

Bay Networks

The Merged Company of SynOptics and Wellfleet

Customizing TCP Services

Part No. 110048 A

Customizing TCP Services

Router Software Version 8.10
Site Manager Software Version 2.10

Part No. 110048 Rev.A
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Bay Networks

The Merged Company of SynOptics and Wellfleet

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About This Guide

If you are responsible for configuring and managing Wellfleet® routers, you need to read this guide. It describes how to customize Wellfleet router software for Transmission Control Protocol (TCP) services.

Refer to this guide for

- ❑ An overview of TCP
- ❑ Implementation notes that may affect how you configure TCP services
- ❑ Instructions on editing TCP, Telnet, and FTP parameters

For information and instructions about the following topics, see *Configuring Wellfleet Routers*:

- ❑ Initially configuring and saving an Internet Protocol (IP) interface
- ❑ Retrieving a configuration file
- ❑ Rebooting the router with a configuration file

Before You Begin

Before using this guide, you must complete the following procedures:

- ❑ Create and save a configuration file that contains at least one IP interface.
- ❑ Retrieve the configuration file in local, remote, or dynamic mode.

Refer to *Configuring Wellfleet Routers* for instructions.

How to Get Help

For additional information or advice, contact the Bay Networks Help Desk in your area:

United States	1-800-2LAN-WAN
Valbonne, France	(33) 92-966-968
Sydney, Australia	(61) 2-903-5800
Tokyo, Japan	(81) 3-328-0052

Conventions

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: if command syntax is ping <ip_address>, you enter ping 192.32.10.12
arrow character (→)	Separates menu and option names in instructions. Example: Protocols→AppleTalk identifies the AppleTalk option in the Protocols menu.
brackets ([])	Indicate optional elements. You can choose none, one, or all of the options.
user entry text	Denotes text that you need to enter. Example: Start up the Windows environment by entering the following after the prompt: win
command text	Denotes command names in text. Example: Use the xmodem command.

<i>italic text</i>	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
screen text	Indicates data that appears on the screen. Example: Set Trap Monitor Filters
ellipsis points	Horizontal (. . .) and vertical (:) ellipsis points indicate omitted information.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
vertical line ()	Indicates that you enter only one of the parts of the command. The vertical line separates choices. Do not type the vertical line when entering the command. Example: If the command syntax is show at routes nets , you enter either show at routes or show at nets , but not both.

Acronyms

ANSI	American National Standards Institute
ARP	Address Resolution Protocol
ATM	Asynchronous Transfer Mode
CMIP	Common Management Information Protocol
EGP	Exterior Gateway Protocol
FTP	File Transfer Protocol
FDDI	Fiber Distributed Data Interface
IEEE	Institute of Electrical and Electronic Engineers
ILI	intelligent link interface
IS-IS	Intermediate System to Intermediate System
MAC	Media Access Control
MOP	Maintenance Operations Protocol
OSI	Open Systems Interconnection
OSPF	Open Shortest Path First
PVCs	permanent virtual circuits
QENET	Quad Ethernet Link Module
RIP	Routing Information Protocol

Acronyms

SMDS	Switched Multimegabit Data Services
SNAP	Subnetwork Access Protocol
SNMP	Simple Network Management Protocol
SRM	system resource modules
SVCs	switched virtual circuits
TCP/IP	Transmission Control Protocol/Internet Protocol
TFTP	Trivial File Transfer Protocol

Chapter 1

Transmission Control Protocol Overview

In the 1970s, the Defense Advanced Research Projects Agency (DARPA) of the U.S. Department of Defense developed the Transmission Control Protocol (TCP) to provide communication among hosts manufactured by different vendors.

DARPA designed TCP to work within a layered hierarchy of networking protocols, using the Internet Protocol (IP) to transfer data.

This chapter introduces TCP concepts, features, and terminology and consists of the following sections:

- ❑ “Reliability” on page 1-1
- ❑ “Connection Types” on page 1-2
- ❑ “Connections and Connection States” on page 1-2
- ❑ “TCP and IP Service Users” on page 1-4
- ❑ “Telnet” on page 1-5
- ❑ “File Transfer Protocol” on page 1-6

Reliability

Since IP does not always guarantee reliable transfer of data, TCP implements several features to ensure that data arrives at its destination uncorrupted and in the order sent. These features include

- ❑ Sequence numbers. TCP assigns a sequence number to each octet it transmits. The receiving host uses the sequence numbers to make sure that all the data arrives in order.
- ❑ Checksums. To ensure the integrity of the data, the sending host adds a checksum to each segment it transmits. The receiving host recalculates the checksum, and if there is damage, discards the segment.
- ❑ Flow control. Flow control allows the receiving host to regulate how much data is sent to it. To activate flow control, the receiving host advertises a *window* that indicates how much data it can accept. When the transmit window is full, the sending host must stop sending data until the receiving host can open the window again. To control the rate of data transfer on your TCP connections, you can specify the maximum window size allowed for each connection.
- ❑ Acknowledgment with retransmission. TCP requires the receiving host to acknowledge that it has received the data. If the sending host does not receive an acknowledgment within a set timeout interval, the sending station retransmits the data. TCP determines the timeout interval by estimating the average time it takes to send a segment and receive an acknowledgment for it.

