Surfing the Web Quicker Than QUIC via a Shared Address Validation

Erik Sy
Introducing QUIC

- Application: HTTP/2
- Security: TLS
- Transport: TCP
- Network: IP

QUIC

HTTP/2

UDP
Introduction to the QUIC Transport Protocol

- QUIC is going to replace TLS over TCP in HTTP/3
- Improves problems of TLS over TCP
  - Protocol Entrenchment
  - Implementation Entrenchment
  - Handshake Delay
  - Head-of-line Blocking
  - Mobility
- Source-address token speed up the validation of the client’s IP address in subsequent connections between the same peers.
Domain Trees of popular Websites

- Alexa Top 1K Site requires on average 20.24 connections to different hosts
- These hostnames form on average 9.49 TLS trust groups

Shared Client IP Address Validation

- QUIC server having a TLS trust-relation accept source-address tokens generated by each other
  - each accepted source-address token allows client-server pair to save a round trip time during the connection establishment

- Novel QUIC transport parameter is used to inform the client about other hosts accepting a provided validation token
- Proposal saves a round-trip time on 58.75% of the established connections
Longest path of sequential connections with retry is reduced by 39.1%
Conclusion

- Proposal provides great performance improvements for QUIC’s connection establishment during web browsing

- IETF aims to include a shared address validation in a future QUIC version
Thank you

Questions and Answers

E-mail: SoftCOM@erik-sy.de
Slides: https://erik-sy.de/softcom