

# PATHWORKS for DOS (TCP/IP)

digital

TCP/IP User's Reference

Order Number:: AA-PET0A-TK

# **PATHWORKS for DOS (TCP/IP)**

---

## **TCP/IP User's Reference**

Order Number AA-PET0A-TK

**January, 1991**

**Revision/Update Information:** This is a new document.

**Software Version:** PATHWORKS for DOS (TCP/IP) Version  
1.0 or greater

**digital equipment corporation  
maynard, massachusetts**

---

**First Published, January 1991**

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation.

Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

Any software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license. No responsibility is assumed for the use or reliability of software or equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.

Restricted Rights: Use, duplication, or disclosure by the U.S. government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

---

Copyright © Digital Equipment Corporation 1991.

All right reserved  
Printed in U.S.A.

The postpaid Reader's Comments forms at the end of this document request your critical evaluation to assist in preparing future documentation.

The following are trademarks of Digital Equipment Corporation:

DDCMP, DDIF, DEC, DECconnect, DECmate, DECnet, DECnet-DOS, DECrouter, DECserver, DECstation, DECwindows, DECwrite DELNI, DEMPR, DEPCA, DESTA, DNA, EtherWORKS, LA50, LA75 Companion, LAT, LN03, LN03 PLUS, LN03 ScriptPrinter, METROWAVE, MicroVAX, PATHWORKS, PrintServer, RD, ReGIS, RMS-11, RSX, RSX-11, RT, RT-11, RX33, ThinWire, TK, ULTRIX, VAX, VAX Notes, VAXcluster, VAXmate, VAXserver, VMS, VT, WPS, WPS-PLUS, and the DIGITAL logo.

This document was prepared using VAX DOCUMENT, Version 1.2

The following are third-party trademarks:

3Com and EtherLink are registered trademarks of 3Com Corporation. IBM and OS/2 are registered trademarks of International Business Machines Corporation. Intel is a trademark of Intel Corporation. MS-DOS is a registered trademark of Microsoft Corporation. SmartTerm is a registered trademark of Persoft, Inc. Telenet is a registered trademark of GTE Telenet Communication Corporation. UNIX is a registered trademark of UNIX System Laboratories, Incorporated.

---

**HOW TO ORDER ADDITIONAL DOCUMENTATION  
DIRECT MAIL ORDERS**

**USA \***

Digital Equipment Corporation  
P.O. Box CS2008  
Nashua, New Hampshire 03061

**CANADA**

Digital Equipment  
of Canada Ltd.  
100 Herzberg Road  
Kanata, Ontario K2K 2A6  
Attn: Direct Order Desk

**INTERNATIONAL**

Digital Equipment Corporation  
PSG Business Manager  
c/o Digital's local subsidiary  
or approved distributor

In Continental USA, Alaska, and Hawaii call 800-DIGITAL.

In Canada call 800-267-6215.

\* Any order from Puerto Rico must be placed with the local Digital subsidiary (809-754-7575).

Internal orders should be placed through the Software Distribution Center (SDC), Digital Equipment Corporation, Westminister, Massachusetts 01473.

---



# Contents

---

<b>About This Manual</b>	xi
<b>1 Installing TCP/IP on the File Server</b>	
Installing TCP/IP .....	1-1
<b>2 TCP/IP History and Components</b>	
TCP Components .....	2-1
Protocol Stack .....	2-2
Demand Protocol .....	2-2
TCP/IP Protocols .....	2-2
Telnet .....	2-2
Sockets .....	2-3
Bridge Application Program Interface .....	2-3
File Transfer Protocol .....	2-3
Domain Name Resolver .....	2-3
Network Management Driver .....	2-3
Extended Memory Driver .....	2-3
Running DOS-Based Components .....	2-4
FTP Requirements .....	2-4
Network Maintenance Facilities Requirements .....	2-5
Terminal Emulator Requirements .....	2-6
Other DOS-Based Application Requirements .....	2-7

### 3 Demand Protocol Architecture

About Demand Protocol Architecture .....	3-1
Batch Files .....	3-2
Telnet Batch File .....	3-2
FTP Batch File .....	3-3
TCPUNLD .....	3-3
Unloadable TCP/IP Modules .....	3-3
Syntax .....	3-4
Description .....	3-4
Usage Notes .....	3-4
TCPUNLD Status Display .....	3-4

### 4 FTP File Transfer Service

Using the FTP File Transfer Service .....	4-1
Starting FTP with the FTP Command .....	4-2
Starting FTP with the 3FTP Command .....	4-3
Transferring Files to a Host .....	4-4
Transferring Files from a Host .....	4-4
Reentering DOS .....	4-5
Closing the Connection .....	4-5
Terminating FTP .....	4-5
FTP Commands .....	4-5
APPEND .....	4-6
ASCII .....	4-6
BELL .....	4-7
BGET .....	4-7
BINARY .....	4-7
BPUT .....	4-8
BYE .....	4-8
CD .....	4-8
CLOSE .....	4-9
DEBUG .....	4-9
DELETE .....	4-9
DIR .....	4-10
DRIVE .....	4-10

GET .....	4-11
GLOB .....	4-11
HASH .....	4-12
HELP .....	4-12
LAPPEND .....	4-12
LCD .....	4-13
LDIR .....	4-13
LLS .....	4-14
LPWD .....	4-14
LS .....	4-14
MDELETE .....	4-15
MDIR .....	4-15
MGET .....	4-16
MKDIR .....	4-16
MLS .....	4-16
MPUT .....	4-17
OPEN .....	4-17
PROMPT .....	4-18
PUT .....	4-18
PWD .....	4-19
QUIT .....	4-19
QUOTE .....	4-19
RECV .....	4-19
REMOTEHELP .....	4-20
RENAME .....	4-20
RMDIR .....	4-21
SEND .....	4-21
SENDPORT .....	4-21
SHOW .....	4-22
SLASHFLIP .....	4-22
STATUS .....	4-22
TAKE .....	4-23
TYPE .....	4-23
USER .....	4-24
VERBOSE .....	4-24
! .....	4-24



? ..... 4-25

## 5 Terminal Emulation

Using the TTY Terminal Service ..... 5-1  
    Connecting to a Host ..... 5-1  
    Multiple Sessions ..... 5-2  
    Terminating a Connection ..... 5-2  
Running Other Emulators ..... 5-2

## 6 Configuration

What the PROTOCOL.INI File Contains ..... 6-1  
TCP/IP Section ..... 6-3  
RFC NetBIOS Section ..... 6-6  
3Com EtherLink/MC Adapter Section ..... 6-7  
3Com EtherLink II Adapter Section ..... 6-8  
Domain Name Resolver Section ..... 6-11  
Network Management Driver Section ..... 6-11  
Sockets Section ..... 6-12  
Telnet Section ..... 6-13  
PROTOCOL.INI File Template ..... 6-16  
    Example PROTOCOL.INI ..... 6-17

## A Error Messages

Message Format ..... A-1  
Load/Init Errors ..... A-1  
FTP Errors ..... A-8  
Network Maintenance Errors ..... A-14

## B Name Services

Domain Name Service .....	B-1
Hosts File Database .....	B-2

## Index

### Tables

6-1	PROTOCOL.INI File Sections Summary .....	6-1
6-2	TCP/IP Entries and Descriptions .....	6-3
6-3	RFC NetBIOS Entries and Descriptions .....	6-6
6-4	3Com EtherLink/MC Adapter Entries and Descriptions ....	6-7
6-5	EtherLink II Entries and Descriptions .....	6-9
6-6	Domain Name Resolver Entries and Descriptions .....	6-11
6-7	Network Management Driver Entries and Descriptions .....	6-11
6-8	Socket Entries and Descriptions .....	6-12
6-9	Telnet Entries and Descriptions .....	6-13



# About This Manual

---

## Purpose

PATHWORKS for DOS TCP/IP User's Reference describes how to use TCP with Demand Protocol Architecture (DPA), a network software solution that provides DOS-based personal computers access to a wide range of resources over Transmission Control Protocol/Internet Protocol (TCP/IP) networks. This software provides DOS users with terminal emulation capability, and high-speed file transfer using File Transfer Protocol (FTP), Ethernet, or token ring networks.

## Audience

This manual is intended for the user who is familiar with DOS and TCP/IP. It assumes that your DOS workstation is up and running.

## Organization

The following table can help you find information in this manual.

Chapter 1	Explains how to install TCP/IP on a file server
Chapter 2	Introduces the TCP/IP components
Chapter 3	Explains Demand Protocol Architecture
Chapter 4	Explains how to use the File Transfer Protocol
Chapter 5	Explains how to use terminal emulation
Chapter 6	Explains the TCP/IP section and the RFC Net BIOS section
Appendix A	Explains TCP/IP messages
Appendix B	Explains how to resolve host names into IP addresses

## Conventions

This manual uses the following conventions:

Convention	Meaning
<code>Ctrl/x</code>	While you hold down the Ctrl key, press another key or a pointing device button.
<code>Ctrl/Alt/Del</code>	While you hold down the <code>Ctrl</code> and <code>Alt</code> keys, press the <code>Del</code> key.
<code>Esc x</code>	Press the <code>Esc</code> key, release it, and then press another key or a pointing device button.
<code>Return</code>	Press the key that executes commands or terminates a sequence. This key is labeled <code>Return</code> , <code>Enter</code> , or <code>↵</code> , depending on your keyboard.
“enter”	Type all required text, spaces, and punctuation marks; then press <code>Return</code> , <code>Enter</code> , or <code>↵</code> , depending on your keyboard.
MB1, MB2, MB3	MB1 indicates the left mouse button, MB2 indicates the middle mouse button, and MB3 indicates the right mouse button. (The buttons can be redefined by the user.)
UPPERCASE	In VMS, DOS, and OS/2 syntax, uppercase letters indicate commands and qualifiers. You can enter commands and qualifiers in any combination of uppercase or lowercase, unless otherwise noted.
lowercase	ULTRIX commands are case-sensitive. You must enter commands in the correct case, as printed in the text. Lowercase letters in VMS, DOS, and OS/2 syntax indicate parameters. You must substitute a word or value, unless the parameter is optional.
teal blue type	In examples of dialog between you and the system, teal blue type indicates information that you enter. In online (Bookreader) files, this information appears in boldface.
<b>boldface</b>	Boldface type indicates a new term that appears in the glossary. In online (Bookreader) files, boldface indicates information you enter.
<code>kprn</code>	Press the specified key on the numeric keypad of your keyboard.

<b>Convention</b>	<b>Meaning</b>
two-line commands	<p>In VMS commands, a hyphen (-) at the end of a command line indicates that the command continues to the next line. If you type the hyphen and press <b>Return</b>, the system displays the <code>_ \$</code> prompt at the beginning of the next line. Continue entering the command. If you do not type the hyphen, VMS automatically wraps text to the next line.</p> <p>In ULTRIX commands, a backslash (\) performs the same function.</p> <p>In DOS and OS/2 commands, no character is used at the end of the first line; DOS automatically wraps text. Enter the complete command, then press <b>Return</b> at the end of the command.</p>
[ ]	Square brackets in command descriptions enclose the optional command qualifiers. Do not type the brackets when entering information enclosed in the brackets.
/	A forward slash in command descriptions indicates that a command qualifier follows.
	A vertical bar in command descriptions indicates that you have a choice between two or more entries. Select one entry unless the entries are optional.
...	A horizontal ellipsis following an entry in a command line indicates that the entry or a similar entry can be repeated any number of times. An ellipsis following a file name indicates that additional parameters, values, or information can be entered.
.	A vertical ellipsis in an example indicates that not all the data is shown.
NOTE	Notes provide information of special importance.

## Terminology

The terms “personal computer” (PC) and “PC workstation” refer to standalone systems. The term “client” refers to a PC, connected to the network by PATHWORKS software, that can access resources on a server. A server is a system that offers services to clients.

The term “PATHWORKS” refers to PATHWORKS software. PATHWORKS is a trademark of Digital Equipment Corporation.



# 1

## Installing TCP/IP on the File Server

---

This chapter describes how to install the PATHWORKS for DOS TCP/IP software on the file server.

Before you begin the installation procedure, read the the README.TXT file on TCP Utility Disk 1.

### NOTE

To configure the TCP/IP software locally, use Netsetup. See the PATHWORKS *Client Installation and Configuration Guide* for information about Netsetup.

### Installing TCP/IP

Use the following procedure to install TCP/IP software on the file server:

1. At the DOS prompt, connect to the PATHWORKS Version 4.0 file server with read/write access:

```
USE ?: \\nodename\PCSAV40%priv_account password
```

2. Insert the LWRKS 4.0 TCP TRANSPRT diskette into any floppy drive and enter:

```
INSTALL
```

The installation program displays the PATHWORKS V4.0 Installation Screen and the following prompt:

```
Please enter the drive you wish to install to:  
C:
```

3. Enter the letter of the drive connected to the file server and press .
4. Follow the prompts.
5. When the installation program is finished with the LWRKS 4.0 TCP TRANSPRT diskette, remove it from the floppy drive.



## 1-2 Installing TCP/IP on the File Server

6. Insert the LWRKS 4.0 TCP UTIL 1/2 diskette into the floppy drive and enter:

INSTALL

7. Follow the prompts.
8. When prompted to, remove the LWRKS 4.0 TCP UTIL 1/2 diskette from the floppy drive and insert the LWRKS 4.0 TCP UTIL 2/2 diskette.
9. Follow the prompts.

# 2

## TCP/IP History and Components

---

PATHWORKS Transmission Control Protocol/Internet Protocol (TCP/IP) is a set of protocols that allows you to share resources across a network. TCP/IP was developed by the U.S. Department of Defense Advanced Research Projects Agency (DARPA) to provide transparent data exchange between dissimilar computing environments. TCP/IP is considered a *de facto* standard because it has been available publicly for over a decade and specifications have been published for all levels of the protocol.

