Congestion Management Protocols
More QCN Simulation Results

Guenter Roeck, Teak Technologies

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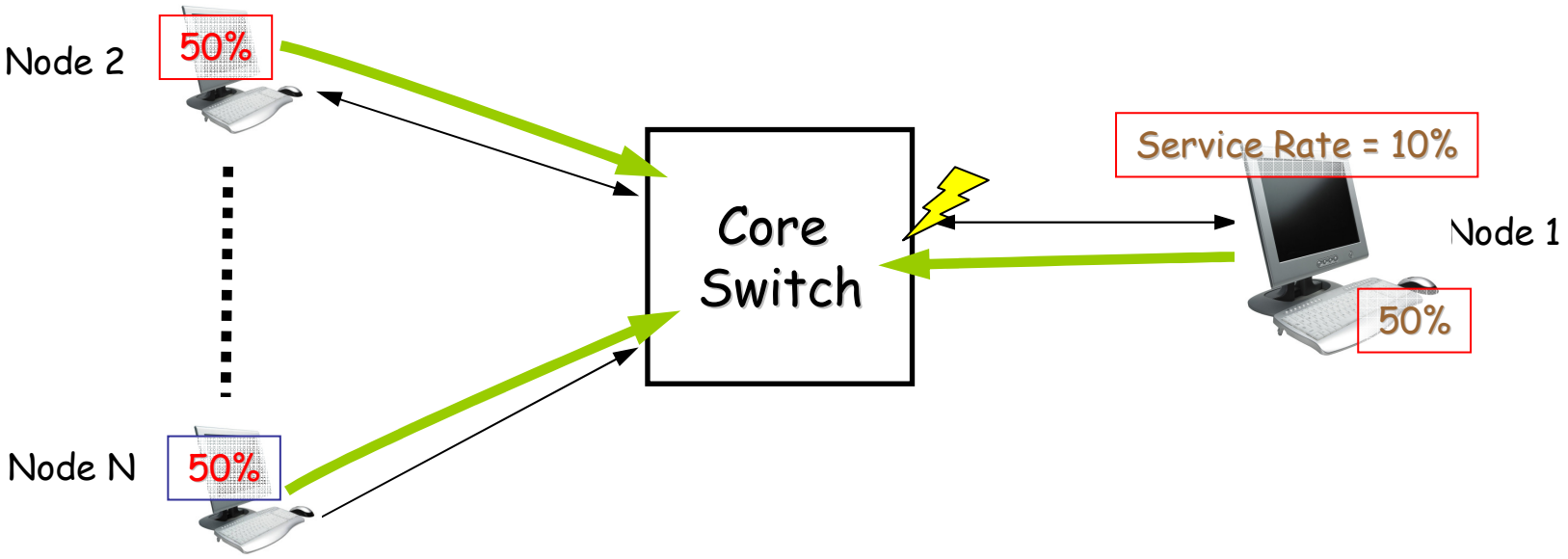
Simulation Parameters

- Traffic
  - Bernoulli
  - Uniform destination distribution
  - 1500 byte frames
- System
  - Switch latency (processing time) = 1us
  - Link latency = 500ns
  - Switch frame capacity = 1,400 packets (2.1MB)
  - No PAUSE generated by switch
  - Egress buffer size 5,000 packets (7.5MB)
- ECM
  - W = 2.0
  - Qeq = 37.5kB
  - Gd = 0.5 / ((2 * W + 1)*Qeq)
  - Gi = 0.1 * (Rlink/Runit) / ((2*W+1)*Qeq)
  - Psample = 2%
  - Runit = Rmin = 1 Mb/s
  - BCN_MAX enabled

Simulation Parameters

- QCN
  - Drift factor = 1.005
  - Timer period = 500 uS
  - Extra fast recovery enabled
  - EFR MAX disabled
  - A = 3 mbps
  - Fast Recovery Threshold = 5
  - Gd = 1/128
  - TO_THRESH = 75 kBytes
  - Qeq = 37.5kB
  - **Hyperactive Increase disabled**
  - **Psample = 1.2% (fixed)**
- QCN – 2nd set of parameters
  - **Hyperactive Increase enabled**
  - **Psample = 1% .. 10% (variable with level of congestion)**

