

CPE 400/600: Computer Communication Networks

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Project 1 (Total 30 points)

Assigned on: Sep 25, 2014, Due back on: Oct 05, 2014, 5pm

Write simulation programs that will simulate the three protocols: Stop-and-wait, Go-Back-N, and selective repeat and compare their performances in terms of throughput. While writing and comparing performances, you will follow the assumptions below.

- a) Each packet is of size 100 Bytes; there are 100 packets to transmit.
- b) For each packet, assume RTT to be a random value between 10 – 50ms. Assume timeout as 45ms.
- c) For any other assumptions you make, explicitly state that assumption in your answer. Your assumptions must be realistic.

With the above assumptions, do the following:

- 1) For the performance comparison, vary the packet error rate from 0 – 0.5 (with the interval of 0.1) with transmitter window size as 4.
 - 2) For the performance comparison, vary the transmitter window from 4 – 16 (with the interval of 4) with packet error rate as 0.2. Note that transmitter window is applicable only for Go-Back-N and selective repeat. For stop-and-wait protocol, the transmitter window size is essentially 1.
- A. For the above scenarios, plot the throughput comparisons for all three protocols with respect to varying packet error rate and varying transmitter window size. From the results, explain which protocol is better under what conditions and why. If the number of packets is increased to 1000 instead of 100, will the trend be same? Comment.
- B. For the above scenarios (with number of packets as 100), compare the number of retransmissions needed among three protocols. If the number of packet is increased to 1000, compare the number of retransmissions. Comment on the trend.
- C. To avoid erroneous receiving (as we saw in class slides) what should be the relationship between transmitter window size and sequence number range? With the transmitter window varying from 4 – 16, what should be the ideal sequence number range and how many bits should be used for sequence number field? Explain your answer by providing a flowchart (as we saw in the class) for the case when transmitter window size is 4.

What to turn in: A folder (containing source code and pdf with screenshots of outputs, answers and explanations) to be uploaded to WebCampus by the due date Oct 5, 2014, 5pm.

Name the file <lastname>_proj1.pdf

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