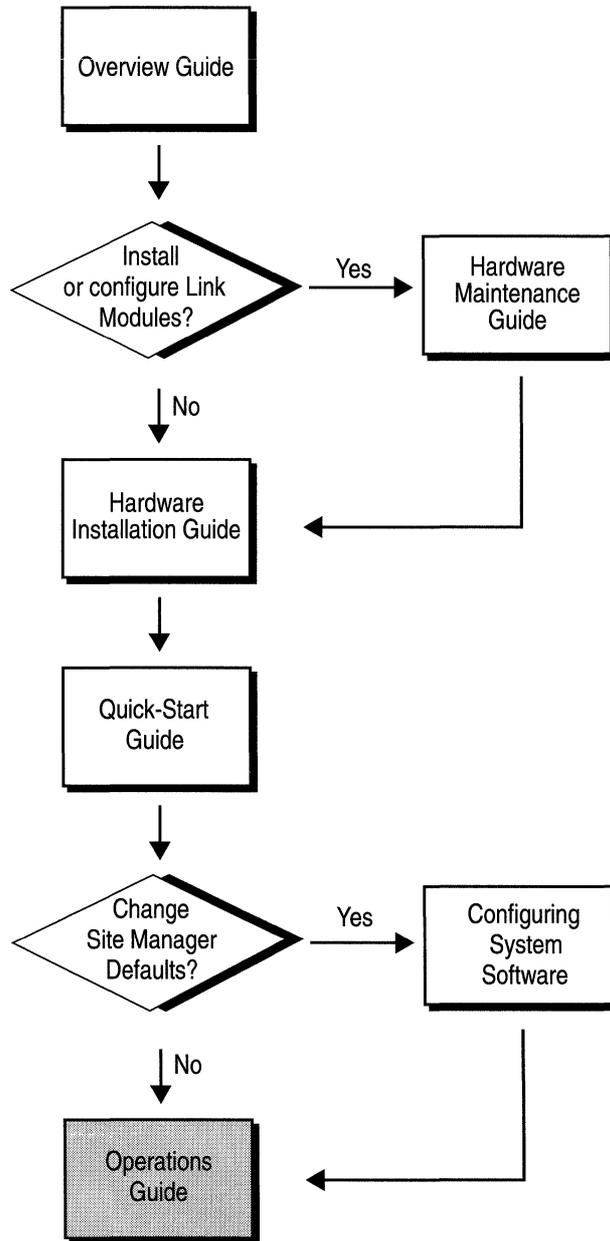


Operations Guide: Technician Interface

Software Version 7.50



Reading Path



Part Number: 105545, Revision A

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Wellfleet shielded cables must be used with this unit to ensure compliance with the Class A limits.

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This digital apparatus (the Backbone Node) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

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About this Guide

Audience and Scope

This guide is written for experienced network managers who are using the Technician Interface (TI) to maintain Wellfleet Backbone Node (BN) software.

This guide describes how to use the TI to manage events and files, access the Wellfleet MIB, boot the BN, reset a slot, run diagnostics, debug network problems, and verify and upgrade the BN software.

How to Use this Guide

Refer to the following table for instructions on how to use this guide.

For Instructions on How to:	Refer to:
Log in and out, issue commands, display online help, configure TI console parameters, and send an ICMP echo request (ping) to a remote IP address	<i>Introduction to the TI</i>
Display, save, and clear events	<i>Managing Events</i>
Display BN filenames, copy or delete BN files, transfer files between the Site Manager and the BN, and compact and format BN volumes	<i>Managing the File System</i>
Access the Wellfleet MIB	<i>Accessing the MIB</i>
Create, save, and use aliases to debug network problems	<i>Managing Aliases</i>
Boot the BN, reset a slot on the BN, run diagnostics, display the BN software version, verify and upgrade BN software, change the date and time, and assign TI passwords	<i>System Administration</i>
Use the Wellfleet MIB	<i>Using the Wellfleet MIB</i>

Document Set

The following guides complete this documentation set:

Overview Guide

Describes the user interface, called the Site Manager application, the system software, and the router hardware.

Hardware Installation Guide

Describes how to physically install the router hardware.

Quick-Start Guide

Describes how to configure the router's initial IP network interface, install the Site Manager application software, and remotely create a pilot configuration for the Wellfleet router using the Site Manager.

Configuring System Software, Volumes I and II

Describes how to use the Site Manager's Configuration Manager application to set Wellfleet router parameters in one of three modes: local, remote, or dynamic.

Hardware Maintenance Guide

Describes how to access the interior of the Wellfleet router, replace the hardware, and how to read the LEDs.

If you are missing any guides, contact Wellfleet Customer Support at 1-800-2LANWAN.

Conventions

This document set uses the following conventions:

Convention:

filename

command

Events/Log Files

Denotes:

Italics denote file and directory names.

Bold text denotes text the user needs to enter.

The slash character (/) separates menu and option names in instructions; this example identifies the Log Files option in the Events menu.

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Introduction to the TI

About this Chapter

This chapter introduces the Technician Interface (TI). The TI provides out-of-band management access to the Wellfleet router. You use the TI to install, maintain, and perform diagnostics on the Wellfleet router.

The TI is a secondary management tool; it provides powerful, but low-level, monitoring and control. It is recommended for use only by trained expert users for non-routine tasks.

Note: The TI is *not* used for routine configuration, monitoring, and control. The Site Manager is the primary tool for these functions.

This chapter assumes you have already established a local or remote TI connection; the *Quick-Start Guide* provides the instructions.

This chapter describes how to perform the TI basics, including logging in and out, issuing commands, displaying online help, configuring the TI console parameters, and sending an Internet Control Message Protocol echo request (ping) to a remote IP address. The first section of this chapter describes the difference between the TI and the Site Manager.

What Is the Difference Between the TI and the Site Manager?

The TI differs from the Site Manager as follows:

- ❑ The TI resides on the Wellfleet router's file system and automatically loads when you boot the Wellfleet router. You do *not* need to install the TI software from a separate medium first; all you need is an ASCII terminal connection to the Wellfleet router.

The Site Manager resides on a SPARC workstation or PC; you need to install the Site Manager software from a diskette or cartridge as part of the initial installation process.

- ❑ You establish a TI session through the BN's System Resource Link Module console port using a local ASCII terminal or a dial-up connection. You establish a Site Manager session independently and establish a connection in-band over the network.
- ❑ The TI is designed to serve as an emergency interface when the Site Manager is unavailable; the Site Manager is designed to serve as the interface for routine configuration and operations.
- ❑ The TI is a command-line interface; it assumes that you are a network manager who knows the TI command syntax, the MIB, and SNMP to issue TI commands. (The TI does display help text, however.)

In contrast, the Site Manager is menu-driven: when you display screens and select options from the Site Manager's popup menus, it automatically sends the appropriate SNMP commands to the Wellfleet router. The Site Manager also provides help text.

Warning: The TI does not provide the consistency checking or verification that the Site Manager static configuration feature provides; TI users can set erroneous values, commit the values to memory, and save the values to configuration files, thereby possibly disrupting router functionality and network activity.

To limit the possibility of disruption, the TI offers password security and two access levels: User (read-only) access and Manager (read-write) access. (Refer to the *TI Commands and Access Levels* section in the *System Administration* chapter for more information.) Wellfleet recommends limiting Manager access to network managers and Wellfleet Customer Support.

Logging In

You select a security access level when you log into the TI. The TI provides two access levels:

- ❑ The User access accepts read-only commands.
- ❑ The Manager access accepts all TI commands.

The *TI Commands and Access Levels* section in the *System Administration* chapter lists all of the TI commands and their associated access requirements.

Note: You must press the enter key after every TI command. TI commands and passwords are case-sensitive. Use upper- and lowercase as indicated.

Enter one of the following commands after the *Login:* prompt to log into User or Manager access:

User

Manager

New systems do not require passwords. If a password is assigned, the *Password:* prompt appears. Enter the password after the prompt.

Figure 1-1 shows the TI Welcome message and the \$ prompt, which appears after you log in. You enter TI commands after this prompt.

The TI limits login attempts to the number determined by the Login Retries parameter (wfConsole.wfLoginRetries) when the Enable Modem parameter (wfConsole.wfModemEnabled) is set to 1 (modem enabled). The default is 3 retries. Refer to the section *Configuring the TI Console Parameters* to change TI defaults.

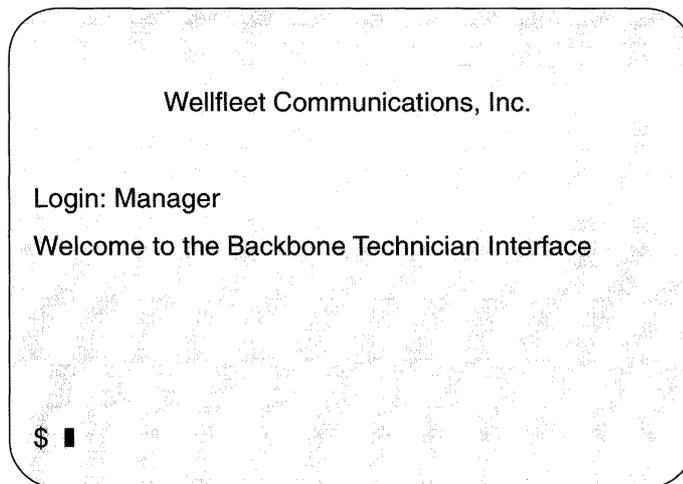


Figure 1-1. TI Welcome Screen

The TI input times out and the *Login:* prompt redisplayes when the Enable Modem parameter is set to 1 (modem enabled) and you do *not* press the return key at the *Password:* prompt within the number of minutes determined by the Password Timeout parameter (wfConsole.wfPasswordTimeOut). The default is 1 minute.

The TI records MIB statistics for the number of login attempts, number of User login failures, number of Manager login failures, and number of other login failures in the wfConsole record. The TI also records MIB statistics on the number of TTY I/O errors that occur on the console, including Frame, Overrun, Parity, and INFINITE errors.

Note: Wellfleet recommends password protection for security reasons. Refer to the *Assigning Passwords* section in the *System Administration* chapter to add password protection.

Logging Out

Enter the following after the \$ prompt to exit a TI session.

logout

The *Login:* prompt reappears if the Enable Modem parameter (wfConsole.wfModemEnabled) is set to its default value: 2 (modem disabled).

The following occurs if you logout and the Enable Modem parameter is set to 1 (modem enabled):

1. The following messages appear:

TI session logged out.

*** Goodbye. ***

2. The TI hangs up the phone.

The TI also logs you out automatically and hangs up the phone if the Enable Modem parameter is set to 1 and you do *not* press the Return key after the following prompts:

- The *Login:* prompt within the timeout value of the Login Timeout parameter (wfConsole.wfLoginTimeOut). The default is 1 minute.
- The command line prompt (which is determined by the Prompt parameter) within the timeout value of the Command timeout parameter (wfConsole.wfCommandTimeOut). The default is 15 minutes.

When the modem connected to the TI loses Carrier Detect, it hangs up and forwards an interrupt, which causes the TI to terminate the session.

Refer to the section *Configuring the TI Console Parameters* to change TI defaults.

Starting a Manager Session

You can initiate a Manager session within a User session by entering the following:

system

The *Password:* prompt appears if a password is assigned to Manager access. Enter the password after the prompt.

When the \$ prompt appears, you are logged into a Manager session.

Enter **logout** to terminate the Manager session. You return to the User session when the \$ prompt reappears.

Issuing TI Commands

TI commands, passwords, and filenames are case-sensitive. You must press the enter key to issue a TI command.

If you issue a command using an incorrect syntax, the TI displays the term *usage*: and the correct syntax to help you.

The TI help text and the instructions in this chapter use the following symbols: <>, [], |, and {}. A description of each symbol and an example of how the symbol is used follows. The commands in the examples show how the syntax notation is used; refer to subsequent sections of this manual for descriptions of the commands.

