



Bachelor thesis No. 1045

Designing and Implementing a GNPpy Wrapper for Increased Programmability



Methods

Programming in Python
Simulation

Topics

Optical networks

Background

One of the modern networking problems is being able to completely take advantage of the hardware devices and operate them as efficiently as possible. Unfortunately, this task is not easy since different scenarios require different device configurations. Given a particular topology, the network operators must thoroughly consider how they will set up their network.

Optical networks have significantly transformed over the last few years because of the tremendous traffic increase. This triggers many design questions and causes several requirements for optical devices like amplifiers, multiplexers, transponders, etc.

GNPpy is an open-source library developed in the frame of the Telecom Infra Project for planning and simulating optical meshed networks. With GNPpy, many aspects of low-level optical networking components can be simulated, like optical signal attenuation along a fiber with respect to the modulation format used in the signal transmission. GNPpy can automatically solve the dimensioning problem given a particular topology. However, GNPpy is somewhat difficult to work with. For this reason, a more user-friendly interface can be developed so that more people can interact more easily with the platform.

Problem Description

For this work, you are called to get familiar with the GNPpy library and leverage its capabilities for simulating optical layer signals and automatic configuration. You will investigate GNPpy's features and design a Python API (Application Programming Interface). On this behalf, you will build a Wrapper software around GNPpy, which you will evaluate in a core network topology. This thesis can be structured in the following steps:

- get familiar with optical network equipment and investigate the GNPpy python package
- develop a Python API and wrapper to create and simulate network topologies in GNPpy
- configure the network using your GNPpy wrapper

Acquired Knowledge and Skills

With this work, you will get a great insight into optical networks and learn to interpret important values for an optical device. Moreover, you will sharpen your skills in Python programming and use the well-established community-developed tool GNPpy. You will also learn how to build an API, which will work as an adapter wrapping the GNPpy package.

Requirements

Programming Experience

Desirable knowledge

Kommunikationsnetze I

Contact

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