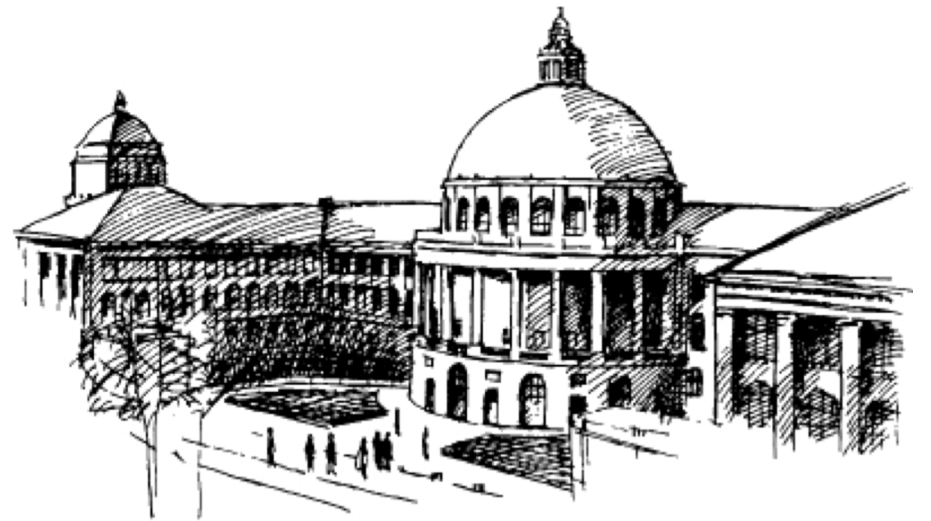


Expansion of the Global SCIONLAB Network

Presented by
Jonghoon Kwon & David Hausheer



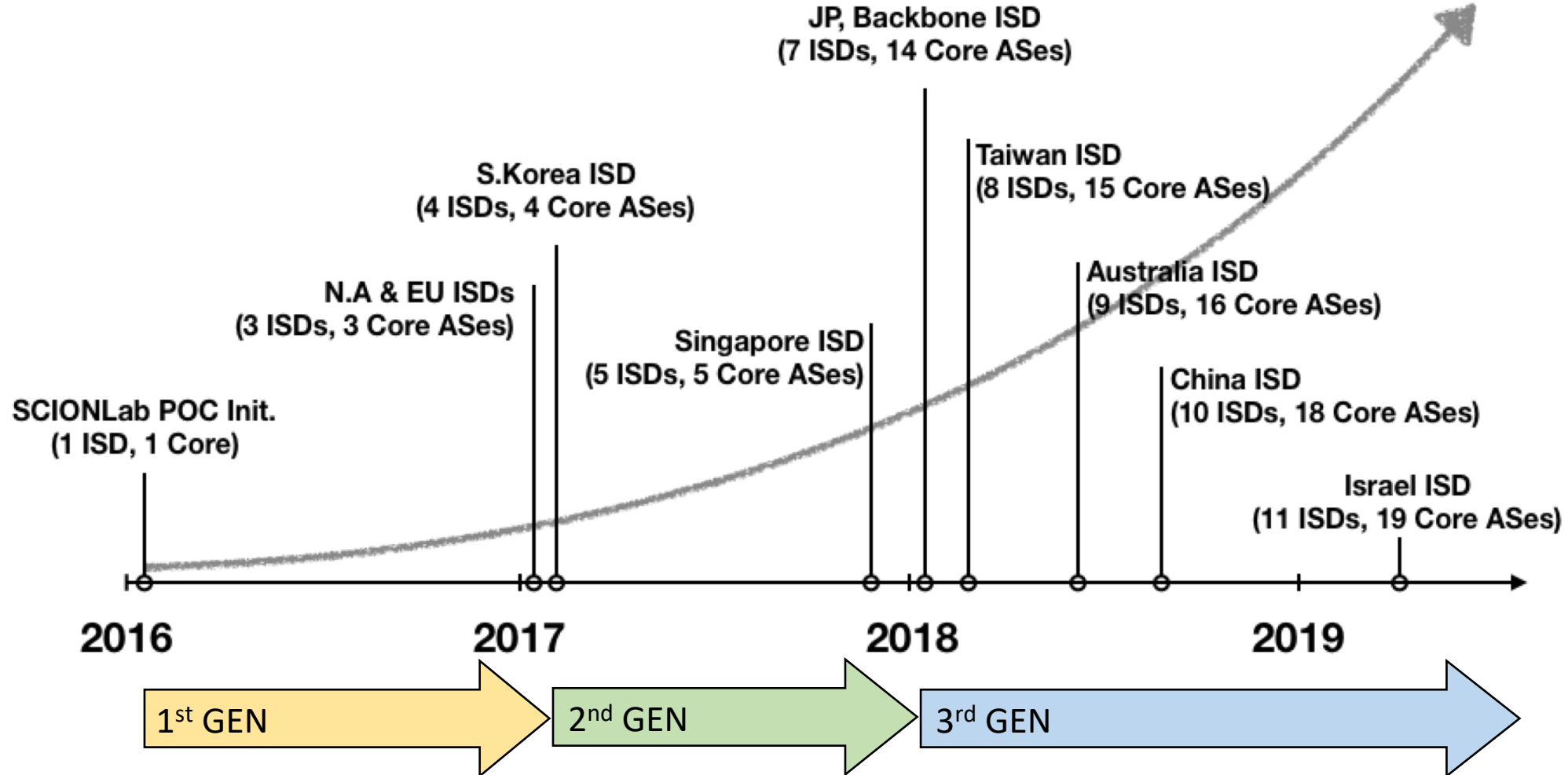
SCIONLAB: A Next Gen. Internet Testbed



Open research network you can use today

Secure and fine-grained inter-domain routing control along with true multi-path communication experience is now possible

