Progress Report: Make NDN Congestion Control work in ndnSIM

6th NDN Hackathon

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The University of Arizona

Motivation

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

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$\Rightarrow$ Task: Fix that.

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1. **ndnSIM doesn't use real TCP or UDP faces.**
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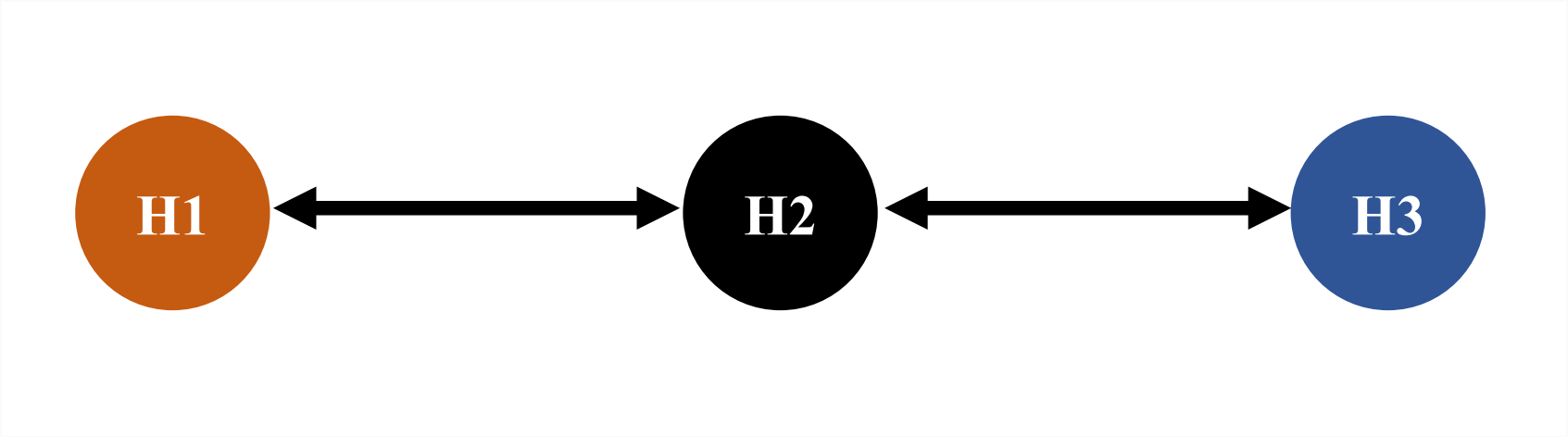
2. **CongestionMarks sent over NDNLP:** Already works!
3. **Implement Consumer App** that reacts to congestion marks (AIMD and TCP CUBIC)

Evaluation Scenario

Very simple scenario:



- 1 Consumer, Runtime: 40s
- RTT: 40ms
- Bottleneck capacity: 50 Mbit/s

How ndnSIM performs right now

ConsumerWindow App:

