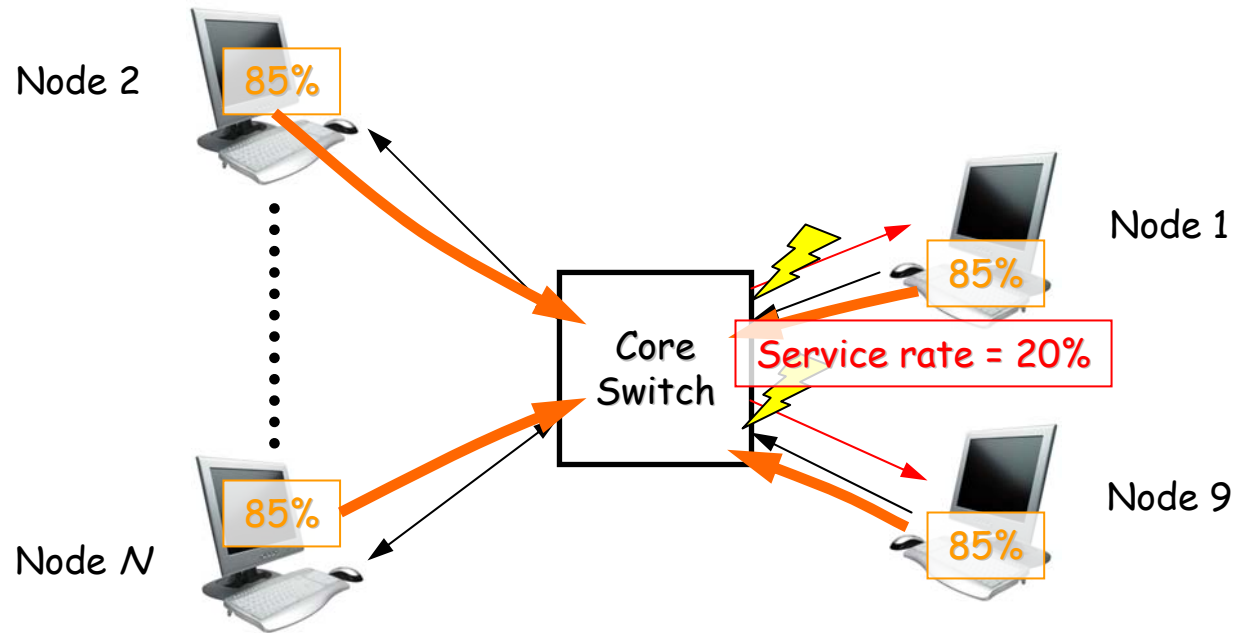# Zurich Hotspot Benchmark: Dual Hotspot Topologies: One and Two Hops

IBM Research
ZRL GmbH, Switzerland
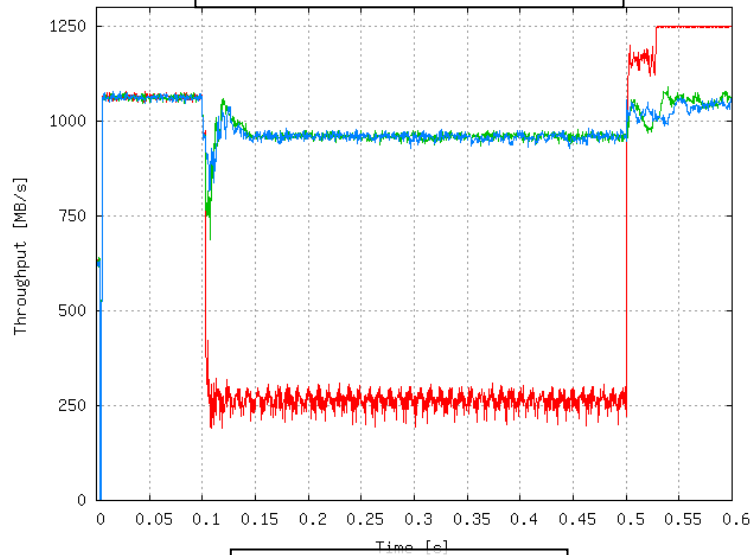
Output-Generated Single-Hop Dual Hotspots
(see sim results next foil)

