

Progress Report: Make NDN Congestion Control work in ndnSIM

6th NDN Hackathon

Klaus Schneider, Ashiqur Rahman, Chavoosh Ghasemi

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The University of Arizona

Motivation

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

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- Tasks: Fix that.

Solution Steps

1. ndnSIM doesn't use real TCP or UDP faces.
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Solution Steps

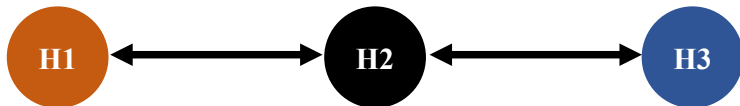
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⇒ NetDeviceTransport: override of virtual function(s) for congestion control.
2. CongestionMarks signaled via NDNLP: Already works!
3. Implement Consumer App that reacts to congestion marks (AIMD and TCP CUBIC.)

Evaluation Scenario

Very simple scenario:



- 1 Consumer
- 50 Mbit/s bottleneck capacity
- 40ms RTT

How ndnSIM performs right now

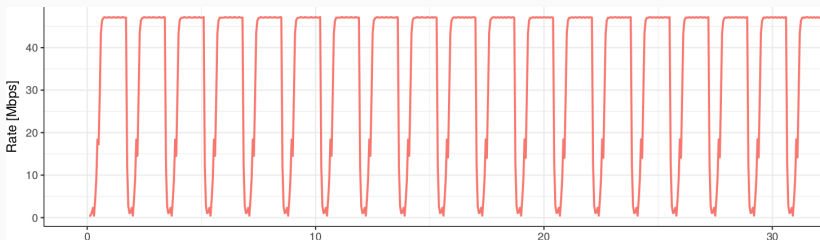
ConsumerWindow App:

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

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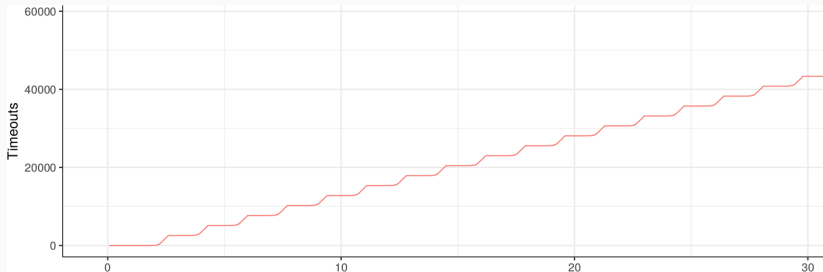
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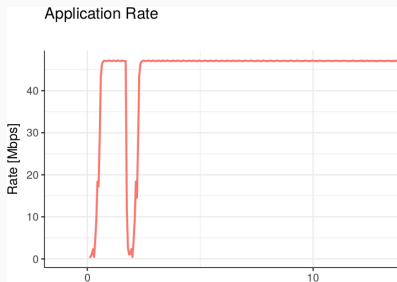


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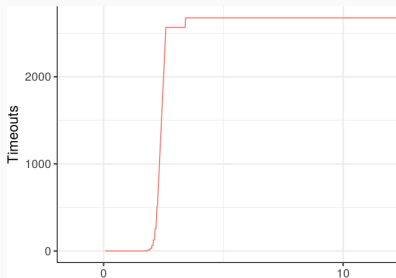
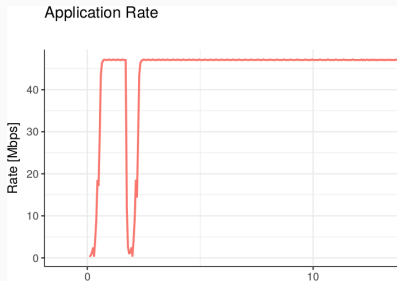
60,000 Timeouts!!!



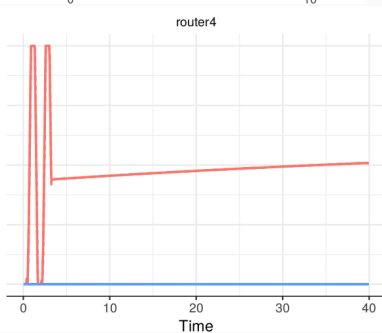
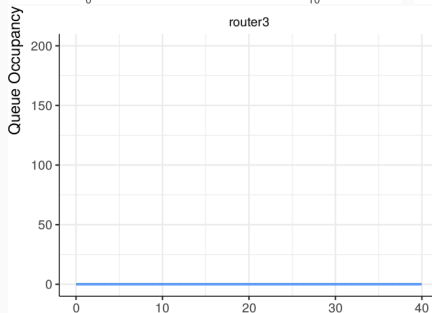
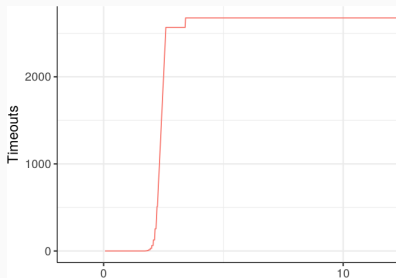
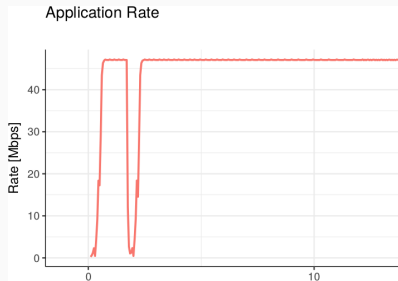
Improved ConsumerWindow (no congestion marks)