- On Data: $m_{cwnd}{+}{+}$

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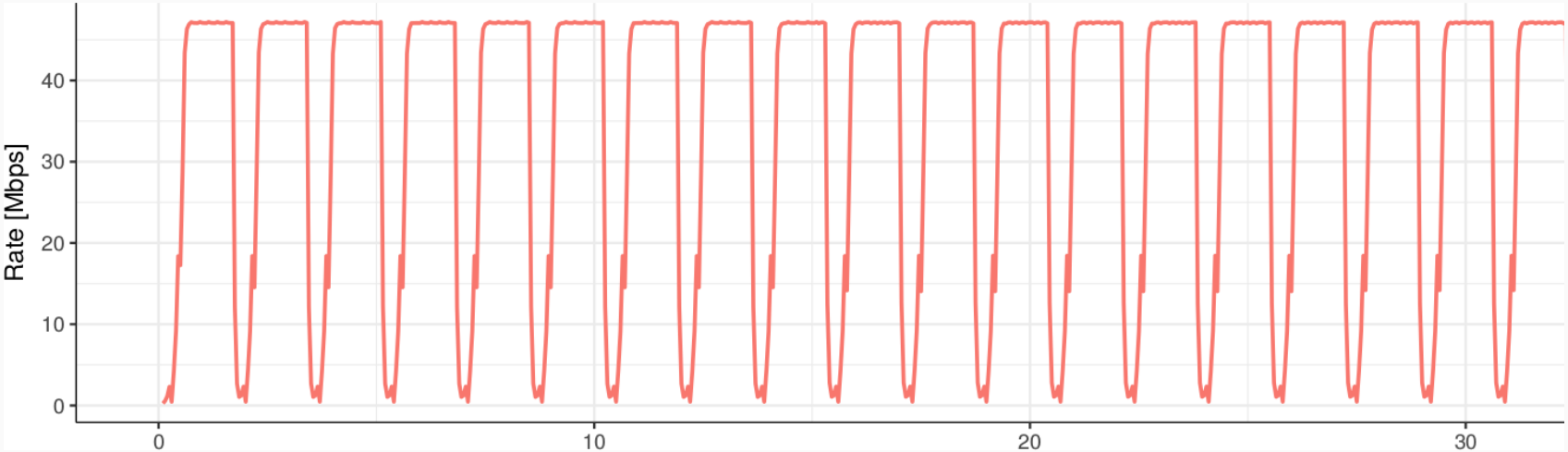
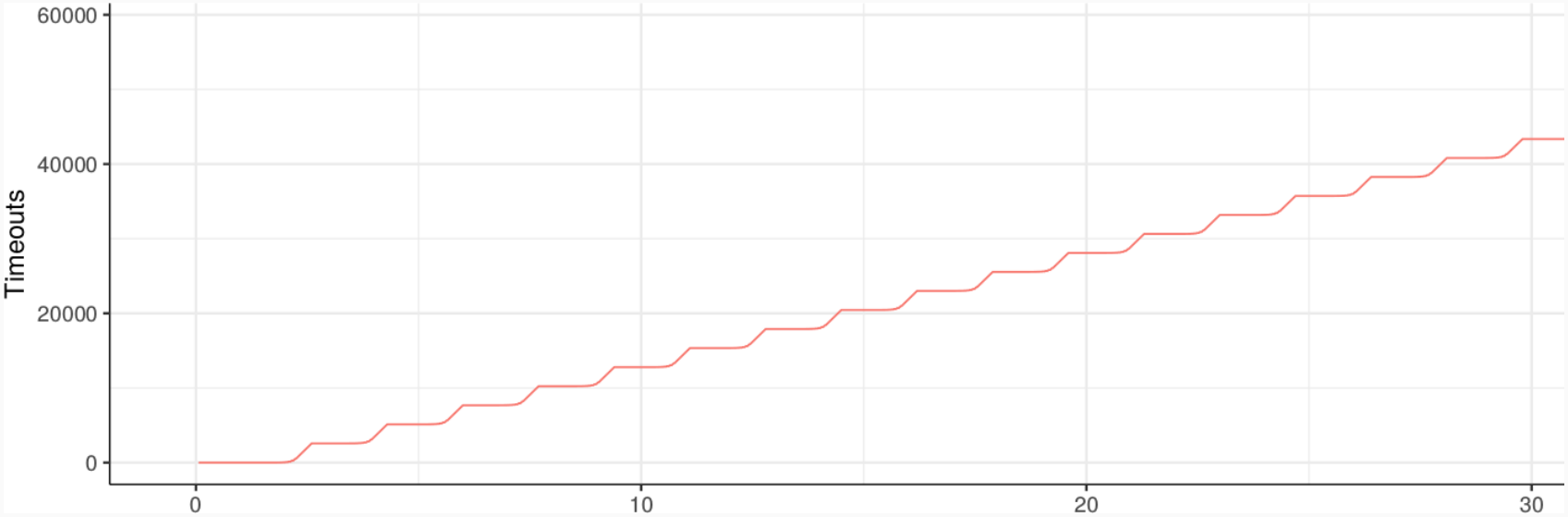
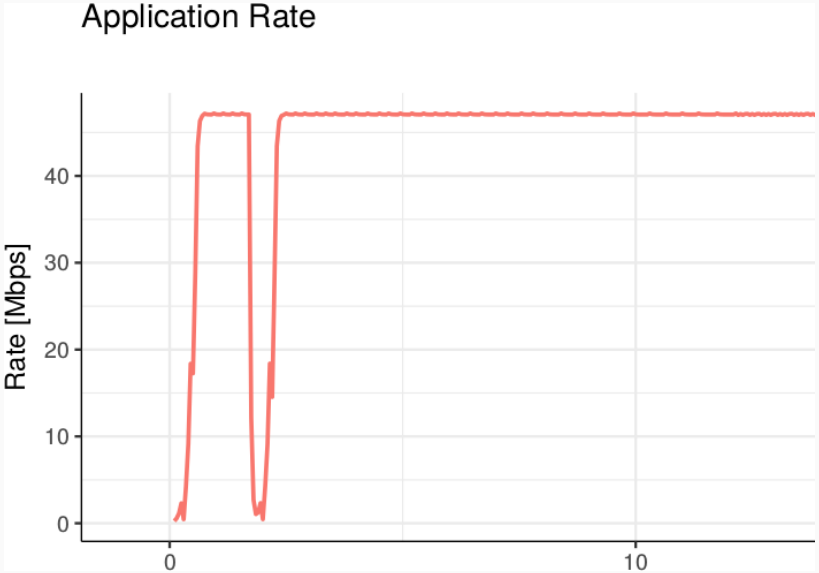