TCP with Demand Protocol Architecture (DPA) allows DOS-based systems to access host applications. These applications include:

- File Transfer Protocol (FTP). Allows the transfer of binary and text files to and from any host computer that supports TCP/IP. This application runs on DOS-based systems.
- Network Maintenance Facilities (NMF). Enables users to do simple network troubleshooting. ARP, PING, and NETSTAT are the NMF tools.
- Terminal emulation. Enables users to use personal computers as display terminals while working interactively on a host computer. This application runs on DOS-based systems.

This chapter describes the components that make up TCP with DPA and lists the requirements for each application.

### TCP Components

TCP with DPA is made up of components arranged in layers. These layers are:

- Application — includes Network Maintenance Facilities (NMF), client applications, FTP, and terminal emulators.
- Interface — includes Network Management (Netman) Application Program Interface (API), Socket library, and Bridge Application Program Interface (BAPI).

- Transport and other protocol drivers — includes Netman driver, Sockets driver, Domain Name Resolver (DNR) driver, Telnet driver, and TCP/IP driver.
- Network Driver Interface Specification (NDIS) Medium Access Control (MAC) driver — a network driver that conforms to the NDIS industry standard.

## Protocol Stack

The TCP software consists of the adapter drivers, the TCP/IP core protocol module, and various internet protocol modules that are loaded after (on top of) the TCP/IP protocol module. This section briefly describes the modules in the protocol stack.

The TCP/IP sockets, Domain Name Resolver, and Network Management protocol modules each have a DOS terminate-and-stay-resident (TSR) program with the file name extension EXE. Telnet, FTP, and BAPI are available only for DOS.

## Demand Protocol

Demand Protocol Architecture (DPA), available only in DOS, allows the protocol stack to be loaded and unloaded, as necessary, to conserve DOS memory. DPA requires that TCPDRV.DOS, a small resident driver, be loaded by the CONFIG.SYS file before any of the TSR protocol modules are loaded.

After TSR modules have been loaded and used, they can be removed from memory by running TCPUNLD.EXE.

## TCP/IP Protocols

The TCP/IP protocol module for DOS is TCPTSR.EXE. The protocols included in these modules are TCP, IP, UDP, ICMP, ARP, and a subnetwork layer. The subnetwork layer implements the Ethernet, 802.3, 802.5, SNAP, and IBM Token Ring Source Routing protocols.

## Telnet

Telnet, available only for DOS, allows you to connect over TCP/IP networks to Telnet servers, including UNIX machines. The Telnet module is TN.EXE, which can be unloaded. The TCP/IP protocol module must be loaded before Telnet can be loaded.

## **Sockets**

The socket module for DOS is SOCKTSR.EXE. The TCP/IP protocol module must be loaded before the socket module can be loaded.

## **Bridge Application Program Interface**

The Bridge Application Program Interface (BAPI) is available only for interface for terminal emulation programs such as VT. This interface allows application developers to write terminal emulation packages for use with TCP.

## **File Transfer Protocol**

FTP.EXE, available only for DOS, is a File Transfer Protocol application program. The socket module must be loaded before FTP can be run.

## **Domain Name Resolver**

The Domain Name Resolver (DNR) modules for DOS is DNRTSR.EXE. The DNR driver resolves network domain names to IP addresses, allowing you to run an application using a domain name instead of an IP address. When you use a domain name, the DNR sends a packet to the domain name server, requesting that the name be resolved to an IP address. The domain name server checks its database, resolves the name to an IP address, and returns it to the requesting machine.

## **Network Management Driver**

The network management module for DOS is NM TSR.EXE. The network management drivers provide for network maintenance facility programs such as PING, ARP, and NETSTAT.

## **Extended Memory Driver**

The extended memory driver, NEMM.DOS, handles context switching of the DOS expanded memory for TCP. NEMM.DOS is required and is always loaded, with or without an expanded memory.

## Running DOS-Based Components

TCP with DPA includes the following DOS-based applications:

- FTP
- NMF
- Terminal emulation

To run any of these applications, certain device drivers (ending in .DOS) must be loaded in CONFIG.SYS, and certain DOS terminate-and-stay resident programs, or TSRs, (ending in .EXE) must be loaded directly from the DOS command line or in a batch file.

To use domain name services instead of a host IP address with FTP, NMF, or terminal emulation, the DNR TSR should also be loaded. For more information on name services, see Appendix B.

TCP with DPA is compatible with other DOS-based applications such as Sidekick.

The following sections describe the device drivers and DOS resident programs required to run FTP, NMF, terminal emulation, and TCP/IP supported applications.

### FTP Requirements

Load the following TSRs from the DOS command line or in a batch file to run FTP:

<b>Program Component</b>	<b>Module</b>
TCP/IP Protocol	TCPTSR.EXE <sup>1</sup>
Domain Name Resolver	DNRTSR.EXE <sup>2</sup>
Socket Library	SOCKTSR.EXE

<sup>1</sup>This is loaded by NETSTART.

<sup>2</sup>This file is not needed if you use a host file.

After you load the TSRs, load the FTP.EXE module to install the application.

Load the following drivers in your CONFIG.SYS file:

<b>Program Component</b>	<b>Module</b>
Protocol Manager	PROTMAN.DOS
NDIS MAC	<mac>.DOS, or .SYS for DEPCA
EMS Memory Management	NEMM.DOS
TCP Resident Driver	TCPDRV.DOS

Chapter 4 describes the FTP commands in detail. To minimize memory use, you can load and unload FTP components when you run 3FTP using DPA.

### **Network Maintenance Facilities Requirements**

To run NMF, you must load the following TSRs from the DOS command line or within a batch file:

<b>Program Component</b>	<b>Module</b>
TCP/IP Protocol	TCPTSR.EXE
Domain Name Resolver	DNRTSR.EXE (optional)
Netman	NMTSR.EXE

After you load the TSRs, load the following modules to install the application.

<b>Program Component</b>	<b>Module</b>
NMF	ARP.EXE
	NETSTAT.EXE
	PING.EXE

Load the following drivers in your CONFIG.SYS file:

<b>Program Component</b>	<b>Module</b>
Protocol Manager	PROTMAN.DOS
NDIS MAC	<mac>.DOS
EMS Memory Management	NEMM.DOS
TCP Resident Driver	TCPDRV.DOS

### **Terminal Emulator Requirements**

To run terminal emulators, load the following TSRs from the DOS command line or within a batch file:

<b>Program Component</b>	<b>Module</b>
TCP/IP Protocol	TCPTSR.EXE
Domain Name Resolver	DNRTSR.EXE
Telnet	TN.EXE
BAPI	BAPI.EXE
Terminal Emulator	TTY.EXE

Load the following drivers in your CONFIG.SYS file:

<b>Program Component</b>	<b>Module</b>
Protocol Manager	PROTMAN.DOS
NDIS MAC	<mac>.DOS
EMS Memory Management	NEMM.DOS
TCP Resident Driver	TCPDRV.DOS

See Chapter 5 for more information on terminal emulators. To maximize memory use, you can load and unload terminal emulator components using DPA. This is explained in more detail in Chapter 3.

## Other DOS-Based Application Requirements

To run third-party, socket-based DOS applications, load the following TSRs from the DOS command line or within a batch file:

---

<b>Program Component</b>	<b>Module</b>
TCP/IP Protocol	TCPTSR.EXE
Domain Name Resolver	DNRTSR.EXE
Socket Library	SOCKTSR.EXE

---

Load the following drivers in your CONFIG.SYS file:

---

<b>Program Component</b>	<b>Module</b>
Protocol Manager	PROTMAN.DOS
NDIS MAC	<mac>.DOS
EMS Memory Management	NEMM.DOS
TCP Resident Driver	TCPDRV.DOS

---





# 3

## Demand Protocol Architecture

---

Demand Protocol Architecture (DPA) makes it convenient for you to load and unload the TCP/IP protocol stack on your DOS workstation. DPA allows the use of modular TSR drivers that are loaded when needed. This enables you to load the specific modules for the application you wish to run. A separate unload utility unloads the modules when you finish. The result is that you use the minimum RAM necessary for running a TCP/IP-based application such as FTP. When you are through running the application, you can unload the modules, maximizing the memory available to run DOS-based applications.

### About Demand Protocol Architecture

The TCP/IP networking software is made up of protocol modules that are loaded separately. For example, to run the terminal emulator software, you load the following modules:

---

<b>Program Function</b>	<b>Program Module</b>
TCP/IP	TCPTSR.EXE
Domain Name Resolver	DNRTSR.EXE
Telnet	TN.EXE
BAPI	BAPI.EXE
Terminal Emulation	VT.EXE

---

These modules are TSRs that can be loaded when running an application and unloaded when the application is no longer in use. TSRs can be loaded from the DOS command line or from a batch file.

Note that the programs must be loaded *in the order listed*, because each depends on the preceding one. You will get error messages if they are loaded out of order. Since DOS has a limited memory management subsystem, network programs must also be unloaded in *reverse* load order (last to load is first to unload) to restore memory. The network unload

utility, TCPUNLD.EXE, unloads the programs. The unload utility is described later in this chapter.

The network load order is maintained by the TSR locator service in the TCP/IP device driver. As network programs are loaded, they bind to other portions of the networking software through calls to the TSR locator. By maintaining a bind count, TCPUNLD determines when a given network program is in use (that is, it has a nonzero bind count). A zero bind count indicates the program is not in use. Only network programs with a zero bind count can be unloaded.

## Batch Files

You can load program modules manually or with a batch file. If you load the modules manually, you can then unload them manually. If you prefer to unload manually, always terminate all outstanding network connections before running TCPUNLD.

TCP/IP comes with two batch files, one for Telnet operation with terminal emulation (3VT) and the other for File Transfer Protocol (3FTP). The contents of both files are listed below.

Note that when you use one of the following batch files, the TCPUNLD command is included in the file, so the programs are unloaded automatically.

### Telnet Batch File

The Telnet batch file is called 3VT.BAT. Its contents are as follows:

```
echo off
:begin
rem load tcp, telnet, and bapi tsr programs
echo Loading TCP/IP Protocols
TCPTSR
TN
BAPI
DNRTSR
rem run the virtual terminal program
VT
rem run the unload program to unload all tsr programs
echo Unloading TCP/IP Protocols...
tcpunld
:end
```

**FTP Batch File**

The FTP batch file is called 3FTP.BAT. Its contents are as follows:

```

echo off
:begin
rem load tcp, dnr, and socket library TSR programs
echo Loading TCP/IP Protocols
TCPTSR
DNRTSR
SOCKTSR
rem run the ftp program
FTP
rem run the unload program to unload all TSR programs
echo Unloading TCP/IP Protocols...
tcpunld
:end

```

**TCPUNLD**

The unload utility (TCPUNLD.EXE) is a network program that facilitates unloading portions of the TCP protocol stack. *The unload utility applies only to DOS.*

**Unloadable TCP/IP Modules**

You can unload the following network programs in DOS:

<b>Module</b>	<b>Description</b>
TCPTSR.EXE	TCP/IP transport <sup>1</sup>
TN.EXE	Telnet protocol
BAPI.EXE	Interface to Telnet protocol module
SOCKTSR.EXE	Sockets
DNRTSR.EXE	Domain Name Resolver
NMTSR.EXE	Network Management Driver

<sup>1</sup>Unload the redirector before unloading TCPTSR.EXE.

## Syntax

TCPUNLD [/VERIFY | /TOPONLY | /STATUS[?]]

## Description

- /VERIFY** Asks the user at each step, "About to unload network program xyz, are you sure? (Y/N)." All network programs are unloaded, in reverse load order, unless the user responds with "N" for some program.
- /TOPONLY** Unloads only the topmost network program (that is, the last network program loaded).
- /STATUS** Displays the name of each loaded network program and its approximate size. The display is in reverse load order (that is, in proper unload order from top of memory down).
- ?** Displays help for command syntax.

If you omit all qualifiers, TCPUNLD unloads all network programs in reverse load order.

## Usage Notes

Be sure to load network TSRs *last*. Any nonnetwork TSR loaded after network TSRs prevents TCPUNLD from removing any subsequent TSR from memory.

## TCPUNLD Status Display

The following is a typical TCPUNLD status display:

```
C:\>TCPUNLD
Network Unload (Version 1.0)
Unloaded network program BAPI (14512 bytes) successfully.
Unloaded network program Telnet (9072 bytes) successfully.
Unloaded network program Sockets (35696 bytes) successfully.
Unloaded network program TCP/IP (74368 bytes) successfully.
```

# 4

## FTP File Transfer Service

---

This chapter describes the File Transfer Service and the procedures for transferring files to and from a network host using the standard FTP protocol.

FTP allows you to transfer files in a convenient and reliable way. Transferring a file is the same as copying the file. The transferred file is not moved or deleted from its original location. When you use FTP, you can transfer files to and from any remote host, and you can share data with others without having to share the actual diskette or tape.

Transferring data files involves connecting with a host using FTP to move a file directory on a remote host to a directory on your personal computer, or the reverse. You can quickly reenter DOS, and you can return from DOS to FTP. When you have reentered DOS, you can issue any DOS command.

In addition, FTP includes many commands that do not require you to be connected to a specific host. The commands are in effect only for the current session.

### Using the FTP File Transfer Service

This section describes the procedures for:

- Starting FTP with the FTP command
- Starting FTP with the 3FTP command
- Transferring files to and from a host
- Reentering DOS
- Closing a connection
- Terminating an FTP session

All of the commands appear with the minimum number of required keystrokes in uppercase characters.

## Starting FTP with the FTP Command

You have two ways to start FTP and connect to a host:

- You can start FTP and connect to a host simultaneously
- You can start FTP first and then connect to a host

The FTP syntax is:

```
FTP [-A | -B] [-D] [-G] [-H] [-I] [-L] [-P] [-S]
    [-U USERNAME [PASSWORD]]
    [-V]
    [HOSTNAME | HOSTADDRESS]
```

where:

- [ ] indicates optional, may be nested
- | indicates that you should choose one or the other, but not both
- A ASCII file transfer
- B binary file transfer
- D debug
- G set GLOB to off (no wildcard expansion)
- H turn HASH on
- I turn off interactive prompting
- L turn BELL on
- P turn SENDPORT off
- S turn SLASHFLIP off
- U username [password]
- V turn verbose off

### Simultaneously Starting FTP and Connecting to a Host

To start FTP and connect to the host simultaneously, enter the following at the DOS prompt:

```
FTP [hostname]
```

You can enter parameters before the host name. The host login prompt appears. Log in as you normally would. After you have logged in, the FTP> prompt appears and waits for the next command.