- ❑ Corner brackets (<>) surround a qualifier that you name (e.g., a filename). For example, the **dir <volume>**: command syntax requires you to insert a volume number as follows:

dir 2:

- ❑ Square brackets ([]) surround an optional qualifier. For example, the **clearlog [<slot-number>]** command syntax allows you to enter an optional parameter. Either of the following commands comply with the syntax specification:

clearlog

clearlog 2

- ❑ A vertical line (|) separates alternative qualifiers. Enter one qualifier from among the alternatives. The **more [on | off]** command syntax, for example, allows you to enter one of the following:

more on

more off

more

- ❑ Curly brackets ({}) surround a required qualifier. For example, the **save {configaliases} <vol>:<filename>** command syntax allows you to enter one of the following commands:

save config 2:config2_20

save alias 2:alias2_20

Displaying Online Help

To display online help text, enter the following, where [`<command>`] is the optional command you want described:

help [`<command>`]

Enter the following to display all TI commands in a brief table:

help help

Enter the following to display all TI commands and their associated syntax requirements:

help

Use this command as an online quick-reference card when you know the command's function, but don't know the command name or its syntax. The screen may scroll automatically; refer to the next section to control scrolling.

When you enter a space and the name of a command after **help**, the console displays a detailed description of the command along with its syntax requirements. For example, the console displays a detailed description of the **date** command when you enter **help date**.

Pausing and Scrolling the Screen

The **more** command allows you to view output before it scrolls off the screen.

If the more mode is on, the system forwards 23 lines to the screen and the following prompt, which appears at the bottom of the screen:

Type: <space> to page; <return> advance 1 line; Q to quit

If the more mode is off, the screen automatically scrolls when it fills.

Enter the following to set or display the more mode, where **[onloff]** is **on** to enable more mode or **off** to disable it:

more [onloff]

Examples	If you enter:	The system does the following:
	more	Displays <i>More mode on</i> or <i>More mode off</i>
	more on	Enables more mode to pause and prompt you when a screen fills
	more off	Disables more mode. The screen scrolls automatically without prompting you.

Aborting Output to the Screen

Press Control-c (hold the control key and press c) to abort printing to the console. The command, which you issued previously to display information to the console, is aborted.

Repeating a TI Command

The **repeat** command (!) executes the last command you entered. You can specify an optional repetition count to repeat the command.

Enter the following to execute the last command you entered, where **<repeat count>** is the optional number of times you want to execute the command. (The default is 1 time.)

! [<repeat count>]

Examples	If you enter:	The system does the following:
	!	Executes the last command you entered
	! 5	Executes the last command you entered five times

Configuring the TI Console Parameters

This section describes how to change the default parameter settings associated with the console port on the System Resources Link Module (SRM-L). The console port connects the Wellfleet router to the TI. This section provides instructions for configuring these parameters from the TI console. Refer to the *Configuration Manager Overview* chapter in the *Configuring System Software* guide if you prefer to configure the console parameters using the Site Manager.

The **set** commands in the parameter descriptions that follow allow you to configure the console parameters using the TI. You must have Manager access to issue a **set** command.

Enter the following command after issuing the **set** commands in the parameter descriptions that follow.

commit

The **commit** command causes the changes you made to the configuration to take effect. For example, the TI software service resets when you enter the **commit** command, causing the changes you made to take effect. However, the following configuration changes take effect immediately and do not require that you enter the **commit** command. (If you do enter a **commit** command after making only these changes, the TI software service does not reset.)

- ❑ Any configuration changes you make using the Site Manager
- ❑ A change to the lines per screen (attribute name `wfLinesPerScreen`) setting
- ❑ A change to the more (attribute name `wfMore`) setting

Refer to the following list of parameters to configure the TI. The list displays the following for each parameter:

- Parameter
- wfConsole attribute name. This name is listed for cross-referencing the MIB. (You do not need to use it to change the parameter setting.)
- Wellfleet default setting
- Options (range of valid settings)
- Parameter's function
- Instructions for setting the parameter
- Command you enter to configure the parameter. When entering the command, choose the new setting from the Options list and enter the new setting in place of **<option>**. Characters displayed in parentheses () in the Options list are symbolic values only. For example, you enter the following command to change the setting of the Parity parameter to 2 (odd):

set wfConsole.3.0 2

Refer to the following parameter descriptions to change the settings.

Parameter :	Baud Rate
Attribute Name:	wfBaudRate
Wellfleet Default:	9600
Options:	9600, 4800, 1200, 600, 300
Function:	Specifies the rate of data transfer between the console and the router.
Instructions:	Set according to your console requirements.
Command:	set wfConsole.1.0 <option>

Parameter : Data Bits

Attribute Name: wfDataBits
Wellfleet Default: 8
Options: 7 or 8
Function: Specifies the number of bits in each ASCII character received or transmitted by the router.
Instructions: Set according to your console requirements.
Command: **set wfConsole.2.0 <option>**

Parameter : Parity

Attribute Name: wfParity
Wellfleet Default: None
Options: 1 (none), 2 (odd), 3 (even)
Function: Enables or disables data error detection for each character transmitted or received.
Instructions: Use the 2 (odd) or 3 (even) setting to enable data error detection.
Use the 1 (none) setting to disable data error detection.
Command: **set wfConsole.3.0 <option>**

Parameter : Stop Bits

Attribute Name: wfStopBits
Wellfleet Default: 1
Options: 1, 2 (1.5), 3 (2)
Function: Specifies the number of bits that follow each ASCII character received or transmitted by the router.
Instructions: Set according to your console requirements.
Command: **set wfConsole.4.0 <option>**

Parameter : Enable Modem

Attribute Name: wfModemEnable
Wellfleet Default: 1 (enable)
Options: 1 (enable) or 2 (disable)
Function: Specifies whether the terminal is connected directly or via a modem to the TI.
Instructions: Use the 1 (enable) setting to configure the terminal for connection via a modem to the TI.
Use the 2 (disable) setting to configure the terminal for connection directly to the TI.
Command: **set wfConsole.5.0 <option>**

Parameter : Lines Per Screen

Attribute Name: wfLinesPerScreen
Wellfleet Default: 24
Options: 0 to 512
Function: Specifies the maximum number of lines displayed on the console screen.
Instructions: Set according to your console requirements.
Command: **set wfConsole.6.0 <option>**

Parameter : Enable More

Attribute Name: wfMoreEnable
Wellfleet Default: 2 (disable)
Options: 1 (enable) or 2 (disable)
Function: Specifies whether the TI pauses after each screen fills with data.
Instructions: Use the 1 (enable) setting to configure the TI to pause after each screen fills with data.
Use the 2 (disable) setting to configure the TI *not* to pause after each screen fills with data.
Command: **set wfConsole.7.0 <option>**

Parameter : Prompt

Attribute Name:	wfPrompt
Wellfleet Default:	ti>
Options:	Any string of up to 19 keyboard characters except for Control key sequences.
Function:	Specifies the text used as a prompt on your console screen.
Instructions:	Accept the default or enter a different text string.
Command:	set wfConsole.8.0 <option>

Parameter : Login Timeout

Attribute Name:	wfLoginTimeout
Wellfleet Default:	1
Options:	1 to 99 (99 indicates infinity)
Function:	Specifies the number of minutes to time out when no one has pressed the enter key after the <i>Login:</i> prompt and the Enable Modem setting is 1 (enable). The TI hangs up the phone when the timeout value is exceeded.
Instructions:	Accept the default or enter a new timeout value.
Command:	set wfConsole.9.0 <option>

Parameter : Password Timeout

Attribute Name: wfPasswordTimeout
Wellfleet Default: 1
Options: 1 to 99 (99 indicates infinity)
Function: Specifies the number of minutes to time out when no one has pressed the enter key after the *Password:* prompt and the Enable Modem setting is 1 (enable). The TI returns to the *Login:* prompt when the timeout value is exceeded.
Instructions: Accept the default or enter a new timeout value.
Command: **set wfConsole.10.0 <option>**

Parameter : Command Timeout

Attribute Name: wfCommandTimeout
Wellfleet Default: 15
Options: 1 to 99 (99 indicates infinity)
Function: Specifies the number of minutes to time out when no one has pressed the enter key after the prompt determined by the Prompt parameter and the Enable Modem setting is 1 (enable). The TI hangs up the phone when the timeout value is exceeded.
Instructions: Accept the default or enter a new timeout value.
Command: **set wfConsole.11.0 <option>**

Parameter : Login Retries

Attribute Name: wfLoginRetries
Wellfleet Default: 3
Options: 1 to 99 (99 indicates infinity)
Function: Specifies the maximum number of login attempts when the Enable Modem setting is 1 (enable). The TI hangs up the phone when the maximum number of login attempts is exceeded.
Instructions: Accept the default or enter a new retry value.
Command: **set wfConsole.12.0 <option>**

Note: When you are done entering **set** commands, enter the **commit** command as described earlier in this section.

Pinging a Remote Device

The **ping** command tests the reachability of a remote device. The Packet Internet Groper (**ping**) program sends an Internet Control Message Protocol (ICMP) echo request to the remote IP address you specify. The remote device responds if it is reachable, and the console displays the response or the result of the request.

Enter the following to send an ICMP echo request (**ping**) to a remote device:

```
ping <address> [-t<timeout>] [-r<retry>] [-s<size>] [-p]
```

where:

<address> is the required IP address, in dotted decimal notation, of the remote device.

[-t<timeout>], **[-r<retry>]**, **[-s<size>]**, and **[-p]** are optional. These parameters are as follows:

<timeout> is the number of seconds each ping times out. If the system receives a response to a ping after it times out, it does not send an “alive” message to the console. The default is 5.

<retry> is the number of successive times to repeat the ping. The system does not wait for the timeout before sending the next ping. The default is 0.

<size> is the number of bytes of data to send with each ping. The default is 16.

-p generates a path report which displays the intervening hop addresses to the destination.

Note: The ICMP echo request (**ping**) does not support loopback [pinging your own system] or broadcast addresses.

The console displays one of the following messages when you issue a **ping** command: (If you enter a value in the **<retry>** argument, the system displays one of the following messages for the default ping plus one for each additional ping:)

- An *alive* message: The message appears if the system receives an ICMP echo response from the target device within the **<timeout>** allowed. The message also indicates the size of the test packet. A sample message follows:

ping: 192.32.1.151 is alive (size = 16 bytes)

- A *does not respond* message: The message appears if the MAC address of the target device is resolved, but the system does *not* receive an ICMP echo response from the target device within the **<timeout>** allowed. A sample message follows:

ping: 193.32.1.151 does not respond

- An *ICMP host unreachable from y.y.y.y* message: The message appears if the local Wellfleet router or remote router whose address is *y.y.y.y* cannot forward the ping request any further along the path to the target device. IP updates its IP routing or ARP table accordingly. A sample message follows, where *y.y.y.y* is the address of the ICMP host:

ping: ICMP host unreachable from 192.32.243.1

- A *target address is unreachable* message: The local Wellfleet router previously issued an *ICMP host unreachable from y.y.y.y* message. Within forty seconds, the local Wellfleet router received a subsequent ICMP echo request addressed to the same target device. The ARP timed out or the address could not be resolved. A sample message follows:

ping: 192.32.1.151 is unreachable

Examples of the **ping** command follow.

Examples	If you enter:	The system does the following:
	ping 192.32.1.51	Pings the device at the IP address 192.32.1.51 and waits up to five (default) seconds for a response. The console displays one of the following messages: <i>ping: 192.32.1.151 is alive (size = 16 bytes)</i> <i>ping: 193.32.1.151 does not respond</i> <i>ping: 192.32.1.151 is unreachable</i> <i>ping: ICMP host unreachable from 192.32.243.1</i>
	ping 192.32.1.51 -p	Does all of the above, but displays the intervening hop addresses to the destination before displaying the response message for each ping. For example, the console displays the following: <i>ping: (192.32.243.1)</i> <i>ping: (192.32.244.2)</i> <i>ping: 192.32.1.151 is alive (size = 16 bytes)</i>
	ping 192.32.1.51 -t3 -r8 -s62	Pings the device at the IP address 192.32.1.51 eight successive times, sends 62 bytes of data with each ping, and waits up to three seconds for a response to each ping. The console displays one of the following for each ping sent: <i>ping: 192.32.1.151 is alive (size = 62 bytes)</i> <i>ping: 193.32.1.151 does not respond</i> <i>ping: 192.32.1.151 is unreachable</i> <i>ping: ICMP host unreachable from 192.32.243.1</i> The console also displays the following type of message after reporting the progress of each ping: <i>ping: 192.32.1.151 responded to 8 out of 8: 100% success</i>

Managing Events

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Managing Events

About this Chapter

This chapter describes how to use the TI to display, clear, and save events.

