Lecture 5

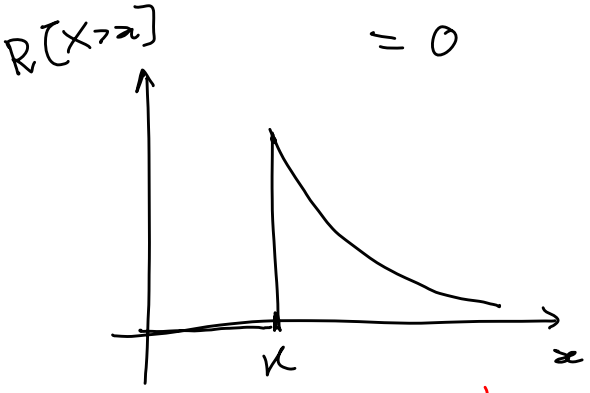
Note Title 1/21/2005

Pareto distribution

$$P[X > x] \propto \frac{1}{x^{\alpha}}$$ — α: shape

$$\forall x \geq k$$ — k: minimum

$P[X > x] = 0$ $\quad x < k$



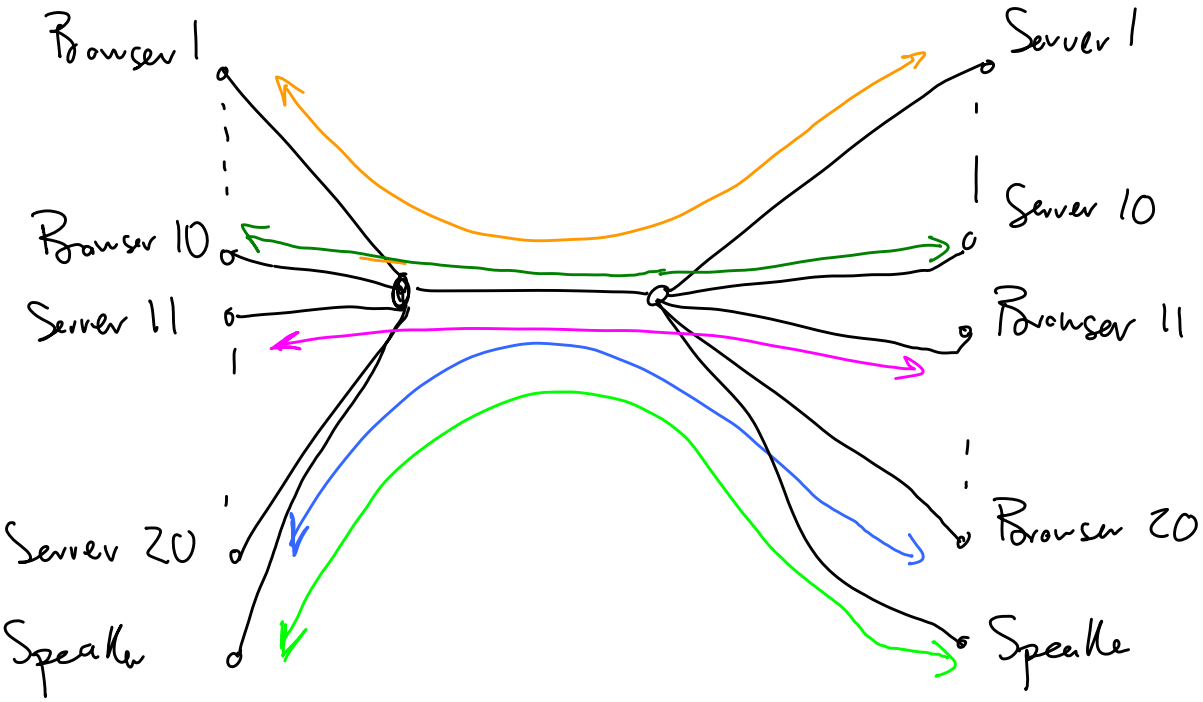
$$E[X] = k \frac{\alpha}{\alpha - 1}$$

$E[X]$: burst rate

k: mean interval

α: shape

$$E[X] = \int_k^{\infty} p(x)\, x\, dx$$



Retx (and Time-outs)

Reliability: detect drop-outs, positive acks } → ?

