

Investigating the Precision of Packet Shaping and Pacing in Linux

Motivation

Traffic shapers are used to improve the QoS in networks as well as enforcing SLAs. For example, prioritized traffic should always have some guaranteed bandwidth while background traffic can utilize the remaining part. Additionally, traffic shaping is also used in test environments to emulate certain network constraints like bandwidth and loss. Linux provides a set of several traffic shapers which can be configured using the `tc` tool [1].

Since there are different queuing disciplines, they differ in their functionality but also in precision. The goal of this thesis is to quantify the precision of different queuing disciplines which are available in Linux. As starting point, we want to reproduce some of the results from related work [2, 3].

[1] "tc(8) — Linux manual page." <https://man7.org/linux/man-pages/man8/tc.8.html>. Accessed: 2020-10-02.

[2] T. N. Minhas, M. Fiedler, J. Shaikh, and P. Arlos, "Evaluation of throughput performance of traffic shapers," in *2011 7th International Wireless Communications and Mobile Computing Conference*, pp. 1596–1600, IEEE, 2011.

[3] R. Lübke, P. Büschel, D. Schuster, and A. Schill, "Measuring accuracy and performance of network emulators," in *2014 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom)*, pp. 63–65, IEEE, 2014.

Requirements

- Experience in working with Linux remotely via ssh
- Basic knowledge about Linux traffic control, shaping, and pacing

Your Task

- Understand how Linux traffic control and queuing disciplines work in general
- Identify different queuing disciplines in Linux for further investigation
- Setup measurement environment for passive measurements
- Assess performance of schedulers regarding for example precision, throughput, number of flows, . . .

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