

Measuring support for MPTCP and SCTP on the Internet

Master / semester thesis

Background

Multipath TCP (MPTCP) [1] is a TCP extension to utilize multiple available path to the same server. MPTCP is used e.g. in iOS for Siri, however, middleboxes in the networks made block unknown TCP options which makes MPTCP unusable in some part of the Internet. SCTP [2] is an alternative transport

protocol to TCP. SCTP is implemented in most operating systems kernels and recently used for WebRTC (<https://webrtc.org/>) implemented in most modern browser for real-time communication such as provided by google hangouts or talky.io. Again, there are middleboxes in the network that block unknown protocols other than TCP or UDP.

Thesis Goals

In this project a large-scale internet measurement study should be performed to assess path impairments of MPTCP and SCTP. The measurement will be based on the use of PATHspider, a path impairment measurement tool developed by ETH and the MAMI project (<https://pathspider.net/>). PATHspider is open source and its code is available on github: <https://github.com/mami-project/pathspider> In order to perform the requested measurements, PATHspider must be extended with plugins for these protocols.

This leads to the following tasks:

1. Extension of PATHspider with plugins for MPTCP and SCTP
2. Development and implementation of a strategie to find MPTCP/SCTP enable measurement target server, e.g. testing the Alexa 1 million list of top web servers or known servers from big content providers such as known IP address from google servers
3. Design and setup of the measurement study using vantage points from cloud provides
4. Evaluation of measurement results to assess MPTCP and SCTP support and detect connectivity problems

Contact: Brian Trammell, trammell@tik.ee.ethz.ch, ETZ G93
Mirja Kühlewind, mirja.kuehlewind@tik.ee.ethz.ch , ETZ G93

Professor: Prof. Laurent Vanbever

References:

1. A. Ford et al: TCP Extensions for Multipath Operation with Multiple Addresses. RFC 6824, IETF (Jan 1013)
2. R. Stewart et al: Stream Control Transmission Protocol, RFC4960, IETF (Sep 2007)