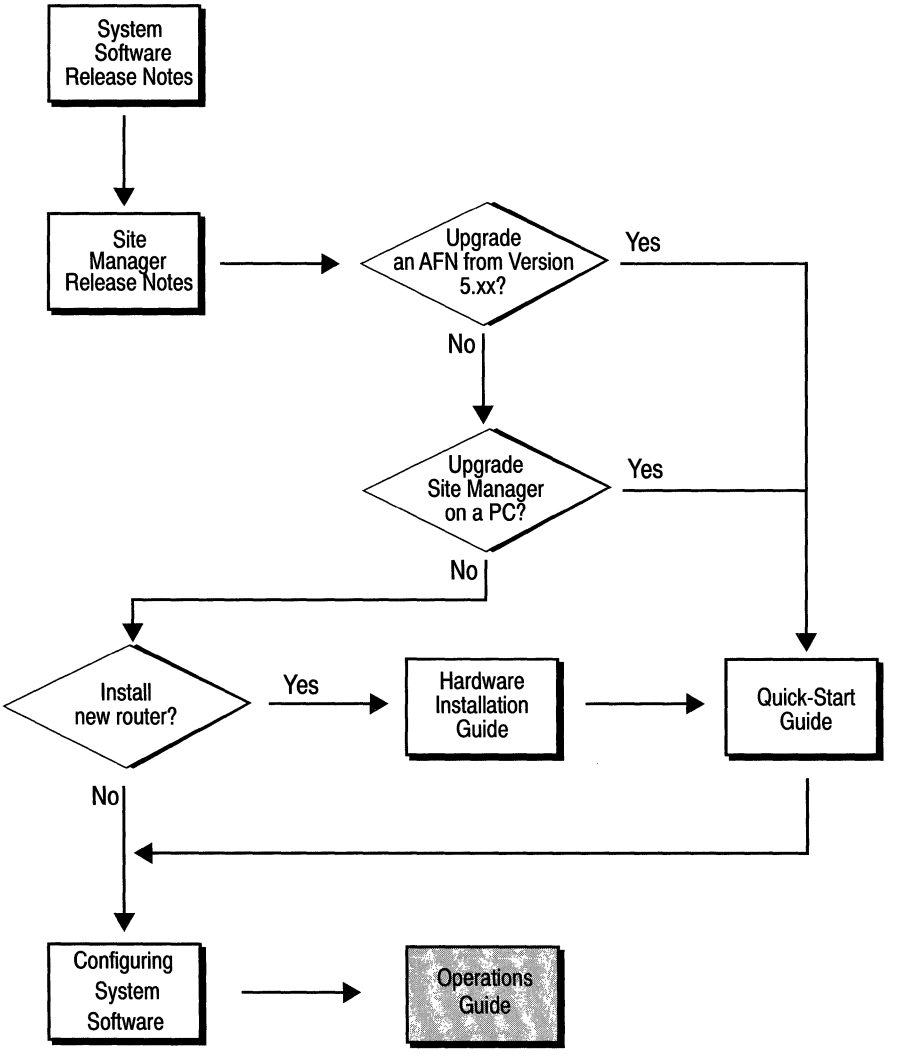
Operations Guide: Technician Interface

Software Version 7.56

Reading Path



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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 router software.

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

Related Documentation

The following documents are shipped with the router:

System Software Release Notes

Provides system software upgrade procedures, lists new features, supported hardware modules, supported protocols, guidelines, and known anomalies in the most current system software release.

Site Manager Release Notes

Provides Site Manager upgrade procedures, guidelines, and known anomalies in the most current Site Manager release.

Hardware Installation Guide

Describes how to physically install the router hardware.

Quick-Start Guide

Describes how to activate the router on your IP network.

The following documents are required, but must be ordered separately:

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.

Operations Guide: Site Manager

Describes how to use the Site Manager to operate the router.

Operations Guide: Technician Interface

Describes how to use the Technician Interface to operate the router.

Hardware Maintenance Guide

Describes how to access the interior of the BLN and BCN, replace hardware in these routers, and read the LEDs.

A Distinct TCP/IP manual is included with PC Site Manager shipments.

You need an MS Windows manual if you are running the Site Manager on a PC.

You need Sun documentation if you are running the Site Manager on a SPARCstation.

Conventions

This guide uses the conventions that follow. The TI on-line help also uses the last four conventions.

Convention:	Denotes:
filename	Italics denote file and directory names.
command	Bold text denotes text the user needs to enter.
ping <ip address>	Corner brackets (< >) indicate that you determine the text to enter based on the description inside the corner brackets. Do not type the corner brackets when entering the command. The sample command **ping 192.32.10.12** complies with this syntax specification.
clearlog [<slot>]	Square brackets ([]) surround an optional qualifier. Do not type the square brackets when entering the command. The sample commands **clearlog** and **clearlog 2** comply with this syntax specification.
more [on | off]	A vertical line (|) separates alternative qualifiers. Enter one qualifier from among the alternatives. Do not type the vertical line when entering the command. The sample commands **more**, **more on**, and **more off** comply with this syntax specification.
save {config|aliases} <vol>:<filename>	Curly brackets ({}) surround a required qualifier. In this case, you must enter **config** or **aliases**. Do not type the vertical line when entering the command. The sample commands **save config 2:config2_20** and **save alias 2:alias2_20** comply with this syntax specification.

Chapter 1

Introduction to the TI

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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 or Telnet connection to the Wellfleet router.

  The Site Manager resides on a SPARCstation 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 router's console port using a local ASCII terminal or 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 access and Manager 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 return key after every TI command. TI commands and passwords are case-sensitive. Use upper- and lower-case 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.

```
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 Login: Manager

    Welcome to the Backbone Technician Interface
```

Figure 1-1. TI Welcome Screen

The TI input times out and the *Login:* prompt redisplays 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 INFIFO 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 return 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.

Refer to the *Conventions* section before Chapter 1 for conventions used in this documentation and the TI on-line help.