History of SCIONLAB



1st Generation (Initial Infrastructure)

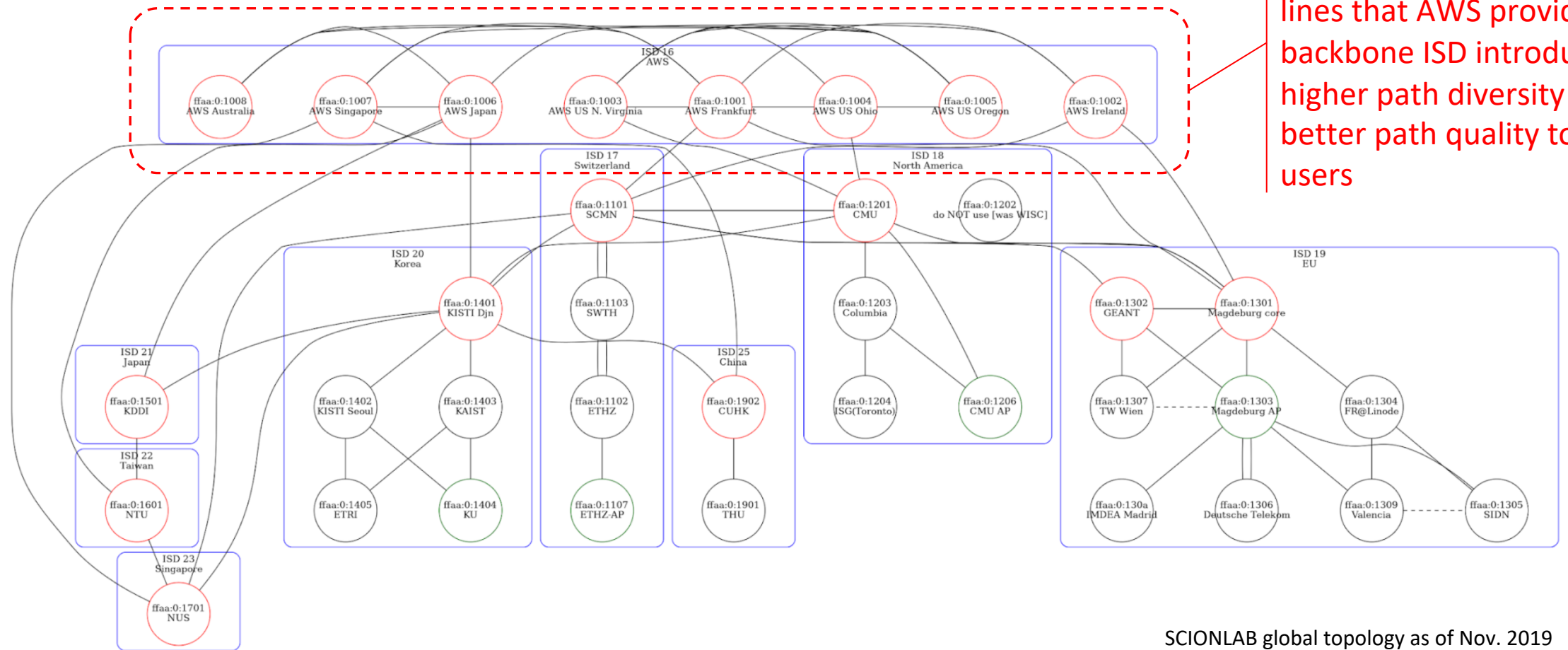
- Started as a *Proof-of-Concept* of SCION network
 - Single ISD with three ASes
- Few participants
 - Swisscom, Switch, ZKB
- Focused on building Infrastructure
 - Control-plane only
- Expanded to 4 ISDs after one year
 - Swiss, EU, N. America, and Asia
 - Achieving global connectivity



