



# CN-SIM: A Baseline Simulation Scenario

**Davide Bergamasco ([davide@cisco.com](mailto:davide@cisco.com))**

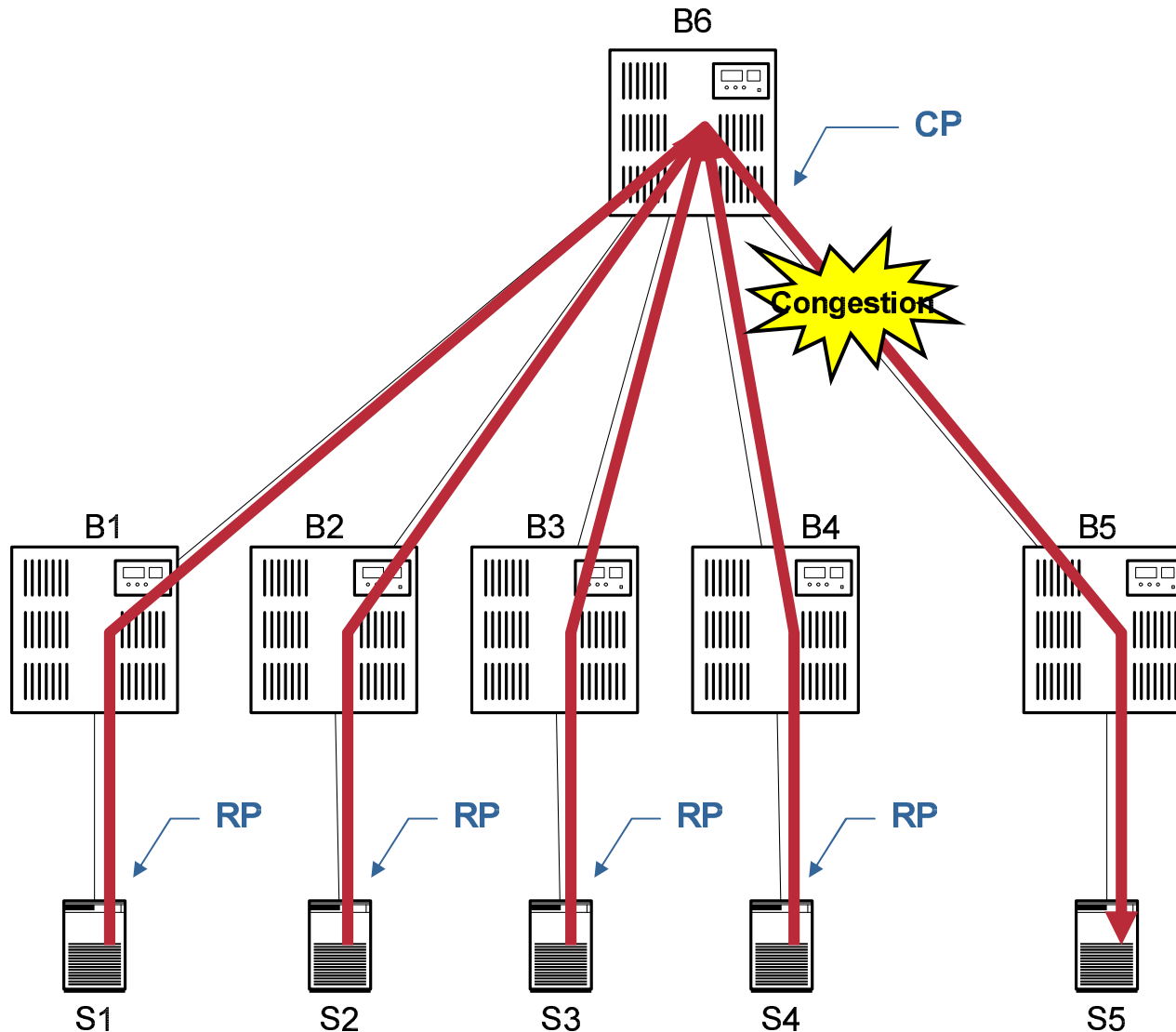
**September 6<sup>th</sup>, 2006**

**Ver. 3**

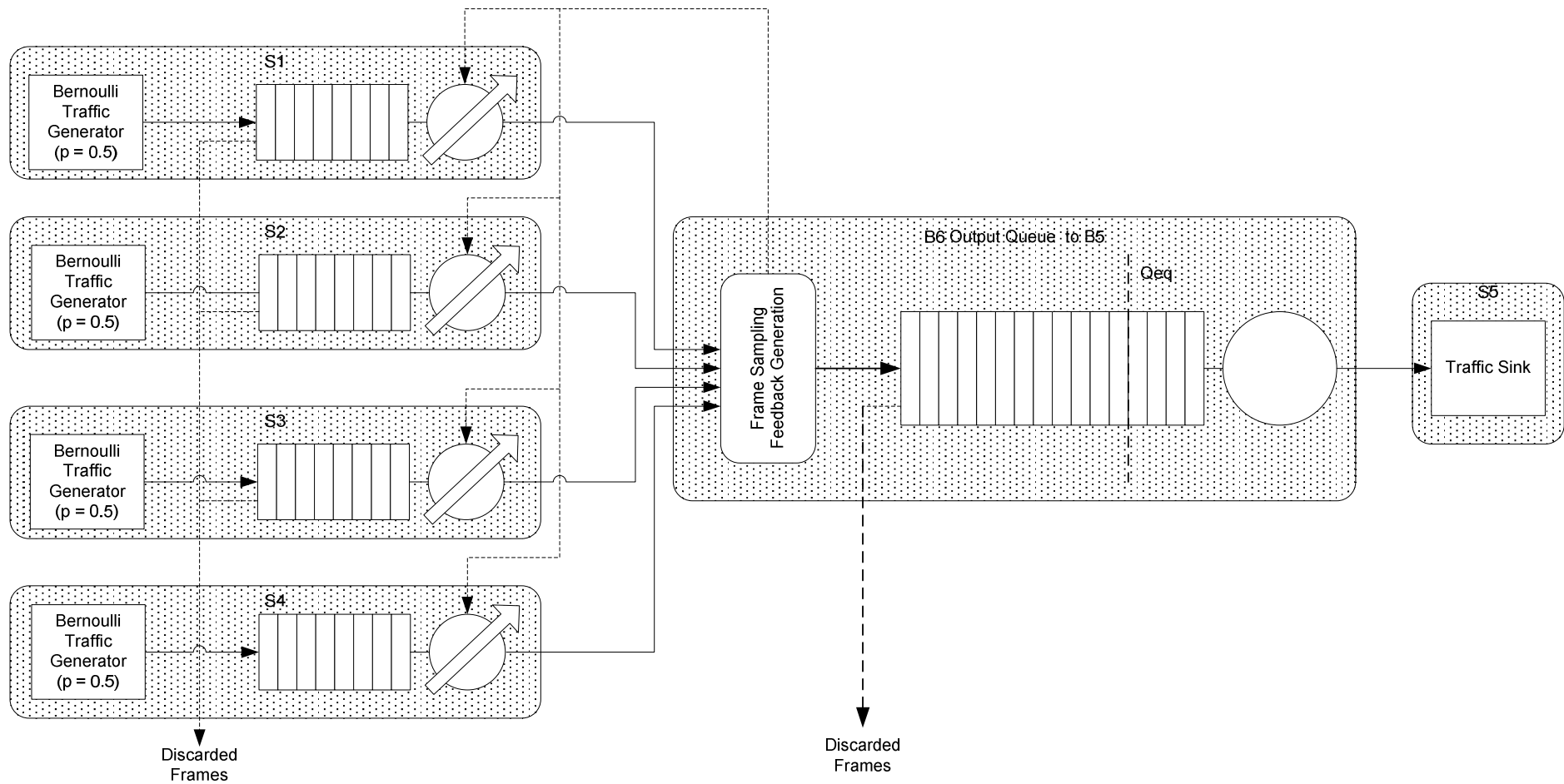
# Motivation

- **So far we have defined a set of common**
  - **Topologies**
  - **Traffic Patterns**
  - **Metrics**
  - **Bridge Model**
- **To ensure comparability of results, we also need to make sure our models and simulation tools are properly calibrated**
- **The **baseline simulation scenario** should allow us to achieve a reasonable alignment quickly and easily**

# Topology & Traffic Pattern



# Topology & Traffic Pattern



# Configuration, Parameters & Workload

- **Short Range, High-Speed Datacenter-like Network**

Link Capacity (C) = 10 Gbps

Buffer Size (B) = 150 KB (both CP and RP)

Switch latency = 1  $\mu$ s

Link Length = 100 m (.5  $\mu$ s propagation delay)

Station processing time = 2  $\mu$ s

Loop Latency = 8  $\mu$ s

- **BCN Control Loop Parameters**

Qeq = 375 64-byte pages (or 16 1500-byte frames or approx 24 KB )

