QUIC-FEC

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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
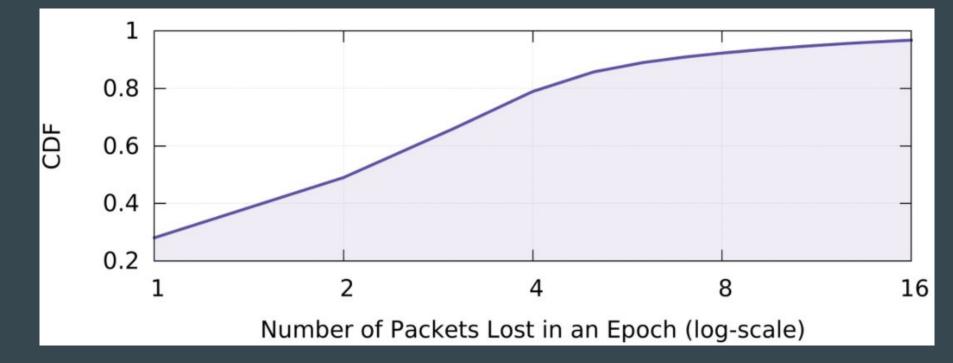- Built into the transport as a core feature

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)

Number of Packets Lost in an Epoch (log-scale)

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