

WORK
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2020

NET
MAKERS

L'evoluzione della rete GÉANT

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GÉANT

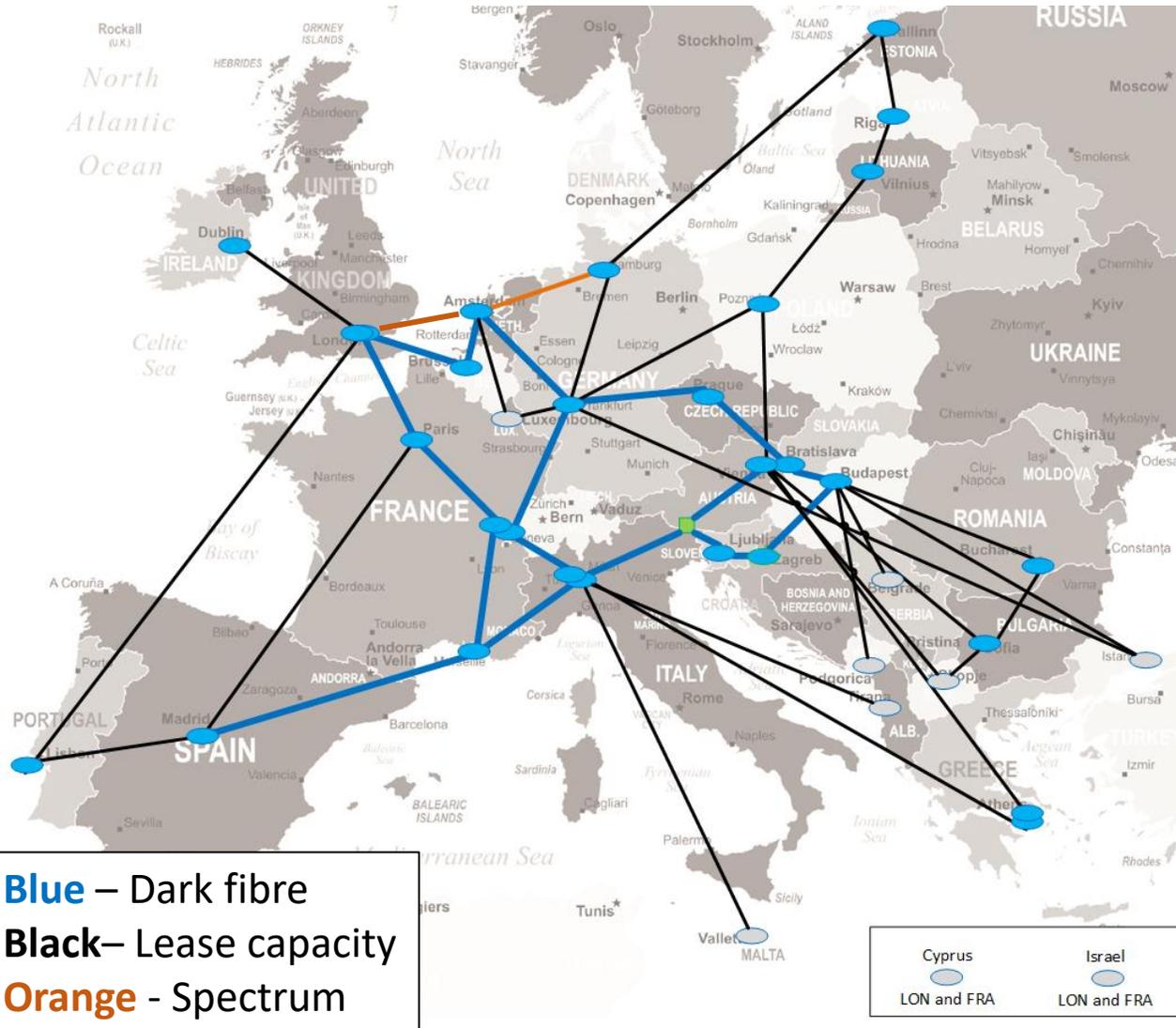


What is GEANT?

