

TCP

Your Name

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TCP

- Slow Start / Congestion Avoidance
- CWND Ssthresh
- Bernoulli TCP
- GUI

TCP (FSM)

- TCP

$$S = \{CLOSED, LISTEN, SYN_SENT, SYN_RECEIVED, ESTABLISHED\}$$

- - $\delta : S \times E \rightarrow S$
 - SYN
 - (Half-open)
 - DDoS

Slow Start

$$cwnd = cwnd + 1$$

Congestion Avoidance

$$cwnd = cwnd + \frac{1}{cwnd}$$

Loss

$$ssthresh = \frac{cwnd}{2}, \quad cwnd \rightarrow 1$$

- TCP
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Bernoulli

$$X \sim \text{Bernoulli}(p)$$

$$X = 1$$

- cwnd
- ssthresh
- TCP Slow Start

TCP

① Network Layer

- (delay)
- (bandwidth)
- (Bernoulli loss)

② TCP Connection Layer

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- FSM
- cwnd / ssthresh
- ACK

③ Simulator (DES)

- Future Event List
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- ssthresh loss →
 - cwnd Slow Start
 - cwnd ssthresh Congestion Avoidance
- TCP Reno