








# Testing Congestion Control and Queue Management Mechanisms

Abhyuday Hegde, Mohit P. Tahiliani, Vishal Kamath (Remote)

Related groups: ccwg, iccrg, tcpm and tsvwg

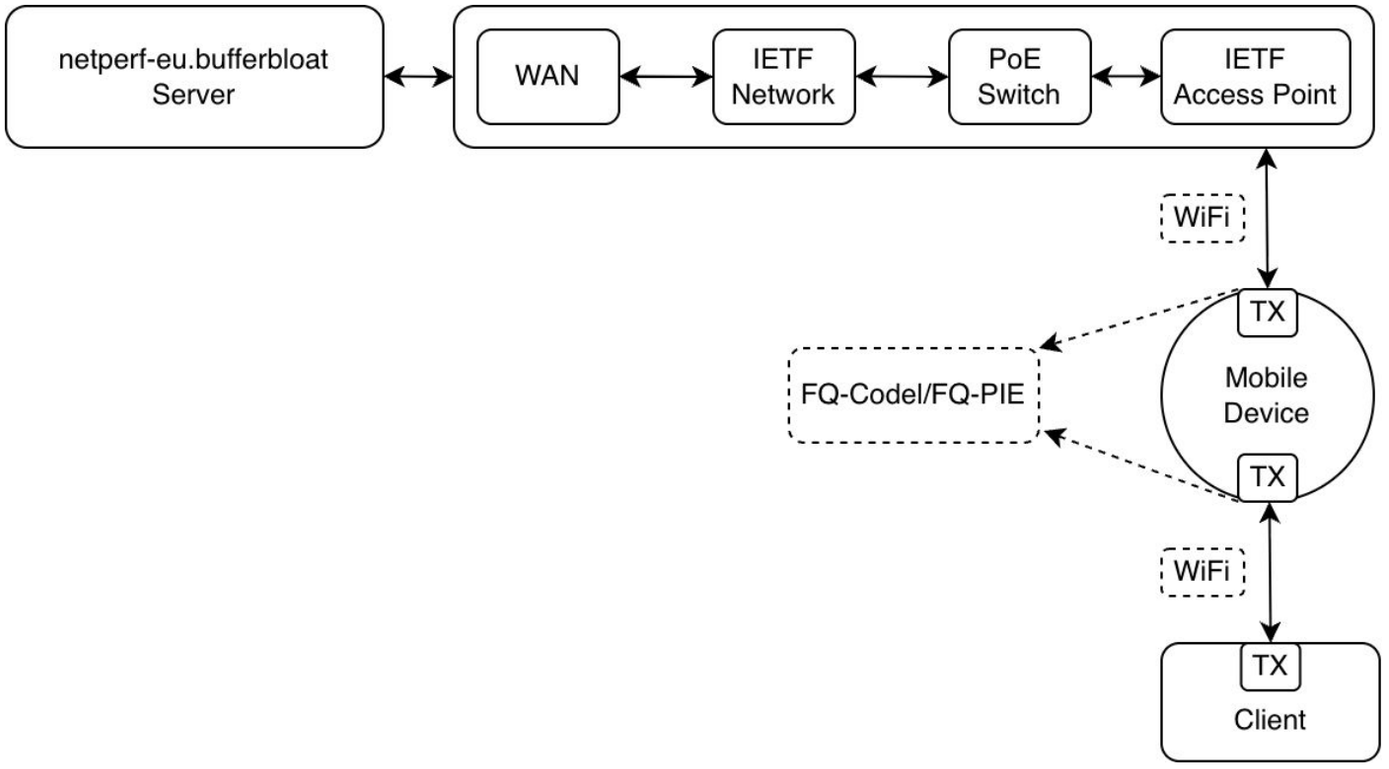
# Objectives (revised)

