escale Semiconductor
Application Note

MSC81xx Ethernet Boot Test

1   Introduction

The application note describes how to verify boot over Ethernet for the MSC8144. The document describes general environment setup with examples executed through Microsoft Windows using Weird Solutions server tools and and Ethernet sniffer from Ethereal (all freeware).

> **NOTE** This procedure is not specific to the MSC8144 and can serve for any other Freescale device that supports boot over Ethernet using a DHCP/TFTP flow. Section 6.2 is specific for the MSC8144 device.

Contents

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2 Test Requirements

You must have the following equipment and software available for setting up and running the Ethernet boot test:

- MSC8144ADS system with appropriate power source and interface connections/cables.
- Personal computer running Microsoft Windows.
- Network card.
- DHCP server (this example uses DHCP Turbo).
- TFTP server (this example uses TFTP Turbo).
- Ethernet packet sniffer (this example uses Ethereal).

> **NOTE** The example server software used in this example is available for download from http://www.weird-solutions.com/ and the Ethernet sniffer software is available from http://www.ethereal.com/.

3 Network Card Setup

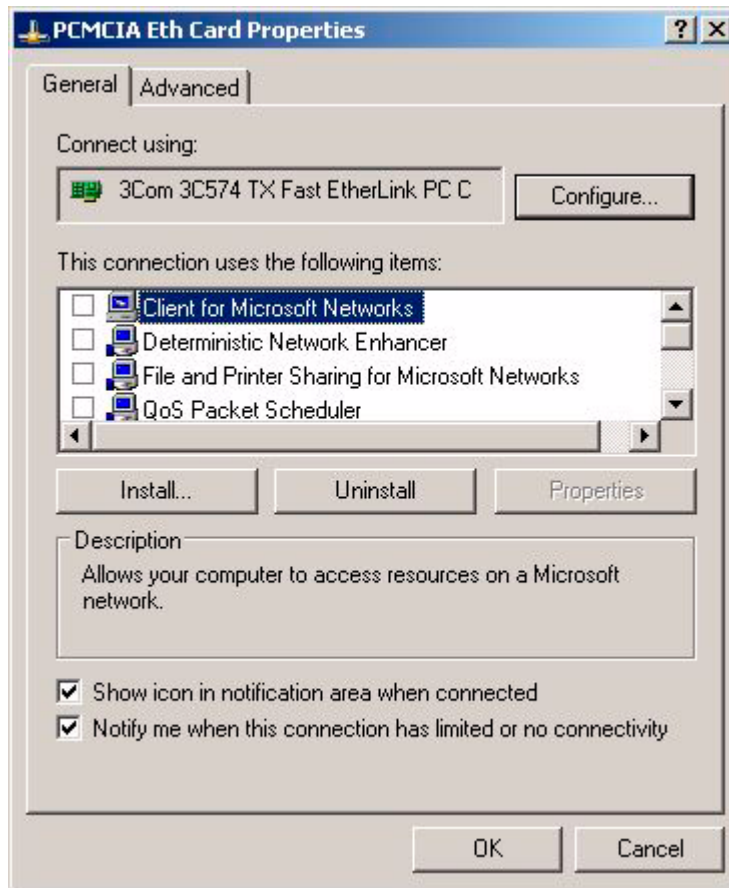Use the following steps to set up the network card:

