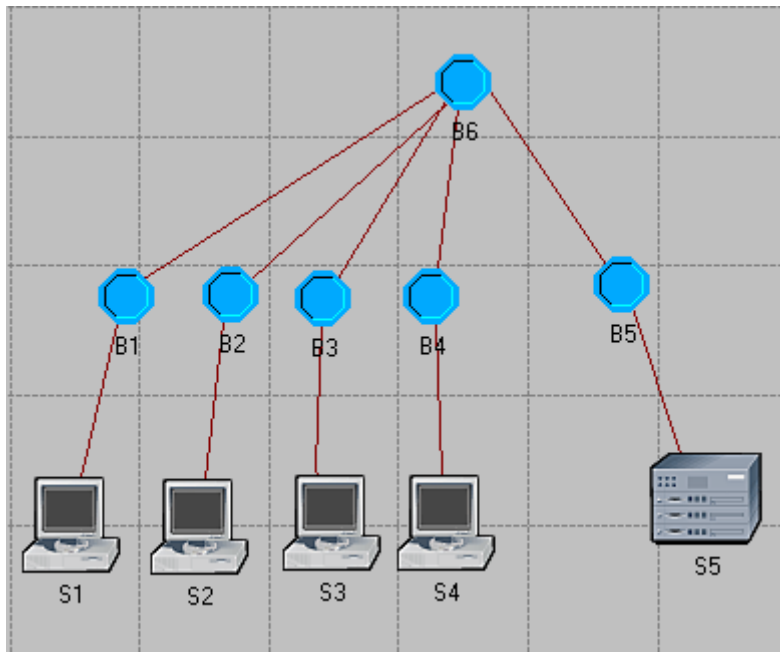# Baseline Scenario Simulation Results

Tanmay Gupta

21st Sep 2006

Topology & Workloads

- All links 10Gbps
- Switch buffer 1MB
- 150KB of buffering in Host, but traffic source stops after memory is full (no drops)
- Latency
  - Switch = 1us
  - Each link = 0.5us
  - Host response time = 2uS
- Sources S1, S2, S3, S4 sending ~4.5Gbps of UDP data to S5
- 1500 byte fixed frame size
- Bernoulli temporal arrival distribution
- Total run time = 200ms
- All sources start at 5ms
- 2 sources stop at 85ms
- BCN parameters:
  - Q_{eq} = 375 64 byte pages
  - Sampling interval = 150KB +- 20KB
  - W = 2
  - $G_d = 5.3 * 10^{-1}$
  - $G_i = 2.6 * 10^{-4}$

Throughput & Fairness

Normalized deviation from target (2.5Gbps)

