EEC 687 Mobile Computing (Spring, 2008)

Ns-2 Laboratory #10

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Lab#1: Impact of Multiple-hop Routes on TCP

- Write a TCL script
  - A string topology consisting of 11 nodes
  - Every two neighboring nodes are separated by 200m
  - No mobility
  - Traffic
    - Node 0 sends TCP packets to node 1 (Test #1)
    - Node 0 sends TCP packets to node 2 (Test #2)
    - …..

- Observation
  - End-to-end throughput
  - What else are you interested in measuring? Cwnd? Rtt?

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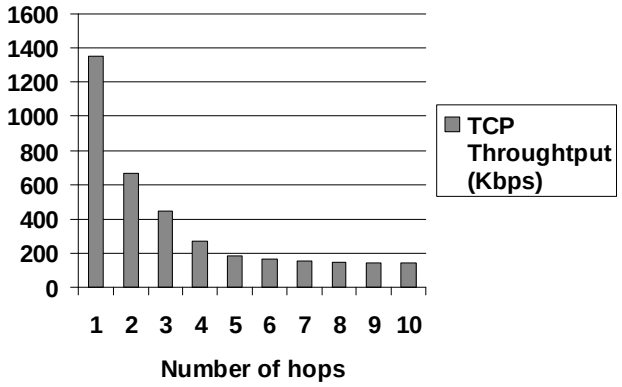
Do You Get a Similar Chart?

Connections over multiple hops are at a disadvantage compared to shorter connections, because they have to contend for wireless access at each hop



TCP Throughput using 2 Mbps 802.11 MAC

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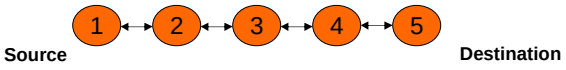
Lab#2: Interplay with 802.11 MAC



- Write a TCL script
  - 5-node scenario
  - A single TCP connection (1 -> 5)
  - Use TCP Reno
- Observation
  - Throughput with different maximum window size (window_) (32, 8, and 4)

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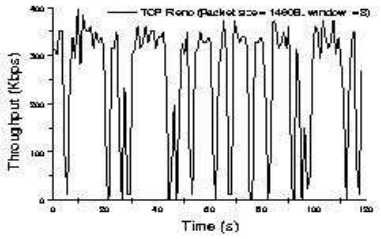
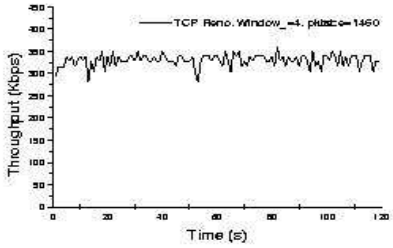
Do You Get a Similar Chart? (Instability Problem)

- When window_=32 or 8, serious oscillation of throughput is observed.
- When window_4, throughput is stable.



(b) Reno, window_=8



(c) Reno, window_=4

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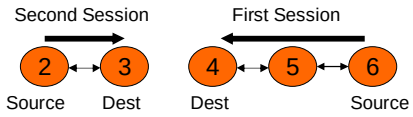
Lab#3: Interplay with 802.11 MAC



- Write a TCL script
  - 5-node scenario
  - The first TCP session (6 to 4) starts at 10.0s.
  - The second TCP session (2 to 3) starts at 30.0s.
- Observation
  - Throughput of the first and second session
  - What else do you want to measure?

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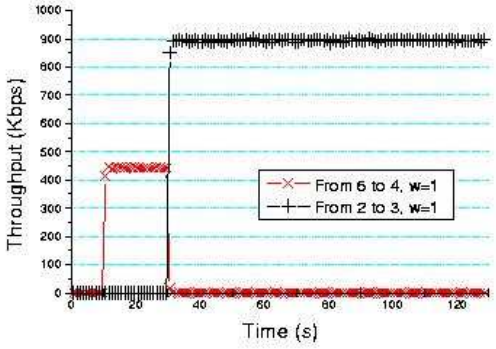
Do You Get a Similar Chart? (Unfairness Problem)

- From 10s to 30s (only the first session exists)
  - The first session has a throughput of about 450kbps
- After 30s (with two sessions)
  - The second session has a throughput of about 900kbps while the first has "zero" throughput



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