

CS5310.001/002, Fall 2020
Computer Networks and Communication Systems
Assignment 3

Issued: 10/28/2020

Due: 11/18/2020

1. ($10 \times 2 = 20$ pts) This problem is pertaining to the CSMA/CD protocol.
 - (1) Assume that *three* machines have experienced one collision with respect to each other at the same time. What is the probability that any one of the three will successfully acquire the channel without going through a second collision?
 - (2) In class discussions it is pointed out that for the Ethernet protocol, the higher the data rate R , the lower the channel efficiency. Explain concisely why that is the case.
2. (20 pts) In the token ring protocol, why the token ring should have enough delay so that the entire token can be on the ring simultaneously? Explain with your own language
3. (20 pts) In Lecture 7, we discussed that byte orders of integers and etc are important. Write a simple client/server program that verifies the byte order concepts.
4. (40 pts) In class we discussed difference between file I/O and network I/O. We discussed the potential different behaviour of the *read* function in the network I/O environment.

Write a client/server application that verifies this. Your server will be a TCP server that waits for requests from the client. The client keeps sending lines of length at least 1000 bytes to the server. The server simply calls *read* function, and then calls the *write* function to send back the value returned from the *read* function call. The client calls *read* function to receive the response and print out the value returned by each read function, followed by a mark that indicates the current string is the value of one read function call. Manually compare the replies received by the client and the input file and write your conclusions.

Please follow the submission instructions for format and required documents. For each programming problem, the actual programs, together with any supplementary files, must be submitted. You cannot simply submit a text/word file for programming problems.