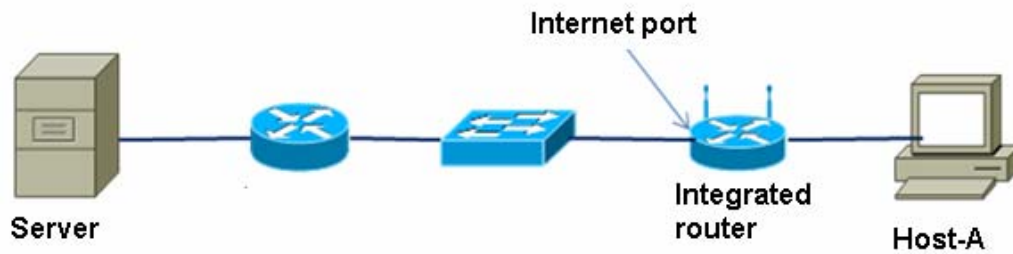Cisco | Networking Academy®
Mind Wide Open™

Lab 9.3.3 Troubleshooting Physical Connectivity

Objectives

- Examine device LEDs to determine proper Ethernet connectivity.
- Select the correct Ethernet cable for use between various types of devices.
- Visually inspect cables for potential problems.
- Use a cable tester to help identify cabling problems.

Background / Preparation

Physical cabling is one of the most common sources of network problems. This lab focuses on connectivity issues related to network cabling. You will visually inspect cabling and LED link lights to evaluate physical connections and to determine if the correct type of cable is being used based on the devices they interconnect. You will also use a cable tester to identify problems with cables.

The instructor will set up the network topology similar to the one shown and will preconfigure the hosts and network devices. The instructor will introduce various connectivity problems, and you will diagnose the cause of these problems by inspecting link lights and testing cables between devices. Various cable types, both good and bad, will be used to interconnect devices for each scenario in the lab.

Work in teams of two, with each person taking the lead in half of the problem scenarios.

The following resources are required:

- Computer running Windows XP Professional (preconfigured)
- Server (preconfigured)
- Integrated router configured as a DHCP server and client (default configuration)
- Router with two Ethernet interfaces configured as the DHCP server to integrated router (preconfigured)
- Mix of Ethernet Cat-5 (minimum) straight-through and crossover cabling, both good and bad, to connect hosts and network devices
- Basic Cat-5 Ethernet cable tester (RJ-45 pin-to-pin continuity checker)
- Advanced cable tester (optional), such as Fluke 620 (or similar)

Step 1: Build the network and configure the hosts

a. Ask your instructor to set up a network topology similar to the one shown with a preconfigured Host-A client computer, integrated router, server, and router. Initially, correct and properly functioning cabling is used so that end-to-end connectivity can be verified. The instructor then introduces cabling problems in each scenario.

b. Problems can consist of using the wrong type of` cable between two devices (straight-through or crossover) or using a defective cable (miswired or improperly terminated). Observe device interface link lights, visually inspect cables, and use a cable tester to determine the problems.

c. Complete steps 2 and 3 of this lab before the instructor introduces problems.

Step 2: Record the correct cable types used between devices

a. Refer to the topology diagram and record the cable type that should be used (straight-through or crossover) based on the devices being connected. Have your instructor verify this information before proceeding.

b. Which type of cable should be used from Host-A to the integrated router?
_____

c. Which type of cable should be used from the integrated router (router portion) to Hub/Switch?
_____

d. Which type of cable should be used from Hub/Switch to Router? _____

e. Which type of cable should be used from Router to Server? _____

Step 3: Record the IP address information for the computers

a. Use the ipconfig command, or get the IP address of Host-A from your instructor, and record it here.

Host-A IP address: _____

b. Get the server IP address from your instructor and record it here.

Server IP address: _____

c. Before starting on problem scenarios, verify end-to-end connectivity by pinging from Host-A to Server. If you do not get a reply from the server, check with your instructor. There may be a problem with the initial hardware or software setup.

Step 4: Scenario 1

a. After your instructor sets up the problem, use visual inspection and a cable tester to isolate the problem.

b. Ping from Host-A to Server. What happened?
_____

c. Check the LED link lights on the various device interfaces. Write down any that are not lit.
_____

d. Disconnect and inspect the cable connecting the network interfaces that were not lit. Describe the problem and how you were able to identify it.
_____
_____
_____

e. What did you do to correct the problem?
_____

f. When the problem is corrected, retest and verify end-to-end connectivity by pinging from Host-A to Server. Was the ping successful? _____

Step 5: Scenario 2

a. After your instructor sets up the problem, use visual inspection and a cable tester to isolate the problem.

b. Ping from Host-A to Server. What happened?

_____

c. Check the LED link lights on the various device interfaces. Write down any that are not lit.

_____

d. Disconnect and inspect the cable connecting the network interfaces that were not lit. Describe the problem and how you were able to identify it.

_____

_____

_____

e. What did you do to correct the problem?

_____

f. When the problem is corrected, retest and verify end-to-end connectivity by pinging from Host-A to Server. Was the ping successful? _____

Step 6: Scenario 3

a. After your instructor sets up the problem, use visual inspection and a cable tester to isolate the problem.

b. Ping from Host-A to Server. What happened?

_____

c. Check the LED link lights on the various device interfaces. Write down any that are not lit.

_____

d. Disconnect and inspect the cable connecting the network interfaces that were not lit. Describe the problem and how you were able to identify it.

_____

_____

_____

e. What did you do to correct the problem?

_____

f. When the problem is corrected, retest and verify end-to-end connectivity by pinging from Host-A to Server. Was the ping successful? _____

Step 7: Scenario 4

a. After your instructor sets up the problem, use visual inspection and a cable tester to isolate the problem.

b. Ping from Host-A to Server. What happened?

_____

c. Check the LED link lights on the various device interfaces. Write down any that are not lit.

_____

d. Disconnect and inspect the cable connecting the network interfaces that were not lit. Describe the problem and how you were able to identify it.

_____

_____

_____

e. What did you do to correct the problem?

_____

f. When the problem is corrected, retest and verify end-to-end connectivity by pinging from Host-A to Server. Was the ping successful? _____

Step 8: Reflection

a. What are some general rules to help you determine which type of Ethernet cable (straight-through or crossover) to use to connect different types of network hosts and devices?

_____

_____

_____

b. Which types of problems can a cable tester detect that might not be determined by visual inspection?

_____