- A non for-profit organization
- Supports collaboration and development amongst researchers, the dissemination of information & knowledge, and provide access to a portfolio of services and infrastructure resources
- Among the main goals is the reduction of digital divide.
- Runs a pan-European network infrastructure - **The GEANT Network**



The GEANT network today



- Dark fibre in Central Europe
- Leased capacity for other regions
- Hub and Spoke
- International links backhauled to fibre PoPs
- Short procurement cycles
- Short term requirements
- Cost and performances impact

The opportunity for a change – IRU SGA

*Go beyond the state-of-the-art by restructuring the backbone network through exploration and **procurement of long-term IRUs and associated equipment to increase the footprint, stimulating the market in cross-border communications infrastructure whilst decreasing the digital divide and reducing costs.***

From EC objectives for the IRU SGA

The SGA is what drives the GN4-3N project.
Amount available in the SGA → **~50.5M EUR**

CAPEX only, but
100% EC funded

A vision for the new network

Bandwidth cost to be the same at every location

Bandwidth cost to be marginal

Infrastructure investment to cover as many countries as possible

Cost share reduction

Lowest latency between every pair of locations

Resiliency

Presence in strategic locations

Minimise infrastructure duplication within R&E community

How can we achieve it?

A combination of:

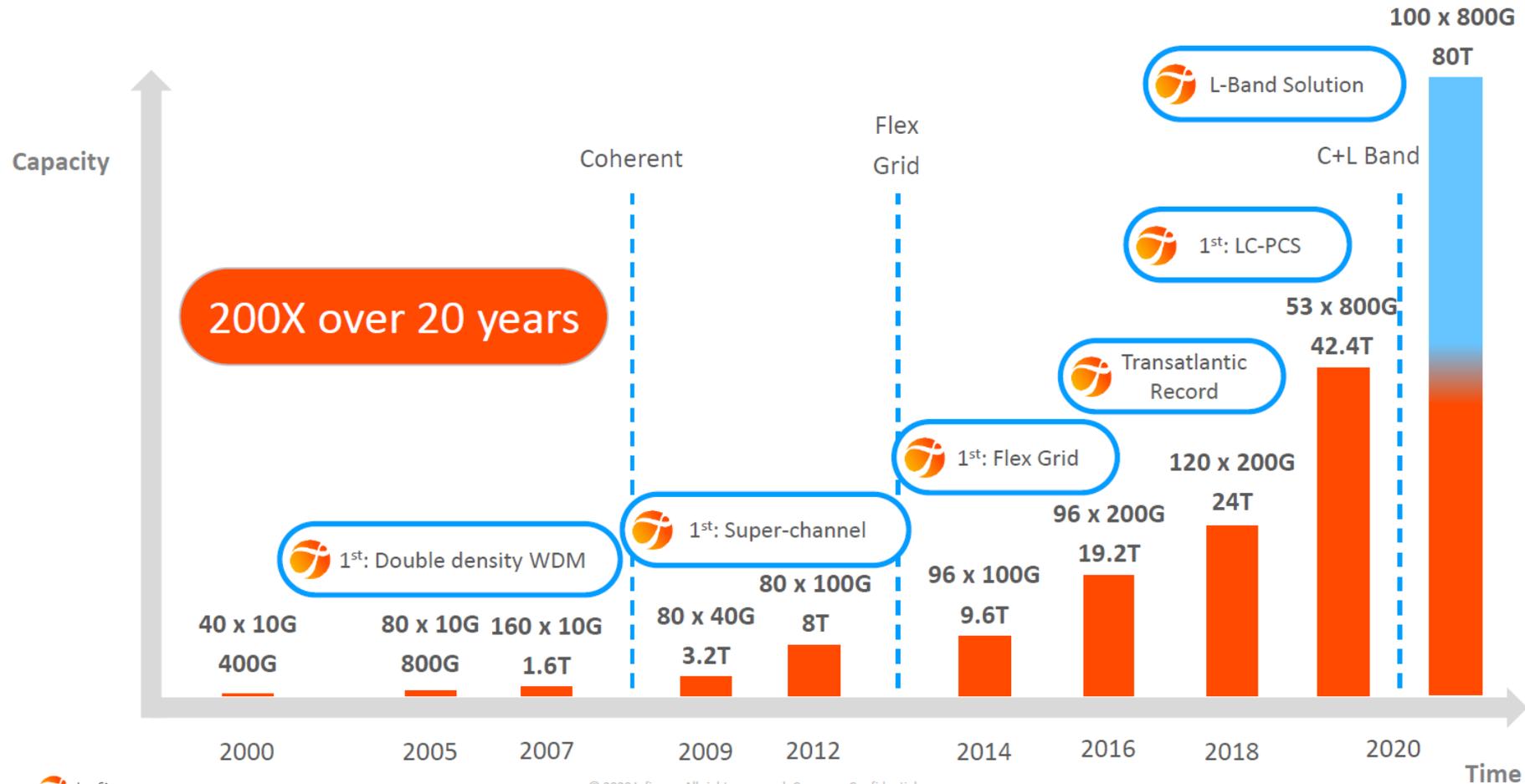
Dark Fibre

+

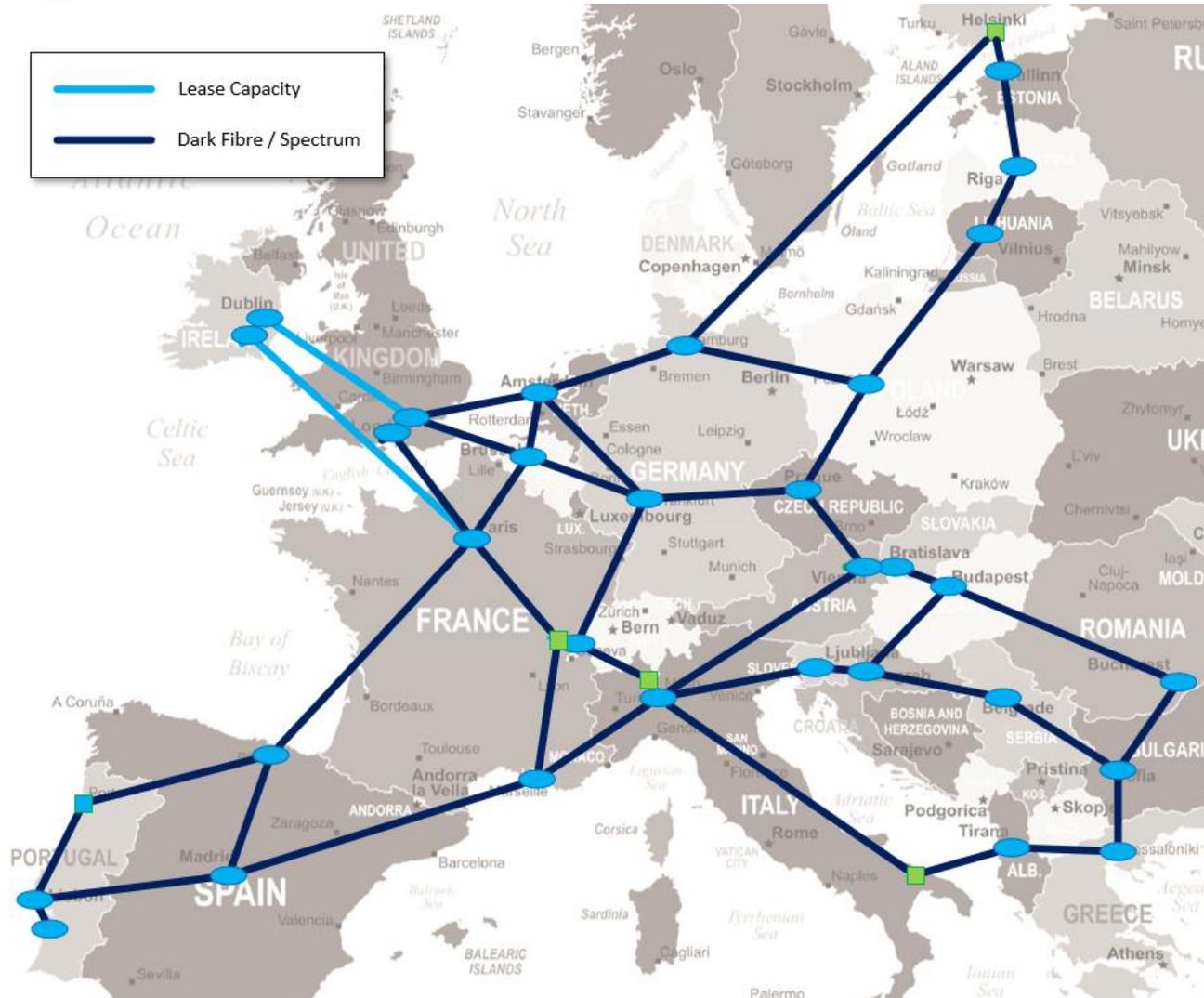
Open Line System (OLS)

