

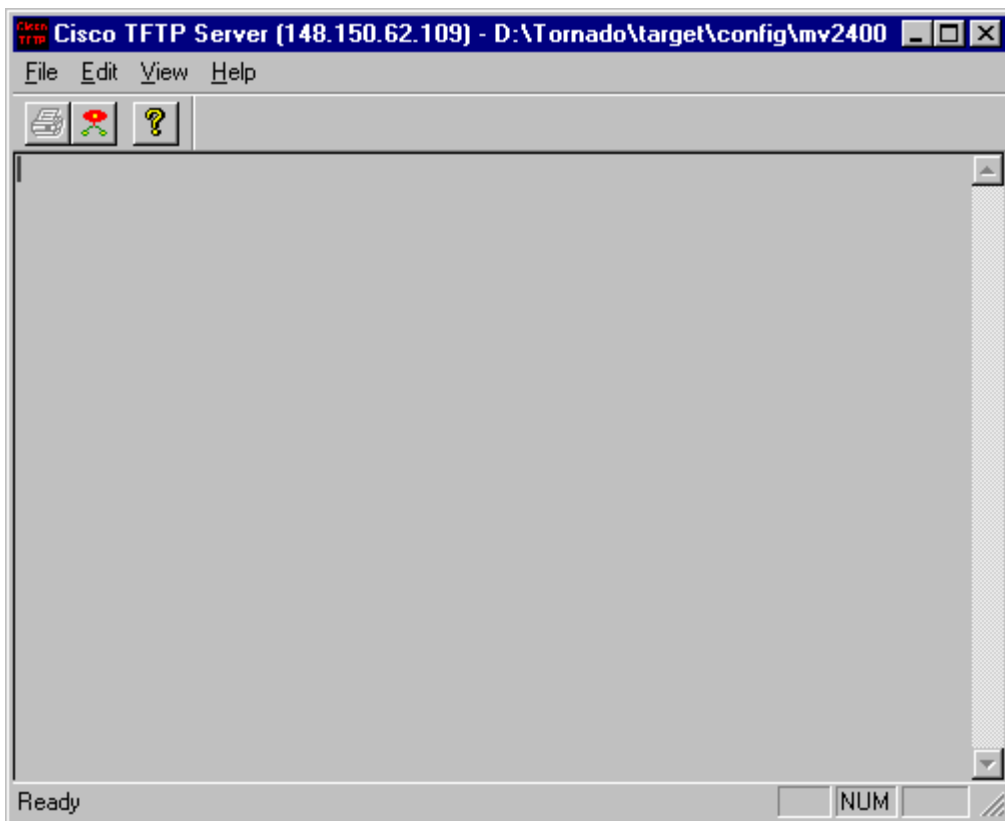
In-place VxWorks boot ROM programming

Comments in red added by BKT 22-May-02

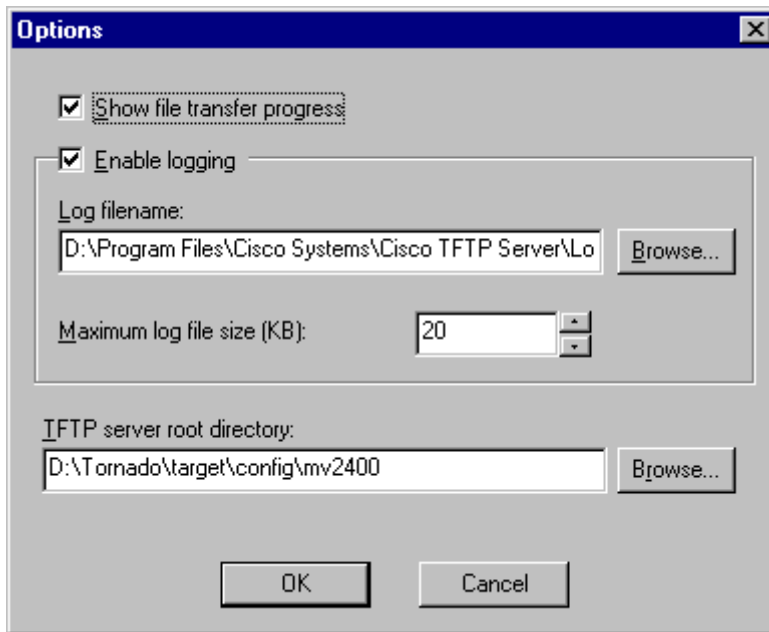
Set up the TFTP server

TFTP stands for "Trivial FTP", which is a low-rent security-less version of FTP. This server program is required because the PC will be talking to PPCBug on the PPC; PPCBug only supports TFTP, and Windows does not have a built-in TFTP server program.

If not already installed, install the Cisco TFTPServer from [\\COBRA\AESD\XCHANGE\Rosenow\TFTPServer1-1-980730.exe](http://COBRA\AESD\XCHANGE\Rosenow\TFTPServer1-1-980730.exe). Start the Cisco TFTPServer on the host computer. You will see something similar to the following:



Note the IP number and path displayed in the title bar of the application, this information will be used in a later step. Select View->Options on the menu bar. The following dialog will be displayed:



Change the TFTP server root directory to the correct BSP directory for your board. In this example, the mv2400 BSP is selected. When you close this dialog, the title bar should show your server root directory.

