
Chapter 2 Solutions

Review Questions

1. What term refers to the physical layout of a network's computers, cables, and other resources?
topology, diagram, layout, or map
2. Joining the computers in a network at a central point creates a star topology. Which of the following statements is true of a star topology network? (Choose all that apply.)
 - c. It requires much more cabling than a bus network.
 - d. Its centralized nature makes network management easier.
3. A physical bus topology network requires terminators. True or False?
True
4. Which of the following statements is true of a ring topology network?
 - b. It provides equal access to all computers on the network.
5. Which of the following physical topologies is the most fault tolerant?
 - c. mesh
6. What are two advantages of a star topology network?
inexpensive
easy to troubleshoot and configure
7. Which physical topology does switching use?
star or extended star
8. A cable break in a bus network does not affect network communications. True or False?
False
9. In a bus network, if the ends of the cable aren't terminated, what occurs?
signal bounce
10. Connecting computers to form a straight line creates a _____ topology network.
physical bus or bus
11. How do switches provide better performance than hubs?
by providing full bandwidth to each port instead of sharing bandwidth, as hubs do
12. Because of its central connection point, a _____ topology network requires a more involved cable installation.
 - a. star
13. What is the central connecting point in a wireless network?
access point or AP
14. What are two disadvantages of a ring topology network?
A single computer failure on a single-ring topology can affect the rest of the network.
Isolating problems on a ring can be difficult sometimes.
15. What type of network can use an ad hoc topology?

wireless

16. List three reasons to keep a network diagram current.

Maintain a record of a network's true layout, its configuration, and its devices and cables. This record is a key troubleshooting tool and is often among the first resources a network administrator consults when problems come up. Other reasons include keeping an accurate inventory of equipment, cables, and other equipment and maintaining a complete record of a network as a planning tool for growth, upgrades, and expansion.

17. What type of device is usually found at the center of an extended star topology?

c. switch

18. What term describes the special packet used in logical ring networks?

a. token

19. A cable break in a star topology network doesn't affect network communications for the entire network. True or False?

True

20. FDDI is implemented as which form of logical topology?

ring

21. A ring network is a(n) _____ topology because the computers are responsible for regenerating the signal.

active

22. Mainframe computers first used the _____ topology.

d. star

23. Which device can handle several conversations and provide full network bandwidth to each device?

b. switch

24. Which device is used as a passive hub?

c. patch panel

25. Which topology is ideal when running cables is impractical?

b. wireless

Hands-on Projects

Hands-on Project 2-1

The worksheet for this project could be completed as follows:

Will the network be peer-to-peer or server-based? The brokerage application demands a server, as does the need for sharing sensitive data and controlling access to files. There are no compelling reasons that indicate a combination network is needed, so a straightforward server-based network appears best for Joe's needs.

If it's server-based, how many servers will be attached to the network? At least one to handle the brokerage software and possibly another to handle file and print services. The actual answer depends on how resource intensive the brokerage application is. Many networks have up to 100 users with a single server handling all user needs (but it usually requires a heavy-duty machine with 1 GB RAM or more, 250 GB of disk space or more, and often two or more CPUs).

How many computers will be attached to the network? At least 25, with additional computers to be added in the near future. (Plan on 40 to 50 client machines in the near term.)

What applications will the computers run? New brokerage software that runs on a server plus standard word-processing and spreadsheet programs.

How many printers will be attached to the network? Five, with the possible need for expansion.

Given this information and what's known about Joe's office layout—two floors in a building, wiring closets available, and conduit between floors—a combination star bus topology makes the most sense. Following this approach, you'd run cable through the conduit between floors and attach to one or more hubs/switches on each floor, and then make use of the wiring closets to centralize cabling to the desktops and servers. The need for file security and the existence of sensitive data also argue strongly for physical server security, so servers should be housed in a locked room with limited access and adequate power and ventilation to keep them running smoothly.

Hands-on Project 2-2

What changes in equipment are required to make this company's network up to date to solve the shared-bandwidth problem? A switch, possibly working at a faster rate, such as 100 Mbps.

What topology and which type of device can be used in the manufacturing area to solve the cabling difficulties? Use a wireless access point in a star topology, and equip computers with wireless NICs.

Hands-on Project 2-3

The worksheet for this project could be completed as follows:

What type of topology should be used in this network? An extended star should be used with a switch as the central device.

Will the network be peer-to-peer or server-based? The discussion of EBiz.com's requirements mentions five existing servers, without requiring the introduction of new servers, so this implementation obviously involves a server-based network.

If it's server-based, how many servers will be attached to the network? As per the problem statement, five servers will be attached to the network.

How many computers will be attached to the network? Counting the servers, 255 computers altogether (five existing servers, 250 employee workstations).

What kind of networking device is easiest to reconfigure? What kind offers the best access to the network medium's bandwidth between pairs of devices? The combination of these two questions is a dead giveaway that the required solution must be built around a switch for the overall network.

Hands-on Project 2-4

The worksheet for this project could be completed as follows:

Will the network be peer-to-peer or server-based? The discussion of ENormInc's requirements requires access to two separate centralized databases; this implementation obviously involves a server-based network.

If it's server-based, how many servers will be attached to the network? Two servers.

How many computers will be attached to the network? Counting the servers, and assuming all 20 workstations are attached in each factory floor work cell, a total of 92 computers (two servers, 50 front-office employee workstations, and 40 factory floor employee workstations).

What applications will the office computers run? The factory floor computers? The office computers will run word-processing and spreadsheet software and client database software to access the two databases; the factory floor computers need access only to the inventory database; each server will support its local database.

What topology works best for the offices given the availability of wiring closets? What topology works best for the factory floor, given its need for constant reconfiguration? The availability of wiring closets for the office workstations indicates that a physical star topology will work (and indeed, these topologies are the most commonly used in that kind of office situation); the need for constant reconfiguration on the factory floor indicates that a flexible solution is required. Normally, this requirement dictates wireless or bus topology solutions. A physical bus topology might be flexible, but it's not nearly as flexible as a wireless topology, and physical bus topologies are obsolete. Wireless is probably the best way to go.

Hands-on Project 2-5

The answers to this project will vary depending on the topology and equipment used in the classroom.

Case Projects

Case Project 2-1

The topology that solves the problem of unequal access to bandwidth is the ring topology. In this topology, all devices have an equal opportunity to communicate on the network.

Case Project 2-2

Answers will vary.

Case Project 2-3

Answers will vary.

Case Project 2-4

A wireless network using an access point solves the wiring difficulties.