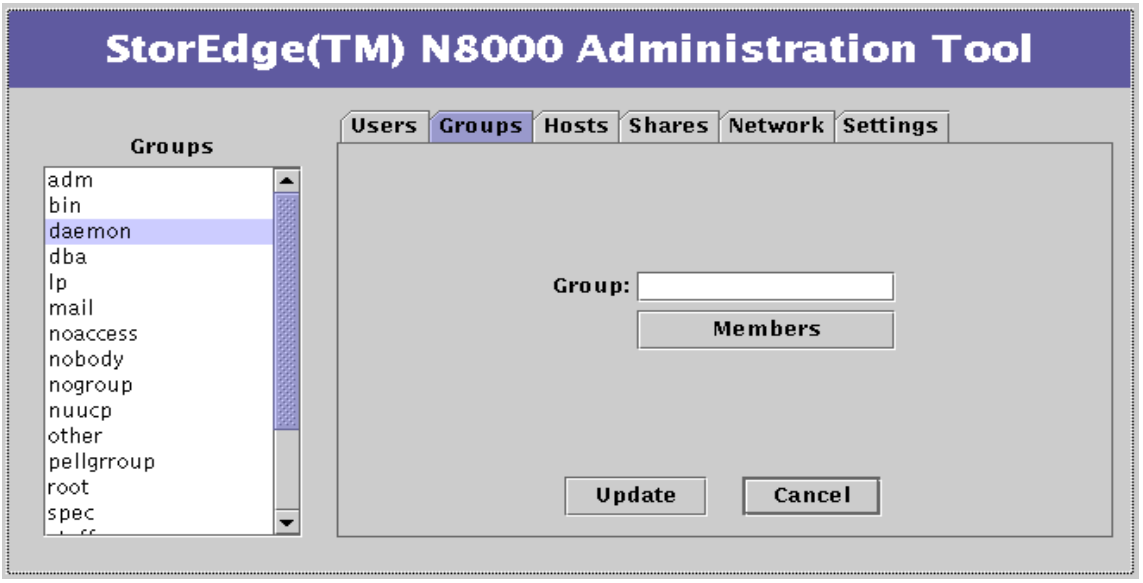

FIGURE 2-8 Groups Tab Dialog Box

- **Group**. This field enables you to name (no more than eight alphanumerics) a new group.
- **Members**. Use this button to select members for a new group. When you click on this button, a new Member Selection list is displayed with available users. To select multiple users for a group, hold down the control key and click on the names in the list.
- **Update**. Click Update to:
  - Create a new group with the indicated membership.
  - Create a new home directory for the group account on the indicated array.
  - Make the group account home directory available through the NFS and CIFS protocols.
- **Cancel**. Cancels the immediate transaction.

Groups Tab Options

View Group

View Group populates the filer window data entry field with information about the highlighted group name. The information shown in the data entry field is light-gray to indicate that the fields are inactive. Click Members to view the membership of the selected group.

Add Group

Add Group activates the dialog box, as shown in FIGURE 2-8.

Change Group

This option enables you to change the membership composition of a selected group.

Click Members to see a Member Selection list with all the current group members. To change the group membership, Control-click to highlight only the desired members, and then click Apply. Only the highlighted members will remain in the group.

Note – For the Change Group option, if you do not hold down the Control key to select or deselect a name in the list box, all currently selected members will be de-selected! If this happens and you want to regain the original membership, simply click Cancel.

Remove Group

Remove Group removes the selected group account from the filer.

Hosts Tab

A host is another name for a computer, or other device, that resides on a network. Each host is uniquely identified on a network by its Internet Protocol (IP) address. An IP address is made up of four numbers, each with a range of 1 to 254, that are separated by periods. In addition, a host can have a name assigned to it for convenience in referring to a specific host. See TABLE 2-1 for examples.

TABLE 2-1 Host Identification Examples

Host Name	IP Address
filer-05	192.168.17.11
benchpress	129.10.56.20

Hosts can have multiple names (aliases) that can refer to the same machine.

Caution – System-supplied host names should not be modified or removed. These include the hostname assigned during the installation of the filer, as well as "localhost."

The Hosts tab (function) is important because, in conjunction with the Shares function, it is another method by which administrators can control the access to the filer data files. The Shares function (which is discussed later) enables the administrator to establish read-only or read-and-write permissions to specific directories based on a specific host.

When you right-click a name in the Hosts list, a menu is displayed with three options, as shown in FIGURE 2-9.

- View Host
- Add Host
- Remove Host

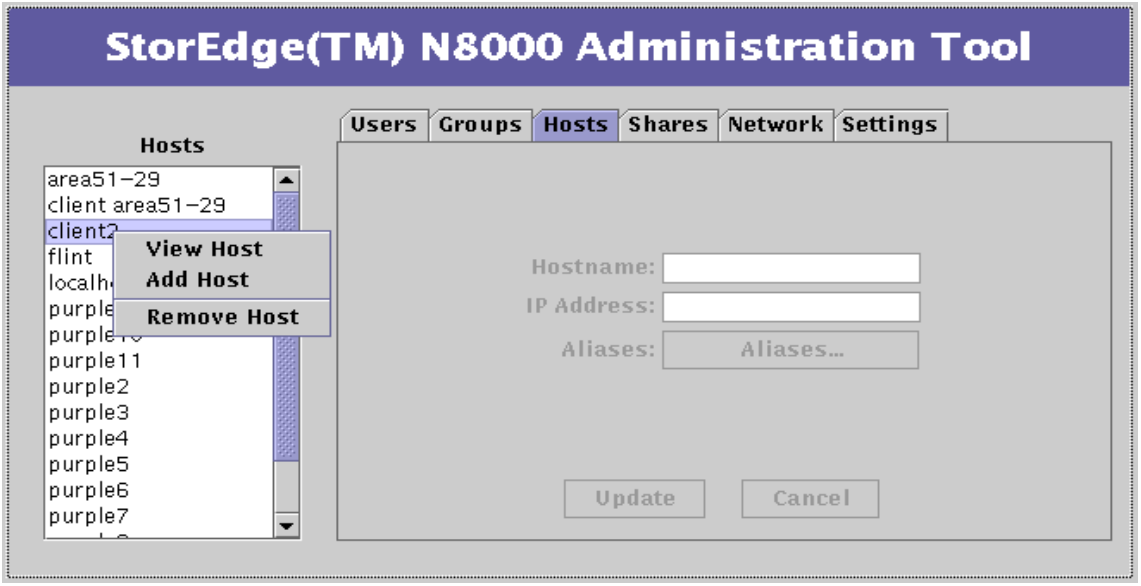

FIGURE 2-9 Hosts Tab List Menu

Hosts Tab Dialog Box

The Hosts tab dialog box is shown in FIGURE 2-10. A description of the dialog box features and data entry fields appears below the figure.

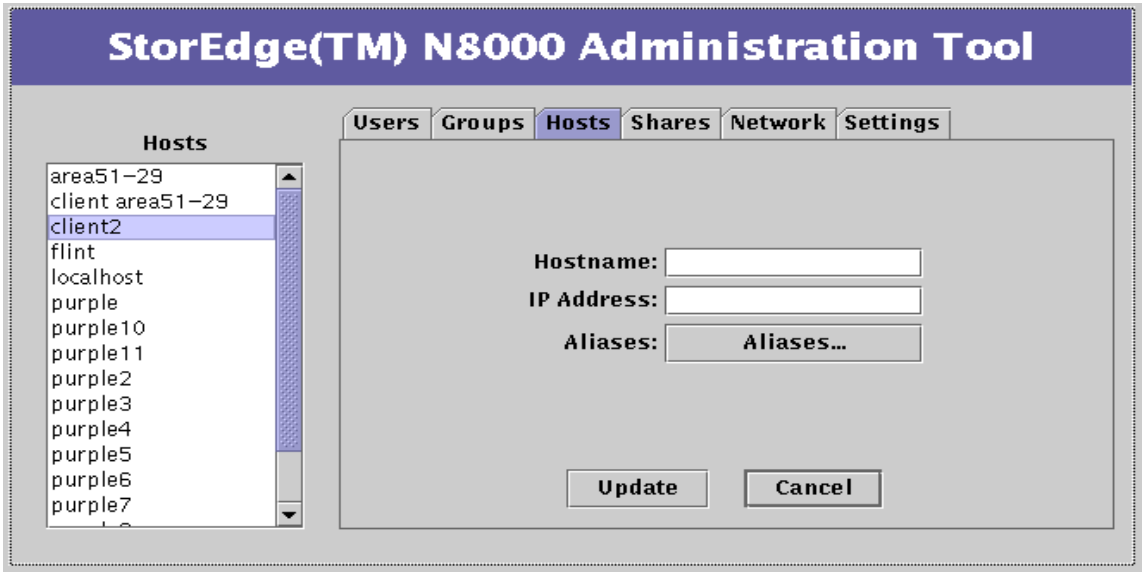

FIGURE 2-10 Hosts Tab Dialog Box

- **Hostname**. This field enables you to assign a primary name to a new host.
- **IP Address**. This field is used to establish a new host IP address.
- **Aliases.** This button enables you to configure alternate names for a given host.
- **Update**. This button enables you to make any changes effective and continue with Hosts Tab processing.
- **Cancel**. This button cancels the immediate transaction.

Hosts Tab Options

View Host

View Host populates the filer window data entry field with information about the highlighted group name. The information shown in the data entry field is light-gray to indicate that the fields are inactive.

Add Host

This option enables you to add a host, which can later be assigned read and write or read-only access to a share. Add Host activates the dialog box, as shown in FIGURE 2-10.

Remove Host

Remove Host removes the selected host account from the filer.

Shares Tab

Shares is the means by which the filer makes its local disk space available to other networked hosts and users on those hosts. This means that for each share, there is an underlying directory that it is “sharing” with the rest of the network.

When you right-click a name in the Shares list, a menu is displayed with three options, as shown in FIGURE 2-11.

- Add Share
- Change Share
- Remove Share

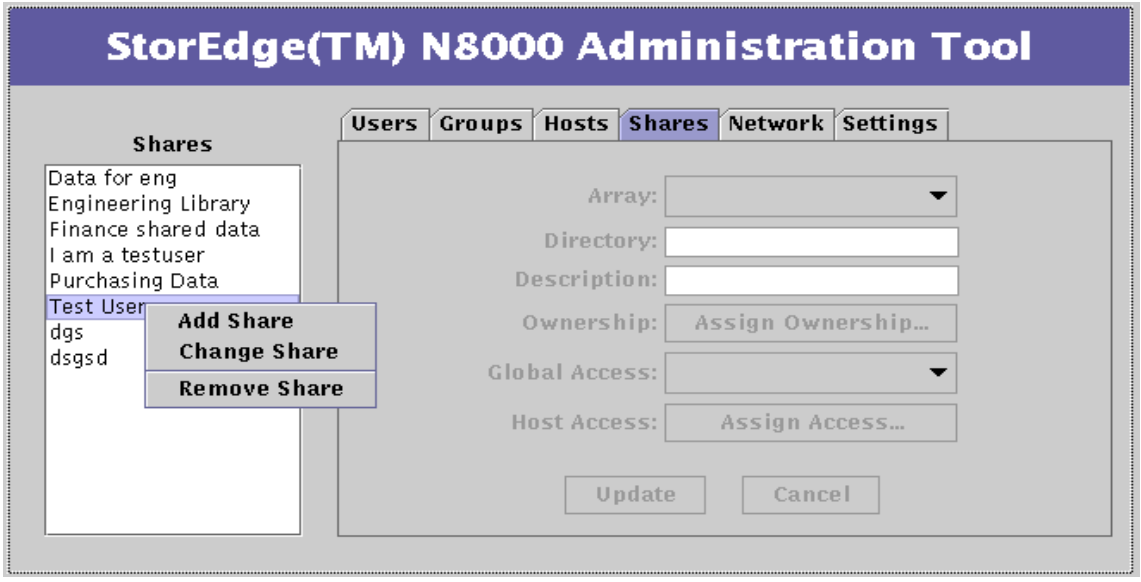

FIGURE 2-11 Shares Tab List Menu

Shares Tab Dialog Box

The Shares tab dialog box is shown in FIGURE 2-12. A description of the dialog box features and data entry fields appears below the figure.

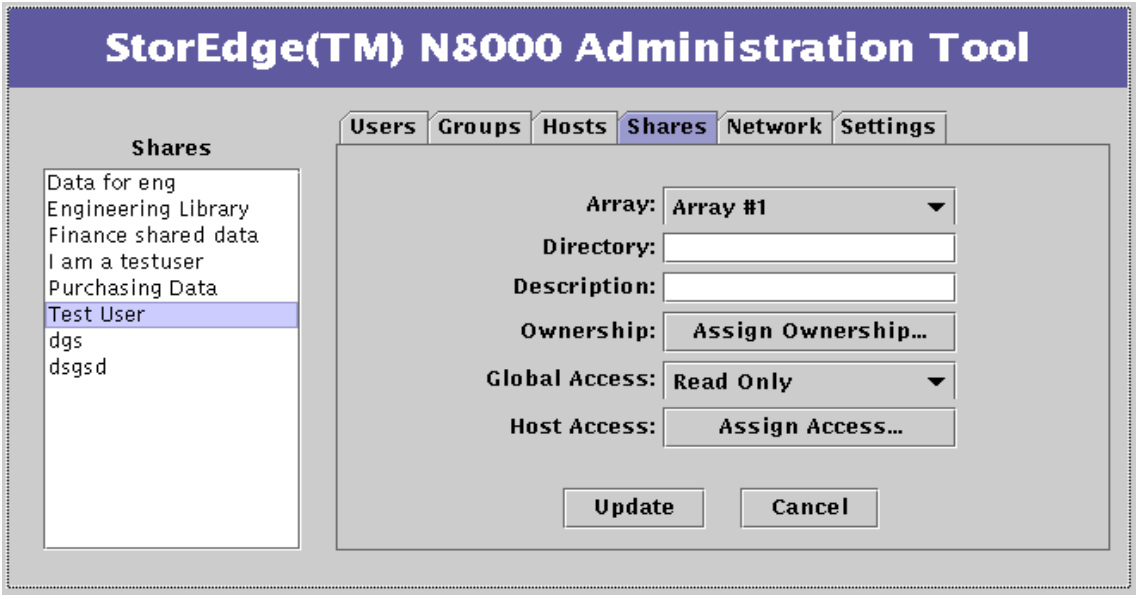

FIGURE 2-12 Shares Tab Dialog Box

- **Array**. Enables you to choose from a list of available arrays. These arrays correspond to the storage devices that are configured on the system. The array name (for example, array #1) is a generic name and has nothing to do with the operating system. The array field maps to a top-level directory such as `/data1`, `/data2`, `/data3`, or `/data4`.
- **Directory**. This field is used to name the directory that will share information on the array specified above.
- **Description**. This field is used to establish the common name for the share that will appear in the Shares list.
- **Ownership**. This button is used to assign user and group ownership to a directory created on the network by the Add Share option. The default user is “root” (the superuser), and the default group is “other.” Once ownership of a directory is assigned, the owner is responsible for setting the permission levels on all the files and subdirectories that reside inside a share.

- **Global Access**. This button is used to establish the access level that any system on the network would have if it mounted this share. It is either Read Only or Read/Write.

  Administrators can create a share and set global access to read or write, but set permissions (using the system commands `chown`, `chgrp`, and `chmod`) so that only one person or a select group of people can have access to it.

- **Host Access**. This button works in a similar fashion to the Global Access button, except that it enables a finer level of control by the host. When you select the Host Access button, a dialog box is displayed with a list of hosts and a data entry field. When you right-click on a name in the host list, a menu with four options is displayed: Update Access, Add Host, Remove Host, and Revert.
  - **Update Access** enables you to select an existing host of this Host Access dialog box host list to change the level of access.
  - **Add Host** enables you to add a new host to the Host Access dialog box host list to set the level of access. This host must have already been added to the main host list with the Host function.

Note – The Add Host process does not add a host to the Hosts Function list; it adds a host only to the Host Access dialog box list.

  - **Remove Host** enables you to remove a host from the Host Access dialog box host list.
  - **Revert** enables you to undo any changes made to the Host Access dialog box host list. The list reverts back to the state before the Host Access dialog box was opened.

  In addition to Read Only and Read/Write, there is a Root access level on the Host Access dialog box. This allows full administrative level access to the named share from a specified remote host.

  There are also two buttons at the bottom of the dialog box.

  - **Update** enables you to make any changes effective and continue with Host Access processing.
  - **Finished** terminates the Host Access session.

Note – If the access assigned to a host matches the share's global access, that host will not appear in the Host Access dialog box host list after an update.

- **Update**. This button enables you to make any changes effective and continue with Shares Tab processing.
- **Cancel**. This button cancels the immediate transaction.

Shares Tab Options

Add Share

This option enables you to create a directory on the filer and make that directory available on the network. Add Share activates the dialog box, as shown in FIGURE 2-12.

Change Share

Change Share enables you to modify the permissions of a share. It works in a similar fashion to Add Share except the Array button is not available.

Remove Share

This option removes the selected share from the filer.

Network Tab

The Network tab (function) allows you to configure the network interfaces that have been installed on the filer. When the filer was installed and configured, the primary interface was established when the prompts for the hostname and IP address were answered. This function enables you to set up additional network interfaces. Each additional interface must have a unique name and address.

Note – Additional network functionality is available. See “trunk” on page 113.

When you right-click a name in the Network list, a menu is displayed with the following three options, as shown in FIGURE 2-13.

- View
- Change
- Disable

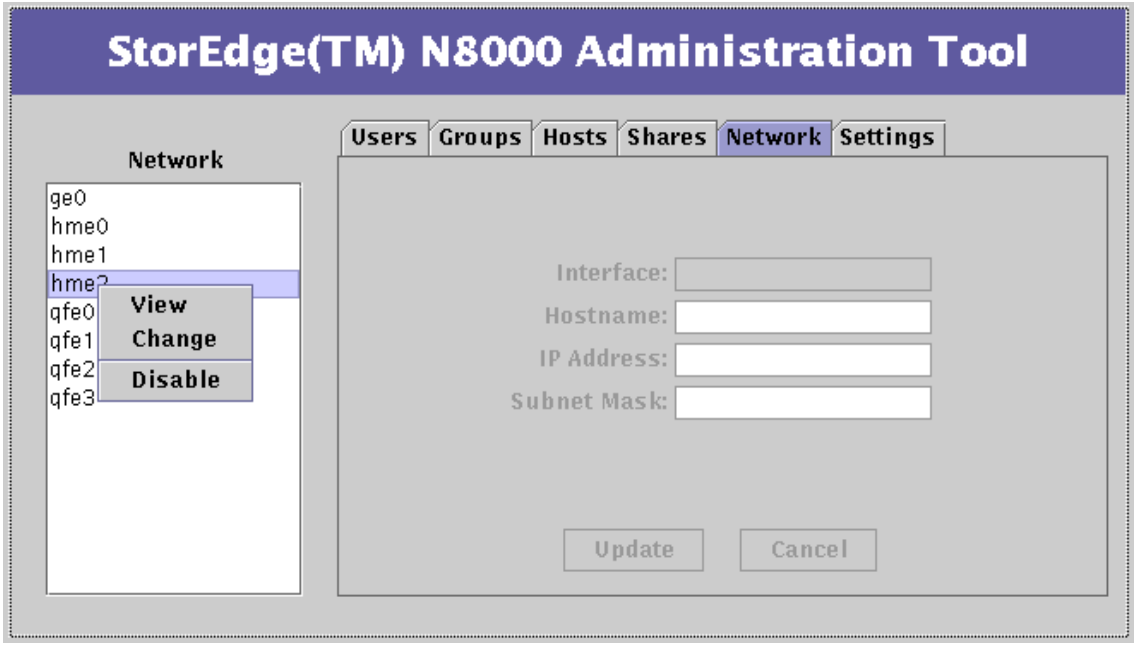

FIGURE 2-13 Network List Menu

Network Tab Dialog Box

The Network tab dialog box is shown in FIGURE 2-14. A description of the dialog box features and data entry fields appears below the figure.

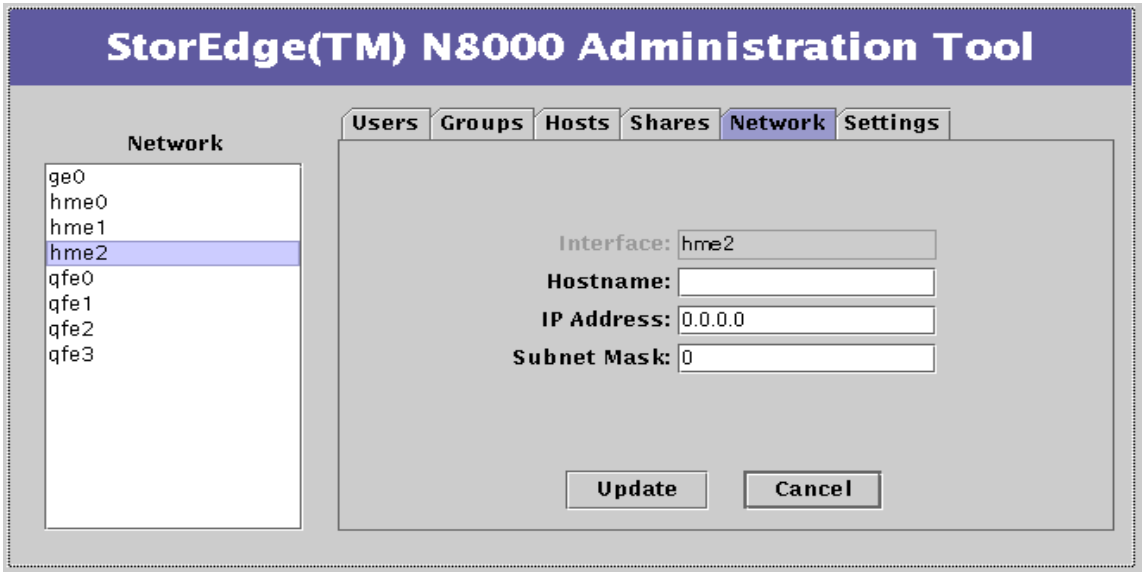

FIGURE 2-14 Network Function - Change

- **Hostname**. This field enables you to assign a unique name to the network interface being changed.
- **IP Address**. This field is used to assign a unique IP address to the network interface being changed.
- **Subnet Mask.** This field enables you to set the subnet mask for the interface being configured. The subnet mask can be entered in either of two ways:
  - Decimal notation; for example, 255.255.255.0
  - Hexadecimal notation; for example ffffff00
- **Update**. This button enables you to make any changes effective and continue with Network Tab processing.
- **Cancel**. This button cancels the immediate transaction.

Caution – Changing the configuration of the network interfaces could cause communication problems between the filer and the rest of the network. Be careful to ensure the filer conforms to the configuration settings of the other hosts on the network.

