CHAPTER 18: Virtual Circuit Switching : Frame Relay and ATM

Solutions to Selected Review Questions

Review Questions

1. In a ***PVC***, two end systems are connected permanently through a virtual connection. In a ***SVC***, a virtual circuit needs to be established each time an end system wants to be connected with another end system.

2. An ATM virtual connection is defined by two numbers: a ***virtual path identifier (VPI)*** and a ***virtual circuit identifier (VCI).***

3. If data packets are different sizes there might be variable delays in delivery.

4. ***Frame Relay*** does not define a specific protocol for the physical layer. Any protocol recognized by ANSI is acceptable.

5. ***T-lines*** provide point-to-point connections, not many-to-many. In order to connect several LANs together using T-lines, we need a mesh with many lines. Using Frame Relay we need only one line for each LAN to get connected to the Frame Relay network.

6. ***DLCIs*** are unique only for a particular interface. A switch assigns a DCLI to each virtual connection in an interface. This way two different connections belonging to two different interfaces may have the same DLCI.

7. ***Frame Relay*** does not use *flow* or *error control*, which means it does not use the sliding window protocol. Therefore, there is no need for ***sequence numbers***.

8. In an UNI, the total length of VPI+VCI is 24 bits. This means that we can define 2^{24} virtual circuits in an UNI. In an NNI, the total length of VPI+VCI is 28 bits. This means that we can define 2^{28} virtual circuits in an NNI.

9. We can briefly summarize the most important issues:

a. Traditional LANs are ***connectionless*** protocols; ATM is a ***connection-oriented*** protocol.

b. Traditional LANs define the route of a packet through ***source and destination addresses***; ATM defines the route of a cell through ***virtual connection identifiers***.

c. Traditional LANs can do ***unicast***, ***multicast***, and ***broadcast*** transmission; ATM is designed only for ***unicast*** transmission.

10. A ***UNI*** (user network interface) connects a user access device to a switch inside the ATM network, while an ***NNI*** (network to network interface) connects two switches or two ATM networks.

11. The ***Application Adaptation Layer (AAL)*** allows existing networks to connect to ATM facilities by mapping packet data into fixed-sized ATM cells. The ***ATM layer*** provides routing, traffic management, switching, and multiplexing services.

12. A ***TP*** (transmission path) is the physical connection between a user and a switch or between two switches. It is divided into several ***VPs*** (virtual paths), which provide a connection or a set of connections between two switches. VPs in turn consist of several ***VCs*** (virtual circuits) that logically connect two points together.