## Starting FTP and then Connecting to a Host

To start FTP first and then connect to a host, complete the following steps:

1. At the DOS prompt enter:

```
FTP
```

You can enter parameters before pressing **Return**. The FTP> prompt is displayed.

2. At the FTP> prompt enter:

```
OPEN remote_hostname | IP_address
```

If you omit a host name or host address, you are prompted for a host name.

If you make a mistake while typing, the following error message is displayed:

```
FTP3003: Invalid or unknown host : hostname
```

Repeat steps 1 and 2.

With a successful connection to the host, FTP displays a login prompt and then waits for the next command at the FTP> prompt.

## Starting FTP with the 3FTP Command

You can also start FTP using the 3FTP command. The 3FTP command does the following to minimize memory use:

- Engages the Demand Protocol Architecture (DPA).
- Loads TCPTSR.EXE, DNRTSR.EXE, and SOCKTSR.EXE.
- Runs FTP.
- Unloads SOCKTSR.EXE, DNRTSR.EXE, and TCPTSR.EXE.

The 3FTP command does not accept parameters. To connect to a host, follow these steps:

1. At the DOS prompt enter:

```
3FTP
```

The FTP> prompt is displayed.

2. At the FTP> prompt enter:

```
OPEN remote_hostname | IP_address
```



#### 4-4 FTP File Transfer Service

If you omit a host name or host address, you are prompted for a host name.

If you make a mistake while typing, the following error message is displayed:

```
FTP3003: Invalid or unknown host : hostname.
```

Repeat steps 1 and 2.

With a successful connection to the host, FTP displays a login prompt and then waits for the next command at the FTP> prompt.

### Transferring Files to a Host

To transfer a file from the personal computer directory to the host, use the PUT command at the FTP> prompt.

#### NOTE

To make sure that you do not delete one of the files on the host by transferring a personal computer file with the same name, check your host directory using the DIR command. You can send the file to a new name.

The PUT command syntax is:

```
PUT local_filename [remote_filename]
```

PUT local\_filename transfers the source file to a file of the same name on the host. [remote\_filename] is optional.

For example, the following command transfers the file TEST1.TXT from your personal computer to the file IP.TEST2 on the host:

```
PUT test1.txt ip.test2
```

### Transferring Files from a Host

To transfer a file from a host to the personal computer, use the GET command at the FTP> prompt.

#### NOTE

To make sure that you do not delete one of your personal computer files by transferring a host file with the same name, check the local directory first using the LDIR command, or transfer the file to a new name.

The GET command syntax is:

```
GET remote_filename [local_filename]
```

For example, the following command transfers the file IP.TEST from the host to the file TEST1.TXT on your personal computer:

```
GET ip.test test1.txt
```

Unless you specify the full pathname of the destination file, the file is placed in your current directory. A pound sign (#) appears on the screen at regular intervals (for each 1024-byte data block that is transferred), indicating that the file transfer is in progress. When the FTP> prompt appears, the file transfer is complete.

## Reentering DOS

You can leave FTP temporarily, but retain it in memory. To leave FTP and return to DOS, press **⏏** and then **Return** at the FTP> prompt. The DOS prompt appears. This allows you to start another terminal emulator or the Network Maintenance Facilities, or to issue any DOS command.

To return to FTP, at the DOS prompt, enter:

```
EXIT
```

The FTP> prompt appears.

## Closing the Connection

To close an FTP connection, at the FTP> prompt, enter:

```
CLOSE
```

The FTP> prompt appears, and you can open another session.

## Terminating FTP

To close an FTP connection and terminate the FTP session, at the FTP> prompt, enter:

```
QUIT
```

## FTP Commands

The following sections describe the commands recognized by FTP. Each command is listed with a description of the command and an example, where appropriate.

When you type the FTP command without providing further instructions, FTP waits for the next command. If you type a command option that requires a connection to a host and you are not connected to a host, FTP displays the error message “FTP4000: Not connected to an FTP server — use OPEN first.” If a command is misspelled, FTP displays the error message “FTP1001: Unrecognized FTP command.” If you abbreviate a command that requires an additional character(s), FTP displays the “Ambiguous command” error message. For more on FTP error messages, see Appendix A.

## APPEND

### Purpose

This command attaches a local file to a file on the remote host. If you omit the remote file name, FTP uses the local file name for the remote file. FTP uses ASCII or BINARY type, whichever is currently specified.

### Format

```
APPEND local_file "remote_file" (for an ULTRIX host)
APPEND local_file remote_file (for a UCX host)
```

### Example

You want to append LOCFILE to REMFILE. Enter the following command:

```
APPEND locfile remfile
```

## ASCII

### Purpose

This command sets the file transfer type of the file to be transferred to ASCII. Use the STATUS command to verify the setting. The default transfer type is ASCII.

See the BINARY command for information on the binary file transfer type. ASCII transfer changes local end-of-line (EOL) characters in the file to remote EOL characters on the remote host.

### Format

```
ASCII
```

## BELL

### Purpose

This command toggles the bell on your workstation to ON (if it was OFF), and OFF (if it was ON). If the bell is ON, it sounds after each file transfer command is completed. The default is OFF. Use the STATUS command to determine the bell mode.

### Format

```
BELL [ON | OFF]
```

## BGET

### Purpose

This command copies the remote file to the local file using the binary transfer type. If you omit the remote file name, FTP prompts you for it. If you omit a local file name, the file retains the same name it has on the remote host. If HASH is ON, a pound sign (#) is displayed for each 1024 data bytes transferred. After the transfer is complete, the transfer type reverts to what it was before execution of BGET.

### Format

```
BGET remote_filename [local_filename]
```

### Example

You want to copy the remote file REMFILE to the local file LOCFILE. Enter the following command:

```
BGET remfile locfile
```

## BINARY

### Purpose

This command sets the file transfer type to support binary image transfer. If you use the binary mode to transfer an ASCII file to a remote host, your text may not have correct EOL terminators. Specify ASCII mode and send the file again. Use the STATUS command to determine the transfer type.

### Format

```
BINARY
```

## **BPUT**

### **Purpose**

This command transfers a local file to the remote host using the binary transfer type. If you omit the remote file name, FTP uses the local file name for the remote file. If HASH is ON, a pound sign (#) is displayed for each 1024 data bytes transferred. After the transfer is complete, the transfer type reverts to what it was before execution of BPUT.

### **Format**

```
BPUT local_filename [remote_filename]
```

### **Example**

You want to transfer the local file MEMOS2.TXT to the remote host and store it with the specified name MEMOS.2. Enter the following command:

```
BPUT memos2.txt memos.2
```

## **BYE**

### **Purpose**

This command terminates your FTP session, and returns you to the DOS prompt. This command is equivalent to the QUIT command.

### **Format**

```
BYE
```

## **CD**

### **Purpose**

This command changes the current directory on the remote host to remote\_directory. If you omit the remote directory, FTP prompts you for it.

### **Format**

```
CD remote_directory
```

### **Example**

You want to change to the directory REMDIR. Enter the following command:

```
CD REMDIR
```

## CLOSE

### Purpose

This command closes (disconnects) the FTP session with the remote host and returns you to the FTP> prompt. You can use the CLOSE command with the OPEN command to communicate with multiple remote FTP servers without leaving FTP.

### Format

```
CLOSE
```

## DEBUG

### Purpose

This command sets DEBUG to ON or OFF. If DEBUG is ON, you can examine the FTP protocol commands being sent between computers. You can use this information to debug problems, but it depends on your workstation. If you omit an argument, DEBUG toggles the current state of DEBUG. The default is OFF. You can use the STATUS command to determine whether DEBUG is set to ON or OFF.

### Format

```
DEBUG [ON | OFF]
```

### Example

You want to set DEBUG to ON. Enter the following command:

```
DEBUG ON
```

## DELETE

### Purpose

This command deletes the file specified on the remote host. If you omit the file name, FTP prompts you for it. If prompting is enabled (see the PROMPT command later in this chapter), FTP prompts you for confirmation before deleting the file.

### Format

```
DELETE "filename"                (for an ULTRIX host)
DELETE "filename","filename.ext"
DELETE filename.ext;1             (for a UCX host)
DELETE filename.ext;2,filename.*;1
```

### **Example**

You want to delete the file MEMOS on the remote host. Enter the following command:

```
DELETE memos
```

## **DIR**

### **Purpose**

This command displays a listing of the contents of the specified remote directory, including the date and time that the files were last modified. It also displays the complete information for every file, just like the VMS DIR /FULL command.

If you omit a remote directory, FTP displays the contents of the current remote working directory. The wildcard (\*) is permitted.

### **Format**

```
DIRECTORY "/usr/temp" [/FULL] (for an ULTRIX host)
```

```
DIRECTORY [usr.temp] [/FULL] (for a UCX host)
```

### **Example**

You want to see a directory of the files in the MEMOS directory. Enter the following command:

```
DIR memos
```

## **DRIVE**

### **Purpose**

This command changes the current disk drive on the personal computer to the specified drive. If you omit a drive, DRIVE displays the current drive.

### **Format**

```
DRIVE [drv[:]]
```

### **Example**

You want to change to drive A and make it the current disk drive. Enter the following command:

```
DRIVE A
```

## GET

### Purpose

This command copies a specified file from the remote host to the personal computer using the current transfer type. If HASH is ON, a pound sign (#) is displayed for each 1024 bytes of data transferred. If you omit a remote file name, FTP prompts you for one. If you omit a local file name, FTP defaults to the same name as the remote file.

### Format

```
GET "remote_file" local_file      (for an ULTRIX host)
GET "remote_file","local_file"

GET remote_file local_file        (for a UCX host)
GET remote_file,local_file
```

### Example

You want to retrieve the remote file MEMO.1 and store it on the local host as MEMO.TXT. Enter the following command:

```
GET memo.1 memo.txt
```

## GLOB

### Purpose

This command sets the GLOB command to ON or OFF. If ON, the GLOB command enables wildcard expansion for the MDELETE, MGET, and MPUT commands. Wildcard expansion is always enabled for the DIR, LDIR, and LLS, and LS commands. If you omit an argument, the GLOB command toggles the current GLOB value. The default is ON.

### Format

```
GLOB [ON | OFF]
```

### Example

You want to set GLOB to OFF. Enter the following command:

```
GLOB OFF
```



## **HASH**

### **Purpose**

This command toggles the pound sign (#) display for each 1024-byte data block transferred. If the pound sign is ON, HASH turns it OFF. If the pound sign is OFF, HASH turns it ON. The screen displays either “Hash mark printing on (1024 bytes/hash mark)” or “Hash mark printing off.” If you omit an argument, the HASH command toggles the current HASH value. The default is OFF. Use STATUS to determine HASH mode.

### **Format**

```
HASH [ON | OFF]
```

## **HELP**

### **Purpose**

This command displays a list of available commands. If HELP is followed by another command name, then FTP displays a brief message about the specified command.

### **Format**

```
HELP [command]
```

### **Example**

You want to know what the CLOSE command does. Enter the following command:

```
HELP close
close   disconnect from a remote host
```

## **LAPPEND**

### **Purpose**

This command appends a remote file to a file on the local host in the current transfer type.

### **Format**

```
LAPPEND remote_filename local_filename
```

**Example**

You want to append the remote file REMFILE to the local file LOCFILE. Enter the following command:

```
LAPPEND remfile locfile
```

**LCD****Purpose**

This command changes the current local directory to another directory you specify. If you omit a directory, FTP prompts you for it.

**Format**

```
LCD local_directory
```

**Example**

You want to change the current directory to the DOC directory. Enter the following command:

```
LCD DOC
```

**LDIR****Purpose**

This command displays a local directory listing. If you specify a local directory, FTP lists that directory. If you omit a directory, FTP lists the contents of the current local working directory. The wildcard (\*) is permitted.

**Format**

```
LDIR [local_directory]
```

**Example**

You want to display the contents of the DOC directory. Enter the following command:

```
LDIR DOC
```

## LLS

### Purpose

This command displays an abbreviated directory listing of file names. If you specify the local directory, FTP lists that directory. If you omit a directory, FTP lists the contents of the current local working directory. The wildcard (\*) is permitted.

### Format

```
LLS [local_directory]
```

### Example

You want to display an abbreviated directory listing of the DOC directory. Enter the following command:

```
LLS DOC
```

## LPWD

### Purpose

This command displays the drive and pathname of the current local working directory.

### Format

```
LPWD
```

### Example

You want to display the drive and path name off the current local directory. Enter the following command:

```
LPWD
```

```
Current directory is A:\.
```

## LS

### Purpose

This command displays an abbreviated, single-column listing of the contents of a directory on the remote host. If you omit a remote directory, LS displays the contents of the current directory. The wildcard (\*) is permitted.

### Format

```
LS [remote_directory]
```

**Example**

You want to display the contents of the DOC directory on the remote host. Enter the following command:

```
LS DOC
```

**MDELETE****Purpose**

This command deletes multiple files on the remote host. You can specify multiple files using wildcard syntax or by listing each file separately. The GLOB command must be enabled for wildcard syntax to be interpreted. Separate MDELETE arguments by at least one space. If you omit the file name, FTP prompts you for it. If prompting is enabled, FTP prompts for confirmation before deleting the file.

**Format**

```
MDELETE filename [filename...[filename]]
```

**Example**

You want to delete all files ending with .MEMOS on the remote host. Enter the following command:

```
MDELETE *.memos
```

**MDIR****Purpose**

This command displays a complete listing of multiple remote directories on the local screen. If you omit a remote directory, FTP prompts you for it. The wildcard (\*) is permitted.