Node 2

85%

Node 1

85%

Core Switch

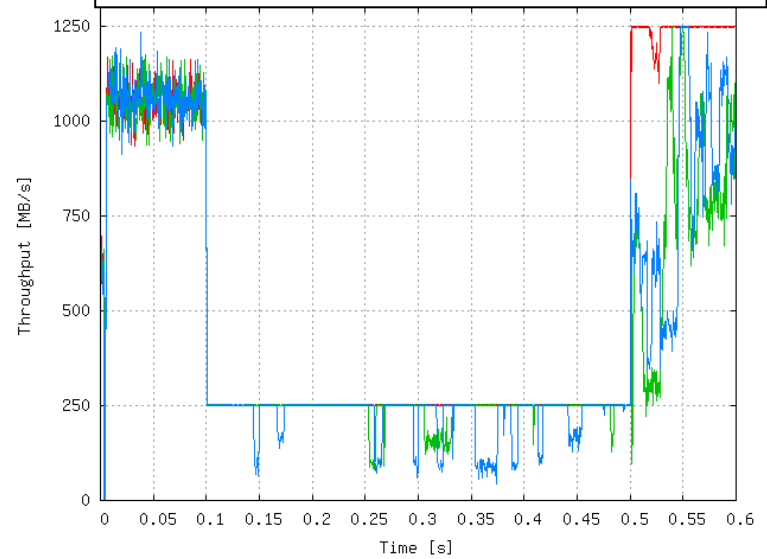Service rate = 20%

85%

Node 9

85%

Node *N*

- All nodes: Uniform destination distribution, load = 85% (8.5 Gb/s)
- Node 1 and node 9 service rate = 20%
- Two congestion points
  - Hotspot degree = N-1
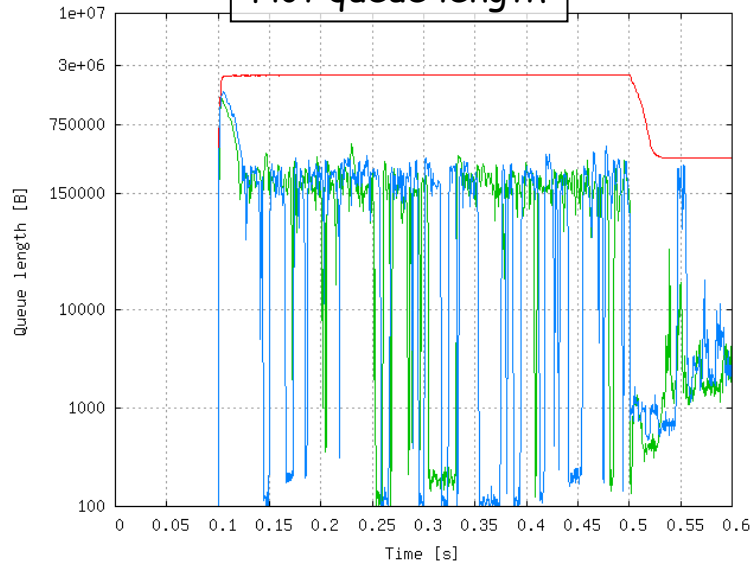 - All flows affected