IMPORTANT: If your PC has more than one Ethernet adapter, TFTP Server always uses the FIRST one in the adapter list; you can't change this. To find out which adapter is first in the list, go to Control Panel, Network and Dial-up Connections, Local Area Connection, right-mouse click to view Properties. And of course make sure your PC is physically connected to the PowerPC via the first Ethernet adapter.

Make the boot ROM image

Use the following command sequence on the host to re-make the BSP boot ROM. This assumes that you have installed VxWorks (Tornado) such that the development tools are command line callable.¹ (First you have to run whatever script you have to define Tornado environment variables)

```
cd target/config/mv2400          (depends on board type)
make clean                       (removes objects but does not remake)
make bootrom_uncmp
elfToBin <bootrom_uncmp >boot.bin (note the spaces)
```

¹Edit the <drive letter>:\Tornado\host\x86-win32\bin\torVars.bat to reflect your setup and run this batch file from a command prompt or, using the information contained in the torVars.bat file, set up your environment using control panel->system->environment.

Load the ROM image into FLASH

Power down the board and switch the ROM jumper to select soldered FLASH (J8 1-2) (for the MV2400)(depends on board). Connect the Ethernet and console serial port cables, then power the board back up. At the PPC4-Bug prompt, start the system clock then set up the network transfer from a TFTP host using `nbiot'. To start the system clock, the set command must be used. The format is: set MMDDYYhhmm where MM is month, DD is day of month, YY is year, hh is hour (24-hour format), and mm is minutes. This command starts the system clock and sets the current date and time. To see if you need to set the time, type time in PPCBug.

```
PPC4-Bug>set 0829000100    (example of setting time)
```

Aside: To see what other commands are available in PPCBug, type `he`. To view a specific command like time, type: `he time`.

Using `nbiot', the Client IP Address, Server IP Address, and Gateway IP Address must be set up for the user's specific environment:

Below, only edit the fields shown in bold. Hit <CR> in all cases.

```
PPC4-Bug>nbiot    ("Network I/O Teach")
Controller LUN =00?
Device LUN   =00?
Node Control Memory Address =00FA0000?
Client IP Address   =123.123.10.100? 148.150.62.1532
Server IP Address   =123.123.18.105? 148.150.62.1093
Subnet IP Address Mask =255.255.255.0?
Broadcast IP Address =255.255.255.255?
Gateway IP Address   =123.123.10.254? 148.150.62.24
Boot File Name ("NULL" for None)   =? .
    (lots more fields here--- just hit <CR>)
Update Non-Volatile RAM (Y/N)? y
PPC4-Bug>
```

Note about Gateway IP Address: All MTS uses 148.150.XX.2. The XX depends on location in the building.

² If the board is on an isolated network, you are at liberty to pick any IP number that you like here as long as it is not the same as the server. The only requirement is that the client and server subnet addresses must match. If the board is on a non-isolated network. Make sure that you don't use someone else's IP address or they will be very upset with you.

³ This must be the same as the number displayed in the title bar of the TFTP server.

⁴ If you are not on an isolated network, you must use enter a Gateway IP address here. Conventionally, at MTS anyhow, this is 148.150.X.2 where X is the subnet that your machines are on.

The file is transferred from the TFTP host to the target board using the 'niop' command. Important: You must have a TFTP server running on your host's subnet for the 'niop' command to succeed. The **path** name must be set to the location of the binary file on the TFTP host. The binary file must be stored in the directory identified for TFTP accesses, but the file name is a relative path and does not include the TFTP directory name: *In other words, the downloaded file will be: Path Name in TFTP Server Title Bar + File Name.*

Below, only edit the fields shown in bold. Hit <CR> in all cases.

```
PPC4-Bug>niop          ("Network I/O Physical")
Controller LUN =00?
Device LUN   =00?
Get/Put      =G?
File Name    =? boot.bin
Memory Address =00004000?
Length       =00000000?
Byte Offset  =00000000?

PPC4-Bug>
```

At this point, the binary image is sitting in RAM at location 0x4000 (do a md 0x4000 and you will see the copyright notice). Now we need to transfer this image from RAM to FLASH ROM.

After the file is loaded onto the target, the 'pflash' command is used to put it into socketed FLASH parts.

This step is extremely critical. If you mess up these numbers, the board will not boot up again unless you remove the munged ROM and replace or reprogram it. These numbers are valid for all Motorola PPC boards.

```
PPC4-Bug>pflash 4000:fff00 ff800100
```

After hitting <CR>, you are prompted for confirmation. Look again at the numbers displayed before proceeding.

When the command is finished, power down the board and switch the ROM jumper to select socketed FLASH (J8 2-3). Then power the board back up.

At this point the FLASH ROM contains the correct information, but the EEPROM still contains old information. This can be modified as follows:

1) Hit any key immediately after reboot sequence begins.

"[VxWorks Boot]:" prompt appears.

2) If desired, type "p" to view current settings.

3) Type "c" to change.

4) Cycle through parameters, typing:

<CR>	to leave unchanged
." <CR>	to erase
<modification> <CR>	to modify

5) When done, the PowerPC parameters should look like this:

boot device	: dc
processor number	: 0
host name	: host
file name	: mv2400 (depends on processor)
inet on ethernet (e)	: 148.150.203.191 (depends on application)
host inet (h)	: 148.150.203.190 (depends on application)
user (u)	: mts_rt
ftp password (pw)	: mts_rt
flags (f)	: 0x8
target name (tn)	: target0
startup script (s)	: startp0.vxc (depends on application)

6) Type @<CR> or CTRL-X to reboot processor.