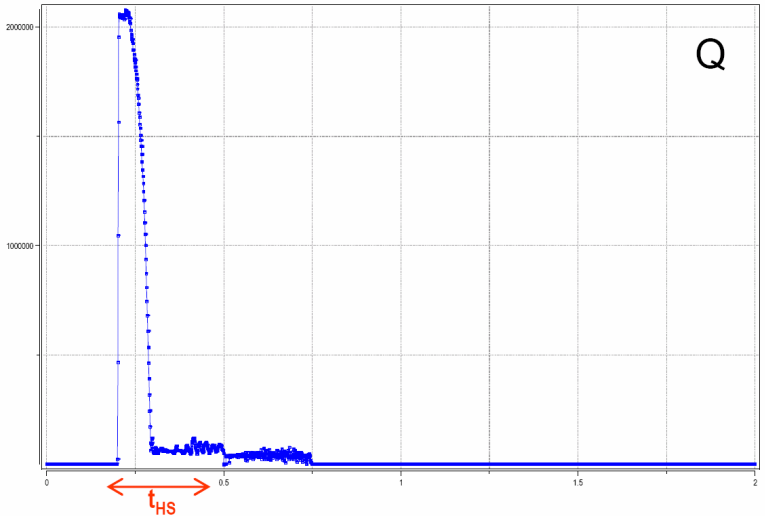
Scenario 3: Output Generated Single Hotspot



- All nodes (16): Uniform distribution, load: 5 Gb/s
- Node 1 (hotspot) service rate: 1Gb/s
- One congestion point
  - Duration: 300 mS from ti=200 ms to 500 ms
- Simulation runtime: 2 seconds

Scenario 3: Queue Length

ECM – ZRL



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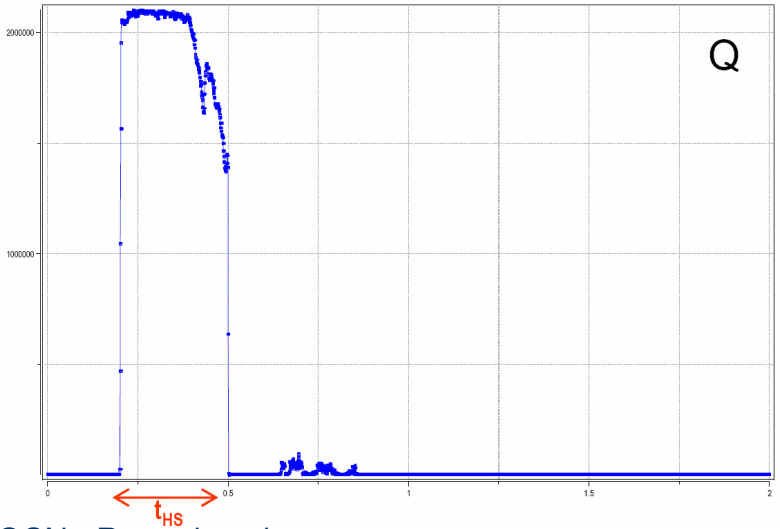
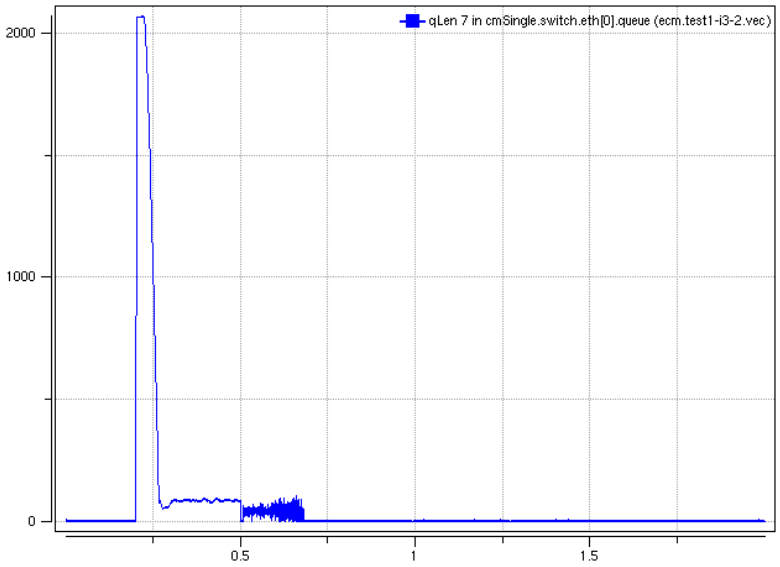


