Progress Report: Make NDN Congestion Control work in ndnSIM

6th NDN Hackathon

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Motivation

- NFD congestion detection doesn't work in ndnSIM (no real TCP/UDP/Unix faces)

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- Tasks: Fix that.

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   $\Rightarrow$ NetDeviceTransport: override of virtual function(s) for congestion control.
2. CongestionMarks signaled via NDNLP: Already works!
3. Implement Consumer App that reacts to congestion marks (AIMD and TCP CUBIC.)

Evaluation Scenario

Very simple scenario:
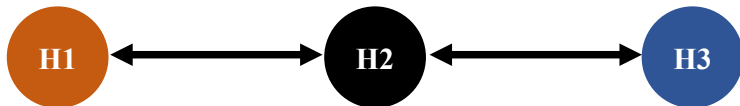
- 1 Consumer
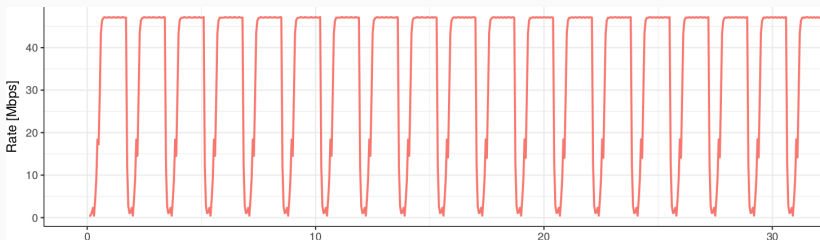- 50 Mbit/s bottleneck capacity
- 40ms RTT

ConsumerWindow App:

- On Data: $m_{cwnd}++$ (constant slow start!)
- On TimeOut: $m_{cwnd} \leftarrow 2$

How ndnSIM performs right now

ConsumerWindow App:

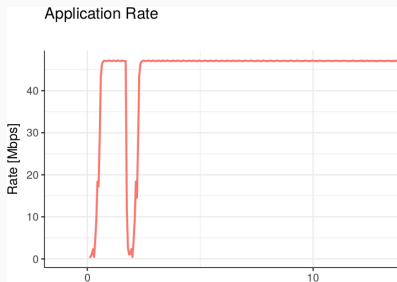- On Data: $m_{cwnd}{+}{+}$ (constant slow start!)
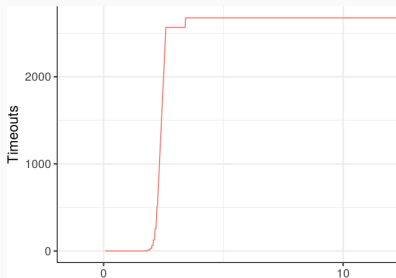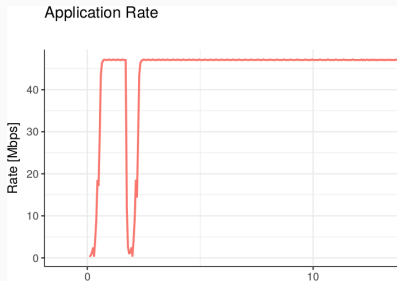- On TimeOut: $m_{cwnd} \leftarrow 2$
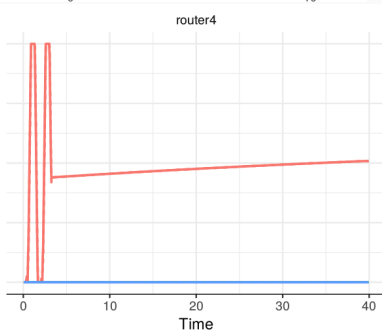
How ndnSIM performs right now

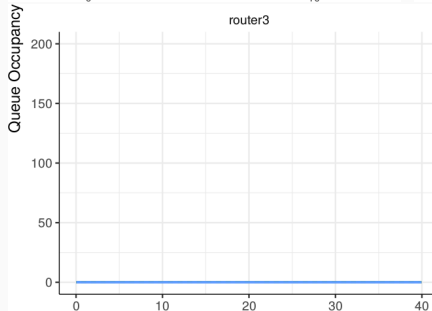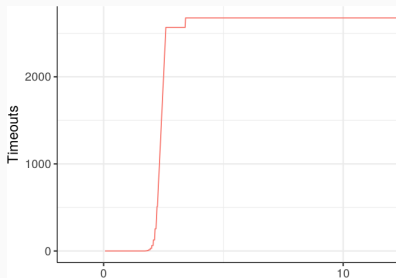60,000 Timeouts!!!