**Format**

```
MDIR remote_path | wildcard_filename
      [remote_path | wildcard_filename]...
      [remote_path | wildcard_filename]
```

**Example**

You want to display the files ending in .C in the current remote directory and all the files in the directory DOCS on the remote hosts. Enter the following command:

```
MDIR *.c docs
```

## MGET

### Purpose

This command is similar to the GET command. MGET transfers multiple files from a remote host using the current transfer type. Each file retains its original name. If you omit a file name, FTP prompts you for it. The wildcard (\*) is permitted if GLOB is enabled.

### Format

```
MGET wildcard_filename [wildcard_filename...[wildcard_filename]]
```

### Example

You want to transfer the files TEST.1 and MEMO.1 to separate files in the current local directory. Enter the following command:

```
MGET test.1 memo.1
```

## MKDIR

### Purpose

This command creates a directory with the specified name on the remote host. You can use the DIR command to verify. Not all remote computers support this command. If you omit the remote directory name, FTP prompts you for it.

### Format

```
MKDIR [remote_directory]
```

### Example

You want to create the directory DOCS on the remote host. Enter the following command:

```
MKDIR [.docs]
```

## MLS

### Purpose

This command displays a listing of file names contained in the remote directories specified. If you omit an argument, FTP prompts you for a remote directory. The wildcard (\*) is permitted.

**Format**

```
MLS rem_path | wildcard_filename
    [rem_path | wildcard_filename]...
    [rem_path | wildcard_filename]
```

**Example**

You want to display the contents of files ending in .C and the contents of SOURCES.DAT. Enter the following command:

```
MLS *.c sources.dat
```

**MPUT****Purpose**

This command is similar to the PUT command. MPUT transfers multiple local files using the current transfer type. Each file retains its original name. If you omit an argument, FTP prompts you for it. The wildcard (\*) is permitted if GLOB is enabled.

**Format**

```
MPUT wildcard_filename [wildcard_filename...[wildcard_filename]]
```

**Example**

You want to transfer the local files MEMO.TXT and DOC.TXT from the current local directory to the current working directory on the remote host, which stores them in separate files. Enter the following command:

```
MPUT memo.txt doc.txt
```

**OPEN****Purpose**

This command opens a session on a computer other than the one that was specified at startup. If a connection to a host is completed successfully, you are prompted to log in. After you log in, you see the prompt “ftp:<hostname or address>.” If you omit the remote host name or the IP address, FTP prompts you for it.

**Format**

```
OPEN remote_hostname | IP_address
```

**Example**

You want to establish a connection with HOST1. Enter the following command:

```
OPEN host1
```

**PROMPT****Purpose**

This command turns interactive prompting ON and OFF. Interactive prompting occurs during multiple file transfers to allow you to selectively retrieve or store files. If prompting is OFF, any MGET or MPUT command transfers all files. The default is ON. You can use the STATUS command to verify PROMPT mode.

**Format**

```
PROMPT [ON | OFF]
```

**PUT****Purpose**

This command transfers a local file to the remote host. If HASH is ON, a pound sign (#) is displayed for each 1024 data bytes transferred. If you omit a remote file, the local file name is used for the remote file. This command is the same as the SEND command.

**Format**

```
PUT local_file "remote_file" (for an ULTRIX host)
PUT local_file,remote_file

PUT local_file remote_file (for a UCX host)
PUT local.*
```

**Example**

You want to transfer the local file MEMOS2.TXT to the remote host and store it with the name MEMOS.2. Enter the following command:

```
PUT memos2.txt memos.2
```

## PWD

### Purpose

This command displays the pathname of the current remote working directory on the remote host.

### Format

```
PWD
```

## QUIT

### Purpose

This command terminates your FTP session and returns you to DOS.

### Format

```
QUIT
```

## QUOTE

### Purpose

This command sends the specified protocol command directly to the remote server. If you omit a protocol command, FTP prompts you for it.

### Format

```
QUOTE protocol_command
```

### Example

You want to send the command NLST directly to the remote server. Enter the following command:

```
QUOTE nlst
```

## RECV

### Purpose

This command copies a file from the remote computer to the workstation using the current transfer type. If you omit a local file name, FTP defaults to the same name as the remote file.

### Format

```
RECV remote_filename [local_filename]
```



### **Example**

You want to copy the file MEMO.2 from the remote computer. Enter the following command:

```
RECV memo.2
```

## **REMOTEHELP**

### **Purpose**

This command displays a list of the FTP commands supported by the host, if implemented on a host computer. If you specify a protocol command, REMOTEHELP displays a brief description of the command.

### **Format**

```
REMOTEHELP [protocol_command]
```

### **Example**

You want to display a brief description of the APPEND command. Enter the following command:

```
REMOTEHELP append
```

## **RENAME**

### **Purpose**

This command changes the old file name to the new file name on the remote host. You can use the DIR command to verify the renaming of files.

### **Format**

```
RENAME "old_filename" "new_filename" (for an ULTRIX host)
```

```
RENAME old_filename.ext new_filename.ext (for a UCX host)
```

### **Example**

You want to rename MEMO.1 to MEMO.2. Enter the following command:

```
REN memo.1 memo.2
```

## RMDIR

### Purpose

This command deletes a specified directory on the remote host. The remote directory must be empty before it can be removed. You can use the DIR command to verify the removal of a directory.

### Format

```
RMDIR filename.dir;
```

### Example

You want to delete the directory DOC on the remote host. Enter the following command:

```
RMDIR doc.dir;
```

## SEND

### Purpose

This command copies a local file to the remote host in the current transfer type. If HASH is ON, a pound sign (#) is displayed for each 1024 data bytes transferred. If you omit a remote file, the local file name is used for the remote file. This command is the same as the PUT command.

### Format

```
SEND local_filename [remote_filename]
```

### Example

You want to copy the local file MEMOS2.TXT to the remote host and store it with the name MEMOS.2. Enter the following command:

```
SEND memos2.txt memos.2
```

## SENDPORT

### Purpose

This command determines whether PORT commands are sent for each data connection. When SENDPORT is ON, FTP attempts to use a PORT command when establishing a connection for each data transfer. The default is ON. You can use the STATUS command to verify.

### Format

```
SENDPORT [ON | OFF]
```

### **Example**

You want to set SENDPORT to OFF. Enter the following command:

```
SENDPORT off
```

## **SHOW**

### **Purpose**

This command displays the contents of the remote file on the screen. If you omit a remote file name, FTP prompts you for it. This command only displays the contents of ASCII (text) files.

### **Format**

```
SHOW remote_file
```

## **SLASHFLIP**

### **Purpose**

This command determines whether to convert backslashes ( \ ) to forward slashes ( / ) on outgoing commands. This is convenient for DOS users who are accustomed to specifying pathnames with backslashes. If you omit an argument, the command toggles the current state of SLASHFLIP. The default is ON.

### **Format**

```
SLASHFLIP [ON | OFF]
```

### **Example**

You want to set SLASHFLIP to OFF. Enter the following command:

```
SLASHFLIP off
```

## **STATUS**

### **Purpose**

This command displays the current status of FTP and indicates which functions are turned ON or OFF.

### **Format**

```
STATUS
```

**Example**

You want to see the current status of FTP. Enter the following command:

```
STATUS
Connected to <hostname>.
Transfer type is ascii.
Bell off.
CNTRL-C interrupt of file transfers off.
Debugging off.
Filename globbing on.
Hash mark printing on.
Interactive prompting off.
Sending of PORT commands on.
Slash translation on.
Verbose mode on.
```

**TAKE****Purpose**

This command reads commands for FTP from the specified file, while input to prompt and password responses come from the keyboard. If you omit a file name, FTP prompts you for it.

**Format**

```
TAKE filename
```

**Example**

You want to execute the FTP commands in the file TAKE.FTP. Enter the following command:

```
TAKE take.ftp
```

**TYPE****Purpose**

This command sets the file transfer type to ASCII or BINARY. If you omit a type, TYPE displays the current type. The default is ASCII.

**Format**

```
TYPE [ASCII | BINARY]
```

### **Example**

You want to set the type of the file to be transferred to ASCII. Enter the following command:

```
TYPE ascii
```

## **USER**

### **Purpose**

This command sets your user name to <username> on the remote computer. If you omit the user name, FTP prompts you for one. FTP also prompts you for a password and account if they are required to complete the login.

### **Format**

```
USER [username]
```

### **Example**

You want to identify yourself as BSMITH, and then log in. Enter the following command:

```
USER bsmith
```

## **VERBOSE**

### **Purpose**

This command turns verbose mode ON or OFF. If verbose mode is ON, all responses resulting from the FTP processes on the remote host are displayed on the screen, and file transfer statistics regarding the efficiency of the transfer are reported. The default is ON. You can use the STATUS command to verify.

### **Format**

```
VERBOSE [ON | OFF]
```

**!**

### **Purpose**

This command exits to DOS, temporarily, if no argument is given, If you specify a DOS command, the program executes it and returns to FTP. If you omit a command, typing EXIT from the DOS prompt returns you to FTP.

**Format**

! [command]

**Example**

You want to execute the CHKDSK command and return to FTP. Enter the following command:

! CHKDSK

**?****Purpose**

This command displays an alphabetical list of FTP commands or a message about the meaning of a specified command. This command is the same as the HELP command.

**Format**

? [command]

**Example**

You want to display information about the APPEND command. Enter the following command:

? APPEND



## Terminal Emulation

---

Terminal emulation programs allow you to use your personal computer as an ASCII terminal. TTY is an emulation program that is part of the TCP product. TCP also supports Reflection, Softterm, and SmarTerm terminal emulation programs.

TTY uses the Bridge Application Program Interface (BAPI) to communicate with the Telnet module. Connect uses the Minimal User Interface (MUI) to communicate with Telnet. The Telnet module translates character streams according to the Internet protocol defined in RFC-854.

This chapter describes how to;

- Use the TTY Terminal Service
- Run other emulators

### Using the TTY Terminal Service

The following sections describe how to use the TTY Terminal Service to connect to and disconnect from, a host, and how to establish multiple connections in a window environment.

#### Connecting to a Host

To connect to a host in a window environment, follow these steps:

1. Invoke a window environment according to the manufacturer's instructions.
2. Invoke TTY as you would any other application. You are prompted to enter a host name.
3. Log in as you normally would.



## Multiple Sessions

In a window environment, you can create multiple sessions by opening additional windows and invoking the TTY program.

To switch between sessions, move the cursor between the windows. Within windows, you can use a word processor to modify files, or FTP to transfer files.

## Terminating a Connection

To terminate the TTY connection and close the window, press **Alt/X**. The DOS prompt is displayed.

## Running Other Emulators

The TCP program supports other emulators such as Reflection, Softerm, and SmarTerm. Using a batch file, you can load the necessary TCP components and the terminal emulator you wish to use. Replace VT in the following batch file with the command that starts the emulator you wish to use:

```
echo off
:begin
rem load tcp, telnet, and bapi TSR programs
echo Loading TCP/IP Protocols
TCPTSR
DNRTSR
TN
BAPI
rem run the virtual terminal program
VT
rem run the unload program to unload all TSR programs
echo Unloading TCP/IP Protocols...
UNLOAD
:end
```

Keep in mind that you are actually using DPA when you use this batch file. Refer to the documentation supplied with your terminal emulator to determine the appropriate command to use in the batch file.

# 6

## Configuration

---

This chapter describes the parameters contained in the PROTOCOL.INI file and their organization. The PROTOCOL.INI file is set up by the installation procedure.

The PROTOCOL.INI file is divided into sections that correspond to the TCP/IP drivers. Each section contains parameters that are used for workstation configuration and binding. The parameters are listed and described briefly.

Network adapter drivers in the DOS products are loaded and configured according to the entries in the CONFIG.SYS and PROTOCOL.INI files. When you start your workstation, the Protocol Manager program reads the PROTOCOL.INI file and binds the protocol and driver modules together. The only network adapter driver parameters that are used are for the driver on your workstation.

### What the PROTOCOL.INI File Contains

Table 6–1 lists the typical sections in a PROTOCOL.INI file. The sections are used for configuring adapter and network drivers. Section names are typical; your PROTOCOL.INI file may be different.

**Table 6–1 PROTOCOL.INI File Sections Summary**

<b>Configuration</b>	<b>Values</b>
ETHERLINKII	3Com EtherLink II adapter
ETHERLINK/MC	3Com EtherLink/MC
TCPIP	TCP/IP protocol driver
RFCNetBIOS	RFC NETBIOS driver
DNR	Domain Name Resolver protocol driver
NMDRV	Network Management Driver protocol driver

**Table 6-1 (Cont.) PROTOCOL.INI File Sections Summary**

<b>Configuration</b>	<b>Values</b>
SOCKETS	Sockets protocol driver
TELNET	Telnet protocol driver
DEPCA	Digital DEPCA

The PROTOCOL.INI file consists of a series of named sections. The format for a typical section is shown below:

```
; DEPCA
[DEPCA]
  drivename = DEPCA$
  interrupt = 3
  ioaddress = 0x300
  dmachannel = 1
```

The example above is for a DEPCA adapter. The first line of each section is a comment that identifies the adapter or protocol. Comments start with a semicolon, and are ignored by the system. Blank lines are permitted for formatting.

The second line, which is enclosed in square brackets, is the module or section name. The name identifies the module to other sections (for example, when resolving bindings). In this example, it is DEPCA. For adapters, the name corresponds to the adapter name.

All sections contain the DRIVERNAME= parameter, which identifies the driver. Most sections also have the BINDINGS= parameter, which connects the various modules.

Entries in sections start at the beginning of a line and are followed by an equal sign and the value assigned to the entry. There can be spaces before and after the equal sign.

Text in the PROTOCOL.INI file is changed to uppercase by the Protocol Manager, with the exception of comment text. Unless otherwise specified, text values can be composed of letters, numbers, or the following characters:

```
$ % ; - _ @ { } ~ ` ! # ( )
```

## TCP/IP Section

The TCP/IP section has two required entries:

- DRIVERNAME
- BINDINGS

The bindings link the TCP/IP protocol to the Ethernet driver. Table 6-2 lists the TCP/IP entries and their descriptions.