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 **[on|off]** is **on** to enable more mode or **off** to disable it:

more [on|off]

Examples

If you enter:	The system does the following:
more	Displays *More mode on* or *More mode off*
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. You can use this name to cross-reference 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 *Login:* 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: *ping: 192.32.1.151 is alive (size = 16 bytes)* *ping: 193.32.1.151 does not respond* *ping: 192.32.1.151 is unreachable* *ping: ICMP host unreachable from 192.32.243.1*
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: *ping: (192.32.243.1)* *ping: (192.32.244.2)* *ping: 192.32.1.151 is alive (size = 16 bytes)*
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: *ping: 192.32.1.151 is alive (size = 62 bytes)* *ping: 193.32.1.151 does not respond* *ping: 192.32.1.151 is unreachable* *ping: ICMP host unreachable from 192.32.243.1* The console also displays the following type of message after reporting the progress of each ping: *ping: 192.32.1.151 responded to 8 out of 8: 100% success*

Chapter 2

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 processor 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 processor 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. (Issuing the **boot** or **reset** command, or pressing the Reset button warm-starts the router.) However, events are lost during a cold start. (Power-cycling the router or issuing the **diags** command cold-starts the router.) When you remove and reinsert a processor module, the events clear from that module only.

Displaying an Event Log

Enter the following command to display the events stored in all 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 -eTFTP	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 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 -ftf	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 volume 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 *10_12.log* file in slot 2
log 2:10_12.log -eTFTP	All events logged by the TFTP driver and stored in the *10_12.log* file in slot 2
log 2:10_12.log -eSNMP -ftf	All trace and fault events logged by the SNMP driver and stored in the *10_12.log* file in slot 2
log 2:10_12.log -s3	All events logged to slot 3 and stored in the *10_12.log* 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

Chapter 3

Managing an NVFS

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Managing an NVFS

About this Chapter

This chapter describes how to use the TI to manage NVFS (Non-Volatile File System) files on the Wellfleet router. This chapter is intended only for users whose routers are equipped with one or more memory cards.

This chapter describes how to do the following:

- Use multiple memory cards
- Name files
- Mount and unmount a volume
- Display the status of each memory card installed in the Wellfleet router
- Display a directory
- Change the active volume
- Copy a file from one volume to another, or to the same volume
- Transfer a file
- Display the contents of a file
- Delete a file
- Compact file space
- Format a memory card

Introduction

The NVFS file system on the router reads and writes to one or more memory cards. Each memory card 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 router can host one memory card. Multiple memory cards are optional in the router. The section that follows provides suggestions on how to manage multiple memory cards.

A volume number is the same number as the slot that hosts the memory card. For example, 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 memory 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
mount		Makes a memory card available
save		Saves the current software configuration, aliases, or events to a file. Refer to *Managing Events*, *Accessing the MIB*, or *Managing Aliases* for instructions on the **save** command.
tftp		Transfers a file to or from the Wellfleet router
type		Displays the contents of a file in ASCII or hexadecimal format
unmount		Makes a memory card unavailable

Using Multiple Memory Cards

This section provides some suggestions on how to manage the use of multiple memory cards on the router.

You may want to use multiple memory cards as follows:

- Use one card as the primary card used for booting.
- Use another card to provide redundancy.

  If you are providing redundancy, be sure to copy files to the redundant volumes when you modify them.
- Use another card to provide temporary storage for log files and test configuration files.

The system boots from the default image (*boot.exe*) and configuration file (*config*) if you do not specify the boot image and configuration file when booting.

Warning: It is possible that the FRE modules can simultaneously load different images or configurations if you have alternate versions of the *boot.exe* or *config* file. Wellfleet recommends that you have only one version of each on the Wellfleet router. Assign new names to alternate versions.

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. Spaces are not allowed.
- Filenames can consist of 1 to 15 characters on the TI, but Wellfleet *strongly* recommends that you limit them to 8 characters to ensure that the Site Manager can manage the files.
- File extensions are optional, and must be preceded by a filename and a dot. The total TI 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 for the FRE modules. (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.

Mounting a Volume

The **mount** command makes a memory card available. Issue the command when you install a memory card. This command is optional on an NVFS.

Enter the command as follows, where **<vol.>** is the number of the slot containing the memory card:

mount <vol.>:

For example, if you enter **mount 3:**, the memory card in slot 3 is available for use.

The screen displays the volume number when you issue the mount command (see Figure 3-1).

Note: The Device Label field applies only to DOS diskettes.

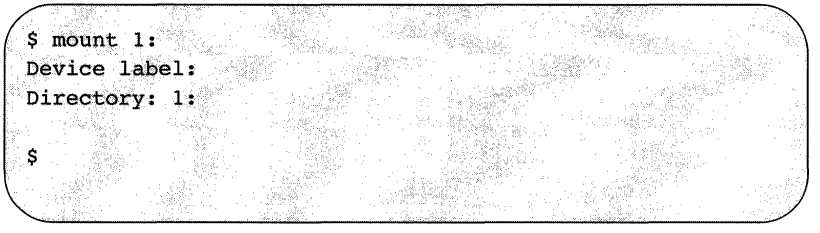

Figure 3-1. Mounting a Volume

Unmounting a Volume

The **unmount** command makes a memory card unavailable. You can issue this command before you remove the memory card. This command is optional on an NVFS.

Enter the command as follows on an NVFS system, where **<volume>** is the number of the slot containing the memory card.

unmount <volume>:

You can use the **-f** argument to force an unmount, regardless of whether a file is in use. (You do *not* risk NVFS file corruption when you use the **-f** argument). When you issue the **unmount** command without using a **-f** argument, the TI reports an error if files are in use at the moment you issue the command.

Examples

If you enter:	The system does the following:
unmount 1:	The memory card in slot 1 is unmounted.
unmount -f 1:	The memory card in slot 1 is forced to unmount.

Displaying the Status of all Memory Cards

Enter **dinfo** to display the status of all memory cards currently installed in the Wellfleet router. Figure 3-2 shows a sample dinfo display of a system with memory cards 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 3-2. Sample Dinfo Display

The dinfo display contains the following data:

Vol: Slot number where the memory card is currently installed. (*Vol* is short for volume.)