2nd Generation (Coordination Service)

- Allowing users to create SCIONLab ASes and join to SCIONLab
 - By simply filling a few necessary information (network setting / machine type)
 - One click download and installation
 - <https://www.scionlab.org>
- Email verification system for the coordination service
 - User verification
- Notification system
 - Notify users of released updates, breaking changes, etc.
 - Status of Join and Connection requests
- Automatic update for SCIONLab nodes
 - Fully automated update procedure
 - Updating live SCIONLab ASes every 12 hours (on bootup update for pending ASes)
- Image builder for various platforms

3rd Generation (AWS Backbone)



Thanks to the dedicated lines that AWS provides, backbone ISD introduces higher path diversity and better path quality to users

SCIONLAB global topology as of Nov. 2019

4th Generation of SCIONLAB Imminent

- Global research networks empower SCIONLAB backbone



Korea Research Environment Open Network 2

- 10 - 100Gbps high-speed research network
- Started from GLORIAD project (Global Ring Network for Advanced Applications Development)
- Interconnected with more than 35 global research networks across the world
 - GÉANT, Internet2, CERN, etc.



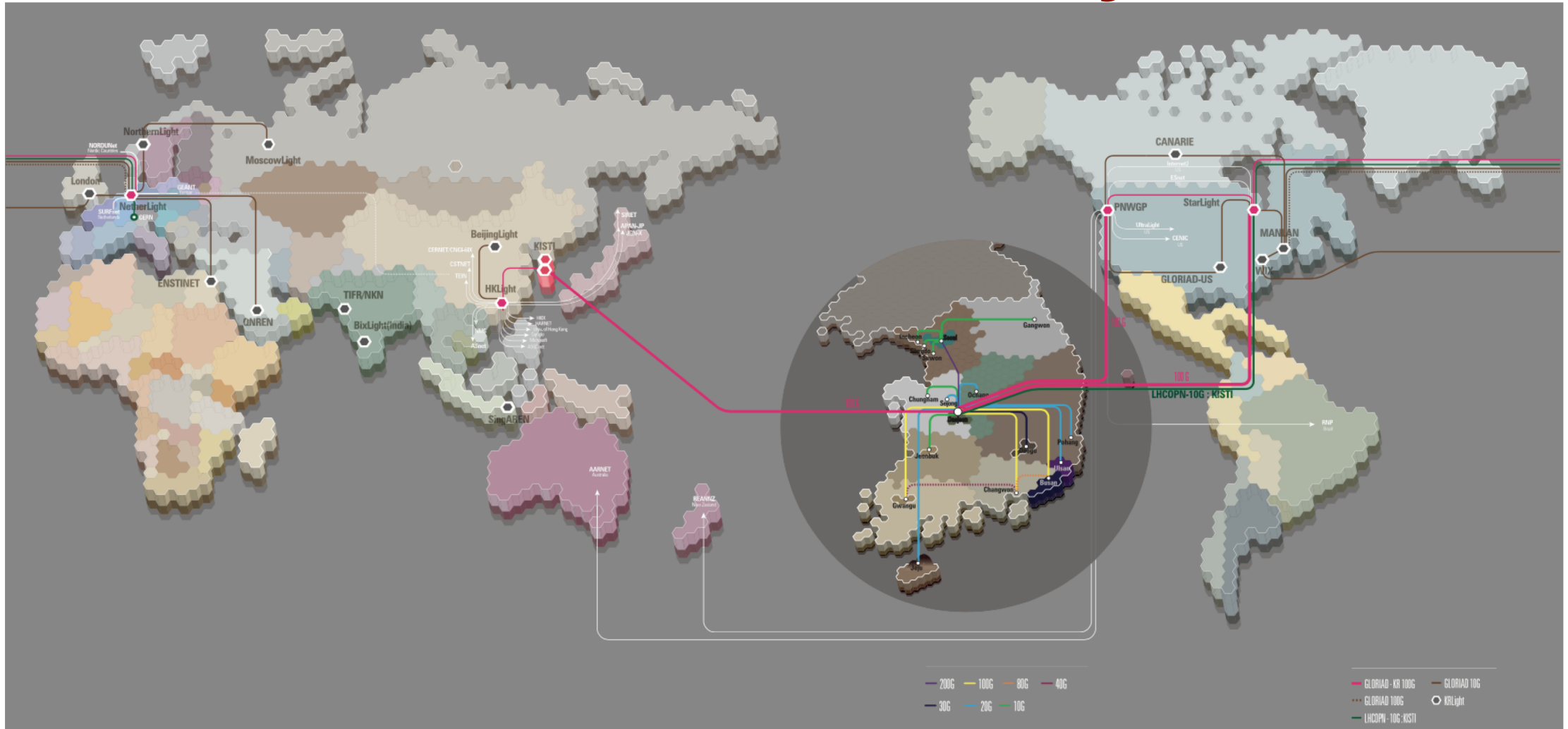
GEANT: European research & education network