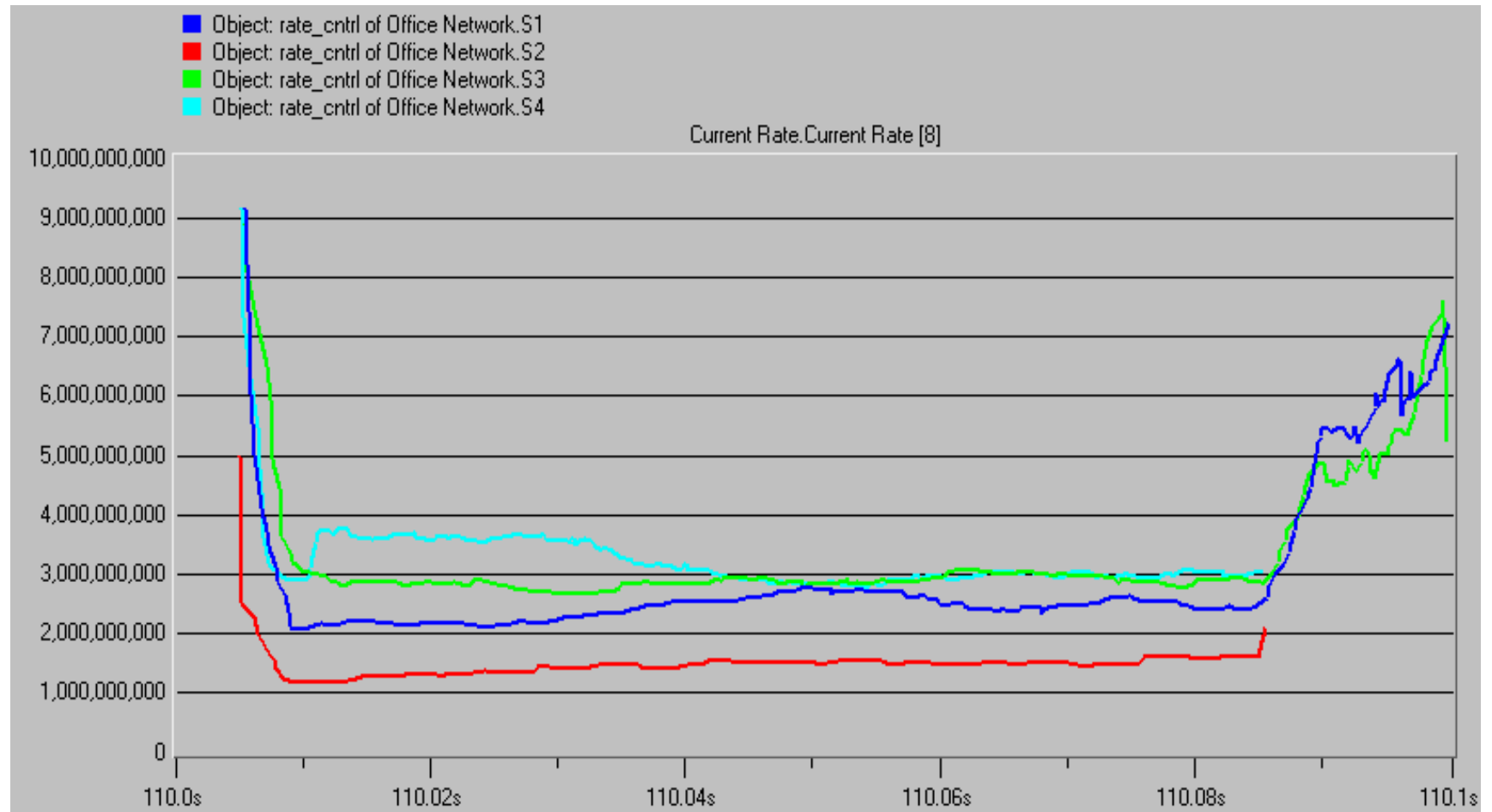| Run	Max	Min	Mean	FI
run149	0.084	0.024	0.048	1
run7	0.216	0.14	0.185	0.97
run21	0.3	0.032	0.174	0.96
run4	0.316	0.036	0.167	0.96
run5	0.368	0.06	0.206	0.94
run6	0.152	0.008	0.082	0.99
run8	0.476	0.036	0.264	0.91
run9	0.184	0.016	0.099	0.99
run10	0.196	0.076	0.128	0.98
run11	0.144	0.024	0.092	0.99