State: Either *formatted* or *corrupted*. If you purchase a card from another supplier, the dinfo display may list it as *corrupted*. If a card is *corrupted*, format it. (Refer to *Formatting a Memory Card* later in this chapter for instructions.)

Total Size: Total number of bytes (used and unused) in the memory card.

Free Space: Number of unused bytes in the memory card.

Contig Free Space: Number of unused bytes in the largest block of available space in the memory card.

When you delete a file on a memory card, the file becomes inaccessible, but the data remains on the card. Eventually, all space is used. The **compact** command copies the active files to memory, erases the memory card, and copies the files back to the memory card. Refer to the *Compacting File Space* section to free up space to prevent or respond to a file allocation failure.

Displaying a Directory

The **dir** command displays a list of the files on a particular volume. You can enter the wildcard characters * and ? to display filenames with 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>:

The directory display shows an entry for each file on the volume. Each entry consists of a filename, size, and modification date/weekday/time. Figure 3-3 shows a sample response to the **dir** command.

Examples

If you enter:	The console displays the following:
dir	The list of files on the active volume
dir *.cfg	The list of files with a *.cfg* extension on the active volume
dir 3:	The list of files on volume 3
dir 4:???.log	The list of files with a three-character filename and a *.log* extension on volume 4

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

File Name              Size    Date      Day      Time
-------------------------------------------------------
BOOT.EXE             630988  06/28/93  Mon.    09:56:50
CONFIG                 2496  06/28/93  Mon.    09:56:50
DEBUG.AL                372  06/28/93  Mon.    15:24:14
FREDIAG.EXE            2476  06/28/93  Mon.    15:24:14
FREBOOT.EXE            1905  06/28/93  Mon.    15:24:14
STARTUP.AL              123  06/28/93  Mon.    15:24:04
TI.CFG                  372  06/28/93  Mon.    15:46:34

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

$
```

Figure 3-3. Sample NVFS Directory Listing

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

- *boot.exe* is the bootable image for the BLN and BCN. *ace.out* is the bootable image for the AFN. 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* or *ace.out* filename for the system to boot successfully after a cold-start. The **boot** command does, however, allow you to specify another software image.
- *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.)
- *frediag.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.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 provide full use of all system buffers. 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 change the active volume. You can also use this command to display the active volume. Enter the following command to display the active volume number:

cd

The following sample 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:	*New Present Working Directory: 3:* (Now when your enter **dir**, the directory contents for Volume 3 are displayed.)

Copying a File

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

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 directory of the volume's contents and determine the filenames that are already in use.

Enter the following to copy 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 slot number of the source volume.

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

Examples

If you enter:	The system does the following:
copy config alt.cfg	Copies the *config* file on the active volume and names the copy *alt.cfg*
copy 3:alt.cfg	Copies the *alt.cfg* file on volume 3 and stores the copy, also named *alt.cfg*, on the active volume
copy 2:l6_22.log 2:span.log	Copies the *l6_22.log* file on volume 2 and names the copy *span.log*
copy 2:config 3:config	Copies the *config* file on volume 2 and stores the copy, also named *config*, on volume 3
copy *.* 3:	Copies all files from the active volume to volume 3
copy 2:*.exe 4:	Copies all executable files from volume 2 to volume 4
copy 3:???.* 4:	Copies all files with a filename of three characters from volume 3 to volume 4

Transferring a File

The **tftp** command invokes the TFTP (Trivial File Transfer Protocol) software to transfer a file 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). Also, 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 target volume to write the new file. This attribute is set during the Quick-Start procedure using the *startup.al* alias **setvol <slot#>** to target an NVFS volume or **setvol 65** to target a DOS volume.

Warning: The destination system in a file transfer automatically overwrites any file already on its volume that has the same filename. If enough space does not exist on the file system for the new file, and the new file has the same name as an old file, the old file will be destroyed and the new file will be corrupt. This is because TFTP copies the new file over the old and runs out of space before completing the copy. Be sure to follow the instructions in this section to avoid corrupting the *config* file.

If the destination system has a memory card to which you are transferring a file, Wellfleet recommends that you compact it first to optimize the space available (refer to *Compacting File Space*) for the file.

Wellfleet recommends that you first copy the file at the source to a new, temporary filename if the name is the same as an existing file at the destination.

Enter the following command to transfer a file:

tftp {get|put} <vol>:<file_spec> <dest_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.

<dest_address> is the address of the remote node.

Warning: The local system erases the file if you enter its address in the **<dest_address>** field of the **tftp** command.

The system executes one TFTP request at a time 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.cfg 192.32.1.62	Sends a copy of *config2.cfg* from volume 2 to the remote node at the IP address 192.32.1.62
tftp get 2:config2.cfg 192.32.1.62	Requests a copy of *config2.cfg* from the remote node at the IP address 192.32.1.62 and stores the copy in the volume on slot 2

After transferring the file, you can copy it at the source to its original name. If the new file at the destination is a configuration file or an executable file, verify its integrity by booting with it. If the system boots and loads the configuration without problems, you can rename or copy the filename at the destination to its original.

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 argument 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. Yes, 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 *startup.al* file, which is stored on the volume in slot 2
type -x 3:config	The *config* file which is stored on the volume in slot 3. This file is displayed in hexadecimal format.

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 *alt.cfg* file on the active volume
delete 2:l6_22.log	Deletes the *l6_22.log* file on volume 2
delete 3:*.log	Deletes all files with the *log* filename extension on volume 3
delete 4:???.log	Deletes all files with a three-character filename and a *log* filename extension on volume 4

Compacting File Space

When you delete a memory card file, the file becomes inaccessible, but the data remains on the card. Eventually, all space is used. The **compact** command copies the active files to memory, erases the card's contents, and copies the files back to the card. If responses to the **dir** or **dinfo** commands reveals more free space than contiguous free space on a memory card, compacting the space on the card increases the contiguous free space.

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

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

compact <vol>:

The *Compacting / Formatting file system on volume <vol>:...* message appears.

The space is compacted when the $ prompt reappears.

Formatting a Memory Card

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

format <vol>:

Use the **format** command to format new memory cards 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.

Chapter 4

Managing a DOS File System

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Managing a DOS File System

About this Chapter

This chapter describes how to use the TI to manage DOS files on the Wellfleet router. This chapter is intended only for users whose routers are equipped with a floppy disk drive.

This chapter describes how to do the following:

- Name files
- Mount and unmount a volume
- Display a directory
- Label a diskette
- Create and remove a directory
- Change the present working directory
- Rename a file or directory
- Copy files to different filenames on the same directory, or to a different directory
- Transfer a file
- Change a file's attributes
- Display the contents of a file
- Delete a file

Introduction

The DOS file system on the router reads and writes to the diskette. The diskette provides system access to the software image and configuration file during a cold start. (A cold start occurs after a power-cycle.)

The DOS file system accepts the DOS commands described in this chapter. Use these commands to manage the files and directories on the diskette.

You issue a command to mount a volume to alert the file system that the diskette is ready for access after you insert a diskette, boot the router, or reset slot 2. To issue an explicit command to alert the system that the diskette is available for access, issue the **mount a:** command. DOS performs an implied mount if you issue any of the DOS file management commands listed in Table 4-1 except, of course, the **unmount** command, if you follow the command with a space and the **a:** volume designator.

Warning: Be sure to issue the **unmount** command as described in this chapter before you remove a diskette, reboot the router, or reset slot 2. File corruption errors can occur when you perform these tasks without first issuing the **unmount** command.

Table 4-1 lists the DOS file management commands you can issue to the TI. 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.

Note: The DOS file system in the router does not format diskettes, however, you can format them on a PC and use them in the router.

Table 4-1. DOS File Management Commands

Command	Wildcard	Function
attr	✔	Changes file attributes
copy	✔	Copies a file from one directory to another or to the same directory
cd		Changes the present working directory
delete	✔	Deletes a file
dir	✔	Displays all files in a directory
label		Changes the internal label of the diskette
mkdir		Creates a directory
mount		Makes the floppy diskette drive available
rename	✔	Renames file and directories
rmdir		Removes a directory
save		Saves the current software configuration, aliases, or events to a file. Refer to *Managing Events*, *Accessing the MIB*, or *Managing Aliases* for instructions on the **save** command.
tftp		Transfers a file to or from the Wellfleet router
type		Displays the contents of a file in ASCII or hexadecimal format
unmount		Makes the floppy diskette drive unavailable

Naming Files and Directories: Rules and Conventions

The rules for naming files and directories are as follows:

- Filenames and directory names must start with an alphabetical character. The remaining characters must be alphanumeric, and may also include the underscore (_) character. Spaces are not allowed.
- DOS directory names and filenames can consist of 1 to 8 characters.
- File extensions are optional, and must be preceded by a dot. They can be from 1 to 3 characters.

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

- Use the *.out* file extension for software images for the ACE modules. (The default software image is *ace.out*.)
- 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.

Mounting a Volume

The **mount** command makes the floppy diskette drive available. Issue the command when you install a diskette.

Enter the command as follows:

mount a:

The screen displays a File System Check Report (see Figure 4-1).

