FECN Performance for Multistage Output Generated Hotspot Configuration

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These slides are also available at:
http://www.cse.wustl.edu/~jain/ieee/fecn707a.htm
Overview

- Multistage Hot-Spot, Fast Start
- BCN
- FECN
Periodically, the sources probe the network for best available rate using “Rate Discovery packet”

The probe contain only rate, Rate limiting Q ID

The sender initializes the probes with rate=-1 (⇒∞)

Each switch computes an “advertised rate” based on its load

The switches adjust the rate in probe packets down if necessary

The receiver reflects the RD packets back to the source

Source send at the rate received
Simulation Results (Multi-Stage Hotspot)

- Multi-stage Output-Generated Hotspot Scenario
  - Link Speed = 10Gbps for all links
  - Loop Latency = 8us

- Traffic Pattern
  - 100% UDP (or Raw Ethernet) Traffic
  - Destination Distribution: Uniform distribution to all nodes (except self)
  - Frame Size Distribution: Fixed length (1500 bytes) frames
  - Offered Load
    - Nodes 1-6 = 25% (2.5 Gbps)
    - Nodes 7-10 = 40% (4 Gbps)
**BCN + BCNmax + 2Qeq + HSSS**

Need 50ms!

Up to 300ms in other versions

Ref: au-sim-bergamasco-multihop-output-generated-010407v1
FECN Queue Lengths (T=1ms)

FECN’s transient response is 2.5 times faster
=> Higher overall throughput.

Fast start with Pause

20ms
FECN Link Throughputs (T=1ms)
Conclusion: FECN’s transient response is 5 times faster than BCN => Higher throughput
FECN Link Throughput (T=0.25ms)
Summary

1. FECN by itself works well even with Fast start
2. FECN is 2.5 faster than BCN in multi-stage hot-spot cases
3. FECN has ten times lower overhead than BCN with 10% sampling
4. FECN can be made even faster by decreasing the sampling interval