ECM - Reproduced



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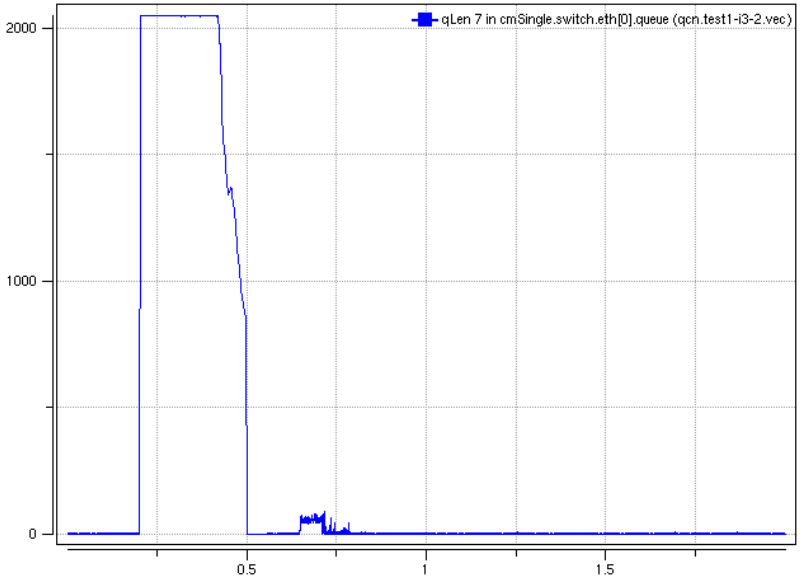

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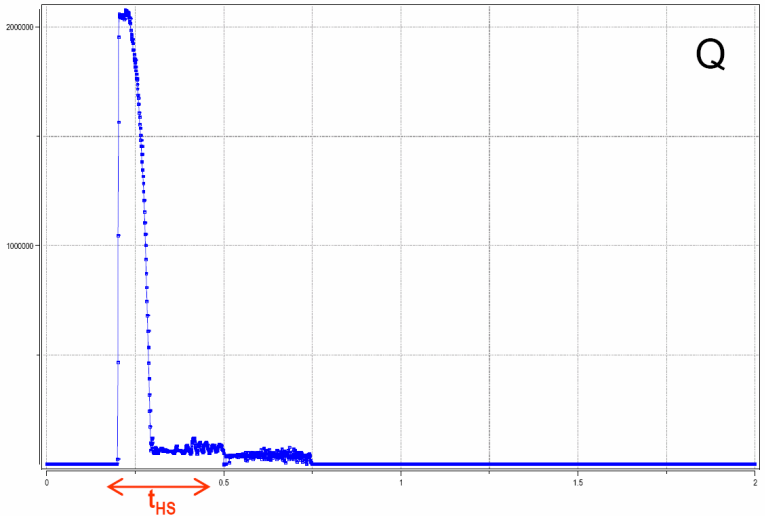

