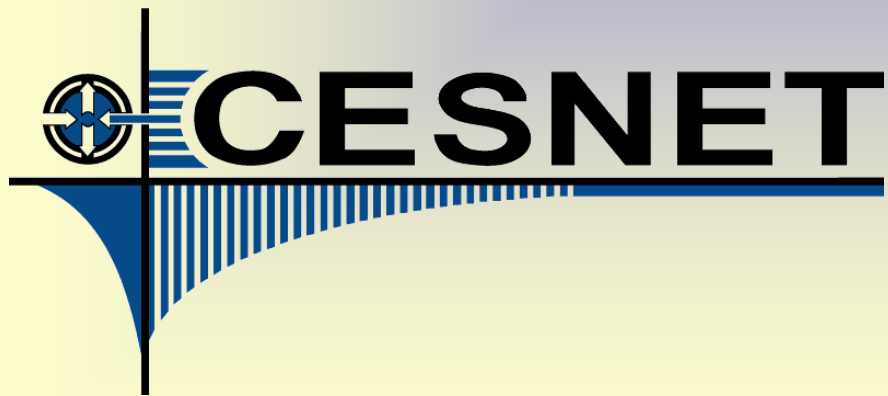


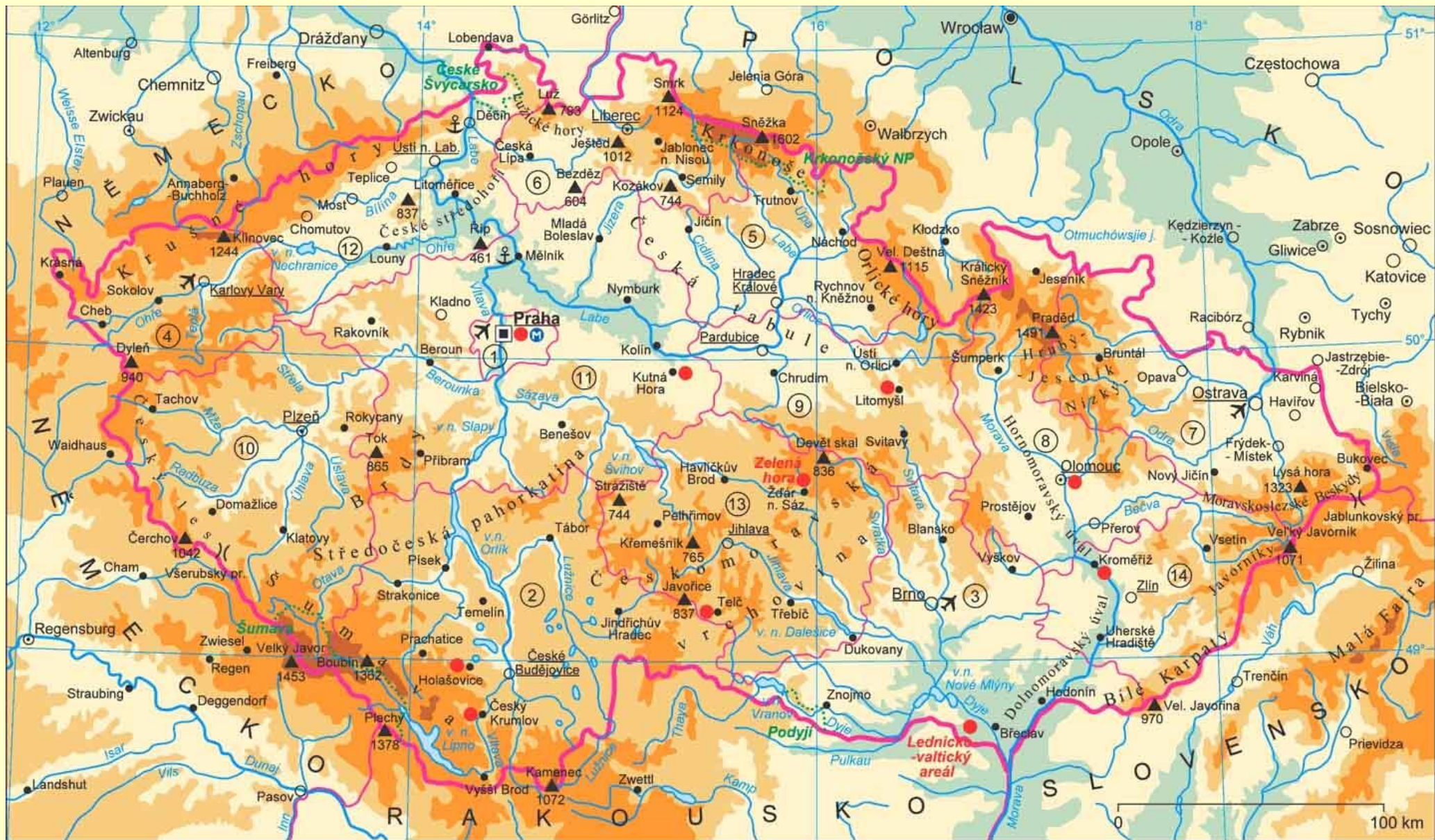
CEF Approach in CESNET Backbone Network



- CESNET
- CEF Approach
- CZECHLIGHT
- Future plans

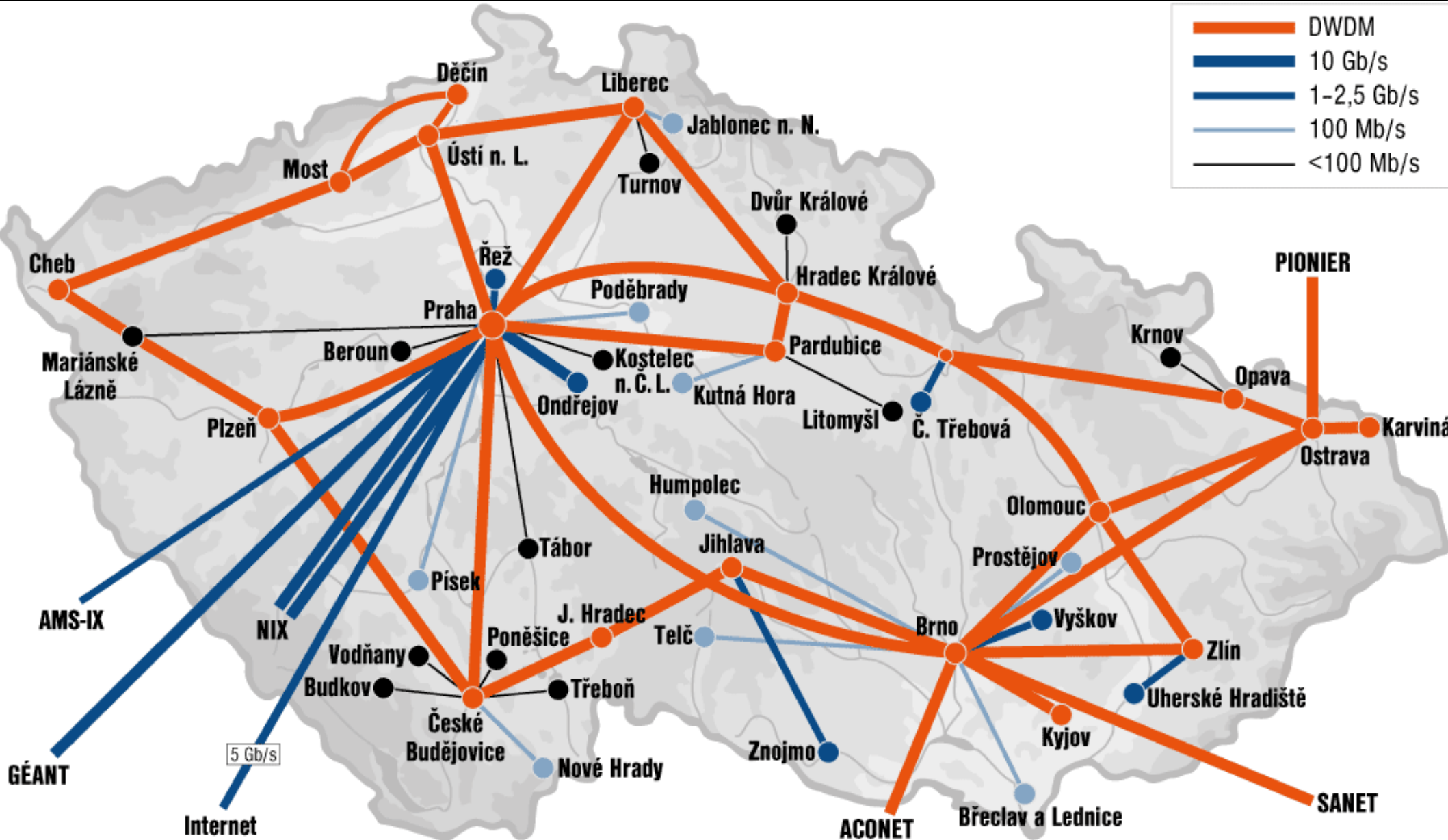
EURÓPA • FYZICKÁ MAPA





- The CESNET (Czech Educational and Scientific Network) association was formed by the Czech universities (27) and Academy of Sciences of the Czech Republic in 1996
- Non-profit organization, funded by Ministry of Education of the Czech Republic, association members and external sources (EU)
- First ISP in Czech republic
- Now pure academic network
- More details on www.ces.net

