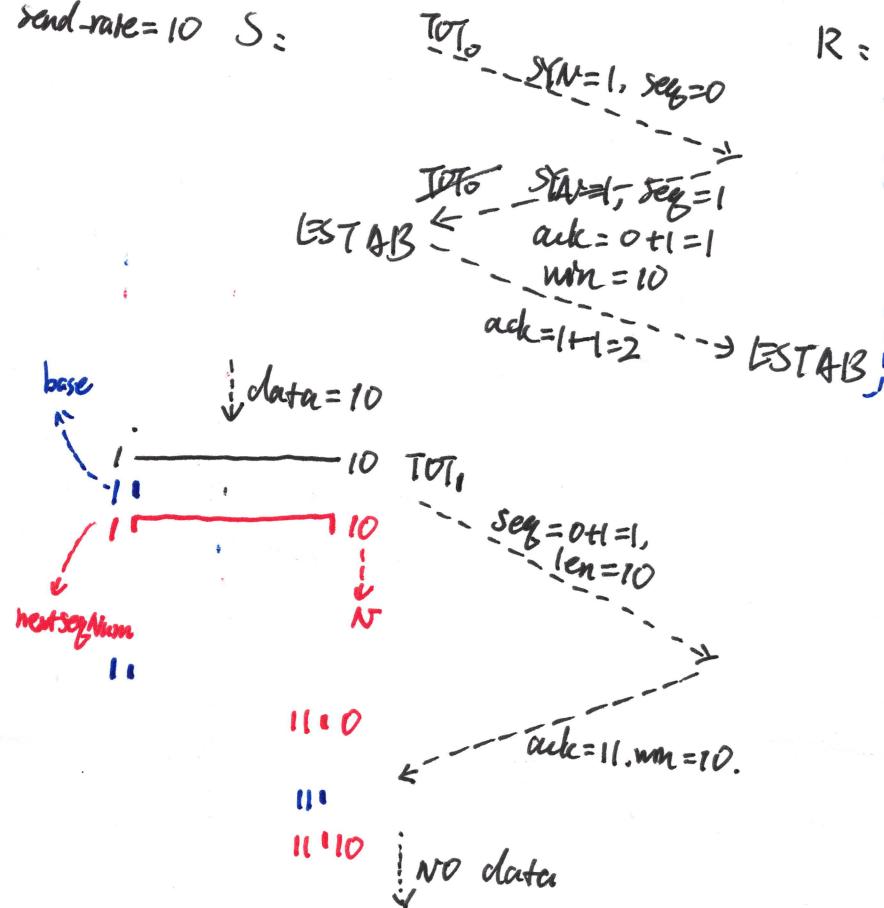


send-rate = 10 S:



R: def_wh = 10, read_rate = 10

3-way handshake

11 10

expected
segnum

\rightarrow deliver - data

-1-

Assum: ① sender can send N B at a time.
② receiver can deliver M B at a time.

② receiver can deliver A or B at a time

- ③ No re-connection.
- ④ N cannot be 0

③ No re-connection.
 ④ N cannot be 0
 ⑤ No Silly Window syndrome.
 ⑥ Impair TCP-Tahoe

S: seq=11

↓ app signals
to close

FIN_WAIT_1 $\xrightarrow{\text{TO}_{TF}}$ FIN=1, seq=11+1=12
Ack=2 \rightarrow CLOSE_WAIT

FIN_WAIT_2 $\xrightarrow{\text{TO}_{TF}}$ FIN, ack=13
seq=2+1
CLOSE_APP

CLOSE_APP
TIME_WAIT $\xrightarrow{\text{TO}_{TF}}$
close()

R:

