Computer Communications and Networks (COMN) 2016/17, Semester 2

Assignment Part 1 Results Sheet

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Question 1 – Number of retransmissions and throughput with different retransmission timeout values with stop-and-wait protocol.

Retransmission timeout (ms)	Number of re-transmissions	Throughput (Kilobytes per second)
5	2083	46.301
10	1042	44.799
15	732	41.618
20	229	41.083
25	203	39.288
30	197	38.131
40	204	34.817
50	214	31.743
75	203	27.348
100	202	23.705

Question 2 – Discuss the impact of retransmission timeout value on number of retransmissions and throughput. Indicate the optimal timeout value from communication efficiency viewpoint (i.e., the timeout that minimizes the number of retransmissions and keeps the throughput as high as possible).

The values above are the average values from a sample of five tries on every retransmission timeout. Looking at the results, it can be deduced that the throughput is reduced as the retransmission timeout is increased. The number of retransmissions at 5ms retransmission timeout reaches approximately 2000 and when that is doubled the number of retransmissions is halved. At 15ms retransmission timeout, the retransmissions are reduced, at 20ms they are reduced even further and for the rest they remain at around the same levels of 200 retransmissions. When the retransmission timeout is less than 20ms, it's expected to lose more packets as the timeout given is low and the packets or the acknowledgements might not be received successfully. Also, we have added a 5ms propagation delay on both transmission pipes therefore it's expected to lose more packets when the retransmission timeout is close to that value. As it can be seen from the results

above, the optimal timeout value that minimizes the number of retransmissions and keeps the throughput as high as possible is the 25ms retransmission timeout. At that value the retransmissions are at a level of 200 approximately, which is a slight improvement from the 20ms timeout and the throughput is almost the same.