S = 150 KB (frames are sampled on average every 150 KB received)

W = 2

Gi =  $5.3 \times 10^{-1}$  (Max rate increase: C/10 when Max Fb<sup>+</sup> = ( 1 + 2 \* W ) \* Qeq is received)

Gd =  $2.6 \times 10^{-4}$  (Max rate decrease: 1/2 when Max Fb<sup>-</sup> = ( 1 + 2 \* W ) \* Qeq is received)

Ru = 1 Mbps

- **Workload: 100% UDP (or Raw Ethernet) Traffic**

S1-S4: fixed-length (1500 bytes) frames, Bernoulli temporal distribution with parameter p = 0.5 (i.e., offered load = 50%)

# Simulation Run & Results

- **Simulation**

Duration: 100 ms

Initial Transient @ t = 5 ms (all sources start)

Final Transient @ t = 80 ms (2 sources stop)

- **Results**

Throughput on congested downlink:

10 Gbps (100%, measured during congestion)

Throughput on uplinks:

2.5 Gbps (25%, measured during congestion)

Frames Transmitted:

125915

Frames Received:

76300

Frames dropped:

2598 @ CP

47017 @ RP

Buffer utilization @ congested link:

See next slide

(Peak of 450 KB when buffer size unbounded)

Rate Fairness @ congested link:

See next slide

# Buffer Utilization

