

$$MSS = 1460$$

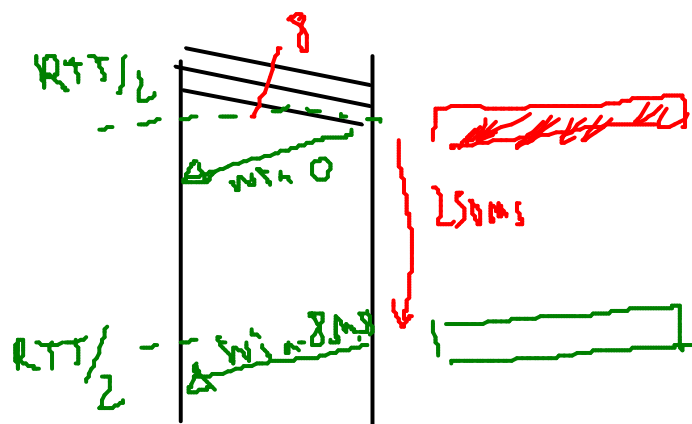
$$V = 2 \text{ Mbps}$$

$$B^R = 8 \text{ MSS}$$

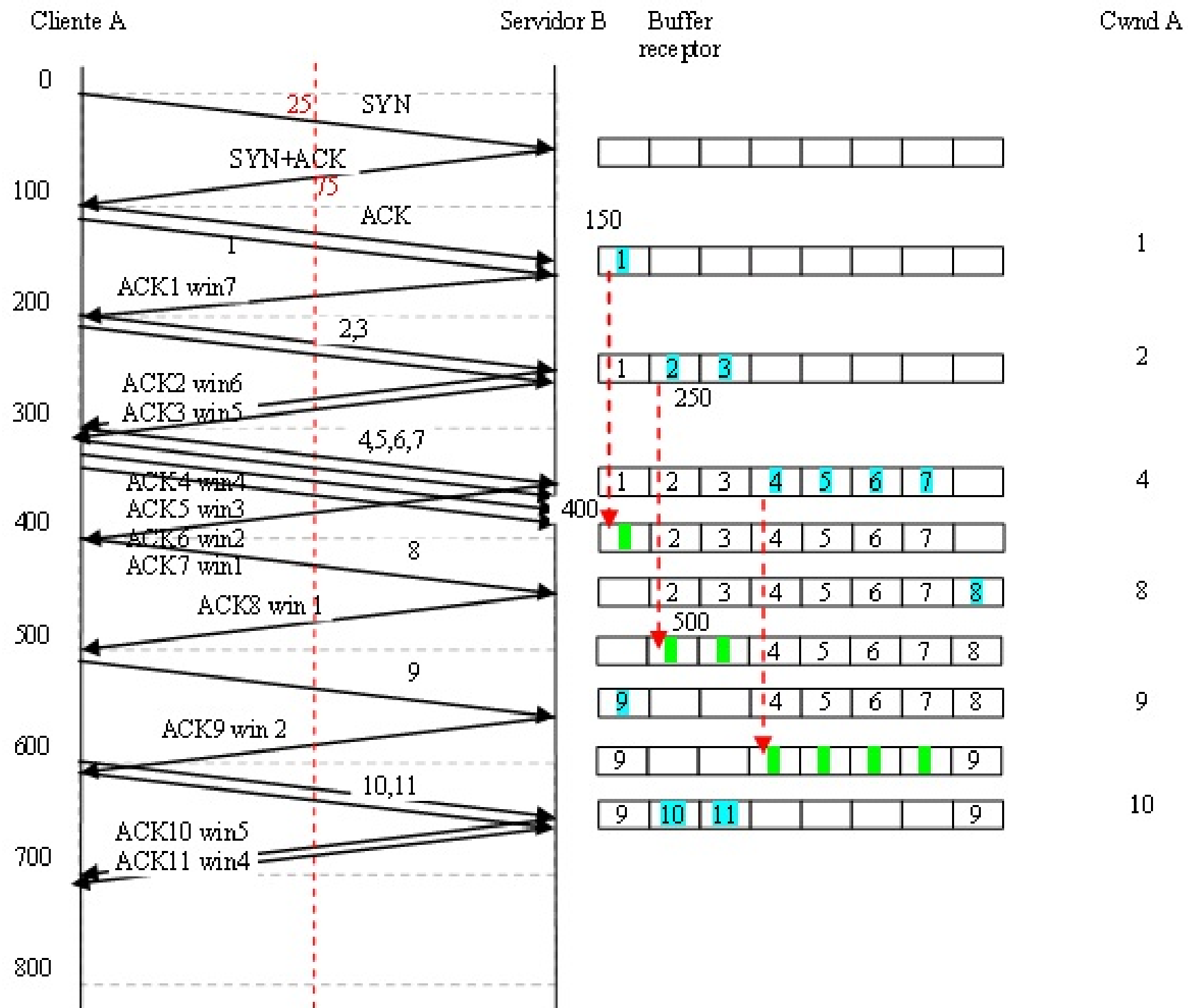
a)

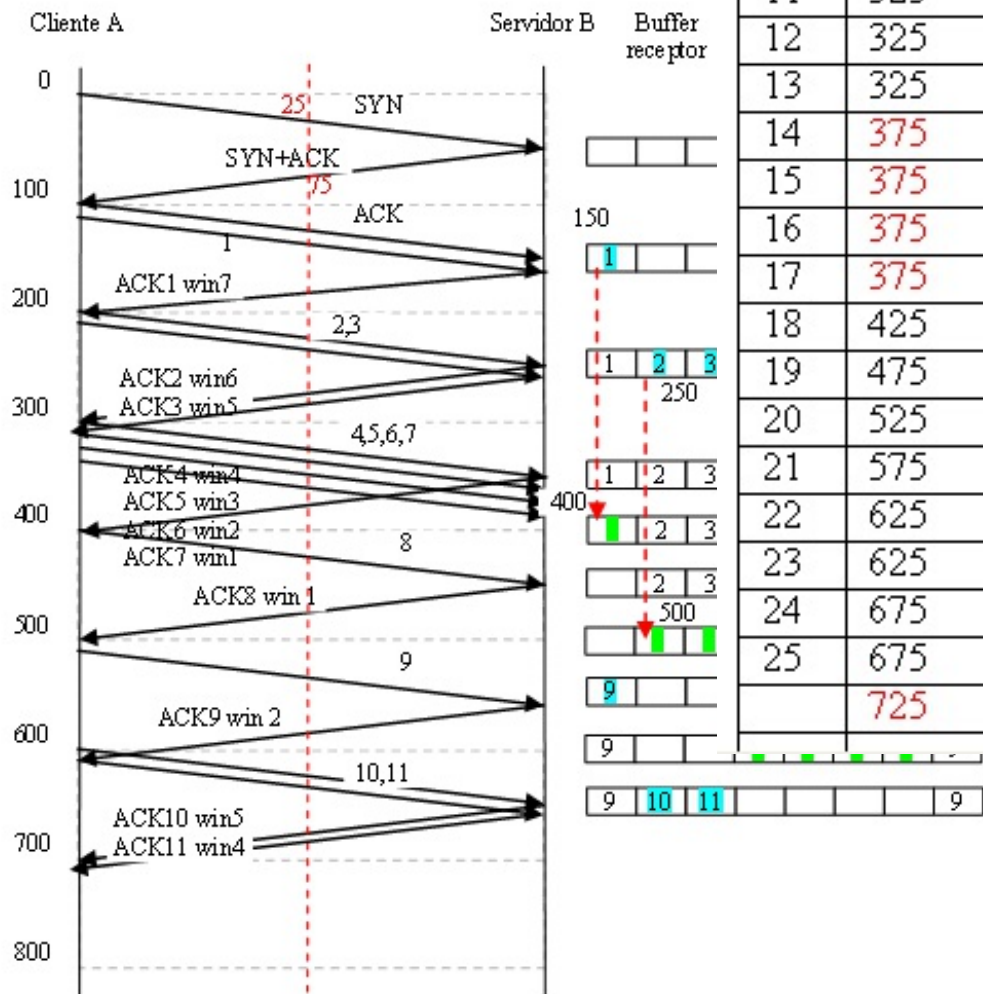
$$2 \text{ Mbps} \rightarrow Cwnd = RTT \times BW = 100 \text{ ms} \times 2 \text{ Mbps} = 1712 \text{ MSS}$$

