802.1au BCN evaluation: BCN-MAX Dynamic Range

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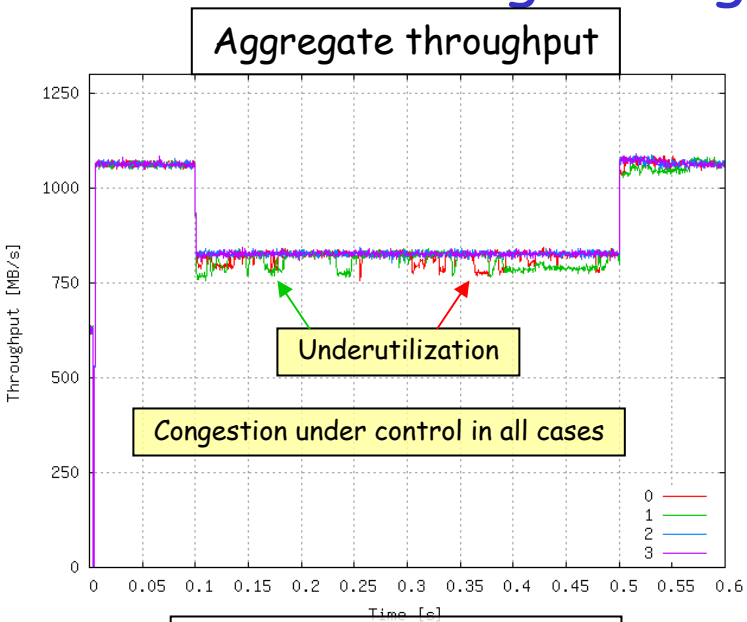
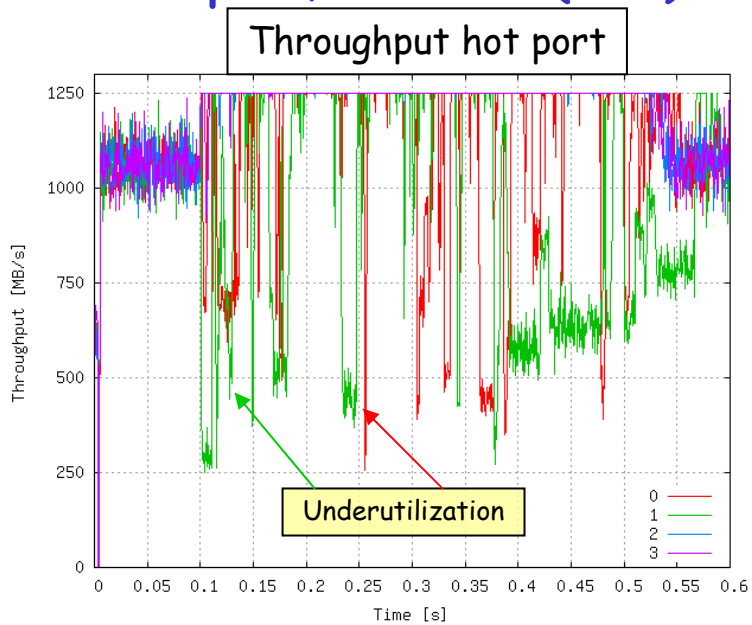
Simulation Setup

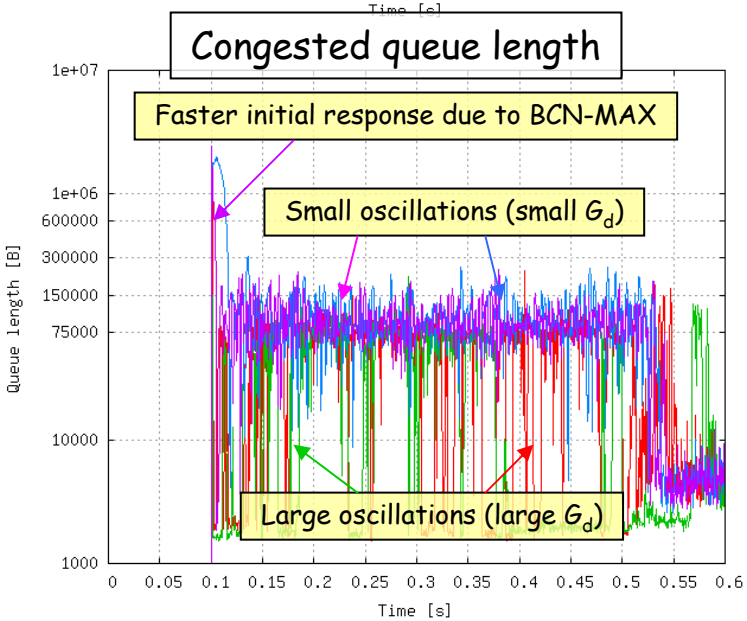
- 16 ports, single-stage
- Load = 85%
- Uniform destination distribution
- 1500 B frames
- Partitioned memory
- Lossless operation
  - PAUSE applied on a per input basis based on local high/low watermarks
  - $watermark_{high} = M - rtt*bw$
  - $watermark_{low} = watermark_{high} / 2$