Connection Types

TCP allows both *active* and *passive* connections (or *opens*). For passive opens, a *TCP client* (the process or program that uses TCP) waits to accept incoming connection requests. Clients using passive opens can listen for only specific connection requests, or for a range of inbound requests. In an active open, the client initiates the connection.

Connections and Connection States

TCP establishes a set of access points, referred to as *ports*, for each host. It associates each port with a network and host address to form a *socket*. A pair of sockets, together with sequence numbers, window sizes, and status information form a *TCP connection*.

Table 1-1 lists the states through which a TCP connection proceeds during its lifetime.

Table 1-1. TCP Connection States

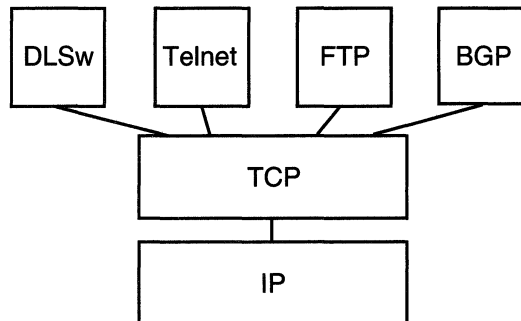
State	Definition
LISTEN (2)	TCP is listening for a connection request from any remote TCP.
SYN SENT (3)	TCP has sent a connection request (SYN segment) and is waiting for a matching connection request and acknowledgment from the remote TCP.
SYNRECEIVED (4)	TCP has sent a connection request, received a matching request, and is now waiting for a confirming connection request acknowledgment from the remote TCP.
ESTABLISHED (5)	The connection is open. Data can be received and sent. This is the normal state for the data transfer phase of the connection.
FINWAIT-1 (6)	TCP is waiting for a connection termination request (FIN segment) from the remote TCP, or for an acknowledgment of a previously sent connection termination request.
FINWAIT-2 (7)	TCP is waiting for a connection termination request from the remote TCP.
CLOSEWAIT (8)	TCP is waiting for a connection termination request from the client.
CLOSING (10)	TCP is waiting for a connection termination request acknowledgment from the remote TCP.
LASTACK (9)	TCP is waiting for acknowledgment of the connection termination request previously sent to the remote TCP.

Table 1-1. TCP Connection States (*continued*)

State	Definition
TIMEWAIT (11)	TCP is waiting for enough time to pass to be sure the remote TCP received the acknowledgment of its connection termination request.
CLOSED (1)	There is no connection.

TCP and IP Service Users

TCP is the layer or service between IP, at the lower layer in the hierarchy of network protocols, and programs running at higher layers in the hierarchy. Figure 1-1 shows a simple network architecture with four users of TCP/IP services: Telnet, TCP, the Border Gateway Protocol, and the Data Link Switching Service.

**Figure 1-1. TCP between IP and Client**

The interface between TCP and programs that use TCP consists of a set of messages exchanged between the clients and TCP, and a set of functions and macros that user programs call to exchange TCP messages. These programs use the functions and macros to

- ❑ Open, close, abort, and get the status of connections
- ❑ Control the flow of data
- ❑ Encapsulate data for transmission by TCP
- ❑ Process received TCP data

When a program passes data to TCP, the TCP layer formats the data and calls on the IP layer to transmit the data to its destination.

For information on creating TCP on the router and editing TCP parameters, see “Configuring and Customizing TCP” on page 3-2.

Telnet

Telnet allows you to access the Technician Interface (TI). You can execute TI commands from a remote host (inbound Telnet) or originate an outgoing Telnet session (outbound Telnet) to another Wellfleet router or network device that accepts Telnet. You use outbound Telnet to access remote routers when Site Manager or Simple Network Management Protocol (SNMP) is unavailable.

To use Telnet to access the Technician Interface, you must assign at least one IP address to the router. The number of Telnet connections you can make to the TI is limited only by the availability of system resources (that is, system memory).

Note: We recommend that you establish no more than one Telnet session per router.

For information on creating Telnet on the router and editing Telnet parameters, see “Configuring and Customizing the Telnet Server” on page 3-6 and “Configuring and Customizing the Telnet Client” on page 3-19.

For complete information about accessing and using the Technical Interface with Telnet, see *Using Technician Interface Software*.

File Transfer Protocol

The File Transfer Protocol (FTP) allows you to

- ❑ Download files from your host system to a remote router and retrieve files from the router.
- ❑ Examine the directory listing of files on the remote router.
- ❑ Delete files on the router.

The FTP client residing on your host and the FTP server residing on the router rely on the underlying support of TCP and IP for the reliable, sequenced transfer of data and control messages.

The FTP client on your host initiates an FTP session with an FTP server on the router. The session establishes two separate connections between host and router: a control connection and a data connection (see Figure 1-2).