1. Open the Network Connections window through the Control Panel (Figure 1.).

Figure 1. Selecting the Network Card
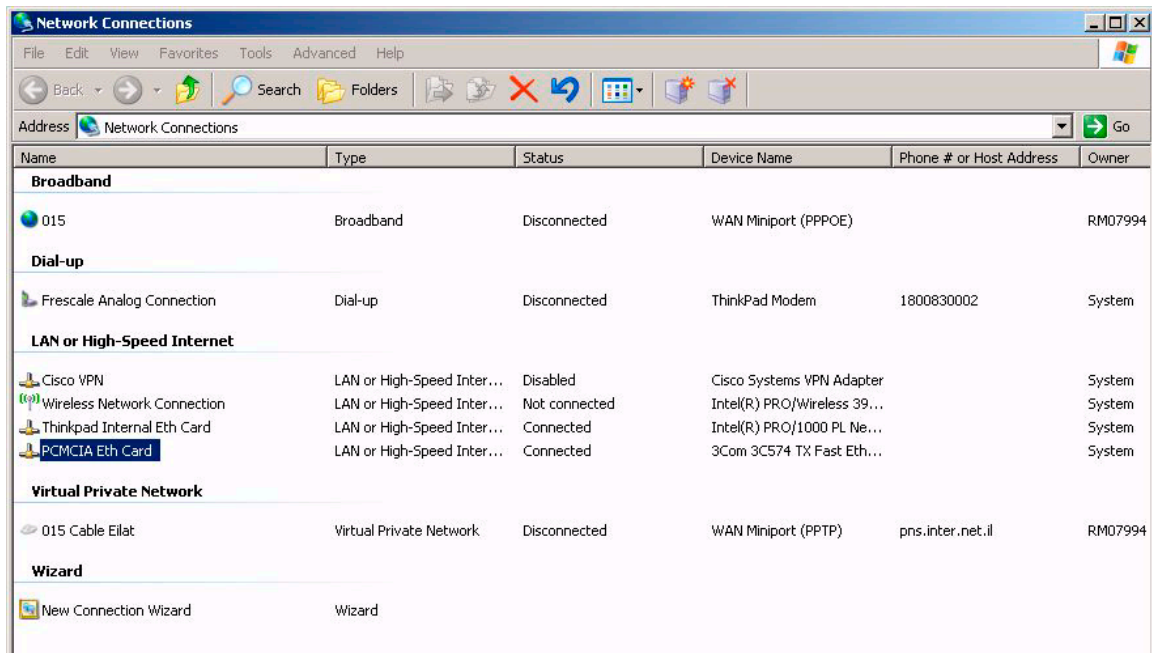
2. Select properties for the dedicated network card (Figure 2.).

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Figure 2. Card Properties

3. Enable the Internet Protocol (TCP/IP) and Network Monitor **ONLY!**

4. Set the IP address to be a fixed address (10.0.0.1) and the Subnet Mask to be 255.255.255.0 (Figure 3.).

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Figure 3. Setting the IP Addresses
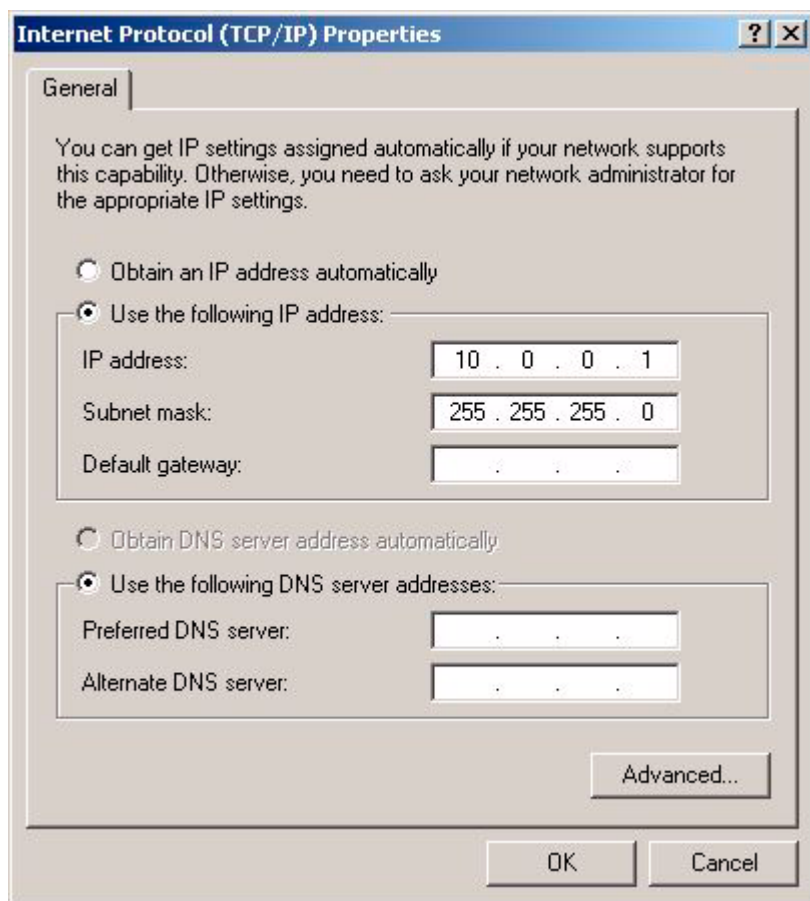
5. You may have to restart the computer to complete the update.