How ndnSIM performs right now

40,000 Timeouts!!!



Improved ConsumerWindow (no congestion marks)



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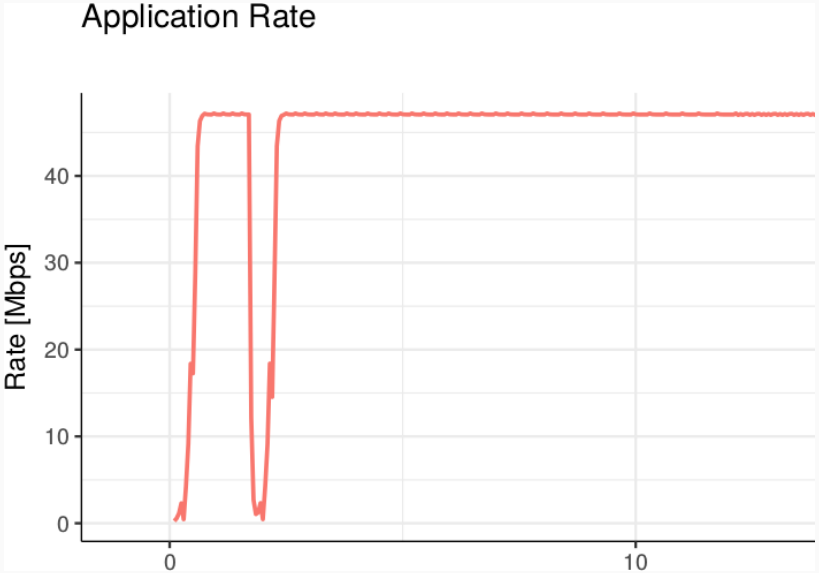

