



Master thesis No. 1075

Decentralized Multi Domain Coordination for Availability-Aware IP-Optical Routing



Methods

Programming
Performance Evaluation

Topics

Intent-based networking
Multi-layer networks

Background

Network service providers are facing the challenge of managing increasingly complex multi-domain IP-optical networks. The traditional management of these separate IP and optical layers, often across multiple administrative domains with different policies, leads to significant inefficiencies and difficulty in ensuring resilient, high-quality services. The lack of a unified, automated approach to coordinate these disparate layers and domains has become a major obstacle, driving the need for more sophisticated solutions to handle the growing demands of modern networking.

Problem Statement

MINDFul.jl is an open source Framework for Intent-driven Multi-Domain Network coordination that aims to research coordination algorithms using intent directed-acyclic graphs. Within this work, you are asked to investigate and evaluate literature solutions and algorithms in the field.. More specifically, you will need to:

- get familiar with Intent-Based Networking (IBN) and Software-Defined Networking (SDN)
- conduct literature research regarding multi-domain IP-Optical coordination mechanisms and algorithms
- implement such solutions in MINDFul.jl
- evaluate the solutions with each other

Acquired Knowledge and Skills

With this work, you will get an insight into the current network trends of SDN and IBN. Moreover, you will gain experience with IP-Optical network operation and the scientific programming language Julia.

Contact

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