Results: M = 600 KB/port

Aggregate throughput
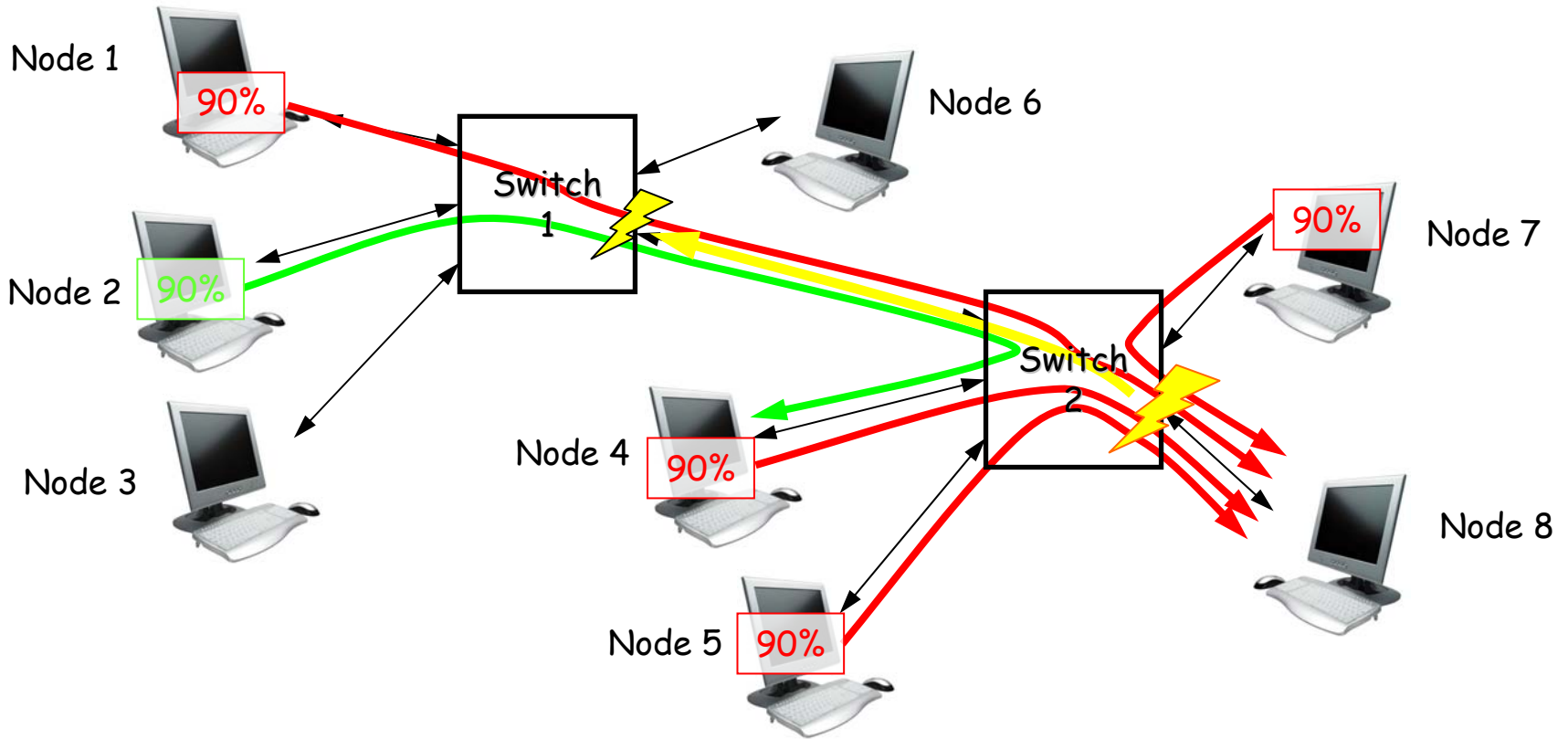

### Hot port 1 throughput (9 not shown)

Hot queue length

G_d = 3.3333*10^{-6}
P_s = 0%
P_s = 2%, G_i = 1.3333*10^{-3}
P_s = 2%, G_i = 1.6667*10^{-2}

Two-Hop Fabric, Dual Hotspot: Light & Heavy (L/H)

- Two switches, all links 10 Gb/s, no background traffic
- Four flows of 9 Gb/s each from nodes 1, 4, 5, 7 to node 8
- One flow of 9 Gb/s from node 2 to node 4
- Two congestion points
  - Port from switch 1 to switch 2
  - Port from switch 2 to node 8
- Fair allocation should provide 2.5 Gb/s for all flows to node 8 and 7.5 Gb/s for flow to node 4