Why Fibre? – a resource that keeps giving

Evolution of DWDM Capacity over Time



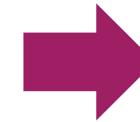
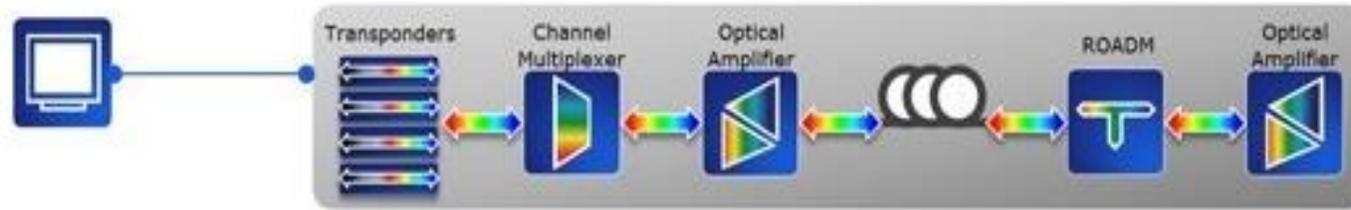
A fibre topology



- Built together with NRENs from ground up
- Based on long term Fibre/Spectrum IRUs (15 years)
- Increase of meshing
- Better regional connectivity
- Large increase of DF connected NRENs (14 ->25)
- PoPs in strategical locations

