Chapter 10

Networking Types, Devices, and Cabling

Reviewing the Basics

1. What type of network topology is used when five switches are used on a small LAN and each switch connects to multiple computers on the LAN?

A star bus topology or a hybrid topology

2. Place the following networking technologies in the order of their highest speed, from slowest to fastest: WiMAX, dial-up networking, cable Internet, Fast Ethernet, 3G

Dial-up networking, 3G, cable Internet, WiMAX, Fast Ethernet

3. What is the difference between ADSL and SDSL?

ADSL uses one upload speed from the consumer to an ISP and a faster download speed.

SDSL uses equal bandwidths in both directions.

4. Among satellite, cable Internet, and DSL, which technology experiences more latency?

Satellite

5. When using DSL to connect to the Internet, the data transmission shares the cabling with what other technology?

Regular telephone

6. When using cable Internet, the data transmission shares the cabling with what other technology?

Television

7. What is the name of the port used by an Ethernet cable? What is the name of the port used by a dial-up modem?

RJ-45, RJ-11

8. If you want to upgrade your 100BaseT Ethernet network so that it will run about 10 times the current speed, what technology would you use?

Gigabit Ethernet or 1000BaseT

9. What is the maximum length of a cable on a 100BaseT network?

100 meters or 328 feet

10. What does the 100 in the name 100BaseT indicate?

The transmission speed of the network, which is 100 Mbps.

11. Which type of networking cable is more reliable, STP or UTP? Which is used on LANs?

STP is more reliable, UTP is used on LANs

12. Which is more expensive, UTP CAT5e cabling or STP CAT5e cabling?

STP CAT5e is more expensive because it is shielded

13. When looking at a network cable that is not labeled, describe how you can tell if the cable is a straight-through cable or a crossover cable.

Carefully examine the colors of the wires that you can see through the clear plastic RJ45 connector.

14. What technology is used when power is transmitted on a network cable?

Power over Ethernet (PoE)

15. Describe the difference between a hub and a switch.

A hub is a pass-through device that transmits all frames to all devices it is connected to except the device sending the frame. A switch is "smarter" and transmits frames only to the device to which the frame is addressed, or, if the MAC address table doesn't have a particular entry, the switch operates like a hub and sends the frame out to all devices except to the one sending the frame.

16. How is a wireless access point that is also a bridge more efficient in handling network traffic than a wireless access point that is not a bridge?

Because the bridge limits the amount of traffic between the two network segments. It allows only the traffic to pass that is destined for the other segment.

17. What type of cable uses an F connector?

TV coax cable

18. Why does a CAT6 cable have a plastic core? Which two types of cabling is recommended for Gigabit Ethernet?

To keep the pairs of twisted wires separated which reduces crosstalk. CAT-5e and CAT6

19. How many wires does a CAT5 cable have? A CAT5e cable? A coaxial cable?

Eight, eight, one

20. Which tool can you use to verify that a network port on a computer is good?

Loopback plug

21. After making a straight-through cable, which tool can you use to certify the cable?

Cable tester

22. Which tool can help you find a network cable in the walls of a building?

Toner probe

23. Which tool is used to firmly attach a RJ45 connector to a network cable?

Crimper

24. Which tool can help you find out which wall jack connects to which port on a switch in an electrical closet?

Loopback plug

25. Name two places where you might find a keystone RJ45 jack in a building.

In a patch panel in the network closet and in a RJ45 wall jack

26. List the number assigned each pair and the color of each pair used in twisted-pair networking cables.

Pair 1 is blue; pair 2 is orange; pair 3 is green, and pair 4 is brown.

27. What two standards are used to wire networking cables?

T568A and T568B

28. Of the two standards in Question 26, which standard is the most common? Which is required for all U.S. government installations?

T568B, T568A

29. Using either of the two wiring standards, what are the colors of the two pairs used to send and/or receive data on a 100BaseT network?

Green and orange

30. How many pairs of wires are crossed in a crossover cable that will work on a 100BaseT network? On a 1000BaseT network?

Two pair, four pair

31. To prevent crosstalk in a keystone RJ45 jack, what is the minimum length of wire that should be untwisted?

½ inch

Thinking Critically

1. Linda has been assigned the job of connecting five computers to a network. The room holding the five computers has three network jacks that connect to a switch in an electrical closet down the hallway. Linda decides to install a second switch in the room. The new switch has four network ports. She uses one port to connect the switch to a wall jack. Now she has five ports available (two wall jacks and three switch ports). While installing and configuring the NICs in the five computers, she discovers that the PCs connected to the two wall jacks work fine, but the three connected to the switch refuse to communicate with the network. What could be wrong and what should she try next?

Answer:

Try connecting one of the non-working computers to a wall jack. If that works, then the problem is the switch, the cable connecting the switch to the wall jack, or the wall jack the switch is using. First try installing the switch on a known-good jack. Then replace the cable to the switch; then replace the switch.

2. If a Gigabit Ethernet NIC is having a problem communicating with a 100BaseT switch that only supports half duplex, what steps can you take to manually set the NIC to the speed and duplex used by the switch? Which speed and duplex should you choose?

Go to Device Manager and open the properties box for the NIC. Click the Link Speed tab and select 100 Mbps Half Duplex.

3. You connect a computer to an RJ-45 wall jack using a straight-through cable. When you first open the browser on the computer, you discover it does not have Internet access. Order the following steps in the correct order to troubleshoot the problem.
    a. Use a loopback plug to verify the network port on the computer.
    b. Rewire the keystone RJ45 wall jack.
    c. Use a loopback plug to verify the network port in the wall jack.
    d. Exchange the straight-through cable for a known good one.
    e. Verify the status indicator lights on the NIC.
    f. Use a cable tester to test the network cable and termination from the switch in the electrical closet to the wall jack.

Answer: e, a, c, d, f, and b:

e. Verify the status indicator lights on the NIC.

a. Use a loopback plug to verify the network port on the computer.

c. Use a loopback plug to verify the network port in the wall jack.

d. Exchange the straight-through cable for a known good one.

f. Use a cable tester to test the network cable and termination from the switch in the electrical closet to the wall jack.

b. Rewire the keystone RJ45 wall jack.