- W = 2.0
- M = 300 KB
- $Q_{eq} = M/4$
- $Q_{sc} = (watermark_{high} + watermark_{low})/2$
- $G_{d0} = 1 / ((2W+1) * Q_{eq}) = 4/(5*Q_{eq})$
- $G_i = 400*G_d$
- $R_u = R_{min} = 10$ Mb/s
- No BCN(0,0), no self-increase

BCN-MAX: Single-stage IG hotspot, N = 16 (PM)







P_s = 2%, G_d = 2.5*G_{d0}, BCN-MAX off
P_s = 2%, G_d = 2.5*G_{d0}, BCN-MAX on
P_s = 2%, G_d = 0.5*G_{d0}, BCN-MAX off
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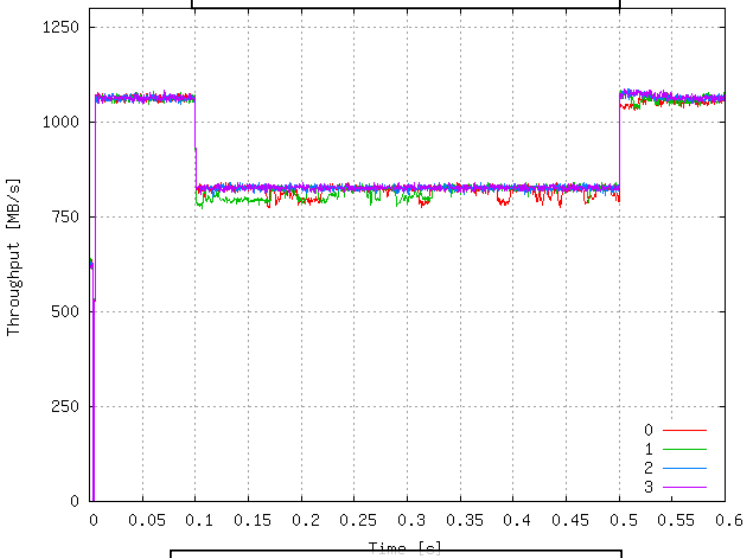
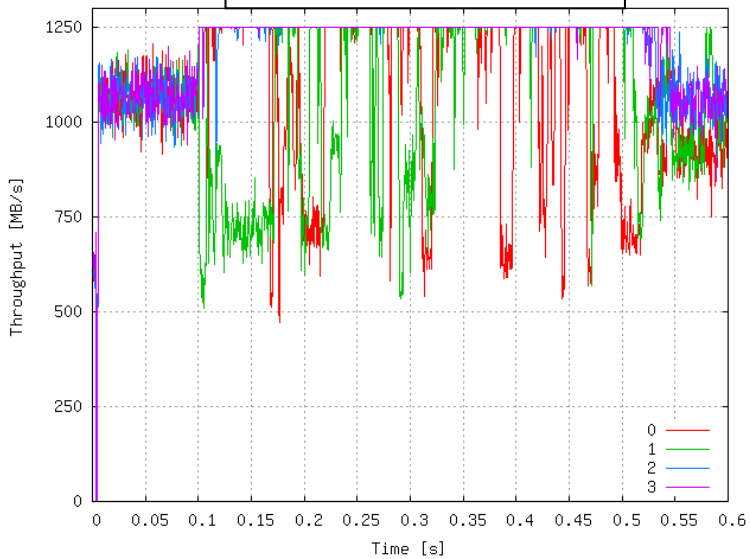
BCN-MAX: Single-stage IG hotspot, N = 16 (SM)