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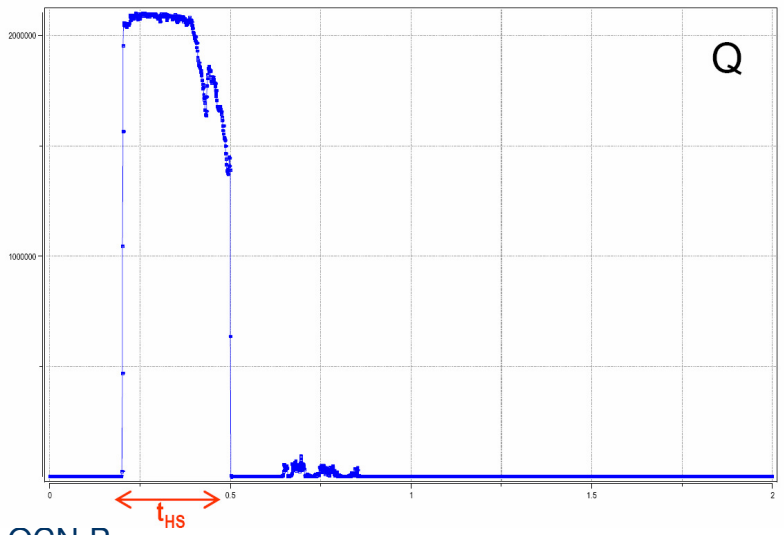
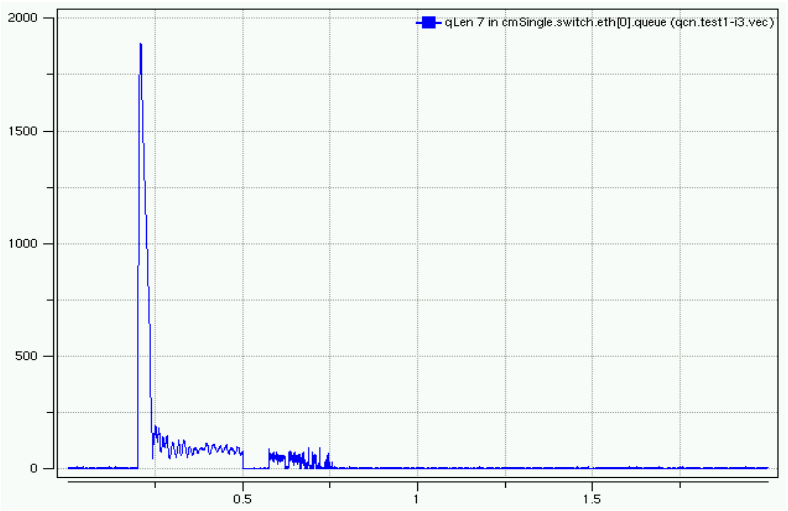
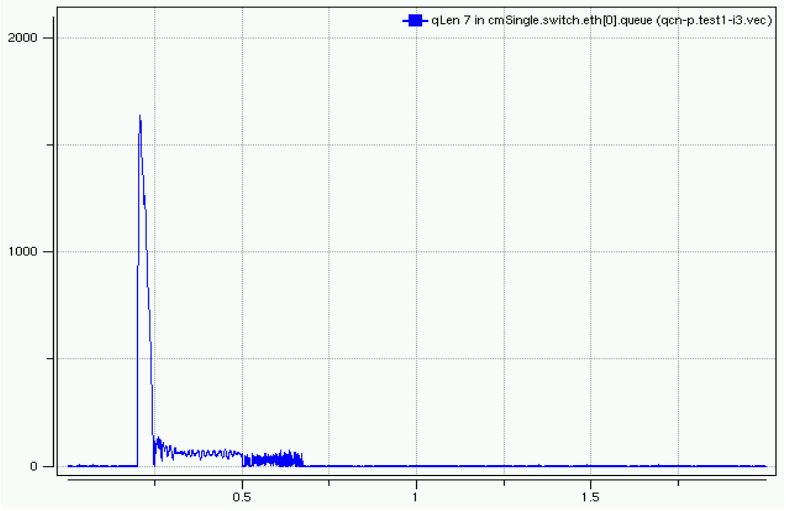