```
$ mount a:
Device label:
Directory: A:\

File System Check Report:
      Allocated but unused clusters:          0
      Used but Unallocated clusters:          0
      Cluster chains shared between files:    0
      File size is wrong:                     0
      Missing EOF:                            0
      Directory Errors:                       0

$
```

Figure 4-1. Mounting a Volume

The File System Check Report indicates the number of errors on a diskette. All values should be zero. Non-zero values indicate file corruption. Refer to the description of these values and to the DOS events in the log to determine the cause. The most common cause of file corruption is that DOS was interrupted while writing to the diskette and was unable to complete its operation. This can occur when the power resets, the router reboots, or slot 2 is reset. You can avoid corrupting files when performing these tasks by entering the **unmount** command first, and ensuring the system does not respond with an error message indicating a file is in use.

The File System Check Report entries are as follows:

- *Allocated but unused clusters* shows the number of reserved sectors that are not allocated to files.

  The router may in some cases be able to recover from this error when mounting the volume. The TI displays a message indicating success or failure after a recovery attempt. Enter the **unmount a:** and **mount a:** commands to determine whether DOS fixes the error. If the file system comes up clean, the error is fixed. If an error is detected again, use the check disk (CHKDSK) command with the fix (/F) switch on a PC to free the allocated but unused sectors.

- *Used but Unallocated clusters* shows the number of unreserved sectors that are allocated to files. The directory is corrupt.

  Use a PC to reformat the diskette.

- *Cluster chains shared between files* shows the number of sector chains that are allocated to more than one file.

  Use the check disk (CHKDSK) command on a PC to determine which files are corrupt, and delete those files.

- *File size is wrong* shows the number of File Allocation Table (FAT) entries and directory table entries that do not match.

  Use a PC to reformat the diskette.

- *Missing EOF* shows the number of files in the FAT that are missing an End of File (EOF) marker.

  Use a PC to reformat the diskette.

- *Directory Errors* shows the number of errors in the directory.

  Refer to the log. Use a PC to reformat the diskette if necessary.

Unmounting a Volume

The **unmount** command makes the floppy diskette drive unavailable. You issue this command before you remove a diskette, reboot the router, or reset slot 2. When you issue the **unmount** command without using a **-f** argument, an error is reported if files are in use at the moment you issue the command.

To unmount the currently active volume, ensure the diskette drive LED is off, and enter the command as follows:

unmount

The system reports an error if a file is in use at the moment you issued the command. Otherwise, you can assume that the unmount was executed. If the system reports an error, ensure the diskette drive LED is off and retry until no error is reported.

You can use the **-f** argument to force an unmount, regardless of whether a file is in use.

Warning: Use the **-f** argument to force an unmount only in emergencies. File corruption errors may occur when you force an unmount while DOS is writing to the diskette.

Enter the command as follows to force an unmount:

unmount -f

Displaying a Directory

The **dir** command displays a list of the files in a directory. You can enter the wildcard characters * and ? to display filenames with the character strings you specify. Wildcard characters may not be used in the directory portion of the pathname.

Enter the following command to list the files stored in the default directory:

dir

Enter the following command to display selected contents of another directory, where **<dir_name>** is the path to the directory, and **<filename.ext>** is the file specification you want to display:

dir \<pathname>\<filename.ext>

Figure 4-2 shows a sample response to the **dir** command. The screen shows an entry for each file on the volume. Each entry consists of a filename, size, modification date/weekday/time, and attributes.

Examples

If you enter:	The system does the following:
dir	Displays the list of files in the present working directory
dir *.cfg	Displays the list of files in the present working directory with a *.cfg* extension
dir ???.log	Displays the list of files in the present working directory with a three-character filename and a *.log* extension

```
$ dir
Performing mount check...

