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# **Assignment #4**

Confidence Intervals, Regression, TCP+AQM  
(Continued)

# Confidence Intervals, Regression

- Given:  $n=6$  random RTT samples (in ms):

{31, 23, 29, 52, 28, 41}

Find: sample mean ( $\bar{x}$ ), sample standard deviation ( $s$ ), 90% confidence interval (CI) & 99% CI for the *population* mean

- What is the coefficient of determination (R-squared): define? How is it different from the variance of the samples?
- What are SST, SSE, SSR? How are they related to each other and the variance of the samples?

# Questions

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- Reno TCP vs. SACK TCP
  - What's the key difference between them?
  - What metrics are appropriate for measuring this difference?
  - Design a test scenario to show the difference.
- TCP AIMD Congestion Control vs Binomial CC:
  - What's the key difference between them?
  - What metrics are appropriate for measuring this difference?
  - **[Note:** *In the next class, we will IMPLEMENT Binomial CCs in ns-2]*
- RED vs. DropTail
  - What's the key difference?
  - Why RED drops packet randomly?
  - What's the major effect if using RED instead of DropTail?

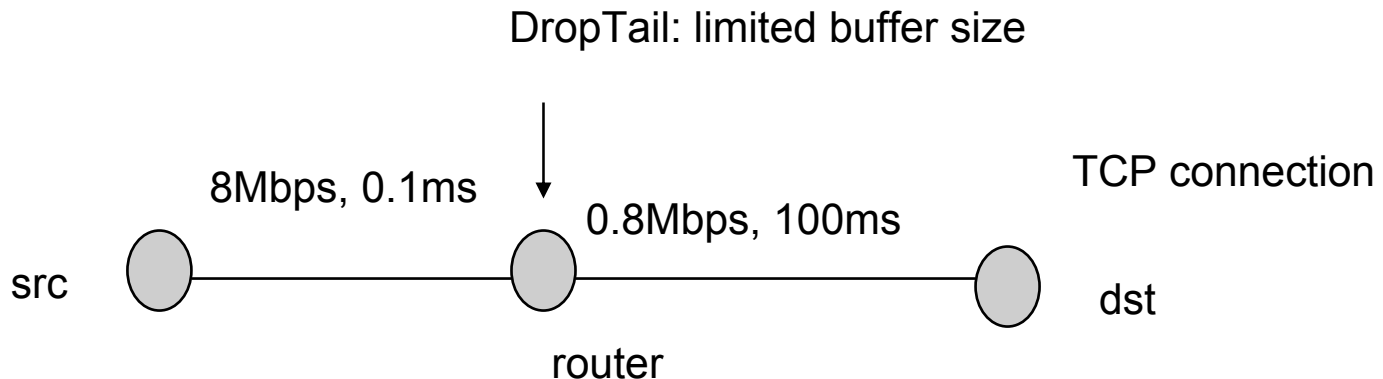
# Questions

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- Suppose a number of flows share a single droptail bottleneck
- If you change the following parameters, what do you expect?
  - Buffer size from 10 packets to 1000 packets;
  - Segment size from 100B to 1KB;
  - The number of flows from 3 to 10.
- Write down what do you expect?

# Assignment #4

- Validate the experiment in Section 6.5 of tcp-sack paper
- Sample code at `/home/net/ns/ns-2.26/tcl/test/test-sack`
- Generate your own ns script based on the sample code



- Generate Sequence # vs. Time graph at the node src;
- Compute average throughput at dst.

# Submission

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- Write ns2 script to measure TCP Reno/SACK performance difference.
- Submissions:
  - Ns2 simulation script;
  - All graphs and statistics.
- Due the Sunday Oct 1<sup>st</sup>, 11:55pm