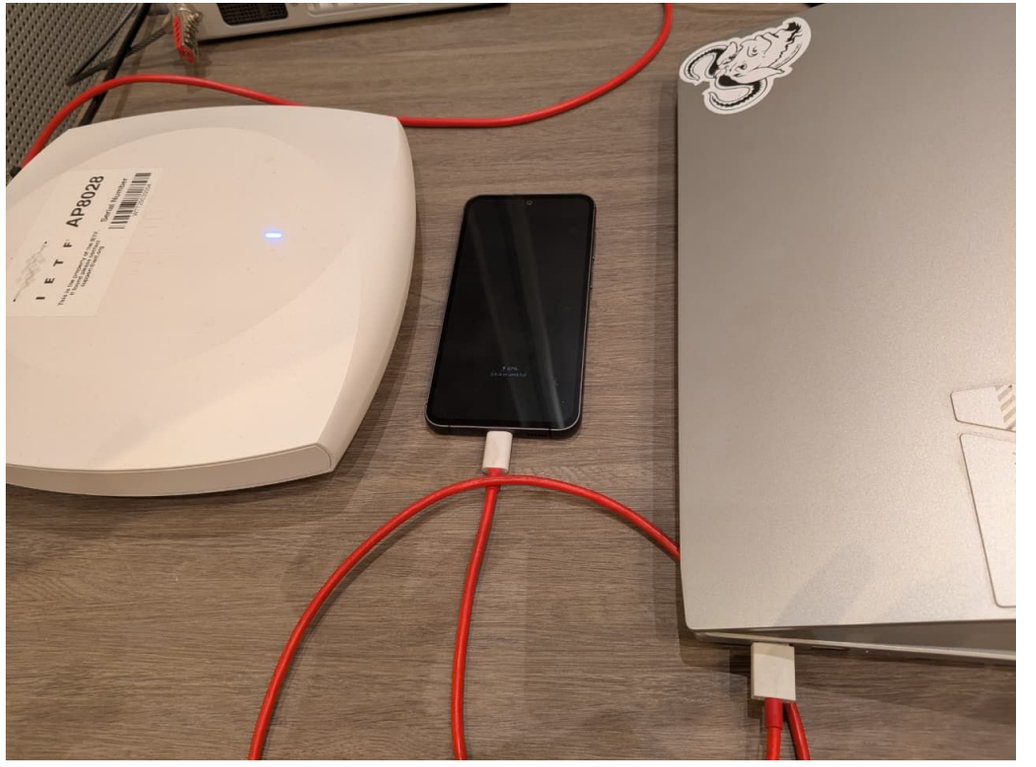
1. Performance Evaluation of FQ-CoDel and FQ-PIE in Mobile Hotspot
    - Status: **Completed**
2. Testing of FQ-CoDel and FQ-PIE using WiFi AP (QQ-IW-235)
    - Status: **Completed**
3. Testing the integration of picoquic with ns-3
    - Status: **Completed**