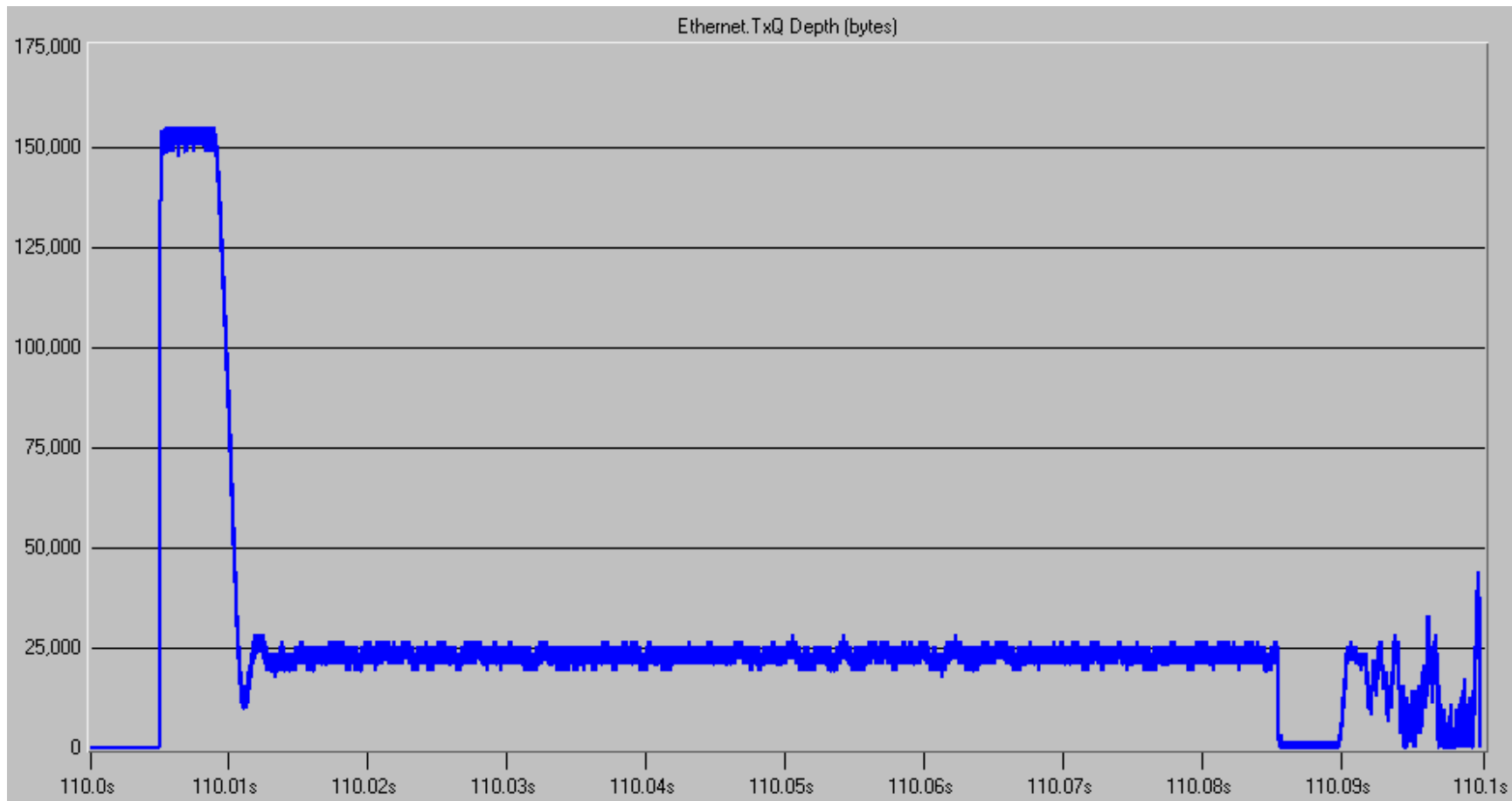Normailized Max. Deviation = 0.48