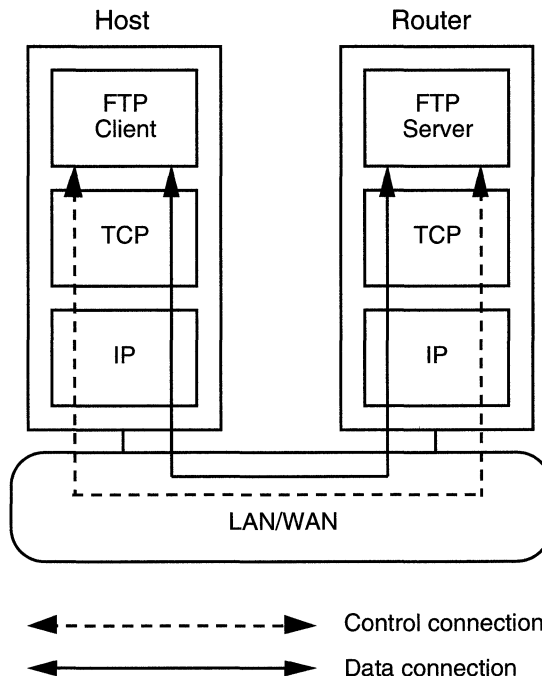


Figure 1-2. FTP Client and Server

Table 1-2 describes the FTP commands supported by the FTP server on Wellfleet routers.

Table 1-2. FTP Commands Supported by the FTP Server

Command	Code	Description
Access Control Commands		
User Name	USER	Initiates an FTP session for the user.
Password	PASS	Succeeds the User command to complete the user's identification for access control.
Logout	QUIT	Terminates the session and closes the control connection.
Transfer Parameter Commands		
Data Port	PORT	Specifies the data port to be used in the data connection.
Representation Type	TYPE	Specifies the data transfer type. The server supports transfer of ASCII and image (binary) data.
Transfer Mode	MODE	Specifies the transfer mode. The server supports stream mode only.
File Structure	STRU	Specifies the file structure type. The server supports file (no record) structure only.
FTP Service Commands		
Retrieve	RETR	Causes the server to transfer the specified file to the client.
Abort	ABOR	Causes the server to abort the previous FTP service command and any associated transfer of data.

Table 1-2. FTP Commands Supported by the FTP Server *(continued)*

Command	Code	Description
Store	STOR	Causes the server to accept the data transferred over the data connection and store it on the server.
Store Unique	STOU	Specifies the same operation as the Store command and, in addition, causes the server to create the resulting file in the current directory under a name unique to that directory.
Delete	DELE	Causes the server to delete the specified file on the server.
List	LIST	Causes the server to send to the client a detailed list of files.
Name List	NLIST	Causes the server to send to the client a list of filenames.
Status	STAT	Causes the server to send to the client the status of the control connection. If the server receives the command during a file transfer, the server sends the client the status of the file transfer.
Help	HELP	Provides helpful information.
No Operation	NOOP	Specifies no action but causes the server to send an OK reply.
Change Working Directory	CWD	Causes the server to change the volume.
Implementation-specific FTP Commands		
Compact	COMP	Causes the server to compact the flash card. This command should succeed a delete command.

As network administrator, you use Site Manager to create the FTP server on the router and edit FTP server parameters. For complete information and instructions, see “Configuring and Customizing the FTP Server” on page 3-23.

For More Information about TCP

If you would like more information about the Transmission Control Protocol, refer to

Comer, Douglas E. *Internetworking with TCP/IP, Volume I: Principles, Protocols, and Architecture*. Englewood Cliffs, New Jersey: Prentice Hall, Inc., Second Edition, 1991.

Chapter 2

TCP Implementation Notes

This chapter contains specific implementation notes to keep in mind when you configure Wellfleet's TCP services.

Memory Considerations

The Transmission Control Protocol requires a significant amount of memory to

- Retain copies of outbound data in case they must be retransmitted
- Keep copies of inbound data in case they are received out of order and must be rearranged
- Manage the TCP connections

The amount of memory used per TCP connection is dynamic. Each connection uses a small amount of overhead memory (less than 1 KB), even if the connection is idle. As the size of the transmit-and-receive window increases, so does the memory for connections. It expands as much as TCP allows.

You can control the window size by setting a value for the Max. Window Size parameter. The maximum amount of memory TCP can use for a connection is equal to the overhead memory plus twice the window size (because the window can fill in both directions).

The value you set for Max. Window Size depends on how much memory you need for things other than TCP. If you have a complicated

configuration, there will not be much space for TCP connections so you should specify a low Max. Window value. Systems with less involved configurations can support more TCP connections and a higher Max. Window value.

If TCP consumes too much memory on the router, connections can become slow or useless, or even abort. TCP uses feedback mechanisms to indicate to clients when resources are becoming scarce. However, if clients disregard this feedback, TCP has to break connections. TCP attempts to monitor the connections consuming the most memory and break those first to maintain connections consuming less memory.

Chapter 3

Editing TCP, Telnet, and FTP Parameters

Once you enable IP on your router, you can use Site Manager to create TCP, Telnet, and FTP on the router and customize TCP, Telnet, and FTP parameters.

