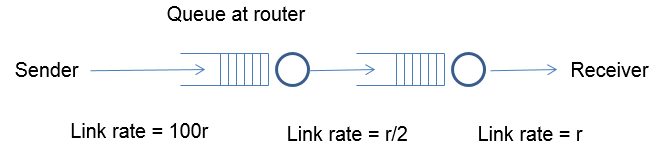
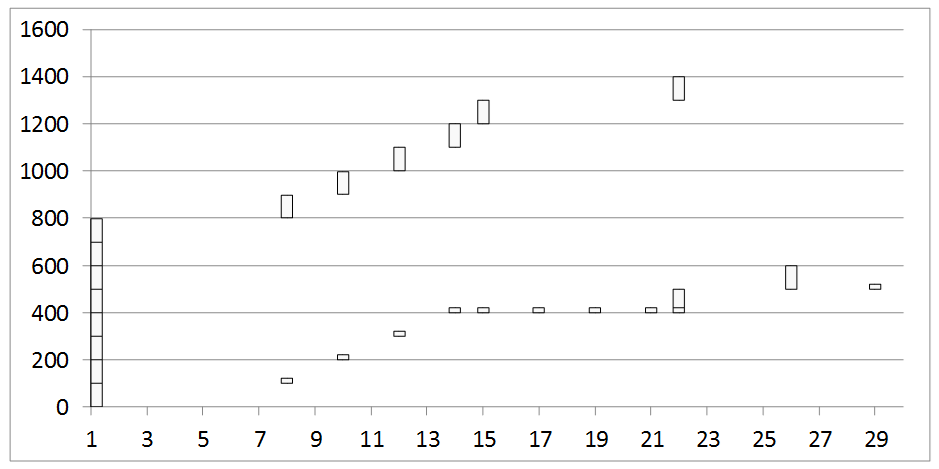
**COL-334/CSL-374/CSL-672: Assignment 3, Semester 2014-2015**

1. Now consider a different scenario where the access link is very fast but the next link is slower.



Assume an initial window size of 8 this time. As in the previous question, the window size is reduced to half upon receiving triple duplicate acknowledgements, and it is incremented by 1 / int (congestion window) upon receiving an acknowledgment. A timeout occurs if the last unacked packet goes unacknowledged for more than 25 time units. The buffer size at the first router is limited, and it follows a drop-tail policy. Assume that all packet losses happen due to buffer overflow at the first router. Answer the following questions:



* + 1. What is the RTT in this case?

Ans: 7 units (time between first packet at t=1 and its ack at t=8). Other packets take longer due to slow 2nd link and buffering at fist router. Also evident from ack received after 7 units (at t=29) for packet 400-499 (sent at t=22) when the network had no pending packets.

* + 1. Can you infer the buffer size at the first router? How?

Ans: Buffer Size is 4. Since the router follows the tail drop policy and 5th packet has been dropped after seeing three duplicate ack and also 6th packet has been dropped after seeing it’s timeout at time26, it suggests that the buffer size of the router is 4.

* + 1. Why is there no retransmission at time 17 despite a triple dup ack? Why does this retransmission happen later at time 22? Why do two packets get fired off at time 22?

Ans: No retransmission happens at time 17, because on receiving 3 dup ack, the window size became 4.312 and at that moment there were 6 packets in the network. For the packet to be transmitted, the number of the packets in the network must be less than the congestion window size, which is not the case at time 17.

At time 22, the window size is 5.065 and the outstanding packet in the network is 3. Therefore the two packets get fired off at time 22.

* + 1. When did a timeout occur? Which packet gets timed out?

Ans: The timeout occurs at time 26. Packets 6,7,8 (500 – 799) get timed out.