

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 DLCI 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.