QUIC-FEC

20170720 - IETF 99
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QUIC WG Charter: FEC initially out of scope
QUIC FEC v1 Recap

Single XOR recovery packet

- Predetermined start point.
- Recovered on a packet level.
- Built into the transport as a core feature.

Issues

- Packet loss is highly correlated, so even when loss occurred, 70% of FEC packets recovered nothing.
- Integration into the core transport made it difficult to change FEC.
- Insufficient for real time applications (ie: WebRTC).

For HTTP traffic, sending the earliest outstanding packet beat sending XOR FEC packet.
QUIC loss distributions

Number of losses within an epoch (aka RTT)
QUIC FEC use cases

A better Tail Loss Probe

- Currently TLP retransmits the earliest outstanding after a timeout
- Useful for HTTP as well as other applications
- Difficult to know when quiescence is going to start
- Loss is correlated, so ideally generate more FEC packets as necessary

Realtime communications (ie: RTP for WebRTC)

- Recovery via retransmission may not be an option
- Devices may be computationally constrained (ie: phones and tablets)

QUIC tunnels (VPNs, etc)

- Buffering + Retransmission introduces issues with the embedded transport
- FEC based recovery may be sufficiently fast to avoid negative interactions