rLEDBAT experiments

Marcelo Bagnulo & Albert García-Martínez
IETF 115 - London
rLEDBAT

• Set of mechanisms that enable using LEDBAT++ at the receiver side for a TCP connection

• Use cases: LEDBAT(++) oblivious servers/CDNs/middleboxes/firewalls

• rLEDBAT implementation for Linux: https://github.com/net-research/rledbat module
Experiment setup

- **rLEDBAT enabled client** C1
- **Standard Linux client** C2
- **R1**: Bottleneck - Drop-tail
- **R2**: Configurable - RTT & Capacity
- **S1**: Windows Server – LEDBAT++
- **S2**: Linux – Cubic, BBR (v1 & v2)

Servers generating bulk transfer
Experiments

- Goal: Compare rLEDBAT and LEDBAT++ performance
- Impact on a Constant Bit Rate communication
- Performance when running solo
  - Different RTTS, capacities, buffer larger/smaller than target (60ms)
- Inter rLEDBAT fairness
  - Simultaneous flows, late comer
  - Different RTTs, capacities
- Competition against Cubic
  - Different RTTs, capacities, buffer larger/smaller than target (60ms)
- Competition against BBR
  - Different RTTs, capacities, buffers, BBRv1 and BBRv2
Conclusions

• In all experiments, rLEDBAT performance is close to LEDBAT++

• Including known LEDBAT++ pitfalls
  • Struggle to seize capacity when running solo for large RTTs
  • Fail to yield when competing with BBR for RTTs smaller than T.