CN-SIM:
Topologies and Workloads

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Timeline

3/1/2007
Finish Required Sims

7/1/2007
Finish Extended Sims

Jan   Apr   Jul
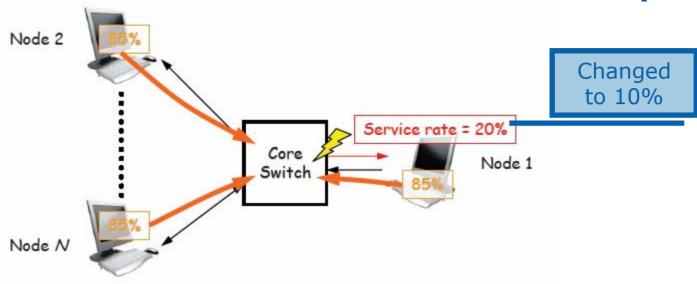
12   2006   9/30/2007

- Define "Required Sims"

- Define "Extended Sims"

- Multiple presentations from Mitch Gusat (IBM), Prof. Jain for setting up the Benchmark

- Need to decide "Required" vs. "Extended"

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1. Output Generated Hot Spot Single Hop
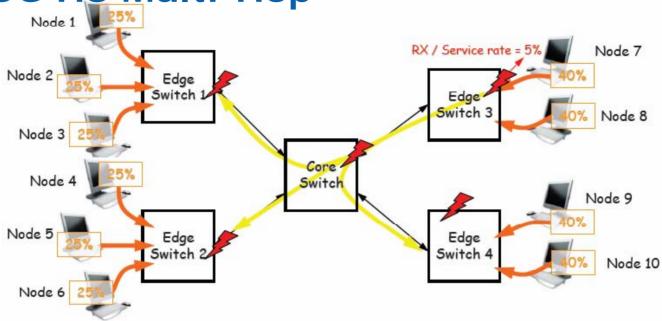

Workload:

- All Nodes (10) : Uniform Distribution, load = 8.5Gbps
- Node 1 Service Rate = 1Gbps
- One Congestion Point
  - Hotspot:
    - Degree: 9, Severity = 8.5:1,
    - Duration: 80 mS from t_i=10 to 90 mS

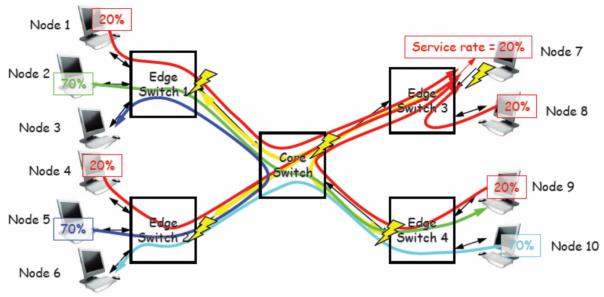- Scenarios: 2Gbps, 1Gbps, 0.5Gbps OG service rates

Required

2. OG HS Multi-Hop

Workload:
- All: Uniform distribution traffic (background traffic)
- Nodes 1-6: 25% (2.5Gbps), Nodes 7-10: 40% (4 Gbps)
- Primary Hotspot:
  - Node 7 service rate = 5% (Rx only)
  - If saturation tree spreads => 5 congestion points total

- Scenarios:
  - PAUSE: Enabled/Disabled

Required

3. OG HS Multi-Hop: Selected Victims
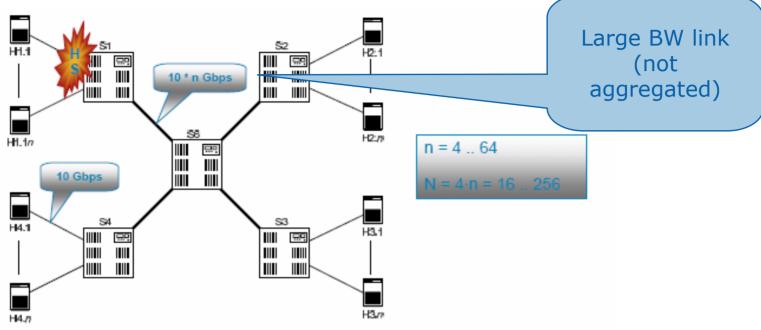

Workload:

- Four culprit flows of 2 Gb/s each from nodes 1, 4, 8, 9 to node 7 (hotspot)
- Three victim flows of 7 Gb/s each: node 2 to 9, node 5 to 3, node 10 to 6
- Node 7 service rate = 20%
- Five congestion points, All switches and all flows affected
- Fair allocation provides 0.5 Gb/s to all culprits and 7 Gb/s to all victim

