2net FTP Server for DOS

User and Configuration Guide

Version 1.4

2net Limited

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1. Description

The 2net FTP Server provides FTP (File Transfer Protocol) connectivity for embedded and hand-held systems. FTP is a simple and widely supported method of transferring files between systems. An FTP server is ideal for field upgrades, downloading large data logs and system development.

2netFTP for DOS is written as a small Terminate-Stay-Resident (TSR) program that runs in the background without interfering with the foreground control application. It has an integrated TCP/IP stack to make it easy to configure and deploy. Access to the network may be through an Ethernet packet driver or a dial-up link using the PPP driver that is also included in the package

2. System Requirements

- Intel x86 compatible CPU
- 128 KB free RAM
- MS-DOS 3.3 or later
- A network adapter and packet driver or Hays compatible modem or null modem cable.

3. Network Configuration

There are three distinct options for connecting the web server to a network: LAN, direct serial cable and dial-up line using a modem.

3.1. LAN Connection

A connection over an Ethernet LAN requires a packet driver. Almost all network cards are supplied with one on the distribution diskettes, usually in a directory named PKTDRV. If there isn't one, a collection of packet drivers is freely available for a wide range of PC Ethernet interfaces from Crynwr (http://www.crynwr.com). Finally, you can use an ODI driver if you load an ODI to packet converter after the driver. ODIPKT from FTP Software is an example of such a converter.

Once the driver is loaded you can load 2netftp. Usually all the command to do this are put in AUTOEXEC.BAT. In addition, some network parameters must be written into the [Network] section of the 2NET.CFG file

3.2. The [network] section of the 2net.cfg file

Keyword	Description
my_ip=<ip address>	The IP address of the PC in standard "dotted decimal" format
Netmask=<mask>	The subnet mask in dotted decimal format

Here is a sample file:

```
[Network]
my_ip=192.168.1.6
netmask=255.255.255.0
```

3.3. Direct Serial Connection

You can connect 2netftp to another system using a null modem cable and the pppd driver supplied. The client end acts as the initiator and 2netftp as the responder; 2netftp supplies the IP addresses for both systems.

Pppd emulates a packet driver. It should be loaded before 2netftp, usually from the autoexec.bat file. The behaviour of pppd is controlled by the pppd.cfg file. For direct serial line connection, pppd.cfg typically contains

```
COM1
57600
auth
silent
resident
asyncmap 0
10.0.0.2:10.0.0.6
```

A detailed description of all the keywords that may appear in the pppd.cfg file are given later. The keywords used here are

COM1	Sets the communications port. The default is COM1, so this line can be omitted
57600	The baud rate. The default is 57600, so this line can be omitted also
auth	Enable PAP authentication. The names and passwords are contained in the file *pppdpap.cfg*
silent	Disables active negotiation. It will remain silent until contacted
resident	Load as a TSR
asyncmap 0	Disables character escape codes
10.0.0.2:10.0.0.6	Local and remote IP addresses. When the connection is made, the 2netftp server will have address 10.0.0.2 and the client will have 10.0.0.6

The pppdpap.cfg file contains a list of the users allowed to log on to the pppd gateway, up to a **maximum of 10**. There is one user and password per line. For example, the user "guest" with password "123" would look like this:

```
guest     *     123
```

Both user name and password may be up to **63 characters** long, **Case is significant**.

3.4. Direct Serial Connection From Windows 95

It is common to need to connect to 2netftp using a direct connection from a PC running Windows 95, using the standard Dial Up Networking components. Configuring a Windows null modem driver can be tricky, so this procedure is supplied to make the 2netftp system behave like a standard modem.

Windows Configuration

Assuming that Dial Up Networking is already loaded, you need to add a "Standard" modem and create a new dial-up networking connection.

To add the modem, open up the Control Panel and click on the Modems icon. Click on the "Add…" button, and in the next dialog check the box marked "Don't detect my modem; I will select it from a list". Click "Next" and in the next dialog select "Standard Modem Types" and from that list select "Standard 19200 bps Modem". Select the COM port the null modem cable is connected to, and click "Next", then "Finish". Back in the "Modem Properties" dialog box, select the newly installed modem and click "Properties". Drop down the list under "Maximum Speed" and select the baud rate you intend to connect at.

To create a Dial Up Network connection, click on the "Make a New Connection" icon in Dial Up Networking and select the modem you have just added. Click "Next", and in the next dialog enter some numbers for the telephone number – it doesn't matter what, I always use "1234". Click "Next" and then "Finish", and this time you really are finished.

2netftp Configuration

The pppd.cfg file should look something like this:

```
COM1
57600
auth
silent
resident
asyncmap 0
10.0.0.2:10.0.0.6
connect "win95.scr"
```

The “connect” keyword tells pppd to run a script that emulates a modem.

3.5. Dial-up Connection via Modem

Normally, the system running 2netftp will be answering incoming calls originated from a client system running Windows 95 or similar.

The modem is controlled by pppd using the script specified in a “connect” statement. A typical pppd.cfg file would be:

```
COM1
57600
modem
auth
silent
resident
asyncmap 0
10.0.0.2:10.0.0.6
connect "answer.scr"
```

The only difference here is that “local” has been replaced by “modem” to indicate that the modem status lines are to be monitored. The script file “answer.scr” supplied with 2netftp contains the following modem commands:

```
ABORT ERROR ABORT BUSY ABORT 'NO DIALTONE'
ABORT 'NO CARRIER'
REPORT CONNECT
TIMEOUT 60
'' ATZ
OK AT&F
OK AT&C1
OK ATS0=2
OK ''
RING
'' CONNECT
```

This will reset the modem and set it into auto answer mode at the beginning and every time the link is closed or dropped unintentionally.

