Packet Loss Signaling for Encrypted Protocols

draft-ferrieuxhamchaoui-tsvwg-lossbits

Alexandre Ferrieux – Orange Labs
Isabelle Hamchaoui – Orange Labs
Igor Lubashev – Akamai

IETF 105

Networks can look like dumb pipes,
<u>only</u> if someone can find leaks and patch them quickly

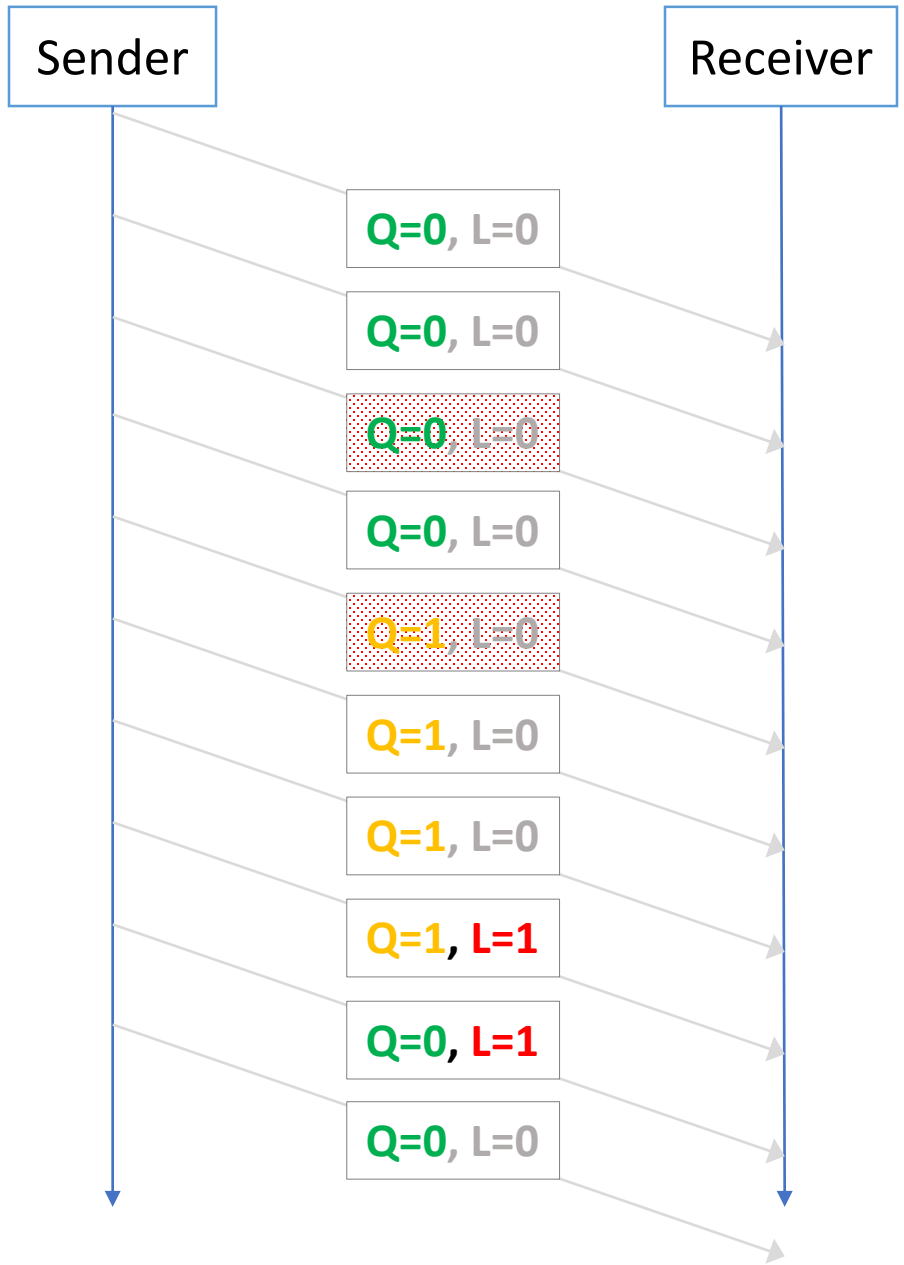
- TCP: observe seq#, ack#, sacks

- Transport with encrypted headers: ☹
  (QUIC has a “latency Spin bit”, so you may get an RTT estimate but *not* loss)

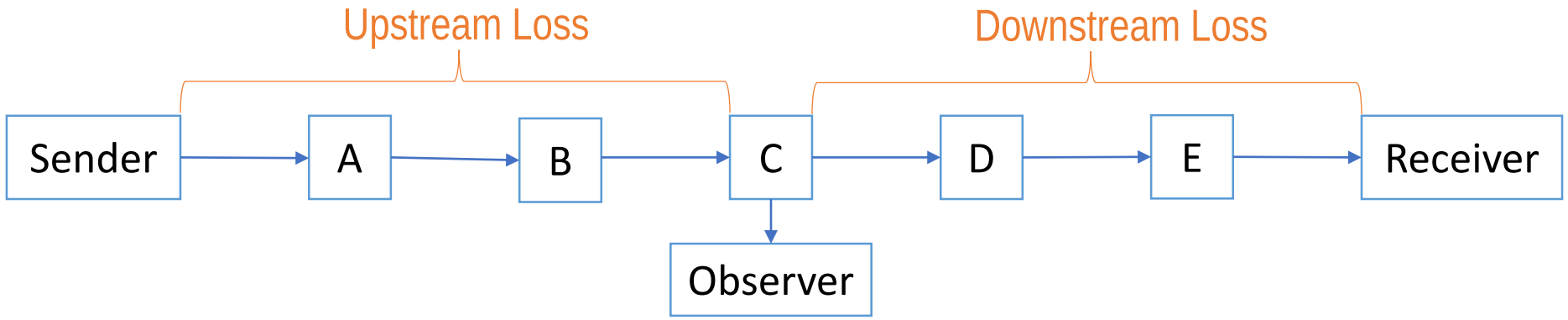
Proposal: Two “Loss bits”