**Table 6-2 TCP/IP Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
ARPTBLSIZE=	The number of ARP cache table entries. Default: 10
BINDINGS=	The name of the adapter that TCP/IP uses, such as ETHERLINK. The software supplies this entry during installation.
CLIENTMSG=	An internal data structure used by TCP NetBIOS. CLIENTMSG should equal the number of NetBIOS sessions (NUMSESSIONS) multiplied by 2. Default: 5
CLIENTBD=	An internal data structure used by TCP NetBIOS. CLIENTBD should equal the number of NetBIOS sessions (NUMSESSIONS) plus the number of NetBIOS names (NUMNAMES) plus 11. Default: 10
CLIENTMSG=	An internal data structure used by TCP NetBIOS. CLIENTMSG should equal the number of NetBIOS names (NUMNAMES) plus 10. Default: 10
CLIENTOD=	An internal data structure used by TCP NetBIOS. CLIENTOD should equal the number of NetBIOS sessions (NUMSESSIONS) plus 1. Default: 2

**Table 6-2 (Cont.) TCP/IP Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
DEFAULTGATEWAY0=	The gateway to use when the IP address is not in the network. The format is four decimal numbers (0 through 255) in the format XXXX XXXX XXXX XXXX. You must use spaces as delimiters. The system administrator supplies this value.
DRIVERNAME=	TCPIP\$. This entry is required. Use this exact spelling.
IPADDRESS0=	The Internet protocol address. The address is four decimal numbers (0 through 255) in the format XXXX XXXX XXXX XXXX. You must use spaces as delimiters.
IPSOCKETSIZE=	The number of additional IP sockets required by specific applications. Default: 0
LBP=	The percentage of buffer space allocated to large buffers. Default: 50 The space not allocated to large or medium buffers is allocated to small buffers.
LBUFSZ=	The size in bytes of the large buffers. Range: 1000 to 4100 Default: 1
LOADFACTOR=	The memory, in percent, allocated for buffers. In general, as LOADFACTOR increases, performance increases, but it takes more memory. Use a higher LOADFACTOR when you have fewer connections, and a lower LOADFACTOR with more connections. If LOADFACTOR is too low, packets are lost. Range: 60 through 100 Default: 100
MBP=	The percentage of buffer space allocated to medium buffers. Default: 30

**Table 6-2 (Cont.) TCP/IP Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
	The space not allocated to large or medium buffers is allocated to small buffers.
MBUFSZ=	The size in bytes of the medium buffers. Range: 500 to 1000 Default: 600
SBUFSZ=	The size in bytes of the small buffers. Range: 70 to 400 Default: 100
SNAP=	Part of the packet header. Specify YES for token ring or 802.3 operation. Specify NO for Ethernet operation. Default: NO
SUBNETMASK0=	The subnet mask. The mask is four decimal numbers (0 through 255) in the format XXXX XXXX XXXX XXXX. It is used to mask the IP address for subnet operations so that one site can use one internet address for multiple physical networks.  For example, for a mask equal to 255 255 255 0, the first three segments of the IP address remain as is, to identify the network. The last segment is ignored, to identify a network host. You must use spaces as delimiters.
TCPCONNECTIONS=	The maximum TCP/IP connections for your machine. The maximum allowable for DOS is 8. Default: 8
TCPCONNTIMEOUT=	The time in seconds before TCP/IP stops its attempt to connect, if a connection fails. Default: 0

**Table 6-2 (Cont.) TCP/IP Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
TCPSEGMENTSIZ=	The maximum amount of TCP/IP data, in bytes, in a single packet. Default: 1450
TCPWINDOWSIZE=	The maximum amount of unacknowledged data, in bytes, that can be received in every TCP/IP connection. Range: 1450 through 1530 Default: 1450

## RFC NetBIOS Section

The RFC NetBIOS section has two required entries:

- DRIVERTNAME
- BINDINGS

The bindings link NetBIOS to the TCP/IP driver. Table 6-3 lists the RFC NetBIOS entries and their descriptions.

**Table 6-3 RFC NetBIOS Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
DRIVERTNAME=	TCPNB\$. This entry is required. Use this exact spelling.
BINDING=	The name of the protocol the driver uses. The entry must be:  TCP/IP This is a required entry.
NUMNCB=	The maximum number of network control blocks NetBIOS supports. A value of 254 is recommended for a server. Range: 10 through 254 Default: 16

**Table 6-3 (Cont.) RFC NetBIOS Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
NUMNAMES=	The maximum number of names supported by NetBIOS. A value of 64 is recommended for a server.  Range: 4 through 64  Default: 6
NUMSESSIONS=	The maximum number of sessions supported by NetBIOS. For a workstation, this value should be the number of LAN manager servers on the network. A value of 50 is recommended for a server.  Range: 1 through 254  Default: 8
SCOPE=	The RFC NetBIOS scope identifier. It must be a valid domain name, such as;  SCOPE="SCOPE.COMPANY"  Range: 0 through 100  Default: ""

### 3Com EtherLink/MC Adapter Section

The following is an alphabetical listing of possible parameters and values for the EtherLink/MC adapter section of the PROTOCOL.INI file. Under MS-DOS, the driver file name is ELNKMC.DOS.

**Table 6-4 3Com EtherLink/MC Adapter Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
DRIVERNAME=	ELNKMC\$ (Required entry).
MAXTRANSMITS=	Sets the number of entries for outgoing packets in the transmit queue of the MAC driver. Each queue entry adds 138 bytes to the memory used by the MAC driver. Increasing the value of this parameter may improve performance in server configurations. Using a value less than the default or installation value severely degrades performance.  Range: 8 to 50



**Table 6-4 (Cont.) 3Com EtherLink/MC Adapter Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
	Default: 8
NETADDRESS=	Overrides the network address of the adapter to a user-specified address. This parameter is a hexadecimal string of exactly 12 digits enclosed in quotes.  For example:  <code>netaddress = "02608C010001"</code>
SLOTNUMBER=	Specifies the microchannel slot number in the computer where the adapter resides.  Use this parameter to override the default of the lowest numbered slot with an EtherLink /MC in it. For example, if you are using two adapters, both cannot be lowest numbered, so you must specify this keyword for at least one of them.  Range:1 to 8

## 3Com EtherLink II Adapter Section

The following is an alphabetical listing of possible parameters and values for the EtherLink II adapter section of the PROTOCOL.INI file.

Under MS-DOS, the driver file name is ELNKII.DOS.

### NOTE

If the EtherLink II adapter is set to run in shared memory mode, two of the parameters in this section, `datatransfer=` and `dmachannel=`, are ignored. The data transfer type becomes memory to memory string moves. The EtherLink II occupies 8K of computer high memory at C8000, CC000, D8000, or DC000, depending on the memory jumper position. If you are using the 3ComEMM expanded memory manager, be sure the memory space accessed by the EtherLink II adapter does not conflict with that used by the expanded memory manager.

**Table 6-5 EtherLink II Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
<b>DATATRANSFER=</b>	<p>Sets the data transfer mode on the adapter. Possible values are:</p> <p><b>Block_dma</b>      Intermediate DMA transfer mode for 8086 and 8088 computers.</p> <p><b>Demand_dma</b>     Fastest DMA transfer mode for 8086 and 8088 computers. This is the default value for the <code>datatransfer=</code> parameter on these computers.</p> <p><b>Pio_byte</b>         Transfer mode for 80286 and 80386 computers. Sometimes used to slow data transfer on a very fast 80386 computer.</p> <p><b>Pio_word</b>         Fastest transfer mode for 80286 and 80386 computers.</p> <p><b>Single_dma</b>      Slowest DMA transfer mode for 8086 and 8088 computers.</p> <p>On an 80286 or 80386 computer, the <code>dmachannel=</code> value is ignored and the default becomes <code>pio_word</code>.</p> <p>If the adapter is set to shared memory mode, this parameter is ignored. See the note at the beginning of this section.</p>
<b>DMACHANNEL=</b>	<p>Sets the DMA channel for the adapter.</p> <p>1      Use DMA channel 1.</p> <p>3      Use DMA channel 3.</p> <p>If the adapter is set to shared memory mode, this parameter is ignored. See the note at the beginning of this section.</p> <p>Default: 1</p>
<b>DRIVERNAME=</b>	<b>ELNKII\$</b> (Required entry). If there is a second EtherLink II driver, its name is <b>ELNKII2\$</b> .
<b>INTERRUPT=</b>	<p>Sets the interrupt level for the adapter. On an 80286 or 80386 computer, interrupt level 2 equals interrupt level 9.</p> <p>Range: 2 to 5</p>

**Table 6-5 (Cont.) EtherLink II Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
	Default: 3
IOADDRESS=	Indicates the current I/O address jumper configuration of the adapter. This setting must match the switch setting on the adapter.  Range: 0x250 to 0x350  Default: 0x300
MAXTRANSMITS=	Sets the number of entries for outgoing packets in the transmit queue of the MAC driver. Each queue entry adds 138 bytes to memory used by the MAC driver. Increasing the value of this parameter may improve performance in server configurations. Using a value less than the default or installation value severely degrades performance.  Range: 8 to 50  Default: 8
NETADDRESS=	Overrides the network address of the adapter to a user-specified address. This parameter is a hexadecimal string of exactly 12 digits enclosed in quotes.  For example:  <code>netaddress = "02608C010001"</code>
TRANSCEIVER=	Sets the transceiver on the adapter.  External      Used for a DEC-Intel-Xerox (DIX) connection.  Onboard  Default: Onboard
XMITBUFS=	Indicates the number of transmit buffers to allocate on the adapter. Allocating a second transmit buffer may improve transmit performance while reducing the amount of memory available for storing received packets. Each buffer adds 146 bytes to memory used by the MAC driver.  Range: 1 to 2  Default: 2

## Domain Name Resolver Section

The Domain Name Resolver (DNR) driver section has two required entries: `DRIVERNAME=` and `BINDINGS=`. The bindings link it to the TCP/IP driver. There must be a domain name server, otherwise the DNR does not work. The following list shows DNR driver entries and values.

**Table 6–6 Domain Name Resolver Entries and Descriptions**

<code>DRIVERNAME=</code>	DNR\$ (Required entry). Use this exact spelling.
<code>BINDINGS=</code>	TCPIP (Required entry). Name of the protocol for this driver to use.
<code>NAMESERVER0=</code>	The IP address of the domain name server, which maintains a database of domain names.
<code>DOMAIN=</code>	The name of the ARPA domain where your workstation is located. The domain name can contain as many fields as fit within 116 characters, and must be enclosed in quotes.  Default: "COMPANY.COM"

## Network Management Driver Section

The Network Management driver section has two required entries: `DRIVERNAME=` and `BINDINGS=`. The bindings link it to the TCP/IP driver. The following list shows NMDRV entries and values.

**Table 6–7 Network Management Driver Entries and Descriptions**

Entry	Description
<code>DRIVERNAME=</code>	NMDRV\$ (Required entry). Use this exact spelling.
<code>BINDINGS=</code>	TCPIP (Required entry). Name of the protocol for this driver to use.
<code>SYSTEMDESC=</code>	Is an ASCII string describing the hardware where TCP is running, and the version of the operating system. The parameter value must be in quotes. For example:  "3COM WORKSTATION"

**Table 6-7 (Cont.) Network Management Driver Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
	Default: ""
SYSTEMID=	Specifies the ID for your network type and product, and for the company that supplied your workstation. For example, 1 specifies U.S., 3 specifies commercial, and so forth. The parameter value must be in quotes.  Default: "1.3.6.1.4.1.43.1.5"

## Sockets Section

The Sockets driver section has two required entries: **DRIVERNAME=** and **BINDINGS=**. The bindings link it to the TCP/IP driver. The following list shows sockets driver entries and values.

**Table 6-8 Socket Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
DRIVERNAME=	SOCKETS\$ (Required entry). Use this exact spelling.
BINDINGS=	TCPIP (Required entry). Name of the protocol for this driver to use.
NUMSOCKETS=	Specifies the maximum number of sockets to be supported.  Range: 1 to 32  Default: 32
POOLSIZE=	Specifies the buffer size, in bytes, used by the sockets driver for nonblocking send calls. This parameter is set when the system initializes.  Range: 0 to 15000  Default: 10000

**Table 6-8 (Cont.) Socket Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
NUMTHREADS=	Specifies the maximum number of execution threads the sockets support. Range: 1 to NUMSOCKETS Default: NUMSOCKETS
MAXSENDSIZE=	Maximum send size allowed on UDP, or nonblocking TCP/IP sends. Range: 32 to 4096 Default: 1024

## Telnet Section

The Telnet section has two required entries: `DRIVERNAME=` and `BINDINGS=`. The bindings link it to the TCP/IP driver. The following list shows Telnet entries and values.