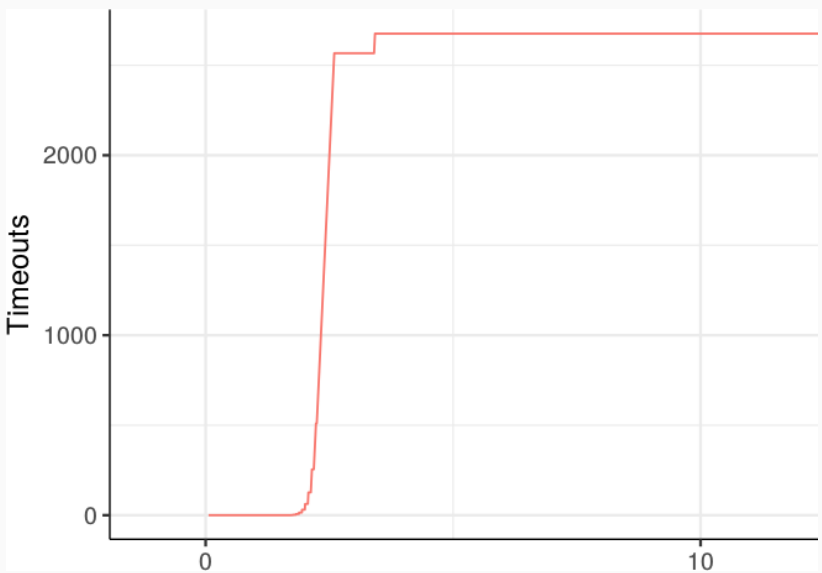

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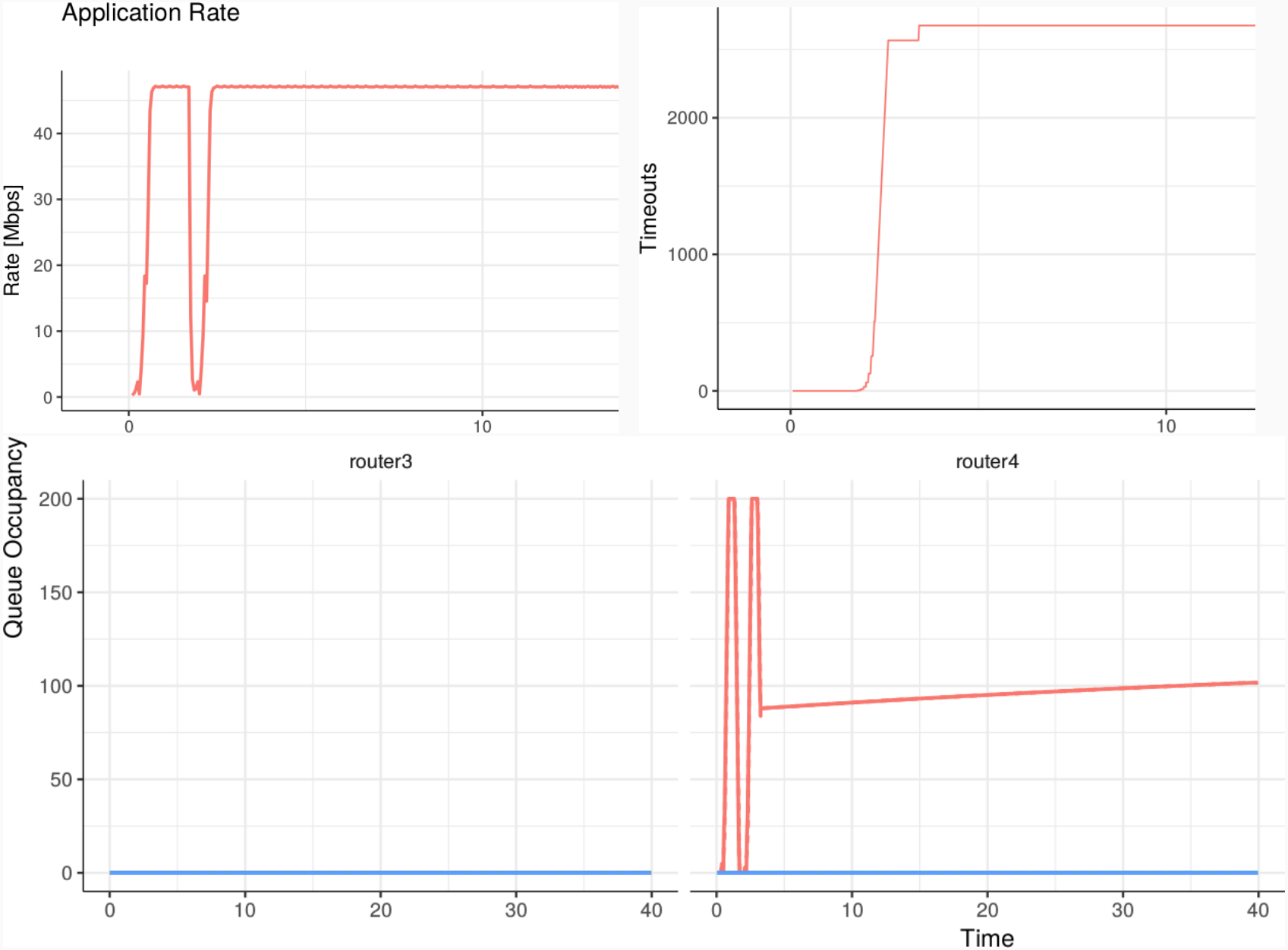
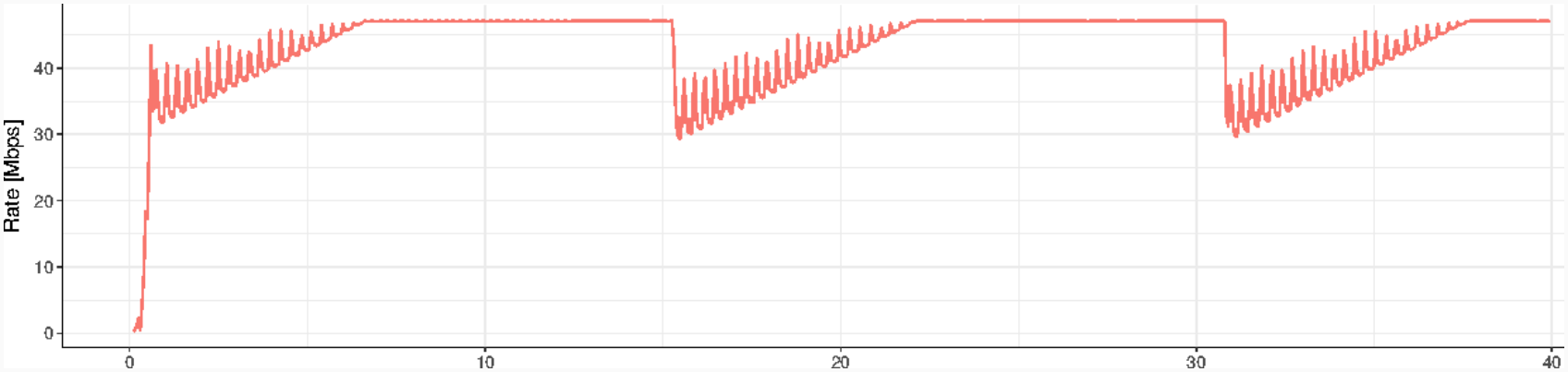


