Universität Stuttgart

INSTITUT FÜR
KOMMUNIKATIONSNETZE
UND RECHNERSYSTEME
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Master thesis No. 944

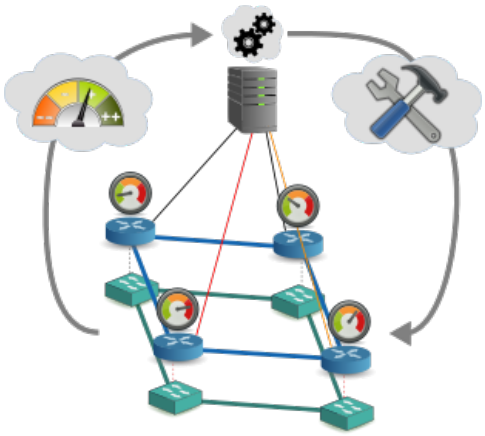
Event-Triggered Dynamic Multi-Layer Network Reconfiguration

Methods
Programming in Java
Performance Evaluation

Topics
Multi-layer networks
Optical networks

Background

Novel and higher-quality Internet services fuel an exponential growth of traffic in internet service providers' transport networks. This leads to a significant increase in resource demand with large variations over time thus requiring more efficient and dynamic operation of future networks. The Software-Defined Networking (SDN) paradigm enables an efficient and dynamic (re)configuration of multi-layer transport networks. A reconfiguration can, for example, be triggered by various events such as a timer, exceeding given indicator thresholds or combinations of these approaches. Reconfigurations have to be triggered sufficiently often to achieve an efficient operation, but not too often in order to maintain stability.



Task

A software tool has been developed at IKR which determines an efficient network configuration. This tool shall be extended by an event-driven control mechanism. In this project you will design, implement and evaluate approaches for an event-driven control of the reconfiguration process. The approaches and algorithms will be integrated into the existing simulation tool and compared regarding their performance. This project involves the following tasks:

- Identification of relevant indicators
- Design of appropriate approaches and algorithms
- Implementation of approaches as modules within the framework
- Simulative evaluation of both parameterization and performance

Acquired Knowledge and Skills

You will learn to identify a solution approach for a specific problem in literature, to adapt and to implement it. Furthermore you learn how to evaluate a complex system through simulation. You will gain insight into multi-layer networks and heuristic algorithms. In addition, you will gain experience in using an extensive, modular, object-oriented software framework.

Requirements
Programming Experience in Java

Desirable knowledge
Kommunikationsnetze I

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