Refer to the sections in this chapter to manage the event log. Refer to the chapter *Managing Events and Traps* in the *Operations Guide: Site Manager*, for information about the event display format or about specific events.

How the System Manages Events

Events are logged by the operating software in each FRE module and stored in a first-in, first-out (FIFO) memory buffer.

When you issue a command to display or save the current log, the system sorts the events from all FRE modules in chronological order. You can also clear events from all slots or from a single slot.

The event logs are checksum protected; events are protected during a warm start (**boot** command, **reset** command, or Reset button). However, events are lost during a cold start (power-cycle or **diags** command). Also, when you remove and reinsert a FRE module, the events clear from that module.

Displaying an Event Log

Enter the following command to display the events stored in all FRE event buffers.

log

The system sorts the events and displays them in chronological order. Refer to the chapter *Managing Events and Traps* in the *Operations Guide: Site Manager*, for information about the event display format or about specific events.

Note: To stop the Wellfleet router from printing to the console, press Control-c (hold the Control key and press c).

You can also enter optional arguments in the **log** command to select the event types you want to display. Enter the following command to limit the display of events:

```
log [-d<date>] [-t<time>] [-e"<entity>"] [-f<severity>] [-s<slot id>]
```

You can enter any combination of the following optional parameters:

<date> is the date in mm/dd/yy format. The system displays the events logged on and after that date.

<time> is the time in hh:mm:ss format. The time you can enter ranges from 00:00:00 to 23:59:59. The system displays the events logged at and after that time.

"<entity>" is a software service that logged events. Quotes are required when the **<entity>** contains spaces. Use uppercase letters when specifying the **<entity>**. Refer to the chapter *Managing Events and Traps* in the *Operations Guide: Site Manager*, for a list of the entities.

<severity> is one or more letter codes for an event type. The system displays the events by type. The severity codes are **f** for fault, **i** for informational, **t** for trace, **w** for warning, and **d** for debug. (Debug events are intended only for Wellfleet Customer Support).

<slot id> is the number of the slot containing a Link Module. The system displays the events associated with the Link Module.

Examples	If you enter:	The console displays:
	log	All events in memory
	log -d10/12/93	All events logged since October 12, 1993
	log -t09:02:00	All events logged since 09:02:000 today. If it is earlier than 09:02:000, the console displays all events logged since 09:02:000 yesterday
	log -e TFTP	All events logged by the TFTP driver
	log -ffw	All fault and warning events
	log -s3	All events logged in slot 3
	log -eTFTP -ffw -s3	All fault and warning events logged by the TFTP driver in slot 3

Saving an Event Log

You can save the events in the current event buffer to a file for later retrieval.

Warning: The system automatically overwrites any file already on the volume that has the same filename. To avoid overwriting an existing file, display a list of the volume's contents (with the **dir <vol>**: command) and determine the filenames already in use.

Enter the following, where **<vol>** is the slot number of the volume to store the file and **<logfile>** is the name of the file you are creating to store the events.

save log <vol>:<logfile>

Wellfleet recommends that you use the *.log* file extension when creating log files.

You can verify that the log file is saved by entering the **dir <vol>**: command.

You can use the same optional arguments when displaying a log file you previously saved as you can to display a current log (refer to the section that follows for instructions.)

Another option is to limit the event types you save to a log file. When you display the log file after saving it, only those event types you saved are displayed. Enter the following command to limit the event types you save to a log file:

save log <vol>:<logfile> [-d<date>] [-t<time>] [-e"<entity>"] [-f<severity>] [-s<slot id>]

Refer to the previous section for a description of the optional arguments.

Note: The **save log** command does *not* clear events from memory. Refer to *Clearing Events* to clear events.

Examples

If you enter:

The system does the following:

save log 2:10_12.log

Saves all events to a file named *10_12.log* in slot 2

save log 2:10_12.log -d10/12/93

Saves events logged since October 12, 1993 to a file named *10_12.log* in slot 2

save log 2:temp.log -t09:02:00

Saves events logged since 09:02:000 today to a file named *temp.log* in slot 2. If it is earlier than 09:02:000, the system saves all events logged since 09:02:000 yesterday.

save log 3:tftp.log -eTFTP

Saves events logged by the TFTP driver to a file named *tftp.log* in slot 3

save log 3:snmp.log -eSNMP -fff

Saves trace and fault events logged by the SNMP driver to a file named *snmp.log* and stores the file in slot 3

save log 2:slot3.log -s3

Saves events logged to slot 3 to a file named *slot3.log* in slot and stores the file in slot 2.

Displaying a Log File

You can use the **log** command to display a log file you previously saved. Enter the following to display a log file, where **<vol>** identifies the slot location and **<logfile>** is the name of the log file you want to display:

```
log [<vol>:<logfile>]
```

The system reads the log file, which is stored in binary, and forwards an ASCII representation to the console.

The event format is identical to the format of the current log display.

You can use the same optional arguments when displaying a log file as you can to display or save the current log. Enter the following command to limit the event types to display:

```
log [<vol>:<logfile>] [-d<date>] [-t<time>] [-e"<entity>"] [-f<severity>] [-s<slot id>]
```

Refer to *Displaying an Event Log* for a description of the optional arguments.

Examples	If you enter:	The console displays:
	log 2:10_12.log	All events stored in the <i>10_12.log</i> file in slot 2
	log 2:10_12.log -eTFTP	All events logged by the TFTP driver and stored in the <i>10_12.log</i> file in slot 2
	log 2:10_12.log -eSNMP -fff	All trace and fault events logged by the SNMP driver and stored in the <i>10_12.log</i> file in slot 2
	log 2:10_12.log -s3	All events logged to slot 3 and stored in the <i>10_12.log</i> file in slot 2

Clearing Events

Clearing events from the event log buffer is useful if you want to conduct an experiment and examine the event log afterwards.

Note: You may want to save the log to a file for later retrieval before clearing it. (Refer to the previous section.)

Enter the following to clear all events from the event buffer, where **<slot-number>** is the location of the log buffer you are clearing:

clearlog [<slot-number>]

The system automatically clears all events from the buffer associated with the slot you indicated.

Examples	If you enter:	The system does the following:
	clearlog	Clears all events from memory
	clearlog 2	Clears all events from the slot 2 event buffer

Managing the File System

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Managing the File System

About this Chapter

This chapter describes how to use the TI to manage files on the Wellfleet router.

This chapter describes how to do the following:

- ❑ Display the status of each volume installed in the Wellfleet router
- ❑ Display the contents of a volume
- ❑ Change the active volume
- ❑ Display the contents of an ASCII file
- ❑ Copy a file from one volume to another, or to the same volume
- ❑ Delete a file
- ❑ Transfer a file between any Wellfleet router and the Site Manager workstation
- ❑ Compact file space
- ❑ Format a volume

Introduction

The Flash memory card provides the BN with nonvolatile file storage (NVFS). The Flash card also provides system access to the software image and configuration file during a cold start. (A cold start occurs after a power-cycle or after you enter the **diags** command).

Each FRE module in the BN can host one volume (Flash memory card). Multiple Flash cards are optional in the BN. They provide redundancy, additional storage, or both.

Note: If you are providing redundancy, be sure to copy files to the redundant volumes when you modify them.

Each volume number is the same number as the slot that hosts the volume: that is, volume 2 resides on slot 2.

Table 3-1 outlines the NVFS commands. The Wildcard column indicates whether you can use wildcards (* and ?) when entering the commands. You use wildcards to display multiple filenames, and copy or delete multiple files. The wildcards have the same meaning as those in UNIX:

- The * wildcard matches any number of characters, including zero characters.
- The ? wildcard matches any single character. A match occurs only when a character is present in the position indicated by the wildcard.

The sections that follow describe the commands in detail. They also show how to use the wildcards.

Table 3-1. NVFS Commands

Command	Wildcard	Function
compact		Reallocates file space on a volume (Flash card)
copy	✓	Copies a file from one volume to another or to the same volume
cd		Changes the active volume
delete	✓	Deletes a file from a volume
dinfo		Displays the volume number, status, and space for each volume
dir	✓	Displays all files on a volume
format		Erases any existing files on a volume and formats the volume
save		Saves the current software configuration, aliases, or events to a file on the NVFS. Refer to <i>Managing Events</i> , <i>Accessing the MIB</i> , or <i>Managing Aliases</i> for instructions on the save command.
tftp		Transfers a file to or from the Wellfleet router
type		Display the contents of a file on a volume in ASCII or hexadecimal format

Displaying Volume Memory

Enter **dinfo** to display the status of each volume (Flash card) currently installed in the Wellfleet router. Figure 3-1 shows a sample dinfo display of a system with volumes installed in slots 2 and 3.

```

$ dinfo

```

VOL	STATE	TOTAL SIZE	FREE SPACE	CONTIG FREE SPACE
2:	FORMATTED	2097152	1458420	1458420
3:	FORMATTED	2097152	1458420	1458420

Figure 3-1. Sample Dinfo Display

The dinfo display contains the following data:

VOL: The slot numbers where the volumes are currently installed.

STATE: The state of the volume is either *FORMATTED* or *CORRUPTED*. If you purchase a card from another supplier, the dinfo display may list it as *CORRUPTED*. If a volume is *CORRUPTED*, format it. (Refer to *Formatting a Volume* later in this chapter for instructions.)

TOTAL SIZE: The total number of bytes (used and unused) on the volume.

FREE SPACE: The number of unused bytes on the volume.

CONTIG FREE SPACE: The number of unused bytes in the largest block of available space on the volume.

When you delete a Flash card file, the file becomes inaccessible, but the data remains on the Flash card. Eventually, all space is used. The **compact** command copies the active files to memory, erases the Flash card, and copies the files back to the Flash card. This procedure provides more space, provided that the *CONTIG FREE SPACE* is less than the *FREE SPACE*.

Warning: Back up the files by copying them to a second Flash card before issuing the **compact** command.

Refer to the *Compacting File Space* section to reorganize space to prevent or to respond to a file allocation failure.

Displaying the Contents of a Volume

You use the **dir** command to display a list of the files on a particular volume. You can use the wildcard characters ***** and **?** to display filenames having the character strings you specify.

Enter the following to list the files stored on the active volume:

dir

Enter the following to list the files stored on a different volume, where **<vol>** is the slot number containing the volume:

dir <vol>

Examples follow. Figure 3-2 shows a sample response to the **dir** command.

Examples	If you enter:	The console displays the following:
	dir	The list of files in the active volume
	dir *.cfg	The list of only those files with a <i>cfg</i> filename extension on the active volume
	dir 3:	The list of files in slot 3
	dir 4:???.log	The list of files with a three-character filename and a <i>log</i> filename extension on slot 4

```
$dir
Volume in drive 1: is
Directory of 1:

File Name           Size      Date      Day      Time
-----
boot.exe            630988   01/18/93   Mon.    11:08:12
config              2496     01/18/93   Mon.    11:08:12
debug.al            372      01/18/93   Mon.    11:08:12
diag1101.exe       2476     01/18/93   Mon.    11:08:12
freboot.exe        1905     01/18/93   Mon.    11:08:12
startup.al          123      01/18/93   Mon.    11:08:12
ti_only.cfg        372      01/18/93   Mon.    11:08:12

 2097152 bytes - Total size
 1458420 bytes - Available free space
 1458420 bytes - Contiguous free space
```

Figure 3-2. Sample Directory Listing

The factory-default filenames shown in Figure 3-2 are as follows:

- *boot.exe* is the bootable image. The system automatically references this binary file for booting instructions unless you specify another bootable image. You *cannot* read or change this file. This file must have the *boot.exe* filename for the system to boot automatically after a cold-start, or after you press the Reset button, issue the **boot** command, or issue the **reset** command to the entire system.
- *config* is the default configuration file. The system references this binary file for configuration data when booting. (However, you can specify another configuration file with the **boot** command). You can change the configuration by copying an alternate configuration file to *config*. Also, you can store alternate or future configurations.