**Table 6-9 Telnet Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
DRIVERNAME=	TELNET\$ (Required entry). Use this exact spelling.
BINDINGS=	TCPIP (Required entry). Name of the protocol for this driver to use.
NSESSIONS=	Maximum number of Telnet sessions supported. Range: 1 to 32 Default: 4
MAX_OUT_SENDS=	Maximum number of outstanding sends per session. Range: 1 to 5 Default: 3
MAX_SEND_SIZE=	Maximum buffer size, in bytes, for each send. Range: 1 to 1024 Default: 128

**Table 6-9 (Cont.) Telnet Entries and Descriptions**

Entry	Description
DRIVER_EOL=	<p>Specifies the end-of-line (EOL) sequence the Telnet driver sends to the Telnet server. Some servers require a (CR,NUL) pair, and others require a (CR,LF) pair. Many servers accept both. This parameter tells the driver what the default sequence should be when a session is created. Options are:</p> <ol style="list-style-type: none"> <li>1 (CR,NUL)</li> <li>2 (CR,LF)</li> </ol> <p>Default: 1</p>
APP_EOL=	<p>Specifies what the application (terminal emulator, or other) sends to the Telnet driver for its end-of-line sequence (such as <b>Return</b>). Most emulators send a single carriage return when you press <b>Enter</b> or <b>Return</b>, or they can be configured to do so. For those that send (CR,LF) or (CR,NUL), the driver must know that the character after the carriage return is part of the EOL.</p> <p>In most cases, no special mapping should be applied to a single LF character. Only when the driver is configured to expect a (CR,x) pair and the LF is preceded by CR will the two characters be treated as a single EOL. This parameter tells the driver what EOL character to expect from the emulator when the session starts.</p> <p>Two values are allowed:</p> <ol style="list-style-type: none"> <li>1 (CR)</li> <li>2 (CR,x), where x is any other character</li> </ol> <p>Default: 1</p>
ECM_CHAR=	<p>Specifies the Enter Command Mode (ECM) character. The ECM character allows you to access the Bridge Application Program Interface (BAPI) session management from a terminal emulator that does not provide session management.</p>

**Table 6–9 (Cont.) Telnet Entries and Descriptions**

Entry	Description
BRK_ACTION=	<p>Normally you specify an ASCII control character (that is, the combination of <code>[Ctrl]</code> plus any other key) as the ECM character. To specify a control character, enter a caret (^) followed by any character as the <code>ecm_char=</code> parameter value. You can also enter the ASCII hexadecimal value of that combination (0x followed by the hexadecimal digits). Always enclose the parameter value in quotes. For example, to specify <code>[Ctrl/C]</code> as the ECM character, you enter either:</p> <pre>ecm_char="^c"</pre> <p>or</p> <pre>ecm_char="0x03"</pre> <p>To specify an ASCII display character as the ECM character, enter the character in quotes or its hexadecimal value in quotes as the parameter value.</p> <p>To specify no ECM character, enter:</p> <pre>ecm_char="none"</pre> <p>Default: <code>"^^"</code> or <code>"0x1E"</code></p> <p>Determines the action taken when you generate a break signal. Possible values are:</p> <ol style="list-style-type: none"> <li>1 No action.</li> <li>2 Enter command mode.</li> <li>3 Send "interrupt process" to host.</li> <li>4 Send "interrupt process" to host and ECM.</li> </ol> <p>Default: 3</p>



**Table 6-9 (Cont.) Telnet Entries and Descriptions**

<b>Entry</b>	<b>Description</b>
MUI_PROMPT=	<p>Specifies the prompt when you are in BAPI command mode and you press the ECM character. The prompt must be an ASCII string up to 10 characters, and must be enclosed in quotation marks if the string includes a space. Do not use quotation marks within the string.</p> <p>Default: "MUI&gt; "</p>
REDIREC_COM=	<p>Specifies whether BAPI should redirect the first, second, or neither COM port to the network interface. Possible values are:</p> <ul style="list-style-type: none"> <li>0 Characters through neither port are redirected to or from the network.</li> <li>1 Characters through COM1 (via BIOS INT 14h) are redirected to or from the network.</li> <li>2 Characters through COM2 (via BIOS INT 14h) are redirected to or from the network.</li> </ul> <p>Range: 0 to 2</p> <p>Default: 1</p>

## PROTOCOL.INI File Template

The following template is an example of the parameters for the TCP/IP protocol, drivers, and adapters

The Netsetup utility modifies this template according to the specified configuration choices, and then creates the PROTOCOL.INI file. Thus, the contents of a given PROTOCOL.INI file depend on the protocols and adapters specified during configuration.

**Example PROTOCOL.INI**

```

;*****
; %VER1.1d Protocol Manager Initialization File Template
; The following are default sections for various adapters and
; protocols
;*****

;***** .i.adapter:parameter settings:examples;
;** ADAPTERS      **
;*****

; 3Com 3C503
[ETHERLINKII]
    DRIVERVERNAME = ELNKII$
    INTERRUPT = 3
    IOADDRESS = 0x300
    XMITBUFS = 2

; 3Com 3C523
[ETHERLINK/MC]
    DRIVERVERNAME = ELNKMCS

;*****
;** PROTOCOLS      **
;*****

; TCP Protocol drivers .i.protocols, sample parameters;

```

## 6-18 Configuration

### [TCPIP]

```
DRIVERNAME = TCPIP$
BINDINGS = ETHERLINK/MC
IPADDRESS0 = xxx xxx xxx xxx
SUBNETMASK0 = xxx xxx xxx xxx
DEFAULTGATEWAY0 = xxx xxx xxx xxx
SNAP = NO
ARPTBLSIZE = 10
IPSOCKETSIZE = 0
TCPCONNECTIONS = 8
TCPCONNTIMEOUT = 0
TCPWINDOWSIZE = 1024
TCPSEGMENTSIZ = 1024
LOADFACTOR = 100
LBP = 50
MBP = 30
LBUFSZ = 1100
MBUFSZ = 600
SBUFSZ = 100
CLIENTOD = 2
CLIENTBD = 10
CLIENTMSG = 10
CLIENTAMSG = 5
```

### [TCPGLOBAL]

```
HOSTNAME = "NETSTATION"
NETFILES = "C:\ETC"
```

### [DNR]

```
DRIVERNAME = DNR$
BINDINGS = TCPIP
NAMESERVER0 = xxx xxx xxx xxx
DOMAIN = "COMPANY.COM"
```

### [NMDRV]

```
DRIVERNAME = NMDRV$
BINDINGS = TCPIP
SYSTEMID = "1.3.6.1.4.1.43.1.5"
SYSTEMDESC = ""
```

### [SOCKETS]

```
DRIVERNAME = SOCKETS$
BINDINGS = TCPIP
NUMSOCKETS = 32
POOLSIZE = 10000
NUMTHREADS = 32
MAXSENDSIZE = 1024
```

```
[TELNET]
  DRIVERNAME = TELNET$
  BINDINGS = TCPIP
  NSESSIONS = 4
  MAX_OUT_SENDS = 3
  MAX_SEND_SIZE = 128
  DRIVER_EOL = 1
  APP_EOL = 1
  REDIRECT_COM = 1
  ECM_CHAR = "^^"
  BRK_ACTION = 3
  MUI_PROMPT = "MUI> "

[RFCNETBIOS]
  DRIVERNAME = TCPNB$
  BINDINGS = TCPIP
  NUMNCBS = 16
  NUMNAMES = 6
  NUMSESSIONS = 8
  SCOPE = ""
```



# A

## Error Messages

---

This appendix lists TCP load/init messages and FTP messages that are displayed on the station. Each message is followed by an explanation of its probable cause and a recommended recovery action.

Messages of each type are listed in ascending numerical order.

### Message Format

The format of TCP messages is:

- NET####: message text
- FTP####: message text
- NMF####: message text

where:

####	Is a four-digit number that identifies the message.
message text	Is a short message that describes the error or status condition that generated the message.

### Load/Init Errors

**NET0100: Incorrect value for *<parm name>* detected in PROTOCOL.INI file by *<module name>*.**

*Explanation:* An incorrect value or incorrect number of values for a parameter was found in the PROTOCOL.INI file. *<module name>* is the name of the network module that encountered the incorrect value. *<parm name>* is the name of the parameter that has the incorrect value.

*User Action:* Correct the value in the PROTOCOL.INI file.

**NET0101: The value for *<parm name>* not found in PROTOCOL.INI file by *<module name>*.**

*Explanation:* Either a parameter is missing or the value for the parameter is missing from the PROTOCOL.INI file.

*User Action:* Add the parameter and its value to the PROTOCOL.INI file.

**NET0102: Cannot load *<module name>* *<vers>*: incompatible DOS version.**

*Explanation:* The network could not be loaded because it cannot execute on the version of DOS that is currently on the workstation. The version of DOS must be 3.0 or greater. *<module name>* is the name of the network module that detected the incompatible DOS version. *<vers>* is the version number of the network module. You get this error message if you try to load the network software in the DOS-compatibility environment.

*User Action:* On a DOS workstation, install a version of DOS that is 3.0 or greater.

**NET0103: Insufficient memory to allocate *<value>* *<parm name>* by *<module name>*.**

*Explanation:* There was not enough memory for the network software to obtain internal resources that it needs, for example, internal buffers used by the network software. *<module name>* is the name of the network module that was unable to obtain the resource. *<value>* is the amount of the resource, and *<parm name>* is the name of the parameter/resource.

*User Action:* Lower the amount of the resource that was requested.

**NET0104: Insufficient memory to initialize *<module name>*.**

*Explanation:* There was not enough memory to obtain all the resources needed by a network module *<module name>*, for example, internal buffers used for sending messages.

*User Action:* Lower the amount of resources needed by *<module name>* in order to fit in the amount of resources available.

**NET0105: Bind failure: <module name> cannot bind to <module name>.**

*Explanation:* For the network to load successfully, each piece of the network software must load successfully. This error is displayed when all network modules have not loaded successfully. The first <module name> is the name of the network module that is now failing to load. The second <module name> is the name of the network module that is not loaded.

This situation could arise from the following:

- Upon loading, a module detected an error and failed to load. In this case, an error message indicating the problem should have been displayed (prior to the current one).
- If the CONFIG.SYS or AUTOEXEC.BAT file were modified, it is possible that one of the network module names was deleted and, as a result, that module did not load.
- If a secondary protocol stack is being used, it must be manually loaded before executing the service that requires it.

*User Action:* Have the network administrator determine the cause of the problem and make any necessary corrections. If the CONFIG.SYS or AUTOEXEC.BAT file was modified, use a backup copy of the CONFIG.SYS or AUTOEXEC.BAT file.

**NET0106: Open failure on PROTOCOL.INI by <module name>.**

*Explanation:* An error occurred while trying to open the PROTOCOL.INI file. <module name> is the name of the network module that encountered the problem.

*User Action:* Check CONFIG.SYS for the PROTMAN installation line:

```
DEVICE=PROTMAN.DOS/I: <PROTOCOL.INI path>
```

Verify that the PROTOCOL.INI file is present in the directory indicated in the CONFIG.SYS file. The DEVICE=PROTMAN.DOS line in the CONFIG.SYS file should contain an /I option followed by the path to the PROTOCOL.INI file.

If the file is being read from a diskette, make sure the diskette is inserted in the disk drive.



**NET0107: Read failure on PROTOCOL.INI by <module name>.**

*Explanation:* An error occurred while trying to read the PROTOCOL.INI file. <module name> is the name of the network module that encountered the problem.

*User Action:* If the file is being read from a diskette, make sure the diskette is inserted in the disk drive. If the problem persists, try restoring a backup copy of the file.

**NET0108: Close failure on PROTOCOL.INI by <module name>.**

*Explanation:* An error occurred while trying to close the PROTOCOL.INI file. <module name> is the name of the network module that encountered the error.

*User Action:* If the file resides on a diskette, make sure the diskette is inserted in the disk drive.

**NET0109: TCP is not loaded—detected by <module name>.**

*Explanation:* A network module (named TCP) whose services are required by <module name> was not loaded. This may be due to errors detected when the TCP module attempted to load, or because the TCP module was deleted from the load process; that is, the TCP module was deleted from the CONFIG.SYS file.

*User Action:* Check that the configuration file contains the line:

```
DEVICE=TCPDRV.DOS
```

If the configuration file contains the DEVICE=TCPDRV.DOS line, restart and look for error messages. The loading process pauses when an error is encountered.

**NET0110: Insufficient memory to load <module name> <vers>.**

*Explanation:* As the network is loading, modules are “relocated” or moved to other areas in memory to make more efficient use of available memory. In this case, there was not enough memory to relocate a network module. <module name> is the name of the network module that could not be moved.

*User Action:* Try to make more memory available. One way to do this when running DOS is to have the network administrator reduce the number of resident programs that are present in memory.

**NET0111: Error accessing NEMM.DOS. <module name> <vers> not loaded.**

*Explanation:* NEMM.DOS (Network Expanded Memory Manager) is a network module that is required by all other network modules to load. Either NEMM.DOS was corrupted on the disk, or it was accidentally deleted from the load process. <module name> is the name of the network module that is not loaded.

*User Action:* Verify that NEMM.DOS was not accidentally deleted from the load process: there should be a DEVICE=NEMM.DOS line in the CONFIG.SYS file. If CONFIG.SYS is correct, NEMM.DOS can be copied from the installation disks to the proper directory. If there are a number of corrupted files, rerun tcpsetup to reinstall the network software.

**NET0112: Relocation failure. <module name> <vers> not loaded.**

*Explanation:* At load time, network modules are moved in memory to make the most efficient use of memory. In this case, a network module could not be moved to the desired location. This may be due to corruption of the network module as it resides on the disk. <Module name> is the name of the module that could not be relocated. <vers> is the version number of the module.

*User Action:* Reinstall the network by rerunning tcpsetup. If the load continues to fail, contact your network administrator.

**NET0113: Network context failure. <module name> <vers> not loaded.**

*Explanation:* A network module detected an error while accessing expanded memory. This may be due to corruption of the network's NEMM.DOS module, or it may be due to errors in the expanded memory software or hardware. <module name> is the name of the network module that failed to load; <vers> is the version number of the module.

*User Action:* Reinstall the network using tcpsetup. If the error persists, run the diagnostics provided with the expanded memory hardware.

**NET0114: Warning: memory release failure in <module name> <vers>.**

*Explanation:* An error occurred when the network module <module name> attempted to release system memory it no longer requires. This is a diagnostic warning only; the module was able to load and should function properly; however, a small amount of system memory is not accessible. <module name> is the name of the network module that detected the error. <vers> is the version number of the module.

*User Action:* None—This is only a warning. If you continue to get this message, restart to free memory not released.

**NET0116: TCP access failure by <module name>.**

*Explanation:* The network module, <module name>, detected an error while accessing the network TCP module. This may be due to corruption of either <module name> or the network TCP module.

*User Action:* Reinstall the network using tcpsetup.

**NET0117: Incorrect PROTOCOL.INI format detected by <module name>.**

*Explanation:* Information in the PROTOCOL.INI file is incorrectly formatted, due to corruption of the file.

*User Action:* Replace the PROTOCOL.INI file with a backup copy.