QCN – 2nd parameter set

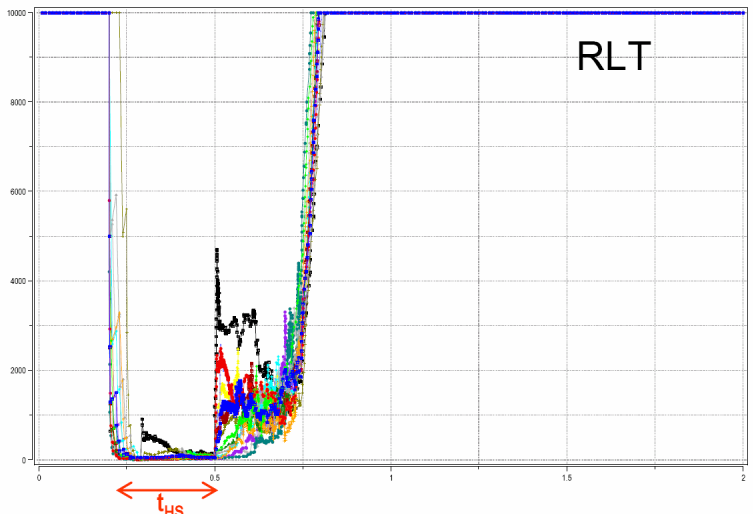


QCN-P



Scenario 3: Data Rate

ECM - ZRL



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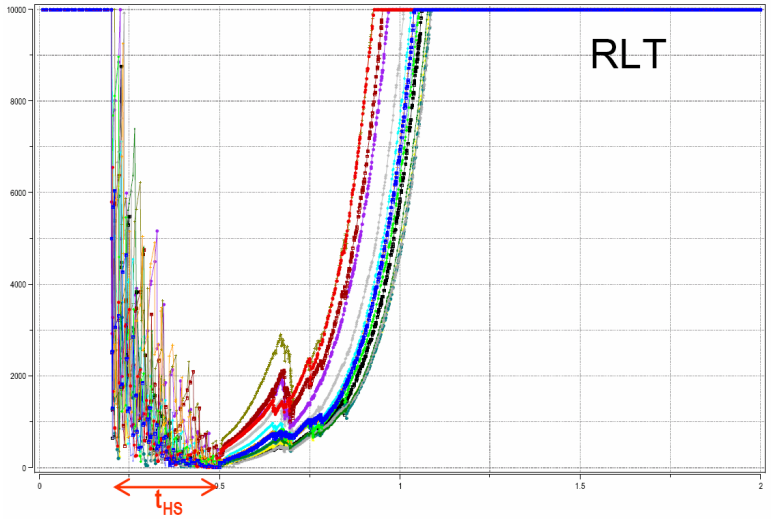
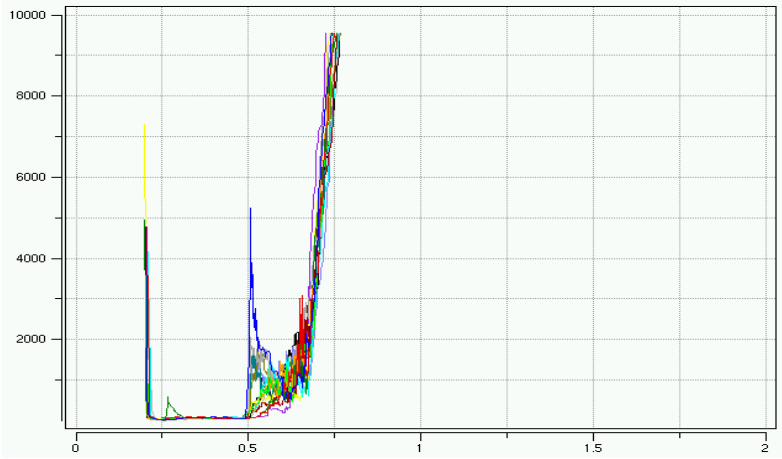


ECM - Reproduced



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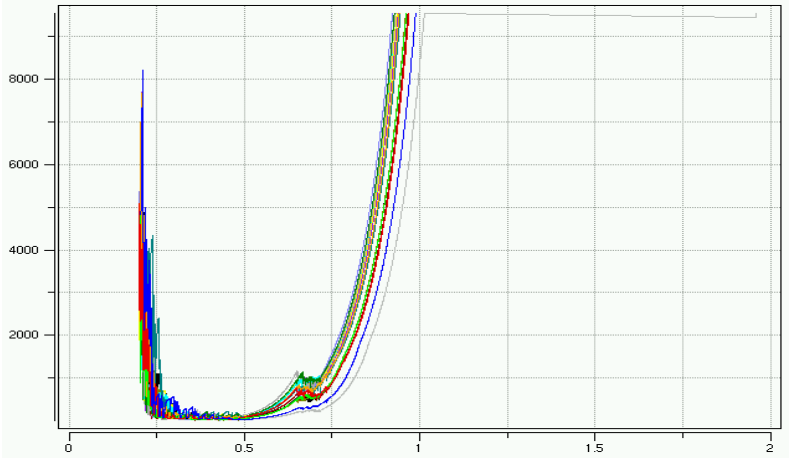

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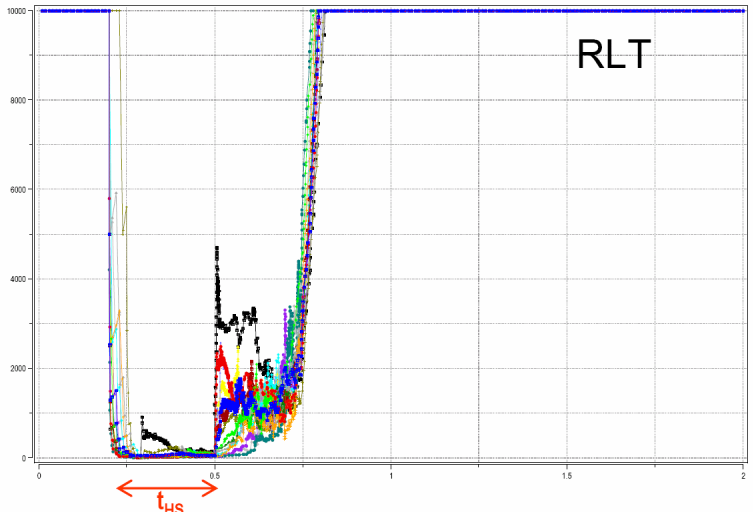