This file must have the *config* filename for the system to configure automatically after booting. Wellfleet recommends that you copy the *config* file to a new backup filename before overwriting the *config* file.

- ❑ *debug.al* is an ASCII file containing aliases (commands that abbreviate long or multiple commands) that you can use to debug common network problems. (Refer to *Debugging with Predefined Aliases* in the *Managing Aliases* chapter to use the aliases in this file.)
- ❑ *diag1101.exe* is a copy of the diagnostics image resident on the diagnostics PROM. You *cannot* read or change this file.
- ❑ *freboot.exe* is a copy of the bootstrap image resident on the bootstrap PROM. You *cannot* read or change this file.
- ❑ *startup.al* is an ASCII file containing aliases that you use during the initial start-up.
- ❑ *ti_only.cfg* is a configuration file containing the MIB variables associated with the default TI console operating parameters. This file contains the minimal configuration necessary to operate the Wellfleet router. You boot with this file when updating a PROM to provide full bandwidth along the Parallel Packet Express (PPX). You may also want to boot with this file when copying a volume to prevent buffer errors. This file is stored in binary format.

The Total size, Available free space, and Contiguous free space fields that appear below the **dir** display show the same information as the TOTAL SIZE, FREE SPACE, and CONTIG FREE SPACE in the **dinfo** display. Refer to the section *Displaying Volume Memory* for a description of these fields.

Changing the Active Volume

You use the **cd** command to display or change the active volume.

Enter **cd** to display the active volume number. The following response indicates that the active volume is 2:

Present Working Directory: 2:

Enter the following to change the active volume, where **<vol>** is the slot number of the volume:

cd <vol>:

The new active volume is displayed.

Examples	If you enter:	The console displays the following:
	cd	The present active volume number
	cd 3:	<i>New Present Working Directory: 3:</i> (Now when you enter dir , the directory contents for Volume 3 are displayed.)

Displaying the Contents of a File

The **type** command displays the contents of a file. Before displaying a file, enter **more on** to display the file one screen at a time.

Enter the following to display a file:

```
type [-x] <vol>:<filename>
```

Where:

-x is an optional command to display the file in hexadecimal format. This allows files containing non-printable information to be viewed.

<vol> specifies the slot number of the volume containing the file.

<filename> is the name of the file you are displaying.

The file is displayed in the same format in which it is stored (provided that you do not enter the **-x** argument): binary for log files and ASCII for alias files. Log files are stored in binary format; use the **log** command described in *Displaying an Event Log* in the chapter *Managing Events* to display a log file in ASCII format.

Examples	If you enter:	The console displays the following:
	type 2: startup.al	The contents of the <i>startup.al</i> file, which is stored on the volume in slot 2
	type -x 3:config	The <i>config</i> file which is stored on the volume in slot 3. This file is displayed in hexadecimal format.

Naming Files: Rules and Conventions

The rules for naming files are as follows:

- ❑ You must specify the volume location (slot number) of any file you reference and of any file you can create. The sections that follow detail the syntax requirements, including the slot number specification, for each command.
- ❑ Filenames must start with an alphabetical character. The remaining characters must be alphanumeric, and may also include the underscore (`_`) character.
- ❑ Filenames can consist of 1 to 15 characters.
- ❑ File extensions are optional, and must be preceded by a filename and a dot. The total limit of the filename and file extension is 15 characters (including the dot).

Also, Wellfleet recommends you use the following conventions when naming files so that you can distinguish files by type.

- ❑ Use the `.exe` file extension for software images. (The default software image is `boot.exe`.)
- ❑ Use the `.cfg` file extension for alternate configuration files. (The default configuration file is `config`.)
- ❑ Use the `.al` file extension for alias files.
- ❑ Use the `.log` file extension for log files.

Copying a File

The **copy** command makes a copy of a file. You can use the wildcard characters * and ? when issuing the copy command.

Warning: The system automatically overwrites any file already on the volume that has the same filename as the file you are creating. To avoid overwriting an existing file, display a list of volume's contents (with the **dir <vol>** command) and determine the filenames that are already in use.

Enter the following to make a copy of a file on the active volume:

```
copy <oldfile> <newfile>
```

Enter the following to copy a file to a different volume:

```
copy <vol>:<oldfile> <vol>:<newfile>
```

Where:

<vol> in **<vol>:<oldfile>** is the source slot number.

<vol> in **<vol>:<newfile>** is the target slot number.

Examples	If you enter:	The system does the following:
	copy config alt.cfg	Copies the <i>config</i> file on the active volume and names the new copy <i>alt.cfg</i>
	copy 3:alt.cfg	Copies the <i>alt.cfg</i> file on slot 3 and stores the new copy, also named <i>alt.cfg</i> , on the active volume
	copy 2:log1 2:log10.20	Copies the <i>log1</i> file on slot 2 and names the new copy <i>log10.20</i>
	copy 2:config 3:config	Copies the <i>config</i> file on slot 2 and stores the new copy, also named <i>config</i> , on slot 3
	copy *.* 3:	Copies all files from the active slot to slot 3
	copy 2:*.exe 4:	Copies all executable files from slot 2 to slot 4
	copy 3:log?.* 4:	Copies all files with the <i>log</i> prefix from slot 3 to the active volume

Deleting a File

The **delete** command deletes the files you specify. You can use the wildcard characters ***** and **?** when issuing the delete command.

Warning: You cannot recover a file after it is deleted. The delete command does not prompt you to verify a deletion.

Enter the following to delete a file on the active volume:

delete <filename>

Enter the following to delete a file on a different volume:

delete <vol>:<filename>

Where:

<vol> is the slot number of the volume containing the file.

<filename> is the name of the file.

You can enter **del** or **delete** when deleting a file.

Examples	If you enter:	The system does the following:
	delete alt.cfg	Deletes the <i>alt.cfg</i> file on the active volume
	delete 2:log10.20	Deletes the <i>log10.20</i> file on slot 2
	delete 3:*.log	Deletes all files with the <i>log</i> filename extension on slot 3
	delete 4: ????.log	Deletes all files with a three-character filename and a <i>log</i> filename extension on slot 4

Transferring a File

The **tftp** command invokes the TFTP (Trivial File Transfer Protocol) software to execute a file transfer between a Wellfleet router and another router or host capable of serving tftp file transfer requests.

The TFTP software resides within the IP Router. Consequently, you must load and enable the IP Router to use TFTP (refer to the *Quick-Start Guide* for instructions.)

Note: When you transfer a file to a Wellfleet router, the TFTP driver of the receiving (client) Wellfleet router uses the value of the *wfTftp.2.0* MIB attribute to determine the volume number of the volume to write the new file. If you are transferring a file to a client Wellfleet router, use the **set** command to set the value of *wfTftp.2.0* on the client Wellfleet router to the correct slot number before issuing the **tftp** command.

Enter the following command to transfer a file:

```
tftp {get|put} <vol>:<file_spec> <address>
```

where:

{get|put} is **put** if you are transferring the file to the remote node or **get** if you are transferring the file to the local Wellfleet router.

<vol> is the slot number containing the volume in the local Wellfleet router.

<file_spec> is the name of the file to be transferred.

<address> is the address of the remote node.

Warning: The system erases the contents of the file if you enter the address of the local system in the **<address>** field. Also, the destination system automatically overwrites any file already on the volume that has the same filename. To avoid overwriting an existing file on the Wellfleet router, display a list of the volume's contents (with the **dir <vol>:** command) and determine the filenames already in use.

The system executes one TFTP request at a time, and suspends disk logging and communications with the TI for the duration of the file transfer. The destination system stores the file under its original name.

Examples	If you enter:	The local system does the following:
	tftp put 2:config2 192.32.1.62	Sends a copy of <i>config2</i> on slot 2 to the remote node at the IP address 192.32.1.62
	tftp get 2:config2 192.32.1.62	Requests a copy of <i>config2</i> from the remote node at the IP address 192.32.1.62 and stores the copy in the volume on slot 2

Compacting File Space

When you delete a Flash card file, the file becomes inaccessible, but the data remains on the Flash card. Eventually, all space is used. The **compact** command copies the active files to memory, erases the Flash card, and copies the files back to the Flash card. This procedure provides more space, provided that the **dir** or **dinfo** displays more free space than contiguous free space.

Warning: Back up the files by copying them to a second Flash card before issuing the **compact** command.

Enter the following to erase the Flash memory card and rewrite its files, where **<vol>** is the slot number of the card:

compact <vol>:

The space is compacted when the \$ prompt reappears.

Formatting a Volume

Enter the following to erase all files on a volume and format it, where <vol> is the slot number of the card:

format <vol>:

Use the **format** command to format new volumes if you do not obtain them from Wellfleet.

Enter **dinfo** to ensure that the card is formatted after you format it.

Warning: You cannot recover your files after entering the **format** command. Wellfleet recommends that you copy them to a second volume before issuing the **format** command.

Accessing the MIB

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Accessing the MIB

About this Chapter

This chapter describes how to use the TI to access and manage the Wellfleet Management Information Base (MIB). This chapter assumes you know how to manage the MIB, but need instructions to enter MIB management commands at the TI console. Refer to the appendix *Using the Wellfleet MIB*, for more information about the Wellfleet MIB.

This chapter describes how to do the following:

- Display MIB object names, identifiers, and values
- Change MIB values
- Load MIB value changes into RAM to take effect immediately
- Save the configuration in RAM to a file for later retrieval when booting

Note: The TI is *not* intended for routine configuration, monitoring, and control. The Site Manager is the primary tool for these functions.

Listing MIB Objects

You can display MIB object names and their associated identifiers using the **list** command. When you want to display or change a MIB value but don't know its object or attribute name, use this command.

Enter the following to display a list of all MIB object names and identifiers:

list

You can also enter the following to display a list of attributes and their associated identifiers, where [**<obj_name>**] is the name of the object at the level above the attributes:

list [<obj_name>]

Finally, you can display a list of instance identifiers using the **list** command. Enter the following to display a list of instance identifiers:

list [[instances] <obj_name>]

Where:

[instances] is the optional key word **instances**.

[<obj_name>] is the name of the object at the level above the attributes.

Examples	If you enter:	The console displays:
	list	All object names and their associated object identifiers: <i>wfCSMACDEntry = 1.3.6.1.4.1.18.3.4.1.1</i> <i>wfFddiEntry = 1.3.6.1.4.1.18.3.4.4.1</i> <i>wfFddiSmtEntry = 1.3.6.1.4.1.18.3.4.15.1.21</i> ...
	list wfCSMACDEntry	All attribute names and associated attribute identifiers of the <i>wfCSMACDEntry</i> object: <i>wfCSMACDDelete = 1</i> <i>wfCSMACDEnable = 2</i> <i>wfCSMACDState = 3</i> ...
	list instances wfCSMACDEntry	All instance identifiers of the <i>wfCSMACDEntry</i> object configured on your system: <i>inst_ids = 2.1</i> 2.2 4.1 4.2

Getting MIB Values

The **get** command displays the value of a MIB object. You can also insert a wildcard character (*) in the attribute name *or* identifier to display the values of multiple objects.

Enter the following to display one or more object identifiers and their associated values:

```
get {<object>.<attribute>.<instance>}
```

where:

<object> is the required object name or identifier.

<attribute> is the required name, identifier, or wildcard character of the object attribute(s). The wildcard character * displays all attributes of the object and their associated values.

<instance> is the optional name or identifier of the instance. An asterisk (*) in place of the instance displays all instances of the object and their associated values.

Note: You *cannot* use more than one wildcard in the **get** command.

The following examples demonstrate various ways to display the value of an attribute. The attribute in these examples is named *wfSnmpDisable*. Its instance ID is 1. Its object name is *wfSnmp* and object identifier is *1.3.6.1.4.1.18.3.5.3.5.1*.

The instance ID of 0 is reserved for base record objects. Specifying the base record instance ID in the **get** command is optional. (Refer to the second example.)

The last example demonstrates how to obtain a group of values associated with an object.

