TUM

Thesis M.Sc.

Description and Processing of Security Policies

Motivation

Modern concepts such as Software-Defined Networking (SDN), Network Functions Virtualization (NFV) and IT clouds will allow service providers offering novel and more flexible services to their customers. Technically this is largely realized using existing hypervisor based virtualization and Cloud Computing concepts. Flexibility allows the services to change more rapidly, which may also change the performance needs even during the service runtime. The arising management challenges are significant. This is especially true for security related requirements and in the context of multiple administrative domains.

However, techniques for automated security management of distributed, cloud-based services are lagging behind. Many of the security policy frameworks and languages developed in the past focus on specific security issues, e.g. Monitoring or firewall configuration. More comprehensive approaches, which can be adapted to the above mentioned security management needs, seem to be missing.

Your Task

You will participate in the development of an experimental security policy language (eSPL) which aims to support a formal approach for policy-based security management of cloud-spanning services. Building on previous work done by both Nokia Bell Labs and Fraunhofer AISEC, you will look at some interesting parts of that eSPL and extend it. Furthermore, you should examine if parts can be translated and processed with logic programming (e.g. using PROLOG) to solve partial problems, such as detecting certain types of contradictions.

Preknowledge

- Basic network background and programming experience (preferably C++)
- Some background in theoretical computer science, interest in looking at logic programming (e.g. PROLOG)

Organization

NOKIA Bell Labs

Fraunhofer AISEC

This Master Thesis is conducted in cooperation between Nokia Bell Labs, Fraunhofer AISEC and TUM as part of the SENDATE-PLANETS project. Nokia Bell Labs will lead the supervision, an accompanying internship contract with Nokia is possible and desirable. Preferably you will work at Nokia Bell Labs most of the time and have regular exchange with the advisors from Fraunhofer AISEC and TUM. Language for work documentation and Thesis is English.

Contact

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