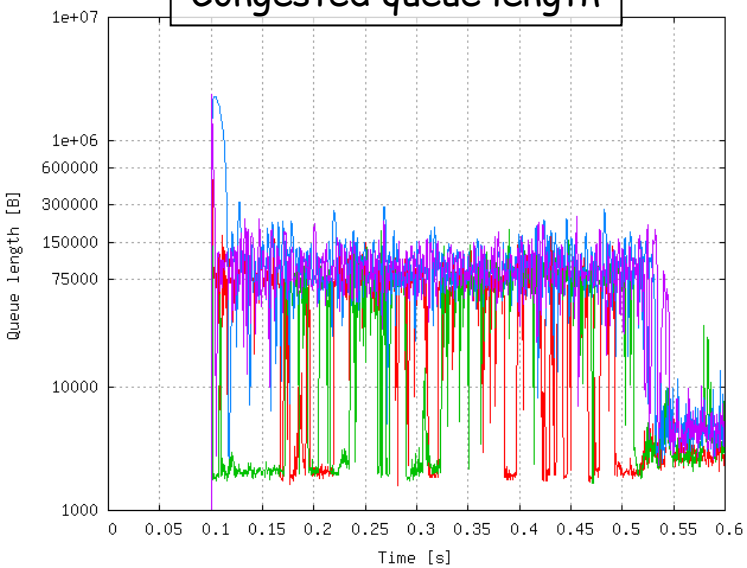
Aggregate throughput



Throughput hot port



Congested queue length



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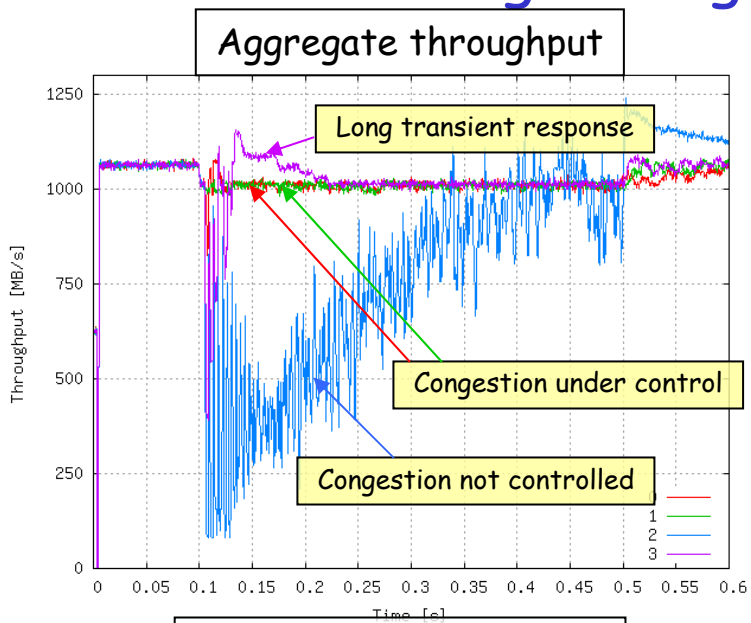
