**OCT 6, 2020 : TCP continued**

### Cong. Avoidance.
- CW = 10, SSThreshold = 8
- TCP is now in Cong. Avoid (CA) phase.
- Now, say A13 comes to Tx.
- Tx removes CW to: [14, ... , 23]
- CW = 10/8.
- Tx sends P23.

### Packet Drop
- Tx
- Rx
- T10

### ACKs dropped.
- Rx can optimize ACKs by sending ACKs for every K packets.
  - K often = 2.

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**Packet Drop**

**ACKs dropped**

**Cong. Avoidance**

- CW
- SSThreshold
- Slow start
- Exp. increase
- Linear increase

**Time (in RTT)**

**Packet Drop**

**ACKs dropped**

**Cong. Avoidance**

- CW
- SSThreshold
- Slow start
- Exp. increase
- Linear increase

**Time (in RTT)**

**Packet Drop**

**ACKs dropped**

**Cong. Avoidance**

- CW
- SSThreshold
- Slow start
- Exp. increase
- Linear increase

**Time (in RTT)**

**Packet Drop**

**ACKs dropped**

**Cong. Avoidance**

- CW
- SSThreshold
- Slow start
- Exp. increase
- Linear increase

**Time (in RTT)**
DupACK \rightarrow \text{Out of order (000) pkt received by Rx}

Rx says let's wait 2 watch \rightarrow \text{no need to panic yet.}

\text{Triggers "fast recovery phase"}

\text{SSThreshold} = CW/2
\text{CW} = CW + 3
\text{CW} = 4 + 3 = 7
\left[5, 6, 7, 8, 9, 10, 11\right]

new pkts transmitted.
Fast Recovery (3 dupACK)

- Set \( \text{SST} = \text{CW}/2 \)
- Reward \( \text{CW} = \text{CW} + 3 \)
- Keep inc\( \uparrow \) \( \text{CW} \) for every new dupACK
- Once new ACK, treat as normal and inc\( \uparrow \) \( \text{CW} \) depending on slow start or CA.
$C_L = 8$

$[9, 16]$