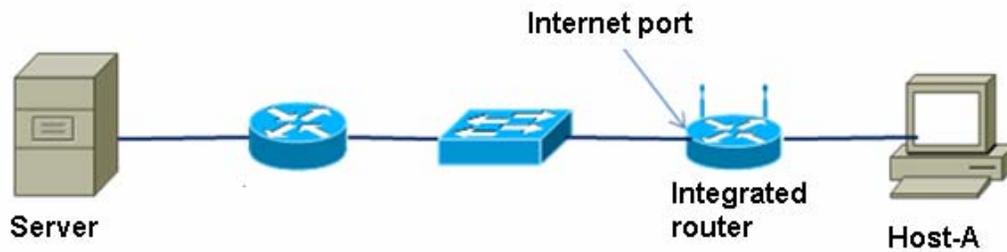


Lab 9.2.7 Troubleshooting Using Network Utilities



Objectives

- Use network utilities and the integrated router GUI to determine device configurations.
- Select the appropriate network utilities to help troubleshoot connectivity problems.
- Diagnose accessibility problems with Web, FTP, Telnet, and DNS servers.
- Identify and correct physical problems related to cable types and connections.

Background / Preparation

In this lab, you use the browser and various troubleshooting utilities, such as **ipconfig**, **ping**, **tracert**, **netstat**, and **nslookup** to diagnose and correct connectivity problems. These command line interface (CLI) utilities are available on most current operating systems, although the exact command and syntax may vary. Windows XP commands and syntax are used in this lab.

Your instructor will set up the network topology similar to the one shown here and will preconfigure the client computer, integrated router, server, and external router for each scenario in the lab. Various software and hardware connectivity problems will be introduced, and you will diagnose the cause from the client computer.

There are six scenarios. Work in teams of three, with each person taking the lead in two of the scenarios, and the other team members assisting.

The following resources are required:

- Computer running Windows XP Professional with Web, FTP, and Telnet clients (CLI or GUI).
- Server running a combination of DNS, HTTP, FTP, and Telnet services (preconfigured). This server will simulate Internet connections and can be a server with these services actually installed and running or a server running the Discovery Live CD.
- Integrated router configured as a DHCP server and client (default configuration).
- Router with two Ethernet interfaces configured as a DHCP server to integrated router (preconfigured).
- Ethernet Cat-5 (minimum) straight and crossover cabling to connect hosts and network devices.

Step 1: Build the network and configure the hosts

- Have your instructor set up a network topology similar to the one shown with the Host-A client computer, integrated router, server, and router preconfigured.
- Work from Host-A to issue commands to troubleshoot problems introduced by the instructor.

- c. All commands are issued from a command prompt window. Open a command prompt window by clicking Start > All Programs > Accessories > Command Prompt. Keep the window open for the duration of the lab.

Step 2: Record the baseline IP address information for computers and integrated router

NOTE: Perform this step before the instructor introduces problems.

- a. Host-A configuration—Issue the command that displays the IP address information for Host-A, including the DNS server, and record the information below. Which command did you use?

IP address: _____

Subnet mask: _____

Default gateway IP address: _____

DNS server IP address: _____

DHCP server IP address: _____

How did Host-A obtain its IP address? _____

- b. Integrated router configuration—From Host-A, open a browser and go to the integrated router GUI by entering 192.168.1.1 as the URL address. Log in to the integrated router using the default user ID and password (check with your instructor if necessary). Check the internal and external IP address information and record it below.

Internal IP address: _____

Subnet mask: _____

Is the DHCP server enabled? _____

External (Internet) IP address: _____

Subnet mask: _____

Default gateway IP address: _____

DNS server IP address: _____

- c. Server configuration—Obtain the Server IP configuration from your instructor and record the information below.

IP address: _____

Subnet mask: _____

Default gateway IP address: _____

Web Server 1 protocol and name: _____

Web Server 2 protocol and name: _____

FTP Server 1 protocol and name: _____

FTP Server 2 protocol and name: _____

Step 3: Scenario 1—Diagnose Web server access

- a. After your instructor sets up the problem for this scenario, use various utilities to diagnose the problem.
- b. Open your browser and enter the name of the Web Server 1 from Step 2. What happened?

- c. Which commands did you use to diagnose the problem? _____
- d. Report the problem or suspected problem to the instructor. What was the problem?

- e. What did you do to correct the problem, if anything?

- f. You may need to contact the instructor to correct the problem. When the problem is corrected, retest and verify access to the server.

Step 4: Scenario 2—Diagnose Web server access

- a. After your instructor sets up the problem for this scenario, use various utilities to diagnose the problem.
- b. Open your browser and enter the name of the Web Server 2 from Step 2. What happened?

- c. Which commands did you use to diagnose the problem? _____

- d. Report the problem or suspected problem to the instructor. What was the problem?

- e. What did you do to correct the problem, if anything?

- f. You may need to contact the instructor to correct the problem. When the problem is corrected, retest and verify access to the server.

Step 5: Scenario 3—Diagnose FTP server access

- a. After your instructor sets up the problem for scenario, use various utilities to diagnose the problem.
- b. Use your FTP client (CLI or GUI) to connect to FTP Server 1 from Step 2. What happened?

- c. Which commands did you use to diagnose the problem? _____

- d. Report the problem or suspected problem to the instructor. What was the problem?

- e. What did you do to correct the problem, if anything?

- f. You may need to contact the instructor to correct the problem. When the problem is corrected, retest and verify access to the server.

Step 6: Scenario 4—Diagnose FTP server access

- a. After your instructor sets up the problem for this scenario, use various utilities to diagnose the problem.
- b. Use your FTP client (CLI or GUI) to connect to FTP Server 2 from Step 2. What happened?

- c. Which commands did you use to diagnose the problem? _____

- d. Report the problem or suspected problem to the instructor. What was the problem?

- e. What did you do to correct the problem, if anything?

- f. You may need to contact the instructor to correct the problem. When the problem is corrected, retest and verify access to the server.

Step 7: Scenario 5—Diagnose Telnet server access problem

- a. After your instructor sets up the problem for this scenario, use various utilities to diagnose the problem.
- b. Use a Telnet client (CLI or GUI) to connect to the name of **Server 1 identified in Step 2**. What happened? _____
- c. Which commands did you use to diagnose the problem? _____

- d. Report the problem or suspected problem to the instructor. What was the problem?

- e. What did you do to correct the problem, if anything?

- f. You may need to contact the instructor to correct the problem. When the problem is corrected, retest and verify access to the server.

Step 8: Scenario 6—Analyze TCP connections to Host-A

- a. Ask your instructor to verify that all problems introduced with the lab setup have been corrected. Using the appropriate clients, connect to the Web, FTP, and Telnet servers simultaneously from Host-A.

- b. From the command line, issue a command to display the current active TCP connections to Host-A with names of the servers and protocols. Which command did you use? _____
- c. Which named connections did you see? _____
- d. From the command line, issue a command to display the current active TCP connections to Host-A with IP addresses and protocol port numbers. Which command did you use? _____
- e. Which IP addresses and port numbers did you see?

- f. From the command line, issue a command to display the current active TCP connections to Host-A, along with the program that created the connection. Which command did you use?

- g. Which program executable (filename with an .exe extension) is listed for each of the connections?

Step 9: Reflection

- a. When troubleshooting the problem scenarios during this lab, which troubleshooting technique did you use primarily (top-down, bottom-up, or divide and conquer)?

- b. Which utility or command do you feel was the most useful for network troubleshooting?