To configure and customize TCP on the router, see the following sections:

- ❑ “Creating TCP” on page 3-2
- ❑ “Editing TCP Parameters” on page 3-3
- ❑ “Deleting TCP from the Router” on page 3-6

To configure and customize Telnet on the router, see the following sections:

- ❑ “Creating a Telnet Server” on page 3-6
- ❑ “Editing Telnet Server Parameters” on page 3-10
- ❑ “Deleting a Telnet Server from the Router” on page 3-18
- ❑ “Creating the Telnet Client” on page 3-19
- ❑ “Editing Telnet Client Parameters” on page 3-19
- ❑ “Deleting Telnet Client from the Router” on page 3-22

To configure and customize FTP on the router, see the following sections:

- ❑ “Creating the FTP Server” on page 3-23

- “Editing FTP Server Parameters” on page 3-23
- “Deleting the FTP Server from the Router” on page 3-27

Note: The instructions in this section assume that you have already configured IP on the router. If you did not configure IP, see *Configuring Wellfleet Routers* for instructions.

Configuring and Customizing TCP

Use Site Manager to create TCP, edit TCP parameters, and delete TCP from the router.

Creating TCP

To create TCP on the router, select Protocols→Global Protocols→TCP→Create TCP from the Wellfleet Configuration Manager window (Figure 3-1).

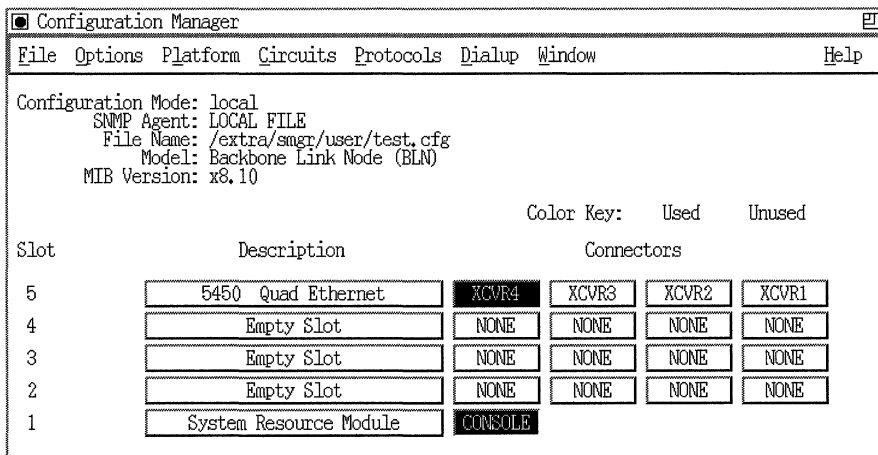


Figure 3-1. Wellfleet Configuration Manager Window

Editing TCP Parameters

To edit TCP parameters:

1. Select Protocols→Global Protocols→TCP→Global from the Wellfleet Configuration Manager window (refer to Figure 3-1). The system displays the Edit TCP Global Parameters window (Figure 3-2).

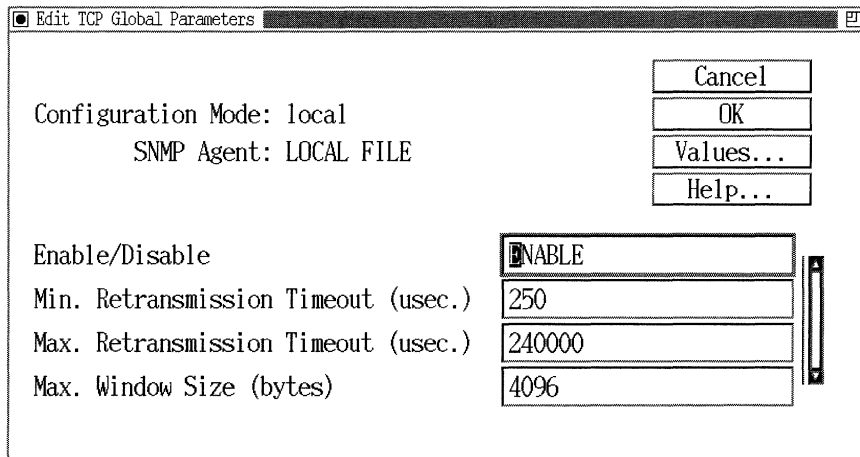


Figure 3-2. Edit TCP Global Parameters Window

2. Edit the parameters on this screen, using the descriptions in the next section as a guide.
3. Click on the OK button to save your changes and exit the window.

If you want to delete TCP, skip to “Deleting TCP from the Router.”