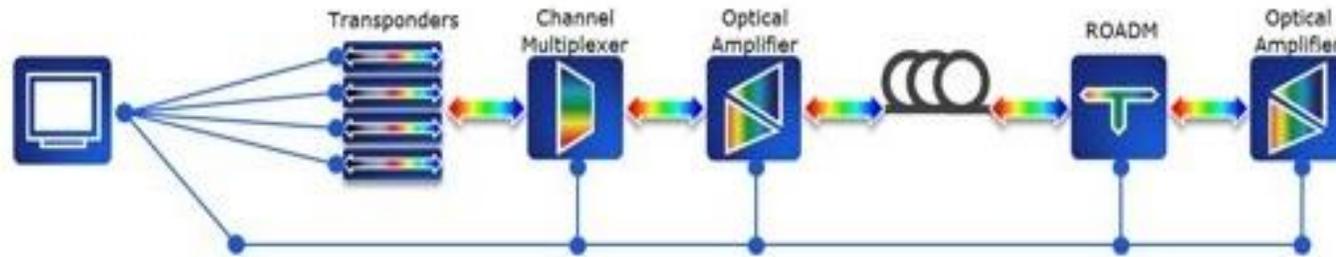
Line system choices

- No Disaggregation: Entire transport network acts as one element



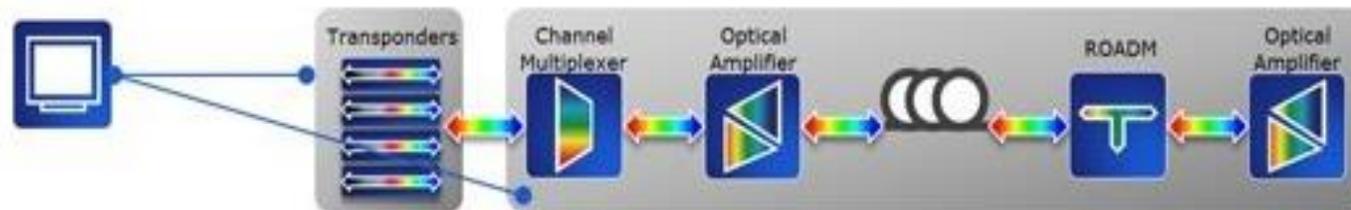
Current closed interop model

- Fully Disaggregated: Everything is a separate network element



Long-term vision. But open standards and management under development

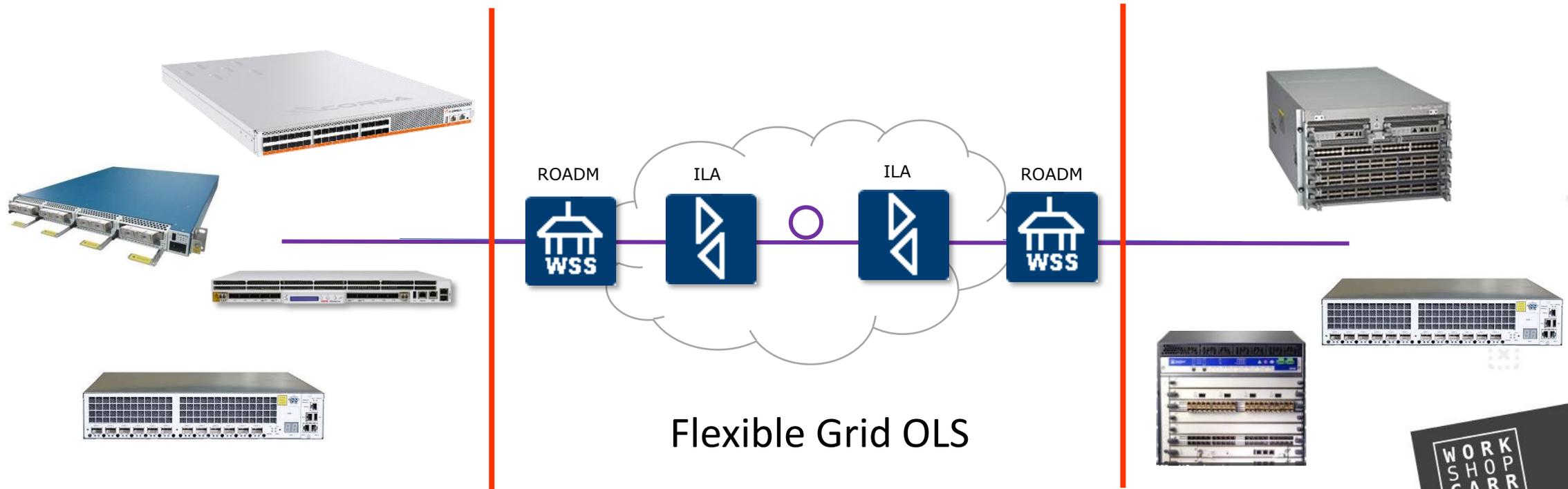
- Partially: Transponding is one element, OOLS is second.



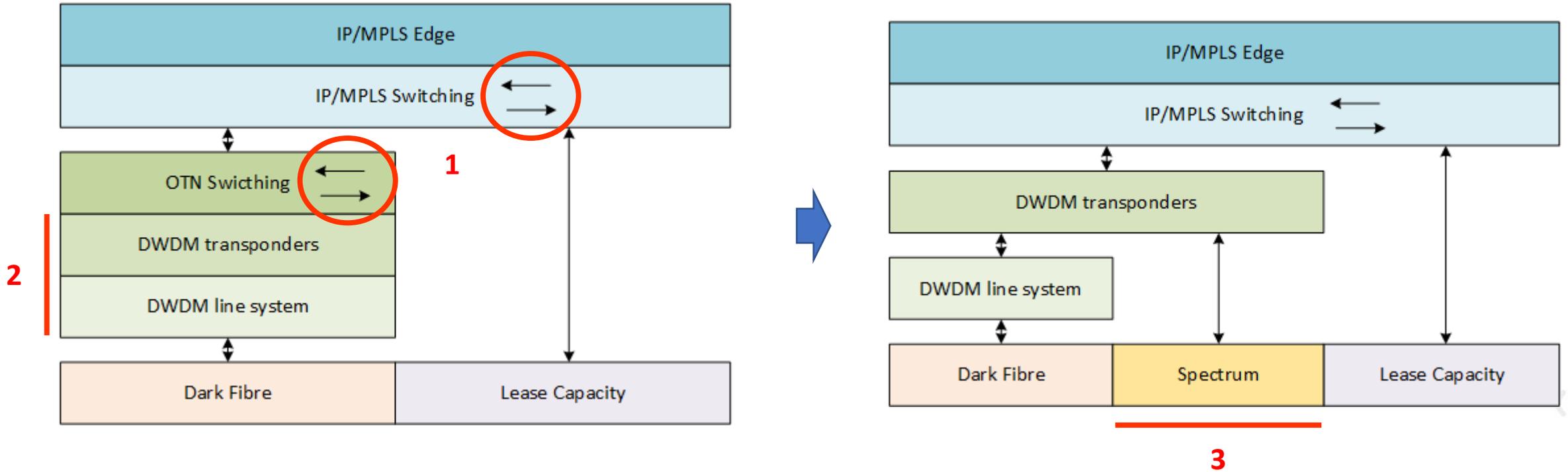
Medium term solution. Open access, single management plane for OLS

The Open line System

- Technology is moving faster in the packet and transponders than the amplifiers and WSS.
- Alien waves allow transponders from multiple vendors (and parties!) to operate on a single line system.
- Still benefit from a single vendor providing end-to-end optical management: Channel & span equalization, DCN connectivity (OSC), ALS, Alarm reporting ect.

