

Thesis  
B.Sc.

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# Building a Simulation Framework for TCP Based on ns-3

## Motivation



*ns-3* is a network simulator [1] which is free and publicly available for research. Running measurements on real hardware requires expensive testbeds. Additionally, other researchers can hardly reproduce the results. Thus, emulation and simula-

tion became very popular in network research since they provide also flexibility and portability. Each of them has different advantages and disadvantages. For example, emulation can rely on software implemented in the system (e.g. the network stack in Linux) but might produce wrong results when the hosts computing capabilities are exceeded. On the other side, a simulator and time each single packet precisely. However, the simulator has to be programmed correctly, otherwise the results differ from real hardware.

[1] G. F. Riley and T. R. Henderson, "The ns-3 Network Simulator," in *Modeling and tools for network simulation*, pp. 15–34, Springer, 2010.

## Requirements

- Experience in working with Linux
- Python (and optionally C++) programming skills
- Optionally, experience working with ns-3

## Your Task

- Familiarize with setting up simulations with ns-3
- Survey different congestion control implementations for ns-3 (focusing on BBR)
- Implement the measurement framework in ns-3

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