$$B^R \rightarrow V_R = \frac{B^R}{RTT} = \frac{8 \text{ MSS}}{100 \text{ ms}} = 9344 \text{ kbps}$$



$$VAR = \frac{B^R}{\frac{RTT}{2} + 250 \text{ ms} + \frac{RTT}{2}} = \frac{8 \text{ MSS}}{350 \text{ ms}} = 26897 \text{ kbps}$$





N° paq	Timestamp (ms)	Paquete	wnd A	Win B	Disponible=Min (WR,cwnd)- pendientesACK
1	25	ipA.pA > ipB.pB: S 0:0(0) win 8MSS <mss 1460>	1		SlowStart
2	75	ipB.pB > ipA.pA: S 0:0(0) ack 1 win 8MSS <mss 1000>	1	8	1
3	125	ipA.pA > ipB.pB: ack 1 win 8MSS			
4	125	ipA.pA > ipB.pB: 1:1461(1460) ack 1 win 8MSS			0
5	175	ipB.pB > ipA.pA: ack 1461 win 7MSS	2	7	2
6	225	ipA.pA > ipB.pB: 1461:2921(1460) ack 1 win 8MSS			1
7	225	ipA.pA > ipB.pB: 2921:4381(1460) ack 1 win 8MSS			0
8	275	ipB.pB > ipA.pA: ack 2921 win 6MSS	3	6	3
9	275	ipB.pB > ipA.pA: ack 4381 win 5MSS	4	5	4
10	325	ipA.pA > ipB.pB: 4381:5841(1460) ack 1 win 8MSS			3
11	325	ipA.pA > ipB.pB: 5841:7301(1460) ack 1 win 8MSS			2
12	325	ipA.pA > ipB.pB: 7301:8761(1460) ack 1 win 8MSS			1
13	325	ipA.pA > ipB.pB: 8761:10221(1460) ack 1 win 8MSS			0
14	375	ipB.pB > ipA.pA: ack 5841 win 4MSS	5	4	4
15	375	ipB.pB > ipA.pA: ack 7301 win 3MSS	6	3	3
16	375	ipB.pB > ipA.pA: ack 8761 win 2MSS	7	2	2
17	375	ipB.pB > ipA.pA: ack 10221 win 1MSS	8	1	1
18	425	ipA.pA > ipB.pB: 10221:11681(1460) ack 1 win 8MSS			0
19	475	ipB.pB > ipA.pA: ack 11681 win 1MSS	9	1	1
20	525	ipA.pA > ipB.pB: 11681:13141(1460) ack 1 win 8MSS			0
21	575	ipB.pB > ipA.pA: ack 13141 win 2MSS	10	2	2 Cong Avoid
22	625	ipA.pA > ipB.pB: 13141:14601(1460) ack 1 win 8MSS			1
23	625	ipA.pA > ipB.pB: 14601:16061(1460) ack 1 win 8MSS			0
24	675	ipB.pB > ipA.pA: ack 14601 win 5MSS	10	5	5
25	675	ipB.pB > ipA.pA: ack 14601 win 4MSS	11	4	4
	725	ipA.pA > ipB.pB: 16061:17521(1460) ack 1 win 8MSS			3

$$d) N_{FIN} = SYN + DATOS + 1 = 47 + \underbrace{50 \cdot 1024 \cdot 1024}_{\substack{\text{50 MB} \\ \text{"} \\ 50 \cdot 10^6}} + 1 = 57.428.848$$

Mbps
 $\uparrow$
 $50 \cdot 10^6$

e) ① $\uparrow CPU$ $\uparrow$ memoria $\uparrow$ disco $\cancel{V_A} \rightarrow V_R (V_R)$

② $B^R = RTT \times \check{V_T} = 100ms \times 2Mbps = 17'12ms$

