Latency Evaluation of Software Switches

Using software switches is a method to overcome the problem of having specialized hardware for each type of packet processing in networks. Especially for emulated networks it is particularly important, as this enables to execute the switch and the virtual machines on the same host. Multiple such software switches are available such as VPP, Open vSwitch, VALE software switch, or others [3]. To analyze a complete network on one host, connections in hardware or hardware-assisted modes using SR-IOV can be used. This enables building larger networks using a small number of hosts still using the Network Interface Card to process the requests.

The target of this thesis is to analyse the performance characteristics, such as packet loss, latency, or throughput of different software switches, when multiple instances are executed on separated virtual machines on the same host with a specific focus on introduced latency. The network builds on SR-IOV using optimization parameter analyzed in [2]. An example of Open vSwitch analysis in a different scenario can be found in [1]. Moreover, suggesting the software switch for future usage in emulated, hardware-assisted networks improved for low-latency and reliable applications is a target of this thesis.

Motivation

General interest in computer networks
Experience with Linux and Bash programming

Your Profile

Conducting research on software switches
Measure latency characteristics of software switches on different topologies
Compare results and suggest particular software solutions for future usage

Your Tasks


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