A Sequence Number Extension for HTTP Datagrams

draft-ihlar-masque-datagram-numbers

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Updates since 116

- Expanded background section describing ATSSS and motivation.
- No changes to the wire format
Recap

● Extend HTTP Datagrams with sequence numbers.
  ● Expected to be used with 3GPP ATSSS
    – Defined as a datagram mode in TS 23.501
    – Preferrable that wire format is defined by IETF rather than by 3GPP CT1.

● Useful for multipath proxy scenarios where proxied payload is:
  – Duplicated over multiple paths.
    • Numbers help with deduplication
  – Transmitted in parallel over multiple paths.
    • Numbers help with minimizing out-of-order delivery
Some Early Measurements

- Thesis student working on multipath and scheduling in relation to proxies.
- Early measurement results focusing on the reordering issue.
- Simple RR scheduler.
- Simple reordering buffer in Masque proxy with static size.
  - $k_{\text{PacketThreshold}} = 3$
  - $k_{\text{TimeThreshold}} = \frac{9}{8}$ RTT
- e2e QUIC implementations with RFC 9002 default handling of loss detection and congestion control.
Emulation Setup

Docker Setup in VM

- Docker Container (Client)
- Docker Container (Proxy)
- Docker Container (Server)

Delay:
- 10 ms delay
- 30 ms delay
- 25 ms delay
CWND, BIF 2 Mbps

- 5 packets
- 12 packets
- Stream mode

- e2e BIF
- e2e CWND
- tunnel path1 BIF
- tunnel path1 CWND

Time [s] vs CWND, Bytes in Flight [KBytes]
Next Steps

- More measurements

- Working group adoption?