 Volume in drive A: is DISK 1
 Directory of A:\

File Name              Size     Date      Day       Time     Attributes
-------------------------------------------------------------------------
.                         0   01/01/92   Wed.     12:00:00   -d----
..                        0   01/01/92   Wed.     12:00:00   --r---
ACE.OUT              630988   06/28/93   Mon.     09:56:50   a-----
CONFIG                  380   06/28/93   Mon.     09:56:50   a-----
DEBUG.AL               3004   06/28/93   Mon.     15:24:14   a-----
STARTUP.AL              380   06/28/93   Mon.     15:24:04   a-----
TI.CFG                  372   06/28/93   Mon.     15:46:34   a-----

   55296 bytes - Total size
   41984 bytes - Available free space
$
```

Figure 4-2. Sample DOS Directory Listing

The factory-default filenames shown in Figure 4-2 are as follows:

- *ace.out* is the bootable image for an AFN. 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 *ace.out* filename for the system to boot successfully after a cold-start. The **boot** command does, however, allow you to specify another software image.
- *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.)
- *startup.al* is an ASCII file containing aliases that you use during the initial start-up.
- *ti.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. This file is stored in binary format.

Table 4-2 identifies the DOS file attributes that may appear in a DOS directory display, and their meanings. Refer to the *Changing File Attributes* section for more information about file attributes.

Table 4-2. DOS File Attributes

Attribute Flag	Meaning
a	Archive needed
d	Subdirectory
v	Volume ID
s	System file
h	Hidden
r	Read-Only file

Labeling a Diskette

The **label** command changes or displays a diskette's internal label. Enter the following to display the internal label:

label

Enter the following to change the internal label, where **<dsk_name>** is the new label:

label <dsk_name>

The name you enter may be from 1 to 11 characters. You can use letters, numbers, symbols, or spaces. But you cannot enter the following characters:

' " / \ { } : * | < > + = ; : ? ( ) & ^

Examples

If you enter:	The system does the following:
label	Displays the internal label of the diskette
label disk1	Writes the internal label *disk1* to the diskette

Creating a Directory

The **mkdir** command creates a new directory. Enter the following to create a new directory, where **<dir_name>** is the new directory name you are creating, and **<pathname>** is the name of the path to that directory:

mkdir \<pathname>\<dir_name>

Examples	If you enter:	The system does the following:
	mkdir logs	Creates a new sub-directory called *logs*
	mkdir \logs\L_6_23	Creates a new sub-directory called *L_6_23* in the path called *logs*

Removing a Directory

The **rmdir** command removes an existing directory. The directory must be empty before it can be removed. Enter the following to remove a directory, where **<dir_name>** is the directory name you are removing, and **<pathname>** is the name of the path to that directory:

rmdir \<pathname>\<dir_name>

Examples	If you enter:	The system does the following:
	rmdir \logs\L_6_23	Deletes the sub-directory called *L_6_23* in the *logs* path
	rmdir logs	Deletes the sub-directory called *logs*

Changing the Working Directory

The **cd** command changes the present working directory. You can also use this command to display the present working directory. Enter the following command to display the present working directory:

cd

Enter the following command to change the present working directory:

cd \<dir_name>

Enter the following command to change the present working directory to the parent directory (one level above the current one):

cd ..

Enter the following command to change the present working directory to the root directory:

**cd **

Examples

If you enter:	The system does the following:
cd	Displays the present working directory
cd \old	Changes the present working directory to the sub-directory *old*
cd \ old\logs	Changes the present working directory to the sub-directory *old* \ *logs*
cd ..	Changes the present working directory to the parent directory
**cd **	Changes the present working directory to the root directory

Renaming a File or Directory

The **rename** command changes a filename or directory name.

If you specify a path to the file or directory, the file is moved to the new directory. The new file or directory must reside on the same diskette as the original. You can use the wildcard characters * and ? to rename files and directories with the character strings you specify. Enter the following to rename a file or directory:

rename <old_name> <new_name>

Note: You cannot rename a file whose attributes are h (for hidden) or s (for system). Refer to the *Changing File Attributes* section for instructions on changing these protections.

Examples

If you enter:	The system does the following:
rename new.cfg old.cfg	Changes the file named *new.cfg* in the present working directory to *old.cfg*
rename *.cfg *.arc	Changes all filenames in the present working directory with a *.cfg* extension to a *.arc* extension.
rename \logs\l6_22.log \investig\span.log	Moves the *l6_22.log* file in the *logs* directory to the *investig* directory and renames the file to *span.log*

Copying a File

The **copy** command makes a copy of a file. You can use the wildcard characters * and ? when issuing the copy command to copy multiple files. The new file must reside on the same diskette as the original. (Use a PC to copy a file from one diskette to another.)

Warning: The system automatically overwrites any file already in the directory that has the same filename as the file you are copying. To avoid overwriting an existing file, display the directory and determine the filenames that are already in use.

Enter the following command to copy a single file in the present working directory and rename the new version of the file:

copy <old_name.ext> <new_name.ext>

Enter the following command to copy a file from one directory to another, and use the same filename:

copy \<dir_1>\<old_name.ext> \<dir_2>

Enter the following command to copy a file from one directory to another, and use a new filename:

copy \<dir_1>\<old_name.ext> \<dir_2>\<new_name.ext>

Examples

If you enter:	The system does the following:
copy config alt.cfg	Copies the *config* file in the present working directory and names the new copy *alt.cfg*
copy *.* \newfiles	Copies all files in the present working directory to the directory *newfiles*.
copy \logfiles\l6_22.log \investig\span.log	Copies the *l6_22.log* file from the *logfiles* directory to the *investig* directory and names the new file *span.log*

Transferring a File

The **tftp** command invokes the TFTP (Trivial File Transfer Protocol) software to transfer a file 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). Also, 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 target volume to write the new file. This attribute is set during the Quick-Start procedure using the *startup.al* alias **setvol 65** to target the DOS volume.

Warning: The destination system in a file transfer automatically overwrites any file already on its volume that has the same filename. If enough space does not exist on the file system for the new file, and the new file has the same name as an old file, the old file will be destroyed and the new file will be corrupt. This is because TFTP copies the new file over the old and runs out of space before completing the copy. Be sure to follow the instructions in this section to avoid corrupting the *config* file.

Wellfleet recommends that you first rename or copy the file at the source to a new, temporary filename if the name is the same as an existing file at the destination.

Enter the following command to transfer a file:

tftp {get|put} <file_spec> <remote_IP_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.

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

<remote_IP_address> is the address of the remote node.

Warning: The local system erases the file if you enter its address in the **<remote_IP_address>** field of the **tftp** command.

The system executes one TFTP request at a time 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 config2.cfg 192.32.1.62	Sends a copy of *config2.cfg* to the remote node at the IP address 192.32.1.62
tftp get config2.cfg 192.32.1.62	Gets a copy of *config2.cfg* from the remote node at the IP address 192.32.1.62