Avg. Normalized Max. Deviation = 0.24
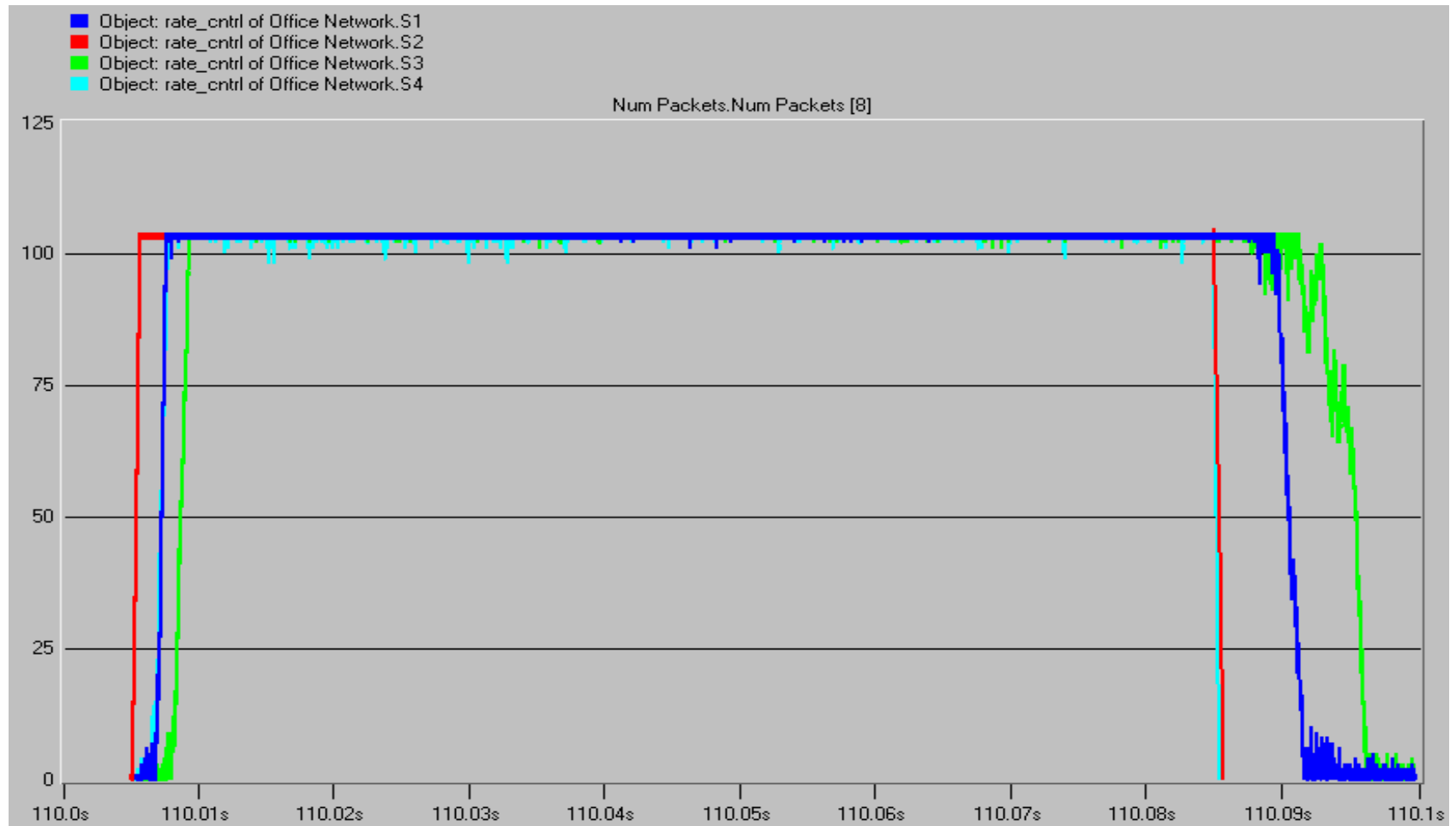
Avg. FI = 0.97