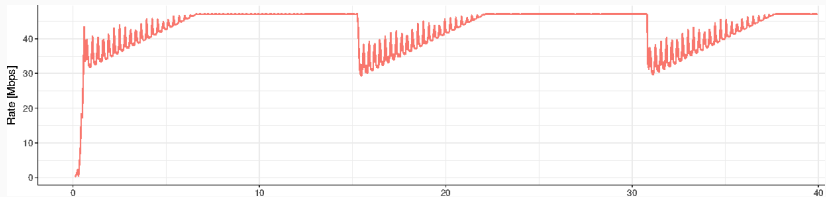
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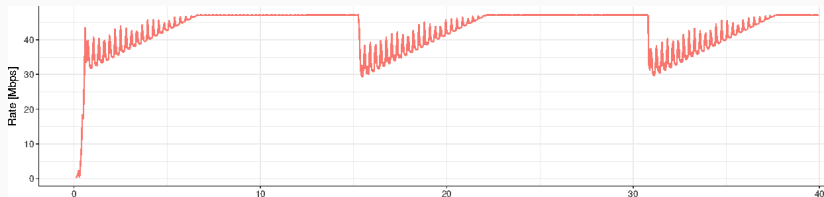


ConsumerPCON – AIMD

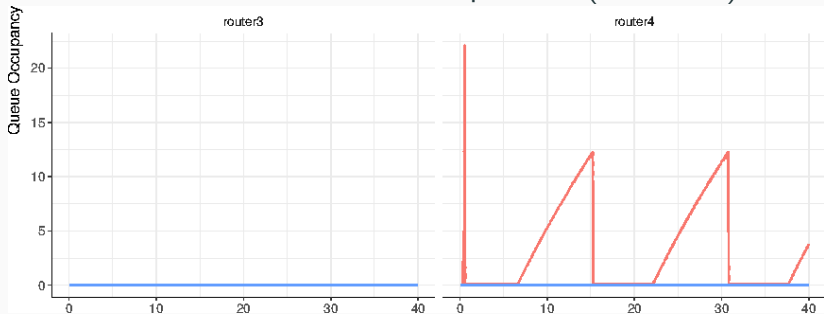


No Timeouts!, Shorter “sawtooth” patterns (about 15s)

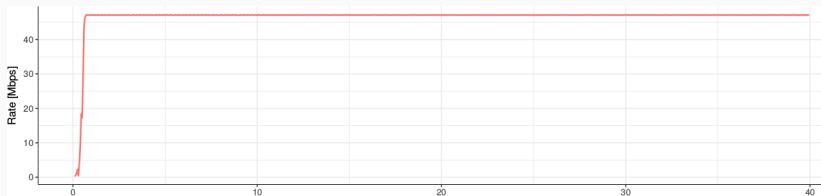
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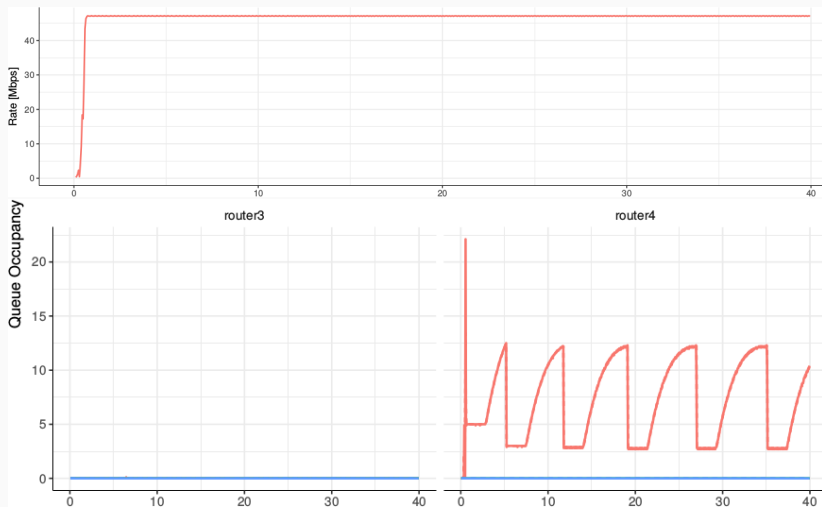
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ConsumerPCON – CUBIC



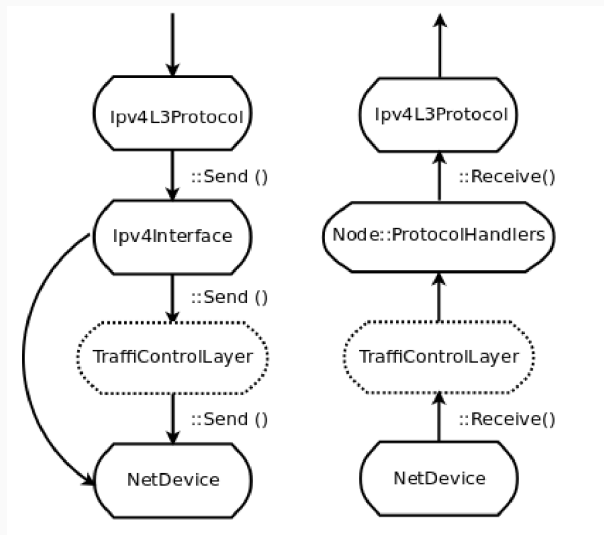
ConsumerPCON – CUBIC



Even Shorter Sawtooths (about 7s)!

Corner-stone

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



Experimental environment

Local topology:

- UDP Tunnels & TCP Tunnels
- Ethernet & WiFi

Any Questions?

Klaus Schneider, Eric Newberry, Chavoosh Ghasemi