# FQ-CoDel vs FQ-PIE: Flent tests using a Mobile Hotspot



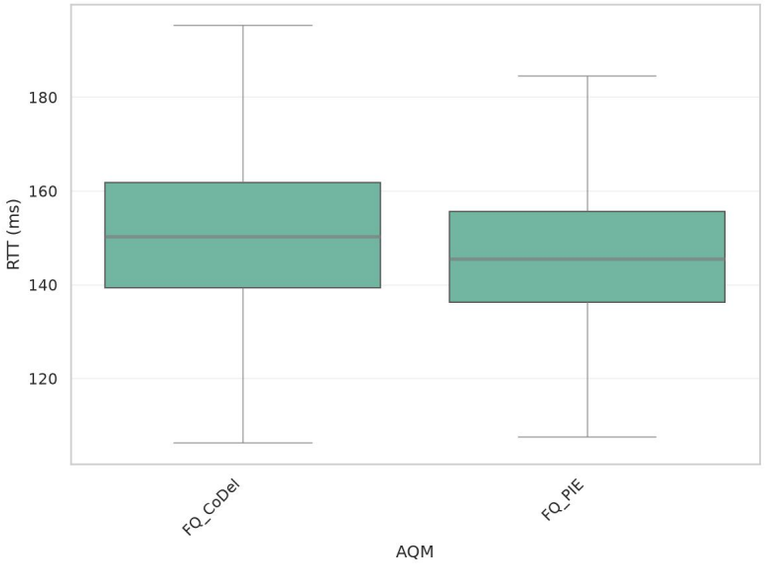



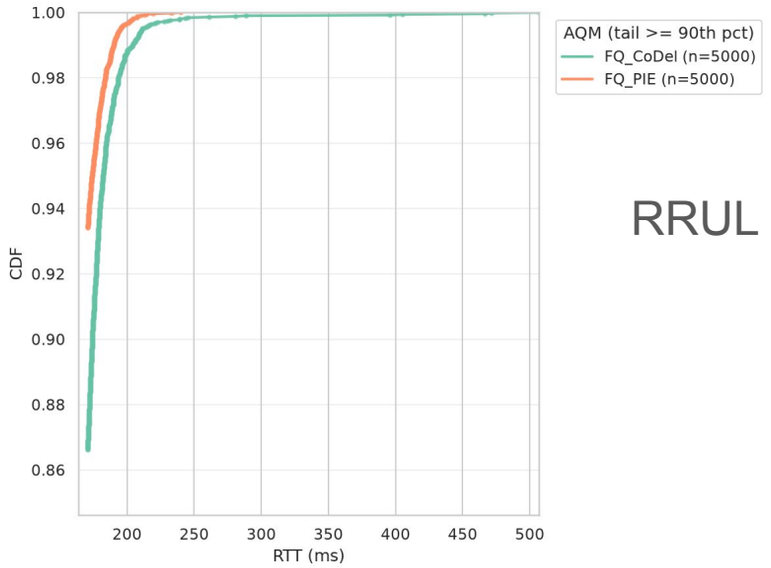
Thanks to:
Madhan Raj Kanagarathinam
Samsung R&D Institute, Bangalore, India

Join us at tsvwg (21 July 2026, 1100 CET): https://datatracker.ietf.org/meeting/126/materials/agenda-126-tsvwg

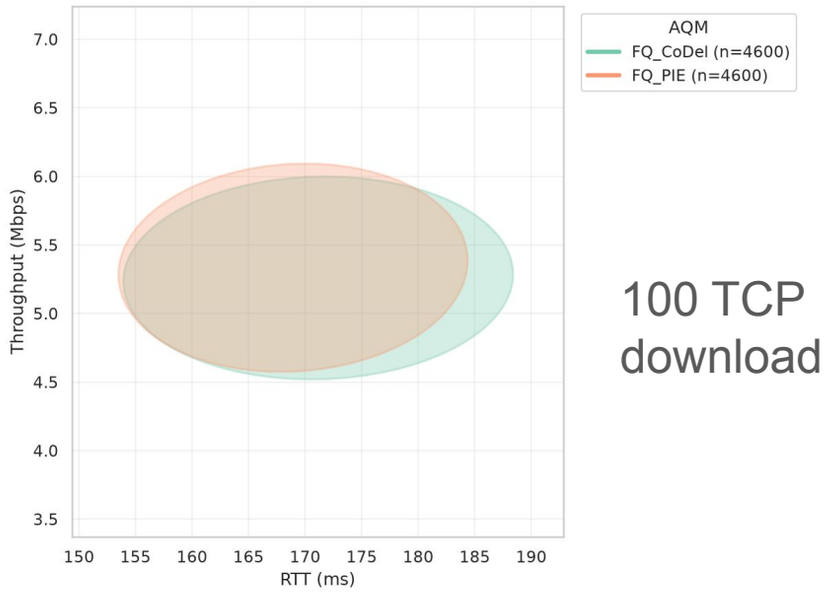
# FQ-CoDel vs FQ-PIE: Flent tests using a Mobile Hotspot

