Design of a Benchmarking Framework for MASQUE-Proxies

Existing proxying technology comes with drawbacks. SOCKS is unencrypted and HTTP CONNECT is currently limited to proxying of TCP data. The MASQUE working group of IETF [1] plans to extend the current HTTP CONNECT with capabilities for proxying UDP and even IP-layer traffic. They focus on HTTP/3 which runs on top of the new transport protocol QUIC, which offers improved performance, embedded security and multiplexing. This technology has already attracted the attention of research [2], with its biggest current use case being Apple’s iCloud Private Relay [3]. With many more possible use cases [4], performance and challenges of different scenarios need to be measured and identified. The main goal of this thesis is to design a benchmarking framework running on top of our high-precision timestamping hardware which simulates different static scenarios for MASQUE proxies.

- Familiarize yourself with our hardware, the MASQUE documents and the existing implementations
- Find or identify different use case scenarios for MASQUE proxies
- Implement and set them up on our hardware
- Identify and measure different challenges and performance factors

[1] https://datatracker.ietf.org/wg/masque/about/

Familiarity with GNU/Linux and network protocols, basic research skills.

Lion Steger stegerl@net.in.tum.de
Marcel Kempf kempf@net.in.tum.de