

Design of Spectral- and Cost-Efficient High-Capacity Optical Transport Networks

Optical Networking

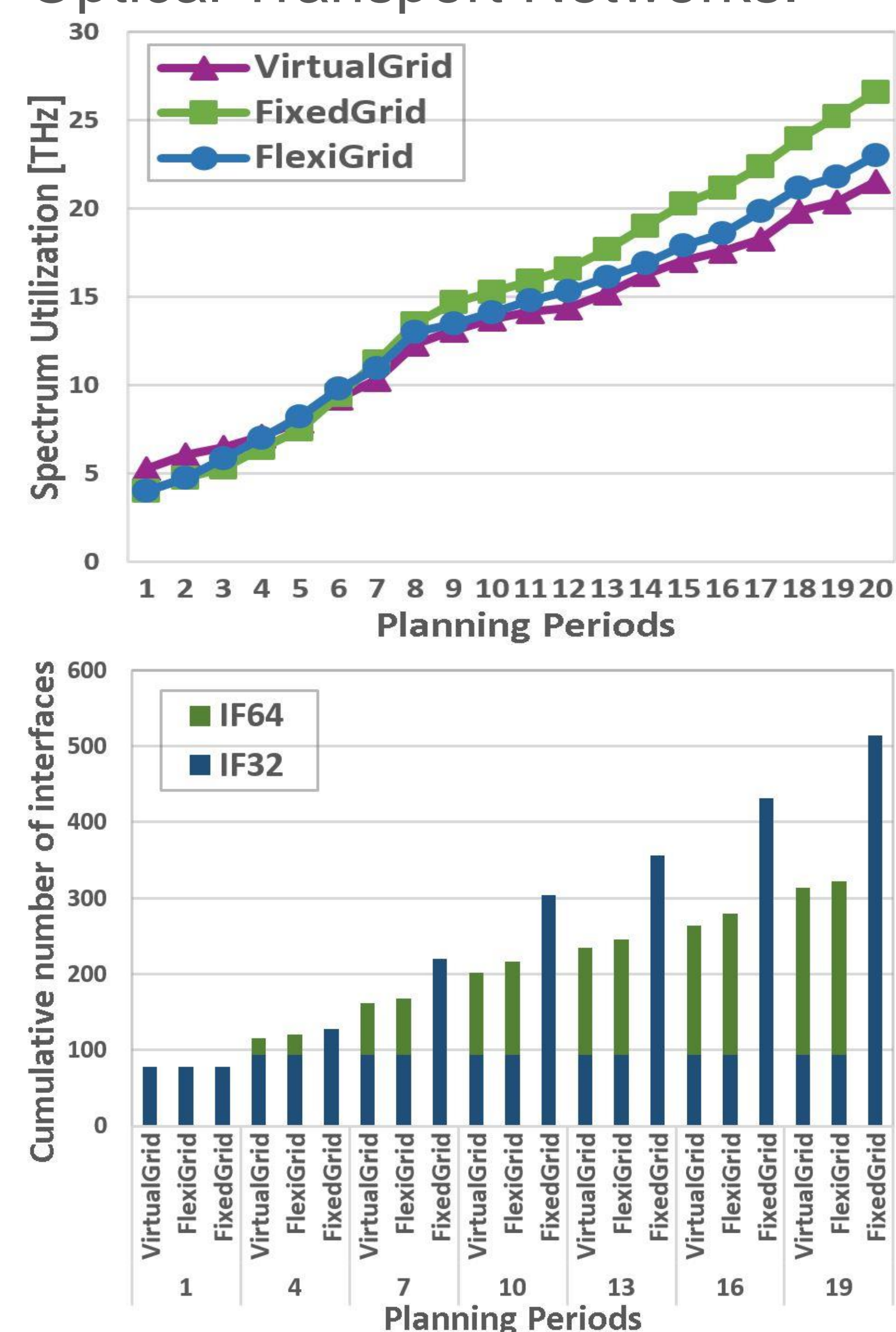
Background and challenges

- 2010-2015: Bachelor/Master in Electric and Computer Engineering. Instituto Superior Técnico
- 2015: **Master Thesis** supervised by **IT members** from Optical Communications group. The study allowed to publish **two different papers** at **21st European Conference on Networks and Optical Communications (NOC)** and **Optical Switching and Networking**.
- 2015-2017: Software Developer, Infinera Portugal.
- 2017-Present: **PhD Student, Instituto de Telecomunicações**.
PhD in Industry: IT SECTOR project fully funded by Infinera Portugal.



Description and main innovation

- PhD Thesis:** Design of Spectral- and Cost-Efficient High-Capacity Optical Transport Networks.
- Traffic growth** is a continuous concern for **network operators** due to the need to ever-more demanding applications, e.g. cloud computing. Consequently, a **capacity scaling** of the telecommunications networks will be required, which will be possible due to the support of **higher symbol-rates** and **higher order modulation formats**.
- Besides the advantages, this change will inevitably **raise planning and dimensioning challenges**, one of the major ones being the **support of flexible grid** that can affect the **network performance** due to **fragmentation limitations**.
- Hence, it was developed a **network design framework** to provision services **using higher symbol-rates** with the aim of **minimizing the capital expenditures** and the **spectral resource usage**. It includes a **strategy to manage the spectrum resources** from the beginning of network operation in order to **mitigate spectrum fragmentation**.



Achievements

Conferences:

- “Network Design Framework to Spectral- and Cost- Efficiently Exploit Next-Generation Line Interfaces”, Optical Fiber Communications Conference (OFC), **Paper: M1A.4**, San Diego, CA, 2018.
- “Spectral-Efficient Provisioning of Protected Services over DWDM Networks Exploiting High-Symbol Rate Line Interfaces”, European Conference on Optical Communication (ECOC) **Paper: We3D.5**, Rome, 2018.

Journals:

- “Network Design Framework to Optimally Provision Services Using Higher-Symbol Rate Line Interfaces”, **Journal of Optical Communications and Networking**, vol. 11(2).