Thesis B.Sc.

Thesis M.Sc.

Guided Research

An Analysis of Linux Firewall Performance

Motivation

Since Linux 3.13, Nftables is intended to replace protocol specific solutions that were responsible for Linux firewall functionality, namely Iptables to filter IPv4 connections, Ip6tables to filter IPv6 connections, Arptables to filter ARP connections and Ebtables to filter Ethernet bridging connections. With Nftables jumping back and forth in the list of modules is not required any more in order to process firewall rules which promises to be a more efficient approach.

This thesis is placed in the context of the SENDATE project. The goal of SENDATE is to provide the scientific, technical, and technological concepts and solutions for future networking. The activity of TUM in SENDATE includes performance studies of software components for networking. Therefore, we use the Baltikum Testbed which provides supportive infrastructure for measurements in controlled environments. The testbed supports experimenters with automated setups, experiment coordination, result collection and visualization.

Source: forum post on nickles.de 27.03.2015

Your task

Objective of this thesis is to benchmark firewall performance in the Baltikum Testbed at the case study of the Linux Firewall. Given the tools in the Baltikum Testbed, a benchmarking setup for firewalls shall be created. The setup shall comply with state-of-the-art as it is defined in published firewall studies or benchmarking recommendations like RFC 3511. Where established best practices is recognized as outdated e.g. due to the change from hardware devices to software-based network functionality running on x86-severs, recommendations and new tests may be proposed and implemented.

The thesis contains the following work packages:

- Familiarization with literature about Linux firewalls, the testbed, and benchmarking state-of-the-art
- Setting up the test environment, and its tests
- Measure the performance of Linux based Firewalls
- Write your thesis

Before this topic can be taken, further clarification and specification of tasks has to be made in order to fit personal capabilities and the type of thesis. In case you are interested do not hesitate and contact

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