**NET0118: Insufficient TCP resources to load <module name>.**

*Explanation:* The parameter configurations for the network TCP module do not contain enough resources to allow <module name> to load. This may be due to modifying PROTOCOL.INI and changing parameters for one or more services modules without changing the corresponding TCP resources.

*User Action:* Remove and reinstall the TCP software to build a new PROTOCOL.INI file and to establish a proper base configuration for network module resources at load time.

**NET0119: PROTOCOL.INI file too large.**

*Explanation:* There is not enough memory to analyze the contents of the PROTOCOL.INI file. The PROTOCOL.INI file exceeds the 8K bytes maximum size allowed.

*User Action:* Edit PROTOCOL.INI and remove unnecessary entries in order to decrease the size.

**NET0120: Logical driver name <name> not found in PROTOCOL.INI.**

*Explanation:* The specified logical driver name was not found in PROTOCOL.INI.

*User Action:* Rerun tcpsetup to create a new PROTOCOL.INI file.

**NET0121: Insufficient TCP resources to load <module name>.**

*Explanation:* The parameter configurations for the network TCP module do not contain enough resources to allow <module name> to load. This may be due to modifying PROTOCOL.INI and changing parameters for one or more service modules without changing the corresponding TCP resources.

*User Action:* Rerun tcpsetup to build a new PROTOCOL.INI file and to establish a proper base configuration for network module resources at load time.

**NET0122: Exceptional error condition detected by <module name>.**

*Explanation:* An internal software error has occurred.

*User Action:* Restart your workstation.

**NET0123: Cannot access Protocol Manager.**

*Explanation:* An error occurred while trying to access the Protocol Manager. This error can occur if the Protocol Manager device driver has not been configured in CONFIG.SYS, or if Protocol Manager cannot be accessed due to an unexpected software error.

*User Action:* Be sure that CONFIG.SYS contains the following line:

```
DEVICE=<path>PROTMAN.DOS/I: <PROTOCOL.INI path>
```

Verify that the PROTOCOL.INI file is present in the directory indicated in the CONFIG.SYS file.

**NET0124: TCP/IP module must be loaded before Windows/386.**

*Explanation:* An error occurred trying to load TCP TRS inside the Windows/386 environment. The TCP/IP module was not loaded. The loading process stops.

*User Action:* Load the TCP/IP module first, then load Windows/386.

**NET0125: NETBIND must be executed before TCP/IP TSR module is loaded.**

*Explanation:* An error occurred trying to load the TCP/IP TSR module. The NETBIND program was not executed.

*User Action:* Run NETBIND first, then load the TCP/IP TSR module.

## FTP Errors

**FTP1000: Ambiguous command—does not contain enough characters to be uniquely identified.**

*Explanation:* The FTP command specified does not contain enough characters to uniquely identify the command you want to use. For example, RE is an ambiguous command because it could mean either REMOTEHELP or RENAME. In this example, a third letter must be used to uniquely specify the command.

*User Action:* Reenter the desired command specifying the entire FTP command, or enter enough characters so that the command cannot be confused with another valid command.

**FTP1001: Unrecognized FTP command.**

*Explanation:* FTP did not recognize the command. Either the command was misspelled, or it is not supported by this implementation of FTP.

*User Action:* Check the spelling of the command. Retry the operation using a valid FTP command. To invoke the FTP HELP facility, at the FTP prompt enter:

```
HELP
```

**FTP1002: Missing closing quotation mark—assumed at end of string.**

*Explanation:* FTP detected a missing quotation mark and proceeds as if the quotation mark was at the end of the input string.

*User Action:* If FTP's assumption of the placement for the quotation mark is incorrect, you need to reissue the command and the quoted data with the correct quotation placement.

**FTP1003: String too long—must be no longer than *<length>* characters.**

*Explanation:* An invalid string was entered in response to an FTP prompt. The valid length of a string depends on the state of FTP when the error occurred. *<length>* indicates the maximum length.

*User Action:* Reenter a string that is less than or equal to *<length>* characters.

**FTP1004: No match for *<filespec>*.**

*Explanation:* This error can occur if a local file (or files) is specified and a file matching the description does not exist. *<filespec>* may include wildcard characters.

*User Action:* Check spelling and use of any wildcard syntax. Perform a local directory listing to see if the file(s) exist.

**FTP1005: Unable to change local directory to *<directoryspec>*.**

*Explanation:* FTP could not change the current working directory to *<directoryspec>*. This could be caused by incorrect spelling or improper path specification.

*User Action:* Check spelling and syntax of the desired pathname. Verify that the directory exists and reissue the command.

**FTP1006: Ambiguous help command: *<command>*.**

*Explanation:* An FTP command specified in a HELP request does not contain enough characters to be uniquely identified.

*User Action:* Reenter the HELP command specifying the entire FTP command, or enter enough characters so that the command cannot be confused with another valid command.

**FTP1007: Unrecognized help command: *<command>*.**

*Explanation:* An FTP command specified in a HELP request is not recognized.

*User Action:* Check spelling of the command. Also check to make sure that the command is supported by this FTP implementation. To invoke the FTP HELP facility, at the FTP prompt enter:

HELP

**FTP1008: Unrecognized option—*<option>* ignored.**

*Explanation:* This implementation of FTP does not recognize this option. This error only occurs when an invalid option is specified on the command line when starting FTP. All options that can be specified from the command line may also be set from within the FTP application by issuing the appropriate FTP commands.

*User Action:* Make sure the option is supported, then reenter the command.

**FTP1009: The drive specification: *<drivespec>* cannot be located.**

*Explanation:* A drive specified in the DRIVE command cannot be located. This error occurs if the specified drive does not exist.

*User Action:* Specify a valid drive. If the specified drive is a diskette drive, check that a diskette is properly inserted into a specified drive and that the door is closed.

**FTP2000: Unable to open local file: *<filename>*.**

*Explanation:* A local file with the specified *<filename>* could not be opened as requested by FTP. This could be caused by improper spelling of *<filename>*, improper path specification, or by an attempt to open a read-only file for writing.

*User Action:* Check spelling, pathname, syntax, and protections for the specified file name.

**FTP2001: Unable to read from local file—file is locked.**

*Explanation:* A read was attempted on a locked file. This can happen if you attempt to access a file that another program may have open.

*User Action:* Determine if another program has the file open. If the error persists, restart the computer to reset all of the open files.

**FTP2002: Unable to write to local file.**

*Explanation:* A write was attempted to a read-only file, or the disk is full.

*User Action:* Check file protections on the file name specified in the command, and check to verify that the disk to which the file was being written is not full.

**FTP2003: Error loading command interpreter.**

*Explanation:* FTP is unable to provide a temporary command line environment. The operating system cannot locate and execute COMMAND.COM.

*User Action:* Make sure that the command interpreter is specified under COMSPEC. It must also be in a directory that is in the PATH statement.

**FTP2004: Unable to establish pathname for current working directory.**

*Explanation:* Either there was insufficient memory available for allocation, or the pathname was too long. The maximum pathname length is 66 characters (including the two characters specifying the drive).

*User Action:* Check available memory. Also verify that the pathname does not exceed 66 characters.

**FTP3000: Network software not loaded.**

*Explanation:* Either the network transport or the sockets interface was not loaded before attempting to run FTP.

*User Action:* Load either the transport or sockets interface, and then try to run FTP again.

**FTP3001: Internal networking error (<errmsg> - <number>).**

*Explanation:* An attempt to interact with the network has failed. <errmsg> is a text message describing the type of networking error that has occurred.

*User Action:* The connection is terminated, and in most cases the FTP application is also terminated. Try restarting and reloading the network. If the error persists, contact your network administrator.

**FTP3002: Time out expired on network service request.**

*Explanation:* Due to a lost connection, or an extreme delay in the network, a timer has expired and the connection is assumed lost.

*User Action:* The connection was terminated, and in most cases the FTP application was also terminated. Restarting and reloading the network may solve the problem. If the error persists, contact your network administrator.



**FTP3003: Invalid or unknown host: <hostname>.**

*Explanation:* FTP was unable to match <hostname> to an IP address. <hostname> may be spelled incorrectly; it may not be listed in a host file, or it may not be registered on the network.

*User Action:* Check the spelling of the hostname. Make sure <hostname> is included in the host file if the host file is being used for name-to-IP address resolution. If the hostname does not work, try using the IP address in the command.

**FTP3004: Unable to connect to <host> (<reason>).**

*Explanation:* FTP was unable to initiate a connection to the specified host. <reason> is a text message indicating the cause of the failed connection. The reason for the failed connection may be one of the following:

- The connection timed out. For example, a timeout expired prior to connection establishment.
- The connection is refused by the host.
- The host is unreachable. For example, the host is not running or IP addresses may be configured incorrectly.
- Insufficient resources on the network or the workstation.

*User Action:* Attempt the connection again at a later time. If the error persists, contact your network administrator.

**FTP3005: Session lost—connection reset.**

*Explanation:* The session with the remote server was lost unexpectedly. FTP has reset itself to a disconnected state.

*User Action:* Use the OPEN command to try to reestablish a connection to the remote server.

**FTP3006: Data connection closed unexpectedly—transfer failed.**

*Explanation:* During the process of data transfer between an FTP client and server, the data connection was closed by the remote host. This error occurs only when data is being transferred from the local machine to the remote host.

*User Action:* Attempt the data transfer again. If the error persists, contact your network administrator.

**FTP4000: Not connected to an FTP server—use OPEN first.**

*Explanation:* An FTP connection from the local FTP client to an FTP server was not established prior to issuing this command.

*User Action:* After connecting to an FTP server with the OPEN command, try the command again.

**FTP4001: Already connected—use CLOSE first.**

*Explanation:* An OPEN command was issued when the client is already connected to an FTP server. The OPEN command is only valid when FTP is not currently connected to an FTP server. Only one connection can be OPEN at a time.

*User Action:* No action is needed. If you want to connect to a different server, issue the CLOSE command, then reissue an OPEN command to the desired server.

**FTP4002: Server response not understood.**

*Explanation:* A response from the FTP server was not understood by the FTP client. It is possible that an error has caused a loss of synchronization between the server and the client.

*User Action:* If the error persists, exit FTP. Restart the application and reissue the desired commands. The DEBUG option may be valuable in determining the cause of this error.

**FTP4003: Unrecognized transfer type.**

*Explanation:* An unsupported or unrecognized transfer type was specified using the TYPE command.

*User Action:* Be sure to correctly enter only the ASCII and Binary transfer types.

**FTP4004: Connection not accepted by server.**

*Explanation:* The FTP server is currently unable to accept the connection. The cause of this error is dependent on the implementation of the FTP server when a connection was attempted. A common cause is the lack of the necessary system or network resources on the FTP server host.

*User Action:* Attempt the connection again at a later time. If the error persists, contact your network administrator.

**FTP5000: File list overflow.**

*Explanation:* A wildcard expansion has caused an internal FTP buffer to overflow. This may happen if a very generic file specification (for example, \*.\* ) has matched an extremely large number of files. This is possible only on the MGET, MPUT, and MDELETE commands.

*User Action:* Be more specific about the files to be manipulated, or separate the files into smaller categories. For example, where the command MGET \*.\* may cause the capture buffer to overflow, the command MGET \*.c \*.h \*.asm would probably work.

## Network Maintenance Errors

**NMF1000: Network driver error.**

*Explanation:* An internal network driver error has occurred. The error can be in the TCP driver or the network management driver (NMDRV or NM TSR).

*User Action:* Restart the system and try the operation again.

**NMF1001: Too many parameters.**

*Explanation:* Too many parameters are specified in the command line when running PING, ARP, or NETSTAT.

*User Action:* Type PING, ARP, or NETSTAT without any parameters; a brief description on how to use these programs appears on the screen.

**NMF1002: Invalid parameter.**

*Explanation:* The parameter(s) specified for PING, ARP, or NETSTAT is invalid.

*User Action:* Type PING, ARP, or NETSTAT without any parameters and a brief description on how to use these programs appears on the screen.

**NMF1005: Need to run NM TSR.EXE first.**

*Explanation:* The NM TSR.EXE program is not loaded. You must first run the nm tsr program before using any of the NMF functions.

*User Action:* Run the NM TSR program. Make sure you see the message "NM TSR loaded successfully."

**NMF1006: Failed to open nmdrv/nmtrs.**

*Explanation:* The NMTRS program is not accessible to the NMF application.

*User Action:* Run the NMTRS program.

**NMF1008: Insufficient memory.**

*Explanation:* This can happen in running NETSTAT.EXE and ARP.EXE. It means the system does not have enough memory to perform the operation.

*User Action:* Close some active connections and try the operation again. If this does not solve the problem, restart the system.

**NMF1009: Unknown host: <hostname>.**

*Explanation:* This happens when running PING or ARP with a host name. It means that the host name you enter was not found in the domain name server, and either you do not have a local host file or the name was not in your local host file.

*User Action:* Check the name and make sure it is the name you are trying to resolve. If the name is correct, you can either ask the network administrator to add the name into the name server, or you can add it to the local host file. If you know the IP address of the host you are trying to use PING or ARP, you can also use its IP address instead of its host name.

**NMF1010: Name server not responding.**

*Explanation:* This happens when running PING or ARP with a host name. It means the domain name server you specify in your PROTOCOL.INI file is not responding to the name request. Either the server is down or the name service is not available from that host. Furthermore, your system either does not have a local host file, or the name is not found in that file.

*User Action:* There are a number of actions you can consider. First, check the PROTOCOL.INI file to make sure that the IP address of your name server is correct. Second, check to be sure the name server is up and running. You can use PING with the server's IP address to do this. If you already know the IP address of the host you are trying to resolve, you may also bypass the name server by including the name in your local host file, or using the IP address instead of the host name.

**NMF1011: Name server error.**

*Explanation:* This happens when running PING or ARP with a host name. It means the name server you specify in your PROTOCOL.INI file encountered some error and was unable to resolve the name.

*User Action:* Report the problem to your network administrator to see how the problem can be corrected at the name server end. Meanwhile, use either the local hosts file or the IP address for PING and ARP.

