Congestion Exposure in Mobility Scenarios

Faisal Ghias Mir, Dirk Kutscher, Marcus Brunner
{first.last}@neclab.eu

Congestion Exposure is about making congestion visible to the network, which can be used for policing, accounting, and which thus indirectly incentivizes sender adaptation – enabling better capacity sharing. Sender adaptation can be transport-protocol or even application-protocol specific, but in general the idea is to have the sender adapt to the observed path characteristics (current congestion).

When applying congestion exposure to mobile communications, path characteristics can change dynamically due to sender and receiver mobility, but also due to dynamically changing load caused by other mobile users. In this presentation we highlight issues of mobility on the feedback loop especially in network-controlled mobility scenarios. While introducing path changes, the fundamental issue for an operator is the traffic differentiation between compliant and non-compliant sending hosts. In contrast, while shifting between different congestion regions, the prime issue for an end point is controlling the declared congestion that should minimize the deficit close to the receiving host. Similarly, the end host transport should also take user preferences into account since the consumption of congestion quota on the new path will not necessarily be the same as the old one.

This presentation describes a framework for policing, auditing and sender adaption that provides a more robust and accurate congestion exposure feedback loop in mobility scenarios. We have implemented this framework and developed an OpenFlow-based testbed for evaluating it in different configurations.