TCP Global Parameter Descriptions

Use the following descriptions as a guide when you configure the parameters in the Edit TCP Global Parameters window (refer to Figure 3-2):

Parameter: **Enable/Disable**
Default: Enable
Options: Enable | Disable
Function: Enables or disables TCP on the router.
Instructions: Select Disable to disconnect from TCP. Also, you can select Disable if you do not need TCP, but want to be able to access previous TCP statistics.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.3.1.2

Parameter: **Min. Retransmission Timeout**
Default: 250 milliseconds
Range: 100 to 15000 milliseconds
Function: Sets the minimum value for the retransmission timeout. When one side of a TCP connection sends a frame and does not receive an acknowledgment from the other side of the connection within the timeout period, the sending station retransmits the frame.
Instructions: Specify the value you want to use for the minimum timeout period. If you are transmitting on a high-speed network and you set the Min. Retransmit Timeout value too high, network performance may degrade because TCP must wait for the timeout period to elapse before retransmitting unacknowledged data.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.3.1.5

Parameter: Max. Retransmission Timeout

Default: 240000 milliseconds

Range: 15000 to 240000 milliseconds

Function: Sets the maximum value for the retransmission timeout. When one side of a TCP connection sends a frame and does not receive an acknowledgment from the other side of the connection within the timeout period, the sending station retransmits the frame.

Instructions: Specify the value you want to use for the maximum timeout period. If you are transmitting on a low-speed network and you set the Max. Retransmit Timeout value too low, the network may become congested as TCP retransmits unacknowledged frames that have simply not yet reached their destination.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.3.1.6

Parameter: Max. Window Size (bytes)

Default: 4096 bytes

Range: 512 to 65535 bytes

Function: Sets the maximum transmit and receive window size that TCP allows for each connection.

Instructions: Specify the window size. The larger the window size, the more memory each TCP connection can consume.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.3.1.18

Deleting TCP from the Router

To delete TCP from the entire router:

1. Select Protocols→Global Protocols→TCP→Delete TCP from the Wellfleet Configuration Manager window (refer to Figure 3-1). Site Manager asks:
Do you REALLY want to delete TCP?
2. Click on the OK button to delete TCP.

Note: The system automatically deletes Telnet and BGP from the router when you delete TCP.

Configuring and Customizing the Telnet Server

You use the Telnet Server to establish inbound Telnet sessions. The following sections describe how to create the Telnet Server using Site Manager, edit Telnet Server parameters, and delete the Telnet Server from the router.

Creating a Telnet Server

To create a Telnet Server on the router for inbound Telnet sessions:

1. Select Protocols→Global Protocols→Telnet Server→Create Telnet Server from the Wellfleet Configuration Manager window (refer to Figure 3-1). The system displays a window with four TI autoscript parameters. These parameters locate and define the scripts that run automatically at login.
2. Set these parameters, using the descriptions in the next section as a guide.
3. Click on the OK button to save your changes and exit the window.

TI Autoscript Parameter Descriptions

Use the following descriptions as a guide when setting TI Autoscript parameters:

Parameter:	Login Script Search Path
Default:	2:
Options:	A string of valid volume numbers, depending on your login ID (manager or user)
Function:	Specifies a list of file system volumes the system searches if the manager's or user's login script file does not contain a volume specification. The environment variable PATH is set to this string.
Instructions:	Accept the default value (2:) to search for the TI autoscript files on Volume 2. Otherwise, enter a text string that uses the format: <vol>: [<vol>:...]. For example, enter A;1;2: or 2;;4;;6;;9.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.7.1.20

Parameter: Manager's Login Script

Default: automgr.bat

Options: The name of the manager's login script file.

Function: Executes the manager's login script file automatically at login.

Instructions: If you did not change the name of the manager's login script file, accept the default. Otherwise, enter the name of your manager's login script file. This name must be eight characters or less.

If the login script file does not contain a volume specification, the system searches the volumes you specify with the Login Script Search parameter.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.21

Parameter: User's Login Script

Default: autouser.bat

Options: The name of the user's login script file.

Function: Executes the user's login script file automatically at login.

Instructions: If you did not change the name of the user's login script file, accept the default. Otherwise, enter the name of your user's login script file. This name must be eight characters or less.

If the login script file does not contain a volume specification, the system searches the volumes you specify with the Login Script Search parameter.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.22

Parameter: Force User Logout

Default: Disable

Options: Enable | Disable

Function: Specifies whether or not the user can execute a control-c (^C) to break out of a user autoscript at login (when a user autoscript is in effect).

Instructions: Select Enable to prevent the user from using ^C to break out of the user autoscript at login.

Select Disable to allow the user to execute ^C to break out of the user autoscript at login.

Use the default (Disable) if you want users to access the TI. Set to Enable if you want to force users to enter the Telnet logout command.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.23

Editing Telnet Server Parameters

To edit Telnet Server parameters:

1. Select **Protocols**→**Global Protocols**→**Telnet Server**→**Global** from the Wellfleet Configuration Manager window (refer to Figure 3-1). The system displays the Edit Telnet Server Global Parameters window (Figure 3-3).