Network Tab Options

View

View populates the filer window data entry field with information about the highlighted interface. If an interface has not been configured, the IP address field will be set to 0.0.0.0. The information shown in the data entry field is light-gray to indicate that the fields are inactive.

Change

This option enables you to change the configuration of a network interface. Change is also used to configure a previously unconsidered interface.

Disable

This option resets the selected network interface to an unconfigured state. Disable reset all values, including the hostname and IP address.

Settings Tab

The Settings tab (function) is used to configure various system settings and parameters.

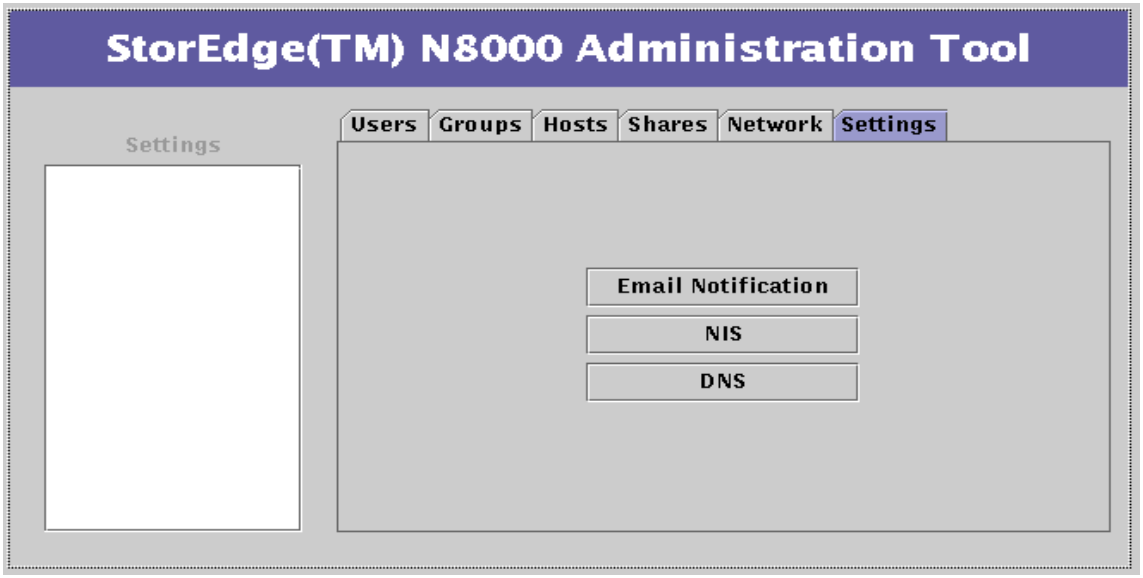

FIGURE 2-15 Settings Function Dialog Box

Settings Tab Dialog Box

When you open the Shares function, a dialog box with three active buttons is displayed, as shown in FIGURE 2-15.

- **Email Notification.** This button is used to configure one or more email addresses to which notification will be sent if a hard drive should fail. Such notifications are sent on either a failure of one of the RAID-protected data disks.

Note – To enable email notifications, a network mail server must be identified to the filer. To identify the network mail server, use the Host function to create a host named “mailhost” or assign the alias “mailhost” to an existing host.

- **NIS.** This button is used to change the Network Information Service (NIS) domain on which the machine resides. NIS is used to distribute various data files across multiple machines.
- **DNS.** This button is used to change the Domain Name System (DNS) information that filer uses to look up network addresses using host names. DNS is the counterpart of an IP address.

CHAPTER 3

Using the Filer Administration Tool

This chapter is organized as follows:

A Business Example

This section provides a typical business example and assumes that you are the system administrator for a company that needs to assign access to the filer for the Finance department. The Finance department has five members and a supervisor. The supervisor and possibly other members need to have different access permissions. The company CFO also needs read-only access to the filer data.

TABLE 3-1 Business Example Summary

Work Objective/Condition	Task	Reference
Start setting up the Finance department functional group.	1. Add a *group* account name for the department. Leave the group membership empty.	"To Add a New Group" on page 39
	2. Add a *user* account name for each member of the department. Assign each member to the group created above, and designate this group to be a primary group.	"To Add a New User" on page 42 Note: Whenever you add a user, a share for that user is automatically created (added) in the home directory. This share can then be modified or deleted with the Shares function.
An employee in the finance department quits.	1. Remove the employee's user account name from the system.	"To Remove a User" on page 46
	2. Delete the employee's user account name from the group.	"To Change a Group" on page 47
Create a common shared data area for the department.	1. Add a *host* name (IP address) for each machine in the department.	"To Add a New Host" on page 50
	2. Add a *share* for the department and establish the hosts, group(s), ownership, and access permissions.	"To Add a New Share" on page 55

TABLE 3-1 Business Example Summary *(Continued)*

Work Objective/Condition	Task	Reference
Set up access to the share for the CFO.	1. Add a *user* account name for the CFO.	"To Add a New Group" on page 39
	2. Add a *host* name (IP address) for the CFO's machine.	"To Add a New Host" on page 50
	3. Change the department *share* to add the CFO host with read-only access.	"To Change a Share" on page 63
The Engineering department is generating so much traffic that it impacts the performance of the primary network.	Move the Engineering department to a separate network and configure one of the filer's network interfaces for use on that network.	"To Change a Network Interface" on page 70
Set up email notifications and client services.	1. As the system administrator, set up email to automatically notify you of any hardware physical failures.	"To Change Email Notifications" on page 70
	2. Set up DNS client service.	"To Change DNS Client Services" on page 72
	3. Set up NIS client service.	"To Change NIS Client Services" on page 74

Procedures

This section contains the following procedures:

▼ To Add a New Group

Use this function to establish groups that can later be categorized into primary groups and subgroups. The new group can be left empty so that members can be assigned later.

1. **Click the Groups tab if it is not active.**
2. **Right-click in the background area of the Groups list.**

   The Groups list box submenu is displayed.

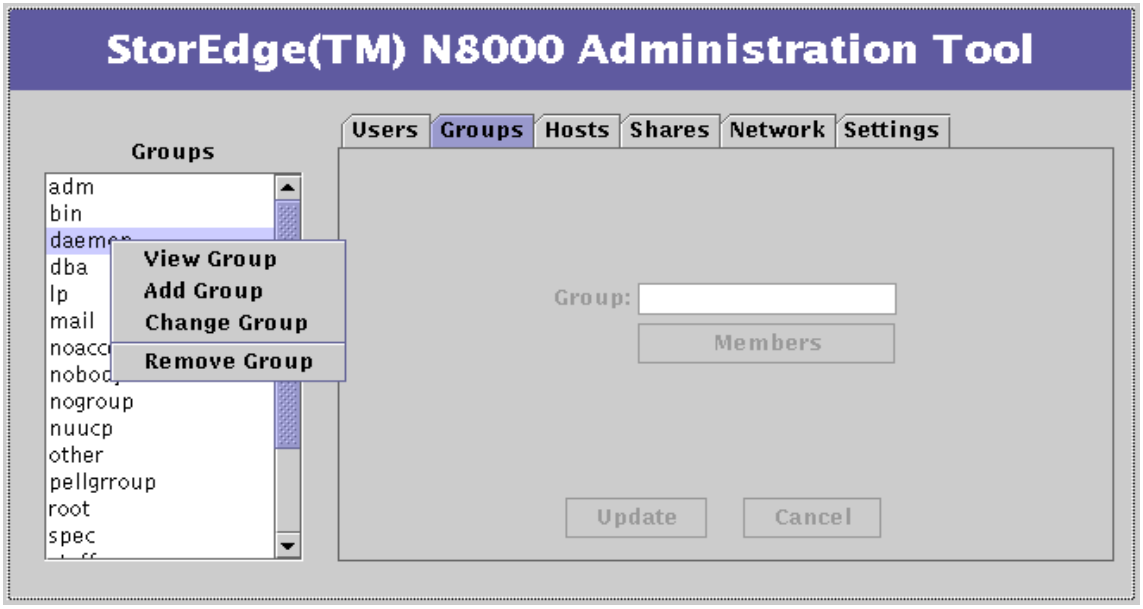

FIGURE 3-1 Groups List Menu

Note – If you right-click on either a name or the background area of a list, a context-sensitive menu is displayed. Context-sensitive means that only those functions that are applicable at that time are displayed. For example, if you right-click on a user name, the full range of functions are displayed; but if you right-click on the background, only the Add function is displayed. This is true for the list menus of all Filer Administration Tool functions.

---

3. **Choose Add Group.**

   The dialog box becomes active.

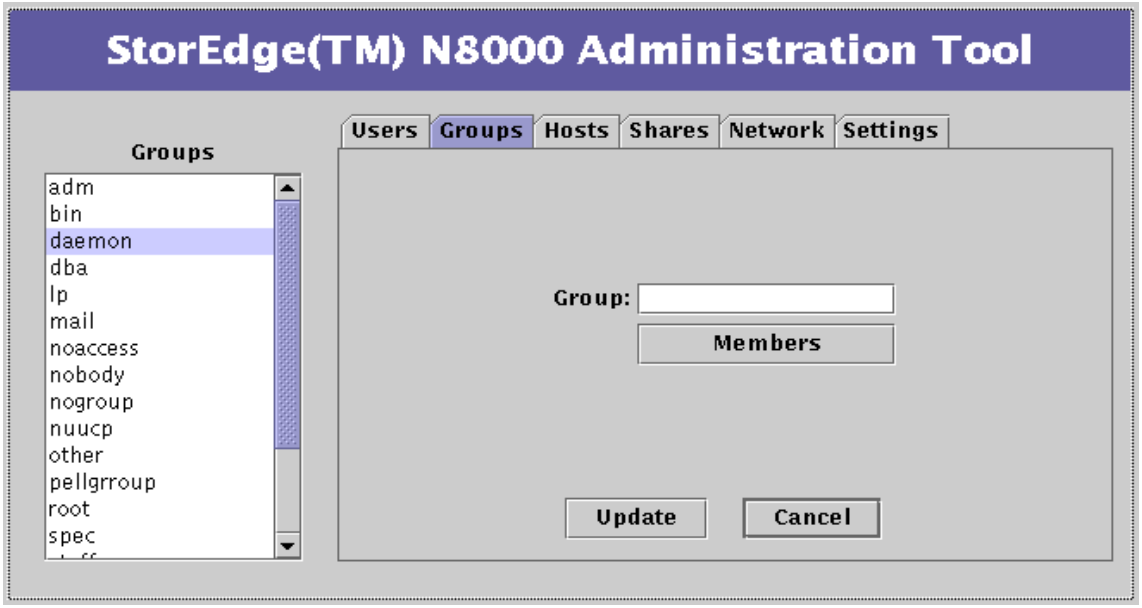

FIGURE 3-2 Groups Function - Add Group

4. **Type a unique group name with no blank spaces and with eight or less alphanumeric characters.**

5. **Click Members, or if the user(s) has not been added to the system yet (as in "A Business Example" on page 36) skip this step to leave the group empty so you can assign members later.**

   The Members Selection list, which shows all current users, is displayed.

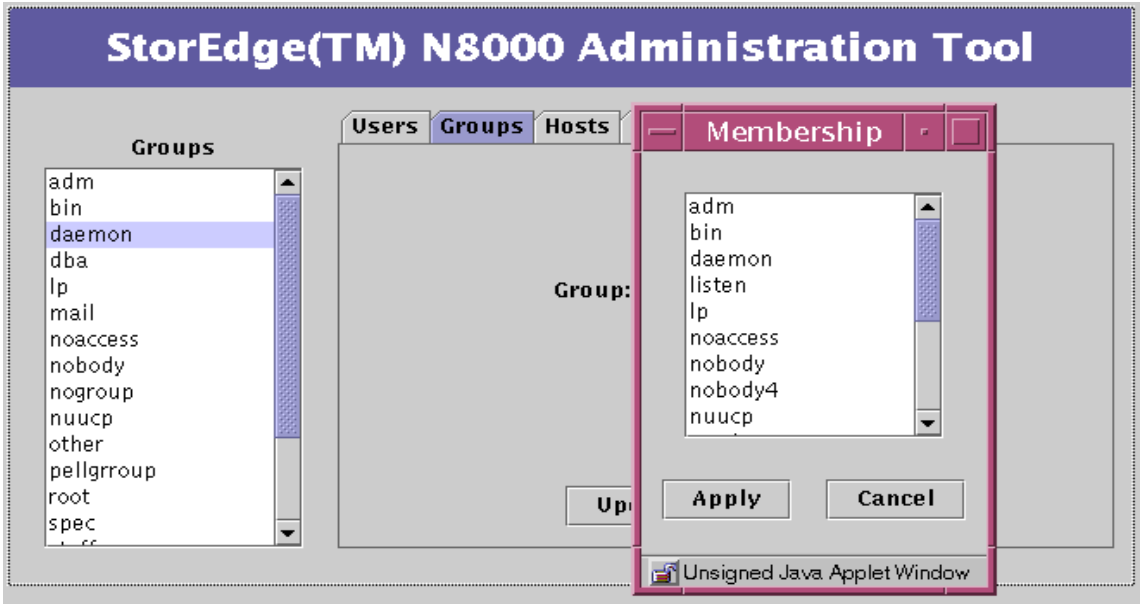

FIGURE 3-3 Groups Function - Members Selection

   a. **Control-click on all the member(s) to be added to the group.**

   b. **Click Apply.**

6. **Click Update.**

Note – Whenever you start to edit a function, you must either enact the changes by using Update or cancel by using Cancel.

---

7. **Verify that the new group is displayed in the Groups list box.**

▼ To Add a New User

1. **Click the Users tab if it is not active.**
2. **Right-click in the background area of the Users list box.**

   The Users list menu is displayed.

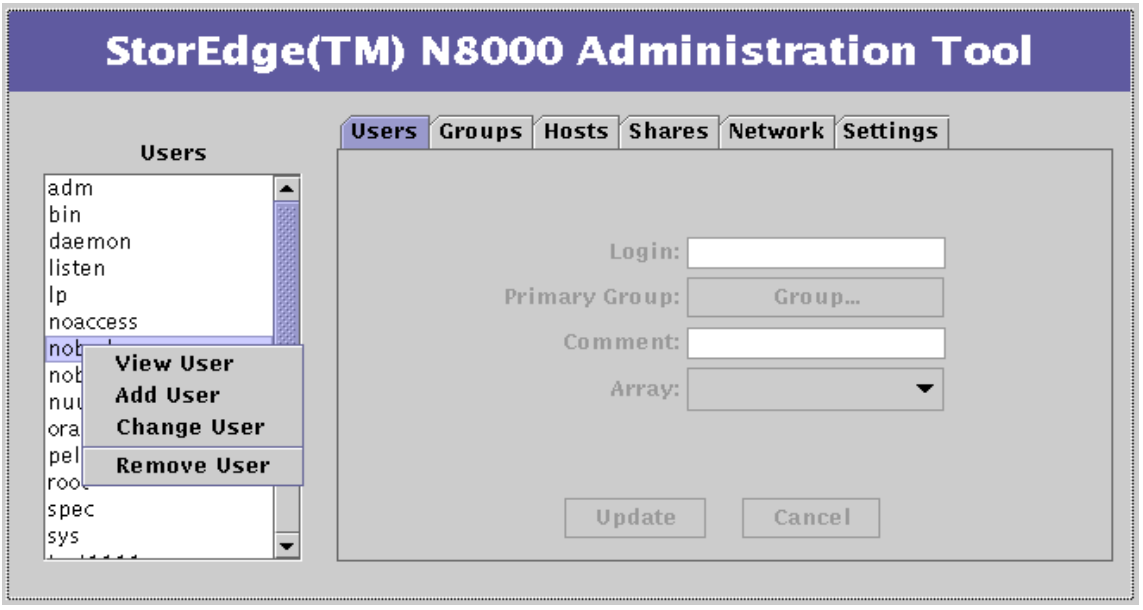

FIGURE 3-4 Users List Menu

3. **Choose Add User.**

   The dialog box become active.

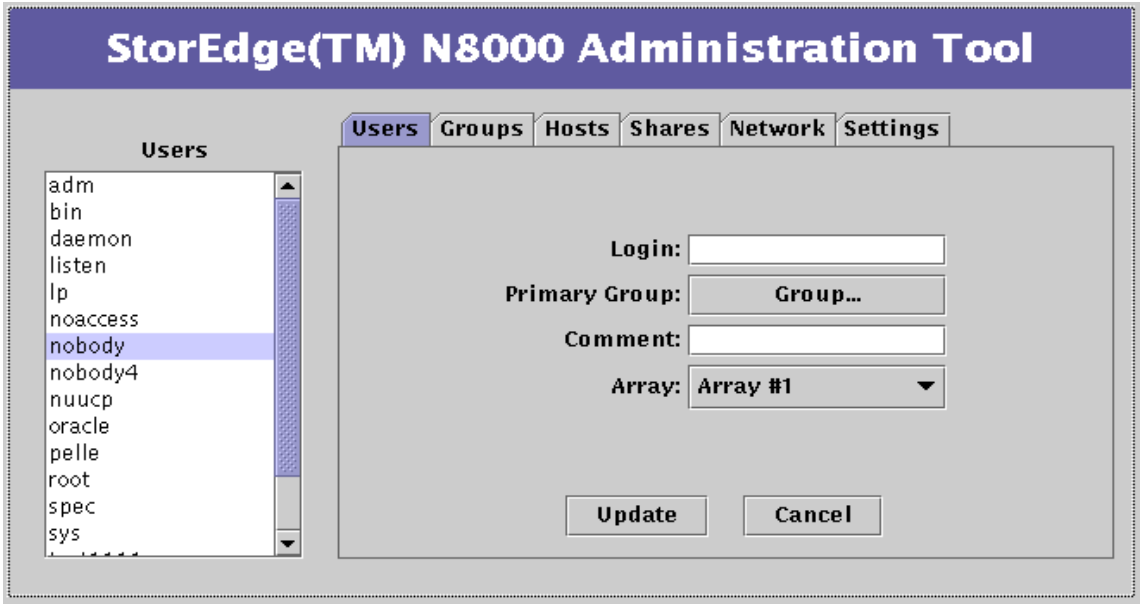

FIGURE 3-5 Users Function - Add User

4. **Type a unique user name with no blank spaces and with eight or less alphanumeric characters.**

   This will be the user's login name.

5. **Click Primary Group.**

   The Group Selection list box is displayed.

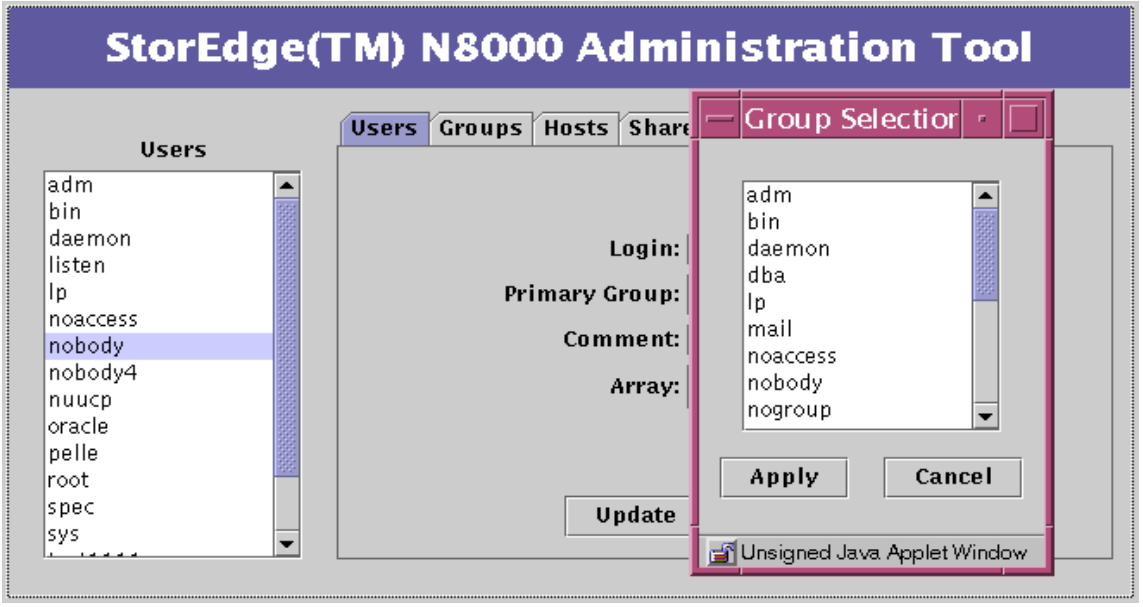

FIGURE 3-6 Users Function - Primary Group - Group Selection

6. **Choose a Group and click Apply.**

   This links the user to this primary group.

7. **Add a comment.**

8. **Click Array and choose an array.**

   There can be any number of user-assigned arrays.

Note – See the `Vol` command in the CLI chapter.

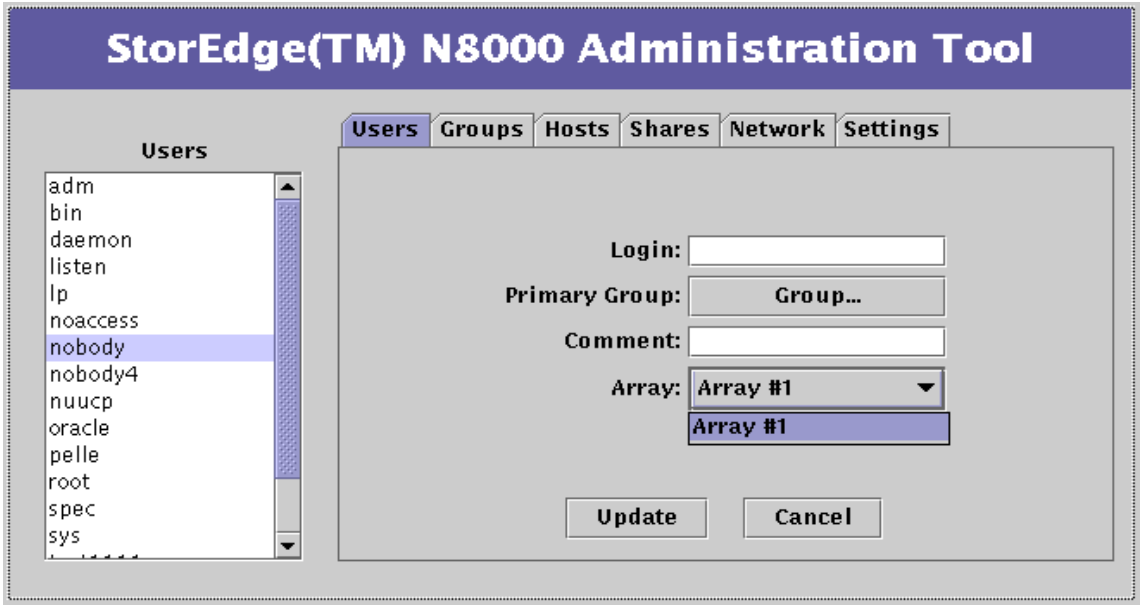

FIGURE 3-7 Users Function - Array Selection

9. **Click Update.**
10. **Verify that the new user is displayed in the Users list.**

▼ To Remove a User

1. **Click the Users tab if it is not active.**
2. **Right-click on a user.**
   The Users list menu is displayed.