Examples	If you enter:	The console displays:
	Any one of the following: get wfSnmp.wfSnmpDisable get wfSnmp.wfSnmpDisable.0 get 1.3.6.1.4.1.18.3.5.3.5.1.1 get 1.3.6.1.4.1.18.3.5.3.5.1.1.0 get 1.3.6.1.4.1.18.3.5.3.5.1.1.* get wfSnmp.1.0 get wfSnmp.1.*	<i>wfSnmp.wfSnmpDisable.0 = 1</i> (The object name, the base record (0), and the value)
	get wfSnmp.*.0	Appending the base (0) to the object name is optional when issuing a get command.
	get wfSnmp.*.*	Likewise, appending the base (0 or *) to the instance identifier is optional when issuing a get command. <i>wfSnmp.wfSnmpDisable.0 = 1</i> <i>wfSnmp.wfSnmpUseLock.0 = 1</i> <i>wfSnmp.wfSnmpLockAddress.0 = 0.0.0.0</i> ... <i>get: Invalid obj.attr.inst specified</i>

Setting MIB Values

The **set** command modifies the value of an instance. You set an instance by specifying its *object.attribute.instance*. You may use names or identifiers to specify object groups and attributes; use only an appropriate identifier or index value to specify the instance.

Note: When you enter the **set** command, the attribute is set on each running FRE.

Enter the following to change the value of an object instance:

set {<object>.<attribute>.<instance> <value>}

Where:

<object> is the name or identifier of the object.

<attribute> is the name or identifier of the attribute.

<instance> is the identifier of a nontabular object or the index value of a tabular object.

<value> is the new value of the object instance. This value may be one of the following, depending on the datatype:

- ❑ Integer, Unsigned Integer types: decimal number
- ❑ IP Addresses: dotted decimal format (i.e. 192.32.0.0)
- ❑ Octet strings: hexadecimal number starting with 0x
- ❑ Display strings: string enclosed in double quotes

Refer to the Wellfleet MIB to determine the datatype.

Warning: If you are running Spanning Tree, always follow any TI **set** command to the Bridge with the corresponding TI **set** command to the Spanning Tree. Otherwise, you may lose connectivity to LANs. Refer to the last two examples that follow.

Also, ensure the values you set are legal. Illegal or incompatible MIB values can disrupt software or network services after you enter the **commit** command. Refer to the Wellfleet MIB for the legal values.

You can use the **list** command or refer to the Wellfleet MIB to determine the symbolic names and identifiers for object groups and attributes.

Use the **commit** command (described in the next section) to notify the software services of the MIB changes accomplished with the **set** command. Then, to copy the changes you make to a configuration file, use the **save** command (described in *Saving the Configuration*).

Note: Be sure to enter **commit** after entering the **set** command (see the next section for instructions.)

Examples	If you enter:	The system does the following:
	Any one of the following: set wfSnmplib.wfSnmplibDisable.0 1 set 1.3.6.1.4.1.18.3.5.3.5.1.1.0 1 set wfSnmplib.1.0 1	Changes the value of the group.attribute.instance <i>wfSnmplib.wfSnmplibDisable.0 (1.3.6.1.4.1.18.3.5.3.5.1.1.0)</i> to 1 to enable SNMP.
	set wfIplInterfaceEntry.2.192.32.13.99.3 2	Changes the value of the group.attribute.instance <i>wfIplInterfaceEntry.WfIplInterfaceEnable.192.32.13.99</i> to 2. This disables IP for the interface whose IP address is <i>192.32.13.99</i> and whose circuit is 3.
	Both of the following: set wfBrTp.2.0 1 set wfBrStp.2.0 1	Changes the values of the group.attribute.instance <i>wfBrTp.wfBrTpBaseEnable.0</i> and <i>wfBrStp.wfBrStpBaseEnable.0</i> to 1 to enable the Translating Bridge and Spanning Tree.
	Both of the following: set wfBrTp.2.0 2 set wfBrStp.2.0 2	Disables the Translating Bridge and Spanning Tree.

Committing MIB Sets

The **commit** command causes all previously entered **set** commands to take effect. When you enter **commit**, the system notifies all software services whose configuration parameters have changed.

Refer to the following section to copy all MIB values from operating RAM to a configuration file for later retrieval.

Saving the Configuration

You can copy all MIB values from operating RAM to a configuration file for later retrieval. You use the **save config** command to copy the configuration in memory to the default configuration file or to an alternate configuration file. Enter the following, where <filename> is the name of the file you are creating to store the configuration:

```
save config <vol>:<filename>
```

Examples	If you enter:	The system does the following:
	save config 2:config	Overwrites the default configuration file <i>CONFIG</i> on the volume in slot 2 with the configuration in memory.
	save config 2:config.2	Creates an alternate configuration file named <i>CONFIG.2</i> on the volume in slot 2 and stores the configuration residing in memory in this file.

Refer to *Booting the Wellfleet Router* in the *System Administration* chapter to load a configuration from a file.

Chapter 5

Managing Aliases

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Managing Aliases

About this Chapter

An alias is a command you create and enter to invoke long or multiple commands. After the alias is created, you enter the alias name to invoke its associated commands.

This chapter describes how to do the following:

- ❑ Create an alias in memory and enter it to invoke its associated commands
- ❑ Display the commands associated with an alias
- ❑ Delete an alias
- ❑ Save aliases to a file in the NVFS for later retrieval
- ❑ Load aliases from a file into RAM
- ❑ Use the aliases in the *debug.al* file to debug common network problems

Note: The *startup.alias* file contains the aliases needed during the initial configuration procedure. (Refer to the *Quick-Start Guide* for instructions on using the startup aliases.)

Creating and Displaying an Alias

You can use the **alias** command to create an alias or to display the commands associated with an alias. Enter the following to display or create an alias:

```
alias [<name> [{"<alias_value>"}]]
```

where:

<name> is one of the following optional alias name types:

- ❑ The name of the alias you are creating. The name may be one to eight alphanumeric characters; the initial character must be alphabetical.
- ❑ The name of an existing alias when you want to display its associated commands.

<alias_value> is a string of TI commands. The following rules apply to inserting characters in the **<alias_value>**:

- ❑ Separate commands with a space and a semicolon (;).
- ❑ Use double quotes (" ") *outside* the **<alias_value>** if it includes a space or a semicolon (;). The quotes are otherwise optional.
- ❑ Enter a backslash (\) before every quote (") character *inside* the **<alias_value>**. This includes the quotes in an **echo** command embedded within the **<alias_value>**.
- ❑ Enter a backslash (\) before the following characters when you use them literally: backslash (\), percentage sign (%), dollar sign (\$) at the last character position of the **<alias_value>**, or another backslash (\) (see examples).
- ❑ Limit the **<alias_value>** to 256 bytes of data (just over three 80-character lines).

You can create an alias that invokes other aliases by entering the alias command and nesting up to 15 other aliases in the **<alias_value>** argument. Separate the aliases with a space and a semicolon (;). (Refer to the last example in the examples that follow.)

When you create an alias, the system stores it in memory. The system can store up to 100 aliases in memory, provided that memory isn't dedicated to other tasks. Use the **save** command (described in the following section) to save the aliases in RAM to a file for later retrieval. You can store as many alias files in your file system as NVFS space allows, but the maximum number of aliases you can store in one file is 15.

Examples If you enter:

If you enter:
alias

The console displays all aliases residing in RAM.

If you enter:
alias ebridge "set wfBrTp.2.0 1 ;set wfBrStp.2.0 1 ;commit"

The system creates an alias named *ebridge* that invokes the commands.

If you enter:
ebridge

The system creates an alias named *ebridge* that does the following:

- Enables the Translating Bridge and Spanning Tree Bridge
- Notifies all relevant software modules of set changes to the MIB.

If you enter:
alias gbridge "get wfBrTp.2.0 ;get wfBrStp.2.0"

The system creates an alias named *gbridge* that gets the Translating Bridge and Spanning Tree Bridge Enable values.

If you enter:
alias sbridge "ebridge ;gbridge"

The system creates an alias named **sbridge** that invokes the aliases **cbridge** and **ebridge**.

Inserting Parameters in an Alias

You can insert one or more parameters in an **<alias_value>** when creating an alias. When the user enters the alias name and follows the name with a value, the value entered by the user replaces the parameter in the **<alias_value>**.

You can insert a parameter in an **<alias_value>** in two ways:

- *Parameter concatenation*: You can insert a dollar sign (\$) in the last character position of the **<alias_value>**. Then, when the user enters the name of the alias and follows the name with the value of the parameter, the system executes the alias with the value the user entered.
- *Parameter reference*: You can embed one or more parameters anywhere inside the **<alias_value>**. For each parameter you embed when creating the alias, you insert a percentage sign (%) and a parameter number. The parameter %1 in an **<alias_value>** takes the value of the first parameter the user enters at the command line after the alias name; the parameter %2 in an **<alias_value>** takes the value of the second parameter the user enters, and so on.

Note: You *cannot* combine the two methods of inserting parameters within an alias.

When parameters are referenced, the parameter number indicates the position of the value in the user entry. This feature allows you to use the same value in a user entry for more than one parameter. (Refer to the last example.)

Examples	If you enter:	The system does the following:
	alias scroll "more \$"	Creates an alias named scroll that invokes the <code>more</code> command and inserts the value the user enters when using the alias (as shown in the next example).
	scroll on	Invokes the command more on .
	cp config2.cfg alt.cfg	Invokes the copy command associated with the alias cp , inserts the <code>config2</code> value in the first parameter position (%1) and inserts the <code>alt.cfg</code> value in the second parameter (%2). The system then invokes the command; it copies the <code>config2.cfg</code> file on slot 2 to a new file <code>alt.cfg</code> on slot 3.
	alias backup "copy 2:%1 3:%1"	Creates an alias named backup that takes in the first value the user enters when using the alias and inserts it in both parameter positions %1 and %2 (as shown in the next example).
	backup config	Invokes the copy command associated with the alias backup , inserts the <code>config</code> value in the parameter positions indicated by %1 in the <code><alias_value></code> , and copies the <code>config</code> file from slot 2 to slot 3.

Inserting Character Strings in an Alias

The **echo** command prints a string of characters to the TI console display; when the Wellfleet router receives the echo request, it sends the accompanying string back to the console display. This command is used primarily to accompany system responses to alias commands with meaningful text. This section describes how to issue an **echo** command and how to insert the **echo** command in an alias.

Enter the following to submit an echo request, where **<string>** is any string of characters:

```
echo ["<string>"]
```

Double quotes are required only when the string contains one or more spaces or semicolons (;).

Examples	If you enter:	The console displays:
	<code>echo hi</code>	<i>hi</i>
	<code>echo "IP Input Statistics:"</code>	<i>IP Input Statistics:</i>

To command the system to display a string of characters when responding to an alias command, you insert an **echo** command within the **<alias_value>**.

Surround each **<string>** within the **echo** with double quotes if the **<string>** contains one or more spaces or semicolons (;). Precede each of the double quotes surrounding the **<string>** with a backslash (\). If you do not use double quotes, insert a backslash before the semicolon that separates the echo command from the next command.

Insert **echo \;** to command the system to display blank lines between commands within an **<alias_value>**.

You can also embed parameter references within an **echo** command. Refer to the last example to see how this is done.

Examples **If you enter:**

If you enter:

```
alias ipstats "echo \; echo \"IP Input Statistics:\"; echo \; get WfIpInterfaceEntry.21.*\; echo \; echo \"IP Output Statistics:\"; echo \; get WfIpInterfaceEntry.24.*"
```

The system creates an alias named **ipstats** that invokes the commands shown in quotes.

Note: The text wraps as you enter text past column 80. You do *not* press the enter key until you enter the entire command.

If you enter:

ipstats

The system displays the following:

IP Input Statistics:

```
wfIpInterfaceEntry.wfIpInterfaceInReceives.192.32.6.4.3 = 141501  
wfIpInterfaceEntry.wfIpInterfaceInReceives.192.32.15.21.4 = 41304  
wfIpInterfaceEntry.wfIpInterfaceInReceives.192.32.16.1.2 = 538  
wfIpInterfaceEntry.wfIpInterfaceInReceives.192.32.243.2.1 = 130137
```

IP Output Statistics:

```
wfIpInterfaceEntry.wfIpInterfaceForwDatagrams.192.32.6.4.3 = 149189  
wfIpInterfaceEntry.wfIpInterfaceForwDatagrams.192.32.15.21.4 = 28400  
wfIpInterfaceEntry.wfIpInterfaceForwDatagrams.192.32.16.1.2 = 1086  
wfIpInterfaceEntry.wfIpInterfaceForwDatagrams.192.32.243.2.1 = 120635
```

Setting Aliases to Display Embedded Commands During Execution

The **verbose** command allows you to display the commands within an **<alias_value>** as an alias executes. This command is useful for locating syntax errors within the **<alias_value>**.