Keywords Used In Pppd.cfg

Key word	Description	Default
COMn	COM port to use, between COM1 and COM4, using the standard port and interrupt numbers. For non-standard configurations, use the **base** and **irq** keywords instead of COMn	COM1
base <port address>	Base port address	0x3f8
irq <irq number>	Hardware interrupt number	4
<speed>	The baud rate: 2400, 4800, 9600, 19200, 38400, 57600 or 115200. The rate to select depends on the type of UART used. The 8250 and 16550 UARTS are supported. The 8250 can only work reliably at speeds up to 9600. If in doubt, start at a low speed and work upwards.	57600
-crtscts	Disable hardware flow control (CTS/RTS)	-
xonxoff	Use software flow control (i.e. XON/XOFF) to control the flow of data to the serial port.	-
modem	Enable modem status line checks (CD and RING)	-
auth	Enable PAP authentication. The names and passwords are contained in the file *pppdpap.cfg*	-
silent	Disables active negotiation. It will remain silent until contacted	-
resident	Terminate and Stay Resident straight away. Otherwise pppd operates as a foreground application until the PPP link is established	-
connect "<script>"	Run the script file at start up. If *resident*, it is also run whenever the link is closed or dropped.	-
L.L.L.L: R.R.R.R	Set the local and remote IP addresses to L.L.L.L and R.R.R.R, each given in the standard dotted decimal notation.	-

Format of the Script File

ABORT STRINGS

An abort string consists of the key word ABORT followed by a string, enclosed in single quotes if it is more than one word. The aborts if one of these strings is received from the modem.

REPORT STRINGS

Report strings are used to display information returned from the modem. When a string is returned from the modem which matches the report string, the string and all characters to the next carriage return are written to the console. In the example, the string REPORT CONNECT will display the speed at which the connection has been made, e.g.

CONNECT 28000 LAPM

TIMEOUT

The TIMEOUT command sets the timeout in seconds for the next expect-send pair (see below). The default timeout is 45s.

EXPECT-SEND PAIRS

The main part of the script consists of a number of “expect-send” pairs. It waits (for up to the current timeout value) for the “expect” string and then sends the “send” string. An empty expect string (‘’) indicates that nothing is expected and the “send” string is sent immediately.

4. Loading 2netftp

2netftp takes zero or more option flags on the command line. They are:

- **-b** Background mode – run in the background as a TSR. This is the default mode of operation.
- **-f** Foreground mode – runs as a normal DOS application.

In most cases the default operation will be used, so just type 2netftp.

At start-up, it first checks for a network driver. If no driver is found it reports the error message:

NO PACKET DRIVER FOUND

If a driver is found, 2netftp reads the 2NET.CFG file and prints out a sign-on message similar to the one below:

```
2net FTP Server 1.4 build 0813 (DOS)
Copyright (c) 2000-2002 2net Limited. All rights reserved.
FTP files located in C:\
Running in background mode
```

4.1. The [2netftp] section of the 2net.cfg file

The operation of 2netftp can be determined by entries in the [2netftp] section of the 2NET.CFG file.

Keyword	Description
`ftproot=<path>`	Sets the root of the files visible to users of the server. e.g. ftp`root=c:\myfiles` Default: c:\ftpfiles
`ftp_alias=<name>,<path>`	Define an alias directory: whenever a user access a path beginning with <name> the server will substitute <path>. You may use aliases to allow access to several parts of a DOS drive, or to access several different drives. For example: `ftp_alias=/drive-d,d:\` allows users to access drive D: using the path /drive-d You can have up to 4 aliases.
`ftp_port=<port>`	Sets the port number used for connections to the server, where <port> is between 1 and 65535. e.g. `ftp_port=2121` Default : 21
`Anonymous=[yes|no]`	Allow or deny access to anonymous users. An anonymous user may log in with the user name “anonymous” and any non null password. Default: no
`ftp_timeout=<seconds>`	Determine the length of time (in seconds) before an ftp session is terminated. In most cases a timeout is necessary to prevent inactive ftp sessions from preventing other users to access the server. **Only 2 concurrent sessions are allowed**. E.g. ftp_timeout=900 Default: 600 (10 minutes)
`MaxTickSlice=[1..32768]`	The maximum number of 55ms timer ticks the web server will run before suspending e.g. maxTickSlice=2 Default: 1
`MinTickGap=[1..32768]`	The minimum number of 55ms timer ticks before 2netftp resumes following a suspend. e.g. minTickGap=2 Default: 1

5. Setting Passwords

Access to 2netftp is by user name and password. A separate utility, *GENPASS*, is used to create and list the passwords up to a maximum of four.

5.1. Genpass

Use GENPASS to create the password file, PWD, and then copy PWD into the directory containing 2netftp.

GENPASS has two options: add a password and list all passwords. To add a password, use the format

```
genpass -a <user name> <password> /
```

where <user name> and <password> are strings of up to 32 characters, without spaces or punctuation. E.g.

```
genpass –a guest opensesame /
```

To list passwords, use the command

```
genpass –l
```

Note that the password is stored in the PWD file in an *encoded* format, but it is not *encrypted*. Hence it is important to protect it from unauthorised access.