

Master thesis No. 985

Design and Implementation of a Distributed SDN Reconfiguration Application



Methods

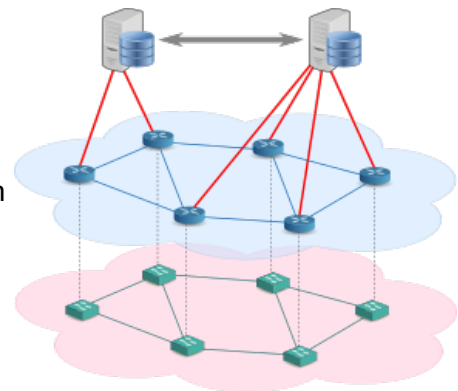
Prototype implementation
Programming in Java

Topics

Communication networks
Multi-layer networks
Network control

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 operation of communication networks because a central controller is aware of the complete network state. A current research topic at the IKR explores methods for the reconfiguration of multi-layer transport networks using the SDN paradigm.



Task

Transport networks must be failure tolerant and need to guarantee high availability. The SDN controller ONOS (<https://onosproject.org/>) provides mechanisms for distributed, high availability setups. In this task, you will design and implement a distributed application for the SDN controller ONOS. This application will allow the reconfiguration of the ONOS-controlled network using algorithms developed at the IKR. The task will comprise the following steps.

- Familiarization with SDN, ONOS and the IKR tool
- Design and implementation of the distributed ONOS application
- Evaluation of the developed application

Acquired Knowledge and Skills

You will acquire a detailed understanding of software-defined networking and its application. You will gain insight into multi-layer networks and network reconfiguration. In addition, you will gain experience in using an extensive, modular, object-oriented software framework in a distributed environment.

Requirements

Programming Experience in Java
Communication Networks II

Desirable knowledge

Kommunikationsnetze I

Contact

M.Sc. Tobias Enderle
room 1.402 (ETI II), phone 685-67992, E-Mail tobias.enderle@ikr.uni-stuttgart.de

M.Sc. Arthur Witt
room 1.403 (ETI II), phone 685-69015, E-Mail arthur.witt@ikr.uni-stuttgart.de