Target Rate (Best FI)

Switch Output Buffer Utilization (Best FI)
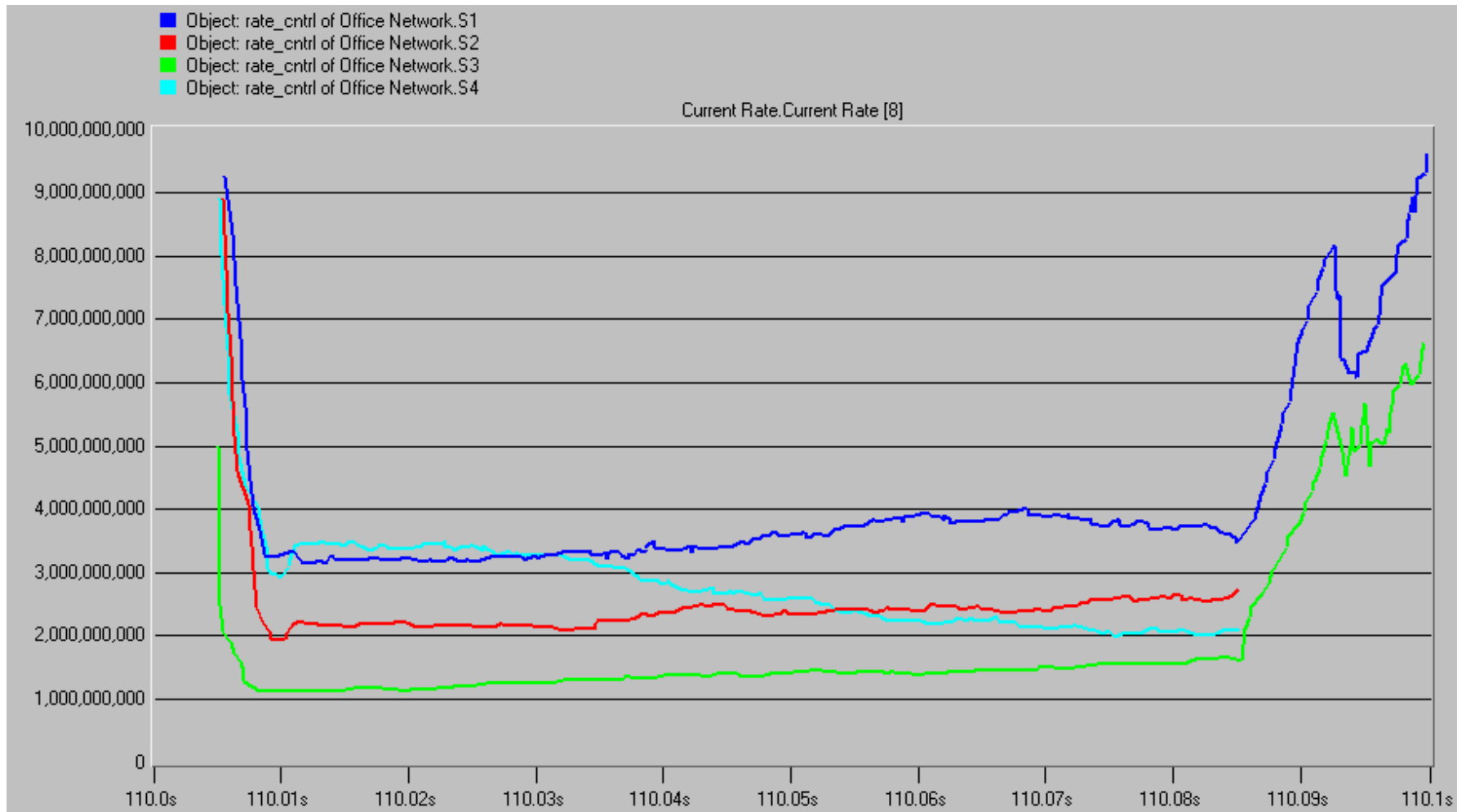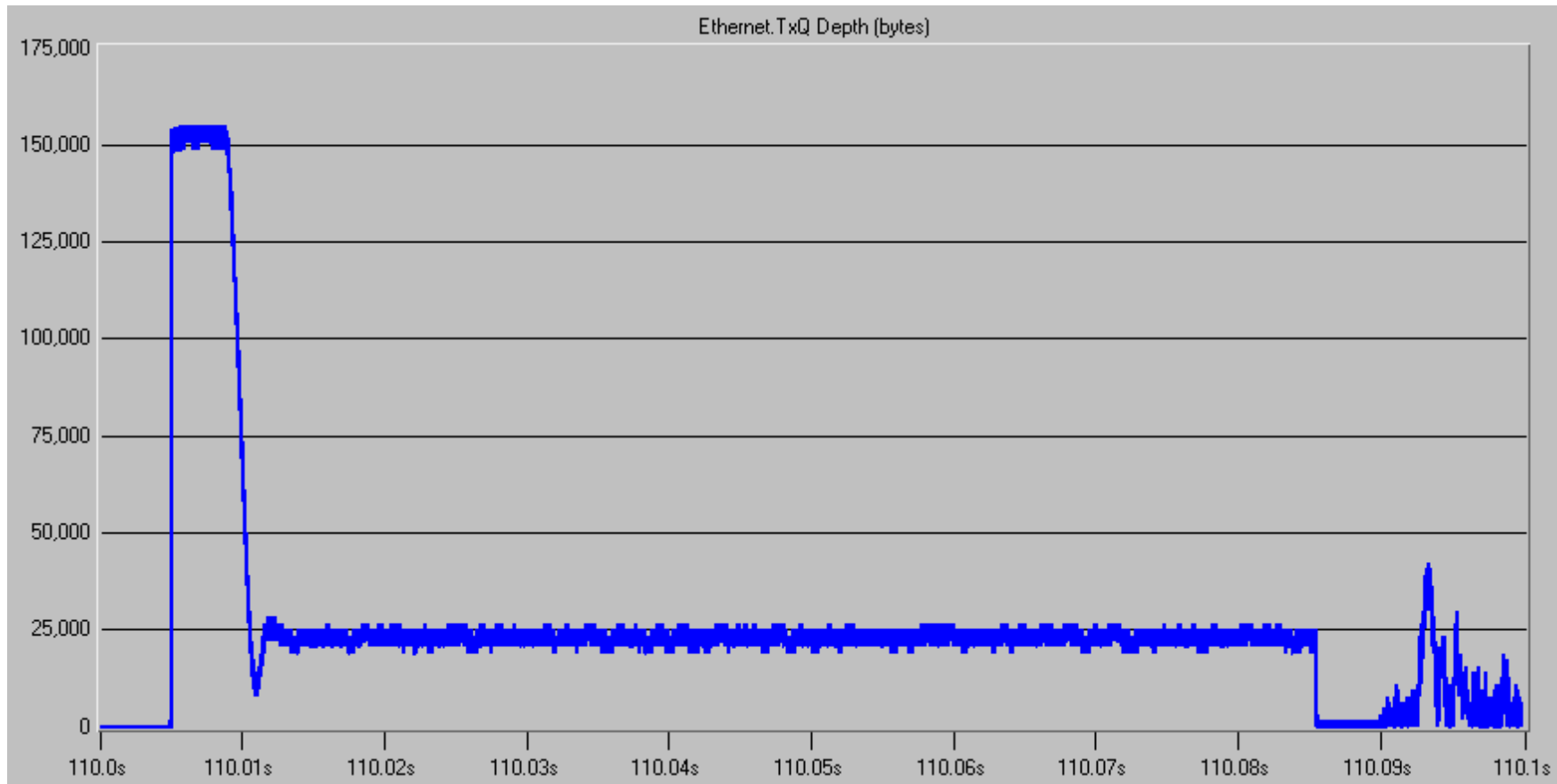