- 10 - 100Gbps high-speed research network
- Connecting 50M users in over 10K institutions
- Reaches more than 100 countries worldwide

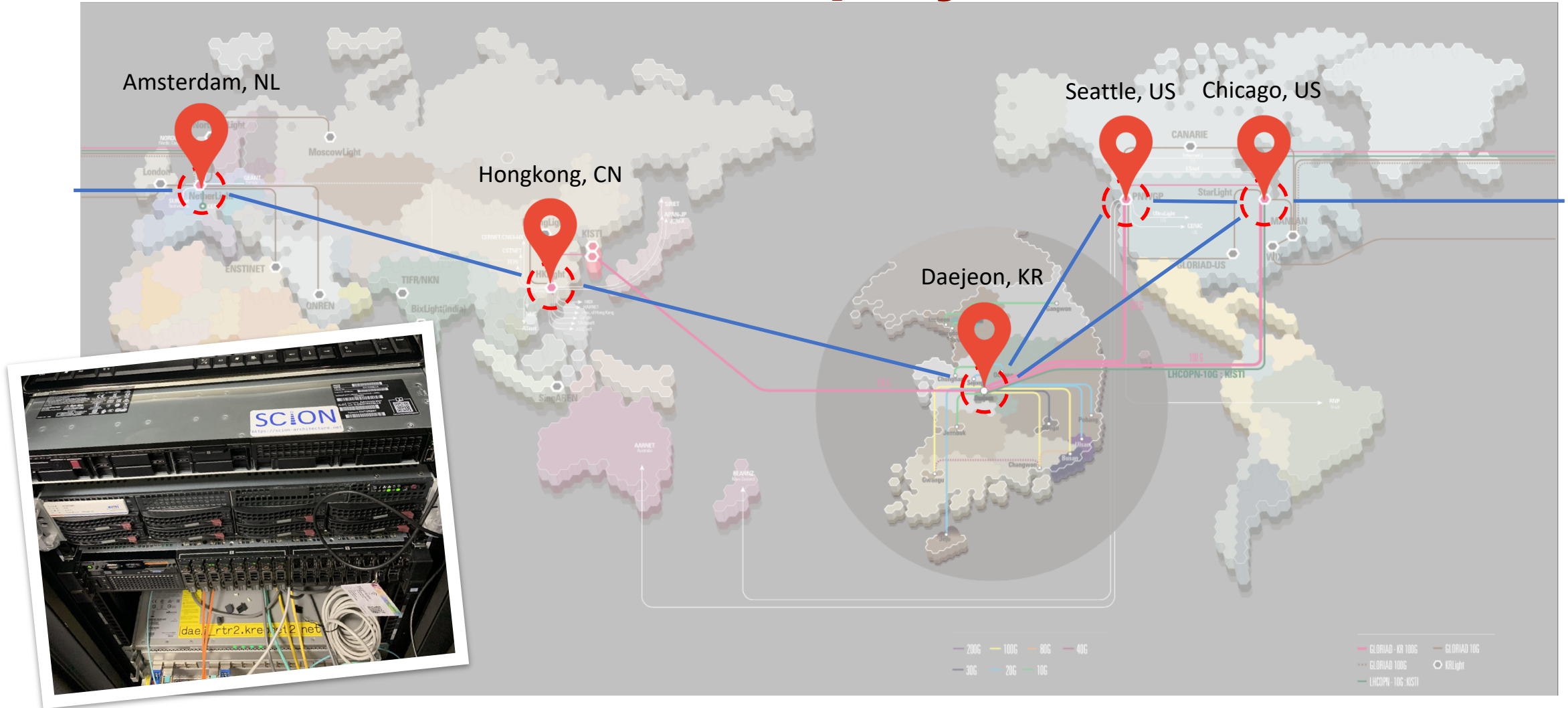