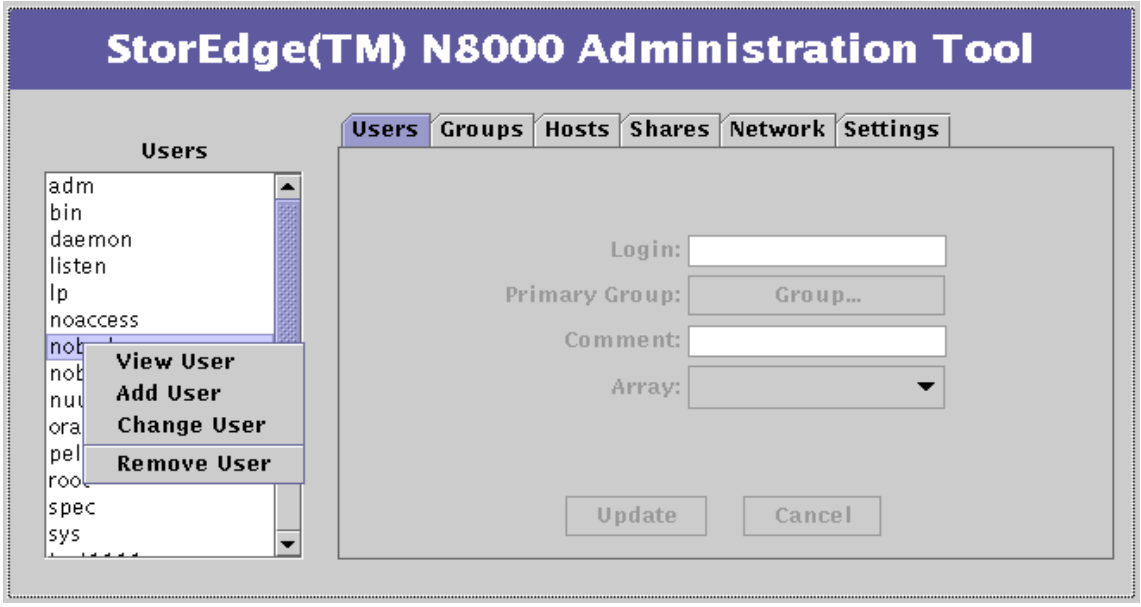

FIGURE 3-8 Users List Menu

3. **Choose Remove User and verify or cancel the removal when prompted.**
4. **Verify that the deleted user does not appear in the Users list.**

▼ To Change a Group

Use the Change Group option to delete members from a group.

Note – To add a new or existing user to a group, use the Users function (see “To Add a New User” on page 42). To add a new user, click in the background area of the Users list. For an existing user, click on the user’s name.

---

1. **Click the Groups tab if it is not active.**
2. **Right-click on a group.**

   The Groups list menu is displayed.

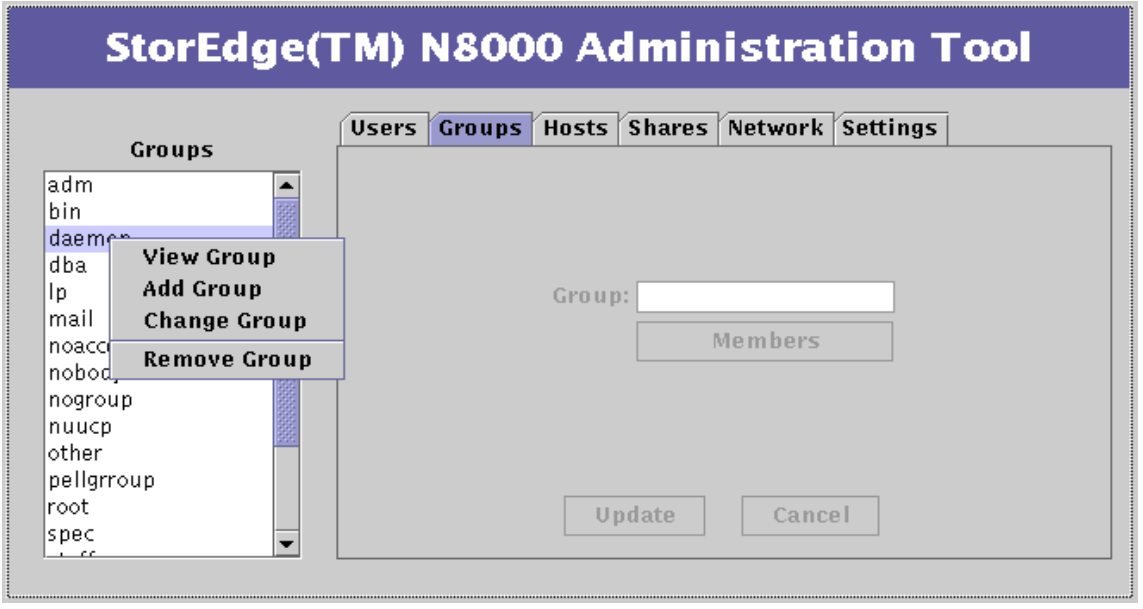

FIGURE 3-9 Groups List Menu

3. **Choose Change Group.**

   The group name is displayed in the data entry field and the Members button becomes active.

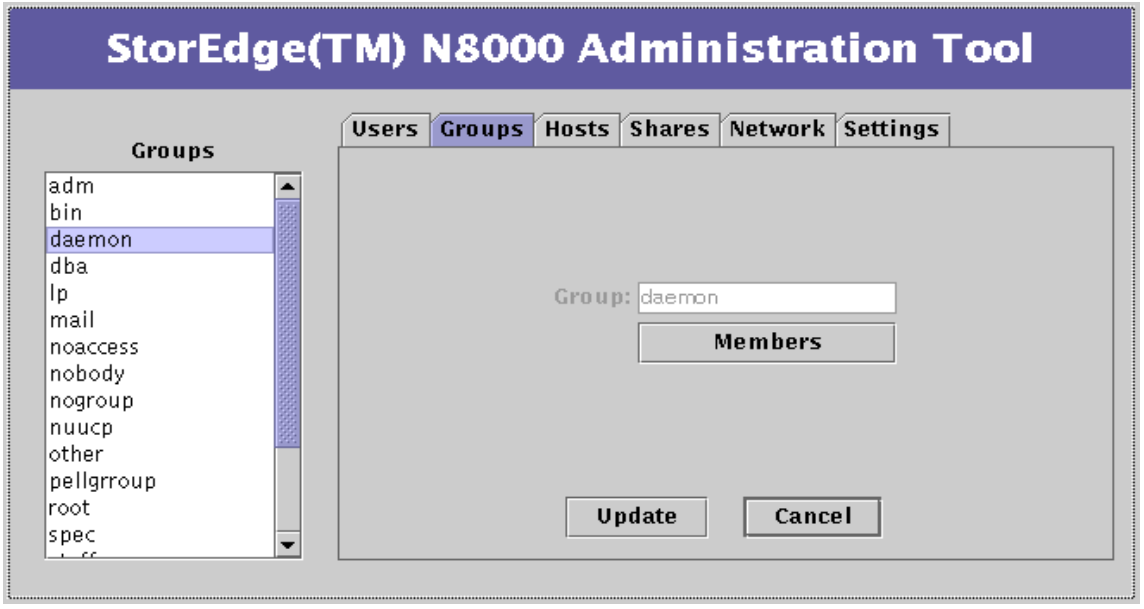

FIGURE 3-10 Groups Function - Change Group

4. **Click Members.**

   The Members Selection list, which contains all members in the named group, is displayed.

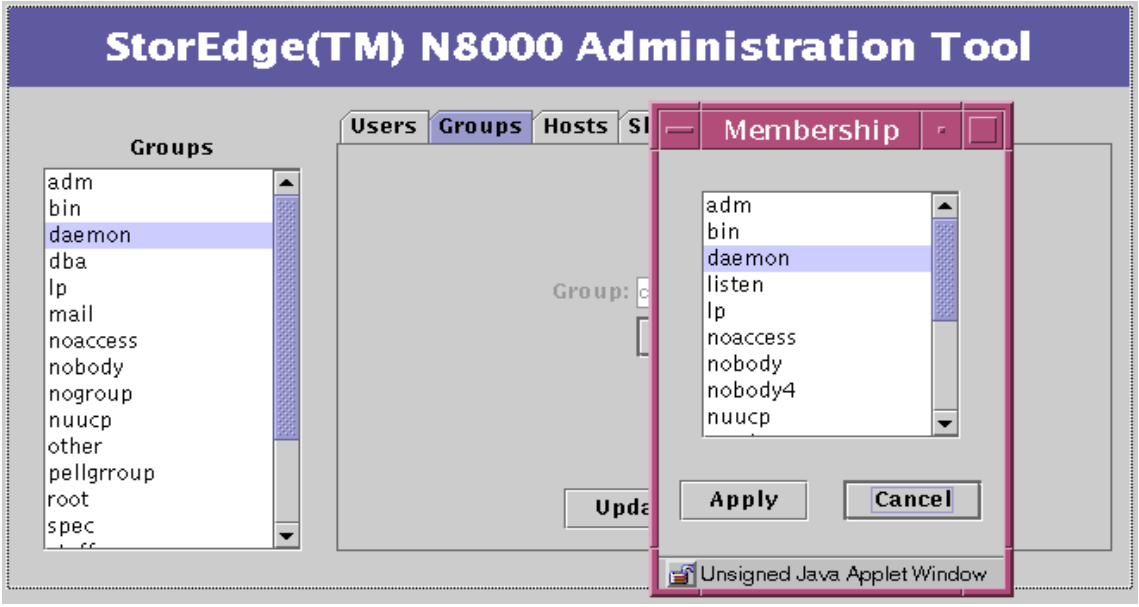

FIGURE 3-11 Groups Function - Member Selection

5. **Control-click to highlight all member that are to *remain* in the group.**

   All members that are not highlighted will be deleted.

Note – If you want to choose more than one member to remain, and you do not hold down the Control key while selecting an new name, the current member(s) are de-selected. If you forget to hold down the Control key and want to regain the original selections, click Cancel.

---

6. **Click Apply.**
7. **Click Update.**
8. **Verify that the excluded member(s) do not appear in the Member Selection list by clicking Members again.**

▼ To Add a New Host

1. **Click the Hosts tab if it is not active.**
2. **Right-click in the background area of the Host list.**

   The Hosts list menu is displayed.

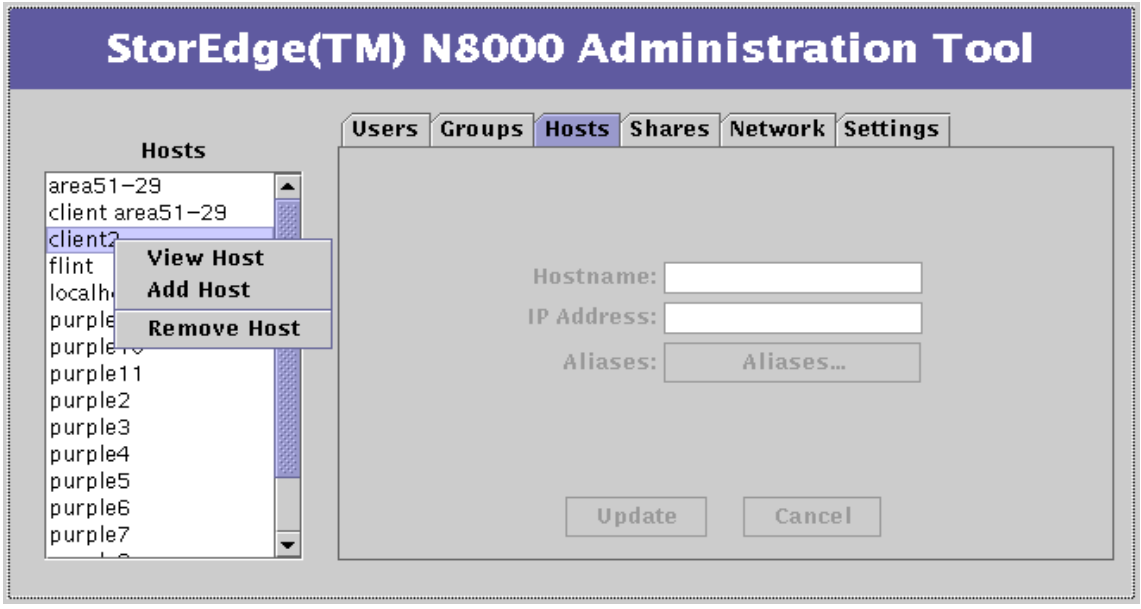

FIGURE 3-12 Hosts List Menu

3. **Choose Add Host.**

   The dialog box become active.

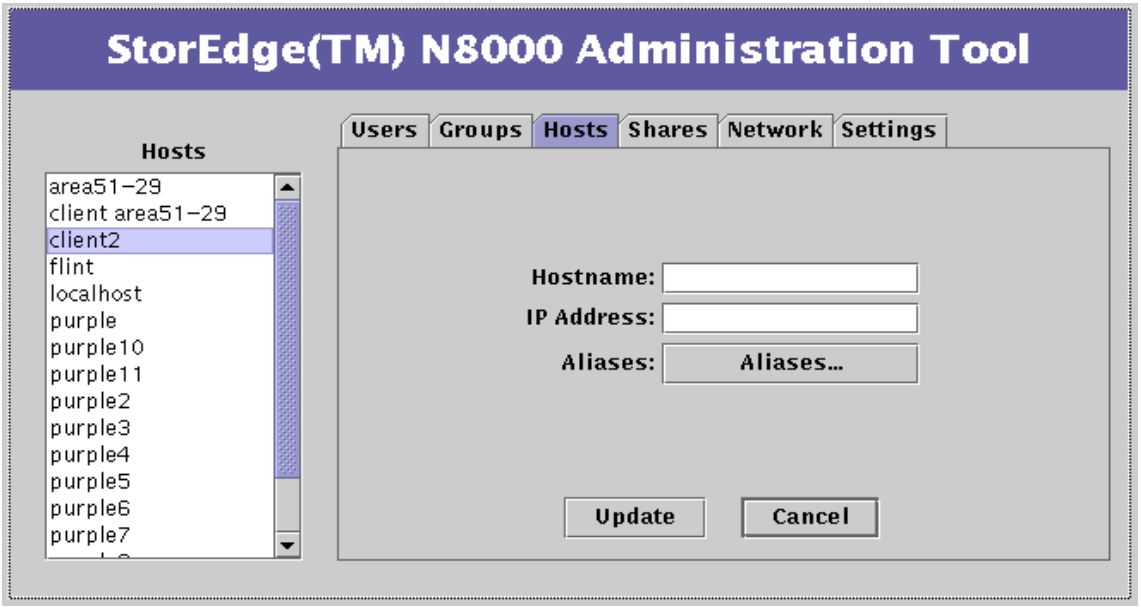

FIGURE 3-13 Hosts Function - Add Host

4. **Type a unique host name.**
5. **Type in the host's IP address.**

6. **Optionally, Click Aliases.**

The Host Aliases list is displayed and might be empty, as shown in FIGURE 3-14.

a. To remove a host, right-click on it, select Remove Host, and select Apply.

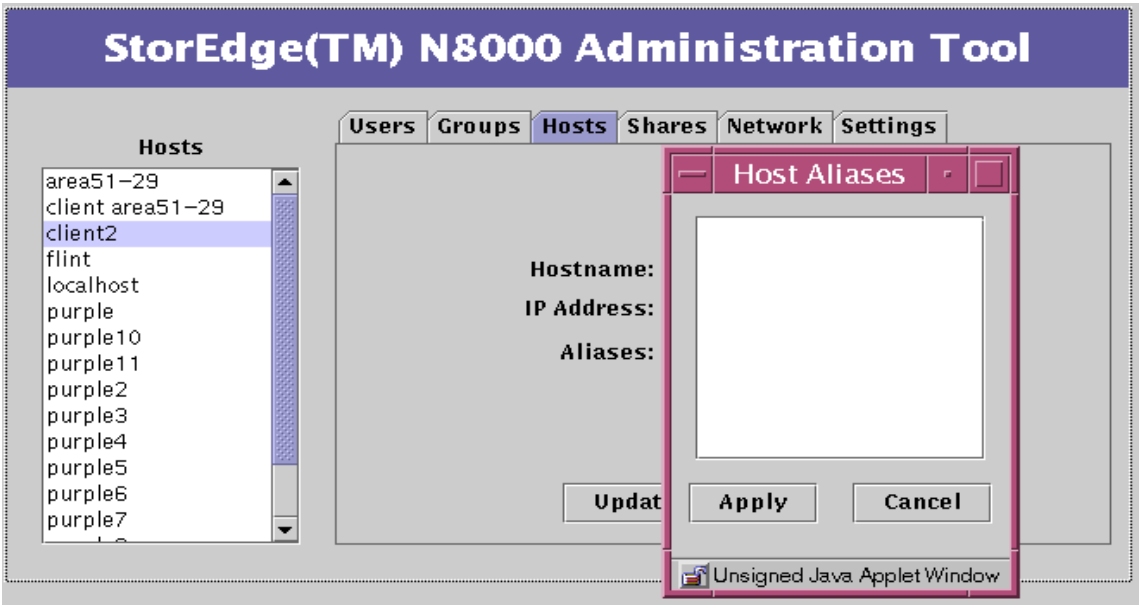

FIGURE 3-14 Hosts Function - Host Aliases

b. To add a host, right-click in the background area.

The Add menu is displayed.

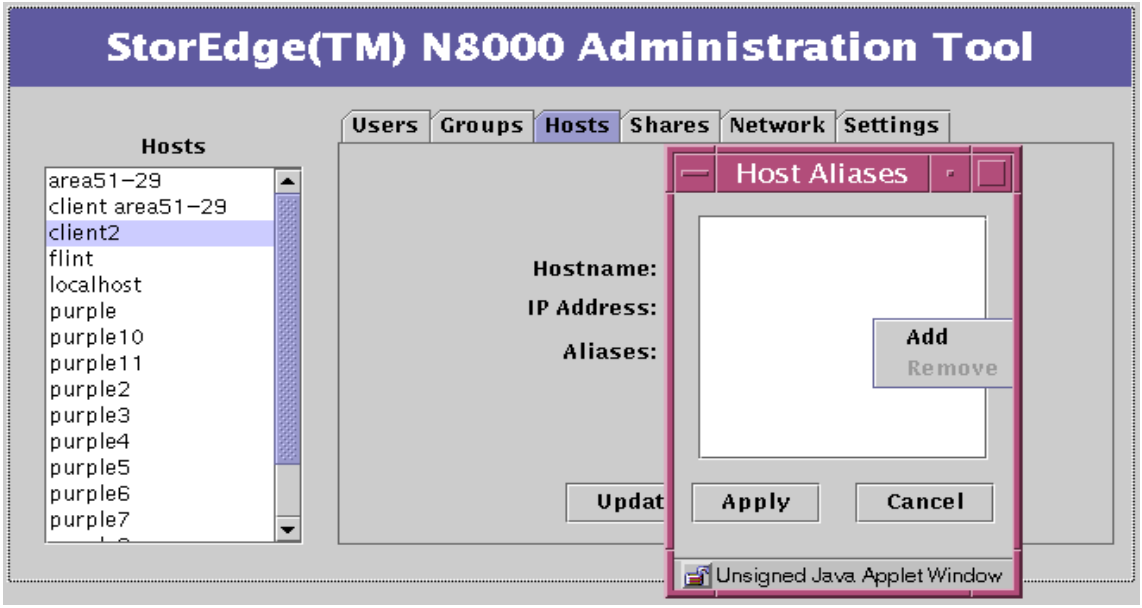

FIGURE 3-15 Hosts Function - Host Aliases - Add

i. Click Add.

The Add Host Alias dialog box is displayed.

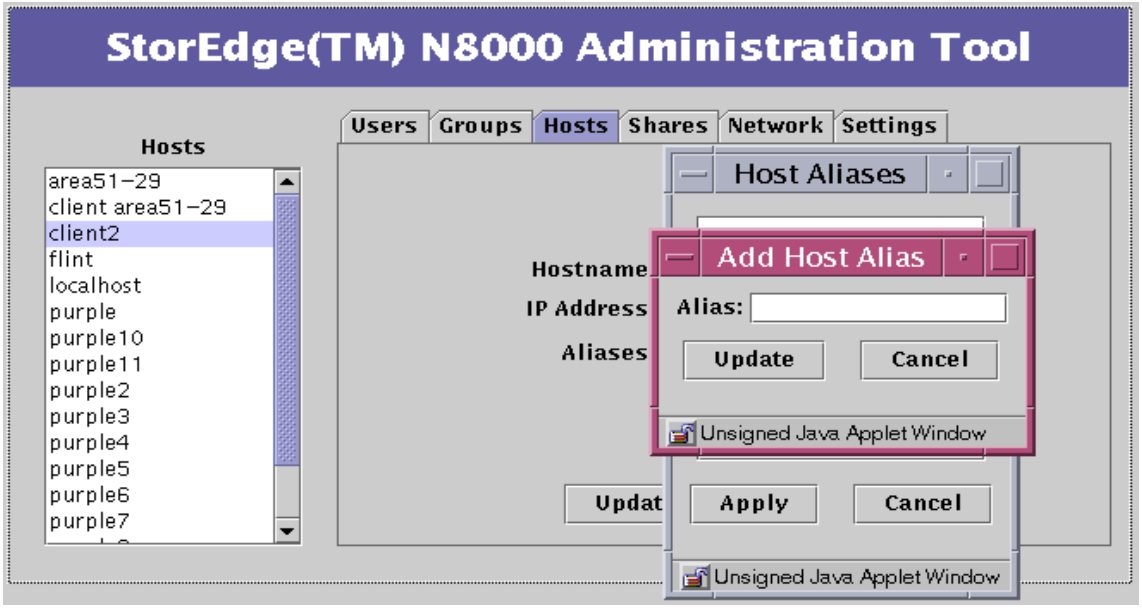

FIGURE 3-16 Hosts Function - Host Aliases - Add - Add Host Aliases

ii. Type the host Alias and click Update.

iii. Click Apply.

7. **Click Update.**
8. **Verify that the host is displayed in the Hosts list.**

▼ To Add a New Share

1. **Click the Shares tab if it is not active.**
2. **Right-click in the background area of the Shares list box.**

   The Shares list menu is displayed.