- **Q**: The “sQuare signal” bit is toggled every N outgoing packets
  (akin to color in RFC 8321)

- **L**: The “Loss event” bit is 1 when *Unreported Loss counter* (ULC) > 0
  - ULC is *incremented* for each packet deemed lost by the protocol
  - ULC is *decremented* for each packet sent with L=1



Loss Calculation



- End-to-End loss (e)

$$e = \text{fraction of packets with L=1}$$

- Upstream loss (u)

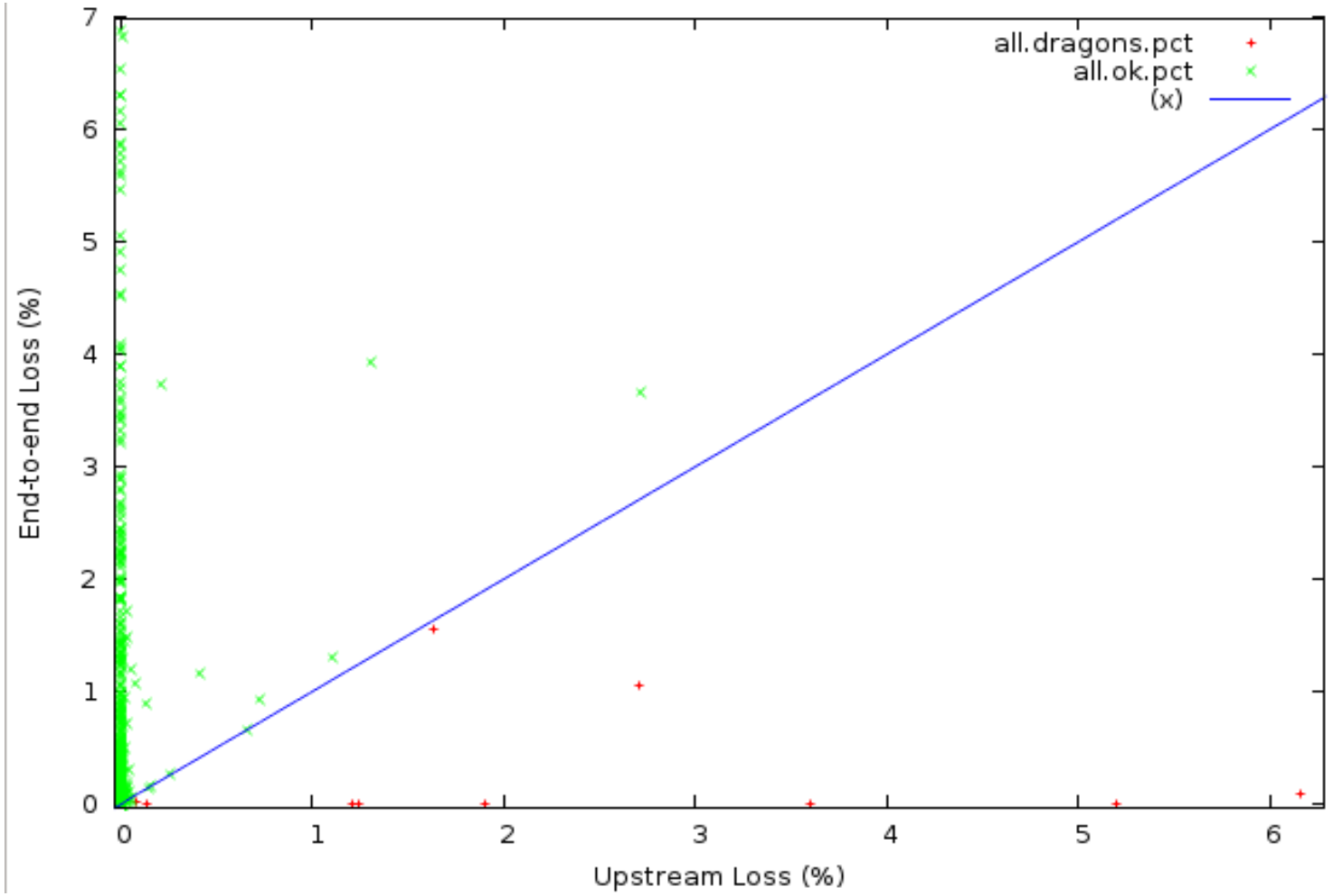
$$u = 1 - \frac{\text{average \# of observed packets in a block (same Q)}}{\text{size of the block}}$$

- Downstream loss (d)

$$(1-u)(1-d) = 1-e \qquad d = \frac{e-u}{1-u}$$

Experimental Data

Akamai serving QUIC to some Orange users in an African country



Interested?

- Side Meeting

  Monday 8:30am in *Sainte-Catherine*

- WG Discussion

  tsvwg (Thursday) – focus on the bits

  maprg (Friday) – focus on the measurements

- Contact Authors

  `draft-ferrieuxhamchaoui-tsvwg-lossbits`