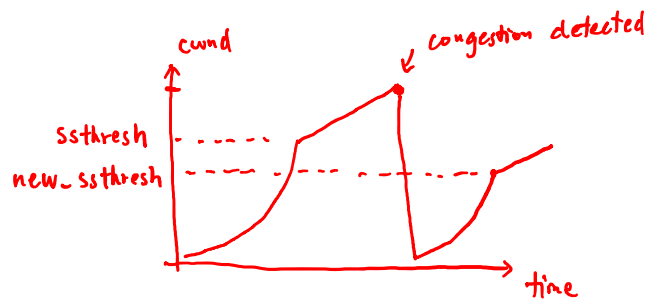
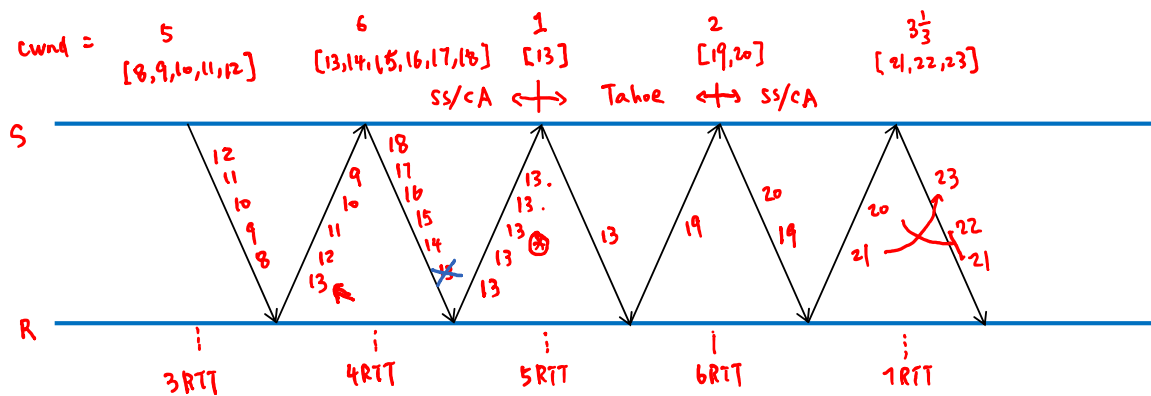


TCP Tahoe
Flowchart



Cpr E 489 -- D.Q.



At 5 RTT:

- 1st dup A13
- 2nd dup A13
- 3rd dup A13 \Rightarrow Congestion Detected
- Retransmit 13
- new_ssthresh = 3
- new_cwnd = 1

unAcked pkts: 13, 14, 15, 16, 17, 18

⑥

4th dup A13 } no action

5th dup A13 }

At 6 RTT:

- A19: non-dup ACK
- $\text{cwnd} = 1 + 1 = 2$

At 7 RTT:

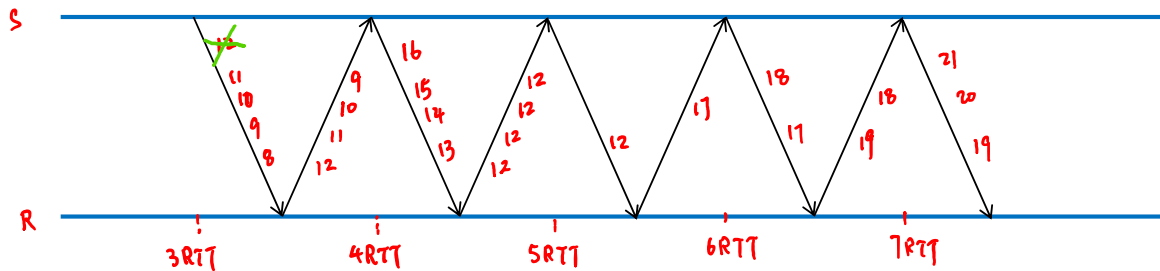
- A20: non-dup ACK
- $\text{cwnd} = 2 + 1 = 3$
- [20, 21, 22]: xmit 21, 22
- A21: non-dup ACK
- $\text{cwnd} = 3 \frac{1}{3}$
- [21, 22, 23]: xmit 23

Cpr E 489 -- D.Q.

cwnd =

5

SS/CA \leftrightarrow Tahoe \leftrightarrow SS/CA



Time	Packet Received	Action Taken	List of unACKed packets	Total # dup ACKs	Estimated # outstanding packets	ssthresh value	cwnd size	cwnd / swnd range	# new packets to send
4 RTT	A9					4	5 + 1/5	9, 10, 11, 12, 13	1: #13
	A10					4	5 + 2/5	10, 11, 12, 13, 14	1: #14
	A11					4	5 + 3/5	11, 12, 13, 14, 15	1: #15
	A12					4	5 + 4/5	12, 13, 14, 15, 16	1: #16
5 RTT	A12					4	5 + 4/5	12, 13, 14, 15, 16	0
	A12					4	5 + 4/5	12, 13, 14, 15, 16	0
	(*) A12	C.D. retransmit 12				2	1	12	0
	A12					2	1	12	0
6 RTT	A17	non-dup ACK				2	2	17, 18	2: 17, 18
7 RTT	A18	non-dup ACK				2	2 + 1/2	18, 19	1: 19
	A19					2	3	19, 20, 21	2: 20, 21

$$\textcircled{1} \quad \text{new_cwnd} = \text{cwnd} / 2$$

$\textcircled{2} \quad \text{dup ACKs}$



total #
outstanding
packets
~~~~~  
||

$\leq$

cwnd  
~~~~~  
estimated network capacity

$$\text{total \# unACKed pkts} - \text{total \# dup ACKs}$$

