Measuring Explicit Congestion Negotiation (ECN) support based on P2P networks

Master / semester thesis

Background

Explicit Congestion Notification (ECN) [1] is a TCP/IP extension that allows congestion signaling without packet loss and therefore can greatly increase the performance on the Internet. Even though ECN was standardized in 2001, and it is widely implemented in end systems, it is barely deployed. This is due to a history of problems with severely broken middleboxes shortly after standardization, which led to connectivity failure and guidance to leave ECN disabled. Recent measuremnet studies [2, 3] have show an increasing support of ECN on websevers of up to 50% which is the first step for ECN deployment on the Internet. Further on-going activities in research and standardization aim to make the usage of ECN more beneficial. Therefore it is import to assess the marginal risk of enabling ECN negotiation by default on client end-systems.
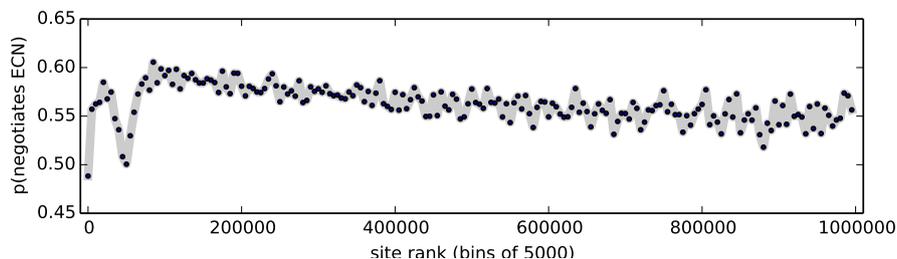

Figure 1: Proportion of websites negotiating ECN by Alexa top 1 mio rank

Thesis Goals

This measurement study aims to further assess the deployment status of ECN support utilizing Peer-to-Peer (P2P) networks. Based on popular content a set of IP addresses should be identified and probed for ECN support. The measurement methodoloy will be based on the same approach as used in [3]. Therefore a measurement tool called ECN-Spider is available that must be adapted to the P2P enviroment.

This leads to the following tasks:

1. Creation of a target IP address list based on popular P2P content

2. Adaptation of ECN-Spider to utilize an exsiting P2P client or perfrom TCP connection tests

3. Evaluation of measurement results to assess ECN support and detect connectivity problems

4. Interactive reprensentaion of the results on http://ecn.ethz.ch

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

Professor: Prof. Dr. Bernhard Plattner

References:

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2. Kühlewind, M., Neuner, S., Trammell, B.: On the State of ECN and TCP Options in the Internet. In: Proc. Passive and Active Measurement 2013, Hong Kong (March 2013)
3. http://ecn.ethz.ch, November 2014