Lab 8.7.2: Troubleshooting a NIC Using the Ping Command

Estimated time: 15 Minutes

Objective

Upon completion of this lab, you will be able to use the Ping command to test connectivity and troubleshoot problems based on Ping command results.

Equipment

The following equipment is required for this exercise:

- Several Windows 9x PC's with networking installed and configured
- 1 hub or switch
- 1 PC with Internet access

Scenario

As the PC technician at your company, you often receive calls from users with complaints about the network. You are in your office one morning when a user calls and complains that they are unable to reach anything on the network. Because the user is in an office in another building, you decide to try troubleshooting their problem remotely before visiting their office.

Procedures

When working with computers that have networking installed, you will be asked to troubleshoot a variety of problems. Depending on the size of your company, this can become quite challenging. If your users are spread out across multiple floors, buildings, or even cities, it can become extremely time consuming to visit every office for every problem. Luckily, there are utilities that allow a technician to begin troubleshooting a problem without leaving his/her office.

There is a wide variety of troubleshooting tools available to a technician. Many of these tools can be expensive to purchase. However, there are a few utilities that are free and come with virtually every operating system. One of the most commonly used utilities is the Packet Internet Groper (Ping) command. The Ping command is used to test connectivity between two hosts (PC's). When you "ping" a device, you are sending a signal to the device, which will then reply back. If the ping is successful, then you know that the connection between two devices is good. If the ping fails, then you know you have a problem between the devices.

Step 1

Open a command prompt as described below.

Click on **Start** > **Run**

Type the word "command" and click **OK**

Type the command **`ping a.b.c.d`** (a.b.c.d is the IP address of your NIC.)

Did you receive a reply back? _____

How many times did your NIC reply back? _____

How many bytes were used? _____

How much time did it take for a reply? _____

What was the maximum TTL (Time To Live)? _____

Step 2

A workstation's own NIC may be pinged by using its IP address, or something called the loopback address. The address 127.0.0.1 is reserved as the loopback address and is not used on the Internet. Instead, the loopback is an address that pings the NIC installed in the workstation you are currently using.

Type the command **`ping 127.0.0.1`**.

Did you receive a reply back? _____

Are the values for bytes, time, and TTL the same as last time? If not, what has changed?

_____

Step 3

If you can successfully ping your own address, and the loopback, then you have successfully installed the NIC and TCP/IP. Now it is time to test whether or not you can reach other hosts within your network.

Type **`ping A.B.C.D`** (This time A.B.C.D is the address of another workstation within your network.)

Did you receive a reply back? If not, what was the error message?

_____

_____

Are the values the same for bytes, time, and TTL, as they were in Step 1? If not, what has changed?

_____

_____

Step 4

If you are able to successfully ping another workstation that means you have a good connection between the two. There are times, however, when using the ping command will result in a problem.

Type the command "**`ping A.B.C.D.`**" (A.B.C.D is an IP address for someone outside of your network.)

What message did you receive?

_____

_____

What do you think this message might mean?

_____

_____

Now using a PC with an Internet connection, open a DOS prompt and type **`ping 1.1.1.1`**

What message did you receive this time?

_____

_____

What do you think this message might mean?

_____

_____

Troubleshooting

If you have trouble pinging the IP address of your workstation, or if you are unable to ping the loopback address, then you need to check your TCP/IP settings. If you did not setup TCP/IP properly, then you will not be able to ping anything. Check to make sure that you have the protocol installed, and that it is bound to your NIC.

If you have trouble pinging other hosts within your own network, then check your cable and make sure that it is plugged into the hub or switch. Check your IP address, and make sure you entered it correctly, and that the subnet mask is also correct.

Reflection

Once a PC is installed on a network, much of a technician's time will be spent troubleshooting network problems. It is important that a technician try to save as much time as possible. Ping is a great utility to begin troubleshooting a problem. Ping will help a technician determine whether the network problem is related to a bad cable, an incorrect TCP/IP setting, or a problem with a remote device. Make sure you are comfortable using the Ping command and its responses. It will save you a lot of time and energy in the long run.

