November 25, 2014

BLG 337E - PRINCIPLES OF COMPUTER COMMUNICATIONS

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Midterm-2 & ANSWERS

1) (15 points) Give a broad taxonomy for MAC protocols according to their access schemes. Provide brief definitions for each class and one example from each class.

ANSWER: Refer to lecture notes: slide 24 in week6_14102014.pdf and slide 5 in week9_04112014.pdf

2) (10 points) Give brief definitions for a hub, a bridge and a switch and compare them in terms of their network functionalities.

ANSWER: Refer to lecture notes: slides 31-35 in week9_04112014.pdf

3) (15 points) Describe the most popular wireless Internet access technologies today. Compare and contrast them briefly in terms of topology, mobility and access scheme.

ANSWER: Refer to lecture notes: slides 2-7 in week11_18112014.pdf

4) (10 points) Why is an ARP query sent within a broadcast frame? Why is an ARP response sent within a frame with a specific destination MAC address?

ANSWER: Refer to lecture notes: slide 10 in week10_11112014.pdf

5) (25 points) A MAC protocol uses CRC as error detection scheme with a specific header format H=<X,Y>, where X is the remainder and Y is the data frame to send. Assume that, a data frame polynomial $x^9+x^8+x^6+x^4+x^3+x+1$ is to be transmitted using a generator polynomial is x^4+x+1. Write H for this specific data transmission.

ANSWER: Refer to lecture notes: slides 29 in week10_11112014.pdf

6) (25 points) Consider three LANs interconnected by two routers, as shown in the Figure 1 below.

ANSWER: Refer to lecture notes: slides 09-13 in week10_11112014.pdf

6a. (5 points) Assign random MAC addresses to all of the NIC adapters.

6b. (10 points) Consider starting a connection from Host E to Host B. Suppose all of the ARP tables are up to date. Give all the necessary steps to build this connection.

6c. (10 points) Repeat (6b), now assuming that the ARP table in the sending host is empty and the other tables are up to date.

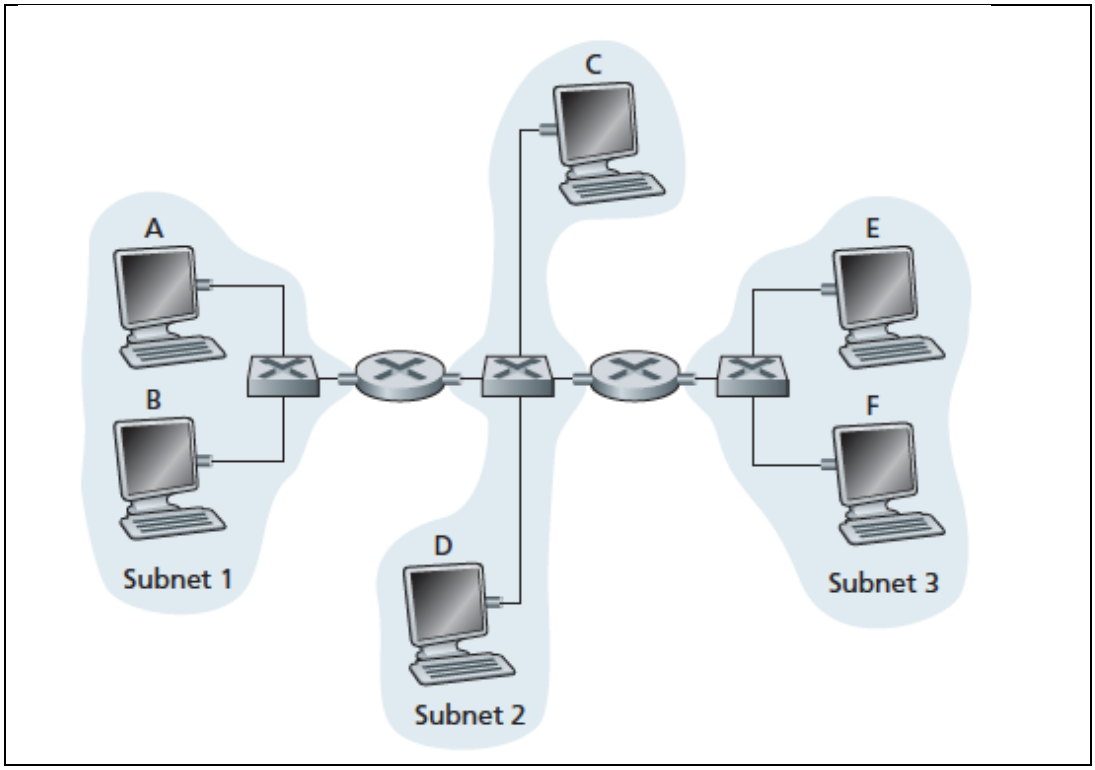

Figure 1