COMP90007 Internet Technologies

Assignment 2

Due Date: Sunday 24th April 2016.

This assignment has 10 questions of equal weight and is worth 5% of the total marks for the subject. Answers must be submitted as a PDF file via the comp90007 Assignment 1 submission form in the LMS by ***Sunday 24th April 2016****. Late submissions will attract a penalty of 10% per day (or part thereof). Please ensure your name and user name are clearly presented.*

Each question or sub question can be answered in a few sentences. Excessively long answers will be penalized.

All questions can be answered by studying the material from the textbook. You can discuss the assignment topics with your friends, however, all work presented should be your original work. There will be a discussion forum thread for the assignment and any instructions provided in the forum are also part of the specification.

1. Based on the throughput comparison of random access protocols in Figure 4-4 (Page 268) of the textbook, what are the relative advantages and disadvantages of Nonpersistant CSMA compared to 1-persistant CSMA?

2. Refer to the Ethernet frame format in Figure 4.14

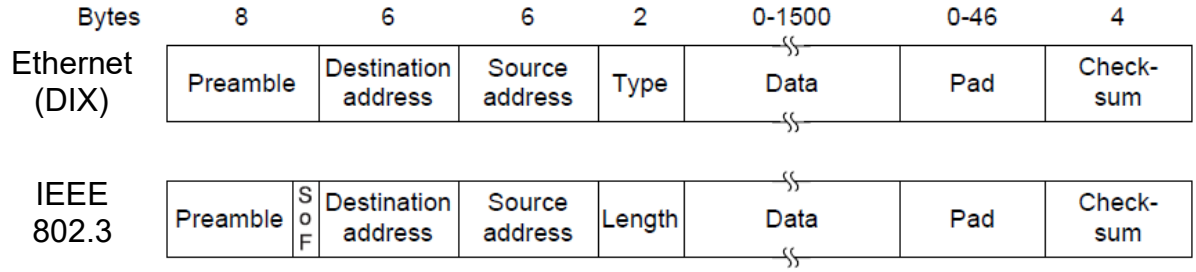


Fig 4.14. Frame formats. (a) Ethernet. (b) IEEE m802.3

a. Explain why padding is required in classic Ethernet frame structure?

b. An IP packet to be transmitted by Ethernet is 62 bytes long, including all its headers. If LLC is not in use, is padding needed in the Ethernet frame, and if so, how many bytes? Briefly justify your answer.

3. In the wireless LAN shown below, station B wants to transmit to station C. Note that all 4 stations lie in a straight line. If B does not detect any collision, does this mean that station C has successfully received the transmission? Briefly justify your answer, assuming that background noise is negligible.

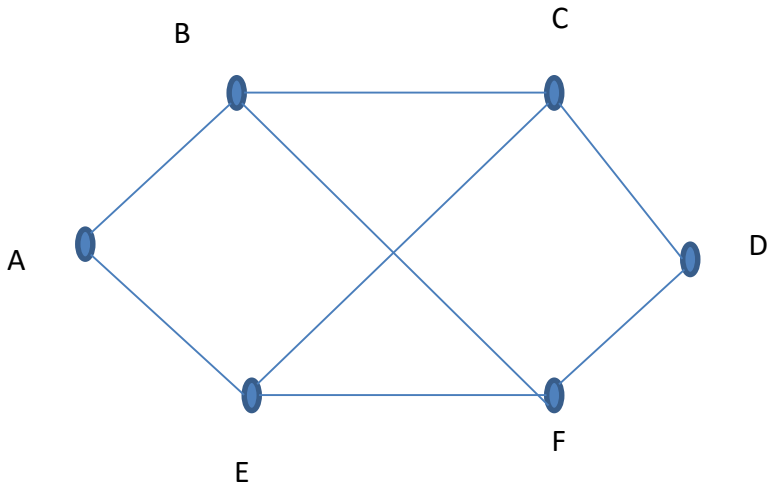
A B C D

4. If a LAN is under high load, would it be more efficient to use a contention protocol or a collision free protocol in the MAC Sub-layer? Briefly explain your answer.

5. Briefly explain how the Binary Countdown Protocol works and describe the relative advantages over the Bit Map Protocol.

6. Briefly expltain what are the advantages of the Binary Exponential Backoff algorithm, which is used to control the time interval before retransmission after a collision in Ethernet.

7. Consider the subnet of the following figure. Distance vector routing is used, and the following vectors have just come in to router C:
From B: (5,0,9,11,7,4);
From D:(15,13,7,0,8,4); and
From E: (8,5,4,9,0,6).
The measured delays to B,D,E are 5,4, and 3 respectively. What is C's new routing table? Give both the outgoing line to use and the expected delay.



8. Briefly explain the difference in the role of the congestion window and the receiver window in TCP.

9. a. If a class B network uses a subnet mask 255.255.240.0, how many subnets are allowed?
b. A large number of consecutive IP addresses are available starting at 128.16.00. Suppose that four organizations A,B,C and D request 2000,1000,2000, and 4000 addresses respectively, and in that order. For each of these, give the first IP address assigned, the last IP address assigned, and the mask in the w.x.y.z/s notation.

10. Briefly explain why connection establishment in the transport layer is more complicated than connection establishment in the data link layer.