After transferring the file, you can rename or copy it at the source to its original name. If the new file at the destination is a configuration file or an executable file, verify its integrity by booting with it. If the system boots and loads the configuration without problems, you can rename or copy the filename at the destination to its original.

Changing File Attributes

The **attr** command changes the DOS file attributes. These attributes are displayed when you enter the **dir** command. You cannot delete or rename a file whose attributes are s (for system) or h (for hidden). This section describes how to reassign attributes to such files so that you can remove these protections.

Hexadecimal values with a '0x' prefix determine the set of attributes associated with DOS files. You determine which hex value is associated with the set of attributes you want for a file. Then you enter the **attr** command, along with the hex value, and the name of the file(s) whose attributes you are assigning.

Enter the following to assign one or more attributes to a file in the present working directory:

attr <hex_value> <filename.ext>

Enter the following to assign one or more attributes to a file in another directory:

attr <hex_value> \<pathname>\<filename.ext>

You can use the wildcard characters * and **?** when naming files. Table 4-3 lists the DOS file attributes, their meanings, and their hex values.

Table 4-3. DOS File Attribute Hex Values

Attribute Flag	Meaning	Hex Value
a	Archive needed	0x20
d	Subdirectory	0x10 - Not user modifiable
v	Volume ID	0x08 - Not user modifiable
s	System file	0x04
h	Hidden	0x02
r	Read-only file	0x01

To assign a single attribute to a file, use the hex value associated with the attribute you want in the attribute command. For example, you enter the following command to assign the read-only file attribute to a file named *config* located in the present working directory:

attr 0x01 config

To assign multiple attributes to a file, add the Hex values associated with the attributes you want and enter the total in the attribute command. For example, to assign the archive needed, hidden, and read-only attributes to the *config* file, add their associated hex values:

0x20 + 0x02 + 0x01 = 0x23

You then enter the following command to assign these file attributes:

attr 0x23 config

You can also assign attributes to a file in another directory by specifying the pathname. For example, you enter the following command to change the file attributes of a file named *l6_23.log* in the *logs* path:

attr 0x23 \logs\l_23.log

Examples

If you enter:	The system does the following:
attr 0X01 config	Sets the attribute of the file *config* to read-only
attr 0X03 config	Sets the attributes of the file *config* to hidden and read-only
attr 0X23 config	Sets the attribute of the file *config* to hidden, read-only, and archive.

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] <filename>

Where:

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

<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. Yes, 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 startup.al	The contents of the *startup.al* file
type -x config	The *config* file in hexadecimal format.

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 in the present working directory:

delete <filename>

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

Note: You cannot delete a file whose attributes are h (for hidden) or s (for system). Refer to the *Changing File Attributes* section for instructions on changing these protections.

Examples

If you enter:	The system does the following:
delete alt.cfg	Deletes the *alt.cfg* file in the present working directory
delete *.log	Deletes all files with the *log* filename extension in the present working directory
delete ???.log	Deletes all files with a three-character filename and a *log* filename extension

Chapter 5

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: *wfCSMACDEntry = 1.3.6.1.4.1.18.3.4.1.1* *wfFddiEntry = 1.3.6.1.4.1.18.3.4.4.1* *wfFddiSmtEntry = 1.3.6.1.4.1.18.3.4.15.1.21* ...
list wfCSMACDEntry	All attribute names and associated attribute identifiers of the *wfCSMACDEntry* object: *wfCSMACDDelete = 1* *wfCSMACDEnable = 2* *wfCSMACDState = 3* ...
list instances wfCSMACDEntry	All instance identifiers of the *wfCSMACDEntry* object configured on your system: *inst_ids = 2.1* *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.***	*wfSnmp.wfSnmpDisable.0 = 1* (The object name, the base record (*0*), and the value) Appending the base (*0*) to the object name is optional when issuing a **get** command. Likewise, appending the base (*0* or *) to the instance identifier is optional when issuing a **get** command.
get wfSnmp.*.0	*wfSnmp.wfSnmpDisable.0 = 1* *wfSnmp.wfSnmpUseLock.0 = 1* *wfSnmp.wfSnmpLockAddress.0 = 0.0.0.0* ...
get wfSnmp.*.*	*get: Invalid obj.attr.inst specified*

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 processor module.

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 wfSnmp.wfSnmpDisable.0 1** **set 1.3.6.1.4.1.18.3.5.3.5.1.1.0 1** **set wfSnmp.1.0 1**	Changes the value of the group.attribute.instance *wfSnmp.wfSnmpDisable.0* (*1.3.6.1.4.1.18.3.5.3.5.1.1.0*) to *1* to enable SNMP.
set wfIpInterfaceEntry.2.192.32.13.99.3 2	Changes the value of the group.attribute.instance *wfIpInterfaceEntry.WfIpInterfaceEnable. 192.32.13.99* to *2*. This disables IP for the interface whose IP address is *192.32.13.99* 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 *wfBrTp.wfBrTpBaseEnable.0* and *wfBrStp.wfBrStpBaseEnable.0* 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 *CONFIG* on volume 2 with the configuration in memory.
save config 2:config.2	Creates an alternate configuration file named *CONFIG.2* on volume 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 6

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.
- 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. Use the **save** command (described in the following section) to save the aliases in RAM to a file for later retrieval. The system can store up to 100 aliases in memory, provided that memory isn't dedicated to other tasks, so limit the number of aliases in an alias file to 100. You can store as many alias files in your file system as space allows.

Examples

If you enter:

alias
The console displays all aliases residing in RAM.

alias ebridge "set wfBrTp.2.0 1 ;set wfBrStp.2.0 1 ;commit"
The system creates an alias named *ebridge* that invokes the commands.

ebridge
The system does the following:
- Enables the Translating Bridge and Spanning Tree Bridge
- Notifies all relevant software modules of set changes to the MIB.

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.

alias sbridge "ebridge ;gbridge"
The system creates an alias named **sbridge** that invokes the aliases **ebridge** and **gbridge**.

Inserting Parameters in an Alias

You can insert one or more parameters in an **<alias_value>** when creating an alias. When you enter the alias name and follow the name with a value, the value 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.

The parameter number indicates the position of the value in the user entry. This feature allows you to use the same value for more than one parameter. (Refer to the last two examples.)

Examples

If you enter:	The system does the following:
alias scroll "more $"	Creates an alias named **scroll** that invokes the more 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**.
alias cp "copy 2:%1 3:%2"	Creates an alias named **cp** that accepts two values and inserts them in parameter positions **%1** and **%2**, respectively (as shown in the next example).
cp config2.cfg alt.cfg	Invokes the **copy** command associated with the alias **cp**, inserts the *config2* value in the first parameter position (**%1**) and inserts the *alt.cfg* value in the second parameter (**%2**). The system then invokes the command; it copies the *config2.cfg* file on slot 2 to a new file *alt.cfg* 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 *config* value in the parameter positions indicated by **%1** in the **<alias_value>**, and copies the *config* 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:
echo hi	*hi*
echo "IP Input Statistics:"	*IP Input Statistics:*

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 first example to see how this is done.

Examples

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.