Enter the following to display the verbose mode:

verbose

If the verbose mode is on, the system displays the commands as they execute. If the verbose mode is off, the system does not display the commands.

Enter the following to change the setting of the verbose mode, where **[onloff]** is **on** to display alias commands or **off** to turn off the display:

verbose [onloff]

Examples	If you enter:	The system does the following:
	verbose	Displays <i>Verbose mode on</i> or <i>Verbose mode off</i>
	verbose on	Displays alias commands when they execute
	verbose off	Does <i>not</i> display alias commands when they execute

Deleting an Alias from Memory

The **unalias** command removes the specified alias from memory. If you substitute the wildcard character (*) for the alias name, the system removes all aliases from memory. Enter the following to delete aliases from RAM:

```
unalias {<alias name>|*}
```

where **<alias name>** is the name of the command you want to delete or * represents all aliases.

Examples	If you enter:	The system does the following:
	<code>unalias scroll</code>	Deletes the alias named <i>scroll</i>
	<code>unalias *</code>	Deletes all aliases from memory

Saving Aliases to a File

You can copy all aliases residing in RAM to a file on a volume for later retrieval.

Enter the following to create an alias file:

save aliases <vol>:<filename>

Where:

<vol> is the slot number of the volume that will store the alias file

<filename> is the name of the alias file.

Example

If you enter:

save aliases 2:aliases.1

The system does the following:

Creates a file named *ALIAS.1* on the volume in slot 2 and copies the aliases from RAM to this file.

Loading Aliases from a File

You can use the **source aliases** command to load the aliases from a file residing on the volume to active RAM. The aliases already residing in memory remain in memory; however, the system overwrites any aliases in memory that have duplicate names. Use the **unalias *** command to delete any aliases in memory if you want to clear aliases from memory before entering the **source aliases** command.

Enter the following to load aliases:

```
source aliases <vol>:<filename>
```

Where:

<vol> is the slot number of the volume storing the alias file.

<filename> is the name of the file that contains aliases.

Example

If you enter:

```
source aliases 2:aliases.1
```

The system does the following:

Loads the aliases contained in the *ALIASES.1* file, which is stored on the volume in slot 2.

Debugging with Predefined Aliases

This section describes how to use aliases that are useful for debugging common network problems. These aliases are located in the *debug.al* file.

Enter the following to load the aliases that are predefined for debugging, where **<vol>** is the slot number of the volume containing the files from Wellfleet:

source aliases <vol>:debug.al

Table 5-1 shows each alias and its associated function. To invoke an alias, enter the alias after the TI prompt. Follow the alias with a space and the parameter indicated, if applicable. The console displays the data associated with the alias.

You can display the commands associated with an alias loaded in memory in two ways:

- You can use the **alias** command to display the commands without invoking them.

You can use the **verbose** command to display the commands associated with an alias whenever an alias executes.

Table 5-1. Aliases for Debugging Network Problems

If you enter:	The system does the following:
cctnames	Displays all circuit names
cctypes	Displays all circuits and their types. The types are as follows: 10 = CSMACD 20 = SYNC 30 = T1 40 = E1 50 = Token 60 = FDDI
decadjs	Displays all DECnet adjacent nodes and their respective adjacency table indexes. The following example shows one line in the display, where 6145 is the index, 2 is the area, and 3 is the node: <i>wfivAdjEntry.wfivAdjNodeAddr.6145 = "2.3"</i>
decadj <index>	Displays DECnet adjacency information about the index you enter. You can obtain the <index> by using the decadjs alias.
decarts	Displays all known DECnet areas and the next hop to each of these areas
decarinf <area>	Displays DECnet Area information for the area you enter
decbase	Displays DECnet global configuration parameters (base record)
decdr	Displays the designated router address for each DECnet interface
decnrts	Displays DECnet Level 1 Routing node information
decninf <area.node>	Displays DECnet information about the node whose area and node you enter.

Table 5-1. Aliases for Debugging Network Problems

If you enter:	The system does the following:
decifs	Displays node and area configuration, and interface indexes for all interfaces running DECnet.
decif <index>	Displays DECnet information for the interface index you enter. You can obtain the <index> by using the decifs alias.
decpri	Displays DECnet circuit priorities for all interfaces
deccost	Displays DECnet circuit costs for all interfaces
decstats	Displays all DECnet receive, transmit, and dropped statistics
enetstats	Displays all Ethernet receive and transmit statistics
fddistats	Displays all FDDI receive and transmit packet statistics
hwslot <slot>	Displays hardware information for the associated slot. This includes the serial no. and revision level.
hwmods	Displays slots and their associated hardware module IDs. Refer to the <i>wfHwEntry</i> section of the appendix <i>Wellfleet MIB</i> to decode the values.
hwnode	Displays serial no. and revision level of router
iproutes	Displays all IP networks that are known and the next hop
iphops	Displays all IP networks that are known and their associated hop counts
iphosts	Displays all configured adjacent IP hosts
iparp	Displays all MAC addresses and associated ARP addresses in the router's ARP cache
ipifs	Displays all IP interfaces and their associated indexes

Table 5-1. Aliases for Debugging Network Problems

If you enter:	The system does the following:
ipif <address.index>	Displays all IP information for the IP interface address you enter. For example, you enter the following where 192.32.10.10 is the first interface: ipif 192.32.10.1 You can obtain the <address.index> by using the ipifs alias.
ipsroutes	Displays all IP static routes configured in the node
ipstats	Displays all IP receive and IP transmit packet statistics
lbbase	Displays all (Learning) Bridge global configuration parameters (base record)
lb fwd	Displays all node MAC addresses in the Bridge's forwarding table
lbif <index>	Displays Bridge information for the interface index you enter. You can obtain the <index> by using the lbstate alias.
lbstate	Displays Bridge interfaces and their current states. The following example shows one line in the list of interfaces, where 1 is the index and 2 is the state: <i>wfBrTpInterfaceEntry.wfBrTpInterfaceState.1 = 2</i> The states are as follows: 1 = up 2 = down 3 = init 4 = present
lbstats	Displays Bridge receive, transmit, and dropped packet statistics
protocols	Displays bit map in decimal form representing all protocols running and their associated slots. Refer to the <i>wfProtocols</i> section of the appendix <i>Wellfleet MIB Specification</i> to decode the values.

Table 5-1. Aliases for Debugging Network Problems

If you enter:	The system does the following:
setvol <slot>	Sets the active volume for TFTP (puts and gets)
shovol	Displays the current active volume for TFTP (puts and gets)
snmpbase	Displays all SNMP configuration parameters (base record)
stid	Displays the Spanning Tree node identifier
stif <index>	Displays all Spanning Tree Bridge information for the (Learning) Bridge interface index you enter. You can obtain the <index> by using the lbstate alias.
stroot	Displays the Spanning Tree designated root node identifier
ststate	Displays the current status of each link running the Spanning Tree protocol in the node. The statuses are as follows: 1 = disabled 2 = blocking 3 = listening 4 = learning 5 = forwarding 6 = broken

Chapter 6

System Administration

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System Administration

About this Chapter

This chapter describes how to boot the Wellfleet router, reset a slot, run diagnostics, display the version number of the Wellfleet router software, and verify and upgrade the software.

Instructions for resetting the date and time, and assigning TI passwords are also included. The last page of this chapter lists all of the TI commands and their associated access levels.

Booting the Wellfleet Router

The TI provides you with the following commands for booting:

- The **boot** command warm-starts the entire system. Pressing the Reset button on the front panel of the Wellfleet router initiates the same procedure.

You can override the default boot image and configuration by specifying an alternative boot image file and an alternative configuration file when entering the **boot** command.

- The **reset** command warm-starts a single FRE module or the entire system with the boot image and configuration currently in use. Resetting the entire system is equivalent to booting it.
- The **diags** command cold-starts a single FRE module or the entire system. The cold-start consists of CPU, backbone, and link diagnostics, and a reboot. If you do *not* enter a slot number, the system tests and reboots all slots.

The section that follows is optional. It describes how each FRE module in the BN boots and loads the configuration when you do *not* override the default boot image (*boot.exe*) and default configuration file (*config*). Refer to the sections that follow to issue the **boot**, **reset**, and **diags** commands (and override defaults if you wish).

How the BN Boots

This section describes how each FRE module in the BN obtains its boot image and configuration when you do *not* override the default boot image file (*boot.exe*) and configuration file (*config*). You do *not* override these files when you power-cycle the BN, issue the **diags** command, hot-swap a module, issue the **reset** command, or issue the **boot** command without specifying defaults.

Figure 6-1 illustrates the default boot and configuration process. This flowchart has two starting points:

- A cold start occurs when you power cycle the BN or issue the TI **diags** command. The FRE processor executes CPU and backbone diagnostics, and if a Link Module is present, link diagnostics. When CPU and backbone diagnostics terminate successfully, and link diagnostics terminate (successfully or unsuccessfully), the FRE processor boots.
- A warm start occurs when you hot-swap a module, press the Reset button, or issue the **boot** or **reset** command. The FRE processor boots without running diagnostics. When you hot-swap a module, the DIAG LED on the front panel and LED 8 on the FRE module daughterboard behind the RFI shield remains on, indicating diagnostics have not been run. (Wellfleet recommends that you issue the **diags** command when you hot-swap a board.

When a FRE module boots, it requests a copy of the boot image currently in use. The first available FRE module to respond to the request forwards a copy of the boot image from its memory. If none is in use, the FRE module boots using the boot image file stored on its own volume, if one is available. The FRE module then boots.

The FRE module requests a copy of the configuration currently in use after it boots. The first available FRE module to respond to the request forwards a copy of the configuration from its memory. If none is in use, the FRE module boots using the default configuration file (*config*) stored on its own volume, if one is available. The FRE module then loads the configuration and initiates software services.

