CHAPTER 1 : Introduction

Solutions to Review Questions

Review Questions

1. The number of cables for each type of network is:

a. *Mesh*: $n(n-1)/2$
b. **Star**: n
c. *Ring*: $n-1$
d. *Bus*: one backbone and n drop lines

2. In *half-duplex transmission*, only one entity can send at a time; in a *full-duplex transmission*, both entities can send at the same time.

3. The general factors are *size*, *distances* (covered by the network), *structure*, and *ownership.*

4. The five components of a data communication system are the *sender*, **receiver**, *transmission medium*, *message*, and *protocol*.

5. Advantages of a multipoint over a point-to-point configuration (type of connection) include *ease of installation* and *low cost*.

6. *Standards* are needed to create and maintain an open and competitive market for manufacturers, to coordinate protocol rules, and thus guarantee compatibility of data communication technologies.

7. The advantages of distributed processing are *security*, *access to distributed databases*, collaborative processing, and faster problem solving.

8. We give an advantage for each of four network topologies:

a. *Mesh*: secure

b. *Bus*: easy installation
c. *Star*: robust
d. *Ring*: easy fault isolation

9. An *internet* is an interconnection of networks. The *Internet* is the name of a specific worldwide network

10. Line configurations (or types of connections) are *point-to-point* and *multipoint*.

11. The three criteria are *performance*, *reliability*, and *security*.

12. A *protocol* defines *what* is communicated, in *what way* and *when*. This provides accurate and timely transfer of information between different devices on a network.

13. We can divide line configuration in two broad categories:

a. *Point-to-point*: *mesh, star, and ring.*

b. *Multipoint: bus*

Exercises

15. Theoretically, in a *ring topology*, unplugging one station, interrupts the ring. However, most ring networks use a mechanism that bypasses the station; the ring can continue its operation.

16. The telephone network was originally designed for voice communication; the Internet was originally designed for data communication. The two networks are similar in the fact that both are made of interconnections of small networks. The telephone network, as we will see in future chapters, is mostly a circuit-switched network; the Internet is mostly a packet-switched network.

17. In a *bus topology*, no station is in the path of the signal. Unplugging a station has no effect on the operation of the rest of the network.

20.

A. Surfing the Internet is the an application very sensitive to delay. We except to get access to the site we are searching.

b. We normally do not expect a file to be copied immediately. It is not very sensitive to delay.

C. E-mail is not an interactive application. Even if it is delivered immediately, it may stay in the mail-box of the receiver for a while. It is not sensitive to delay.

21. In this case, the communication is only between a caller and the callee. A dedicated line is established between them. The connection is *point-to-point.*

22.

a. Mesh topology: If one connection fails, the other connections will still be working.

24. *Unicode* uses **32** bits to represent a symbol or a character. We can define 2^{32} different symbols or characters.

25. This is a *LAN*. The Ethernet hub creates a LAN as we will see in Chapter 13.