Required

4. Multi-Hop Single HS Large Network

Large BW link (not aggregated)
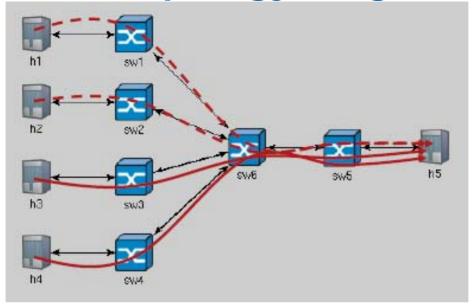
10 * n Gbps

10 Gbps

n = 4 .. 64

N = 4·n = 16 .. 256

Workload:
- Load: H1.1 -- H4.n λ = 85%, Skewed Uniform
  - H1.1 is targeted with 2λ
  - All other nodes with λ (N-2)/(N-1)
- Congestion Point:
  - Node H1.1
  - HS degree = N
  - HS severity = 1.7 : 1

Verdana regular 7pt.

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Required

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5. Symmetric Topology Single HS – Bursty

Workload:

- Point-to-point from h1-4 to h5
- Load: 100%
- H1 and H2 on-off sources (Ton = Toff = 20 ms)
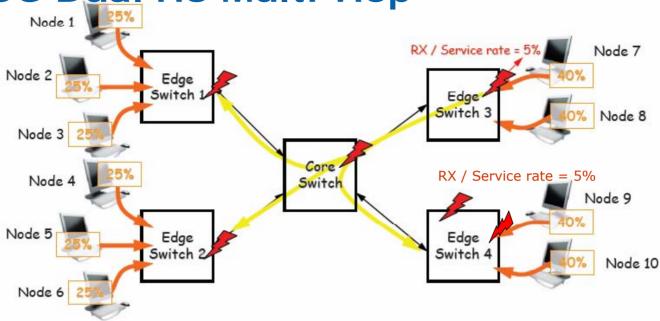- On/Off period exponential distribution

Scenarios:

- Burst periods: 20, 10, 5mS

Verdana regular 7pt.

Legal text goes here

Required

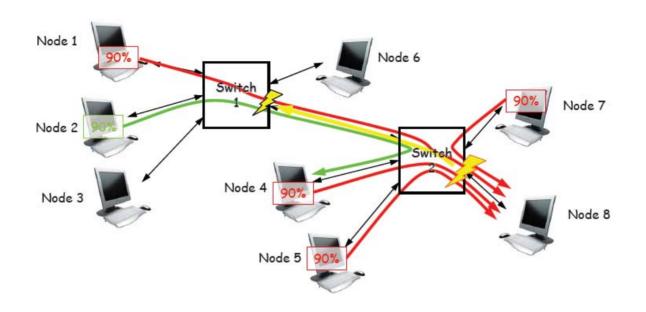(intel)

2. OG Dual HS Multi-Hop

Workload:

- – All: Uniform distribution traffic (background traffic)
- – Nodes 1-6: 25% (2.5Gbps), Nodes 7-10: 40% (4 Gbps)
- – Two Hotspots:
  - • Node 7 & 9 service rate = 5% (Rx only)
  - • If saturation tree spreads => 5 congestion points total

- Scenarios:
  - – PAUSE: Enabled/Disabled

Extended

7. Multistage Dual HS (Light & Heavy)
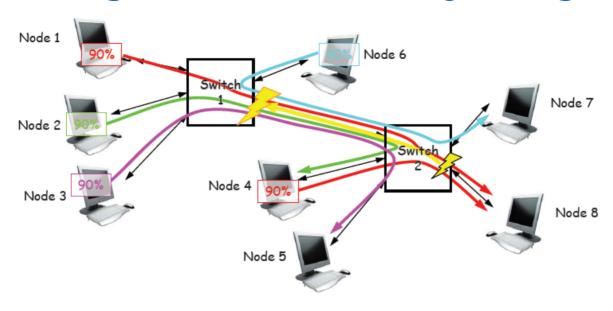

Workload:

- 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/sfor all flows to node 8 and 7.5 Gb/sfor flow to node 4

Extended

8. Multistage Dual HS (Heavy & Light)

Workload:
- Two switches, all links 10 Gb/s, no background traffic
- Two flows of 9 Gb/seach from nodes 1 and 4 to node 8
- Three flows of 9 Gb/seach 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/sfor all flows to switch 2 and 7.5 Gb/sfor flow from node 4 to node 8

Extended

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To be added

- Metric
- Algorithm Parameter Definitions

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