4   DHCP Server Settings

Setting up the DHCP server requires a combination of general set up steps and a set of steps specific for the DHCP Turbo server application.

4.1   General DHCP Server Setup

Use the following general steps to set up the DHCP server:

1. Set a pool of IP addresses.
2. Set the next server as your IP address (10.0.0.1).
3. Set the boot file to be a legal file.

4.2 DHCP Turbo Server Setup

Use the following steps to set up the DHCP Turbo server:

1. Open a new scope (Figure 4.).

Figure 4. Opening a New Scope
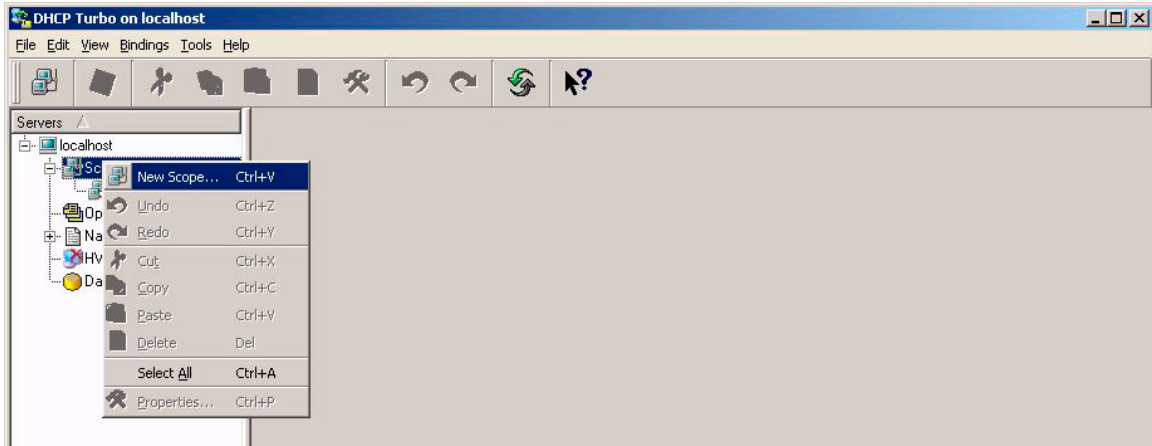
2. Set the address range and subnet mask. Set the segment to be local (Figure 5.).

