Master's Thesis

Disaggregated optical access network planning ILP vs ML

The increase in bandwidth requirements triggered by new services and much more terminals force network providers to upgrade their networks constantly. Obviously, the upgrade takes cost into account, but it should also consider bandwidth, delay, reliability, and security.

This master thesis will aim at modeling, implementing, and evaluating different access network architectures with a network planning tool. For that purpose, different tasks will be considered:

- Define different network architectures based on the state of the art: combining PON and aggregation networks, considering dependabilities, etc.
- Learn and select the best data and planning tool: ArcGIS, Gabriel Graphs, etc.
- Implement planning solution: component placement, fiber/cable layout, etc. using ILP
- Implement planning solution: component placement, fiber/cable layout, etc. using ML
- Evaluate and compare the availability and cost of different architectures.

Example of previous work

Shahid, Arslan; Mas Machuca, Carmen: Dimensioning and Assessment of Protected Converged Optical Access Networks. IEEE Communications Magazine Vol. 55, No. 8, 2017

Prerequisites

Python, ML, and ILP formulation.

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