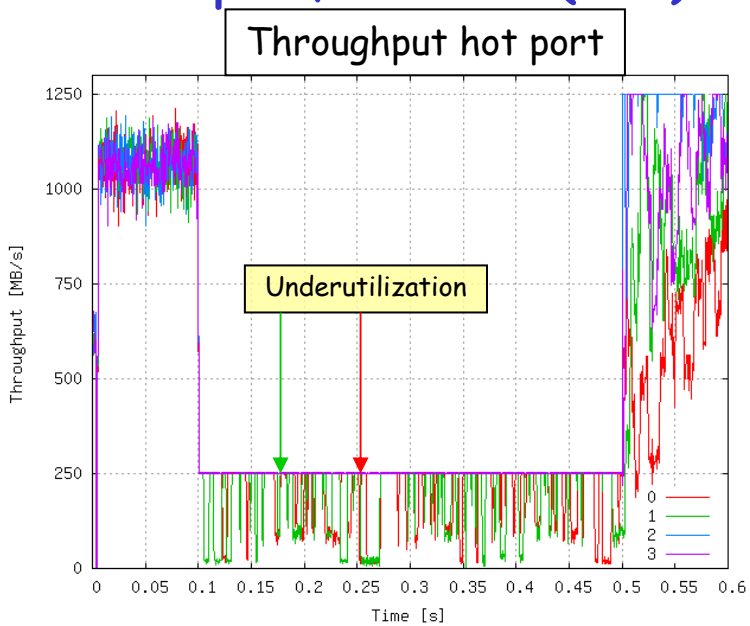
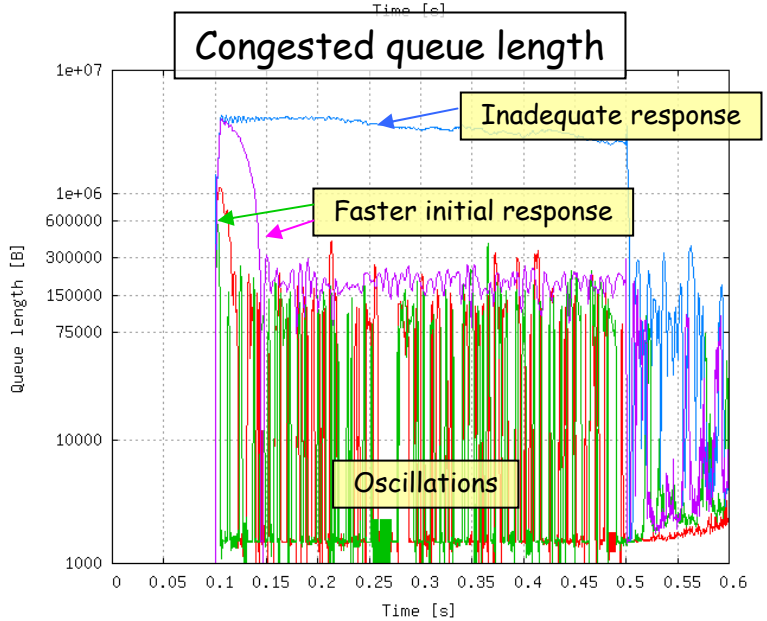
P_s = 2%, G_d = 0.5*G_{d0}, BCN-MAX off
P_s = 2%, G_d = 0.5*G_{d0}, BCN-MAX on