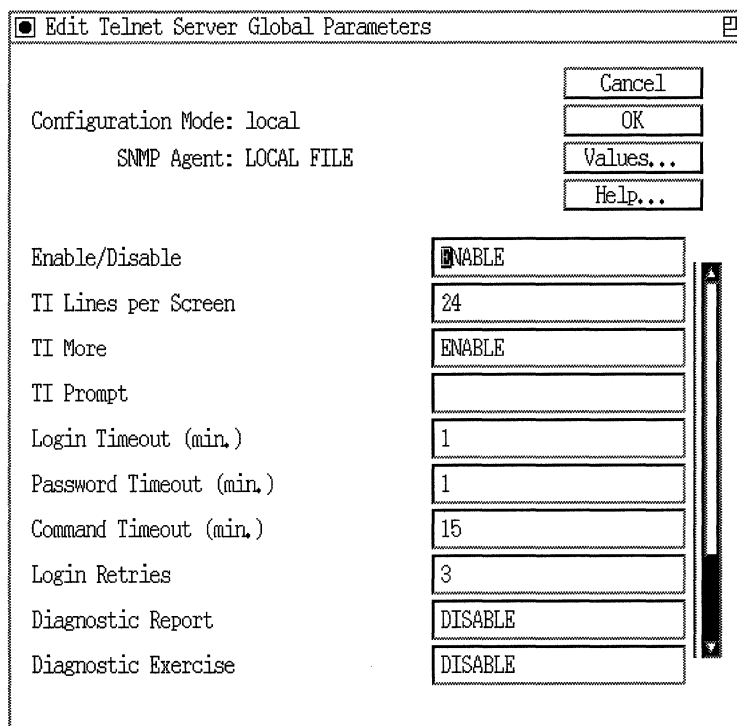


Figure 3-3. Edit Telnet Server Global Parameters Window

2. Edit the parameters on this screen, using the descriptions in the next section as a guide.
3. Click on the OK button to save your changes and exit the window.

Telnet Server Parameter Descriptions

Use the following descriptions as a guide when you configure the parameters in the Edit Telnet Server Global Parameters window (refer to Figure 3-3):

Parameter:	Enable/Disable
Default:	Enable
Options:	Enable Disable
Function:	Specifies whether Telnet is enabled for the IP router, allowing you to establish Telnet sessions to the Technician Interface.
Instructions:	Select Enable to enable Telnet for the IP router. Select Disable to disable Telnet for the IP router.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.7.1.2

Parameter:	TI Lines per Screen
Default:	24 lines
Options:	1 to 24 lines
Function:	Specifies the maximum number of lines displayed on the Telnet TI console screen. The screen may override the number of lines you specify if Telnet can negotiate the window size with the remote client.
Instructions:	Set according to your console requirements.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.7.1.3

Parameter: **TI More**

Default: Enable

Options: Enable | Disable

Function: Specifies whether the TI pauses after each screen fills with data.

Instructions: Select Enable to configure the TI to pause after each screen fills with data. Select Disable to configure the TI not to pause after each screen fills with data.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.4

Parameter: **TI Prompt**

Default: \$

Range: 1 to 18 alphanumeric characters

Function: Specifies the character string used as the login prompt on the Telnet TI console screen.

Instructions: Accept the default (\$) or specify a different character string.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.5

Caution: Site Manager disconnects the current session if you modify this parameter.

Parameter: Login Timeout (min.)

Default: 1 minute

Range: 1 to 99 minutes (99 = infinity)

Function: Specifies the number of minutes that can elapse before the TI disconnects the Telnet session if you do not enter a login ID at the login prompt.

Instructions: Accept the default (1 minute) or specify a different value.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.6

Parameter: Password Timeout

Default: 1 minute

Range: 1 to 99 minutes (99 = infinity)

Function: Specifies the number of minutes that can elapse before the TI disconnects the Telnet session if you do not enter a password at the password prompt.

Instructions: Accept the default value (1 minute) or specify a different value.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.7

Parameter: Command Timeout

Default: 15 minutes

Range: 1 to 99 minutes (99 = infinity)

Function: Specifies the number of minutes that can elapse before the Technician Interface disconnects the Telnet session if you do not enter a command at the command prompt.

Instructions: Accept the default value (15 minutes) or specify a different value.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.8

Parameter: **Login Retries**
Default: 3 login attempts
Range: 1 to 99 login attempts
Function: Specifies the maximum number of login attempts you can make before the TI disconnects the Telnet session.
Instructions: Accept the default value (3) or specify a different value.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.9

Parameter: **Diagnostic Report**
Default: Disable
Options: Enable | Disable
Function: Specifies whether the TI displays a record of all processing operations. Used for diagnostic purposes only.
Instructions: Accept the default (Disable). This parameter is for field service personnel only.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.15

Parameter: **Diagnostic Exercise**
Default: Disable
Options: Enable | Disable
Function: To be determined. Used for diagnostic purposes only.
Instructions: Leave set to the default (Disable). This parameter is for field service personnel only.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.16

Parameter: Diagnostic Network Data

Default: Disable

Options: Enable | Disable

Function: Specifies whether the Technician Interface displays Telnet protocol information. Used for diagnostic purposes only.

Instructions: Accept the default (Disable). This parameter is for field service personnel only.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.17

Parameter: Diagnostic PTY Data

Default: Disable

Options: Enable | Disable

Function: Specifies whether the Technician Interface displays pseudo-terminal driver (PTY) information. Used for diagnostic purposes only.