S: seq=11

↓ app signal to close

FIN_WAIT_1 $\xrightarrow{\text{TO}_{TF}}$ FIN=1, seq=13
X

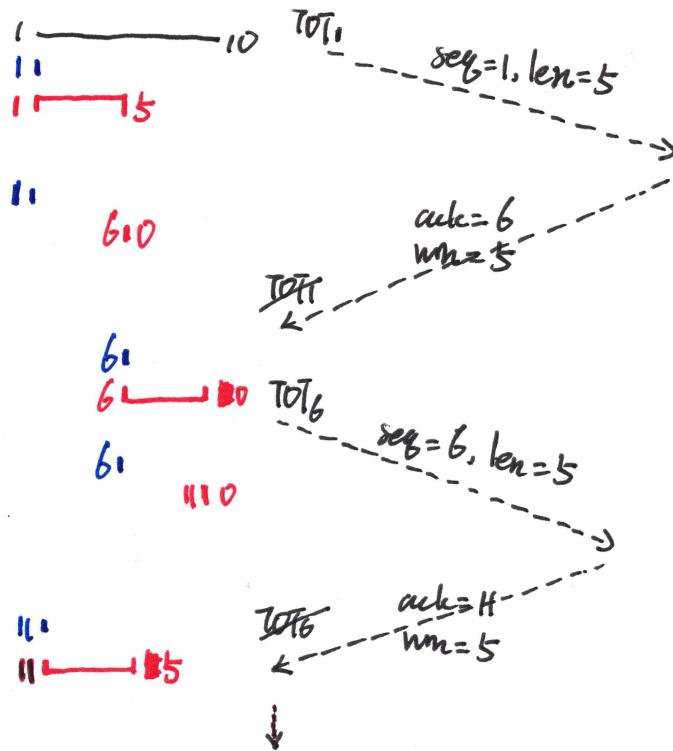
! FIN=1, seq=13 \rightarrow CLOSE_WAIT
!

R:

