

Thesis
B.Sc.

Thesis
M.Sc.

IDP,
Guided
Research

MASQUE- Proxying in User-Space

Topic

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], but is still relatively unknown and has especially seen only very few implementations. Its biggest use case is Apple's iCloud Private Relay [3], their code is however closed source. This encouraged us to start working on MASQUE implementations on our own.

In recent publications we identified limited performance of QUIC libraries on high-rate links [5]. Therefore, we are trying to improve QUICs performance by using the user space networking library DPDK [6].

We want to profit from those speedups by integrating a MASQUE proxy application into a QUIC-DPDK library and assess its performance.



References

- [1] <https://datatracker.ietf.org/wg/masque/about/>
- [2] <https://dl.acm.org/doi/10.1145/3488660.3493806>
- [3] https://www.apple.com/icloud/docs/iCloud_Private_Relay_Overview_Dec2021.pdf
- [4] <https://github.com/cloudflare/quiche>
- [5] <http://www.net.in.tum.de/fileadmin/bibtex/publications/papers/jaeger2023quic.pdf>
- [6] <https://dpdk.org/>

Requirements

- experience with systems programming in C, C++ and/or Rust
- familiarity with GNU/Linux and network protocols
- structured work style

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