Zurich Hotspot Benchmark

Output Generated Case

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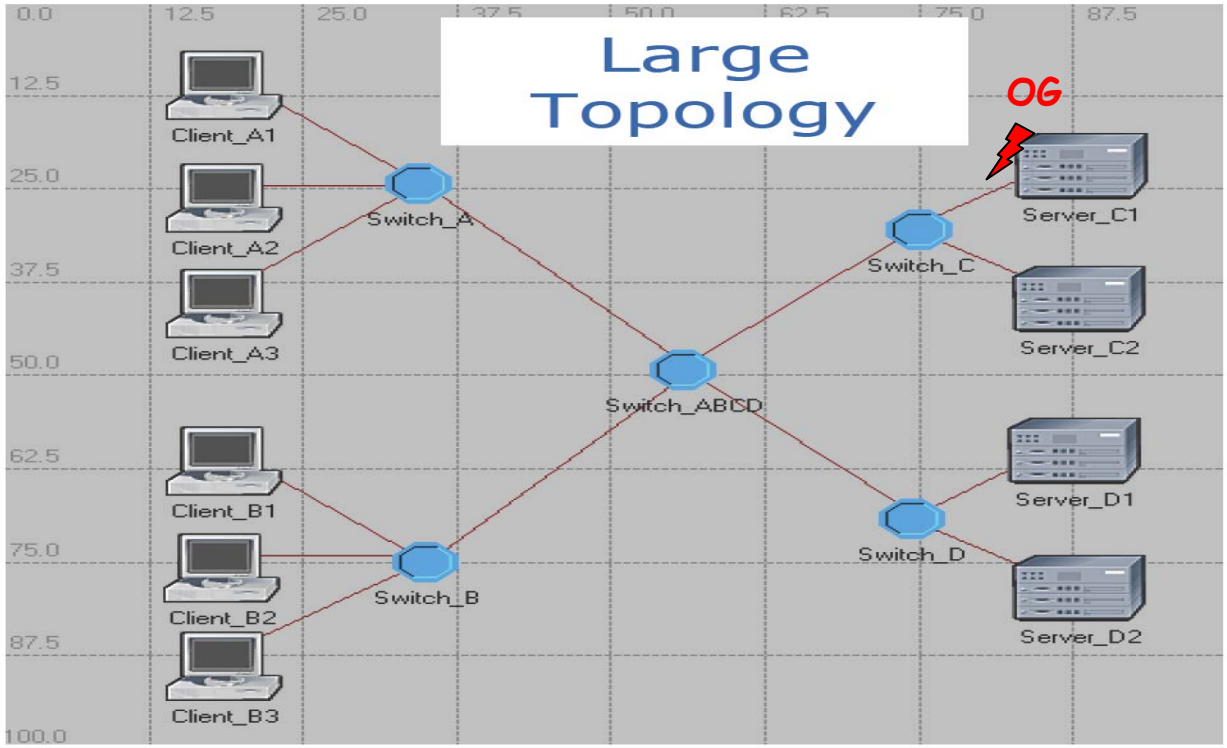
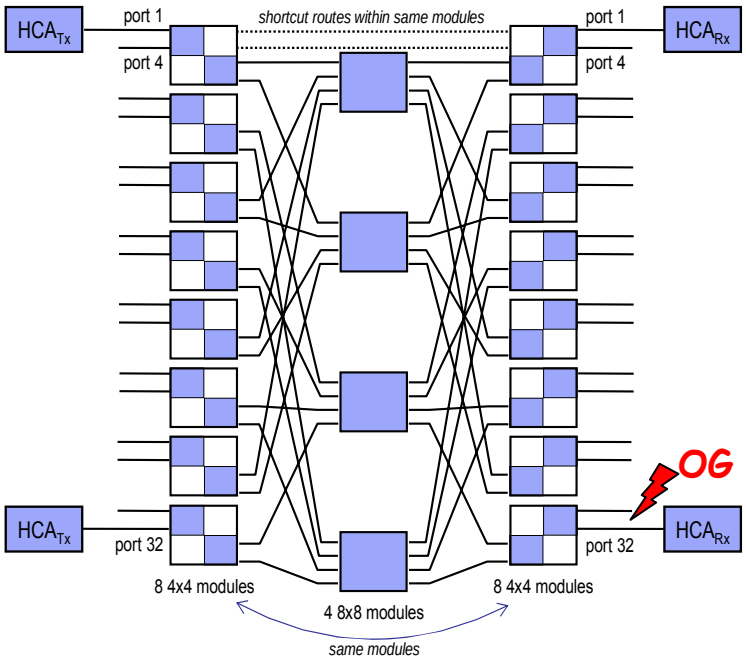
A Simpler Fabric (Baseline/Gupta) w/ Bidir Traffic