Figure 5. Setting the Address Rand and Subnet Mask
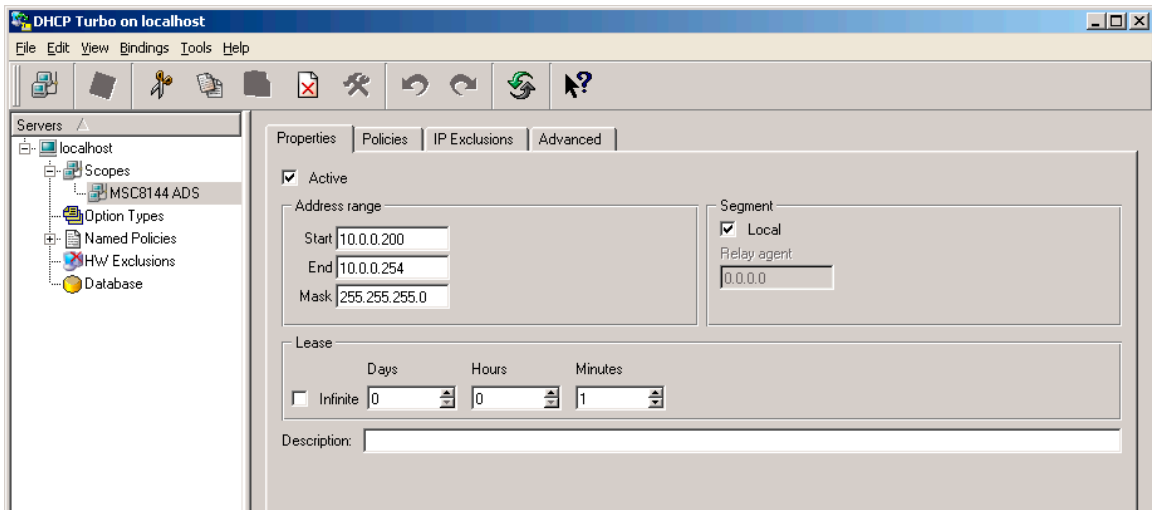
3. Set 2 new policies (see Figure 6.).
   a) Set the boot file to be a legal file.
   b) Set the next address to your IP.

Figure 6. Setting New Policies
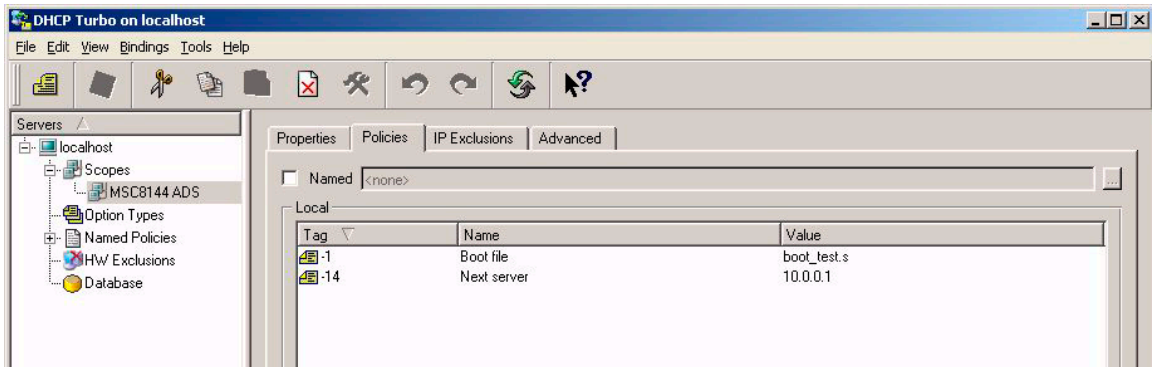
4. Set the server properties (right click the server – localhost by default) (Figure 7.) to the following:

    a) Enable dynamic BOOTP.

    b) Enable detailed logging (will help you debug if there are problems).