ConsumerPCON – AIMD



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

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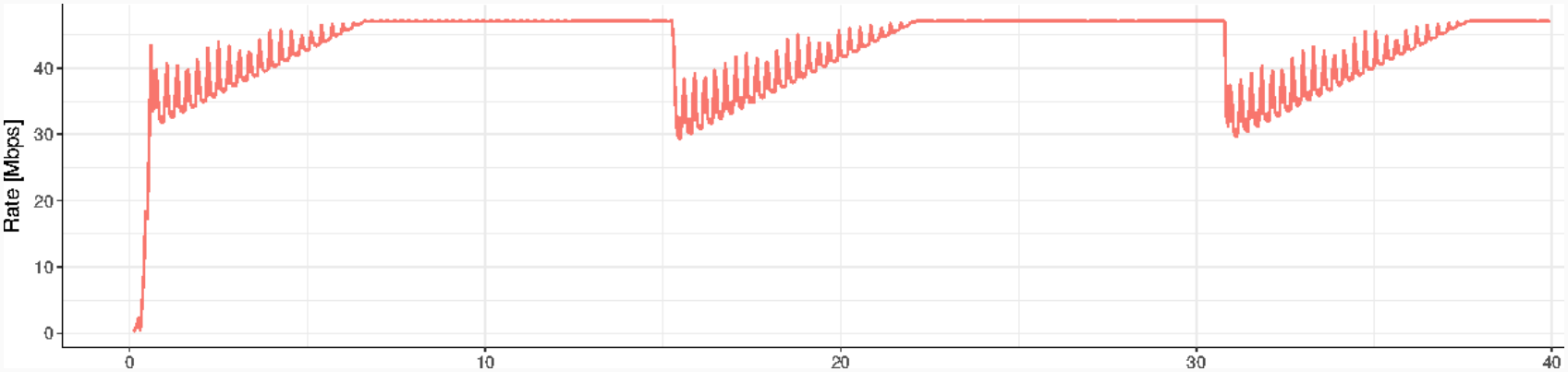

