23-1 Computer Network

HW2 due 10.23 23:59

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1.

1-a. 0010 1010 0010 0100

1-b. to detect errors in transmitted segment.

2.

The segment is not correctly received because checksum value and calculated value is different.

(1000 1101 1111 0010 != 0101 1101 1111 0010)

Receiver can take it while knowing it has error or discard it. Its up to programmer's choice.

3.

When L is length of packet, R is bandwidth, W is window size

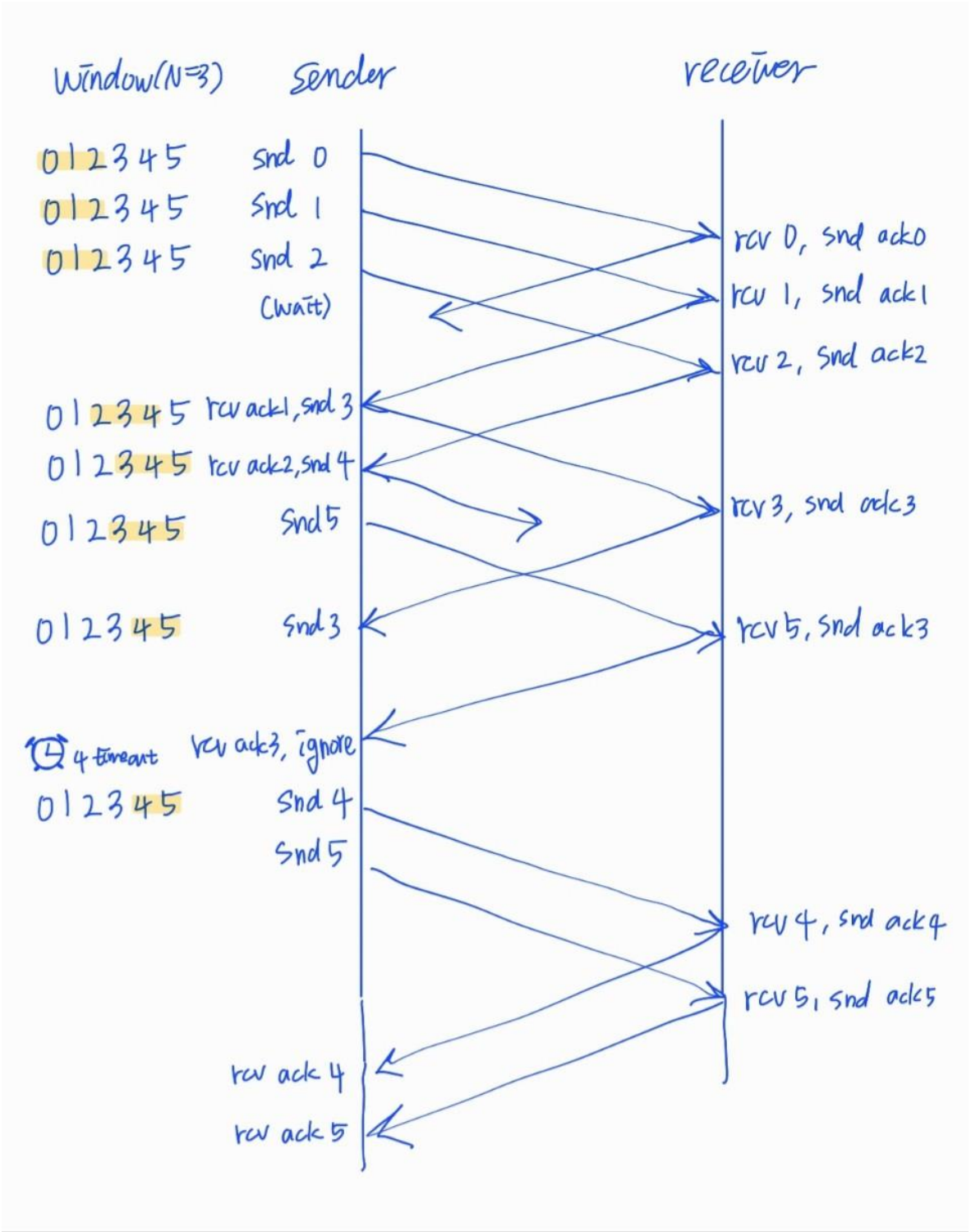
Dt(transmission delay) = L/R = 1500byte / 10Gbps = 0.0012msec

Us(Utilization of sender) = W*Ut / RTT + Ut = 0.0012W / 30.0012

For Us is over 0.8, W should be more than 20000.8

So, window size must more than 20001

4.


window(N=3)
sender
receiver
0 1 2 3 4 5
snd 0
0 1 2 3 4 5
snd 1
0 1 2 3 4 5
snd 2
(wait)
rcv 0, snd ack0
rcv 1, snd ack1
rcv 2, snd ack2
0 1 2 3 4 5
rcv ack1, snd 3
0 1 2 3 4 5
rcv ack2, snd 4
0 1 2 3 4 5
snd 5
rcv 3, snd ack3
0 1 2 3 4 5
snd 3
rcv 5, snd ack3
4 timeout
rcv ack3, ignore
0 1 2 3 4 5
snd 4
snd 5
rcv 4, snd ack4
rcv 5, snd ack5
rcv ack 4
rcv ack 5

5.

5-a. seq# 137, src port# 302, dest port# 80

5-b. seq# 137, src port# 80, dest port# 302

5-c. seq# 97

5-d. seq# 97

6.

TCP flow control force Host A to slow down it's sending speed by let it know the remain buffer size Host B has, if Host B's receiving rate is slower than A's. so, in this case, the total performance will be limited as 600Mbps (following the bottleneck; Host B) even though others (Host A, link) has better performance.