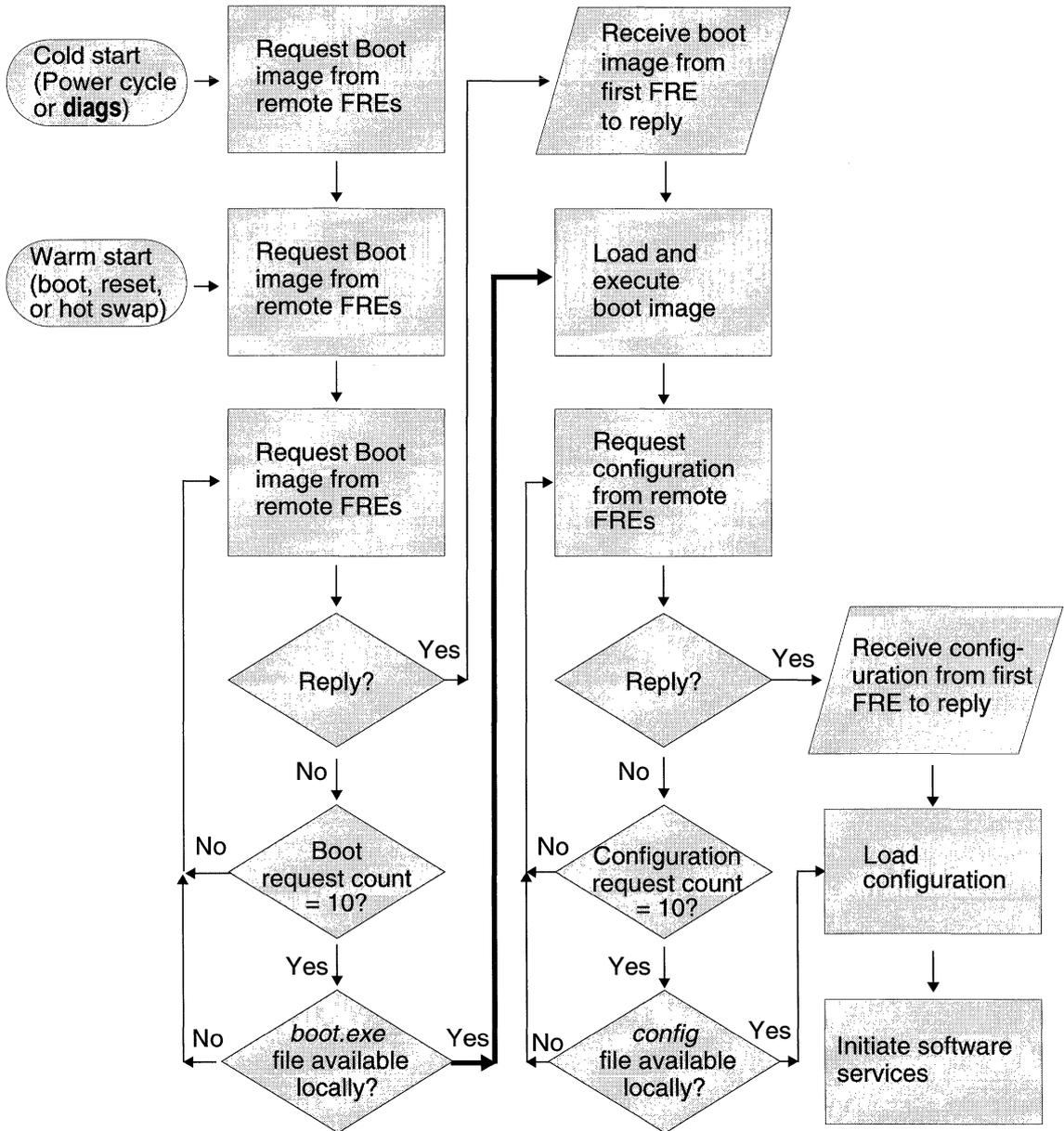


Figure 6-1. Default Boot and Configuration Flowchart

Booting

Use the **boot** command to boot the entire system. If you do not specify the boot image and configuration file when entering the **boot** command, the system boots from the default image and configuration file.

Warning: If you do not specify the boot image and configuration file when entering the **boot** command, the system boots from the default image (*boot.exe*) and configuration file (*config*). Wellfleet recommends that you have only one version of the *config* file on the Wellfleet router. You can comply with this recommendation by assigning new names to alternate versions of the configuration file. It is possible that the FRE modules can simultaneously load different configurations if you have alternate versions of the *config* file and you enter the **boot** command without specifying the volume and configuration file with which to boot.

Enter the following command to boot the entire system with the default software image (*boot.exe*) and default configuration file (*config*).

boot

You can also enter the following command to boot the entire system and override the default software image and configuration file:

```
boot [<vol>:<image_name>-> <vol>:<config_name>->]
```

Where:

<vol>:<image_name> identifies the location and filename of the boot image or - identifies the default boot image (*boot.exe*). The **<vol>** identifies the volume that contains the **<image_name>**. The **<vol>** is the same number as the slot that hosts the volume's associated FRE module.

<vol>:<image_name> identifies the location and name of the configuration file or - identifies the default configuration file (*config*). The **<vol>** identifies the volume that contains the **<config_name>**. The **<vol>** is the same number as the slot that hosts the volume's associated FRE module.

Note: If you are entering one argument in the **boot** command, you must enter the other.

The software image and configuration file revert to their respective default file names (*boot.exe* and *config*) after every boot. To change the default boot or configuration file, overwrite the old default file with the new default file using the **copy** command. But be sure to back up the old default file using the **copy** command before overwriting it.

Examples	If you enter:	The system does the following:
	boot	Boots with the default boot image (<i>boot.exe</i>) and the configuration file (<i>config</i>) on the volume in the first slot to come up with the valid boot name (<i>boot.exe</i>)
	boot 2:- 2:- or boot 2:boot.exe 2:config	Boots with the following: <ul style="list-style-type: none"> • The (default) boot image (<i>boot.exe</i>) on the volume in slot 2 • The (default) configuration file (<i>config</i>) on the volume in slot 2
	boot 2:bootv7.exe 3:-	Boots with the following: <ul style="list-style-type: none"> • The <i>bootv7.exe</i> boot image on the volume in slot 2 • The (default) configuration file (<i>config</i>) in the volume in slot 3
	boot 3:- 2:Trident.cfg	Boots with the following: <ul style="list-style-type: none"> • The default boot image <i>boot.exe</i> on the volume in slot 3 • The user's customized configuration file <i>Trident.cfg</i> on the volume in slot 2
	boot 2:bootv7.exe 2:Trident.cfg	Boots with the following: <ul style="list-style-type: none"> • The <i>bootv7.exe</i> boot image on the volume in slot 2 • The user's customized configuration file <i>Trident.cfg</i> on the volume in slot 2

Resetting a Slot

The **reset** command allows you to reboot a single slot with the boot image currently in use. You reset the slot by entering the slot number after the **reset** command. If you do not enter a slot number when issuing the **reset** command, the entire system reboots with the default boot image and configuration. Entering the reset command without entering a **<slot-number>** is equivalent to entering the **boot** command.

Enter the following to reboot the entire system:

```
reset
```

Enter the following to reboot a single FRE module, where **<slot-number>** is the number of the slot where the FRE module is located:

```
reset [<slot-number>]
```

The following occurs when you reset a FRE module:

1. The GAME operating system software running on the FRE module forwards a boot request to the other FRE modules.
2. The first FRE module to respond to the boot request forwards the boot image resident in its memory.
3. The resetting FRE module receives and executes the boot image. At this instant, connectivity to the associated slot and the services provided in the slot are disrupted. The other FRE modules resynchronize their routing tables after the slot fails to receive packets.
4. The resetting FRE module completes the boot process and requests a configuration. The first available FRE module forwards the configuration resident in its memory.
5. The resetting FRE module loads the configuration image and initiates the services provided by the slot; connectivity is thus reestablished. The resetting FRE module alerts the other FRE modules that it can receive packets.
6. The other FRE modules resynchronize their routing tables accordingly.

Running Diagnostics

The **diags** command cold-starts a single ILI or the entire system. The cold-start consists of CPU, backbone, and link diagnostics; and a reboot. If you do *not* enter a slot number, the system tests and reboots all slots.

Enter the following to run diagnostics and reboot the entire system:

diags

Wellfleet recommends that you issue the **diags** command to the associated slot immediately after you hot-swap a board. Otherwise, the DIAG LED on the front panel and LED 8 on the FRE module daughterboard remain on, indicating diagnostics have *not* been run on the ILI. (Refer to the *Switches and LEDs* chapter of the *Hardware Maintenance Guide* for more information.) If the board is functional, and you do *not* issue the **diags** command, the FRE module automatically boots, loads the configuration, starts the Wellfleet router software services, and operates normally, although the DIAGS LED remains lit.

Enter the following to run diagnostics and reboot a single ILI, where **<slot-number>** is the number of the its slot:

diags [<slot-number>]

The system runs diagnostics on the associated slot, loads the boot image, loads the configuration, and initiates the Wellfleet router software services.

The DIAG LED lights during diagnostics and goes out after diagnostics have determined that the FRE module and its associated Link Module are functional. If they are not functional, the DIAG LED on the front panel and LED 8 on the FRE module daughterboard remain on. If this occurs, ensure the modules are seated properly in the Wellfleet router and issue the **diags** command again. Call Wellfleet customer service if the DIAG LED does not go out.

Displaying the Software Version

Enter **stamp** to display the current software version and the date and time it was created. The response displays the version number and the date it was created.

Verifying and Upgrading Software

The TI provides the following commands for verifying and upgrading executable software:

- The **readexe** command calculates file header and image checksums on executable files on the file system, verifies that the checksums match those within the files, and displays the results and all file header information. Use this command to validate executable files before upgrading.
- The **prom -w** command erases the PROM and copies the contents of the PROM update file to the PROM. Use this command to update a PROM with new software.
- The **prom -v** command compares the contents of a PROM file on the file system to the contents of a PROM. Use this command to verify that the software installed in the file system matches the software loaded on a PROM.

The executable software consists of the following binary files:

- *diag1101.exe* is the diagnostics image file. To upgrade with a new diagnostics image, transfer the new *diag1101.exe* file to the file system, issue the **readexe** command to validate it, and issue the **prom -w** command to load (write) it onto the diagnostics PROM. The diagnostics PROM (programmable read-only memory) device supplies the FRE module with diagnostic instructions during a cold start.

If you want to verify that the image resident on the diagnostics PROM matches the *diag1101.exe* file, use the **prom -v** command.

- *freboot.exe* is the bootstrap image file. To upgrade with a new bootstrap image, transfer the new *freboot.exe* file to the file system, issue the **readexe** command to validate it, and issue the **prom -w** command to load (write) it onto the bootstrap PROM. The bootstrap PROM supplies the FRE module with bootstrap instructions during a cold start.

If you want to verify that the image resident on the bootstrap PROM matches the *freboot.exe* file, use the **prom -v** command.

- *boot.exe* is the boot image file. When the system boots, it automatically loads the default boot image (unless you specify another boot image) from another slot into memory on the FRE board, or, if another slot is unavailable, from the file system to memory. To upgrade with a new image, you transfer it to the file system and reset the system; you do *not* use the **prom -w** command when upgrading with a new boot image.

Note: You cannot edit executable software files.

The sections that follow describe how to use the **readexe**, **prom -w**, and **prom -v** to validate, upgrade, and verify executable software.

Validating an Executable File

You validate executable files before upgrading by using the **readexe** command. This command calculates file header and image checksums on executable files on the file system, verifies that the checksums match those within the files, and displays the results and all file header information.

Enter the following to validate an executable file on the active volume, where **<filename>** is the name of the executable file:

readexe <filename>

Enter the following to validate an executable file on another volume:

readexe <vol>:<filename>

Where:

<vol> is the slot number of the volume storing the file.

<filename> is the name of the executable file.

Figure 6-2 shows a sample system response to the **readexe** command.

Examples	If you enter:	The system does the following:
	readexe diag1101.exe	Calculates file header and image checksums on the <i>diag1101.exe</i> file located on the active volume, verifies that the header and image checksums match those within the file, and displays the results and all file header information
	readexe 3:freboot.exe	Calculates file header and image checksums on the <i>freboot.exe</i> file located on volume 3, verifies that the header and image checksums match those within the file, and displays the results and all file header information

```
$ readexe boot.exe
① Validating header checksum... OK
② Validating image checksum... OK
③ Program execution address space:
   Load Address: 0x30300000 Size: 0x0009A6A9 Bytes Entry point:
   0x00000000
④ PROM storage address space:
   PROM Load address: 0x00000000
⑤ Input file information:
   Workspace: int/7.50/19
   Input file: boot.exe
   Compression: ON
   Revision: 7.50
   Last Modified: Saturday January 23 05:38:09 1993
   File type: Executable file.
   Tool name: Oasys Linker
```

Figure 6-2. Sample Response to readexe Command

The system response to the **readexe** command contains the following information:

- ① *Validating header checksum.* The system calculates a checksum on the file's header and compares the checksum to the data in the checksum field of the file's header. The system reports that the header checksum is *OK* if it matches or *BAD* if it does not match.
- ② *Validating image checksum.* The system calculates a checksum on the file's image data and compares the checksum to the data in the checksum field of the image. The system reports that the image checksum is *OK* if it matches or *BAD* if it does not match.

- ③ Program execution address space. The following fields are displayed in hexadecimal. They provide information about where in memory the file is located.
 - *Load Address* indicates the memory location.
 - *Size* indicates the size of the file.
 - *Entry point* indicates the location in memory of the first software instruction when the file is loaded into memory. This field is 0 if the file is compressed.
- ④ PROM storage address space indicates the location in the PROM for the *diag1101.exe* and *freboot.exe* software. This field is 0 if the file is not stored in a PROM.
- ⑤ Input file information contains the following information about the file:
 - *Workspace* indicates the software release and software integration numbers.
 - *Input File* indicates the filename in question.
 - *Compression* indicates whether the file is compressed. The executable files are normally compressed.
 - *Revision* indicates the software release.
 - *Last Modified* indicates day, date, and time of the software release.
 - *File type* indicates that the file is executable.
 - *Tool Name* is for Wellfleet use only.