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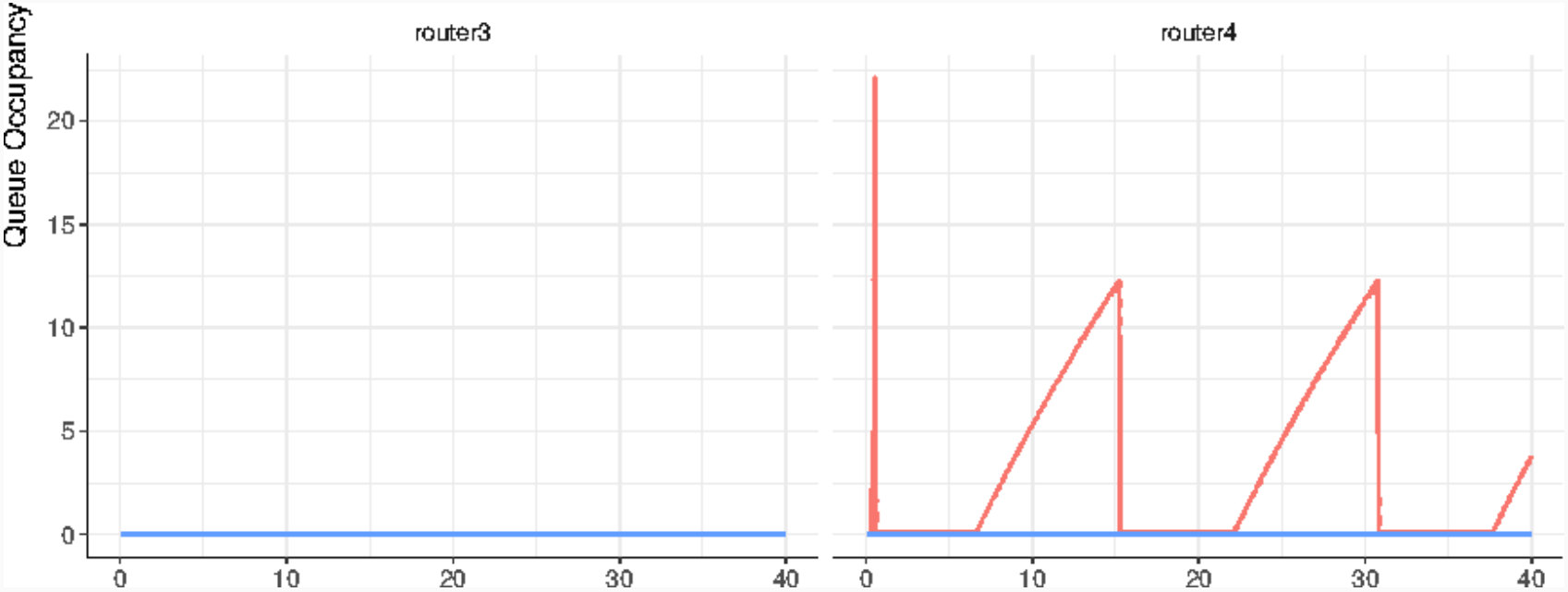