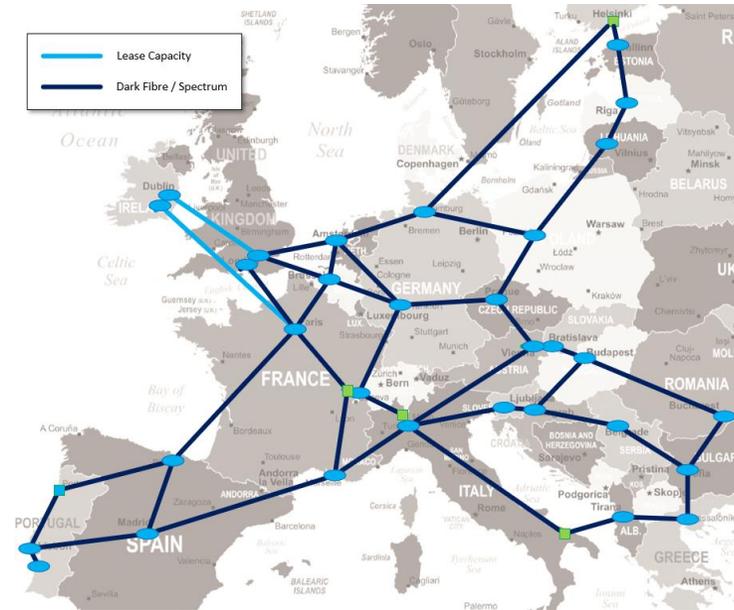
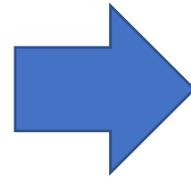
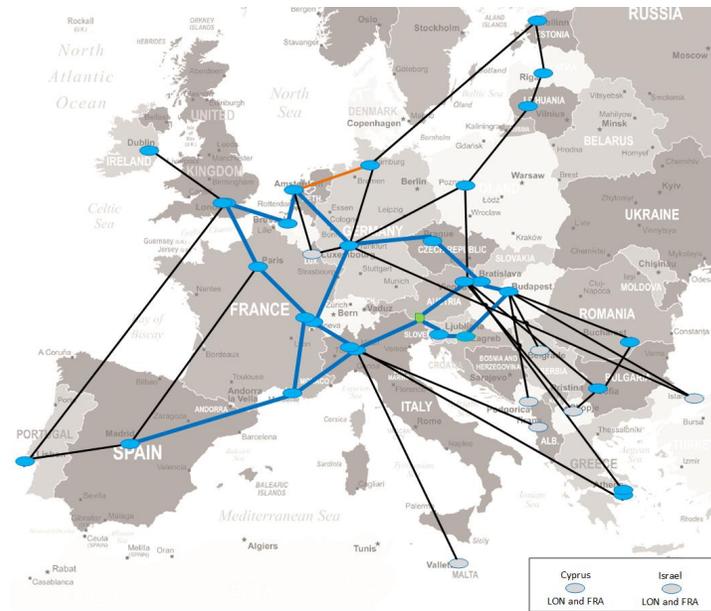


The new Stack



1. Electronic switching twice adds significantly to costs for a marginal gain
2. Transponders and line system in a single block reduces flexibility / creates vendor lock-in
3. Use of spectrum allows for scaling down from full DF with small sacrifice to flexibility

A proposition that works on all fronts



- Improved cost efficiency – running costs several x0% lower
- Stable and (lease capacity) market independent infrastructure
- Much increased footprint where equal cost per bit applies
- “Virtually unlimited” capacity thanks to modern DWDM system on fibre
- Fully owned infrastructure to a number of strategic locations
- Improved response time for all NRENs to any destination

