BCN Calibration Simulation Results

Zhi-Hern Loh
Aug 14th 2006
Workload

- Traffic Type: 100% UDP (or raw Ethernet) Traffic
- Frame Size Distribution: 1500 byte fixed
- Arrival Distribution: Bernoulli temporal distribution
- Offered load at endpoint = 50%
Topology

- Link capacity 10Gbps
- Core switch egress port buffer size infinite
- Rate limiter queue buffer size 150KB
- Switch latency (1 us)
- Link length (not modelled, 0 latency)
- Endpoint response time (not modelled, 0 latency)
BCN Parameters

- Qeq 375 * 64 byte pages
- Frame Sampling 150KB ± 5KB (random jitter)
- $W = 2$
- $G_i = 5.3 \times 10^{-1}$
- $G_d = 2.6 \times 10^{-4}$
- $R_u = 1$ Mbps
Simulation run

• Simulation
  - Duration 200 ms
  - Sources start at t = 5ms
  - 2 flows stop at t = 95ms
  - Simulation stops at t = 200 ms

• Results
  - Throughput 10 Gbps, except when 2 flows end
  - Packets transmitted (during 5ms – 95ms): 149978
  - Packets received (during 5ms – 95ms): 74945
  - Packets dropped (during 5ms – 95ms): 74611
    • 0 drop at CP
Buffer Utilization at Core switch
Accepted Load

Accepted Throughput

Mean throughput measurement

- EP 0: 2521 Mbps
- EP 1: 2632 Mbps
- EP 2: 2606 Mbps
- EP 3: 2235 Mbps

Time (seconds)

Throughput (Mbps)
Egress Throughput

Egress Throughput vs Time

Throughput (Mbps)

Time (seconds)
4 Long Lived Flows Accepted Load
Workload 2

• Reduced offered load
  – No congestion after 2 sources end, previously had congestion due to inter-packet gap.
  – Offered load 49%

• Results
  – Packets transmitted (during 5ms-95ms): 146966
  – Packets received (during 5ms-95ms): 74945
  – Packets dropped (during 5ms-95ms): 71598
Workload 2: Core buffer Utilization

Buffer Utilization at Core Switch

Queue size (bytes)

Time (seconds)
Workload 2: RLQ Rate vs Time

RLQ Rate vs Time

- EP 0
- EP 1
- EP 2
- EP 3

Rate (0-10000 Mbps)

Time (seconds)
Workload 2: Accepted Load

Accepted Throughput

Mean throughput measurement

- EP 0: 1765 Mbps
- EP 1: 2665 Mbps
- EP 2: 3298 Mbps
- EP 3: 2226 Mbps

Throughput (Mbps) vs. Time (seconds)
Workload 2: Egress Throughput

Egress Throughput vs Time

Throughput (Mbps)

Time (seconds)