

AN1765

Application Note

Ethernet Configuration for a ColdFire® Evaluation Board to Download Files from a Personal Computer

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INTRODUCTION

This application note explains how to use a personal computer to transfer code to the target ColdFire® evaluation board. Compared to serial transfers, downloading code to the target evaluation board through Ethernet reduces time and speeds up the evaluation process. Configuring Ethernet downloads is simple and fast. In order to ensure that the configuration is done correctly, however, it is important that all instructions are followed carefully and technical terms are fully understood.

MINIMUM REQUIREMENTS

Information within this document applies to any ColdFire evaluation board that has an NE2000-compatible Ethernet card and requires a trivial file transfer protocol (TFTP) server to download files. To determine if the ColdFire evaluation board meets these requirements, refer to the user's manual that came with the evaluation board. The information in this application note can be used on an existing network with TCP/IP protocol or a two node network consisting of only a single personal computer (PC) and the ColdFire evaluation board.

TECHNICAL TERMS USED

- File Transfer Protocol (FTP)—Requires user authentication. Allows file transfers, directory creation, and multiple file movement during an FTP session.
- Trivial File Transfer Protocol (TFTP)—Allows file transfers without user authentication. Does not allow directory creation or multiple file movement during a TFTP session.
- Straight Twisted Pair Cable—Used to connect any node to an Ethernet connection using a hub.
- Crossover Twisted Pair Cable—Used to connect two Ethernet nodes without a hub. The wiring scheme for both ends of the cable is as follows:

RGBXXWXX
BWRXXGXX

The letter corresponds to the color of the wire. X stands for, 'no connect'. While looking at the RJ45 contacts, the scheme represents the wires facing in the upward direction going from the left to right.



NETWORK CARD INSTALLATION

Skip this section if you are planning to use an existing network.

Install the Ethernet card and any drivers required to complete the installation into the PC (any drivers required for the installation should be supplied with the Ethernet card). Some PNP cards do not require any drivers other than those that come with Windows®. Once the drivers are installed, reboot the computer.

CONFIGURING THE TCP/IP PROTOCOL

To configure the TCP/IP protocol follow these steps:

1. Locate the TCP/IP protocol settings within the Control Panel.
 - In Windows 95®, go to Start -> Settings -> Control Panel and open the Network icon.
 - Administrative privileges may be required with Windows NT® systems.
2. Select the TCP/IP -> <network card> and click on the Properties button.
3. Specify an IP address created by the intranet for the TFTP server. 90.0.0.1 can be used for a personal network address.

Note: When using an additional network card, not connected to an existing network, verify that the address being specified does not already exist. To verify the address does not exist, use the ping command at the Command prompt (Start -> Run), type in 'ping 90.0.0.1'. If there is no response, there probably is no connect with that address. Ask your system administrator to be sure.

4. Specify the subnet mask for the TFTP server to 255.255.255.0.

To connect the ColdFire® evaluation board to an existing network follow these steps:

1. Contact your system administrator for an IP address and the directions.
2. Specify a Gateway address if required.

To configure a two node network:

1. Leave the default settings for the Gateway, WINS, and DNS.
2. Select OK to get out of the properties dialog box
3. Select OK to get out of the network dialog box.

Reboot before trying to use the TCP/IP protocol for the TFTP server.

INSTALLING A TFTP SERVER

Download and install a TFTP server (an FTP server will not work because it requires user authentication). For a free TFTP server called 'NBTFP.ZIP', go to the Freescale ColdFire web site located at:

<http://www.freescale.com/ColdFire>.

Specify any IP addresses if required by the TFTP server. Most servers pick up any and all IP addresses assigned to the computer.

All servers will require a root directory for downloading. Some will default and others will prompt you to enter a specific directory. In either case, make sure the file to download is located in the download directory.

CONFIGURING THE COLD FIRE EVALUATION BOARD

Follow the directions in the evaluation board user's manual concerning the SET command. Using the SET command, specify the client IP address as a new node on the network as follows:

- If the server (PC) is configured for 90.0.0.1 then specify 90.0.0.2 for the ColdFire evaluation board.

- With a subnet mask of 255.255.255.0 the IP address 90.0.0.2 is valid if your PC is set to 90.0.0.1.
- For those with existing networks, contact your system administrator to get an IP address assigned for your ColdFire evaluation board.

Follow the directions in your ColdFire evaluation board user's manual for the remaining SET parameters.

CONNECTING A TWISTED PAIR WITH RJ45 CONNECTORS TO THE NETWORK

For two node networks without a hub, use a crossover twisted pair cable with RJ45 connectors as described earlier. This configuration might be more difficult to get working due to compatibility issues with Ethernet on the ColdFire evaluation board and that on the PC. If, after following all directions, there is no communication, connect both the PC and the ColdFire evaluation board to a hub with straight twisted pair cabling to resolve the communication problem.

For those using a hub, only use straight through twisted pair cables (most commonly used in networks).

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