BCN-MAX: Single-stage OG hotspot, N = 16 (PM)







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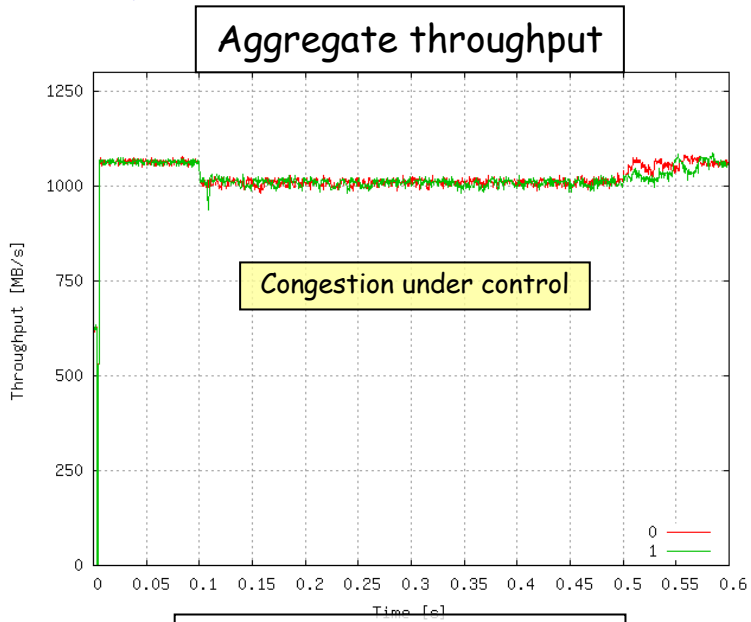
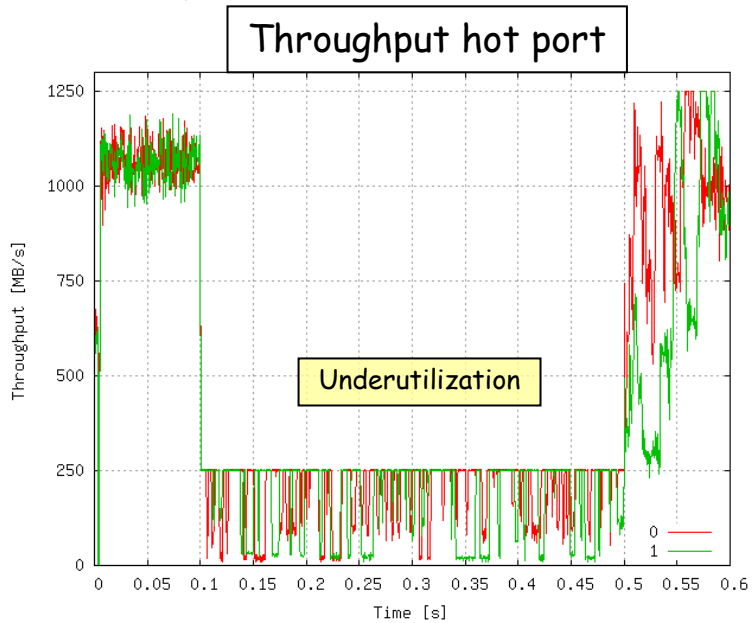
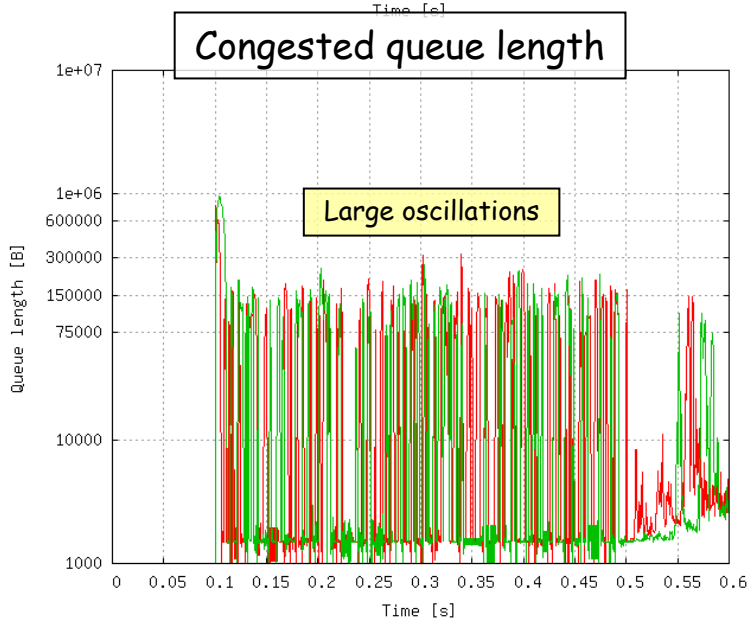
P_s = 2%, G_d = 0.5*G_{d0}, BCN-MAX off
P_s = 2%, G_d = 0.5*G_{d0}, BCN-MAX on