Instructions: Accept the default (Disable). This parameter is for field service personnel only.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.18

Parameter: Diagnostic Options

Default: Disable

Options: Enable | Disable

Function: Specifies whether the Technician Interface displays Telnet options information. Used for diagnostic purposes only.

Instructions: Accept the default (Disable). This parameter is for field service personnel only.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.19

Parameter: Login Script Search Path

Default: 2:

Options: A string of valid volume numbers, depending on your login ID (manager or user)

Function: Specifies a list of file system volumes the system searches if the manager's or user's login script file does not contain a volume specification. The environment variable PATH is set to this string.

Instructions: Accept the default value (2:) to search for the TI autoscript files on Volume 2. Otherwise, enter a text string that uses the format: <vol>: [<vol>:...]. For example, enter A::1::2: or 2::4::6::9.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.20

Parameter: Manager's Login Script

Default: automgr.bat

Options: The name of the manager's login script file.

Function: Executes the manager's login script file automatically at login.

Instructions: If you did not change the name of the manager's login script file, accept the default. Otherwise, enter the name of your manager's login script file. This name must be eight characters or less.

If the login script file does not contain a volume specification, the system searches the volumes you specify with the Login Script Search parameter.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.21

Parameter: User's Login Script

Default: autouser.bat

Options: The name of the user's login script file.

Function: Executes the user's login script file automatically at login.

Instructions: If you did not change the name of the user's login script file, accept the default. Otherwise, enter the name of your user's login script file. This name must be eight characters or less.

If the login script file does not contain a volume specification, the system searches the volumes you specify with the Login Script Search parameter.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.22

Parameter: Force User Logout

Default: Disable

Options: Enable | Disable

Function: Specifies whether or not the user can execute a control-c (^C) to break out of a user autoscript at login (when a user autoscript is in effect).

Instructions: Set the parameter to Enable to prevent the user from using ^C to break out of the user autoscript at login.

Set the parameter to Disable to allow the user to execute ^C to break out of the user autoscript at login.

Use the default (Disable) if you want users to access the Technician Interface. Set to Enable if you want to force users to enter the Telnet logout command.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.7.1.23

Deleting a Telnet Server from the Router

To delete a Telnet Server from the entire router:

1. Select Protocols→Global Protocols→Telnet Server→Delete Telnet Server in the Wellfleet Configuration Manager window (refer to Figure 3-1). Site Manager asks:

Do you REALLY want to delete Telnet Server?

2. Click on the OK button to delete Telnet Server.

Configuring and Customizing the Telnet Client

You use the Telnet Client to establish outbound Telnet sessions. Use Site Manager to create the Telnet Client, edit Telnet Client parameters, and delete the Telnet Client from the router.

Creating the Telnet Client

To create Telnet Client on the router for outbound Telnet sessions, select **Protocols**→**Global Protocols**→**Telnet Client**→**Create Telnet Client** from the Wellfleet Configuration Manager window (refer to Figure 3-1).

Editing Telnet Client Parameters

To edit Telnet Client parameters:

1. Select **Protocols**→**Global Protocols**→**Telnet Client**→**Global** from the Wellfleet Configuration Manager window (refer to Figure 3-1). The system displays the Edit Telnet Client Global Parameters window (Figure 3-4).

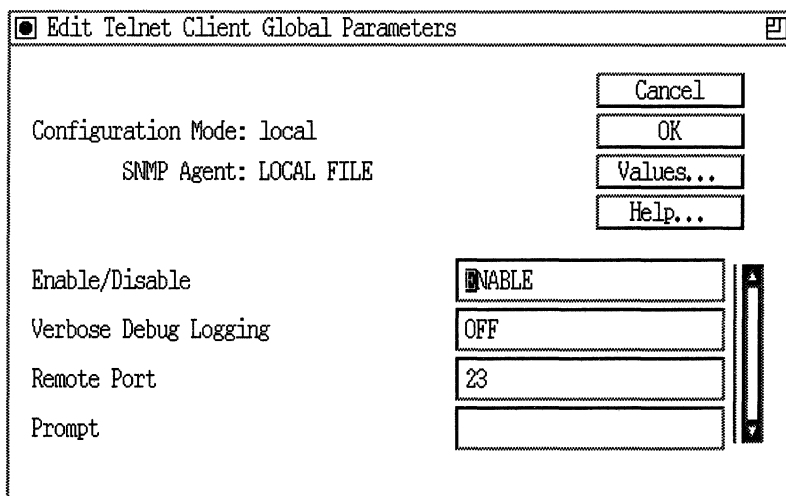


Figure 3-4. Edit Telnet Client Global Parameters Window

2. Edit the parameters on this screen, using the descriptions in the next section as a guide.
3. Click on the OK button to save your changes and exit the window.