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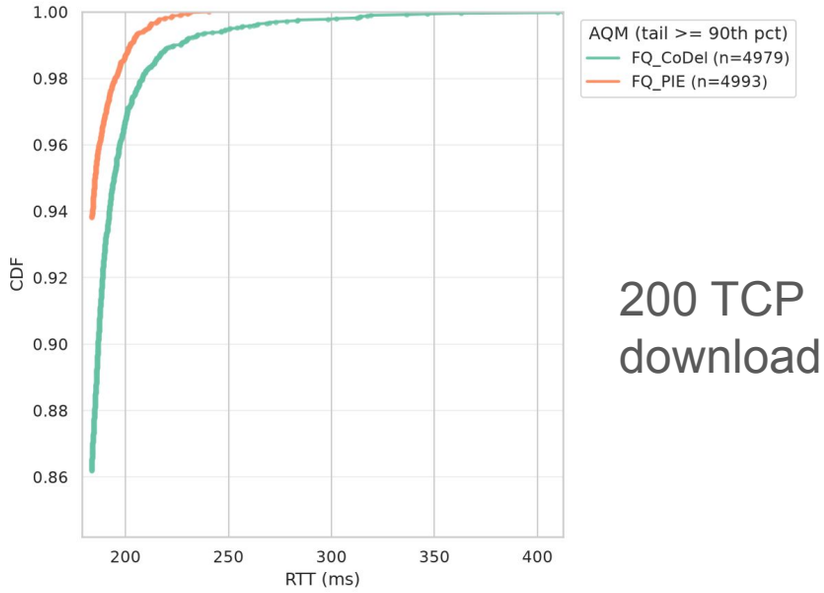



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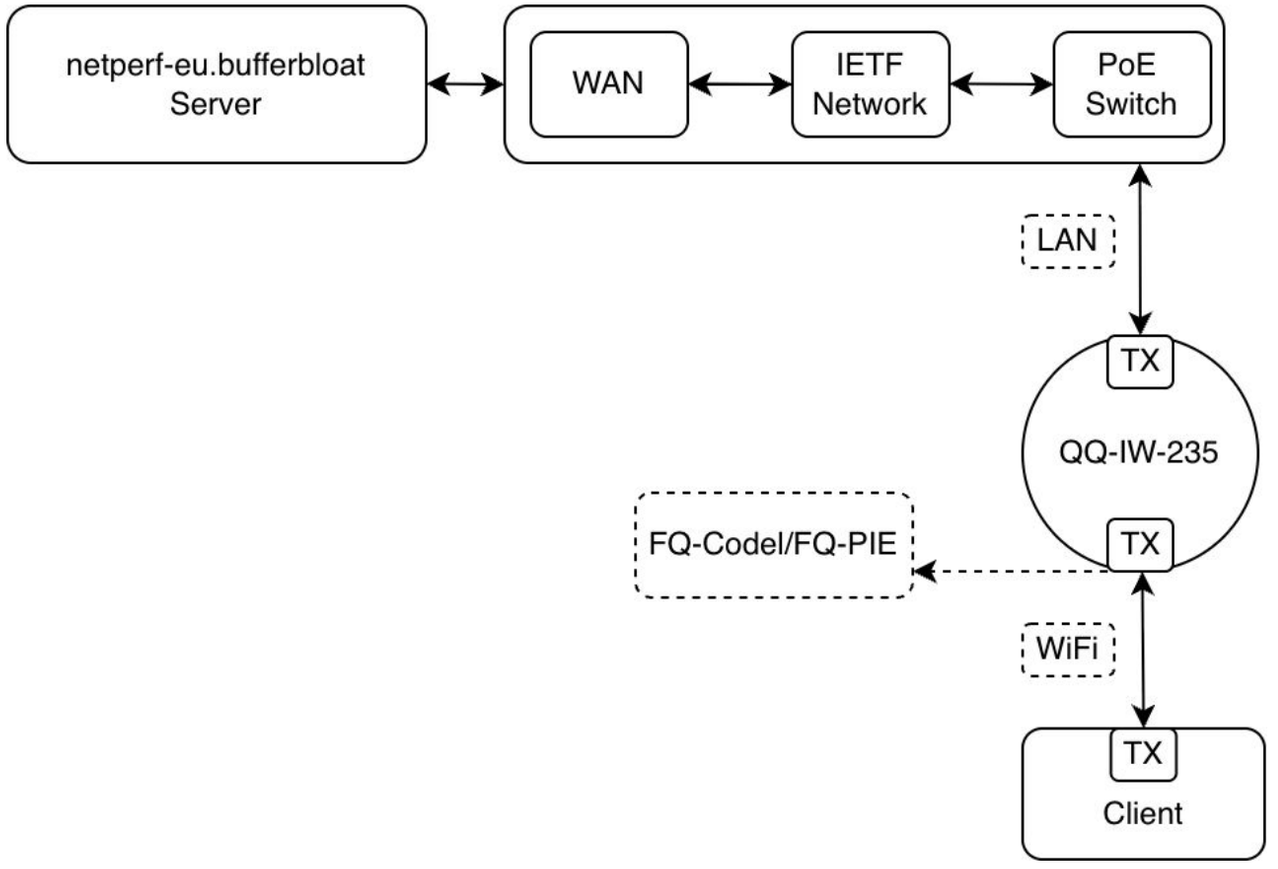