**NMF1012: Domain name server not loaded.**

*Explanation:* This happens when running PING or ARP with a host name. In order to resolve a name using the domain name server, you must load the domain name resolver first.

*User Action:* Run the DNRTSR.EXE program.

**NMF2000: Internet address not available.**

*Explanation:* This happens when running NETSTAT -c or NETSTAT -a. The protocol stack is unable to return the internet (IP) address of this host.

*User Action:* Check the PROTOCOL.INI file to make sure the IP address field is correct.

**NMF2001: TCP connection table not available.**

*Explanation:* This happens when running NETSTAT -t or NETSTAT -a. The protocol stack is unable to retrieve information regarding current TCP connections.

*User Action:* This error message usually is a result of an internal TCP driver error. Restart the system and try the operation again.

**NMF3000: Invalid timeout value.**

*Explanation:* The timeout value specified in the PING command line is invalid. A valid timeout value must be between 1 and 300 seconds.

*User Action:* Try the operation again with a valid timeout value.

**NMF4000: Failed to clear ARP table.**

*Explanation:* The ARP table is corrupted. This can be caused by TCP driver internal error or by other programs corrupting the memory.

*User Action:* Restart the system and try the operation again.

**NMF4001: Insufficient memory to get ARP table.**

*Explanation:* The ARP table is too big to fit in the memory allocated by the ARP.EXE program.

*User Action:* Run ARP -c to clear the ARP table.

**NMF4002: ARP table not available.**

*Explanation:* This happens when running ARP.EXE. The ARP table is probably corrupted.

*User Action:* Restart the system and try the operation again.



# B

## Name Services

---

TCP provides two ways to resolve host names into IP addresses, by using:

- Internet domain name service.
- Local hosts database.

### Domain Name Service

To use the Domain Name Service, you must load Domain Name Resolver (DNR) along with the other TCP modules. DNR takes a host name from an application program, sends a query to a name server (usually a UNIX server, VAX/VMS with UCX) on the network and returns an IP address.

The following application programs use DNR to map a host name to an IP address:

- FTP.EXE
- VT.EXE
- ARP.EXE
- PING.EXE

When a host name instead of an IP address is used, the program first checks whether the DNR is loaded. If it is, the following steps are used to resolve the name:

1. The domain name resolver sends a request over the network to the name server to resolve the name. If successful, the program returns the IP address. If the name server is not active or the host name is not stored in the name server's database, this request fails and the program tries the next step.
2. The program looks for the domain name in the hosts database in the path specified by the netfiles parameter. If the netfiles parameter is not specified, the program looks for the hosts file in the C:\ETC directory.



If both steps 1 and 2 fail, the program returns with a “host name not found” error message. If DNR is not loaded, only step 2 is used.

## Hosts File Database

The local hosts file is a text file similar to the `/etc/hosts` file in a UNIX host. As a result, you can download the hosts file from a UNIX host using the FTP program. You can also construct the hosts file yourself using the following format. Each line of the hosts file consists of the following:

```
Internet address host name [aliases] # comments
```

Items are separated by any number of blanks and/or tab characters. A pound sign (#) indicates the beginning of a comment. Characters that follow this symbol are interpreted by routines that search the file. Internet addresses are specified in the conventional ‘.’ notations. Host names can contain any printable character other than a new line or comment character. A host name can have one or more optional aliases.

The local hosts file must be located in the directory specified by the `netfiles` parameter or in the `C:\ETC` directory.

## A

APPEND command, 4-6  
ARP program, 2-3  
ARP protocol, 2-2  
ASCII command, 4-6  
ASCII file transfer  
    *See* File transfer

## B

BAPI  
    *See* Bridge Application Program Interface  
Batch file program loading  
    for FTP, 3-3  
    for Telnet, 3-2  
BELL command, 4-7  
BGET command, 4-7  
BINARY command, 4-7  
Binary file transfer  
    *See* File transfer  
Bind count for program loading, 3-1  
BPUT command, 4-8  
Bridge Application Program Interface (BAPI), 2-3, 5-1  
BYE command, 4-8

## C

CD command, 4-8  
Changing  
    file name on remote host, 4-20  
    local directory, 4-13  
    local disk drive, 4-10  
    remote host directory, 4-8  
CLOSE command, 4-9  
Closing FTP connections, 4-5  
! command, 4-24

? command, 4-25  
Connecting to host computer  
    after starting FTP, 4-3  
    in a window environment, 5-1  
    while starting FTP, 4-2  
Copying files  
    *See* File transfer  
Creating a remote host directory,  
    4-16

## D

DEBUG command, 4-9  
DELETE command, 4-9  
Deleting  
    multiple files on remote host,  
        4-15  
    remote host directory, 4-21  
    single file on remote host, 4-9  
Demand Protocol Architecture (DPA), 2-2, 3-1, 3-4  
    batch files, 3-2, 3-3  
    TCPUNLD, 3-3, 3-4  
DIR command, 4-10  
Directory  
    abbreviated list for local, 4-14  
    abbreviated list for remote, 4-14  
    changing local, 4-13  
    changing remote host, 4-8  
    creating remote, 4-16  
    deleting remote, 4-21  
    displaying local directory drive  
        and pathname, 4-14  
    displaying pathname for remote  
        host, 4-19  
    displaying remote host file names  
        in specified directories,  
        4-16

## 2 Index

### Directory (Cont.)

- listing a specified remote, 4–10
- listing local, 4–13
- listing more than one remote, 4–15

### Disconnecting

- FTP session with remote host, 4–9

### Disk drive, changing local, 4–10

### Displaying

- FTP commands alphabetically, 4–25
- FTP current status, 4–22
- Help commands, 4–12
- Help commands on remote host, 4–20
- local directory contents, 4–13, 4–14
- multiple remote directories, 4–15
- ON/OFF status for FTP functions, 4–22
- pathname for remote host directory, 4–19
- pound sign for data transfer, 4–12
- remote file contents, 4–22
- remote host abbreviated directory contents, 4–14
- remote host directory contents, 4–10
- remote host file names in specified directories, 4–16
- remote host responses, 4–24

### DNR

*See* Domain Name Resolver

### DNRDRV.OS2, 2–3

### DNRTSR.EXE, 2–3

### Domain Name Resolver (DNR), 2–3, B–1

### Domain name service, B–1

### DOS-based application requirements, 2–4, 2–7

for FTP, 2–4

for NMF, 2–5

for terminal emulators, 2–6

### DOS-based application requirements (Cont.)

other, 2–7

### DOS operating system

Domain Name Resolver module, 2–3

network management module, 2–3

protocol module, 2–2

socket module, 2–3

### DPA

*See* Demand Protocol Architecture

### DRIVE command, 4–10

## E

### Error messages, A–1

File Transfer Protocol, A–8

format, A–1

Load/Init, A–1

network maintenance, A–14

### Ethernet, 2–2

### Exiting DOS temporarily from FTP, 4–24

### Extended memory driver, 2–3

## F

### Files

*See also* Directory

*See also* File transfer

deleting multiple on remote host, 4–15

deleting single on remote host, 4–9

displaying contents of remote, 4–22

### File transfer, 4–1, 4–25

binary type, local to remote, 4–8

binary type, remote to local, 4–7

current type, local to remote, 4–6, 4–17, 4–21

current type, remote to local, 4–11, 4–12, 4–19

interactive prompting, 4–18

local to remote, 4–4, 4–6, 4–17, 4–18, 4–21

**File transfer (Cont.)**

- remote to local, 4-4, 4-5, 4-7, 4-11, 4-12, 4-19
- remote to local using current type, 4-16
- setting type to ASCII, 4-6
- setting type to ASCII or binary, 4-23
- setting type to binary, 4-7

**File Transfer Protocol**

*See* FTP

**File Transfer Protocol (FTP)**

- about, 2-1
- application requirements, 2-4
- batch file, 3-3
- commands, 4-5
- displaying alphabetical list of commands, 4-25
- error messages, A-8
- File Transfer Service, 4-1, 4-25
- wildcard expansion for commands, 4-11

**FTP, 2-3**

3FTP.BAT file, 3-3

FTP.EXE, 2-3

FTP command, 4-2

3FTP command, 4-3

**G**

GET command, 4-4, 4-5, 4-11

GLOB command, 4-11

**H**

HASH command, 4-12

HELP command

*See also* REMOTEHELP command

Host name database, B-2

**I**

ICMP protocol, 2-2

Interrupt 14H interface, 2-3

IP

address, 2-3

**IP (Cont.)**

protocol, 2-2

IP address

- obtaining from domain name service, B-1, B-2
- obtaining from local hosts database, B-2

**L**

LAPPEND command, 4-12

LCD command, 4-13

LDIR command, 4-13

Listing

a specified remote, 4-10

local, 4-13

more than one remote, 4-15

LLS command, 4-14

Load/Init error messages, A-1

Local directory

*See* Directory

LPWD command, 4-14

LS command, 4-14

**M**

MDELETE command, 4-15

MDIR command, 4-15

Memory

extended, 2-3

minimizing for TCP/IP, 3-1

minimizing with 3FTP, 4-3

MGET command, 4-16

MKDIR command, 4-16

MLS command, 4-16

MPUT command, 4-17

Multiple sessions in window environment, 5-2

**N**

Name services, B-1

NEMM.DOS, 2-3

NETSTAT program, 2-3

Network maintenance

error messages, A-14

## 4 Index

### Network Maintenance Facilities

- (NMF), 2-1
- application requirements, 2-5
- Network Management Driver, 2-3
- NMTSR.EXE, 2-3

## O

- OPEN command, 4-17

## P

- PING program, 2-3
- Port command sending, 4-21
- PROMPT command, 4-18
- Protocol stack, 2-2, 2-3
- PUT command, 4-4, 4-18
- PWD command, 4-19

## Q

- QUIT command, 4-19
- QUOTE command, 4-19

## R

- Reading commands from specified file, 4-23
- RECV command, 4-19
- Reentering DOS
  - from FTP, 4-5
- Reflection, 5-2
- REMOTEHELP command, 4-20
- Remote host directory
  - See Directory
- RENAME command, 4-20
- RMDIR command, 4-21

## S

- SEND command, 4-21
- Sending protocol command to remote server, 4-19
- SENDPORT command, 4-21
- Session
  - closing on FTP, 4-9
  - opening on another computer, 4-17

### Session (Cont.)

- termination on FTP, 4-8, 4-19

### Setting

- Debug ON/OFF, 4-9
- file transfer type to ASCII, 4-6
- file transfer type to ASCII or binary, 4-23
- file transfer type to binary, 4-7
- username on remote host, 4-24

- SHOW command, 4-22

### Sidekick, 2-4

- SLASHFLIP command, 4-22

### SmarTerm, 5-2

- SOCKTSR.EXE, 2-3

### Softerm, 5-2

### Starting

- FTP before connecting to host, 4-3
- FTP using 3FTP command, 4-3
- FTP using FTP command, 4-2
- FTP while connecting to host, 4-2

- STATUS command, 4-22

### Subnetwork layer, 2-2

## T

- TAKE command, 4-23

### TCP, 2-2

- applications, 2-1
- components, 2-1, 2-4
- name servers, B-1
- unloadable network programs, 3-3

### TCP/IP

- definition, 2-1
- DPA, 2-2
- minimizing memory, 3-1
- protocol modules, 2-2

### TCPDRV.DOS, 2-2

### TCPTSR.EXE, 2-2

- TCPUNLD.EXE utility, 2-2, 3-3, 3-4

### TCPUNLD status display, 3-4

### Telnet

- batch file, 3-2

- Telnet (Cont.)
    - module, 2-2
  - Terminal emulation, 2-1, 2-3, 5-1, 5-2
    - application requirements, 2-6
    - for Reflection, Soft Term and Smart Term, 5-2
  - Terminate-and-stay-resident programs
    - See also* TSR programs
  - Terminating
    - FTP sessions, 4-8, 4-19
    - TTY connections, 5-2
  - TN.EXE, 2-2
  - Token Ring
    - source routing protocols, 2-2
  - TSR programs, 2-2
    - batch file loading, 3-2, 3-3
    - load order, 3-1, 3-4
  - TTY Terminal Service, 5-1, 5-2
  - TYPE command, 4-23
- U**
- UDP protocol, 2-2
  - USER command, 4-24
  - Username setting on remote host, 4-24
- V**
- VERBOSE command, 4-24
  - 3VT.BAT file, 3-2
- W**
- Wildcard expansion for FTP commands, 4-11



# Reader's Comments

PATHWORKS for DOS (TCP/IP)  
TCP/IP User's Reference  
AA-PET0A-TK

---

Your comments and suggestions help us improve the quality of our publications.

**Please rate the manual in the following categories:**

	Excellent	Good	Fair	Poor
Accuracy (product works as described)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Completeness (enough information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clarity (easy to understand)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organization (structure of subject matter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Figures (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Table of contents (ability to find topic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Index (ability to find topic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Page design (overall appearance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Print quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What I like best about this manual: \_\_\_\_\_

What I like least about this manual: \_\_\_\_\_

Additional comments or suggestions:

\_\_\_\_\_

I found the following errors in this manual:

Page      Description

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

For which tasks did you use this manual?

- Installation
- Maintenance
- Marketing
- Operation/Use

- Programming
- System Management
- Training
- Other (please specify) \_\_\_\_\_

Name/Title \_\_\_\_\_ Date \_\_\_\_\_

Company \_\_\_\_\_ Dept \_\_\_\_\_

Mailing Address \_\_\_\_\_

\_\_\_\_\_ Phone \_\_\_\_\_



Do Not Tear - Fold Here and Tape

**digital**<sup>TM</sup>



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 33 MAYNARD MASS.

POSTAGE WILL BE PAID BY ADDRESSEE

**DIGITAL EQUIPMENT CORPORATION  
CORPORATE USER PUBLICATIONS  
PKO3-1/D30  
129 PARKER STREET  
MAYNARD, MA 01754-9975**



Do Not Tear - Fold Here and Tape

digital