40th

S: send_rate = 10

$$\downarrow \text{data} = 10$$



R: def_wm = 5, read_rate = 10

$$1 \xrightarrow{5}$$

$$6 \xrightarrow{10}$$

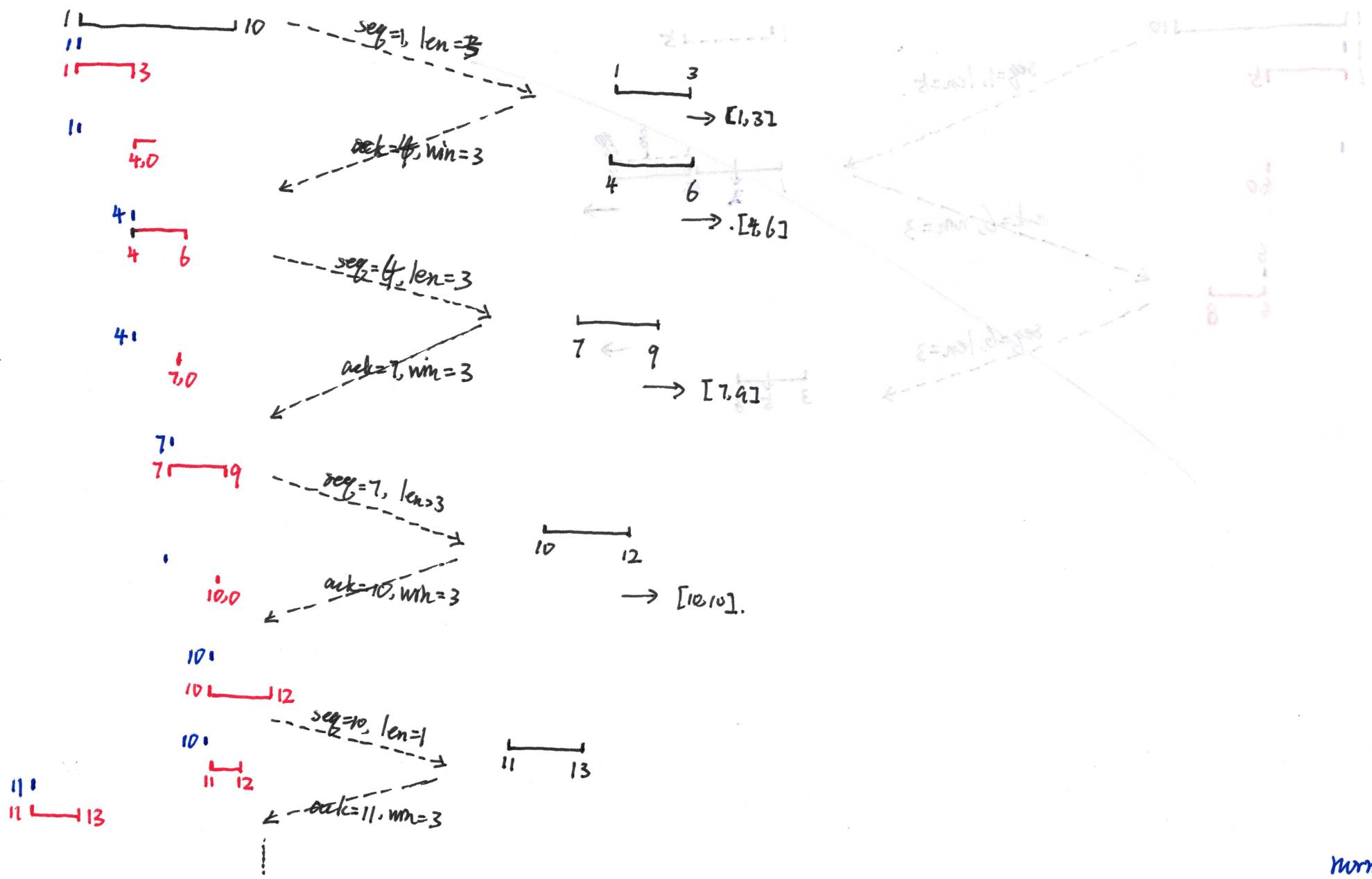
$$\xrightarrow{10}$$

$$\xrightarrow{15}$$

Sender:

$$R := \text{def_min} = 3 = N.$$

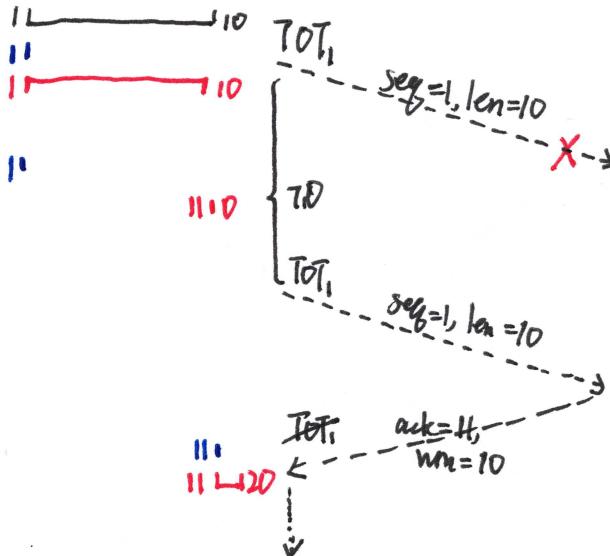
i data = 10



S:

R: N=10.