Ethernet.TxQ Depth (bytes)

Packet Drops = 1380

Rate Controller Q Length (Best FI)

Target Rate (Worst FI)

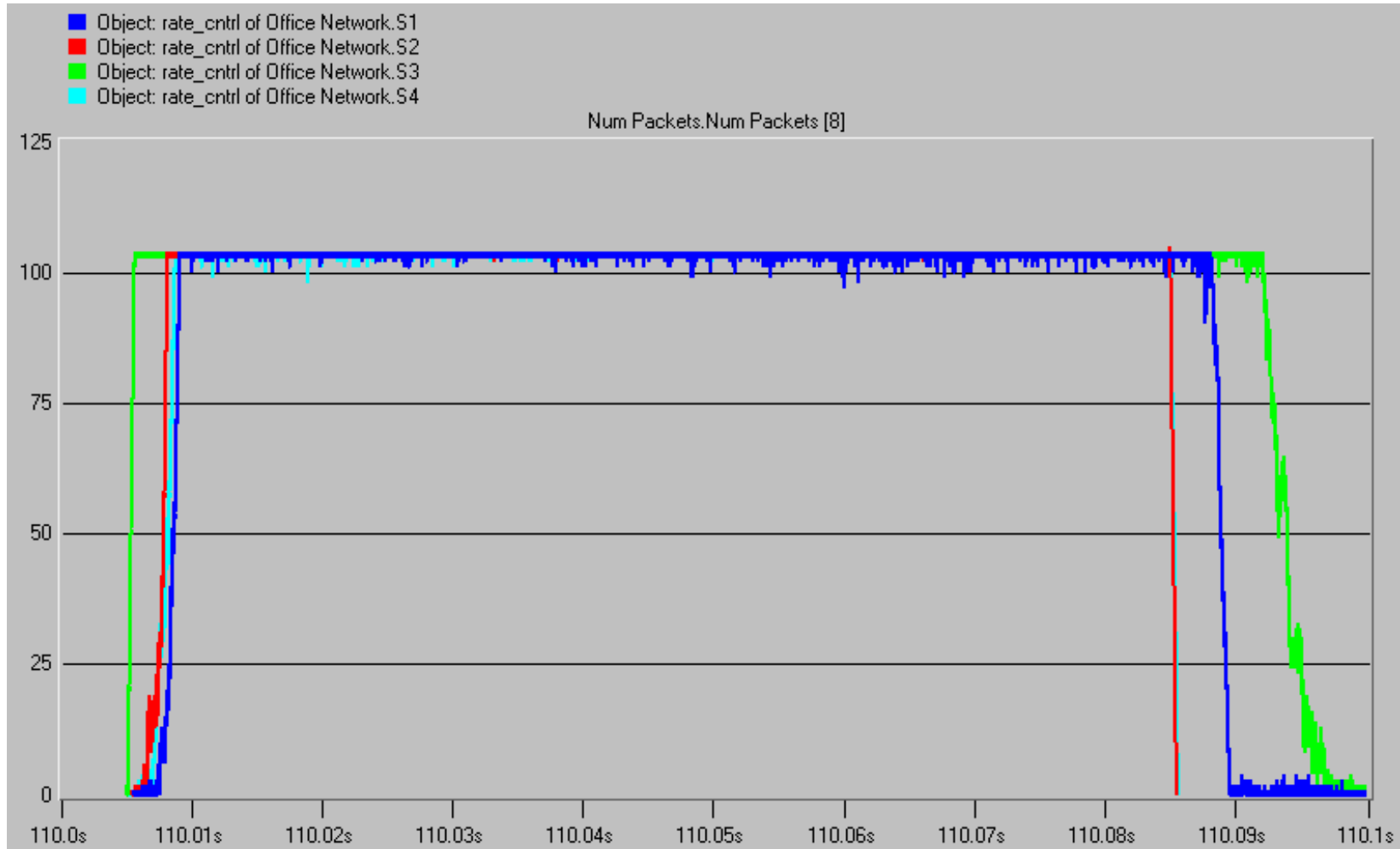# Switch Output Buffer Utilization (Worst FI)