```
\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 **[on|off]** is **on** to display alias commands or **off** to turn off the display:

verbose [on|off]

Examples

If you enter:	The system does the following:
verbose	Displays *Verbose mode on* or *Verbose mode off*
verbose on	Displays alias commands when they execute
verbose off	Does *not* 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:
unalias scroll	Deletes the alias named *scroll*
unalias *	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 volume that will store the alias file

<filename> is the name of the alias file.

Example

If you enter:	The system does the following:
save aliases 2:aliases.1	Creates a file named *ALIASES.1* on volume 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 volume storing the alias file.

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

Example

If you enter:	The system does the following:
source aliases 2:aliases.1	Loads the aliases contained in the *ALIASES.1* file, which is stored on volume 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 volume containing the files from Wellfleet:

source aliases <vol>:debug.al

Table 6-1 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 6-1. Aliases for Debugging Network Problems

If you enter:	The system does the following:
cctnames	Displays all circuit names
ccttypes	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: *wfivAdjEntry.wfivAdjNodeAddr.6145 = "2.3"*
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 6-1. 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 *wfHwEntry* section of the appendix *Wellfleet MIB* 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 6-1. 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 192.32.10.10.1** 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)
lbfwd	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: *wfBrTpInterfaceEntry.wfBrTpInterfaceState.1 = 2* The states are as follows: 1 = up 2 = down 3 = init 4 = present
lbstats	Displays Bridge receive, transmit, and dropped packet statistics
ospf_drs	Reports the designated router and backup designated router for each of the router's attached OSPF networks

Table 6-1. Aliases for Debugging Network Problems

If you enter:	The system does the following:
ospf_intf	Reports the state of all the router's OSPF interfaces, including virtual links The states are as follows: 1 = down 2 = loopback 3 = waiting 4 = point to point 5 = designated router 6 = backup designated router 7 = other designated router
ospf_lsdb	Lists all interfaces in the link state database
ospf_nbrs	Reports the state of every OSPF neighbor that the router knows about The states are as follows: 1 = down 2 = attempt 3 = init 4 = two way 5 = exchange start 6 = exchange 7 = loading 8 = full
protocols	Displays bit map in decimal form representing all protocols running and their associated slots. Refer to the *wfProtocols* section of the appendix *Wellfleet MIB Specification* to decode the values.
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)

Table 6-1. Aliases for Debugging Network Problems

If you enter:	The system does the following:
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 7

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.

This chapter also includes instructions for resetting the date and time and assigning TI passwords. A table of all TI commands and their associated access levels is located at the end of this chapter.

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 processor 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 processor 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 processor module in the router boots and loads the configuration when you do *not* override the default boot image (*boot.exe* or *ace.out*) 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 Router Boots

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

A cold start occurs when you power cycle the router or issue the TI **diags** command. The processor module 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 processor module boots.

A warm start occurs when you hot-swap a module, press the Reset button, or issue the **boot** or **reset** command. The processor module 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 remain on, indicating diagnostics have not been run. (Wellfleet recommends that you issue the **diags** command when you hot-swap a board.

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

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

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* or ace.out) 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 processor 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 volume and filename of the boot image or **-** identifies the default boot image. The **<vol>** identifies the volume that contains the <image_name>.

<vol>:<config_name> identifies the volume and name of the configuration file or **-** identifies the default configuration file (*config*). The **<vol>** identifies the volume that contains the <config_name>.