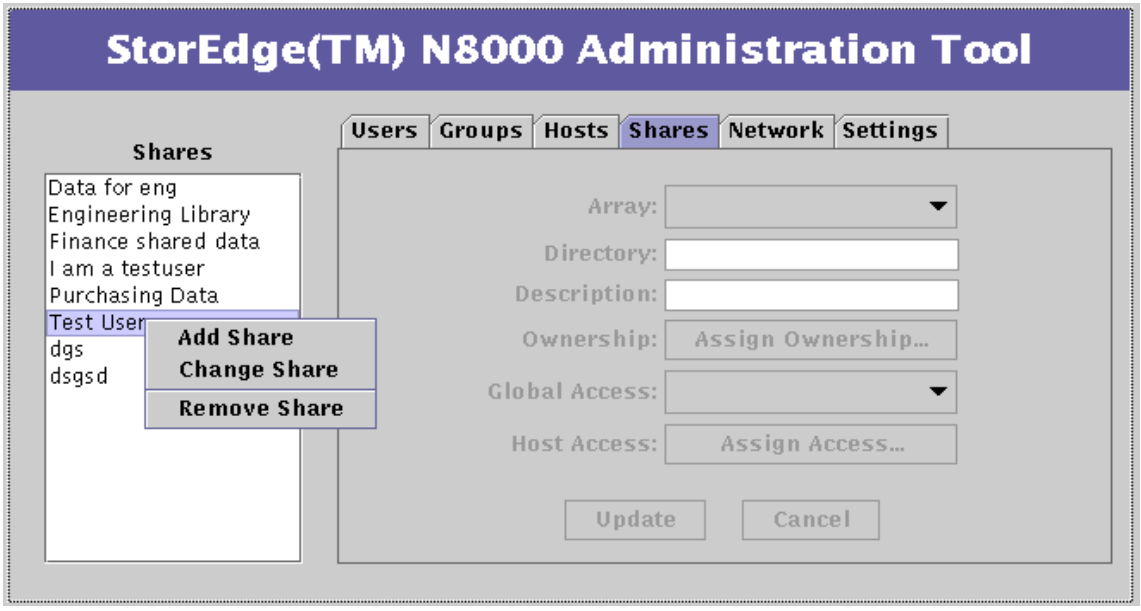

FIGURE 3-17 Shares List Menu

3. **Choose Add Share.**

The dialog box become active.

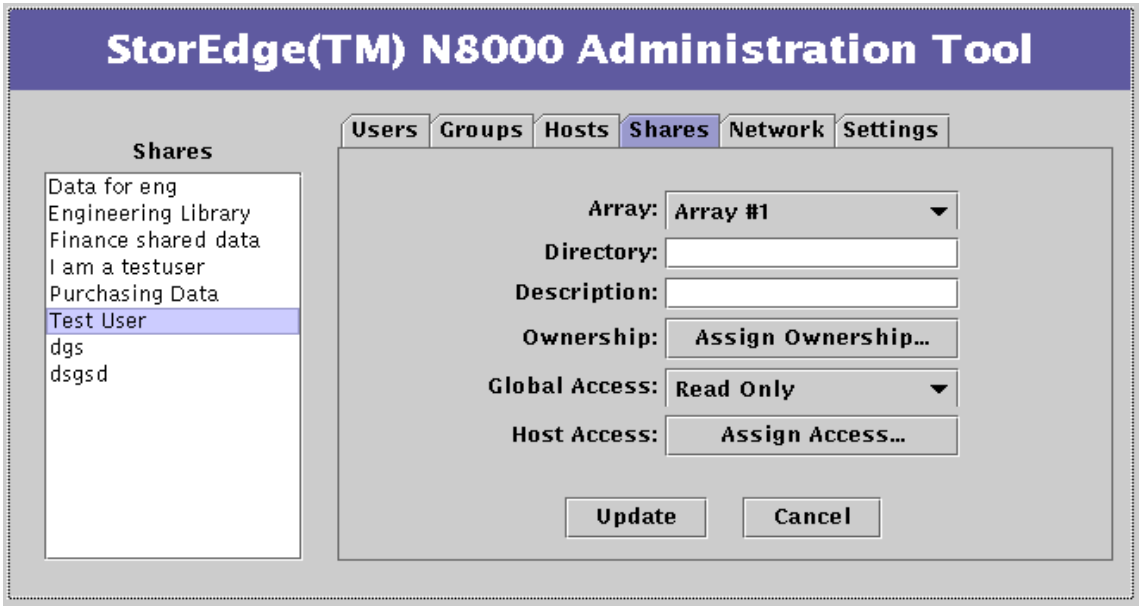

FIGURE 3-18 Shares Function - Add Share

4. **Click Array and choose an array.**

   There can be any number of user-assigned arrays.

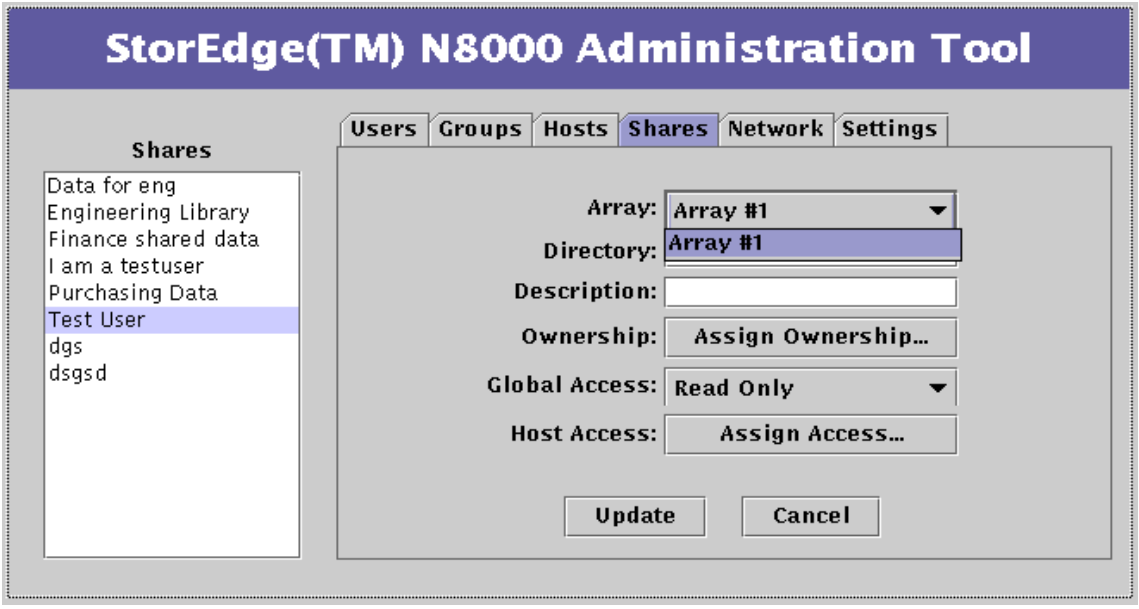

FIGURE 3-19 Shares Function - Array Selection

5. **Type the name of the directory to be created.**

   It will share information on the array specified above.

6. **Type a name for the new share for the department in the Description field.**

7. **Click Ownership.**

   The Ownership dialog box is displayed.

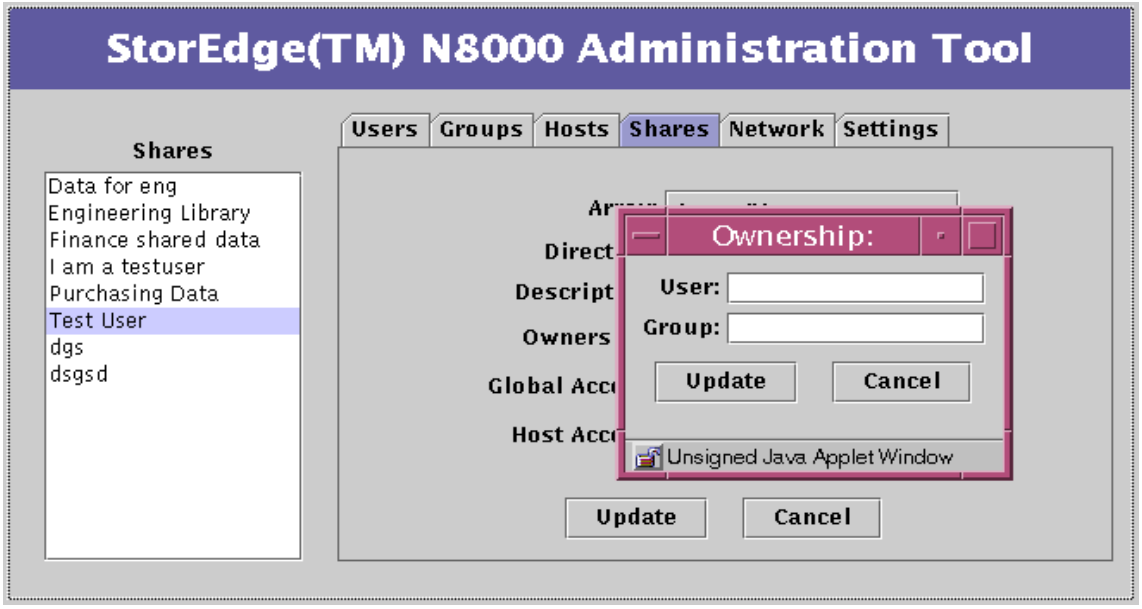

FIGURE 3-20 Shares Function - Ownership

8. **Enter a User name and Group, and click Update.**

   This could be the department supervisor and the department group name.

9. **Click Global Access and choose the Global access level.**

   The global access is for read and write permission for all systems on the network.

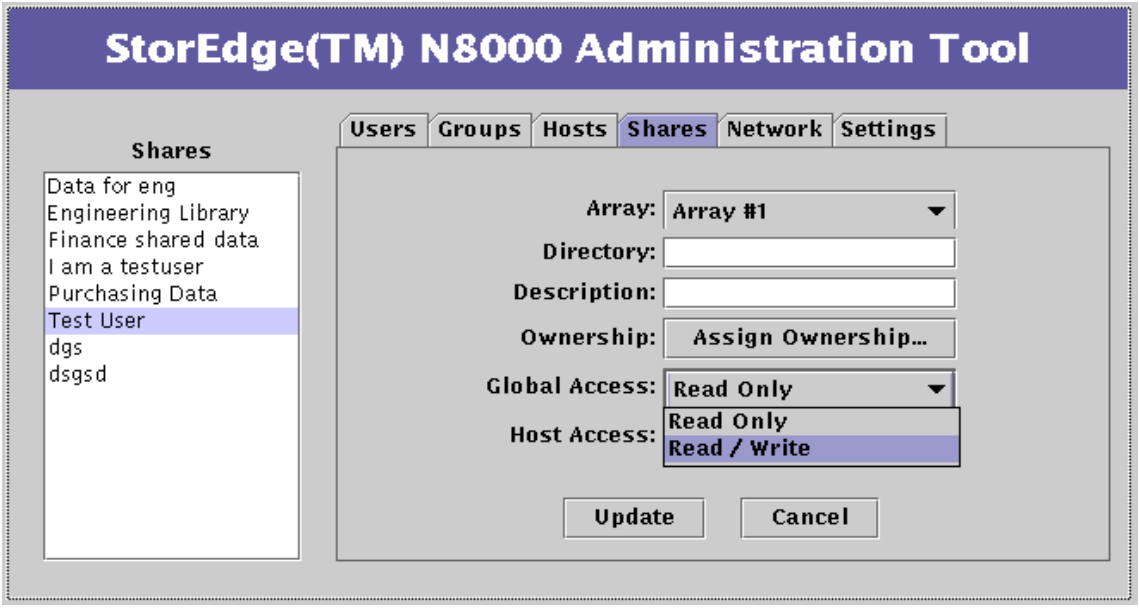

FIGURE 3-21 Shares Function - Global Access

10. Optionally, click Host Access and make the selections you want.

Use this option to create an access permission that is an exception to the global access established in the prior step. Thus, you might assign read / write global access, but you can give a specific host read-only access.

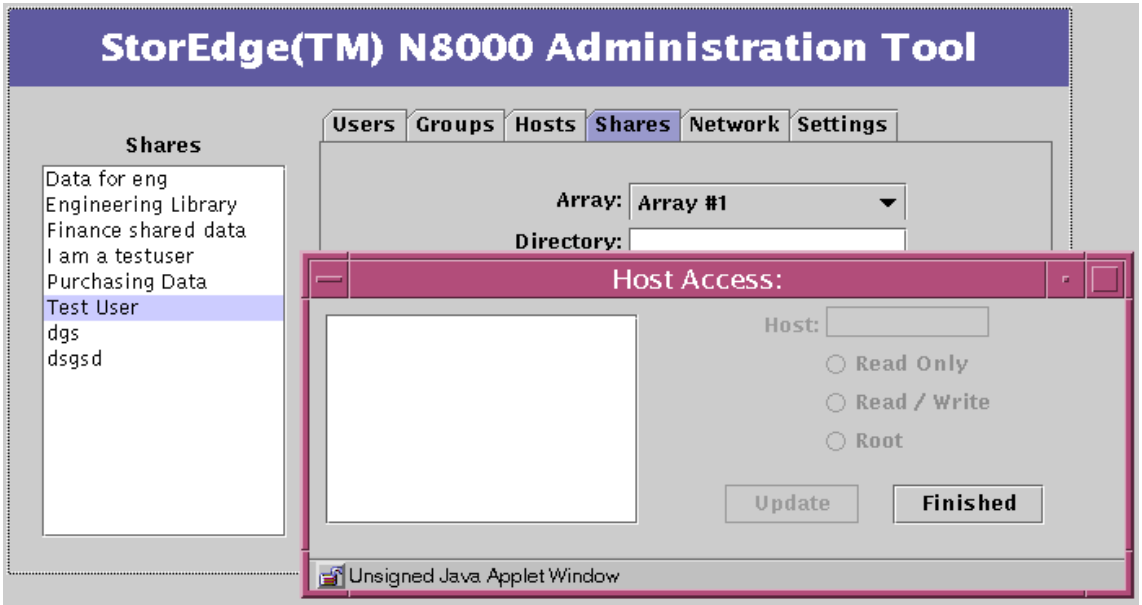

FIGURE 3-22 Shares Function - Host Access

a. To optionally add a host.

i. Right-click in the background area of the Host Access list and choose Add Host.

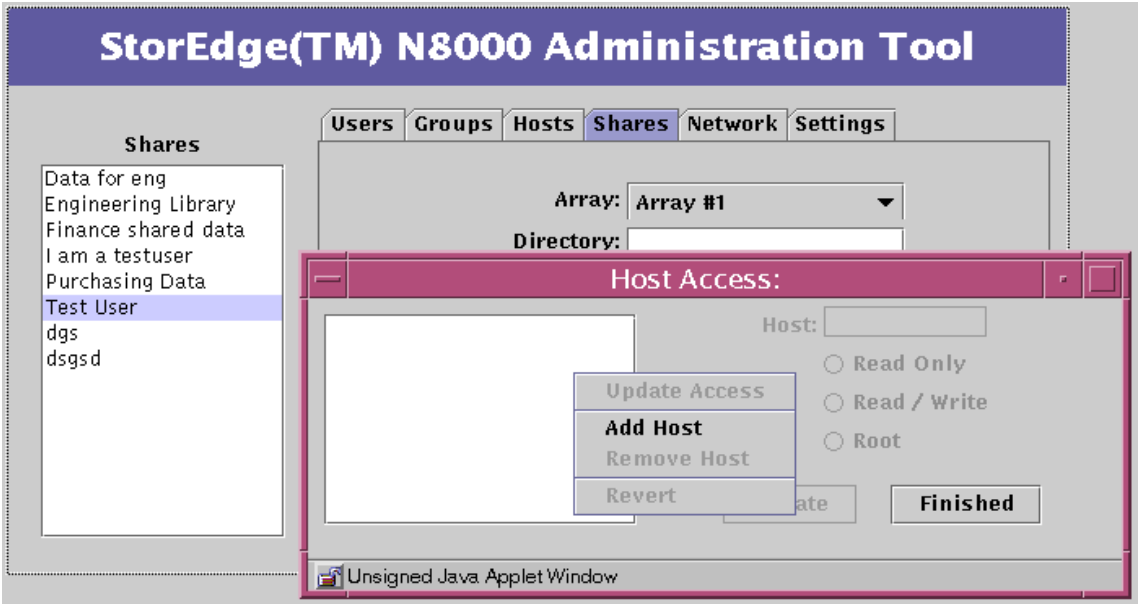

FIGURE 3-23 Shares Function - Host Access Submenu

The Add Host dialog box is displayed.

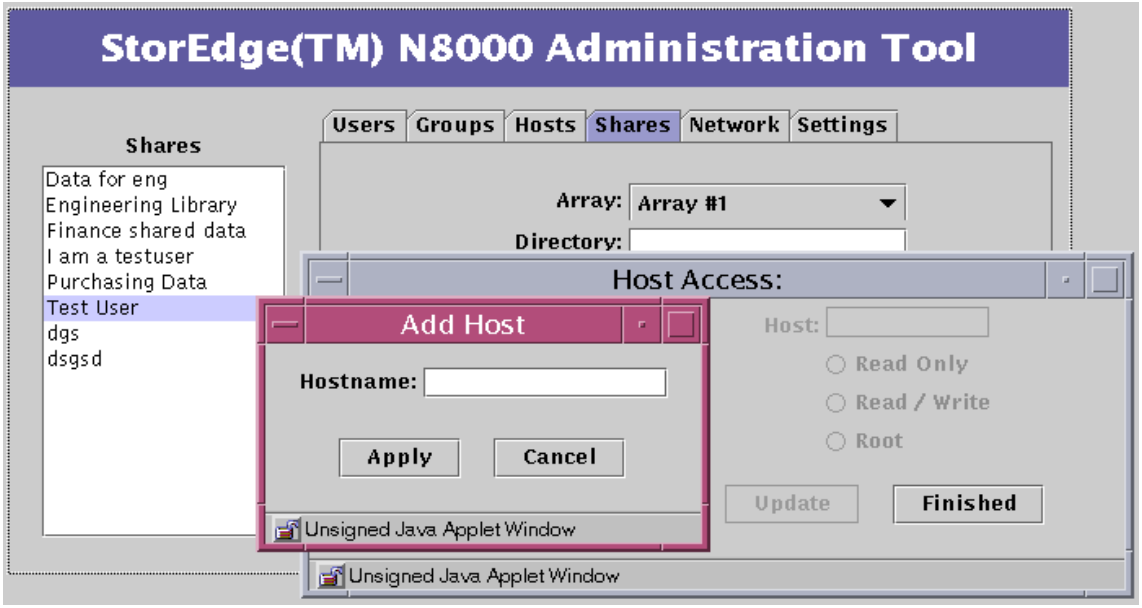

FIGURE 3-24 Shares Function - Host Access - Add Host

ii. Type a host name and click Apply.

The Host Access dialog box displays the newly added host name (refer to FIGURE 3-22).

b. Choose a host.

c. Choose a host access level and click Update.

d. Repeat with any other hosts you want.

e. Click Finished.

11. Click Update.

12. Verify that the new share is displayed in the Shares list.

▼ To Change a Share

1. **Click the Shares tab if it is not active.**
2. **Right-click on a Share.**

   The Shares list menu is displayed.

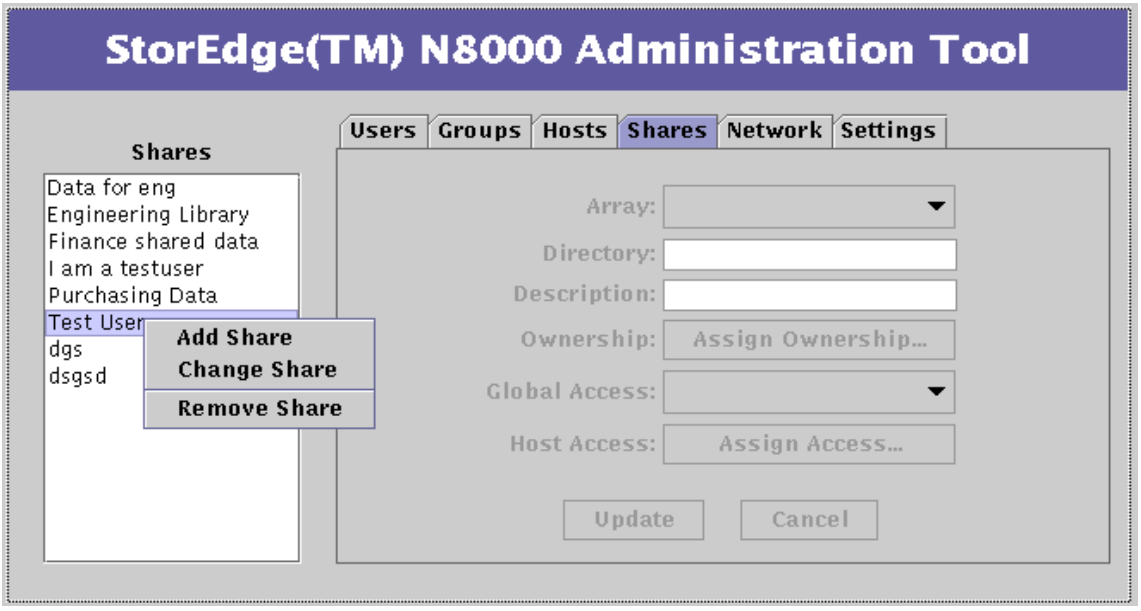

FIGURE 3-25 Shares List Menu

3. **Choose Change Share.**

The last three data entry buttons of the dialog box become active.

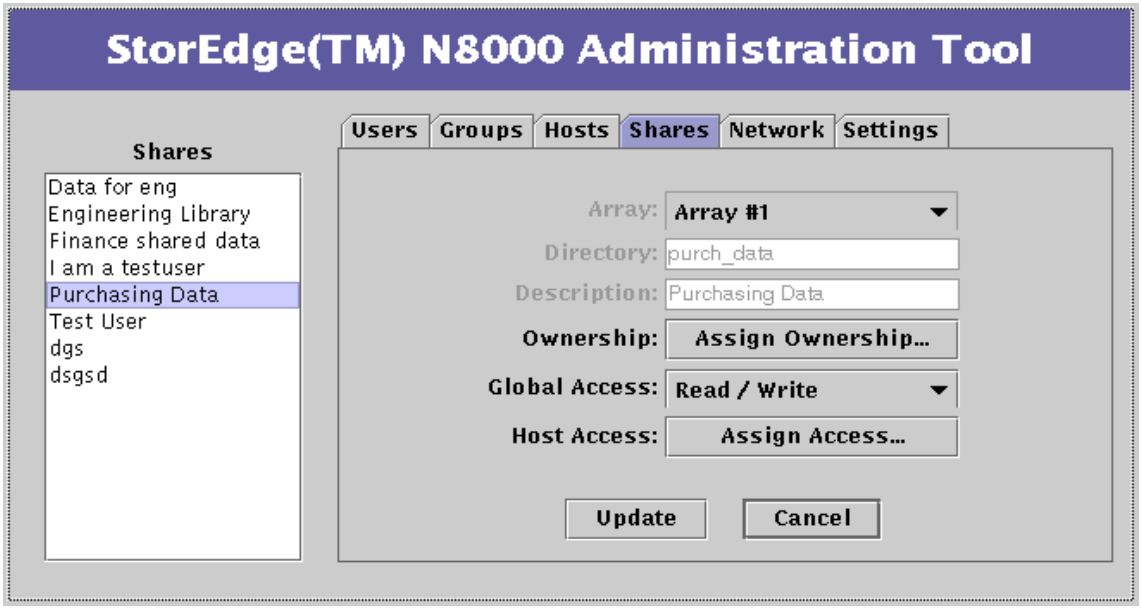

FIGURE 3-26 Shares Function - Change Share

4. **Optionally (if, for example, the previous owner left the company), click Ownership.**

   The Ownership dialog box is displayed.