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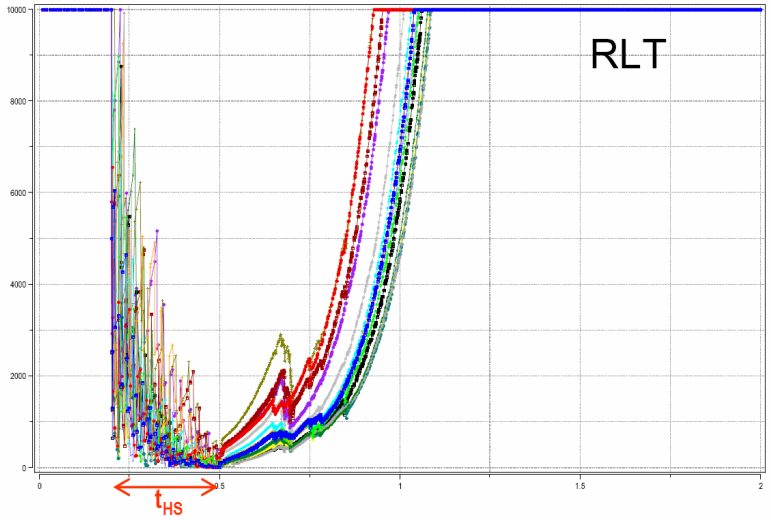

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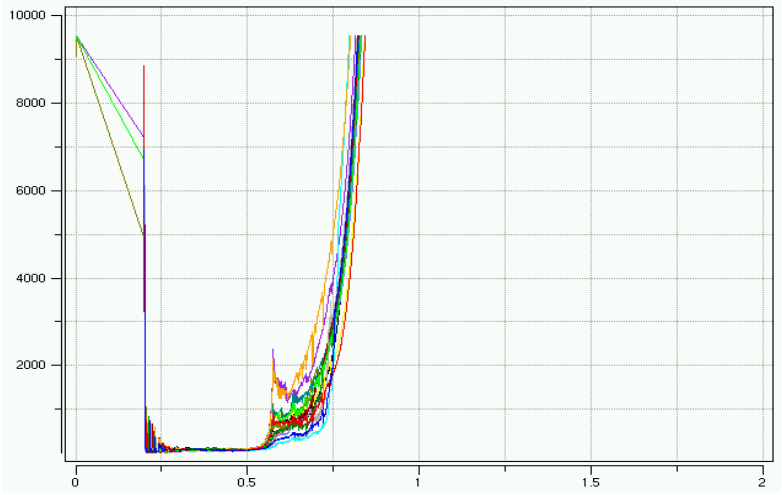

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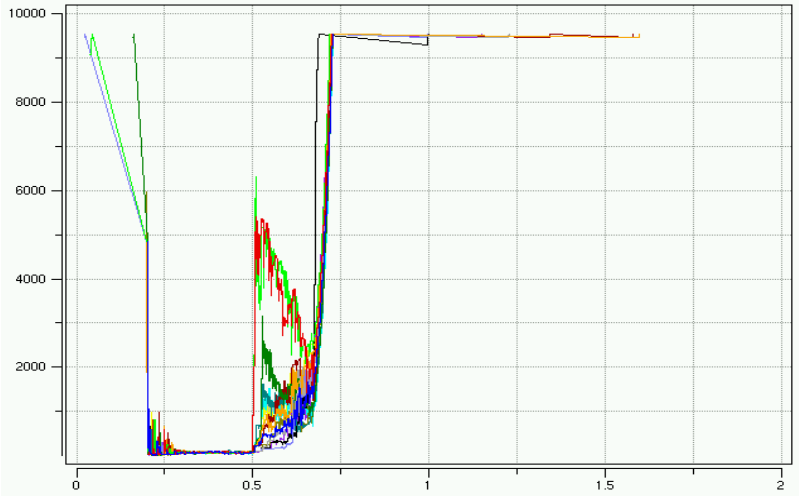

Conclusions

- QCN fails with fixed probe interval
  - Higher increase rate on recovery requires higher (flexible) decrease rate
  - If probe interval is too low (<1.2%), QCN never recovers
- QCN reacts faster with Hyperactive Increase enabled
- Should run QCN simulations with variable probe interval and (possibly) hyperactive increase