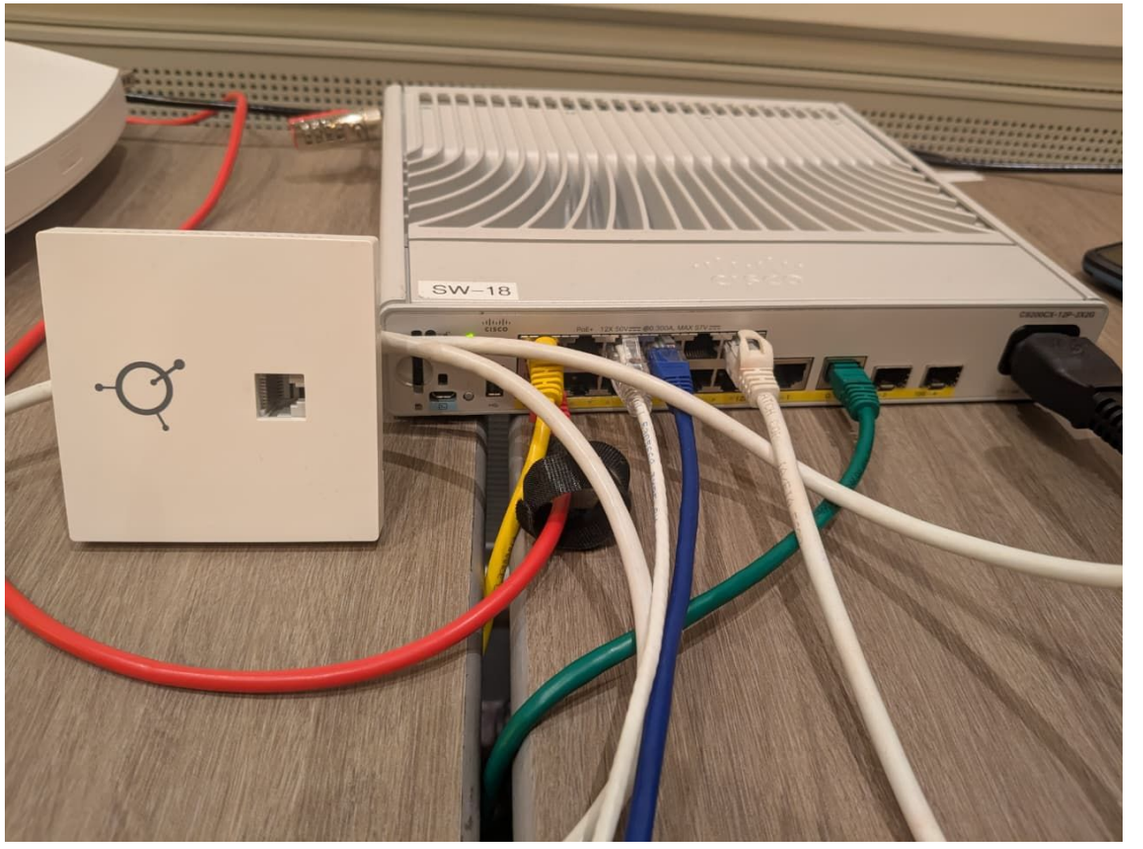

100 TCP download




200 TCP download

# FQ-CoDel vs FQ-PIE: Flent tests using QQ-IW-235

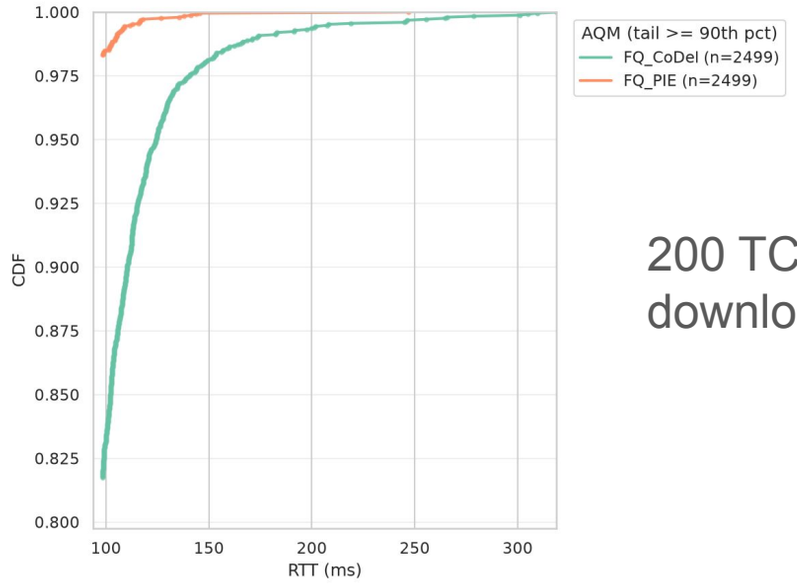


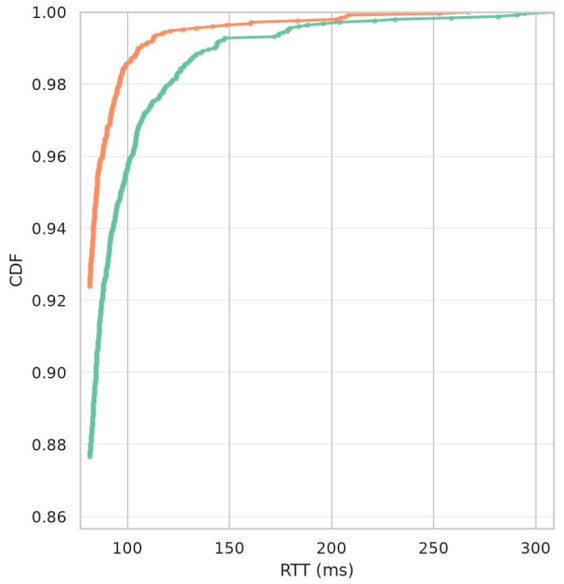