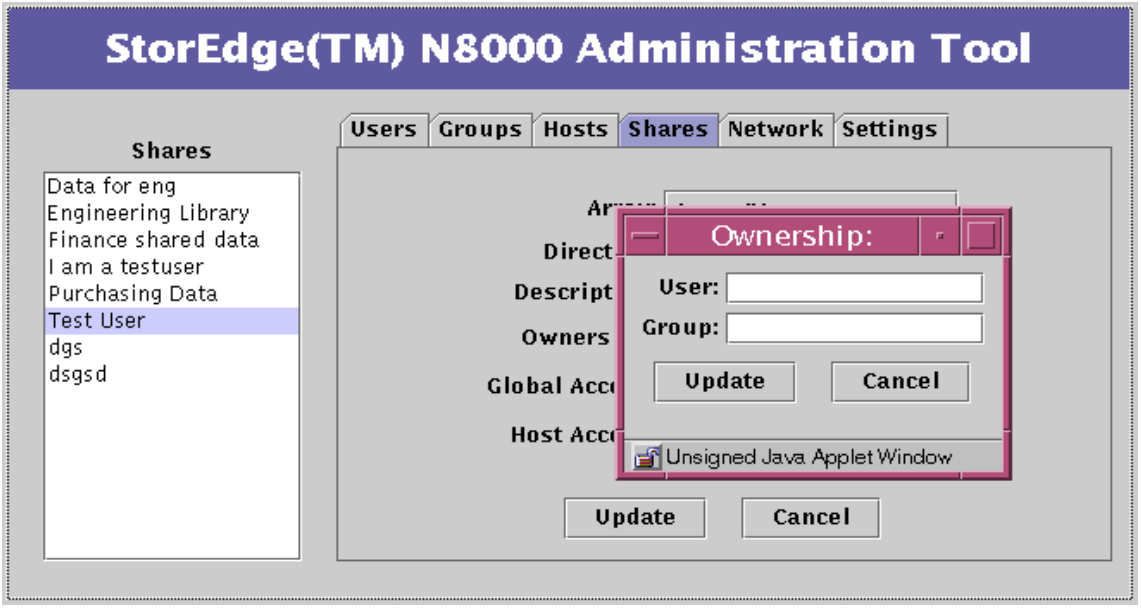

FIGURE 3-27 Shares Function - Ownership

5. **Enter a User and Group name, and click Update.**

6. **Optionally, click Global Access and choose a Global Access level.**

   Global access is for read and write permission for all systems on the network.

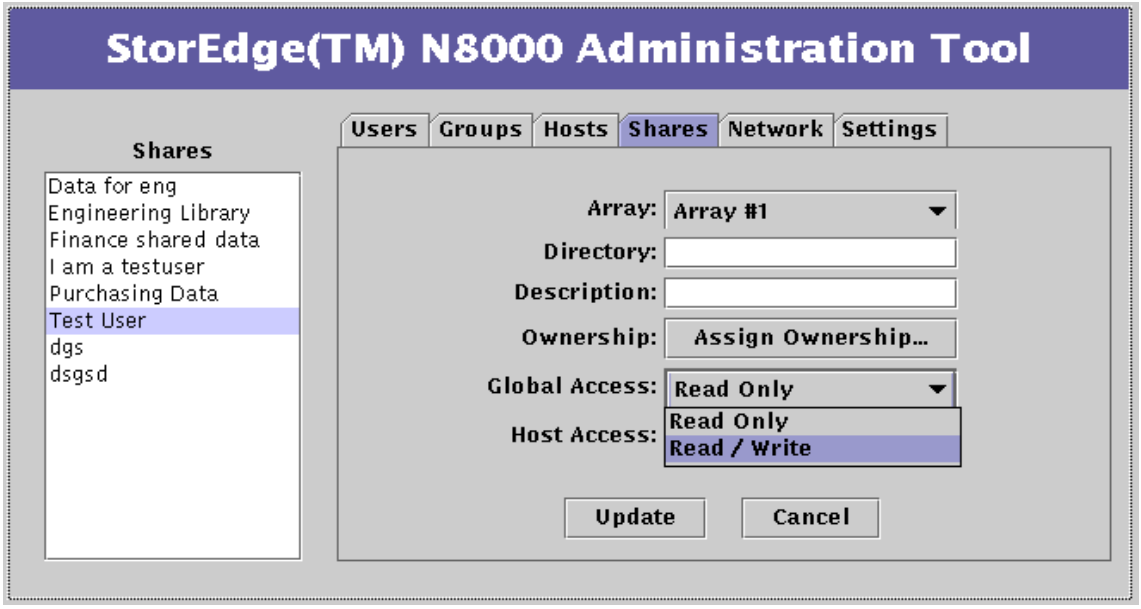

FIGURE 3-28 Shares Function - Global Access

7. **Optionally, click Host Access and make the selections you want.**

   This is the most typical change you might make to a share.

   Use this option to create an access permission that is an exception to the global access established in the previous step. Thus, you might assign read / write global access, but you can give a specific host read-only access.

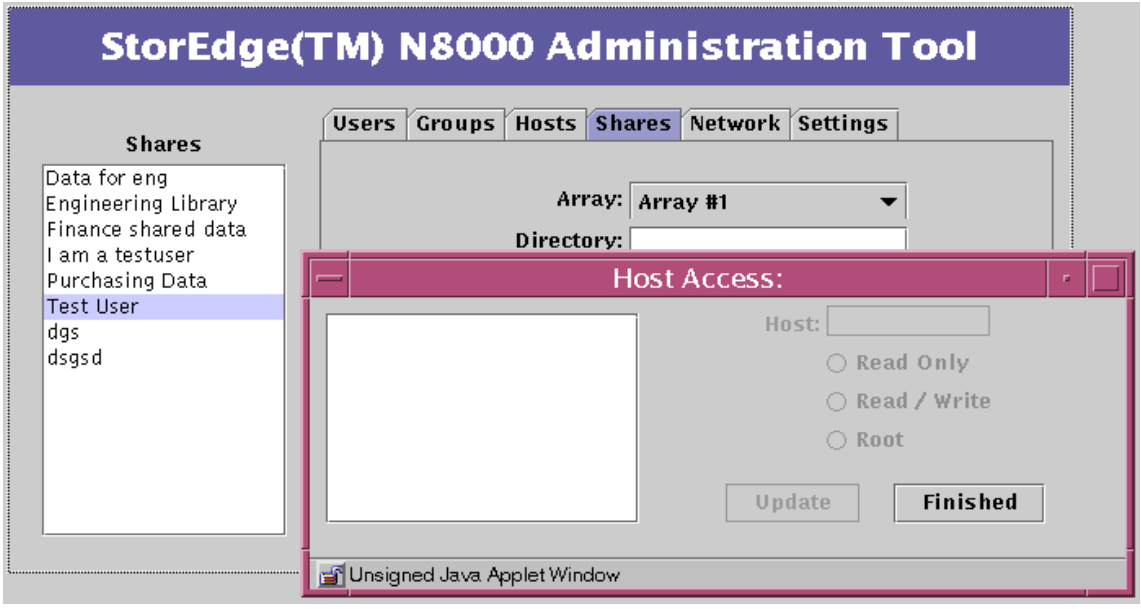

FIGURE 3-29 Shares Function - Host Access

a. To optionally add a host:

i. Right-click in the background area of the Host Access list and choose Add Host.

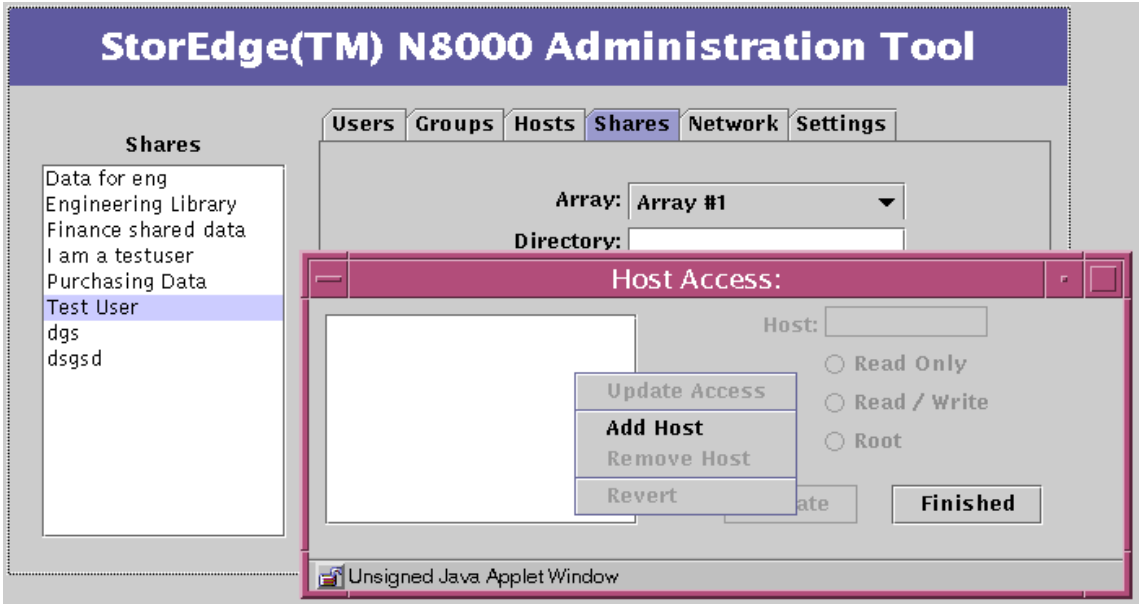

FIGURE 3-30 Shares Function - Host Access Submenu

The Add Host dialog box is displayed.

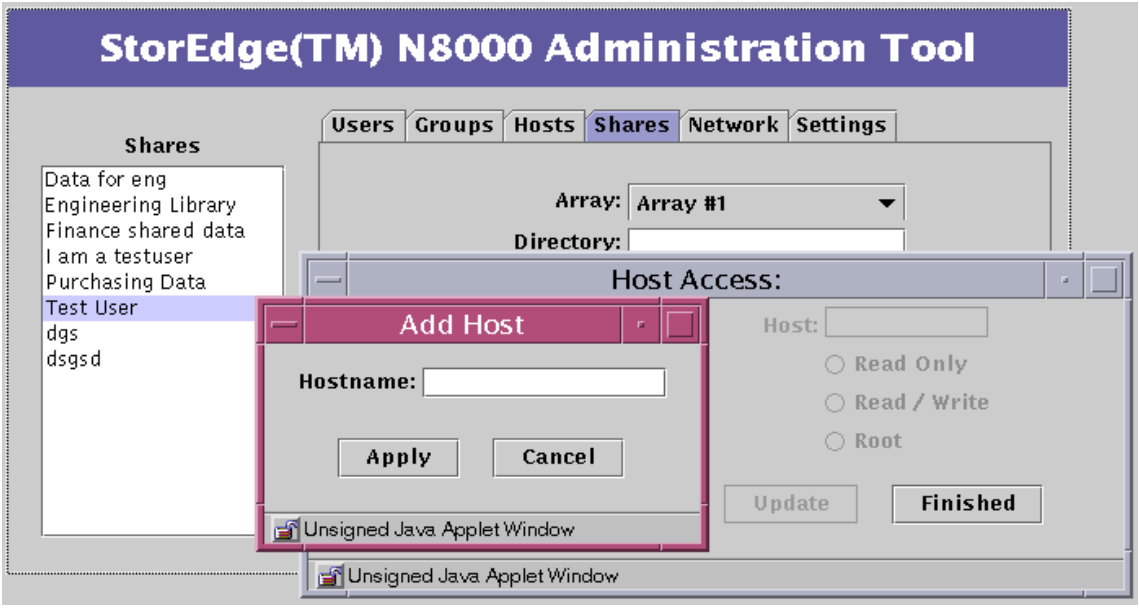

FIGURE 3-31 Shares Function - Host Access - Add Host

ii. Type a host name and click Apply.

The Host Access dialog box displays the newly added host name (refer to FIGURE 3-29).

b. Choose a host.

c. Choose a host access level and click Update.

d. Repeat with any other hosts you want.

e. Click Finished.

8. Click Update.

▼ To Change a Network Interface

Note – See the `Trunk` command in the CLI chapter.

1. **Contact your local Sun sales representative for more information on what network interface options are available for use with the filer.**
2. **Obtain a network card from Sun.**
3. **Install the network card in the filer per the instructions supplied with the card.**
4. **Use the Filer Administration Tool to configure the new interface(s) to operate on the network.**

   Refer to “Network Tab” on page 30.

▼ To Change Email Notifications

1. **Click the Settings tab if it is not active.**

   The Settings menu is displayed.

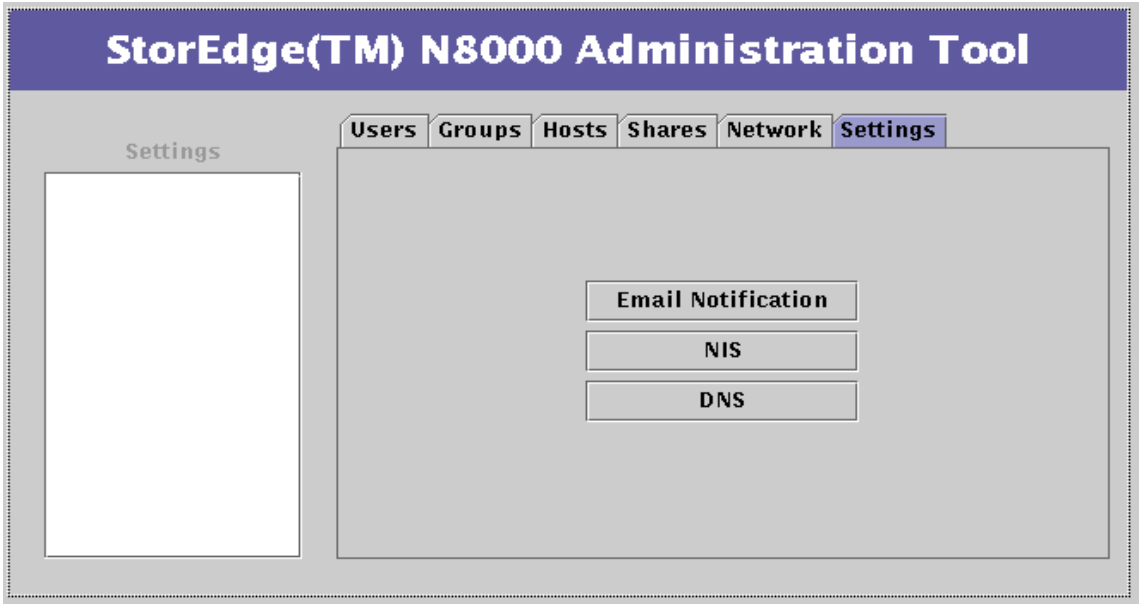

FIGURE 3-32 Settings Function

2. **Click EMail Notification.**

   The EMail Address list box is displayed.

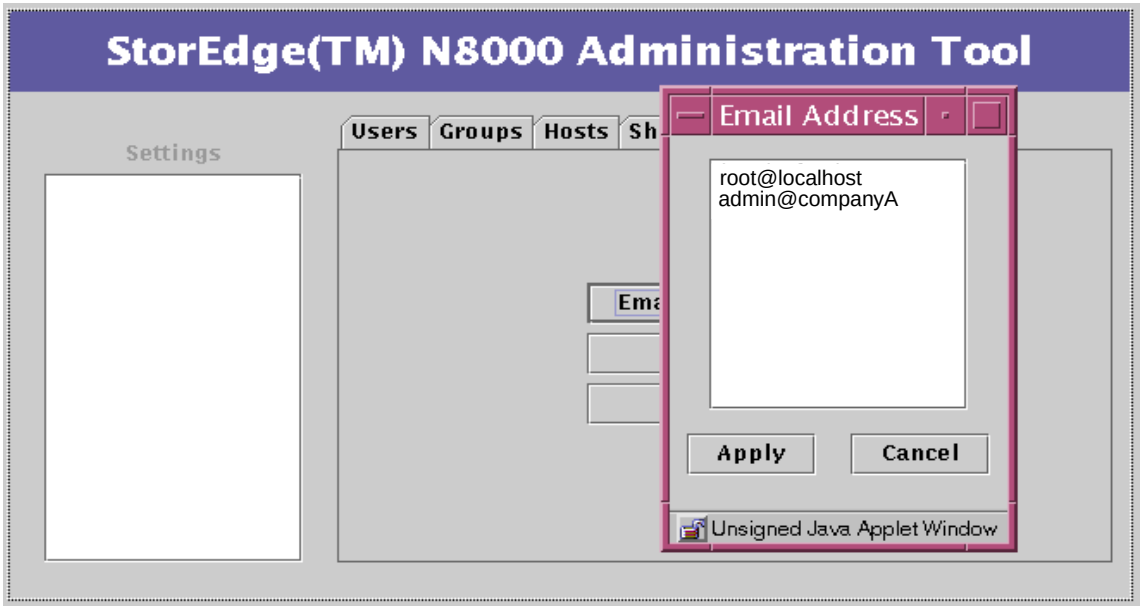

FIGURE 3-33 Settings Function - Email Address

3. **Type a new email address.**
4. **Highlight the new entry and click Apply.**

   The new address is displayed in the list.

▼ To Change DNS Client Services

1. **Click the Settings tab if it is not active.**
   The Settings menu is displayed.

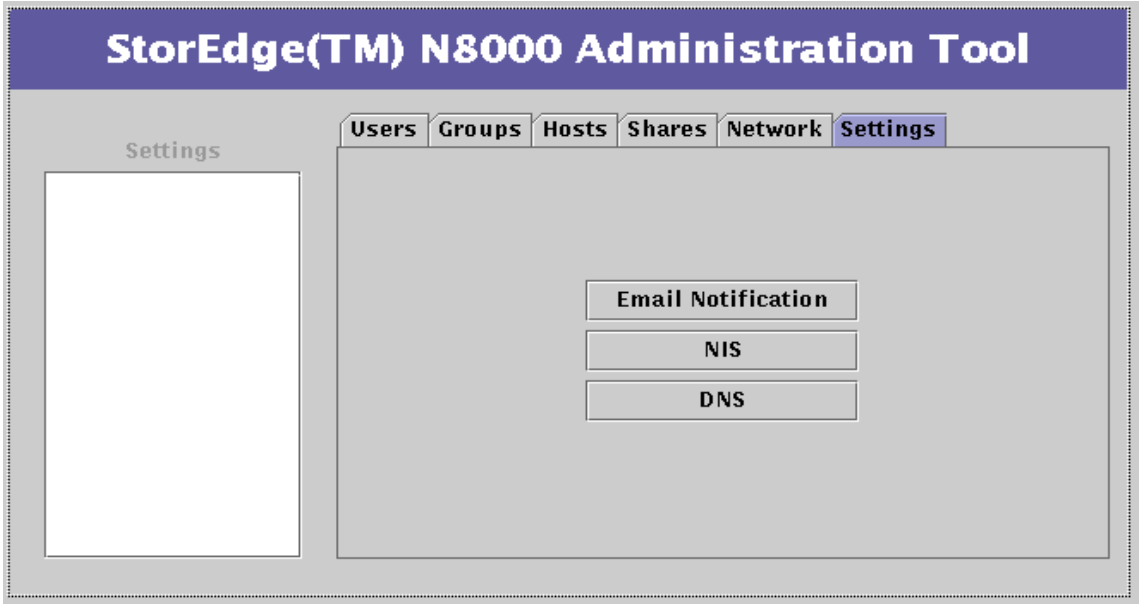

FIGURE 3-34 Settings Function

2. **Click DNS.**

   The DNS Configuration dialog box is displayed.

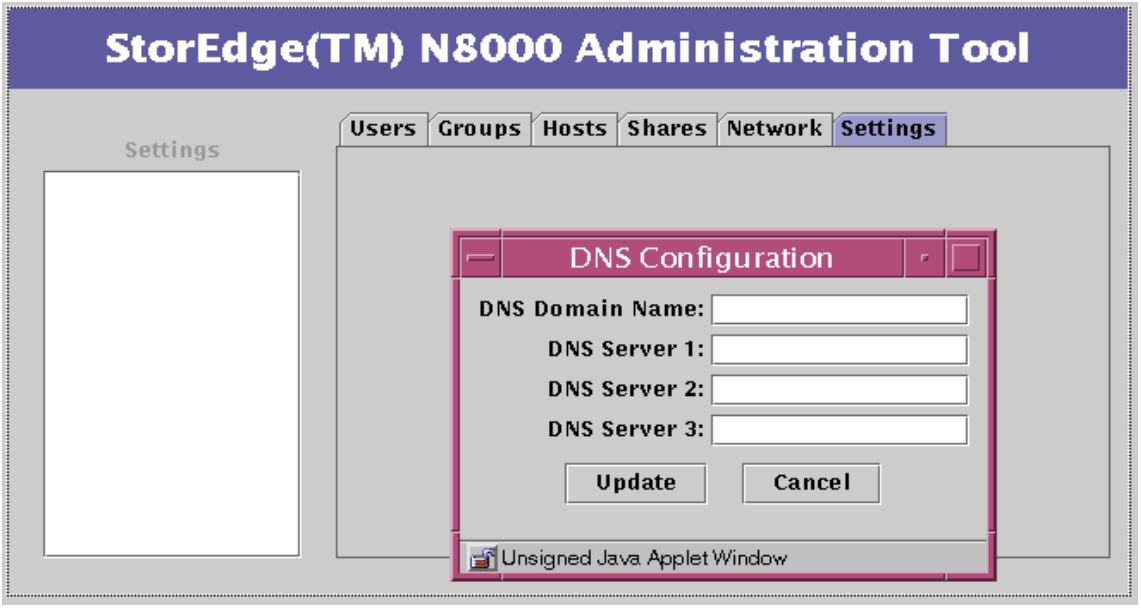

FIGURE 3-35 Settings Function - DNS Configuration

3. **Type a new DNS Domain Name.**
4. **Type the server names that you want associated with the new domain name.**
5. **Click Update.**

▼ To Change NIS Client Services

1. **Click the Settings tab if it is not active.**
   The Settings function menu is displayed.