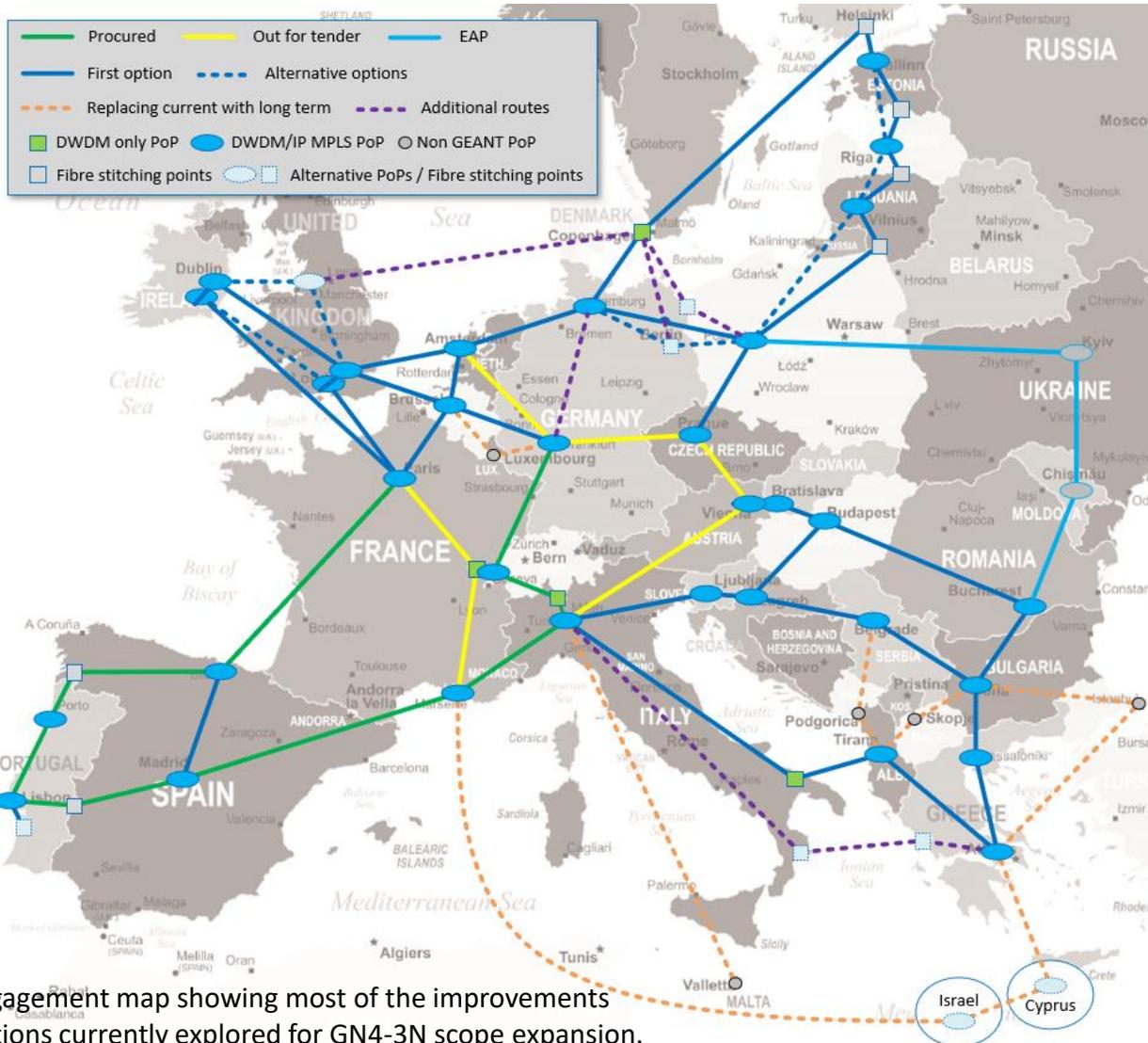
What we have done so far...



- Established a framework accessible to all NRENs for procurement of WDM equipment
- Selected a vendor (Infinera) to provide the Open Line System
- Established 15 years IRU contracts for 15 European routes
- A total of 10,600Km of Dark Fibre
- 6 Providers / 8 Countries



We want to do more!



As infrastructure sharing and improved market outreach keeps providing cost improvements for the reference map, we are looking at expanding the investment to cover as many countries as possible with an infrastructure investment as part of GN4-3N.

Full engagement map showing most of the improvements and options currently explored for GN4-3N scope expansion.

Questions?

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