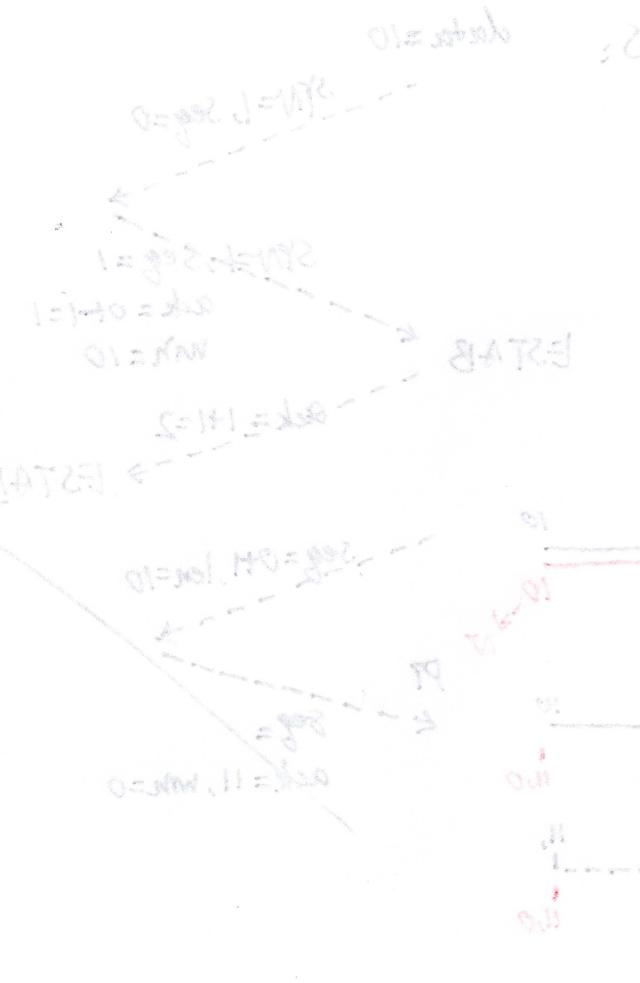
↓ data=10



$$01 = \text{new_seq}, (20, 1, 1) = \text{old_seq} : R$$

01 = old_seq

trans



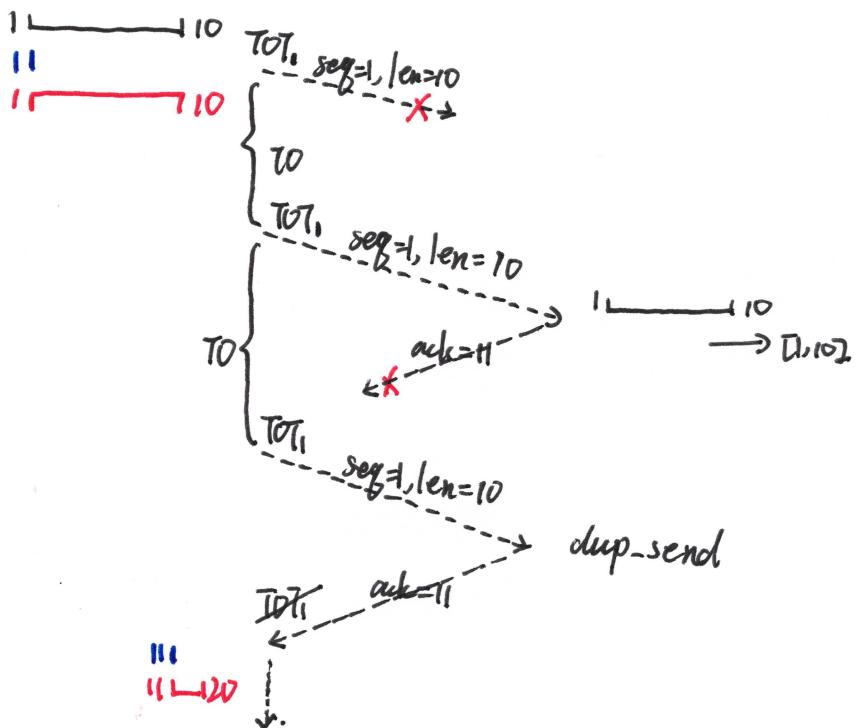
① TOT: Timer-Out timer.

No

S:

↓ data=10

R: N=10.



Non

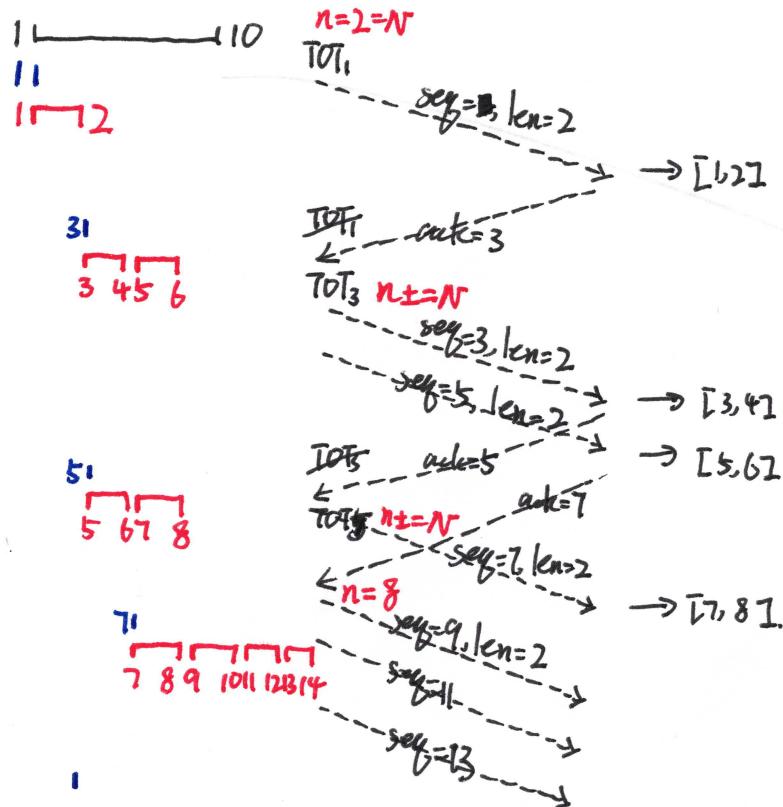
S:

