Motivation

• Low Latency, Low Loss, Scalable Throughput (L4S) architecture is being worked on by the IETF TSVWG

• Evaluation has been conducted to date using small physical testbeds

• Network simulation (ns-3) offers some complementary benefits, including accessibility and ability to introduce various wireless (Wi-Fi access, 4G/5G) network models

• Shared testbeds (CloudLab) offer remote access to physical or virtual machines that can run L4S kernel code
Hackathon Plan

• What problems were you working on?
  – ns-3 simulation models for L4S, and testbed configuration

• What drafts/RFC’s were involved?
  • draft-ietf-.tsvwg-aqm-dualq-coupled-11
  • draft-ietf-.tsvwg-l4s-arch-06.txt

• Specific problems to solve
  • TCP Prague RTT independence, L4S-aware FQ/CoDel, integration

• Create and experiment with integrated source tree; try to validate against Linux testbed results
What got done

• Key results
  • Integrated ns-3 Git branch with many L4S components; preparing for ns-3.32 release (Sept)
    • https://gitlab.com/tomhenderson/ns-3-dev/tree/hackathon/master
    • https://gitlab.com/tomhend/modules/l4s-evaluation/tree/hackathon/master
  • Scripts and documentation for creating an L4S testbed on CloudLab
  • Summary wiki page
  • No interop done at this hackathon (future interop possible)
  • No demos yet...
What we learned

• Lessons learned
  • Issues with existing drafts/RFCs: None found this week
  • New implementation guidance: None this week
  • New feedback to take to WG: New testing capabilities being developed
  • New work to take to WG: None
Wrap Up

Team members:
Tom Henderson (champion), Fraida Fund, Bhaskar Kataria, Deepak Kumaraswamy, Harsha Sharma, Ashutosh Srivastava

First timers @ IETF/Hackathon:
Fraida, Bhaskar, Deepak, Harsha, Ashutosh

ns-3: https://www.nsnam.org

NYU Wireless: https://wireless.engineering.nyu.edu