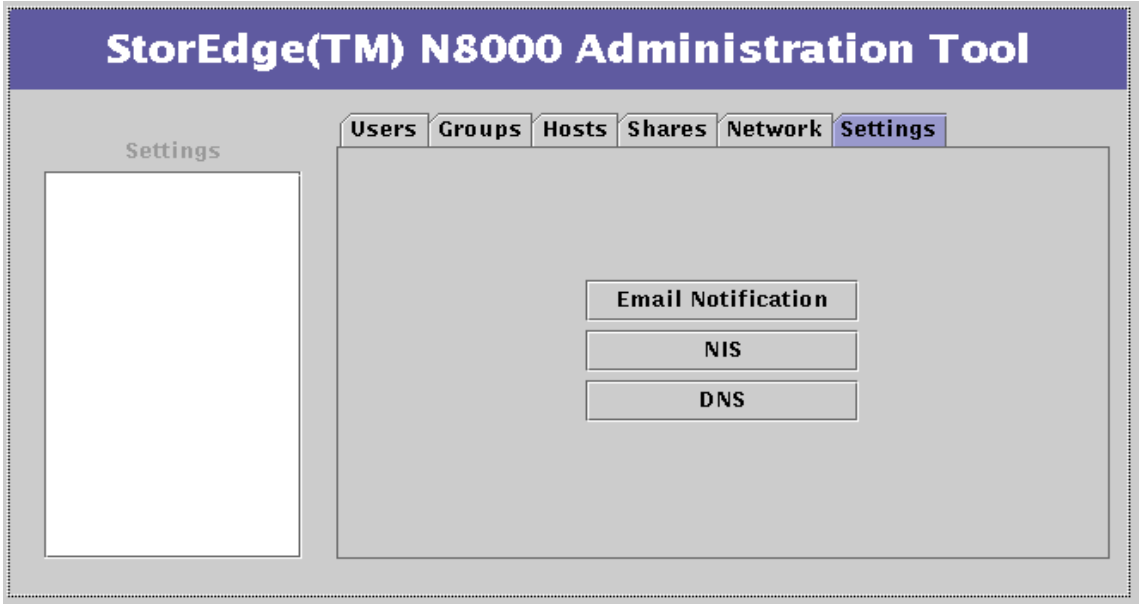

FIGURE 3-36 Settings Function

2. **Click NIS.**

   The NIS Configuration dialog box is displayed.

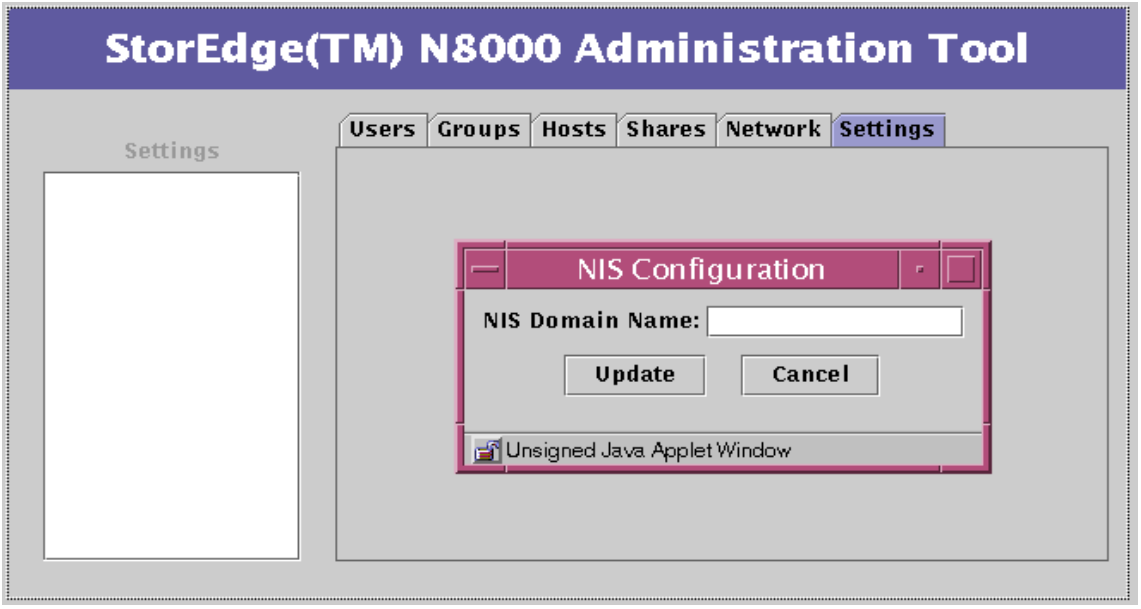

FIGURE 3-37 Settings Function - NIS Configuration

3. **Type a new NIS Domain Name.**
4. **Click Update.**

CHAPTER 4

Command-Line Interface (CLI) Guide

The Sun StorEdge N84000 and N8600 Filers provide a suite of powerful system administration commands for the command-line interface (CLI). This chapter lists the CLI software requirements and describes the commands.

Caution – The CLI is a collection of filer commands to be used by the system administrator. This administrator (admin user) has limited access to the filer CLI commands. The admin user is, in effect, within a restricted shell, and can not perform any task other than those that are provided with the CLI command set.

However, the root user (super user) has unlimited access to all areas of the filer. Therefore, when logged in as the root user, any changes made to these or other commands, either in configuration or in the code, can severely impact the filer's functionality, or prevent proper and predictable results.

This chapter consists of the following sections:

Software Requirements

The following software products are required for the Sun StorEdge N8000 Filer product family CLI:

- The Solaris™ 8 operating environment
- The Solaris PC Netlink 1.2 software
- The Sun Trunking™ 1.2 software

Initial Administrator Login

The filer comes with a simplified command line interface (CLI). To access this interface, telnet to the filer and login with the user name `admin`. The factory-set default password for this account is (also) `admin`. The first time the admin user account is accessed, the system automatically prompts the user to change the factory-set password.

Man Pages

The Solaris operating environment contains online reference manual pages, commonly referred to as *man pages*. Man pages are used to find information quickly. Each man page discusses one subject, which can be a command, library function, file format, or device driver. Man pages also document system information and standards.

To access a man page on the CLI, open a terminal window or shell tool and type `man`, the command name, and press Return:

```
# fman command-name
```

The system will respond with definitions, arguments, and options. You can access man pages for all the commands mentioned in this chapter.

CLI Command Set

The following table lists commands alphabetically.

arp	ifconfig	nis	savecore	uptime
clear	iostat	nis+	sfmounts	useradm
date	mpstat	ping	share	version
df	mt	prtconf	timezone	vmstat
fman	net	quota	trunk	vol
halt	netstat	rdate	ufsdump	
help	nfscfg	reboot	ufsrestore	
hostname	nfsstat	route	unshare	

Command Descriptions

This section describes the CLI commands and gives the functionality, an example, and options or parameters for each command.

This section describes the following commands:

arp

Functionality

The `arp` command displays and modifies the Internet-to-Ethernet address translation tables used by the address resolution protocol.

Options

TABLE 4-1 `arp` Command Options

Option	Function
`-a`	Displays all of the current ARP entries.
`-d`	Deletes an entry for the host called *hostname*. **Note -** This option can only be used by the superuser.
`-f`	Reads the file name *filename* and sets multiple entries in the ARP tables.
`-s`	Creates an ARP entry for the host called *hostname* with the Ethernet address *ether_address*.
`-s temp`	The `arp` entry will not be permanent.
`-s pub`	If the word pub is given, the entry will be published.
`-s trail`	Indicates that trailer encapsulations may be sent to the host.

Examples

```
# arp hostname
# arp -a
# arp -d hostname
# arp -f filename
# arp -s hostname ether_address [temp] [pub] [trail]
```

clear

Functionality

The `clear` command clears your screen whenever possible. It checks the environment for the terminal type and then examines the terminfo database to determine how to clear the screen.

Example

```
# clear
```

In this example, the screen would be cleared.

date

Functionality

The `date` command writes the date and time to standard output or attempts to set the system date and time. By default, the current date and time will be written.

Options

TABLE 4-2 `date` Command Options

Option	Function
-a	Slowly adjusts the time by *sss.fff* seconds, where sss represents seconds and *fff* represents fractions of a second.
-u	Displays or sets the date in Greenwich Mean Time (GMT, or universal time), bypassing the normal conversion to (or from) local time.

Examples

```
# date
Thu Oct 19 16:32:12 PDT 2000
# date -u
Thu Oct 19 23:23:37 GMT 2000
```

df

Functionality

The `df` command displays the amount of disk space occupied by mounted or unmounted file systems, the amount of used and available space, and how much of the file system's total capacity has been used. The file system is specified by device, or by referring to a file or directory on the specified file system.

Used without options, `df` reports on all mounted file systems.

Options

TABLE 4-3 `df` Command Options

Option	Function
`-a`	Reports on all file systems including ones whose entries in `/etc/mnttab` have the `ignore` option set.
`-b`	Prints the total number of kilobytes free.
`-e`	Prints only the number of files free.
`-F`	Specifies the *FSType* on which to operate. The `-F` option is intended for use with unmounted file systems.
`-g`	Prints the entire `statvfs` structure. **Note -** This option is used only for mounted file systems. It cannot be used with the `-o` option. This option overrides the `-b`, `-e`, `-k`, `-n`, `-P`, and `-t` options.
`-k`	Prints the allocation in kilobytes. The output consists of one line of information for each specified file system. This information includes the file system name, the total space allocated in the file system, the amount of space allocated to existing files, the total amount of space available for the creation of new files by unprivileged users, and the percentage of normally available space that is currently allocated to all files on the file system. **Note -** This option overrides the `-b`, `-e`, `-k`, `-n`, and `-t` options.
`-l`	Reports on local file systems only. This option is only for mounted file systems. It cannot be used with the `-o` option.
`-n`	Prints only the *FSType* name. This option prints a list of mounted file system types. This option is used only for mounted file systems. It cannot be used with the `-o` option.
`-o`	Specifies *FSType-specific* options. These options are comma-separated, and with no intervening spaces.
`-t`	Prints full listings with totals. This option overrides the `-b`, `-e`, and `-n` options.
`-V`	Echoes the complete set of file system specific command lines, but does not execute them.
`-P`	Prints the allocation in 512-byte units.

Examples

```
# df -e
Filesystem ifree
/dev/dsk/c0t0d0s0 405820
/proc 1899
fd 0
/dev/dsk/c0t0d0s3 65012
swap 20211
# df -n
. : ufs
/proc : proc
/dev/fd : fd
/cache : ufs
/tmp : tmpfs
# df -V
df -F ufs /dev/dsk/c0t0d0s0
df -F proc /proc
df -F fd fd
df -F ufs /dev/dsk/c0t0d0s3
```

fman

Functionality

The `fman` command displays UNIX-type information on the Man Pages you select by name.

Example

```
# fman help
```

In this example, information would be displayed about the `help` filer command.

halt

Functionality

The `halt` command writes any pending information to the disks and then stops the operating system.

Options

TABLE 4-4 halt Command Options

Option	Function
-d	Forces a system crash dump before rebooting.
-l	Suppresses sending a message to the system log daemon, `syslogd`, about who executed a `halt`.
-n	Prevents the `sync` before stopping.
-q	Quickly halts the system. No graceful shutdown is attempted.
-y	Halts the system even from a dialup terminal.

Example

```
# halt -y
```

help

Functionality

The `help` command prints a list of all available commands on the filer. The command takes no arguments.

Example

```
# help
```

In this example, a list of the filer commands would be printed.

hostname

Functionality

The `hostname` command prints the name of the current host, assigned during the initial configuration of the filer.

Example

```
# hostname
nsuzanne
```

ifconfig

Functionality

The `ifconfig` command is used to configure various settings related to the network ports installed in the filer. Use the `fman` command of the filer CLI for more details.

Options

TABLE 4-5 `ifconfig` Command Options

Option	Function
`addif` *address*	Creates the next unused logical interface on the specified physical interface.
`arp`	Enables the use of the Address Resolution Protocol (ARP) in mapping between network level addresses (default). This is currently implemented for mapping between IPv4 addresses and 10 Mbits/sec. Ethernet addresses.
`-arp`	Disables the use of the ARP.
`auto-revarp`	Uses the Reverse Address Resolution Protocol (RARP) to automatically acquire an address for this interface.
`broadcast` *address*	For IPv4 only. Specifies the address to use to represent broadcasts to the network.
`destination` *dest_address*	Sets the destination address for a point-to-point interface.
`dhcp`	This option is an alias for option `auto-dhcp`.
`down`	Marks an interface "down." When an interface is marked "down," the system does not attempt to transmit messages through that interface. If possible, the interface is reset to disable reception as well. This action does not automatically disable routes using the interface.
`encr_auth_algs`	This option is an authentication algorithm.
`encr_algs`	This option is an encryption algorithm.
`index` *n*	Changes the interface index for the interface. The value of *n* bust be an interface index (*if_index*) that is not used on another interface. *if_index* will be a non-zero positive number that uniquely identifies the network interface on the system.
`metric` *n*	Sets the routing metric of the interface to *n*; if no value is specified, the default is `0`. The routing metric is used by the routing protocol. Higher metrics have the effect of making a route less favorable; metrics are counted as addition hops to the destination network or host.
`modinsert` *mod_name@pos*	Inserts a module with the name *mod_name* to the stream of the device at position *pos*.
`modlist`	Lists all the modules in the stream of the device.
`modremove` *mod_name@pos*	Removes a module with the name *mod_name* from the stream of the device at position *pos*.

TABLE 4-5 `ifconfig` Command Options *(Continued)*

Option	Function
`mtu` *n*	Sets the maximum transmission unit of the interface to *n*. For many types of networks, the `mtu` has an upper limit, for example of `1500` for Ethernet.
`netmask` *mask*	For IPv4 only. Specifies how much of the address to reserve for subdividing networks into subnetworks.
`nud`	Enables the neighbor unreachability detection mechanism on a point-to-go interface.
`-nud`	Disables the neighbor unreachability detection mechanism on a point-to-go interface.
`plumb`	Opens the device associated with the physical interface name and sets up the streams needed for IP to use the device. When used with a logical interface name, this option is used to create a specific named logical interface.
`private`	Tells the `in.routed` routing daemon that the interface should not be advertised.
`-private`	Specifies unadvertised interfaces.
`removeif` *address*	Removes the logical interface on the physical interface specified that matches the *address* specified.
`set`	Sets the *address*, *prefix_length* or both, for an interface.
`subnet`	Sets the subnet *address* for an interface.
`tdst` *tunnel_dest_address*	Sets the destination address of a tunnel. The address should not be the same as the *dest_address* of the tunnel, because no packets leave the system over such a tunnel.
`-trailers`	Disables the use of a “trailer” link level encapsulation.
`tsrc` *tunnel_src_address*	Sets the source address of a tunnel.
`unplumb`	Destroys any streams associated with this physical interface and closes the associated device. When used with a logical interface name, the logical interface is removed from the system. After this option is executed, the device name will no longer appear in the output of **`ifconfig -a`**. An interface must be “down” before it can be unplumbed.
`up`	Marks an interface “`up`.” This option enables an interface after an **`ifconfig`** `down`, which reinitializes the hardware.
`xmit`	Enables an interface to transmit packets. This is the default behavior when the interface is “`up`.”
`-xmit`	Disables transmission of packets on an interface. The interface will continue to receive packets.

Example

To print out the addressing information for each interface, use the following command.

```
# ifconfig -a
lo0: flags=849<UP,LOOPBACK,RUNNING,MULTICAST> mtu 8232
inet 127.0.0.1 netmask ff000000
hme0: flags=863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST> mtu
1500
inet 129.150.154.91 netmask ffffff00 broadcast 129.150.154.255
ether 8:0:20:8a:3a:1b
```

iostat

Functionality

The `iostat` command iteratively reports terminal, disk, and tape input/output (I/O) activity, as well as central processor unit (CPU) utilization.

Options

TABLE 4-6 `iostat` Command Options

Option	Function
`-c`	Reports the percentage of time that the system has spent in user mode, in system mode, waiting for I/O, and idling.
`-C`	When the **`-n`** and **`-x`** options are also selected, this option reports extended disk statistics aggregated by `controller id`.
`-d`	For each disk, reports the number of kilobytes transferred per second, the number of transfers per second, and the average service time in milliseconds.
`-D`	For each disk, reports the read operations per second, write operations per second, and percentage of disk utilization.
`-e`	Displays device error summary statistics. The total errors, hard errors, soft errors, and transport errors are displayed.
`-E`	Displays all device error statistics.
`-I`	Reports the counts in each interval, rather than rates (where applicable).
`-l` *n*	Limits the number of disks included in the report to *n*; the disk limit defaults to 4 for **`-d`** and **`-D`**, and unlimited of **`-x`**. **Note -** Disks explicitly requested are not subject to this disk limit.
`-m`	Reports file system mount points. This option is most useful if the **`-P`** or **`-p`** option is also specified.
`-M`	Displays data throughput in MBytes/sec. instead of KBytes/sec.
`-n`	Displays names in descriptive format (for example, `cXtYdZ`, `rmt/N`, `server:/export/path`).
`-p`	For each disk, reports per-partition statistics in addition to per-device statistics.
`-P`	For each disk, reports per-partition statistics only and no per-device statistics.
`-r`	Emits data in a comma-separated format.
`-s`	Suppresses messages related to “state changes.”

TABLE 4-6 `iostat` Command Options *(Continued)*

Option	Function
-t	Reports the number of characters read and written to terminals per second.
-T	Emits a time stamp.
-x	For each disk, reports extended disk statistics. The output is in tabular form.
-z	Does not print lines whose underlying data values are all zeroes.

Examples

```
# iostat -c
cpu
us sy wt id
49 _1 _0 50
# iostat -e
---- errors ----
device s/w h/w trn tot
sd0 _____0 __0 __0 __0
nfs1 ____0 __0 __0 __0
nfs2 ____0 __0 __0 __0
nfs3 ____0 __0 __0 __0
# iostat -E
sd0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: SEAGATE Product: ST34371W SUN4.2G Revision: 7462 Serial No: 9717E23147
RPM: 7200 Heads: 16 Size: 4.29GB <4292075520 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
# iostat -t
tty
tin tout
__0 ___1
# iostat -x
extended device statistics
device r/s w/s kr/s kw/s wait actv svc_t %w %b
sd0 ___0.1 0.2 _0.8 _1.9 _0.0 _0.0 _82.4 _0 _0
nfs1 __0.0 0.0 _0.0 _0.0 _0.0 _0.0 __0.0 _0 _0
nfs2 __0.0 0.0 _0.0 _0.2 _0.0 _0.0 _16.0 _0 _0
nfs3 __0.0 0.0 _0.3 _0.0 _0.0 _0.0 __7.7 _0 _0
```

mpstat

Functionality

The `mpstat` command reports per-processor statistics in tabular form. Each row of the table represents the activity of one processor. The first table summarizes all activity since booting. Each subsequent table summarizes activity for the preceding interval. All values are rates (events per second) unless otherwise noted.

The `mpstat` command reports the following information.

TABLE 4-7 `mpstat` Command Output Fields

Field	Explanation
`CPU`	Processor ID
`minf`	Minor faults
`mjf`	Major faults
`xcal`	Inter-processor cross-calls
`intr`	Interrupts
`ithr`	Interrupts
`csw`	Interrupts as threads (not counting clock interrupt)
`icsw`	Involuntary context switches
`migr`	Thread migrations (to another processor)
`smtx`	Spins on mutexes (lock not acquired on first try)
`srw`	Spins on readers/writer locks (lock not acquired on first try)
`syscl`	System calls
`usr`	Percent user time
`sys`	Percent system time
`wt`	Percent wait time
`idl`	Percent idle time

Options

The following options are supported.

TABLE 4-8 `mpstat` Command Options

Option	Function
`-p`	Reports processor set membership of each CPU. Sorts the output by *set*. The default output is sorted by CPU number.
`-P` *set*	Displays only those processors in the specified set.

Example

```
# mpstat
CPU minf mjf xcal intr ithr csw icsw migr smtx srw syscl usr sys wt idl
__0 __68 __0 ___0 _251 __45 _92 __23 ___0 ___0 __0 __528 _47 __1 _0 _52
#
```

mt

Functionality

The `mt` command sends commands to a magnetic tape drive. If **`-f`** *tapename* is not specified, the environment variable *TAPE* is used. If *TAPE* does not exist, mt uses the device `/dev/rmt/0n`.

Option

The **`-f`** *tapename* option and variable specify the raw tape device.

Example

```
# mt command ...
```

In this example, *command* is sent to the magnetic tape drive one time.

net

Functionality

The `net` command is used to configure various aspects of the filer's PC connectivity. It can be used to create CIFS shares as well as Microsoft Windows™ users. Use the `net help` command of the filer CLI for more details.

Examples

```
# net
(Names all of the available net commands)
# net help
(Provides a description, syntax and options for the net help command)
# net help help
(Provides a description, syntax and options for the net help command)
# net help names
(Defines all of the naming conventions used in the syntax of the net command)
# net help syntax
(Defines all of the conventions used in the syntax of the net command)
# net help command
(Provides the description, syntax, and options for the net command you enter)
# net command
(Provides the description, syntax, and options for the net command you enter)
# net command/?
(Provides syntax only for the net command you enter)
# net help command/options
(Provides a detailed description of the options for the net command you enter)
```

netstat

Functionality

The `netstat` command displays the contents of certain network-related data structures in various formats, depending on the options you select.

The first form of the command displays a list of active sockets for each protocol. The second form selects one from among various other network data structures. The third form shows the state of the interfaces. The fourth form displays the routing table. The fifth form displays the multicast routing table. The sixth form displays the state of DHCP on one or all interfaces.

Options

TABLE 4-9 `netstat` Command Options

Option	Function
`-a`	Shows the state of all sockets, all routing table entries, or all interfaces, both physical and logical.
`-f` *address_family*	Limits all displays to those of the specified *address_family.*
`-g`	Shows the multicast group memberships for all interfaces.
`-i`	Shows the state of the interfaces that are used for IP traffic. Normally this shows status and statistics for the physical interfaces. When combined with the **`-a`** option, this option will also report information for the logical interfaces.
`-m`	Shows the STREAMS statistics.
`-n`	Shows network addresses as numbers. `netstat` normally displays addresses as symbols.
`-p`	Shows the net to media tables.
`-r`	Shows the routing tables. Normally, only interface, host, network, and default routes are shown, but when this option is combined with the **`-a`** option all routes will be printed including the cache.
`-s`	Shows per-protocol statistics. When used with the **`-M`** option, shows multicast routing statistics instead. When used with the **`-a`** option, the interface statistics are displayed, when available, in addition to statistics global to the system.
`-v`	Verbose. Shows additional information for the sockets and the routing table.