R: $N=2$.

S=11 : R

26 down

j, data = 10

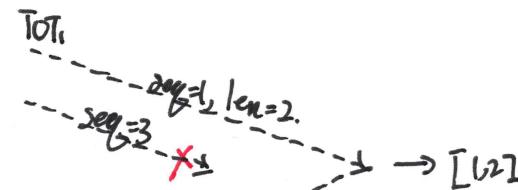
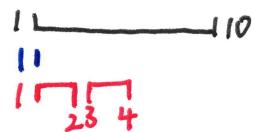


cogestion cat
(c.c.)

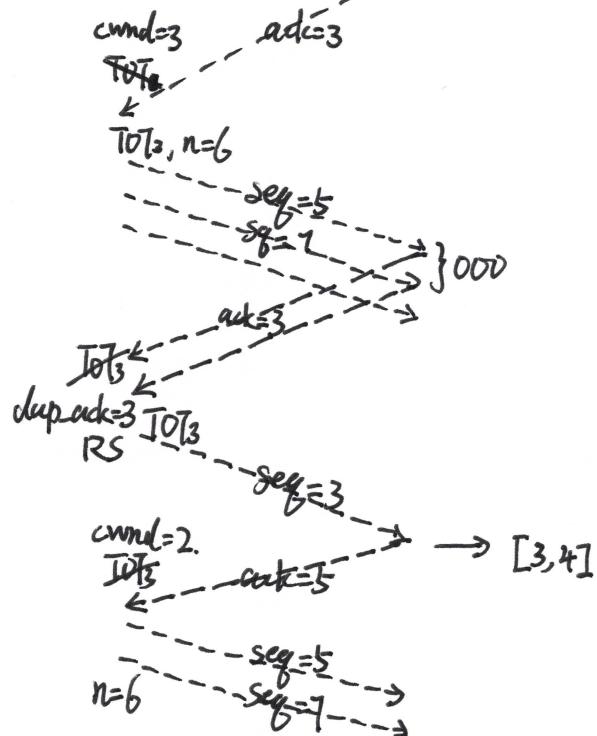
S: cwnd=2, n=4

R: N=2.

↓ data=10



31
3 4 5 6 7 8



RS {
n=N
ssthread = cwnd/2 = 1
cwnd = 1 MSS
dup-ack = 0

OOO: out-of-order.

