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CSE-310

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Assignment 3 (Part B)

1- Congestion window initially was found for each TCP flow i.e. it < 4 until the end.

As we need to estimate at the sender side and do it empirically. **Cwnd size** indicates that how much amount of data can be transmitted to the other end at a time.

➔ The initial cwnd can be estimated by taking the sequence number and adding the data (to be sent) to it (as we have to do it empirically).

➔ Congestion window size starts at first with the initial value icwnd and it grows eventually, so TCP then allows Additive Increase Multiplicative Decrease (AIMD) method to bring the cwnd size in control. Moreover, cwnd size gets increased rapidly in slow start due to its tendency to reach upto ssthreshold asap. When it reaches to ssthreshold value, congestion avoidance state is achieved which lets cwnd size to increase additively after each ACK. Cwnd size gets decreased and ssthreshold to half the cwnd if retransmission occurs due to loss of packets or imeouts.

2- Triple duplicate Acks occurs when three same Ack are received and there might be other seq numbered packets sent but the receiver is expected to receive the Ack numbered next packet. Hence, retransmission occurs due to inability to send the next (ack) packet. Similarly, retransmission occurs due to the lack of acknowledgments and realizes that they have sent lots of packets without having them acknowledged.

We can mark triple duplicate ack by simple checking if particular “tcp.ack” has been received for more than 3 times and its respective seq number hasn’t been sent, resulting in retransmission of that seq number.