Verifying and Upgrading a PROM

You use the **prom** command to upgrade or verify the software on the diagnostics PROM or bootstrap PROM. This command is restricted to the Manager access level.

A release notice will provide instructions for transferring the updated PROM file to a volume. You then issue the **prom** command and reference the new PROM file on the (volume) Flash memory card. You indicate the slot number of the volume and the slot(s) containing the PROM device to be verified or updated. The PROM update file identifies the PROM device within the slot.

If you verify the PROM, the system compares the contents of the file to the contents of the PROM. If you update the PROM, the system erases the PROM and copies the contents of the PROM update file to the PROM.

Warning: The BN requires all of the bandwidth available on the Parallel Packet Express (PPX) during a PROM update. To provide this bandwidth, you must boot with the minimal configuration necessary to operate the BN. This configuration is contained on the *ti_only.cfg* file. Boot the BN with the *ti_only.cfg* file before issuing the **prom** command to write to a file.

Once you enter the **prom** command, it *must* run to completion. The **Control-C** (abort) command is disabled for the duration of the **prom** command execution to allow it to run to completion. Verifying takes up to two minutes per PROM. Updating (writing to) takes from two to ten minutes per PROM.

Enter the following command to verify or update a PROM device:

prom [-v|-w] <vol>:<PROM Update File> <slot-id[range]>

Where:

[-v|-w] is **-v** to verify the PROM or **-w** to write to (update) the PROM.

If you use the **-v** option, the console displays one of the following messages after the verification terminates:

- ❑ *prom: slot <slot ID> completed successfully*
- ❑ *prom: PROM data does not match file data on slot <slot ID>*
- ❑ Another message stating the operation is unsuccessful and describing the problem

If you use the **-w** option, the console displays messages that indicate the version of the file being written, and the progress of the write operation.

<vol>:<PROM Update File> is the slot number of the PROM update file located on a volume, a colon (:), and the name of the update file

<slot-id[range]> is the slot location of the single PROM or the range or group of slot locations you want to verify or update. Use a dash to indicate a range of slots (such as 2-5), or commas or spaces to separate multiple slot locations (such as 2,3,4 or 2 3 4).

Note: When updating PROMS with new software, update all slots that contain FRE processors (all except for slot 1) to avoid a mismatch of software. Slot 1 contains the System Resource Module-Front (SRM-F), which is not equipped with PROMS.

Examples	If you enter:	The system does the following:
	prom -v 2:diag1101.exe 3	Verifies the contents of the Diagnostics PROM on slot 3 against the contents of the <i>diag1101.exe</i> file in the volume in slot 2
	prom -w 2:freboot.exe 3	Erases the Bootstrap PROM on slot 3 and copies the contents of the <i>freboot.exe</i> file in the volume in slot 2 to the PROM on slot 3
	Any one of the following: prom -w 2:diag1101.exe 2, 3, 4, 5 prom -w 2:diag1101.exe 2 3 4 5 prom -w 2:diag1101.exe 2, 3-5 prom -w 2:diag1101.exe 2-5	Erases the Diagnostics PROMs on slots 2, 3, 4, and 5 and copies the contents of the <i>diag1101.exe</i> file in the volume in slot 2 to the PROMs on slots 2, 3, 4, and 5

Resetting the Date and Time

The **date** command displays or changes the system date, time, and time zone offset. The time is based on the 24-hour clock. The offset is the time difference between the current time and Greenwich Mean Time (GMT).

Enter the following to display the system date and time:

date

The date, time, and GMT offset are displayed in hh:mm mmm dd yyyy +|- hh:mm format. The offset is stored as a direction (+ or -) and a value in hours and minutes. Most time zone offset values are in hours, and do *not* include minutes. For example, the Eastern Standard Time Zone is five hours behind GMT and is referenced as GMT-5.

Enter the following to change the date, time, and GMT offset:

date [<yymmddhhmm> [+|-hh:mm]]

The console displays the new date, time and time zone offset.

The time zone is optional.

Note: When you change the date, time, and GMT offset, the GAME operating system distributes the new date and time to all FRE modules.

Examples	If you enter:	The following occurs:
	date	The console displays the current system date and time: <i>Oct 25, 1993 16:00 {GMT-4}</i>
	date 9310251602	The system date and time change to: <i>Oct 25, 1993 16:02</i>
	date 9310251602 -5	The system date and time change to: <i>Oct 25, 1993 16:02 {GMT-5}</i>
	date 9310251602 +3:30	The system date and time change to: <i>Oct 25, 1993 16:02 {GMT+3:30}</i>

Assigning Passwords

This section describes how to assign or reassign the Manager and User access passwords.

The TI runs on a single FRE processor module. When you assign a password, the Gate Access Management Entity (GAME) operating system distributes the new password to nonvolatile RAM in all FRE modules. (Thus, the system retains passwords when you boot the Wellfleet router, reset a slot, or remove a board, and the TI runs on a different FRE module.) However, if you insert a new FRE module, you must reassign the Manager and User passwords; otherwise, the TI will not require passwords when it runs on that slot.

You can assign the User access password when you are logged in as User or Manager. You can assign the Manager access password only when you are logged in as Manager. Proceed as follows to assign a password:

Note: Passwords, as well as TI commands and filenames, are case-sensitive.

1. Enter the following to display or assign a password:

password [Manager|User]

The console displays one of the following messages:

Changing password for User

Changing password for Manager

2. Proceed to step 3 if you are logged in as Manager and you are changing the User password. Otherwise, enter the old password at the following prompt:

Old password:

If there is no old password, press the enter key.

3. Enter the new password after the following prompt:

New Password:

The password may have 0 to 16 alphanumeric characters. If you want to remove password protection, press the enter key.

4. Repeat step 3 after the following prompt:

Retype new password

The console displays one of the following messages:

User password changed

Manager password changed

If you enter the wrong password, the console displays the message:

User password not changed

The \$ prompt reappears.

If you do not reply to password prompts after about 30 seconds, the system cancels the **password** command and displays the following messages:

*** Input timed out. ***

Command aborted

The \$ prompt reappears.

TI Commands and Access Levels

The TI provides two access levels:

- The User access level accepts read-only commands.
- The Manager access level accepts all TI commands.

Table 6-1 lists all TI commands and their associated access levels.

Table 6-1. TI Access Levels

Command	User	Manager	Command	User	Manager
!	✓	✓	logout	✓	✓
boot		✓	more	✓	✓
cd	✓	✓	password User	✓	✓
clearlog		✓	password Manager		✓
commit		✓	ping	✓	✓
compact		✓	prom		✓
copy		✓	readexe	✓	✓
delete		✓	reset		✓
diags		✓	save		✓
dinfo	✓	✓	set		✓
dir	✓	✓	source aliases	✓	✓
echo	✓	✓	stamp	✓	✓
format		✓	system	✓	✓
get	✓	✓	tftp		✓
help	✓	✓	type	✓	✓
list	✓	✓	unalias	✓	✓
log	✓	✓	verbose	✓	✓

Appendix A

Using the Wellfleet MIB

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Figure A-1. Hierarchy of Wellfleet MIB Objects (Summary) A-3

Using the Wellfleet MIB

About this Appendix

This appendix describes how to use the Wellfleet Management Information Base (MIB). The Wellfleet MIB is a proprietary database that contains configuration parameters and statistics. You use the Wellfleet MIB to obtain and change configuration parameters and statistics through the Technician Interface (TI) or through network management software. This appendix provides the following:

- An overview of the structure of the Wellfleet MIB
- A description of the Wellfleet MIB files
- Specifications with which the Wellfleet MIB complies
- Implementation notes

Overview

This section provides an overview of the structure of the Wellfleet MIB.

The object tree assigned to the Wellfleet MIB is as follows:

iso.org.dod.internet.private.enterprises.wellfleet

The corresponding numeric identifier assigned to the Wellfleet MIB is as follows:

1.3.6.1.4.1.18

Figure A-1 shows a partial hierarchy of the *wellfleet* objects. The prefix *wf* that precedes each object name indicates that it is a Wellfleet enterprise-specific object.

The *wfSwSeries7* (*wellfleet.3*) object names and identifies the Wellfleet MIB. The nodes in the first level below *wfSwSeries7* are as follows:

- *wfHardwareConfig* (*wfSwSeries7.1*) contains the objects that pertain to the hardware configuration.
- *wfSoftwareConfig* (*wfSwSeries7.2*) contains the objects that pertain to software that is loaded, such as protocols and drivers, and information required for loading, such as where in memory a driver gets loaded.
- *wfSystem* (*wfSwSeries7.3*) contains the objects that pertain to the system record, console, remote console, and the circuit name table.
- *wfLine* (*wfSwSeries7.4*) contains the objects that determine the functioning of the drivers that control the data link layer media.
- *wfApplication* (*wfSwSeries7.5*) contains the protocol applications.

Refer to the *WFMIB.asn* file for more information about the structure of the Wellfleet MIB. The section that follows describes this file.



Figure A-1. Hierarchy of Wellfleet MIB Objects (Summary)

Wellfleet MIB Files

Two ASCII files describe the Wellfleet MIB. These files are loaded automatically onto the Site Manager workstation when you install the Site Manager software. The Site Manager software modules read these files during startup. You can open these files with any text editor.

Warning: Wellfleet recommends that if you choose to open the MIB files, that you do so with read-only protection to prevent potential corruption of their contents.

The *WFMIB.asn* file is the Managed Object Syntax (MOSY) compilable MIB module containing all MIB definitions and descriptions in Abstract Syntax Notation (ASN.1) format.

The *WFMIB.def* file installed on the PC or the *WfMIB.defs* file installed on the SPARCstation is a MOSY-compiled module containing only MIB definitions.

The Site Manager installation software installs these files in the `\wf\lib` path on the PC and the `/usr/wf/lib` path on the SPARCstation.

Compliance with Specifications

The Wellfleet MIB complies with the standards described in the following documents, with the exceptions noted in the *Implementation Notes* section.

Concise MIB Definitions (RFC 1212)

Management Information Base for Network Management of TCP/IP-based internets: MIB-II (RFC 1213)

Structure and Identification of Management Information for TCP/IP-Based Internets (SMI; RFC 1155)

Information Processing Systems - Open Systems

Interconnection- Specification of Abstract Syntax Notation One (ISO 8824)

Also, the following textbooks provide information about these standards:

Internetworking with TCP/IP, Vol. 1, Douglas E. Comer (Prentice Hall, Englewood Cliffs, N.J.)

The Simple Book, Marshall T. Rose (Prentice Hall, Englewood Cliffs, N.J.)

Implementation Notes

The following implementation notes list the assumptions about MIB-II object definitions, the unsupported objects, and the unsupported operations.

Assumptions

The following assumptions about MIB-II object definitions have been made:

- | | |
|-------------|--|
| ifNumber | Represents the total number of possible interfaces for configured link nodules in the system regardless of whether the interfaces on those modules are actually configured. |
| ifIndex | Corresponds to the Wellfleet circuit number assigned to an interface. It is not a number from 1 to ifNumber. |
| ipAddrEntry | In certain circumstances, the index to this table, ipAdEntAddr, may not be sufficient to identify uniquely a particular instance. In these situations, the attribute ipAdEntIfIndex is appended to the instance identifier for subsequent entries with the same index. |

Unsupported Objects

MIB-II objects in the Release 7.50 software are virtual mappings onto the Wellfleet private MIB. As such, any supported MIB-II object must be derivable from a Wellfleet private object.

The following objects are not maintained in the Wellfleet private MIB and are therefore not provided in Wellfleet's MIB-II support. A noSuchName response will be returned on an SNMP get request for any of the following objects:

- ifDescr
- ifLastChange
- ifInUCastPkts
- ifInNUCastPkts
- ifInUnknownProtos
- ifOutUCastPkts
- ifOutNUCastPkts
- ifOutQLen
- ifSpecific
- at
- ipRoutingDiscards
- tcp
- udp
- egp

Unsupported Operations

The SNMP Set Operation is not supported for MIB-II objects. All set operations must be performed through the Wellfleet private MIB (1.3.6.1.4.1.18.3).

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Operations Guide

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What did you find most useful about this guide?

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