

Thesis
B.Sc.

Thesis
M.Sc.

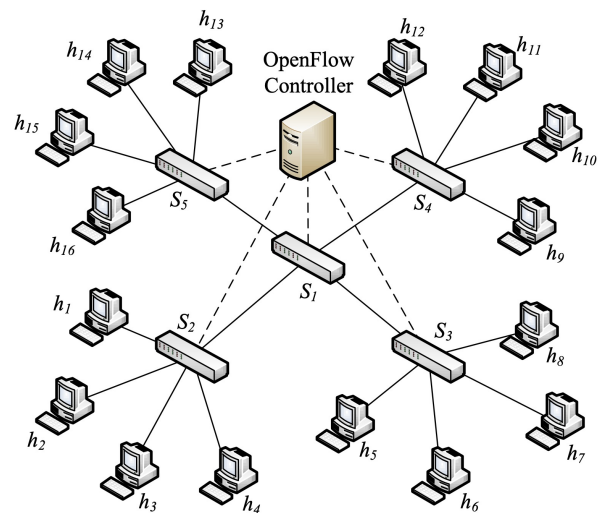
IDP,
Guided
Research

Mininet Performance Evaluation and Optimization

Motivation

Mininet [1] is a network emulation tool utilizing Linux network namespaces for emulation to run complex network topologies on one single host. Measurements run in hardware testbeds are often not reproducible without the same hardware and usually have a fixed topology. Network emulation allows researchers to build reproducible and flexible experiments involving several network nodes and different topologies.

Mininet was initially designed to benchmark SDNs and OpenFlow and is now widely used in publications to evaluate protocols, topologies and more. However, actual performance limitations resulting from Mininet itself are sparsely investigated [2] [3] [4].



- [1] <https://github.com/mininet/mininet>
- [2] Handigol, Nikhil, et al. "Mininet Performance Fidelity Benchmarks." Tech. Rep. (2012).
- [3] Isaia, Philippos, and Lin Guan. "Performance benchmarking of SDN experimental platforms." 2016 IEEE NetSoft conference and workshops (NetSoft). IEEE, 2016.
- [4] Muelas, David, Javier Ramos, and Jorge E. Lopez de Vergara. "Assessing the Limits of Mininet-Based Environments for Network Experimentation." IEEE Network 32.6 (2018): 168-176.

Requirements

- Experience in working with Linux and Mininet
- Python and Bash programming skills

Your Task

- Build tool chain to reproduce results from [3] and [4] on different hardware hosts
- Define metrics to detect Mininet overload situations (packet loss, latency)
- Detect performance bottlenecks (CPU, kernel, Open-Flow controller)
- Improve performance (disable ARP / IPv6, static Open-Flow rules)

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