Packet Drops = 1406

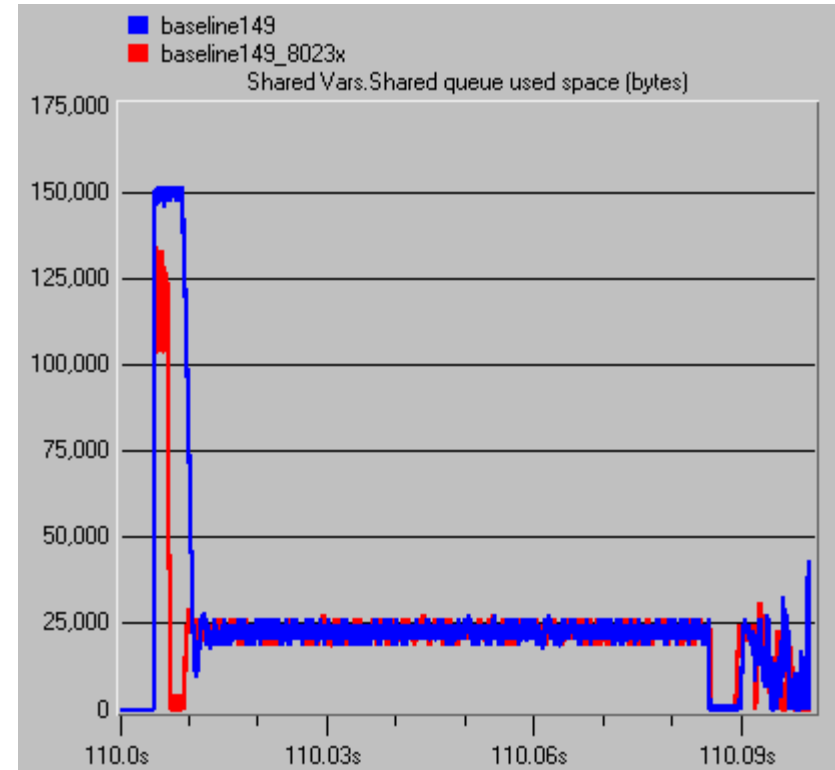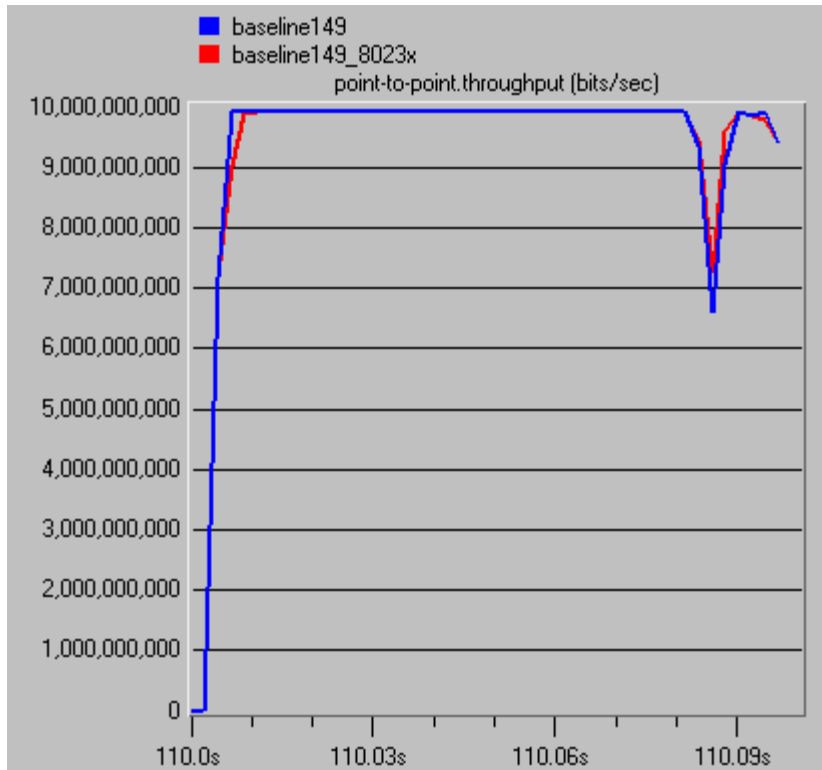# Rate Controller Q Length (Worst FI)

Baseline + 802.3x Simulation Results

- Used the same Topology and Workload as in Baseline

- Enabled 802.3x PAUSE in addition to BCN

- 802.3x parameters used:
  - XON/XOFF threshold sets towards the top of the switch buffer
    - XOFF threshold = 140,800 bytes
    - XON threshold = 128,000 bytes
  - XOFF is sent only to the source whose frame reception results in buffer >= XOFF threshold
  - XON is sent to all ports except the current port when buffer falls below XON threshold

(intel)