Dynamic range: Single-stage OG hotspot, N = 16, DRF = 1



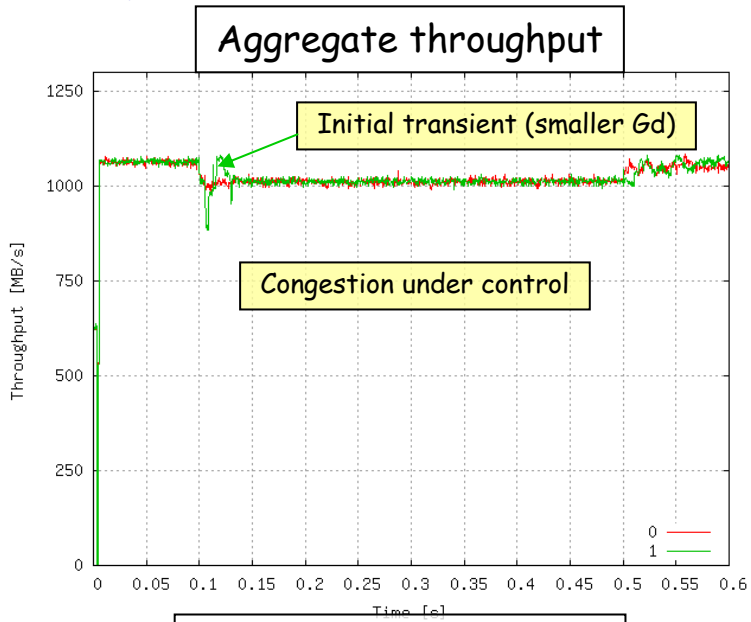


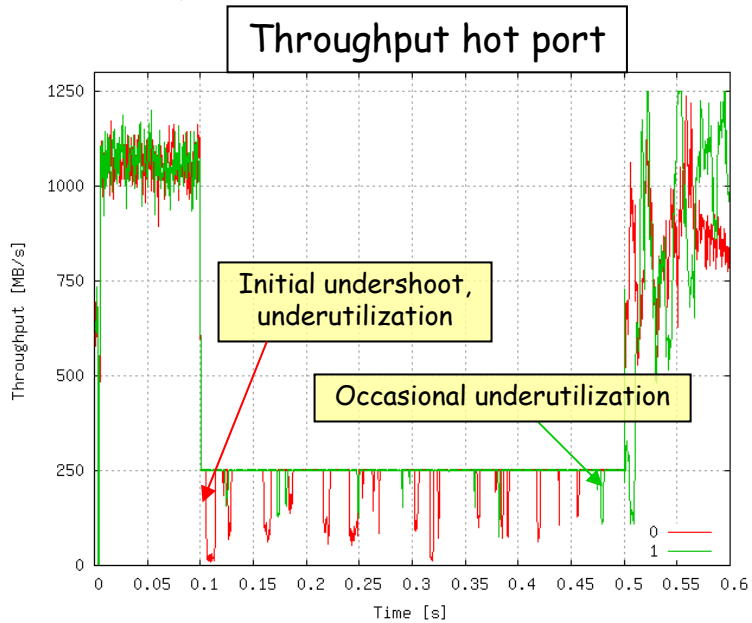


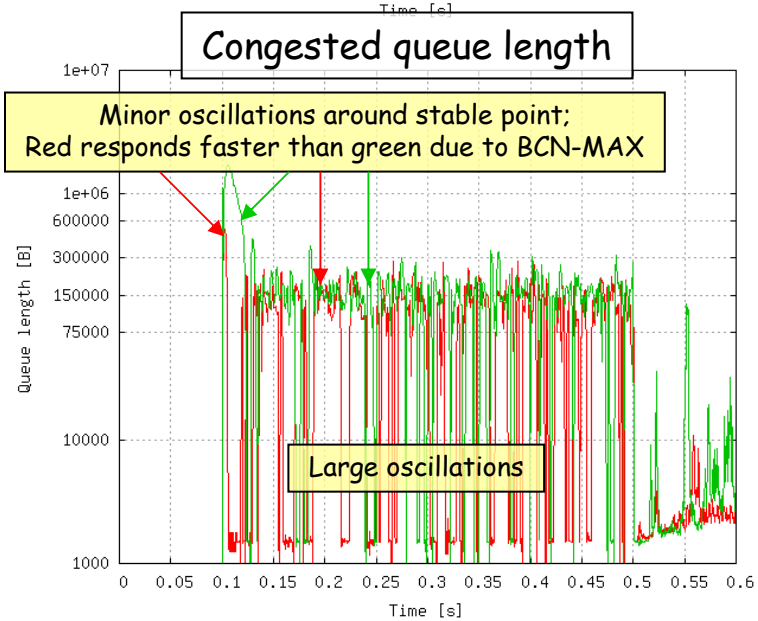
P_s = 2%, G_d = 2.5*G_{d0}/DRF, BCN-MAX on
P_s = 2%, G_d = 2.5*G_{d0}/DRF BCN-MAX off

