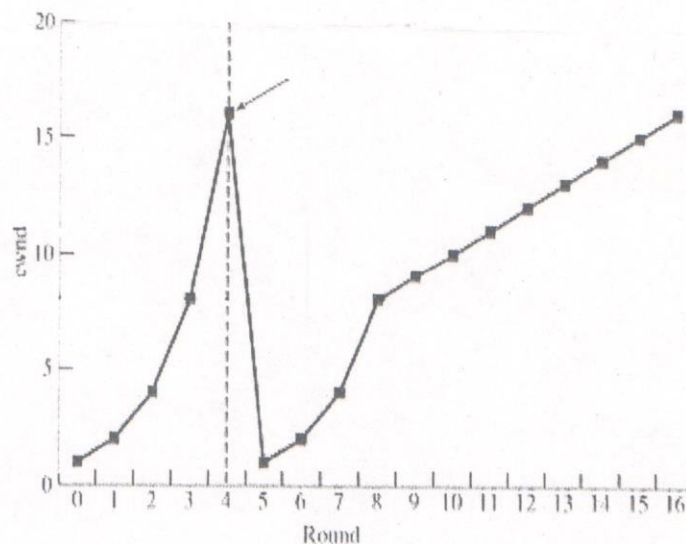


Computer Networks Homework

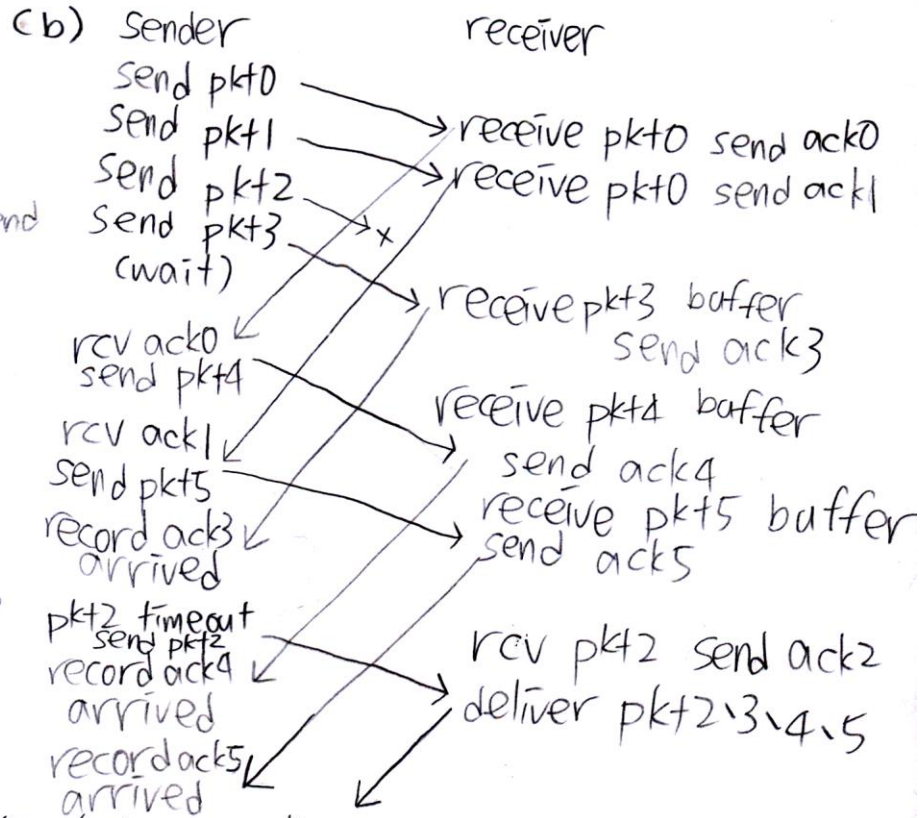
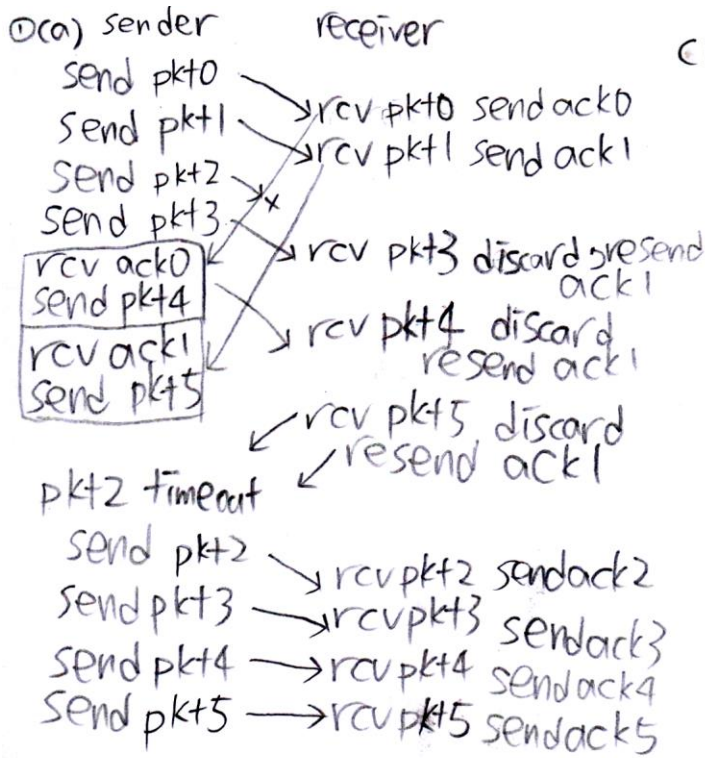
Due date: June 23, 2016

1. Consider the following scenario during the communication between sender and receiver. Suppose Packet0 through Packet4 are transmitted. Then, these packets are correctly received and acknowledged at the receiver, except Packet0 and Packet3 are lost. After sender receives the three acknowledgements from receiver, the packet1 timeout.
 - (a) Sketch the time diagram for above scenario with Go-Back-N protocol.
 - (b) Redo above problem with Selective Repeat protocol.
2. What is the Fast Retransmit of TCP?
3. If the TCP round-trip-time, RTT, is currently 30 msec and the following acknowledgements come in after 26, 32, and 24 msec, respectively, what is the new RTT estimate using the timeout estimating algorithm? Use $\alpha = 0.9$.
4. Please briefly describe how TCP estimate the timeout interval?



5. Consider the plot in the following of TCP window size as a function of time. Answer the following questions.
 - (a) Identify the intervals of time when TCP slow start is operating.
 - (b) Identify the intervals of time when TCP congestion avoidance is operating.
 - (c) After the 4th transmission round, is segment loss detected by a triple duplicate ACK or by a timeout?
 - (d) What is the initial value of Threshold at the first transmission round?
 - (e) What is the value of Threshold at the 7th transmission round?
 - (f) During what transmission round is the 70th segment sent?

詳解



② 如果它接收到重複ACK時，就知道有封包遺失，不用等鬧鐘響就重傳封包。

③ Simple RTT 26 32 24
 Estimated RTT 30

$$30 \times 0.1 + 26 \times 0.9 = 3 + 23.4 \quad A = 23.4$$

④ Estimated RTT = (1 - α) × Estimated RTT + α × Simple RTT

⑤ (a) 0~4 (b) 8~16 (c) timeout (d) 16KB (e) 8KB (f) 38+8+9+10+11=70
 5~8 在第10round時 A=11