



CN-SIM: A Baseline Simulation Scenario

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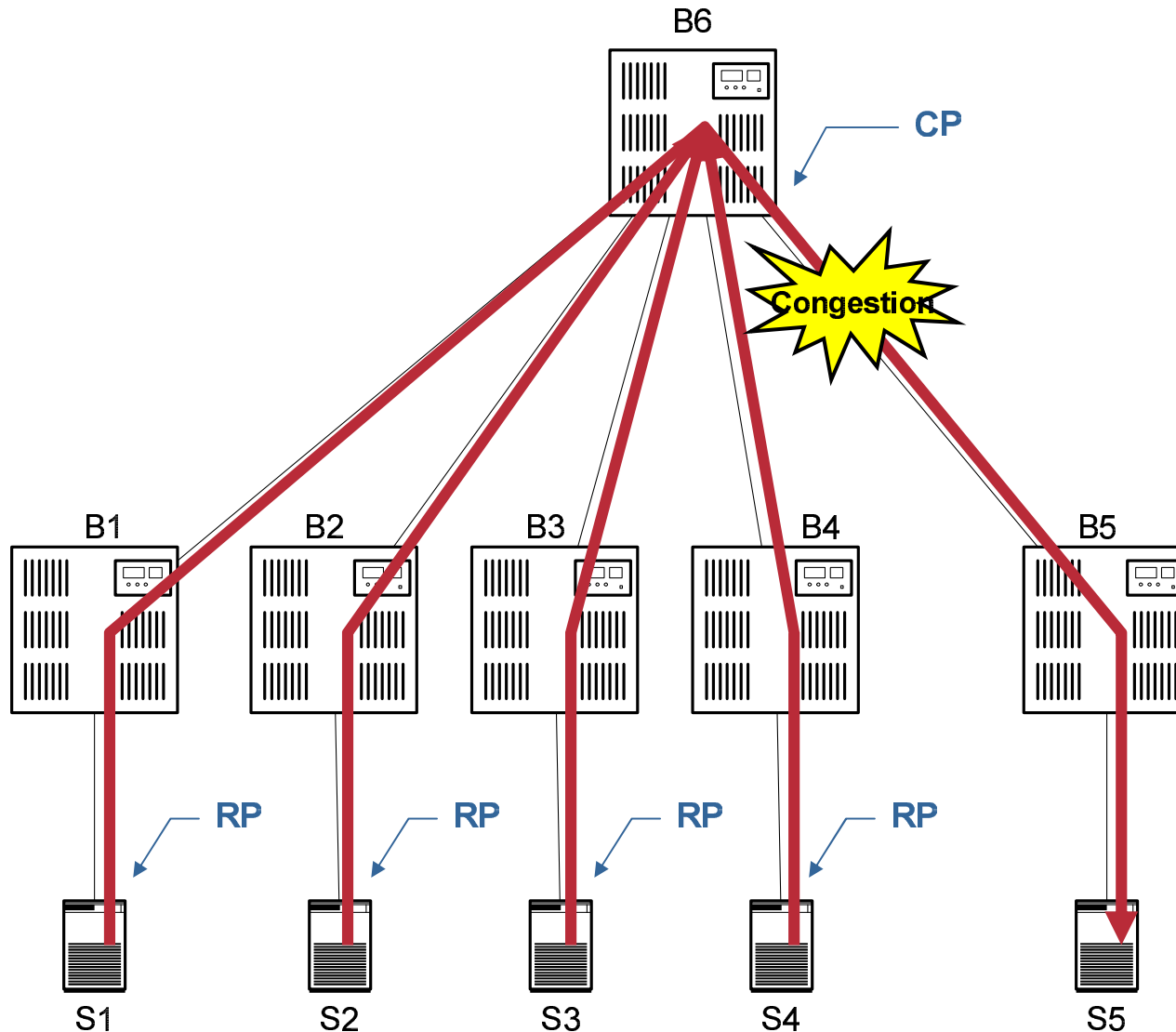
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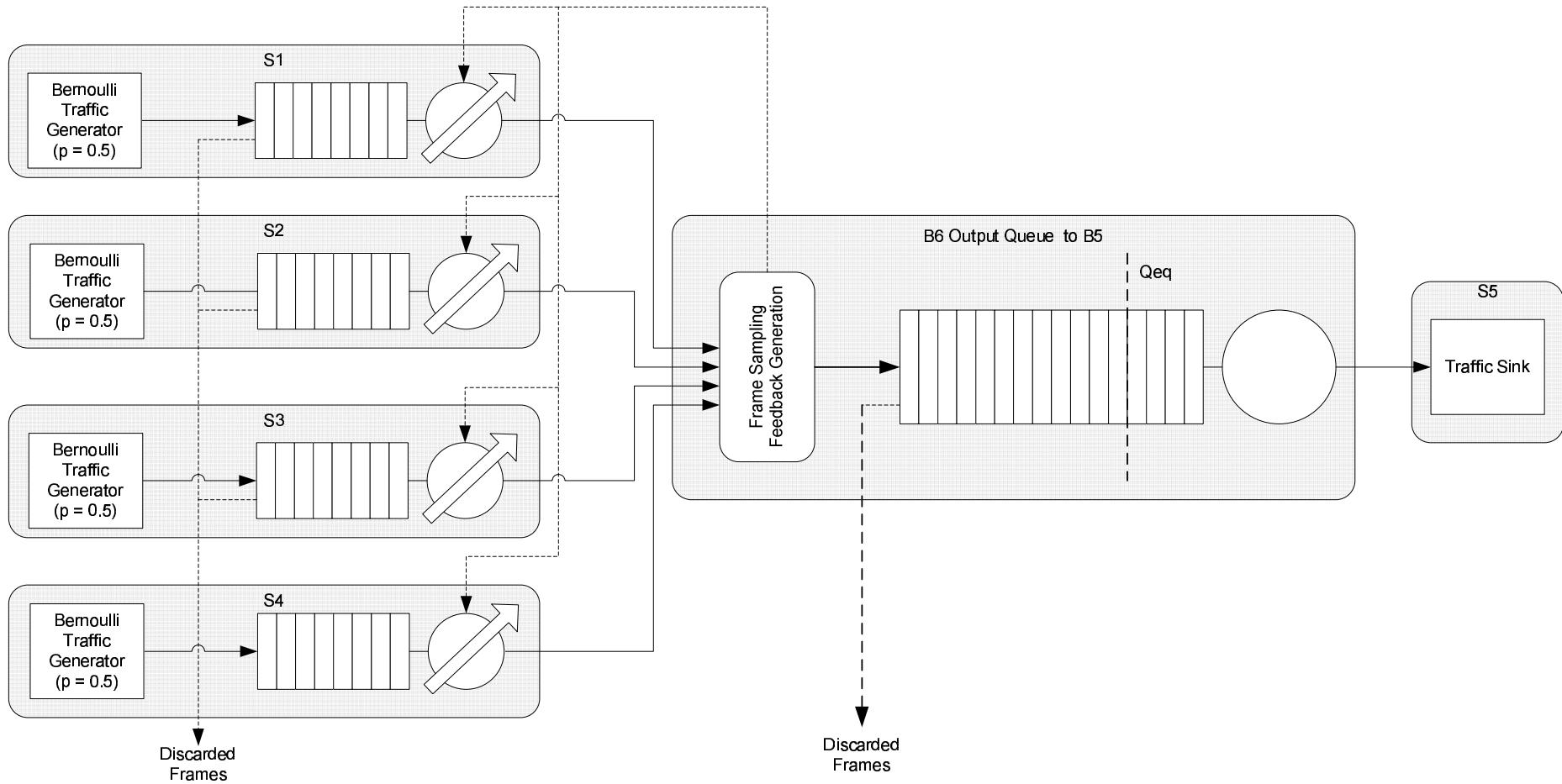
Motivation

- **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 μ s

Link Length = 100 m (.5 μ s propagation delay)

Station processing time = 1 μ s

Loop Latency = 7 μ 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 = 5.3×10^{-1} (Max rate increase: C/10 when Max Fb⁺ = (1 + 2 * W) * Qeq is received)

Gd = 2.6×10^{-4} (Max rate decrease: 1/2 when Max Fb⁻ = (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 (sources start)

Final Transient @ t = 90 ms (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:

139906

Frames Received:

70179

Frames dropped:

0 @ CP

69727 @ RP

Buffer utilization @ congested link:

Similar to diagram on next slide

Buffer Utilization