Thanks to:
Quantum Networks
(Zen Exim Pvt. Ltd.)

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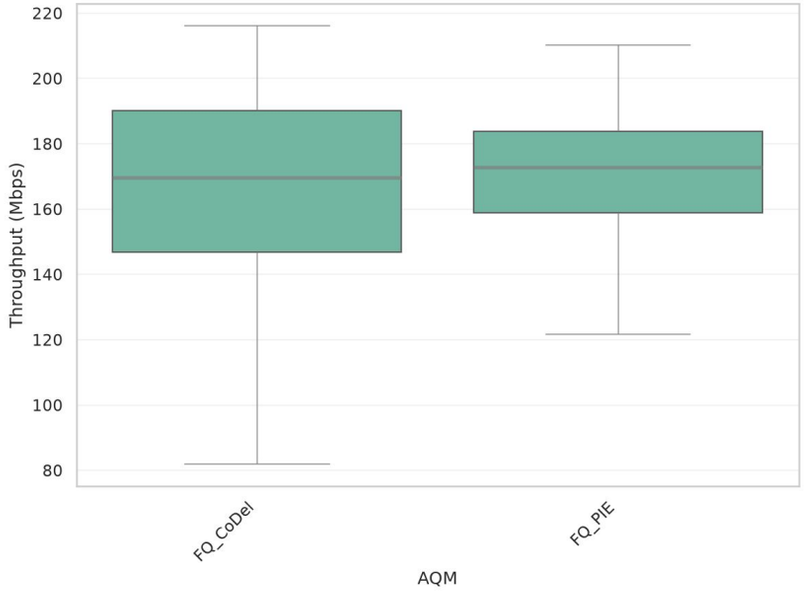
# FQ-CoDel vs FQ-PIE: Flent tests using QQ-IW-235