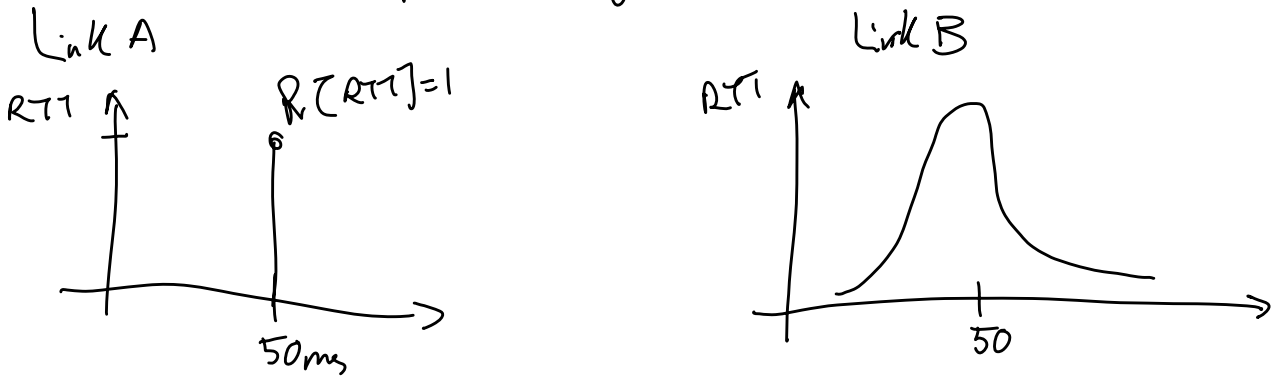
Properties: too short ⇒ too many retx, kills sending rate

too long ⇒ wastes time.

⇒ eg, time such that ack should be very likely received by then.

RTO = retx time-out RTT = round-trip time.

RTO should depend on avg RTT

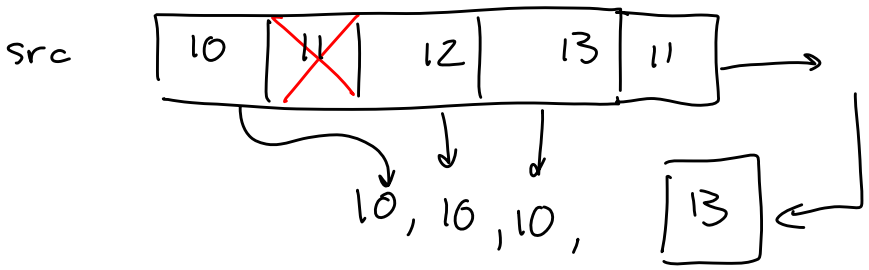


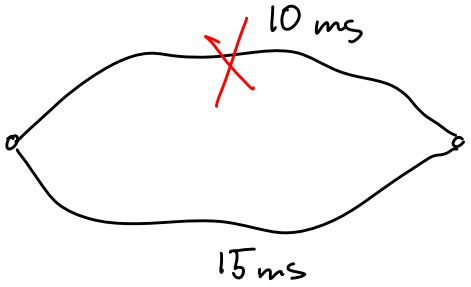
RTO should depend on variability of RTT.

SRTT = sample RTT

RTTVAR = variability of RTT

RTO ← SRTT + 4 RTTVAR.





Strategy	adaptive	smooth
Use latest RTT	perfect	terrible
Global avg	terrible	great.
Compromise	good	good

↳ smooth ⇒ maintain historical data
adaptive ⇒ favor last few samples

Possible solution: maintain last K samples, and use their avg.

Simpler solution: exponential moving avg

$$SRTT \leftarrow \frac{1}{8}\,sample + \frac{7}{8}\,SRTT$$