TABLE 4-9 `netstat` Command Options *(Continued)*

Option	Function
`-I` *interface*	Shows the state of a particular interface. *interface* can be any valid interface such as `hme0` or `le0`. Normally, the status and statistics for physical interfaces are displayed. When this option is combined with the **`-a`** option, information for the logical interfaces is also reported.
`-M`	Shows the multicast routing tables. When used with the **`-s`** option, shows multicast routing statistics instead.
`-P` *protocol*	Limits display of statistics or state of all sockets to those applicable to *protocol*. The protocol can be one of `ip`, `ipv6`, `icmp`, `icmpv6`, `igmp`, `udp`, `tcp`, `rawip`. The command accepts protocol options only as all lowercase.
`-D`	Shows the status of DHCP configured interfaces.

Examples

```
# netstat -g
Group Memberships
Interface Group _________________ RefCnt
--------- ---------------------- ------
lo0 _____ 224.0.0.1 _____________ _____1
hme0 ____ 224.0.1.1 _____________ _____1
hme0 ____ 224.0.0.1 _____________ _____2
# netstat -i
Name Mtu_ Net/Dest_ Address__ Ipkts_ Terrs Opkts_ Oerrs Collis Queue
lo0_ 8232 localhost localhost 23735_ 0____ 23735_ 0____ 0_____ 0
hme0 1500 speedy___ speedy___ 302112 0____ 142515 0____ 0_____ 0
# netstat -m
streams allocation:
___________________________________cumulative allocation
__________current maximum ___________total __failures
streams _______283 ____336 ___________14195 _________0
queues ________736 ____806 ___________34711 _________0
mblk __________550 ___1020 __________104744 _________0
dblk __________534 ___1426 _________8208508 _________0
linkblk _________6 ____340 _________________6 _________0
strevent _______13 ____340 __________185109 _________0
syncq __________14 ____113 _________________34 _________0
qband __________0 ______0 _________________0 _________0

446 Kbytes allocated for streams data
# netstat -r
Routing Table:
__Destination Gateway_______ Flags Ref Use_____ Interface
------------- ------------- ----- --- -------- ---------
nwk04-154 ___ speedy _______ _U __ __3 _____286 hme0
224.0.0.0 ___ speedy _______ _U __ __3 _______0 hme0
default ______ rnwk02b-154 _ _UG _ __0 _____680
localhost ___ localhost ___ _UH _ __0 ___22846 lo0
# netstat -M
Virtual Interface Table is empty
Multicast Forwarding Cache
_Origin-Subnet ___________________Mcastgroup # Pkts In-Vif Out-vifs/Forw-ttl
Total no. of entries in cache:0
#
```

nfscfg

Functionality

The `nfscfg` command enables or disables NFS™ service.

Parameters

The `nfscfg` command accepts the following command-line parameters.

Parameter	Function
`on`	Enables NFS services.
`off`	Disables NFS services.

Example

```
# nfscfg on
```

In this example, NFS services are enabled.

nfsstat

Functionality

The `nfsstat` command displays statistical information about the NFS and RPC (Remove Procedure Call) interfaces to the kernel. It can also be used to reinitialize this information. If no options are given the default is `nfsstat -cnrs`. That is, display everything, but initialize nothing.

Options

TABLE 4-10 `nfsstat` Command Options

Option	Function
`-c`	Displays client information. Only the client side NFS and RPC information will be printed. Can be combined with the **`-n`** and **`-r`** options to print client NFS or client RPC information only.
`-m`	Displays statistics for each NFS mounted file system. This includes the server name and address, mount flags, current read and write sizes, the retransmission count, and the timers used for dynamic retransmission. The `srtt` value contains the smoothed roundtrip time, the `dev` value contains the estimated deviation, and the `cur` value is the current backed-off retransmission value.
`-n`	Displays NFS information. NFS information for both the client and server side will be printed. Can be combined with the **`-c`** and **`-s`** options to print client or server NFS information only.
`-r`	Displays RPC information.
`-s`	Displays server information.
`-z`	Zero (reinitialize) statistics. This option is for use by the superuser only, and can be combined with any of the above options to zero particular sets of statistics after printing them.

Example

```
# nfsstat -m
/home/nsuzanne from ha10nwk-nfs1:/nfs1/home6/nsuzanne
_Flags: vers=3,proto=tcp,sec=sys,hard,intr,link,symlink,acl,rsize=32768,wsize=
32768,retrans=5

/usr/dist from udnwk02c,udnwk02b,udnwk02a:/usr/dist/
_Flags: vers=3,proto=tcp,sec=sys,hard,intr,llock,link,symlink,acl,rsize=32768,
wsize=32768,retrans=5
_Failover:noresponse=1, failover=1, remap=2, currserver=udnwk02a
#
```

nis

Functionality

The `nis` command returns the name of the NIS server and the default domain.

Example

```
# nis
The NIS server is ns-east-110. The default domain is
Ecd.East.Sun.COM
```

nis+

Functionality

The `nis+` command returns the name of the NIS server.

Example

```
# nis+
The NIS server is ns-east-110. The default domain is
Ecd.East.Sun.COM
```

ping

Functionality

The `ping` command utilizes the ICMP protocol's `ECHO_REQUEST` datagram to elicit an ICMP `ECHO_RESPONSE` from the specified *host* or network gateway. If *host* responds, `ping` will print "*host* `is alive`" on the standard output and exit. Otherwise, after *timeout* seconds, it will write "`no answer from` *host*." The default value of *timeout* is 20 seconds.

Options

TABLE 4-11 `ping` Command Options

Option	Function
`-d`	Sets the `SO_DEBUG` socket option.
`-l`	Indicates a loose source route. Use this option in the IP header to send the packet to the given host and back again. This option is usually used with the **`-R`** option.
`-L`	Turns off loopback of multicast packets.
`-n`	Shows network addresses as numbers. `ping` normally displays addresses as host names.
`-r`	Bypasses the normal routing tables and sends directly to a host on an attached network.
`-R`	Record route. Sets the IP record route option, which will store the route of the packet inside the IP header.
`-v`	Verbose output. Lists any ICMP packets, other than `ECHO_RESPONSE`, that are received.
`-i` *interface address*	Specifies the outgoing interface address to use for multicast packets. The default interface address for multicast packets is determined from the (unicast) routing tables.
`-I` *interval*	Specifies the interval between successive transmissions. The default is one second.
`-t` *ttl*	Specifies the IP time to live for unicast and multicast packets.

Example

```
# ping host
# ping -s
```

In the top example, a host is queried to see if it is active. In the bottom example, one datagram per second is sent and a line is printed for every ECHO_RESPONSE received.

prtconf

Functionality

The `prtconf` command prints the system configuration information. The output includes the total amount of memory, and the configuration of system peripherals is formatted as a device tree.

Options

TABLE 4-12 `prtconf` Command Options

Option	Function
-P	Includes information about pseudo devices. By default, information about pseudo devices is omitted.
-v	Specifies verbose mode.
-F	(SPARC only). Return the device pathname of the console frame buffer, if one exists. If there is no frame buffer, prtconf returns a non-zero exit code.
-p	Displays information derived from the device tree provided by the firmware (PROM) on SPARC platforms or the booting system on x86 platforms.
-V	Displays platform-dependent PROM (on SPARC platforms) or booting system (on x86 platforms) version information. This option must be used by itself, because it overrides all others. The output is a string. The format of the string is arbitrary and platform-dependent.
-D	For each system peripheral in the device tree, displays the name of the device driver used to manage the peripheral.

Example

```
# prtconf -F
Console output device is not a frame buffer
# prtconf -V
OBP 3.23.0 1999/06/30 13:53
# prtconf -p
System Configuration: Sun Microsystems sun4u
Memory size: 1024 Megabytes
System Peripherals (PROM Nodes):

Node 'SUNW,Ultra-80'
____Node 'packages'
________Node 'terminal-emulator'
________Node 'deblocker'
________Node 'obp-tftp'
________Node 'disk-label'
________Node 'SUNW,builtin-drivers'
________Node 'sun-keyboard'
________Node 'ufs-file-system'
____Node 'chosen'
____Node 'openprom'
________Node 'client-services'
```

The above example continues on the next page.

```
____Node ‘options’
____Node ‘aliases’
____Node ‘memory’
____Node ‘virtual-memory’
____Node ‘pci’
________Node ‘ebus’
____________Node ‘auxio’
____________Node ‘power’
____________Node ‘SUNW,pll’
____________Node ‘sc’
____________Node ‘se’
____________Node ‘su’
____________Node ‘su’
____________Node ‘ecpp”
____________Node ‘fdthree’
____________Node ‘eeprom’
____________Node ‘flashprom’
__________Node ‘pci108e,1000’
____________Node ‘SUNW,qfe’
____________Node ‘pci108e,1000’
____________Node ‘SUNW,qfe’
____________Node ‘pci108e,1000’
____________Node ‘SUNW,qfe’
____________Node ‘pci108e,1000’
...
```

quota

Functionality

The quota command enables, disables, and reports quotas on a file system.

Quota Commands

The quota command has five functions as described in the table below. Each function may take one or more parameters as described in Function Descriptions.

First Parameter	Function
on	When used with a second *filesystem* parameter, enables quotas on the named file system.
off	When used with a second *filesystem* parameter, disables quotas on the named file system.
edit	When used with a sequence of second parameters, edits quotas for a specific user on the named file system.
report	When used with a second *filesystem* parameter, reports all quotas for all users who have been assigned quotas on the named file system.
clear	When used with a second *filesystem* parameter, disables quotas on the named file system and removes all quota data currently associated with the file system. Prompts the user to confirm these functions to avoid accidental removal of data.

Function Descriptions

on

The on parameter requires the second *filesystem* parameter, where *filesystem* is the mount point for a currently mounted file system.

off

The off parameter requires the second *filesystem* parameter, where *filesystem* is the mount point for a currently mounted file system. All user quota information is maintained even though quotas have been disabled. This allows easy enabling of quotas later.

edit

The `edit` parameter requires using the following parameters in sequence.

Second Parameter	Description
username	The user account to which this quota applies.
filesystem	The file system on which this quota applies.
soft limit	The soft block limit (one block = 1024 bytes).
hard limit	The hard block limit (one block = 1024 bytes).

report

The `report` parameter requires the second *filesystem* parameter, where *filesystem* is the mount point for a currently mounted file system.

clear

The `clear` parameter requires the second *filesystem* parameter, where *filesystem* is the mount point for a currently mounted file system.

Examples

```
# quota on filesystem
# quota off filesystem
# quota report filesystem
# quota clear filesystem
# quota edit username filesystem soft
```

rdate

Functionality

The rdate command sets the system date from a remote host.

Example

```
# rdate hostname
```

reboot

Functionality

The reboot command restarts the operating system. At times, it may be necessary to manually restart the system after an upgrade process or some other event.

Options

TABLE 4-13 reboot Command Options

Option	Function
-d	Forces a system crash dump before rebooting.
-l	Suppresses sending a message to the system log daemon.
-n	Avoids the sync operation. Use of this option can cause file damage.
-q	Quickly and ungracefully reboots the system without shutting down running processes first.

Example

```
# reboot -q
```

route

Functionality

The route command manually manipulates the network routing tables.

Options

TABLE 4-14 `route` Command Options

Option	Function
`-f`	Flushes the routing tables of all gateway entries.
`-n`	Prevents attempts to print host and network names symbolically when reporting actions. This is useful, for example, when all name servers are down on your local network, and you need a route before you can contact the name server.
`-v`	Print additional details (verbose).
`-q`	Suppresses all output.

Example

```
speedy% route add default hostname 0
```

savecore

Functionality

The `savecore` command saves a crash dump of the kernel (assuming that one was made) and writes a reboot message in the shutdown log. The `savecore` command checks the crash dump to be certain it corresponds with the version of the operating system currently running. If it does, `savecore` saves the crash dump data.

Options

TABLE 4-15 `savecore` Command Options

Option	Function
`-L`	Saves a crash dump of the live running Solaris system, without actually rebooting or altering the system in any way. This option forces `savecore` to save a live snapshot of the system to the dump device, and then immediately to retrieve the data and to write it out to a new set of crash dump files in the specified directory.
`-v`	Enables verbose error messages from `savecore`.
`-d`	Disregards dump header valid flag. Forces `savecore` to attempt to save a crash dump even if the header information stored on the dump device indicates the dump has already been saved.
`-f` *dumpfile*	Attempts to save a crash dump from the specified file instead of from the system's current dump device.

Example

```
# savecore directory
```

In this example, the crash dump is saved to the specified directory.

sfmounts

Functionality

The `sfmounts` command lists all the clients that have remotely mounted filer systems from the filer. This information is maintained by the filer host, and is saved across crashes in the `/etc/rmtab` file. The `sfmounts` command takes no options and prints all remote mounts in the format:

```
hostname : directory
```

In the above example, hostname is the name of the client, and directory is the root of the file system that has been mounted.

Example

```
# sfmounts
The following is a list of all clients that have remotely mounted
filesystems from ns-east-92:
remote_client : /directory
129.148.220.161:/var/tmp
credit:/tmp
benchpress:/usr/rbin/bin
```

share

Functionality

The `share` command exports, or makes a resource available for mounting, through a remote file system of type *FSType*. If the option in `-F`*FSType* is omitted, the first file system type listed in `/etc/dfs/fstypes` is used as default. When invoked by itself, `share` displays all shared file systems.

Options

TABLE 4-16 `share` Command Options

Option	Function
`-F` *FSType*	Specifies the file system type
`-o` *specific_options*	Used with specific options `rw` and `ro`.
`-d` *description*	Provides a description of the resource being shared.

Example

```
# share -F nfs -o ro /disk
```

timezone

Functionality

The `timezone` command updates the local time zone by modifying and setting the *timezone* variable to a valid time zone. To complete the process of setting the time zone, the system prompts you to reboot the system.

Parameters

The `timezone` command accepts a valid time zone parameter. If no parameter is entered, you receive a usage message to enter the -H option or a valid time zone. You are first prompted to enter a valid country, followed by a valid time zone for that country. At both of these prompts, you can enter a question mark (**?**) to view a list of valid entries to each prompt.

Option

TABLE 4-17 `timezone` Command Option

Option	Function
`-H`	Lists the valid time zones

Example

```
# timezone US/Eastern
```

In this example, the timezone will change to Eastern Standard Time when the system is rebooted.

`trunk`

Functionality

The `trunk` command logically joins a given number of interfaces on a QuadfastEthernet (qfe) or GigabitEthernet (ge) card to provide enhanced networking features, such as traffic load-balancing and failover service for the filer.

Parameters

Parameter	Function
`create`	Makes a logical trunk(s) among given ports on the qfe or ge card(s) installed on the filer itself. The create command accepts a unique trunk name, IP address, and the interfaces to be used. The fewest number of interfaces to be included in a trunk is two; the maximum is four. Multiple even-number groupings of interfaces are allowed.
`disable`	Temporarily removes a trunk from service. Its basic information is saved, however, it might not be used as a trunk. This command accepts only the trunk's name for action.
`enable`	Activates a disabled trunk. All that is needed is the name of the disabled trunk, and enable reestablishes its full functionality.

Parameter	Function
`destroy`	Permanently removes a trunk from service. All information regarding this trunk is deleted. The only way to restore it is to run the create command again. Destroy accepts only the trunk's name for action. Note: If a trunk is currently disabled, it must be enabled before destroying.
`stats`	Displays statistics regarding the trunk that was inputted by the user. It shows information in run-time regarding the link's throughput.
`config`	Displays the current configuration of trunking on the filer. A table shows the interfaces, if they are trunked, to what head they are trunked. If not trunked, they are labeled as such—whether PCI or SBUS is employed and each original mac address.

Example

```
# trunk create trunk_name ip_address interfaces
# trunk disable trunk_name
# trunk enable trunk_name
# trunk destroy trunk_name
# trunk stats trunk_name
# trunk config
```

ufsdump

Functionality

The `ufsdump` command backs up all files specified by *files_to_dump* (normally either a whole file system or files within a system changed after a certain date) to magnetic tape, diskette, or disk file. When running `ufsdump`, the file system must be inactive. A file system is inactive when it is unmounted or the system is in single user mode.

Examples

To make a full dump of a root file system on `c0t3d0` on a 150-MByte cartridge tape unit `0`.

```
# ufsdump 0cfu /dev/rmt/0 /dev/rdsk/c0t3d0s0
```

To make and verify an incremental dump at level `5` of the `usr` partition of `c0t3d0` on a 12.7-mm (1/2-in.) reel tape unit `1`.

```
# ufsdump 5fuv /dev/rmt/1 /dev/rdsk/c0t3d0s6
```

ufsrestore

Functionality

The `ufsrestore` command restores files from backup media created with the `ufsdump` command.

Example

```
# ufsrestore -rf /mnt/latest_image.dmp
```

unshare

Functionality

The `unshare` command makes a shared local resource unavailable as a file system type FSType. If the option -F FSType is omitted, the first file system type listed in the `/etc/dfs/fstypes` file will be used as the default. The specific_options, as well as the semantics of resource name, are specific to particular distributed file systems.

Options

TABLE 4-18 `unshare` Command Options

Option	Function
`-F FSType`	Specify the file system type.
`-o specific_options`	Specify options specific to the file system provided by the -F option.

Example

```
# unshare /801/eng
```

This example unshares the `/801/eng` directory.

uptime

Functionality

The `uptime` command prints the current time, the length of time the system has been up, and the average number of jobs in the run queue over the last 1, 5, and 15 minutes.

Example

```
# uptime
4:13pm up 20 min(s, 1 user, load average: 0.12, 0.12, 0.11
```

useradm

Functionality

The useradmin command creates, updates, or deletes users from the /etc/passwd file and from the Microsoft Windows™ Primary Domain Controller (PDC). You can also use this command with the view parameter to see the list of users.

First Parameters

The useradmin command accepts first and second parameters.

The first parameters are listed in the following table.

First Parameter	Function
add	Creates a new user account entry in the /etc/passwd, and /etc/ shadow files and in the Solaris PC Netlink PDC. It also does the following: • Creates a home directory for the account on the specified array. • Sets the user and group ownership of the home directory. • Creates an NFS and CIFS share for the directory.
change	Updates an existing user account in the /etc/passwd file and in the Solaris PC Netlink PDC. It also does the following: • Updates the group ownership of the home directory. • Updates the share (NFS and CIFS) description fields to match the comment associated with the account.
remove	Deletes an existing user account from the /etc/passwd and,/etc/ shadow files, and in the Solaris PC Netlink PDC. It also does the following: • Removes the share (NFS and CIFS) associated with the account. • Leaves intact the home directory associated with the account.
view	Allows viewing the details of another specified user. If no user login_name is specified, the details of all users are displayed.
download	This is needed when running a name service. It acquires all the information required to perform the other useradm command parameters. When not running with a name service, error messages will prompt you to use the other commands alone for administration. download requires a login_name, and if creating a share, the corresponding vol_name.

Second Parameters

add

The add function requires using the following parameters in sequence.

Second Parameter	Description
login name	The login name of the account to be created.
group name	The group name of the primary group to be assigned to this account.
comment	The comment field (typically the user's full name). **Note -** Blank spaces must be enclosed in double quotes.
volume name	The volume name of the account to be created.

change

The change function requires using the following parameters in sequence.

Second Parameter	Description
login name	The login name of the account to be updated
-g *group name*	Change the primary group of the user account to *group*.
-c *comment*	Changes the command of the user account to the text in *comment*. **Note -** Blank spaces must be enclosed in double quotes.

remove

The remove function requires the *login name* parameter to indicate the login name of the account to be deleted.

view

As an option, the view function can accept the *login name* parameter to indicate the login name of the account to be viewed. When *login* is omitted, all user accounts are listed.

download

The download function requires using the following parameters in sequence.

Second Parameter	Description
login name	The login name of the account to be updated
share *volume name* | *noshare*	If creating a share, the volume name is required.

Example

```
# useradm add login_name group_name comment vol_name
# useradm change login_name [-g group_name] [-c comment]
# useradm view login_name
# useradm remove login_name
# useradm download login_name {share vol_name | noshare}
```

version

Functionality

The version command displays:

- The model and version of filer in use
- The version of the Administration Tool
- The command-line interface (CLI) version
- The Solaris OS version

Example

```
# version
StorEdge (TM) N8400 Filer 1.1
GUI Administration Tool 1.0
Command Line Interface 1.0
SunOS 5.8
```

vmstat

Functionality

The `vmstat` command reports certain statistics kept about process, virtual memory, disk, trap, and CPU activity.

Without options, `vmstat` displays a one-line summary of the virtual memory activity since the system was booted. If the *interval* is specified, `vmstat` summarizes activity over the last *interval* seconds, repeating forever. If a *count* is given, the statistics are repeated *count* times.

Note – *interval* and *count* do not apply to the **`-i`** and **`-s`** options.

If disks are specified, they are given priority when `vmstat` chooses which disks to display (only four fit on a line). Common disk names are `id`, `sd`, `xd`, or `xy`, followed by a number, for example, `sd`, `xd0`, and so forth.

Options

TABLE 4-19 `vmstat` Command Options

Option	Function
`-c`	Reports cache flushing statistics. By default, reports the total number of each kind of cache flushed since booing time.
`-i`	Reports the number of interrupts per device.
`-s`	Displays the total number of various system events since booting.
`-S`	Reports on swapping rather than paging activity.

Examples

```
# vmstat -c
flush statistics: (totals)
usr ctx rgn seg pag par
__0 __0 __0 __0 __0 __0
# vmstat -i
interrupt total rate
--------------------
clock ___214819 _100
hmec0 ____43146 __20
--------------------
Total ___257965 _120
#
```

vol

Functionality

The `vol` command creates, displays, expands, mirrors, or removes disk volumes on the filer disk storage units.

First Parameters

The `vol` command accepts first and second parameters.

The first parameters are listed in the following table.

.

First Parameter	Function
`create`	Creates a new volume.
`display`	Reports information about volumes and available disks.
`expand`	Increases a volume size to a specified limit, or increases the size by a specified increment.
`mirror`	Creates a mirrored volume.
`remove`	Removes a volume.

Second Parameters

create

The `create` function requires using the following parameters in sequence.

Second Parameter	Description
name	A user-assigned name for the volume being created.
size	The size of the created volume in Mbytes.

display

The `display` function displays information about a specific volume or disk. The `display` function requires the *name* parameter to indicate the name of a specific volume or disk.

If no volume or disk name is specified, the system reports information about all volumes and all available disks.

expand

The `expand` function requires using the following parameters in sequence.

Second Parameter	Description
name	The name of the volume being expanded.
size	A value in Mbytes to increase a volume size. Specified with a (+) indicates an incremental increase in size. Specified without a (+) indicates the total size of the volume.

mirror

The `mirror` function requires using the following parameters in sequence.

Second Parameter	Description
name	The volume to be mirrored. A mirror may be, at most, half the size of the total storage available.

remove

The `remove` function requires the *name* parameter to indicate the name of the volume to be deleted.

Example

```
# vol create name size  (size is in MB)
# vol display name
# vol expand name [size | +size]  (size is in MB)
# vol mirror name
# vol remove name
```

CHAPTER 5

Troubleshooting

This chapter provides troubleshooting procedures for problems you might encounter while using the Filer Administration Tool. For additional troubleshooting help, contact your Sun service provider.