Figure 7. Setting the Server Properties

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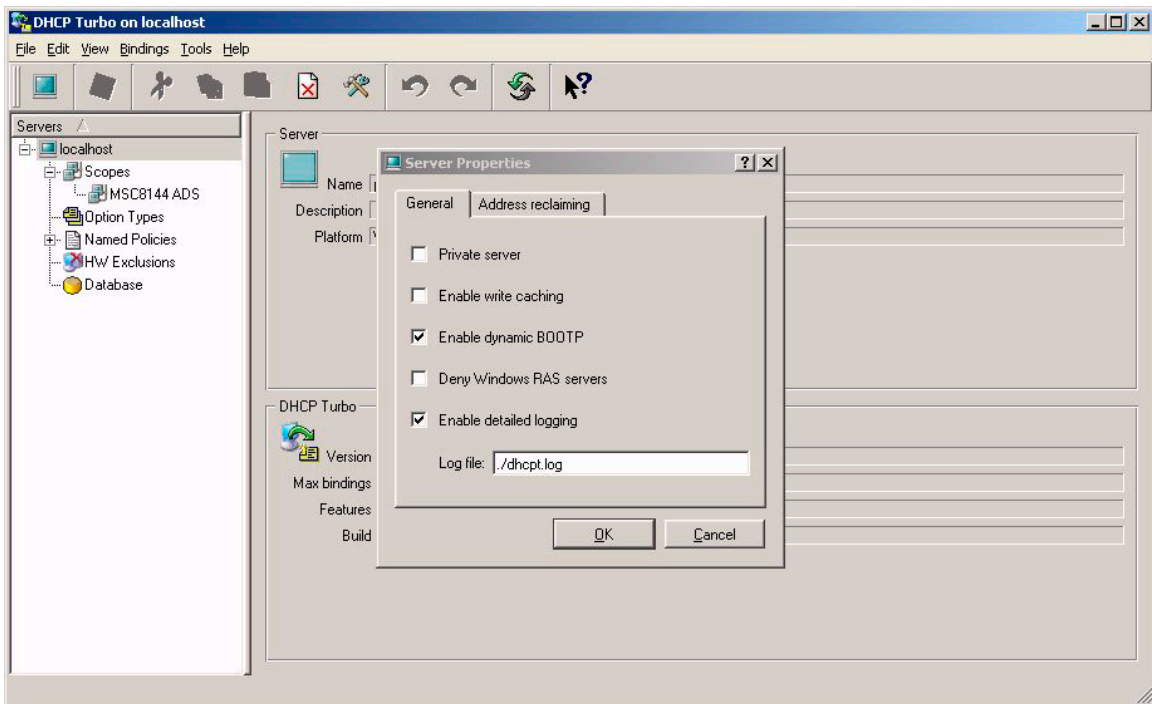
5 TFTP Server Settings

Setting up the TFTP server requires a combination of general set up and specific setup for the TFTP Turbo server application.

5.1 General TFTP Server Setup

Set the TFTP server to accept requests and place the boot file in a directory where the server will find it. This file name should be the same as the one indicated by the DHCP server as the boot file.

5.2 TFTP Turbo Server Setup

Place a legal TFTP file in the tftp_root directory (Figure 8.).

Figure 8. Placing the Legal TFTP File

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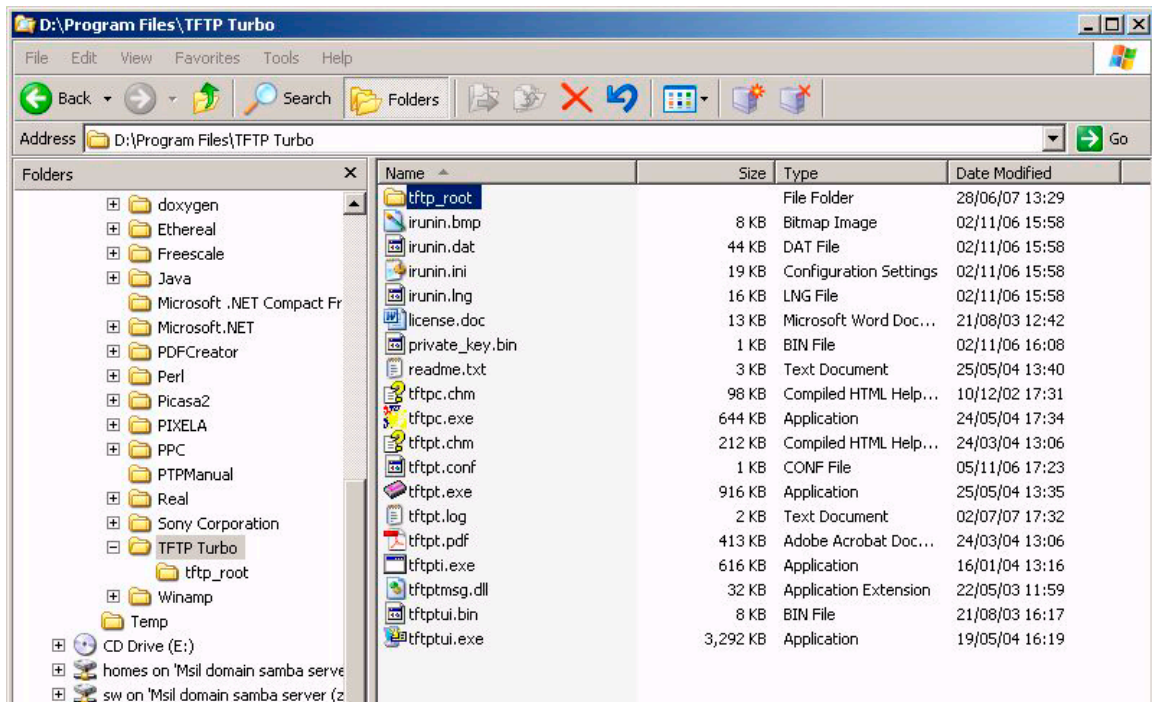
6 Running the Boot Test