Throughput on Congested Link & Congested Switch Buffer Utilization
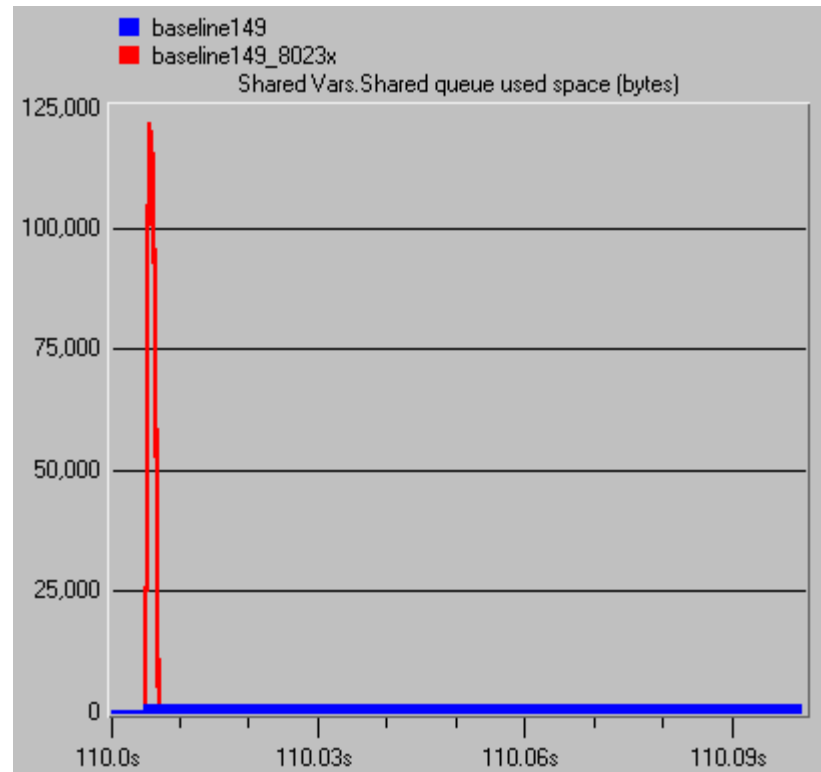

Packet Drops (baseline) = 1380

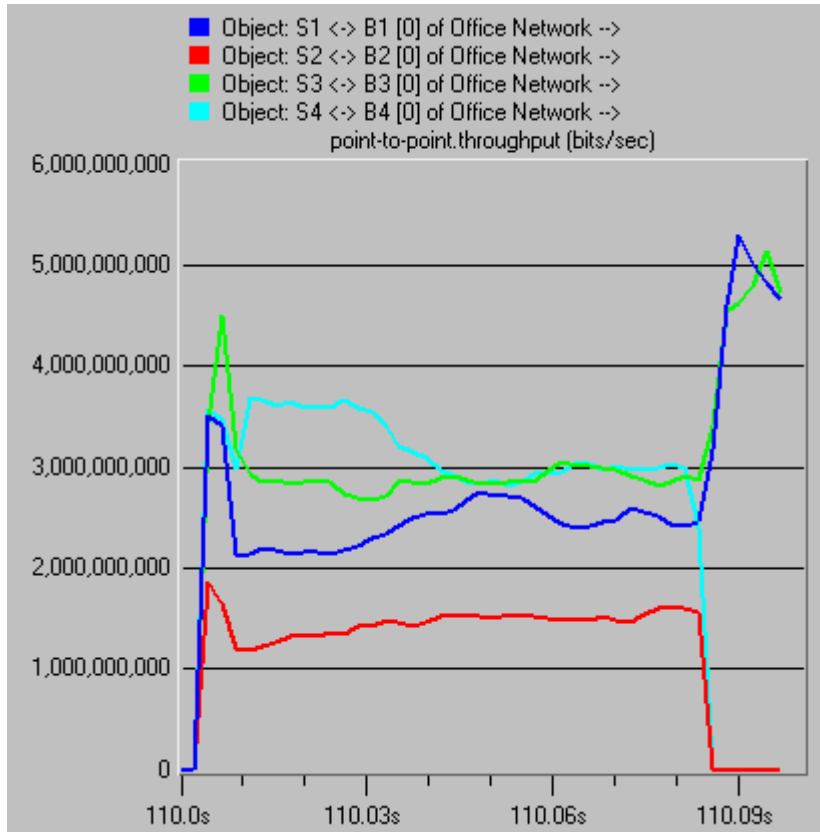Packet Drops (baseline+802.3x) = 0

Uncongested Switch Buffer Utilization (B1)

Uplink Rates

Baseline

Baseline + 802.3x