Network Topology



Customer Empowered Fiber (CEF) concept

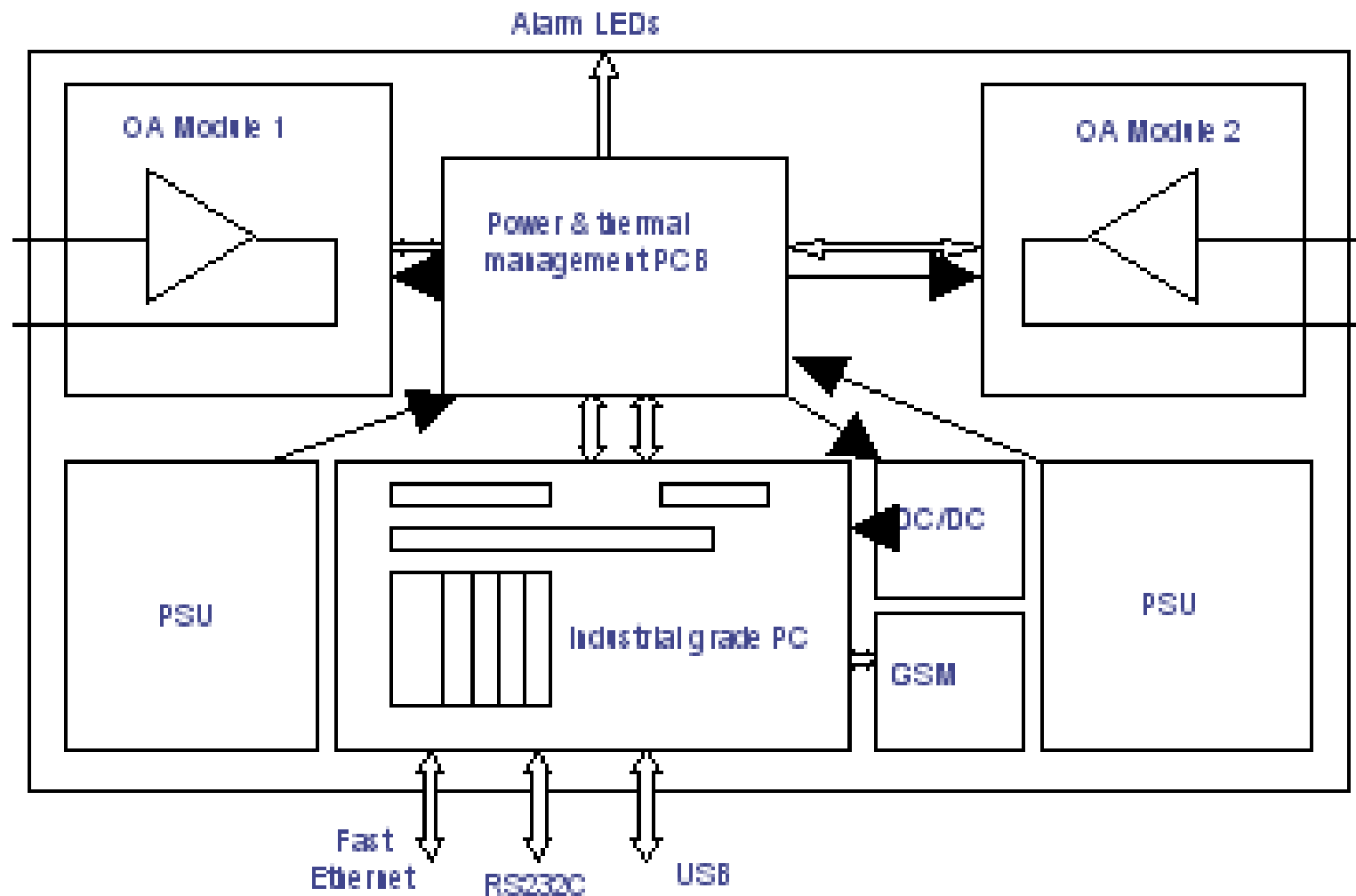
- Leased dark fibers equipped by own transmission technology
- The first lines enlightened in 2000 (PoS STM-16 and 1 GE lines)
- Standard SMF G.652 and NZDSF G.655 fiber types
- About 5,000 km of leased dark fiber lines

- Mostly the whole backbone on CEF
- Both single-channel and DWDM
- Cost effective solution on speed 10Gb and above
- CBF – Cross Border Fiber
- Commercial equipment and Cesnet developed devices

- CESNET fiber optics experimental facility
- Development of fiber optics equipment
- International cooperation and participation on joint research activities

- Based on similar components like commercially available devices
- Linux based management
- Widely deployed in CESNET production network
- Commercially available now
- The family of equipment still growing

CzechLight equipment



- Discrete EDFA optical amplifiers
- Raman amplifiers
- Variable Multiplexers
- Reconfigurable Optical Add/Drop Multiplexer
- Tunable CD Compensators
- Photonic Switches
- Photonic Switches with Multicast Option
- Optical Channel Monitor

- CEF seems to be viable methodology
- Started be utilized outside CESNET

The end



Thank for your attention!

Q & A ?