Open Optical Networks
Lab 7

November 25, 2020

These exercise sets cover some aspects you will find useful for the final exam software development. This exercises can be part of the material for the final exam questions. You are strongly encouraged to find yourself a solution to the presented problems.

Exercises

Two new json descriptions of the network are given:
"node_full.json" and "node_not_full.json"

1. They contains the information of the switching matrix defined for every node in the network. In the first one all the switching matrices are full, meaning that given a node, the spectral information (light-path) can travel from and to any line connected to the node (except going backwards on the same line). In the second one some of these possibilities are prevented defining not full switching matrices. Modify the **Network** constructor and the method **connect()** in order to properly retrieve the switching matrix information from the description json file.

2. Run the main that evaluates the distribution of the SNR on a list of 100 randomly chosen connections for both the network description json files and compare the two results.

3. In realistic scenarios, the switching matrix varies dynamically due to light-path deployments. In order to reproduce a rough abstraction of this behaviour, suppose that, whenever a wavelength cross a node, from a node "in" to a node "out", it blocks the same "in-out" propagation for the first adjacent wavelengths. E.g., assume that the light-path crosses the node "B" coming from "A" to node "C". If the light-path channel is "3", than after the propagation the channel "2" and "4" cannot cross the node "B" coming from "A" to node "C". Modify the **propagate()** method in the **Node** class in order to include this feature by means of a dynamic modification of the switching matrices (be sure that the initial switching

matrices are stored in the **Network** object and that they are restored after the streaming).

4. Run again the main that evaluates the distribution of the SNR on a list of 100 randomly chosen connections for both the network description json files and compare the two results with the previous ones.