Note – To access all the commands required for troubleshooting, you must be logged in as the `root` user.

Caution – The CLI is a collection of filer commands to be used by the system administrator. This administrator (admin user) has limited access to the filer CLI commands. The admin user is, in effect, within a restricted shell, and can not perform any task other than those that are provided with the CLI command set.

However, the root user (super user) has unlimited access to all areas of the filer. Therefore, when logged in as the root user, any changes made to these or other commands, either in configuration or in the code, can severely impact the filer's functionality, or prevent proper and predictable results.

This chapter is organized as follows:

Status Checks and Failure Notification

You can set up the filer system to monitor and notify you of errors in two ways:

- If the Simple Network Management Protocol (SNMP), is available, set it up to monitor the activity of the devices on the network (see “The Filer Administration Tool” on page 7).
- Use the Settings function to set up email notifications for hardware physical failures such as disk drives and power supplies.

You should also check for error messages in `/var/adm/messages` once or twice a week and every time you reboot the filer.

Explanation of Sun StorEdge T3 Disk Tray Hot Spare Operation

A hot spare is an extra data disk used in the event of a failure of one of the data disks in a disk tray. If a data disk in a disk tray fails, the unit enters a degraded mode until all of the data on the failed disk is re-created on the hot spare. This process typically takes between one and two hours. The hot spare disk in the disk tray is in the right-most drive slot (disk 9) if you look at the disk tray from the front.

If a data disk fails, the hot spare becomes active. If the active hot spare fails, the failure can be reported in four ways:

- A host-generated message, found in the `/var/adm/messages` file, indicates a problem with the host-channel connection to the disk tray or a drive failure in the disk tray. Syslog error reports might also be generated.
- A telnet session that monitors the disk tray for its status
- An Simple Network Management Protocol (SNMP) trap message is sent
- A visual indication of a data disk failure by a slow-blinking amber LED on the front of the disk tray above an individual disk drive

If an inactive hot spare fails, the only way to detect the failure is to issue a `healthchk` command from the console.

The procedure for replacing a hot spare is identical to the procedure for replacing a data disk. Refer to “Disk Tray Disk Drive Failure” on page 132.

Troubleshooting N8400, and N8600 System Problems

Note – To access all the commands required for troubleshooting, you must be logged in as the `root` user.

The Filer Administration Tool Does Not Open

The web browser shows a gray box and the login dialog box is not displayed.

1. **Make sure you are using the Netscape 4.x web browser.**
2. **Ensure that the Java™ language is enabled within the Netscape browser.**
3. **Bring up the Java console to check for any error messages.**
4. **If the problem persists, contact your local Sun Customer Service office.**

The Filer Administration Tool Does Not Display Properly

- **Make sure you are using the Netscape 4.x web browser.**

Cannot Ping the Filer on the Network

1. **Check to make sure you can ping other hosts on the network.**
2. **Verify the filer network cable is properly connected.**
3. **Check the network with the console connection.**
   a. **Connect the serial cable to the filer.**
   b. **Log in as a root user.**

      If no login prompt is displayed, do the following:

      - Ensure you are using the correct cables.

Are you using the NULL modem cable that comes with the filer in the serial port A on the back of the controller?

- Check that the system configuration settings are in compliance with the appropriate guide:
  - *Sun StorEdge N8400 Filer Installation, Configuration, and Service Guide*
  - *Sun StorEdge N8600 Filer Installation, Configuration, and Service Guide*

c. Try to ping another host on the network.

If you can ping another host, a problem exists with the network.

d. Check to see if the filer can see traffic on the network by typing:

```
# snoop -d interface
```

Where *interface* is the name of the network interface device being used. Some examples are `hme0`, `hme1`, `qfe0`, `qfe1`, `ge0`, and `ge1`.

If nothing is displayed on the screen, verify again that the cable connections are correct.

Note – No indicated traffic means that the interface is not connected to the network.

---

e. Type:

```
# ifconfig -a
```

The output could look something like the following:

```
lo0: flags=849<UP,LOOPBACK.RUNNING, MULTICAST>mtu 8232
    inet 127.0.0.1 netmask ff000000
hme0:flags=863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST>
    mtu 1500 inet 192.1.1.1 netmask ffffff00 broadcast 192.1.1.255
```

f. Verify that the following settings are correct:

- IP address
- Broadcast address
- Flags

g. If any setting is incorrect, perform the following steps:

i. Type:

```
# vi /etc/hosts
```

ii. Search the file to locate the filer IP address, which should be immediately below the local host IP address.

```
127.0.7.1 localhost name
192.130.151.22 filername loghost name
```

iii. Correct the *filername* IP address.

iv. Reboot by typing:

```
# init 6
```

The broadcast address and interface flags are automatically corrected.

4. If the problem persists, contact your local Sun service provider.

The Web Browser Displays the Message: The requested item could not be loaded by the proxy

1. **Make sure that the URL address requested is correct and complete (**`IP address:`*hostname*`)`**.**
2. **Verify that the web server software is running by establishing a telnet connection to the filer from another host and typing:**

```
# ps -ef|grep httpd
```

An output similar to the following should be displayed.

```
# nobody 4298 4296 0 Apr 24 ?      0:00 /usr/apache/bin/http
# nobody 4306 4296 0 Apr 24 ?      0:00 /usr/apache/bin/http
#   root  4296    1 0 Apr 24 ?     0:00 /usr/apache/bin/http
# nobody 4302 4296 0 Apr 24 ?      0:00 /usr/apache/bin/http
# nobody 4301 4296 0 Apr 24 ?      0:00 /usr/apache/bin/http
# nobody 4300 4296 0 Apr 24 ?      0:00 /usr/apache/bin/http
# nobody 4299 4296 0 Apr 24 ?      0:00 /usr/apache/bin/http
```

- If the http processes are not displayed, contact your local Sun service provider.
- If the http processes are displayed and the problem persists, carefully verify the URL address again.

Long Reboot Time

The filer is designed to have a fast reboot time due to a logging file system. The file system consistency check (`fsck`) time should be no more than 10 seconds. If it takes longer than 10 seconds:

1. **Check the console attached to the system to see what is happening to the system.**

   If you see no output and a lot of disk activity (the green LEDs on the disk drives are blinking), the system is working. Wait until it is finished.

2. **Check to see if the system has been modified by altering the mount options in the** `/etc/vfstab` **file.**
3. **If the problem persists, contact your local Sun service provider.**

Troubleshooting N8400 and N8600 Component Problems

Disk Tray Disk Drive Failure

With the Sun StorEdge N8400 and N8600 Filers, a disk drive failure can be reported in four ways:

- A host-generated message, found in the `/var/adm/messages` file, indicates a problem with the host-channel connection to the disk tray or a drive failure in the disk tray. Syslog error reports might also be generated.
- A telnet session that monitors the disk tray for its status
- A Simple Network Management Protocol (SNMP) trap message is sent
- A visual indication of a data disk failure by a slow-blinking amber LED on the front of the disk tray above an individual disk drive

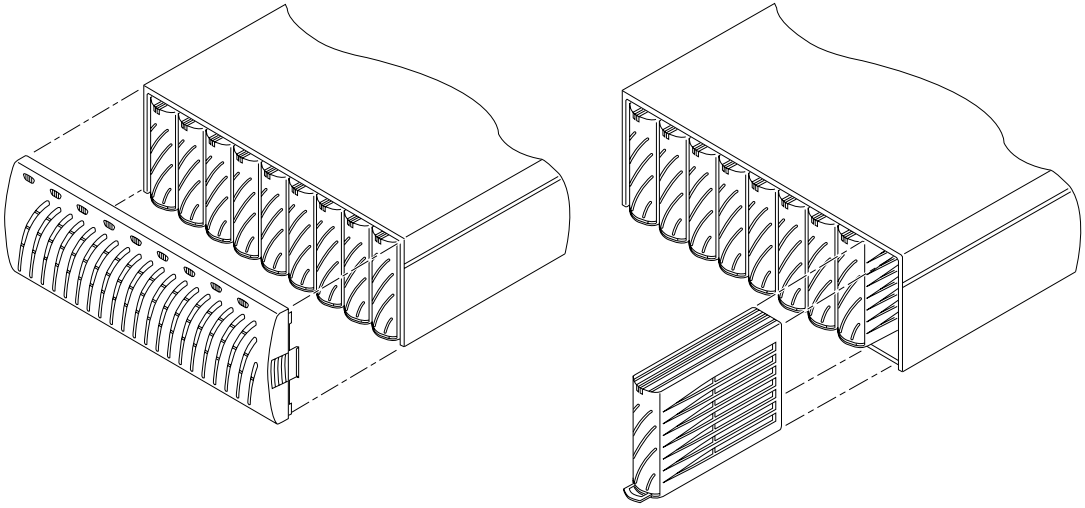

FIGURE 5-1 Removing the Sun StorEdge T3 Disk Tray Front Panel and a Disk Drive

Note – When a slow-blinking amber LED indicates a drive failure, always verify the field replaceable unit (FRU) status using the disk tray command-line interface (CLI) before replacing the drive. Do not confuse the disk tray CLI with the filer CLI. The filer CLI is used to access a simplified set of commands to manage the system.

- **Replace the disk drive by following the instructions in** *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual***.**

Note – Upon removing a disk drive from a powered-on disk tray, you will have 30 minutes to install a new drive, or the disk tray will automatically power-off.

Note – Replace only one disk drive in a disk tray at a time to ensure that no data is lost. Complete any volume reconstructions and ensure that the disk drive is fully functional before replacing another disk drive in the same disk tray.

The default configuration of the disk trays is to automatically spin up and re-enable a replaced disk drive, then automatically reconstruct the data from the parity or hot spare disk drives. Disk drive spinup takes about 30 seconds. Reconstruction of the data on the disk drive can take up to one hour, depending on system activity.

Note – In some cases, if a disk drive is removed and replaced on a powered-off or incompletely booted disk tray, the internal system monitoring facilities may not correctly detect the drive replacement. Therefore, always replace disk drives on powered-on, fully booted disk trays only.

For more information refer to:

- *Sun StorEdge T3 Disk Tray Installation, Operations, and Service Manual*
- *Sun StorEdge T3 Disk Tray Administrator's Guide*

▼ To Verify Drive Reconstruction

To check the status of a drive and verify the reconstruction of the data, choose one of the two following methods:

- **Visual**. When you place the new drive into the disk tray, the following sequence should take place:
  - Disk drive amber LED blinks fast. Disk is spinning up.
  - Disk drive green and amber LEDs blink fast. Disk is being initialized.
  - Disk drive green LED blinks fast and amber LED is steady. Disk is being reconstructed.

- Disk drive green LED is steady. Done.

- **Telnet**. Start a telnet session to the disk tray and use the `proc list` command via the disk tray's Command Line Interface (CLI).

```
t300:/:<35> proc list
```

Note – Do not confuse the disk tray CLI with the filer CLI. The filer CLI is used to access a simplified set of commands to manage the system.

An output similar to the following should be displayed.

```
VOLUME   CMD_REF   PERCENT   TIME   COMMAND
v1       20241     23        0.09   vol recon
```

Cannot Ping a Disk Tray on the Network

1. **Check to make sure you can ping other hosts on the network.**
2. **Verify that you have set the correct hostname and IP address for the disk tray.**

   Refer to the data recorded in the appropriate guide:

   - *Sun StorEdge N8400 Filer Installation, Configuration, and Service Guide*
   - *Sun StorEdge N8600 Filer Installation, Configuration, and Service Guide*
3. **Check that the cable connections are in compliance with the appropriate guide:**

   - *Sun StorEdge N8400 Filer Installation, Configuration, and Service Guide*
   - *Sun StorEdge N8600 Filer Installation, Configuration, and Service Guide*

Disk Tray Power and Cooling Unit (PCU) Failure

The cooling fans and power supplies are combined as one field-replaceable unit (FRU) of the disk tray. This failure can be reported in four ways:

- A host-generated message, found in the `/var/adm/messages` file, indicates a problem with the host-channel connection to the disk tray or a drive failure in the disk tray. Syslog error reports might also be generated.
- A telnet session that monitors the disk tray for its status
- A Simple Network Management Protocol (SNMP) trap message is sent
- A blinking amber LED on the PCU. See FIGURE 5-2 and TABLE 5-1 for an explanation of the PCU LEDs.

- **See the replacement instructions in the** *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual.*

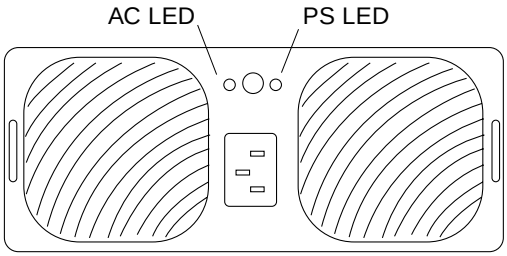

FIGURE 5-2 Power and Cooling Unit on Rear Panel of Sun StorEdge T3 Disk Tray

TABLE 5-1 Power and Cooling Unit LED Descriptions

AC LED (green or amber)	PS LED (green or amber)	Description
Off	Off	• Power is off • No AC input
Amber	Off	• Power is off • Power switch turned off • AC power is available
Green	Off	Occurs when disk tray is shut down: • PCU disabled • AC power is available

TABLE 5-1 Power and Cooling Unit LED Descriptions *(Continued)*

AC LED (green or amber)	PS LED (green or amber)	Description
Green	Green	Normal operating state: • PCU receiving AC power • Power switch is turned on • AC power is available
Amber	Amber	• Switch is off; disk tray will power off after PCU is disabled
Green	Amber	Indicates one or more of following: • Over-temperature condition; PCU disabled • DC power not available; PCU disabled • Both fans fault; PCU disabled • Battery on refresh cycle
Green	Blinking green	• Battery not OK
Green	Blinking amber	Indicates one or more of following: • PCU disabled • One fan fault • Battery hold-time low; PCU remains enabled • Battery out of warranty; PCU remains enabled • Battery life-span failure; PCU remains enabled Note—Verify a power and cooling unit failure using the CLI.

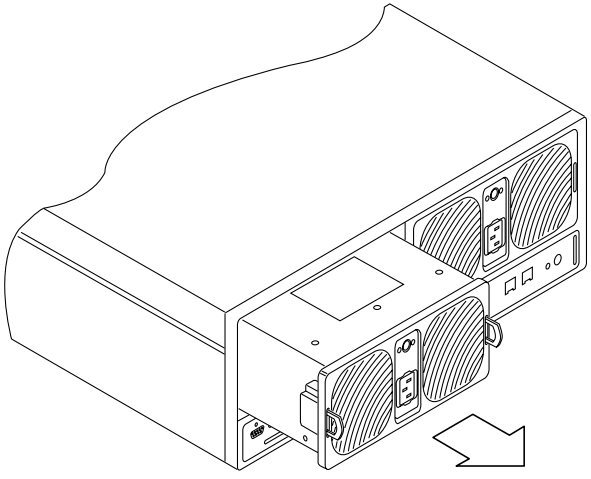

FIGURE 5-3 Removing a Sun StorEdge T3 Disk Tray Power and Cooling Unit

Disk Tray Controller Card Failure

This failure can be reported in four ways:

- A host-generated message, found in the `/var/adm/messages` file, indicates a problem with the host-channel connection to the disk tray or a drive failure in the disk tray. Syslog error reports might also be generated.
- A telnet session that monitors the disk tray for its status
- A Simple Network Management Protocol (SNMP) trap message is sent
- A blinking amber LED on a controller card. See FIGURE 5-4, TABLE 5-2, and TABLE 5-3 for an explanation of the controller card LEDs.

- **See the replacement instructions in the** *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual.*

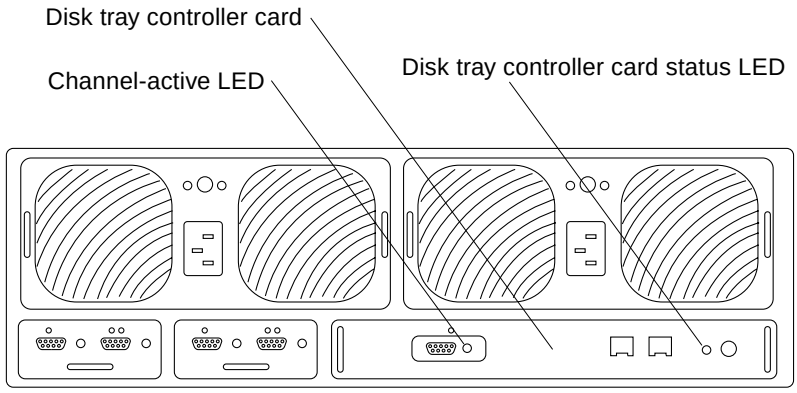

FIGURE 5-4 Controller Card on Rear Panel of Sun StorEdge T3 Disk Tray

TABLE 5-2 Channel-Active LED Descriptions

Channel Active LED (green)	Description
Off	• Port disabled
Solid	• Port enabled, idle
Blinking	• Port enabled, activity

TABLE 5-3 Controller Status LED Descriptions

Controller Status LED (green or amber)	Description
Off	• Controller not installed (not recognized)
Green	• Controller OK
Amber	• Controller boot/shutdown/firmware download in progress
Blinking amber	• Controller failure; OK to replace controller
	Note—Verify a controller card failure using the CLI.

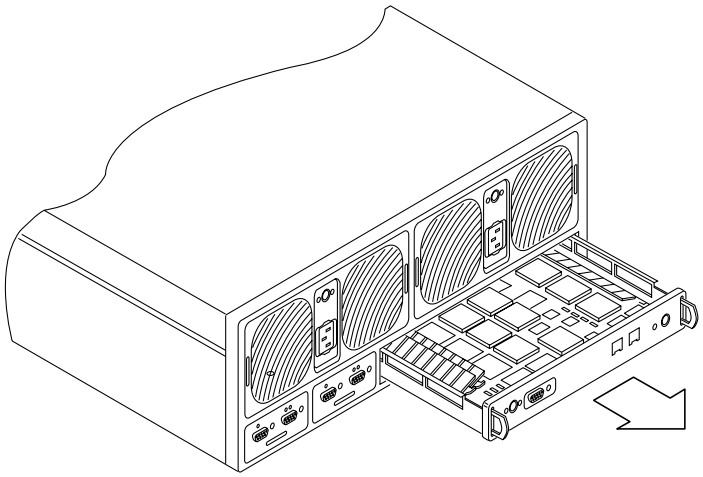

FIGURE 5-5 Removing the Sun StorEdge T3 Controller Card

Disk Tray Interconnect Card Failure

This failure can be reported in four ways:

- A host-generated message, found in the `/var/adm/messages` file, indicates a problem with the host-channel connection to the disk tray or a drive failure in the disk tray. Syslog error reports might also be generated.
- A telnet session that monitors the disk tray for its status
- A Simple Network Management Protocol (SNMP) trap message is sent
- A blinking amber LED on a interconnect card. See FIGURE 5-6 and TABLE 5-4 for an explanation of the interconnect card LEDs.

- **See the replacement instructions in the** *Sun StorEdge T3 Disk Tray Installation, Operation, and Service Manual.*

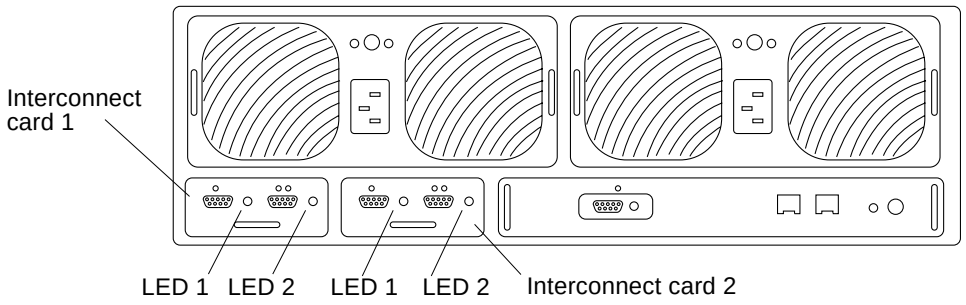

FIGURE 5-6 Interconnect Cards on Rear Panel of Sun StorEdge T3 Disk Tray

TABLE 5-4 Interconnect Card LED Descriptions

Interconnect Card Status LED (green or amber)	Description
Off	• Interconnect card not installed (not recognized)
Green-solid	• Interconnect card OK • Cable OK (if present)
Green-slow blink	• Interconnect card OK • Cable bad; OK to replace cable
Amber-solid	• Interconnect card firmware download in progress
Amber-slow blink	• Interconnect card failure; OK to replace interconnect card
	Note—Verify an interconnect card or cable failure using the CLI.

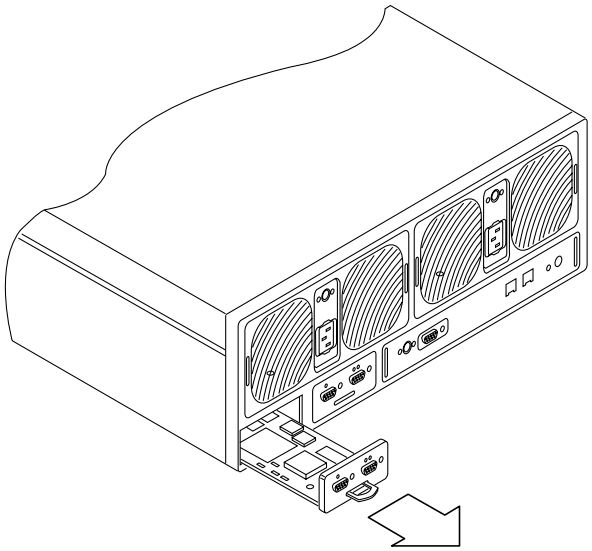

FIGURE 5-7 Removing a Sun StorEdge T3 Disk Tray Interconnect Card

Sun Enterprise 420R Server Power Supply or Fan Tray Failure

These failures can be reported in two ways:

- Error messages in the `/var/adm/messages` file
- An amber LED on the front of the controller/server lights

- **To correct either of these two failures, contact your local Sun service provider.**

Sun Enterprise 4500 Server Peripheral Power Supply and Power and Cooling Module (PCM) Failure

The peripheral power supply provides power to the peripheral subsystems, the drives, the fans in the AC box, and the fan in the key switch box. A PCM provides power for a number of boards. The PCMs also supply cooling air to the adjacent boards in chassis slots 1 through 8. Failure of either of these units can be reported in two ways:

- Error messages in the `/var/adm/messages` file
- An amber LED on the front of the controller lights

- **To correct either of these two failures, contact your local Sun service provider.**

Sun Enterprise 420R or 4500 Server Boot Disk Failure

If one of the two boot disks fails, you are notified in two ways:

- Error messages in the `/var/adm/messages` file
- An email message is sent to the address established with the Settings function. Refer to “To Change Email Notifications” on page 70.

- **To correct this problem, contact your local Sun service provider.**

Index