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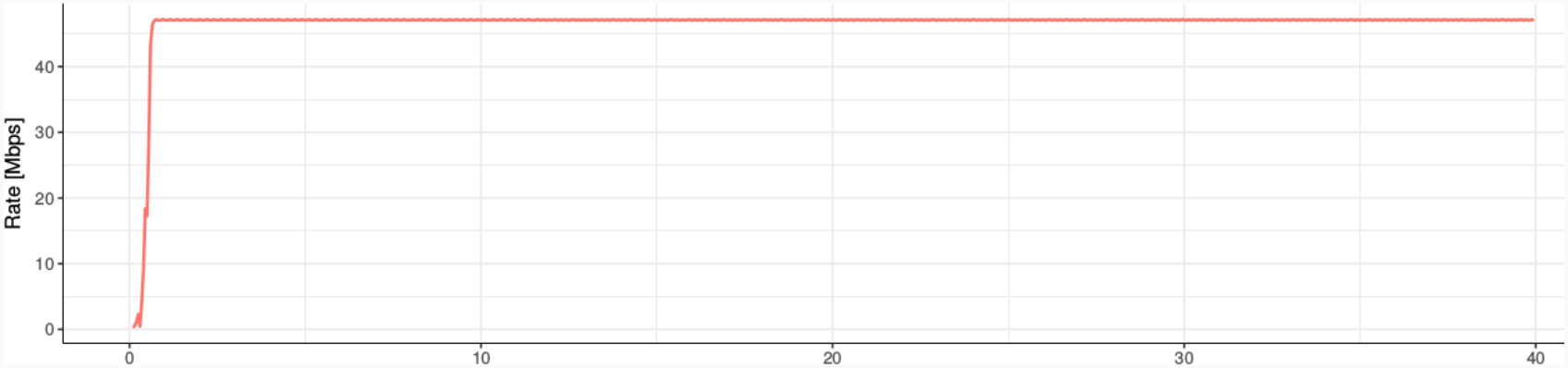

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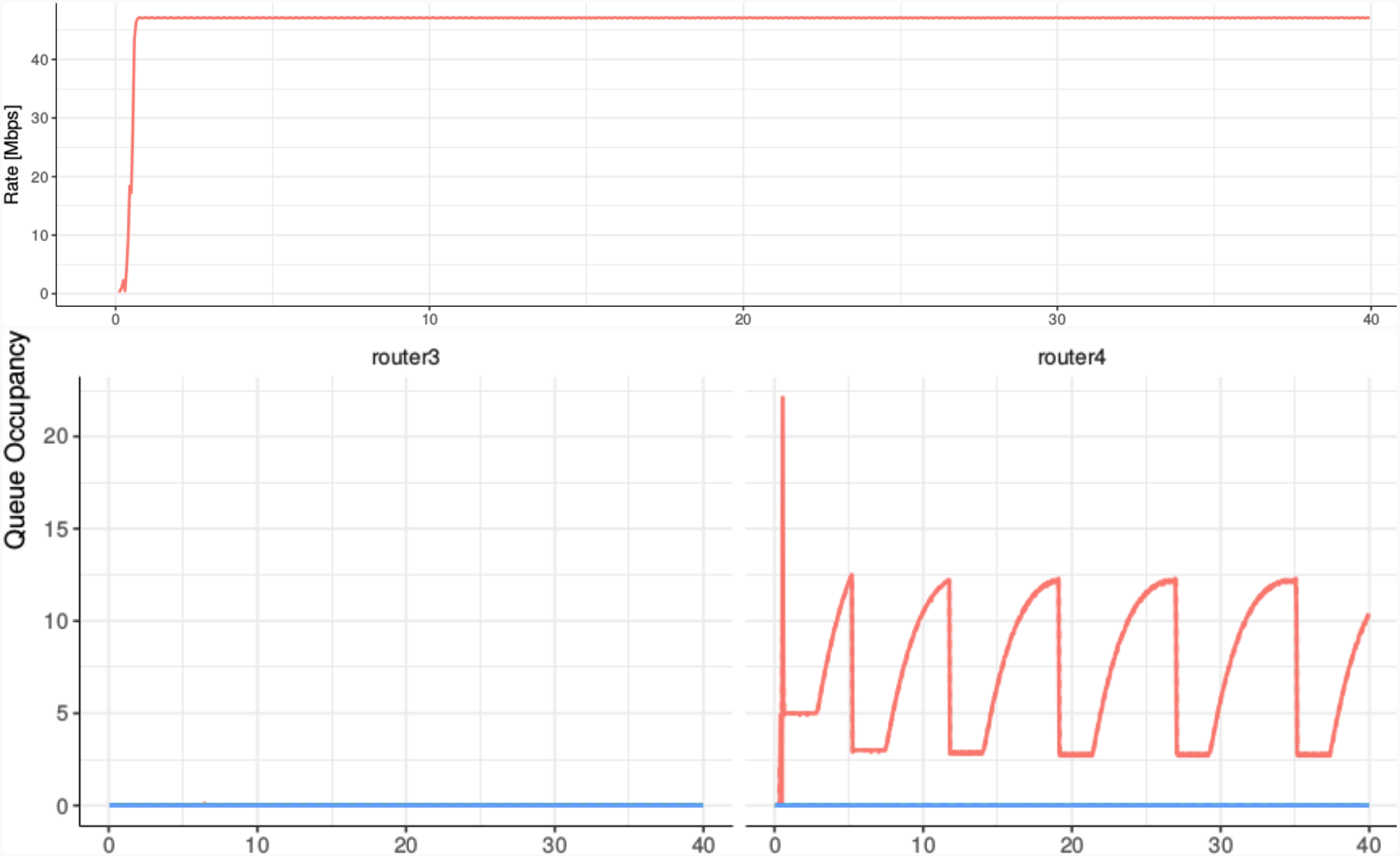

