Chair of Network Architectures and Services
Department of Informatics
Technical University of Munich

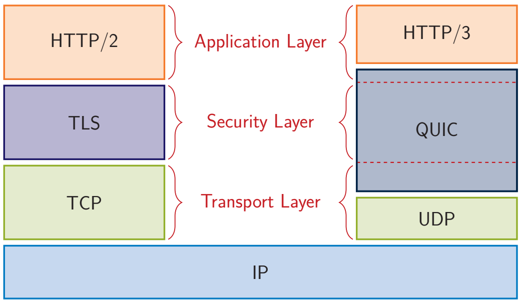
Thesis B.Sc.

Thesis M.Sc.

IDP

Evaluating Different QUIC Scan Approaches

Motivation



In May 2021 QUIC was finally specified by the IETF [1], a lot of implementations exist [2] and as shown by related work [3,4], deployment is on the rise. A major goal of QUIC is to combine a fast connection establishment, with reduced overhead and early encryption.
Therefore, it builds on UDP and directly incorporates TLS. UDP provides a lightweight transport protocol with widespread compatibility in network devices, while TLS, majorly version 1.3, provides state-of-the-art encryption and 0-RTT or 1-RTT handshakes.
This makes the analysis of configurations and real-world behavior based on passive traffic captures nearly impossible. Thus, a proper analysis requires active scans. This work focuses on the evaluation of different QUIC scan approaches, a setup of a local test environment including different server implementations and targeted Internet scans.

Your Task

- Setup a local test environment including different QUIC servers
- Design and evaluate different stateless and stateful QUIC scan setups/configurations
- Identify sources of errors
- Evaluate the impact on targeted Internet Scans

Requirements

- Basic programming knowledge in Python or Go
- Familiarity with GIYF-Based work approaches

Bibliography

[1] https://datatracker.ietf.org/doc/html/rfc9000
[2] https://github.com/quicwg/base-drafts/wiki/Implementations
[3] Rüth, Jan, et al. ”A First Look at QUIC in the Wild.” International Conference on Passive and Active Network Measurement. 2018.
[4] Zirngibl, Johannes, et al. ”It's over 9000: Analyzing early QUIC Deployments with the Standardization on the Horizon” IMC. 2021.

Contact

Johannes Zirngibl zirngibl@net.in.tum.de
Patrick Sattler sattler@net.in.tum.de

https://net.in.tum.de/members/zirngibl/