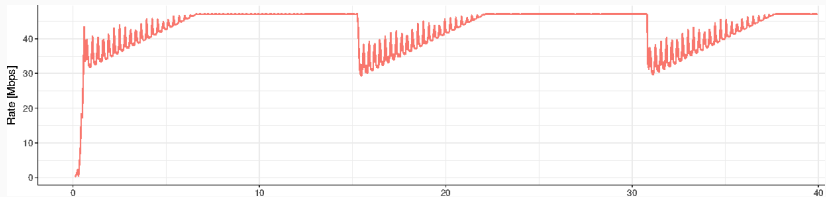Application Rate
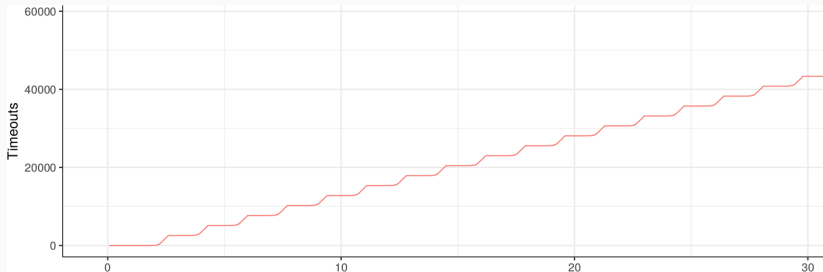
Improved ConsumerWindow (no congestion marks)

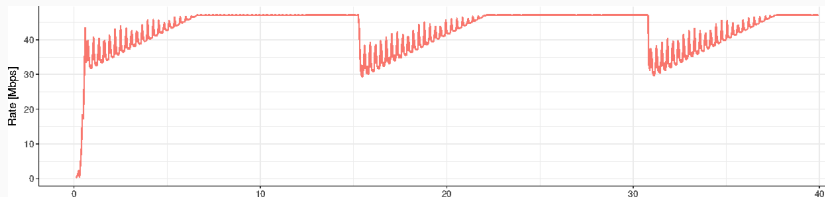# Improved ConsumerWindow (no congestion marks)
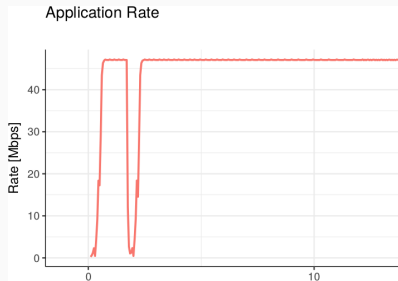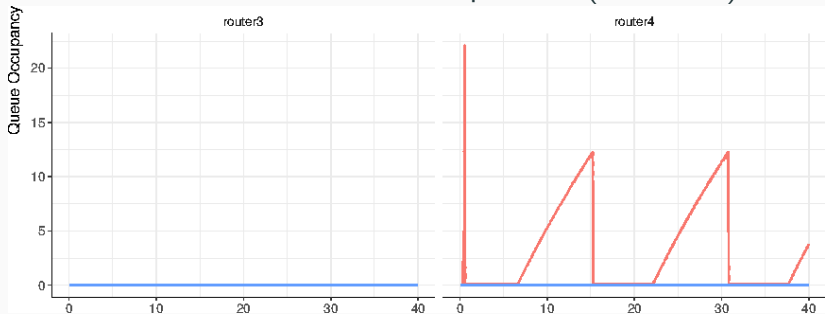
ConsumerPCON – AIMD

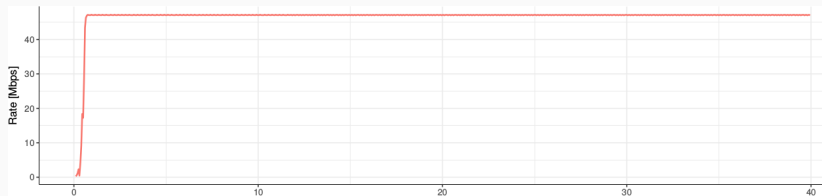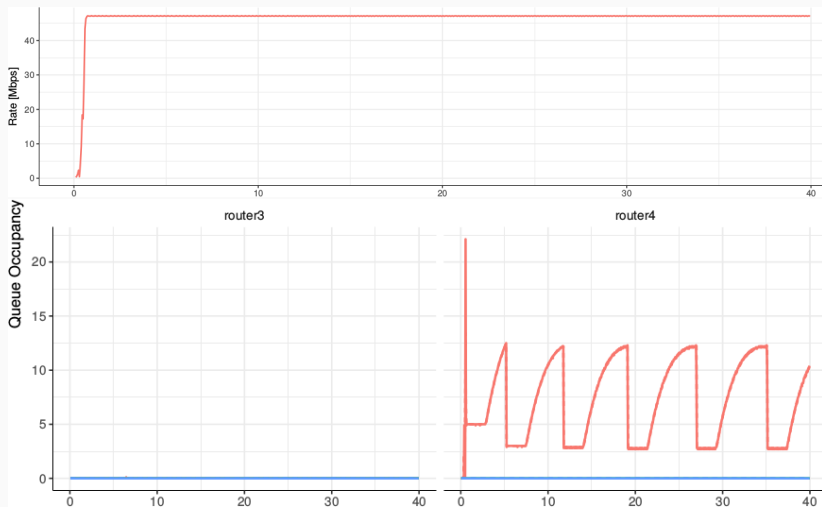No Timeouts!, Shorter "sawtooth" patterns (about 15s)

ConsumerPCON − AIMD

No Timeouts!, Shorter "sawtooth" patterns (about 15s)

ConsumerPCON − CUBIC

Even Shorter Sawtooths (about 7s)!

Future Work

Congestion Detection via adapted CoDelQueue:

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NS-3 separated queuing in traffic-control module as: