

# Evaluation of AQM schemes to support Low Latency in the Internet

Master thesis

## Background

Many modern applications require low latency transmission in the Internet which is not explicitly supported today. Most networks are optimized for high throughput and low loss. This increases latency due to high queuing delays. Only very few applications actually need both high throughput and low latency, therefore the network could offer a new parallel Internet service that provides lower latency compared to the best effort service that is usually offered today. This can be achieved by separating flows into different queues at the bottleneck link that operate either independently or could be coupled as proposed by the DualQ Coupled AQM for Low Latency, Low Loss and Scalable Throughput (L4S) [1].

## Thesis Goals

The goal of this project is to evaluate different solutions for the realization of such a low latency service, including DualQ for L4S.

This leads to the following tasks:

1. Implementation and configuration of different AQM setups in the ns-3 network simulator [2].
2. Design of an experimental setup focusing on traffic conditions and cases that may have scalability or fairness issues.
3. Evaluation and representation of simulation results.

**Contact:** Mirja Kühlewind, [mirja.kuehlewind@tik.ee.ethz.ch](mailto:mirja.kuehlewind@tik.ee.ethz.ch) , ETZ H93  
Brian Trammell, [trammell@tik.ee.ethz.ch](mailto:trammell@tik.ee.ethz.ch), ETZ H93

**Professor:** Prof. Laurent Vanbever

## References:

1. K. De Schepper, B. Briscoe, O. Bondarenko, I. Tsang: DualQ Coupled AQM for Low Latency, Low Loss and Scalable Throughput. Internet-Draft, IETF (Oct 2016): <https://datatracker.ietf.org/doc/draft-briscoe-tsvwg-aqm-dualq-coupled/>
2. ns-3: <https://www.nsnam.org/>