

Thesis
B.Sc.

IDP,
Guided
Research

Implementation of Network Traffic Models

Motivation

In order to evaluate new concepts and prototypes of network systems, often synthetically generated traffic is used. For some use cases minimum-sized packets at line-rate are sufficient. However real-world traffic has different properties and several theoretical models are existing that aim to describe network traffic e.g. as stochastic processes.

Those models can be used with a set of parameters to generate traffic with known properties. This traffic could be either generated offline and stored as a packet dump for replay to a device under test or a scriptable traffic generator such as MoonGen could be used to generate those data and provide them live to a device under test.

Your Profile

- General interest in computer networks
- Some programming experience
- **Plus:** Experience with Python, Lua, C(++), and Linux

Your Tasks

- Literature survey on network traffic generation models
- For a subset of those models identify parameters to e.g. describe periodic packet bursts, request/response patterns, packet loss or jitter.
- Define a text-based data format for those (e.g. JSON, YAML or XML based)
- Optional: Conduct an overview of available packet generators and their capabilities.
- Implement some of those models offline (generate PCAP files).
- Optional: Develop a library for MoonGen that make your models available for online packet generation.
- Optional: Compare your approach with other available packet generators.

Literature

- [1] Balakrishnan Chandrasekaran. Survey of Network Traffic Models.
- [2] P. Emmerich, S. Gallenmüller, D. Raumer, F. Wohlfart, and G. Carle. MoonGen: A Scriptable High-Speed Packet Generator. In *Internet Measurement Conference 2015 (IMC'15)*, Tokyo, Japan, Oct. 2015.

Contact

Kilian Holzinger	holzinger@net.in.tum.de
Florian Wiedner	wiedner@net.in.tum.de
Henning Stubbe	stubbe@net.in.tum.de
Sebastian Gallenmüller	gallenmu@net.in.tum.de