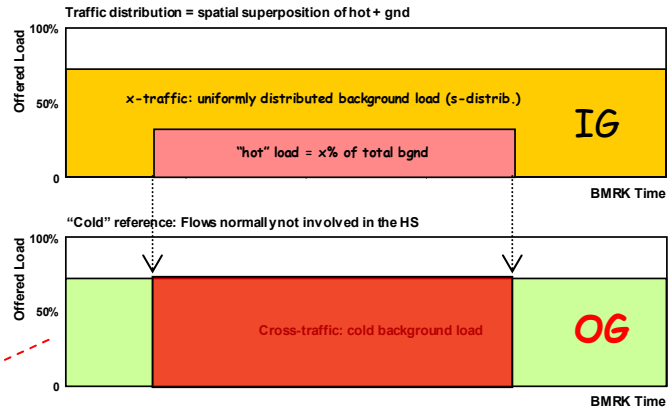


1. edge nodes are bidir
   1. dual function: each client and server will simultaneously source and sink traffic
   2. hence 10 sources and 10 sinks
2. 3-hop network

- Always: constant load (50-80)% uniform spatial distribution
- Hotspot period: from t_i to t_f, the sink at Server_C1 slows down its RX rate from 100% to 20% (as in ZRL's tree-based study)
  - **Obs. PAUSE must be enabled to trigger a saturation tree!**

Input vs. Output-generated Hotspot w/ PAUSE





- **Moderate OG:**
  1. Network initially loaded w/ <u>uniform</u> background traffic at 70%.
  2. During a defined congestion period, DST=32 (or 0) reduces its RX rate to 20%.
  - ➢ Obs. PAUSE must be enabled to trigger a saturation tree!

Effect: the "cold" bgnd load traffic becomes hotspot "culprit", with hotspot degree HSD=N-1 and severity HSV= Bgnd_load / RX_rate

Moderate OG from Zurich Hotspot Benchmark (ZHB)

- Source nodes generate* one or more hotspots according to matrix $[\lambda_{ij\_hot}]$: $t_{p->q} = \alpha_{k\_hot}\,[\lambda_{ij\_hot}]:t_{p->q}$, $[\lambda_{ij\_hot}]$ is specified** per case as below

1. Congestion **type**: IN- or OUT- put generated

2. Hotspot **severity**: HSV = $\lambda_{aggr} / \mu_{HS}$, $\lambda_{aggr} = \sum \lambda_i$ at hotspotted output, μ_{HS} = service rate of the HS
   - *Mild* 1 < HSV <= 2
   - *Moderate* 2 < HSV <= 10
   - *Severe* HSV >> 10.

3. Hotspot **degree**: HSD is the fan-in of congestive tree at the measured hotspot
   - *Small* HSD < 10% (of all sources inject hot traffic)
   - *Medium* HSD ~ 20..60%
   - *Large* HSD > 90%.

* Traffic generation is a Markov-modulated process of burstiness B (indep. dimension)

**Metrics and measurement methodology are subject of another deck