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* or *ace.out* 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 (*boot.exe*) and the configuration file (*config*) on the volume to come up with the valid boot name (*boot.exe*)
boot 2:- 2:- or **boot 2:boot.exe 2:config**	Boots with the following: • The (default) boot image (*boot.exe*) on volume 2 • The (default) configuration file (*config*) on volume 2
boot 2:bootv7.exe 3:-	Boots with the following: • The *bootv7.exe* boot image on volume 2 • The (default) configuration file (*config*) on volume 3
boot 3:- 2:Trident.cfg	Boots with the following: • The default boot image *boot.exe* on volume 3 • The user's customized configuration file *Trident.cfg* on volume 2
boot 2:bootv7.exe 2:Trident.cfg	Boots with the following: • The *bootv7.exe* boot image on volume 2 • The user's customized configuration file *Trident.cfg* on volume 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 processor module, where **<slot-number>** is the number of the slot where the processor module is located:

reset [<slot-number>]

The following occurs when you reset a processor module:

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

Running Diagnostics

The **diags** command cold-starts a single slot 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 processor 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 processor 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 processor 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:

- *frediag.exe* is the diagnostics image file. To upgrade with a new diagnostics image, transfer the new *frediag.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 processor module with diagnostic instructions during a cold start.

  If you want to verify that the image resident on the diagnostics PROM matches the *frediag.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 bootable image file for the BLN and BCN. *ace.out* is the bootable image for an AFN. When the system boots, it automatically loads the default boot image (unless you specify another boot image) from another slot into memory on the processor module, 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 volume storing the file.

<filename> is the name of the executable file.

Figure 7-1 shows a sample system response to the **readexe** command.

Examples

If you enter:	The system does the following:
readexe frediag.exe	Calculates file header and image checksums on the *frediag.exe* 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 *freboot.exe* 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

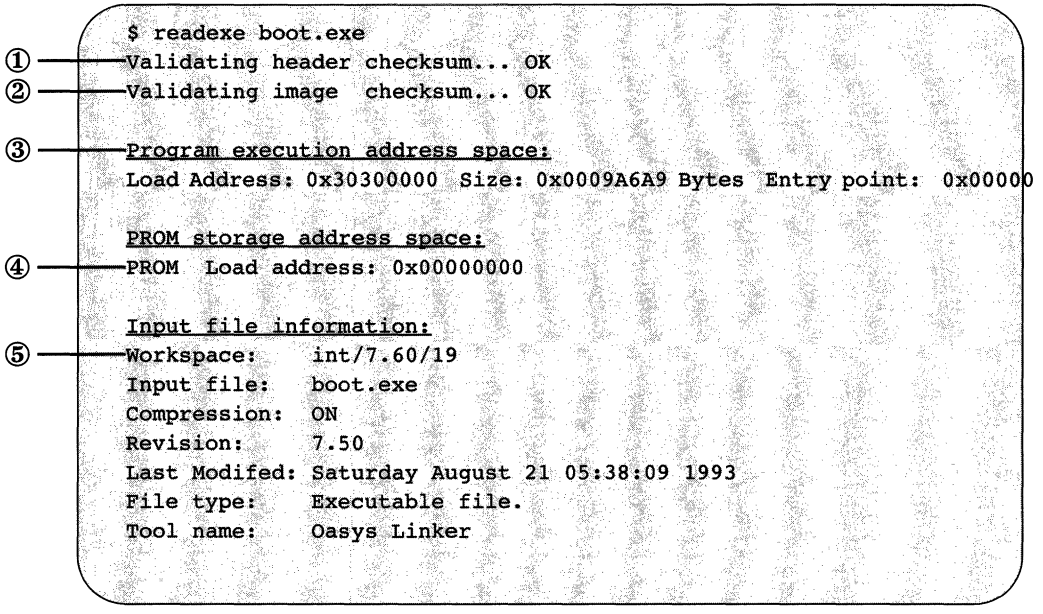

Figure 7-1. Sample Response to readexe Command

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 *frediag.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 note 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. 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 router requires all of the bandwidth available during a PROM update. To provide this bandwidth, you must boot with the minimal configuration necessary to operate the router. This configuration is contained on the *ti_only.cfg* file. Boot the router 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 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 modules to avoid a mismatch of software.

Examples

If you enter:	The system does the following:
prom -v 2:frediag.exe 3	Verifies the contents of the Diagnostics PROM on slot 3 against the contents of the *frediag.exe* file on volume 2
prom -w 2:freboot.exe 3	Erases the Bootstrap PROM on slot 3 and copies the contents of the *freboot.exe* file on volume 2 to the PROM on slot 3
Any one of the following: **prom -w 2:frediag.exe 2, 3, 4, 5** **prom -w 2:frediag.exe 2 3 4 5** **prom -w 2:frediag.exe 2, 3-5** **prom -w 2:frediag.exe 2-5**	Erases the Diagnostics PROMs on slots 2, 3, 4, and 5 and copies the contents of the *frediag.exe* file on volume 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 processor modules.

Examples

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

Assigning Passwords

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

The TI runs on a single processor module. When you assign a password, the Gate Access Management Entity (GAME) operating system distributes the new password to nonvolatile RAM in all processor 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 processor module.) However, if you insert a new processor 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 7-1 lists all TI commands and their associated access levels.

Table 7-1. TI Access Levels

Command	User	Manager	Command	User	Manager
!	✔	✔	more	✔	✔
attr (DOS only)	✔	✔	mount	✔	✔
boot		✔	password User	✔	✔
cd (DOS only)	✔	✔	mkdir	✔	✔
clearlog		✔	password Manager		✔
commit		✔	ping	✔	✔
compact		✔	prom		✔
copy		✔	readexe	✔	✔
date	✔	✔	rename (DOS only)		✔
delete		✔	reset		✔
diags		✔	rmdir	✔	✔
dinfo	✔	✔	save		✔
dir	✔	✔	set		✔
echo	✔	✔	source aliases	✔	✔
format		✔	stamp	✔	✔
get	✔	✔	system	✔	✔
help	✔	✔	tftp		✔
label (DOS only)	✔	✔	type	✔	✔
list	✔	✔	unalias	✔	✔
log	✔	✔	unmount	✔	✔
logout	✔	✔	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 *wfSwSeries*7 (*wellfleet.3*) object names and identifies the Wellfleet MIB for the Series 7 software. The nodes in the first level below *wfSwSeries*7 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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What did you find most useful about this guide?

What did you find least useful about this guide?

What information that you expected or needed was missing?

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