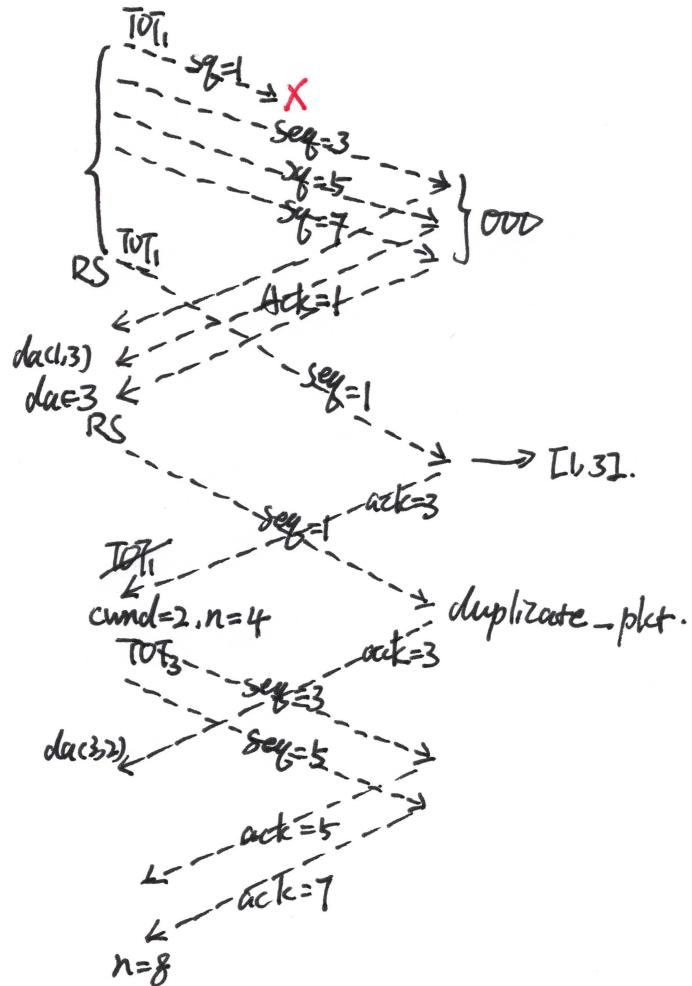
slow T

CC

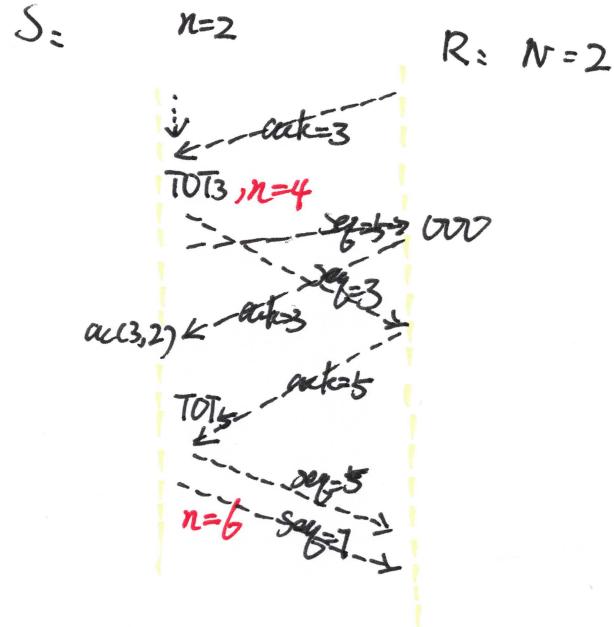
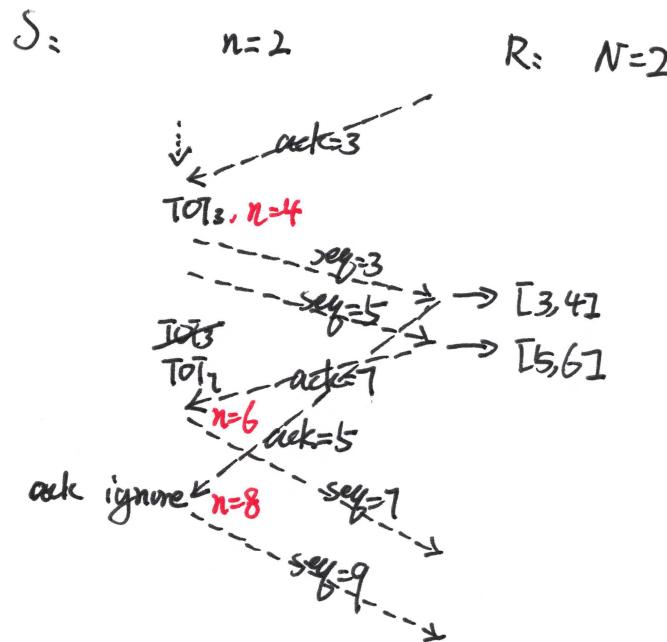
slow