DRF = dynamic range factor

Dynamic range: Single-stage OG hotspot, N = 16, DRF = 2







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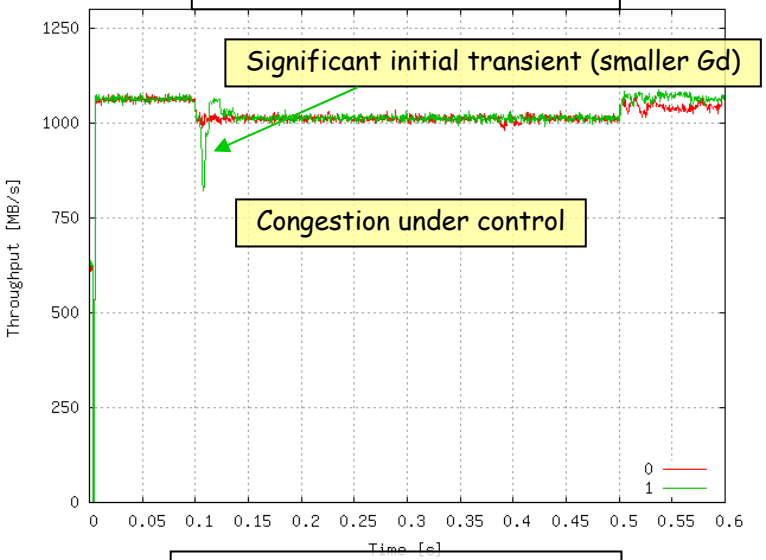
P_s = 2%, G_d = 2.5*G_{d0}/DRF, BCN-MAX off

Dynamic range: Single-stage OG hotspot, N = 16, DRF = 4

Aggregate throughput



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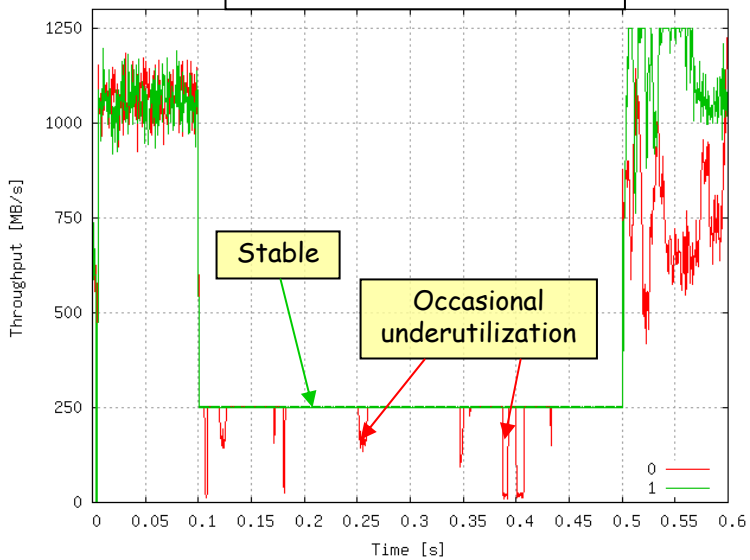

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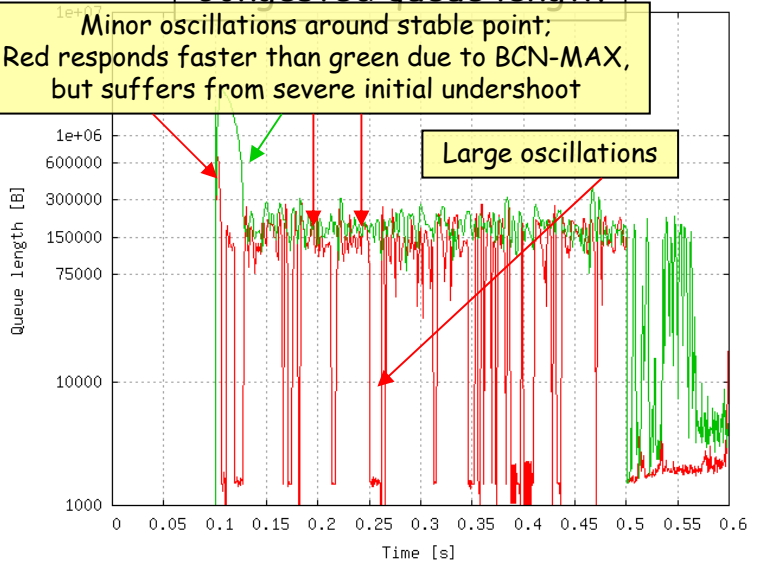

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P_s = 2%, G_d = 2.5*G_{d0}/DRF BCN-MAX off