The following subsections describe how to set up the personal computer to run the test using the files configured in the previous section and expected test results.

6.1 Setting Up the Personal Computer

Use the following steps to set up and run the Ethernet boot test:

1. For local loop tests (not vs. an actual network), disconnect the main network connection in order to not interfere with it.
2. Open the services panel under computer management (Figure 9. and Figure 10.).

Figure 9. Accessing the Computer Management Screen

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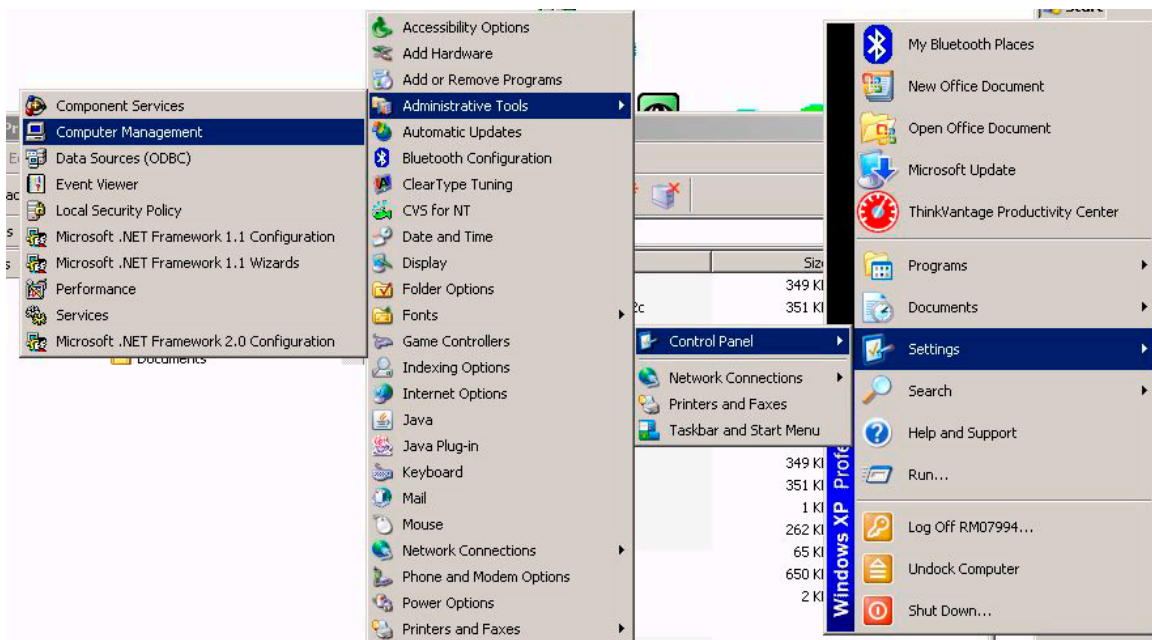
Figure 10. Computer Management Screen
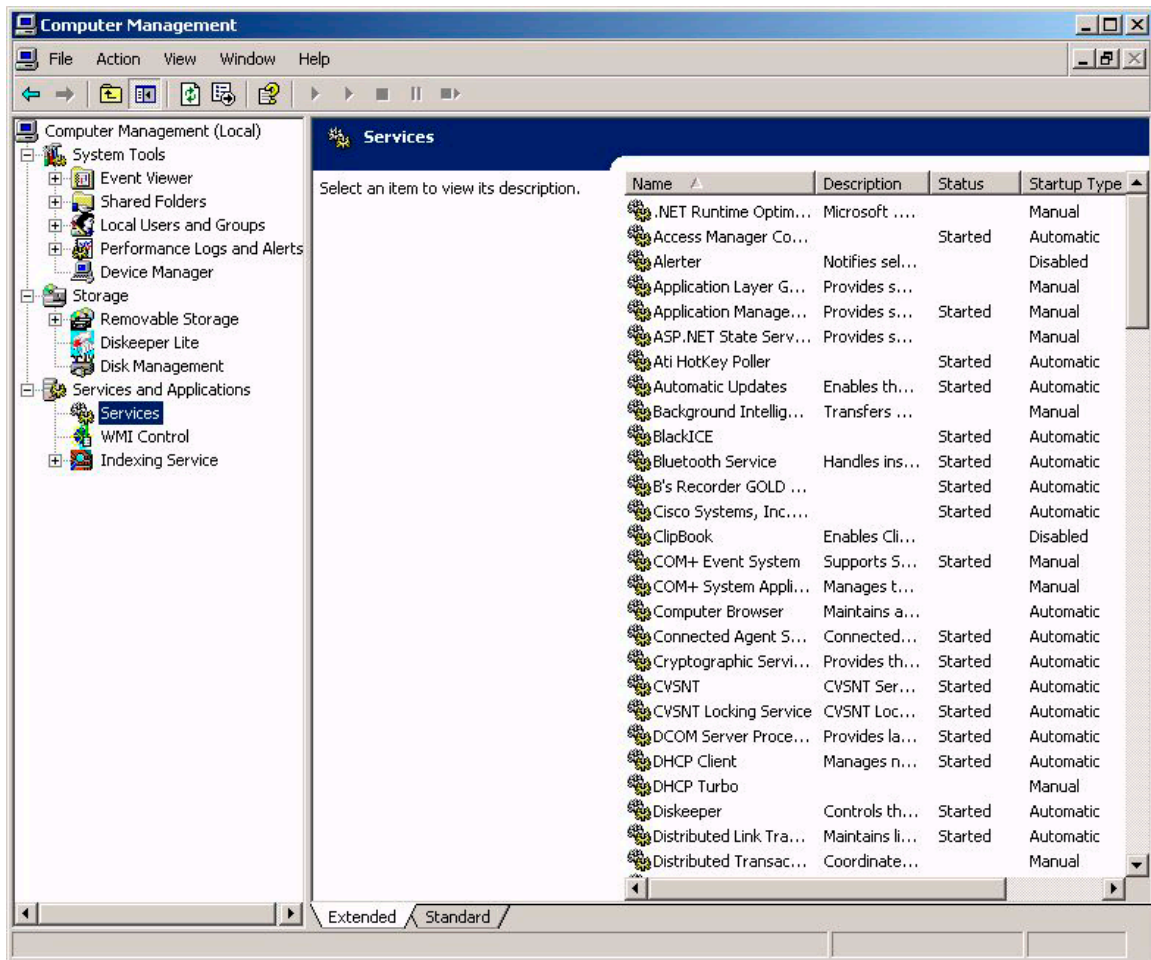
3. Disable any firewall services that my be active.

4. Disable the DHCP client service.

5. Enable the DHCP server service as well as the server itself.

6. Enable the TFTP server service as well as the server itself.

7. Use an Ethernet traffic sniffer to monitor traffic.

8. Run the test now. The results are described in Section 6.2.

9. When you complete your testing, restore the old computer settings.

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6.2 Expected Traffic Pattern

You should observe the following traffic patterns (Figure 11.):

1. DHCP protocol.
2. Gratuitous ARP from the MSC8144.
3. ARP from the MSC8144 trying to find the TFTP server's MAC address.
4. TFTP protocol.

Figure 11. Ethernet Traffic Patterns Observed Using an Ethernet Sniffer

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