

Bachelor thesis No. 914

Selection, Implementation and Evaluation of Heuristics determining Light Paths in dynamic optical Networks



Methods

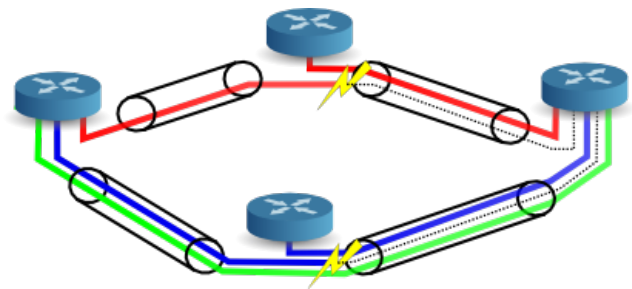
Performance Evaluation
Programming in Java

Topics

Multi-layer networks
Optical networks

Background

Novel and higher-quality Internet services fuel an exponential growth of traffic in transport networks. The energy consumption of such networks grows accordingly. A promising countermeasure to this effect is the dynamic reconfiguration of network resources in order to match the fluctuations in traffic load. To this purpose a mechanism is used which optimizes the topology of a transport network



depending on the available resources and the traffic load. This topology has to be established in the optical layer using lightpaths, i.e. optical connections between network nodes. This requires meeting resource constraints and continuity criterions. For example every wavelength i.e. color may exist only once per fiberlink to avoid creating a conflict (cf. figure).

Task

The IKR-developed tool which serves to analyze the effects of the dynamic operation of optical networks currently does not consider the establishment of the lightpaths. In this project you will identify, implement and analyze approaches to realize lightpaths suitable for dynamic optical bypassing.

This project involves the following tasks:

- Familiarization with the Routing and Wavelength Assignment (RWA) problem
- Identification and adaptation of a suitable heuristic
- Implementing said heuristic as part of an existing simulation tool
- Analysis of the performance of the implemented algorithm

Acquired Knowledge and Skills

You will learn to identify a solution approach for a specific problem in literature, to adapt and to implement it. 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

Contact

Dipl.-Inf. Uwe Bauknecht

room 1.403 (ETI II), phone 685-69012, E-Mail uwe.bauknecht@ikr.uni-stuttgart.de