**QUIC Congestion Control Identification and Analysis**

**Abstract:**

QUIC (Quick UDP Internet Connection) is a secure general-purpose, encrypted, multiplexed, and low-latency transport protocol designed from the ground up to improve transport performance for HTTPS traffic. QUIC has recently (May 2021) became RFC standard (RFC 9000) and is expected to become the dominant transport protocol in the Internet over TCP. QUIC has many features that were designed to overcome TCP’s drawbacks.

QUIC advantages over TCP (From Prof. Reuven Cohen’s lecture notes):

![QUIC main advantages over TCP](image)

- Built-in security
- Protocol can rapidly evolve
- Multiplexing many data streams over the same connection without head-of-line blocking
- Reduced connection establishment latency
- Improved loss recovery and congestion control
- Connection migration (e.g., move from Wifi to cellular)

**Future plans**
- Forward error correction
- MultiPath support
  - e.g. split the traffic between Wifi and cellular interfaces

Note: “HTTP over QUIC” is different from HTTP2

Further information can be found in the IETF workgroup page: [https://quicwg.org/](https://quicwg.org/)

**Purpose of the Project:**

In QUIC the sender may unilaterally choose several congestion control algorithms. The purpose of this project is to identify and analyze the congestion control mechanisms used by commercial software tools.
What will be done in this project?

1. Ramp-up QUIC monitoring tools (QVIZ, QLOG)
2. Ramp-up a QUIC lab client-server environment (This project is done in summer semester 2021 and expected to be completed before W2021 semester)
3. Monitor QUIC flows generated in the lab and identify their Congestion Control mechanism
4. Monitor QUIC flows used by several content suppliers, identify and analyze their congestion control mechanism.

Remark:

The exact measurements and analysis to perform will be defined along the progress of the project.

Prerequisites:

1. Introduction to computer networks (236334)
2. Internet Networking (236341)

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