fast

$$S: \text{cwnd} = 4, n = 2 \cdot 4 = 8 \quad R: N = 2$$



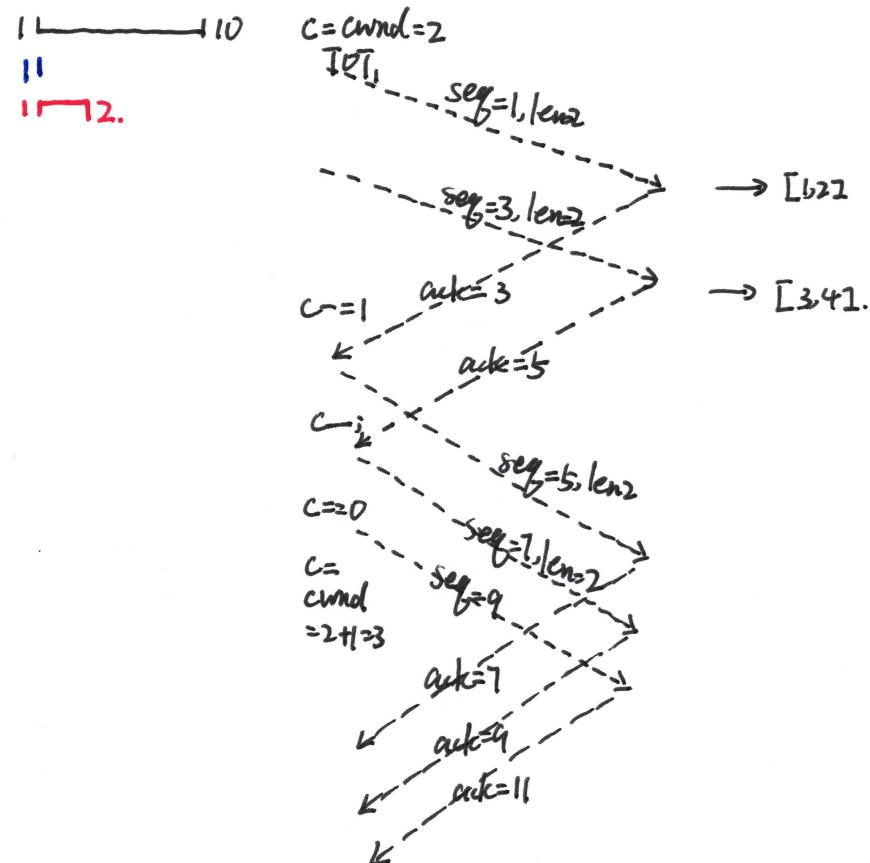
CC



S: cwnd=2

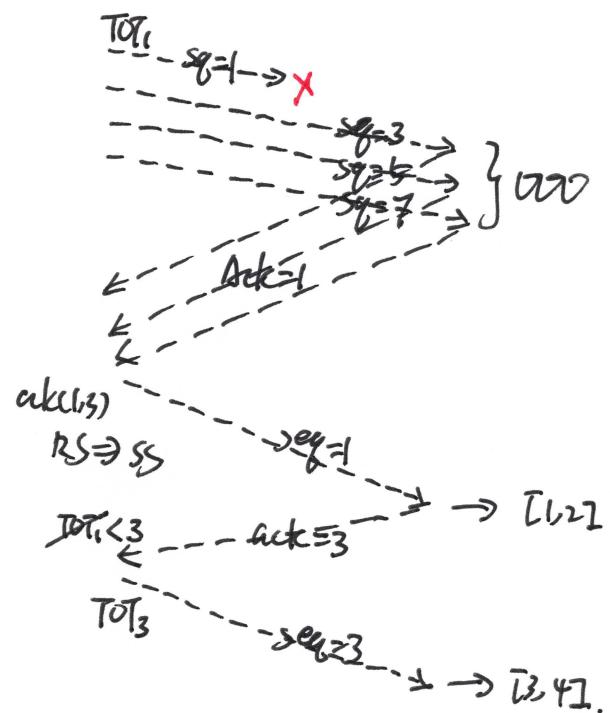
R: r=2.

↓ data=10 $cwnd \geq ssThreshold$



S: cwnd=4, n=8, C=4

R: n=2



congest
adv
just

* TC
H

CC.