Even Shorter Sawtooths (about 7s)!

Future Work

Congestion Detection via **adapted CoDelQueue:**

- Worked well in ns3 3.23 (PCON simulation code)

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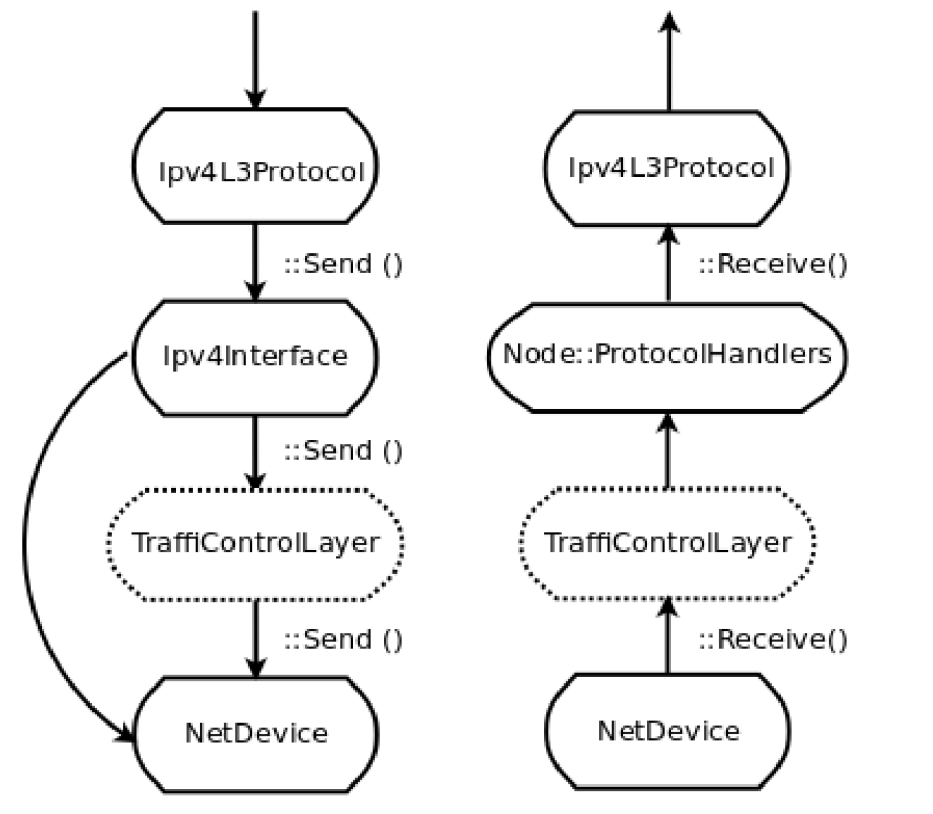
NS-3 separated queuing in traffic-control module as:



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3. **Explicit Congestion Marks**
4. **CUBIC > AIMD**

`https://github.com/6th-ndn-hackathon/congestion-control`

The End

Any Questions?

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