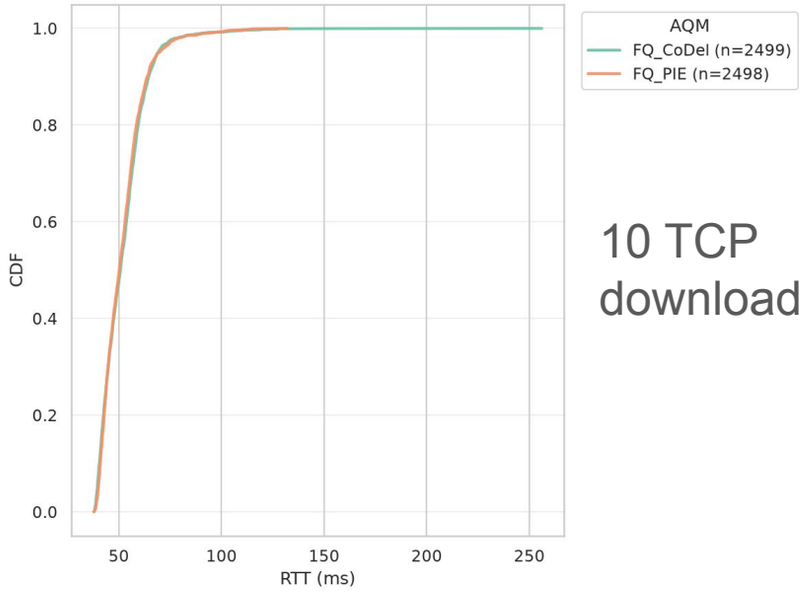

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# Testing the integration of picoquic with ns-3

- picoquic
  - C implementation of QUIC & MPQUIC
  - Follows RFC 9000, 9001 and 9002
  - Actively maintained
- ns-3
  - Discrete event network simulator
  - Allows control over the topology
  - Reproducible experiments

```
======= picoquic-ns3 competing flows results ========
  Topology      : 1000Mbps-20Mbps-1000Mbps, RTT 80ms
  Start delay   : 0 s

  Flow 1 (c4)
  Streams opened: 1
  Upload bytes  : 10000000
  Server rx     : 10000000
  Transfer time : 6.55424 s
  Upload Mbps   : 12.2058 Mbps
  Server rx Mbps: 12.2058 Mbps

  Flow 2 (cubic)
  Streams opened: 1
  Upload bytes  : 10000000
  Server rx     : 10000000
  Transfer time : 9.46767 s
  Upload Mbps   : 8.44981 Mbps
  Server rx Mbps: 8.44981 Mbps
=====================================================
```

Scan this to access the code

Credits: Akshat Bharara, Samved Sajankila, Sanjay S. Bhat, Jeferson Provalto, Swaraj Singh

ns-3 NETWORK SIMULATOR

# Other things that got done prior to IETF 126!




- Patch to align the implementation of PRR with RFC 9937 in FreeBSD
  - First patch to FreeBSD (thanks, Richard Scheffenegger and Michael Tuexen!)
- New models for LEDBAT++ and rLEDBAT in ns-3
  - LEDBAT++: https://gitlab.com/nsnam/ns-3-dev/-/merge_requests/2752
  - rLEDBAT: https://gitlab.com/nsnam/ns-3-dev/-/merge_requests/2828
- New application in ns-3 to simulate Flent-like tests
  - Done as a part of GSoC 2026: https://www.nsnam.org/wiki/GSOC2026Flent
- New topology helpers for multiple bottleneck topologies in NeST
  - https://gitlab.com/nitk-nest/nest/-/tree/master/examples/topology-helpers

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# Thank you!