

Master thesis No. 985

## Design and Implementation of a Distributed SDN Reconfiguration Application



### Methods

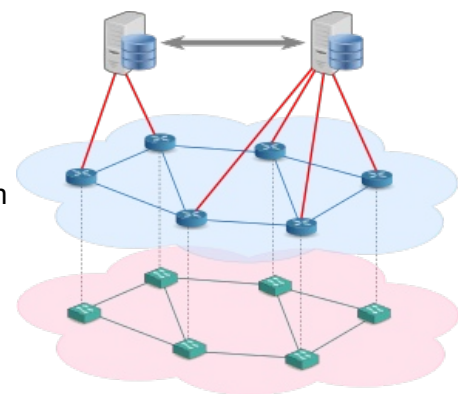
Prototype implementation  
Programming in Java

### 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

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