CHAPTER 13 : Local Area Networks: Ethernet

Solutions to Selected Review Questions

Review Questions

1. The common Ten-Gigabit Ethernet implementations are ***10GBase-S***, ***10GBase-L***, and 10GBase-E.

   Standard Ethernet: **10 Mbps**
   Fast Ethernet: **100 Mbps**
   Gigabit Ethernet: **1 Gbps**
   Ten-Gigabit Ethernet: **10 Gbps**

2. A ***bridge*** can raise the bandwidth and separate collision domains.

3. A ***layer-2 switch*** is an N-port bridge with additional sophistication that allows faster handling of packets.

4. The ***preamble*** is a 56-bit field that provides an alert and timing pulse. It is added to the frame at the physical layer and is not formally part of the frame. SFD is a onebyte field that serves as a flag.

5. The common Fast Ethernet implementations are ***100Base-TX***, ***100Base-FX***, and ***100Base-T4***.

6. An ***NIC*** provides an Ethernet station with a 6-byte physical address. Most of the physical and data-link layer duties are done by the NIC.

7. In a ***full-duplex Ethernet***, each station can send data without the need to sense the line.

8. The rates are as follows:

Standard Ethernet:	**10 Mbps**
Fast Ethernet:	**100 Mbps**
Gigabit Ethernet:	**1 Gbps**
Ten-Gigabit Ethernet:	**10 Gbps**

9. A ***multicast address*** identifies a group of stations; a ***broadcast address*** identifies all stations on the network. A ***unicast*** address identifies one of the addresses in a group.

10. The common traditional Ethernet implementations are ***10Base5***, ***10Base2***, ***10- Base-T, and 10Base-F.***

11. The common Gigabit Ethernet implementations are ***1000Base-SX***, 1000Base-LX, ***1000Base-CX****, and* ***1000Base-T***.

Exercises

16. The smallest Ethernet frame is 64 bytes and carries 46 bytes of data (and possible padding). The largest Ethernet frame is 1518 bytes and carries 1500 bytes of data. The ratio is (data size) / (frame size) in percent. We can then answer the question as follows:

Smallest Frame Frame size = 64 Data size δ___ 46 **Ratio** δ___ **71.9%**

Largest Frame Frame size =1518 Data size = 1500 **Ratio = 98.8%**

17. The smallest frame is 64 bytes or 512 bits. With a data rate of 10 Mbps, we have

T_{fr} = (512 bits) / (10 Mbps) = **51.2 ⌠s**

This means that the time required to send the smallest frame is the same at the maximum time required to detect the collision.