Telnet Client Parameter Descriptions

Use the descriptions in this section as a guide when you configure the parameters in the Edit Telnet Client Global Parameters window (refer to Figure 3-4):

Parameter:	Enable/Disable
Default:	Enable
Options:	Enable Disable
Function:	Specifies whether the Telnet Client is enabled for the IP router, allowing you to establish outbound Telnet sessions from the Technician Interface to another router or to a Unix station that supports Telnet.
Instructions:	Select Enable to enable Telnet Client for the IP router or Disable to disable it.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.7.2.2
Parameter:	Verbose Debug Logging
Default:	OFF
Options:	ON OFF
Function:	Specifies whether the Technician Interface displays the negotiation process between the Telnet Server and Telnet Client. This parameter is for diagnostic use only.
Instructions:	Select ON to enable verbose debug logging or OFF to disable it.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.7.2.3

Parameter:	Remote Port
Default:	23
Options:	Any valid TCP port number.
Function:	Specifies the default remote Telnet Server's TCP port.
Instructions:	Enter the appropriate value for the default remote Telnet Server's TCP port.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.7.2.4

Parameter:	Prompt
Default:	telnet>
Options:	Any text string less than 40 characters long.
Function:	Specifies the default Telnet Client command prompt.
Instructions:	Enter any text string less than 40 characters long. For example, Router1%.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.7.2.5

Deleting Telnet Client from the Router

To delete Telnet Client from the entire router:

1. Select Protocols→Global Protocols→Telnet Client→Delete Telnet Client in the Wellfleet Configuration Manager window (Figure 3-1). Site Manager asks:
Do you REALLY want to delete Telnet Client?
2. Click on the OK button to delete Telnet Client from the router.

Configuring and Customizing the FTP Server

Use Site Manager to create the FTP Server, edit FTP Server parameters, and delete the FTP Server from the router.

Creating the FTP Server

To create an FTP server on the router,

1. Select Protocols→Global Protocols→FTP→Create FTP from the Wellfleet Configuration Manager window (refer to Figure 3-1).

Editing FTP Server Parameters

To edit global parameters for the FTP server:

1. Select Protocols→Global Protocols→FTP→Global from the Wellfleet Configuration Manager window (refer to Figure 3-1). The system displays the Edit FTP Global Parameters window (Figure 3-5).

Parameter	Value
Configuration Mode	local
SNMP Agent	LOCAL FILE
Enable/Disable	DISABLE
Default Volume	2
Login Retries	3
Idle Time Out (secs)	900
Max. Sessions	3
Type of Service	BINARY
Control Connection	LOWDELAY
Data Transfer	HIGHTHROUGHPUT
TCP Window Size	16000

Figure 3-5. Edit FTP Global Parameters Window

FTP Server Parameter Descriptions

This section describes the global parameters you set using the FTP Global Parameters window.

Parameter:	Enable/Disable
Default:	Enable
Options:	Enable Disable
Function:	Specifies whether the FTP subsystem is enabled or disabled.
Instructions:	Specify Disabled if you want to disable FTP on the router.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.10.1.2
Parameter:	Default Volume
Default:	Volume 2
Options:	Volume 1 through 13, Volume A
Function:	Specifies the number of the file system volume to which FTP writes transferred files and from which FTP retrieves files for transfer.
Instructions:	On systems with a floppy disk, specify Volume A.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.10.1.3

Parameter: Login Retries

Default: 3 retries

Options: An integer

Function: Specifies the number of FTP login retries allowed after a login failure.

Instructions: Enter a value representing the number of login attempts that FTP will accept before rejecting logins.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.10.1.4

Parameter: Idle Time Out

Default: 900 seconds

Options: An integer

Function: Specifies the length of time (in seconds) that FTP waits before closing an idle FTP control connection.

Instructions: Determine the maximum idle time you want to allow and specify the time value in seconds.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.10.1.5

Parameter: Max Sessions

Default: 3 sessions

Options: An integer

Function: Specifies the maximum number of sessions allowed at one time.

Instructions: Determine the maximum number of simultaneous sessions you want to allow and specify a value.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.10.1.6

Parameter: Type of Service

Default: Binary
Options: Binary | ASCII
Function: Specifies the current data transmission type.
Instructions: To transfer files consisting of ASCII characters, specify ASCII transmission. For non-ASCII files, specify Binary.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.10.1.7

Parameter: Control Connection

Default: Low Delay
Options: Normal | Low Delay
Function: Specifies the Type of Service value that FTP inserts in IP datagrams on a control connection.
Instructions: Choose the option that determines how the Internet transport layer handles datagrams on a control connection.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.10.1.8

Parameter: Data Transfer

Default: High Throughput
Options: Normal | High Throughput
Function: Specifies the Type of Service value that FTP inserts in IP datagrams on a data transfer connection.
Instructions: Choose the option that determines how the Internet transport layer handles datagrams on a data transfer connection.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.10.1.9

Parameter:	TCP Window Size
Default:	16000 bytes
Range:	5000 to 64000 bytes
Function:	Specifies the size of the windows used for TCP connections.
Instructions:	Determine the window size you require and specify the size in bytes.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.10.1.10

Deleting the FTP Server from the Router

To delete the FTP server from the entire router:

1. Select Protocols→Global Protocols→FTP→Delete FTP in the Wellfleet Configuration Manager window. Site Manager asks:
Do you REALLY want to delete FTP?
2. Click on the OK button to delete the FTP server from the router.

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