Two-Hop Fabric, Dual Hotspot: Heavy & Light (H/L)
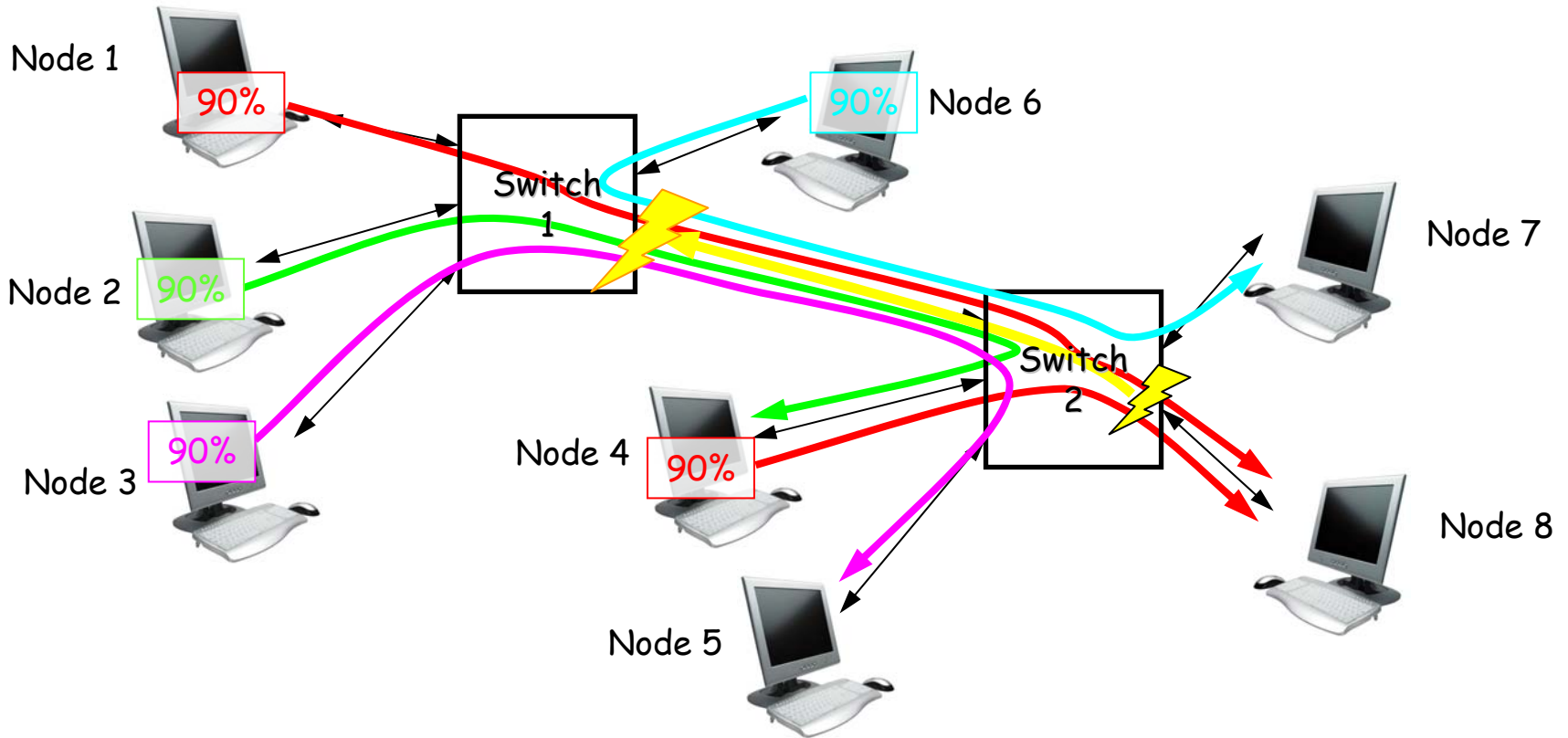
- Two switches, all links 10 Gb/s, no background traffic
- Two flows of 9 Gb/s each from nodes 1 and 4 to node 8
- Three flows of 9 Gb/s each from node 2 to node 4, 3 to 5, and 6 to 7
- Two congestion points
  - Port from switch 1 to switch 2
  - Port from switch 2 to node 8
- Fair allocation should provide 2.5 Gb/s for all flows to switch 2 and 7.5 Gb/s for flow from node 4 to node 8