Fed4FIRE: Federation of NGI testbeds

- Access to >16 testbeds (ExoGENI, Grid5000, etc.)

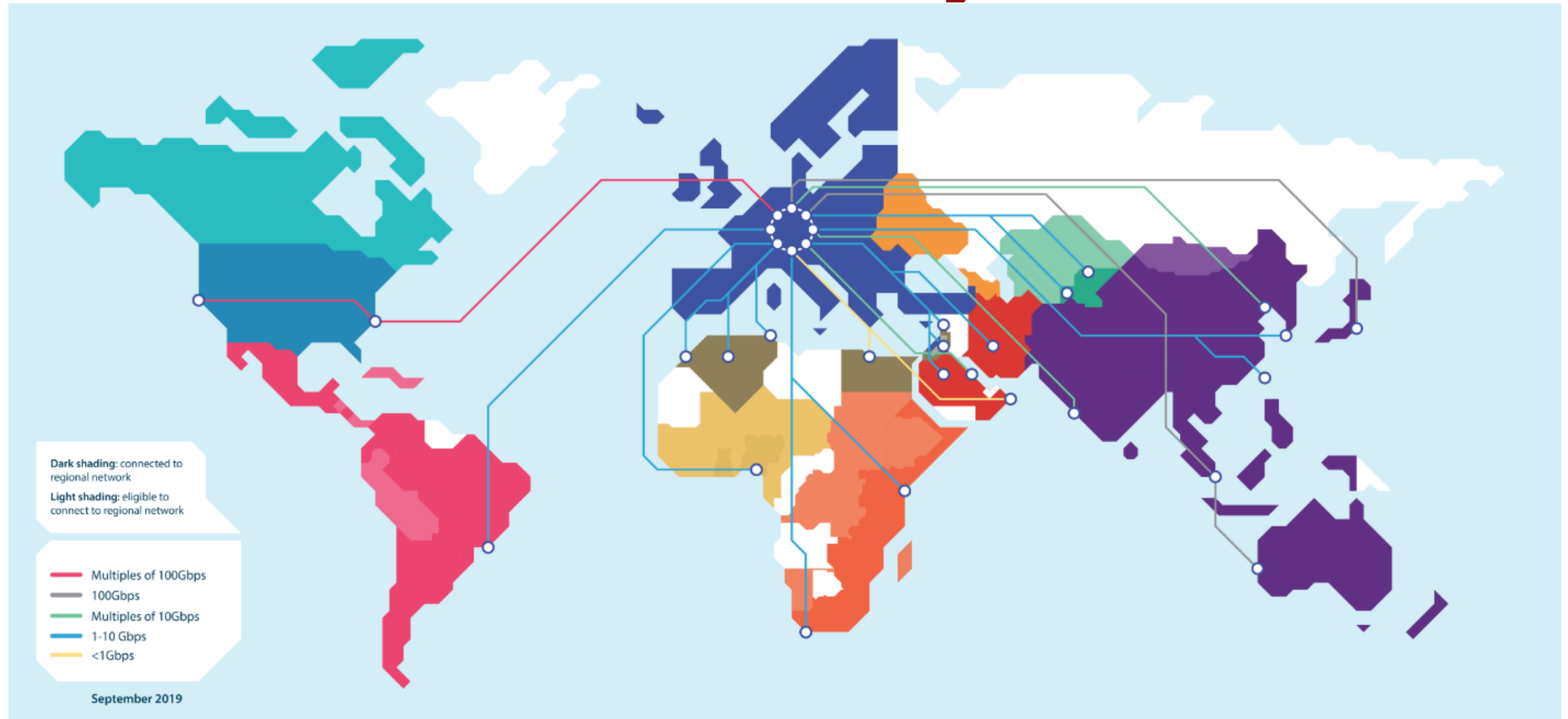
KREONET2 Global Connectivity



KREONET2-SCION Deployment

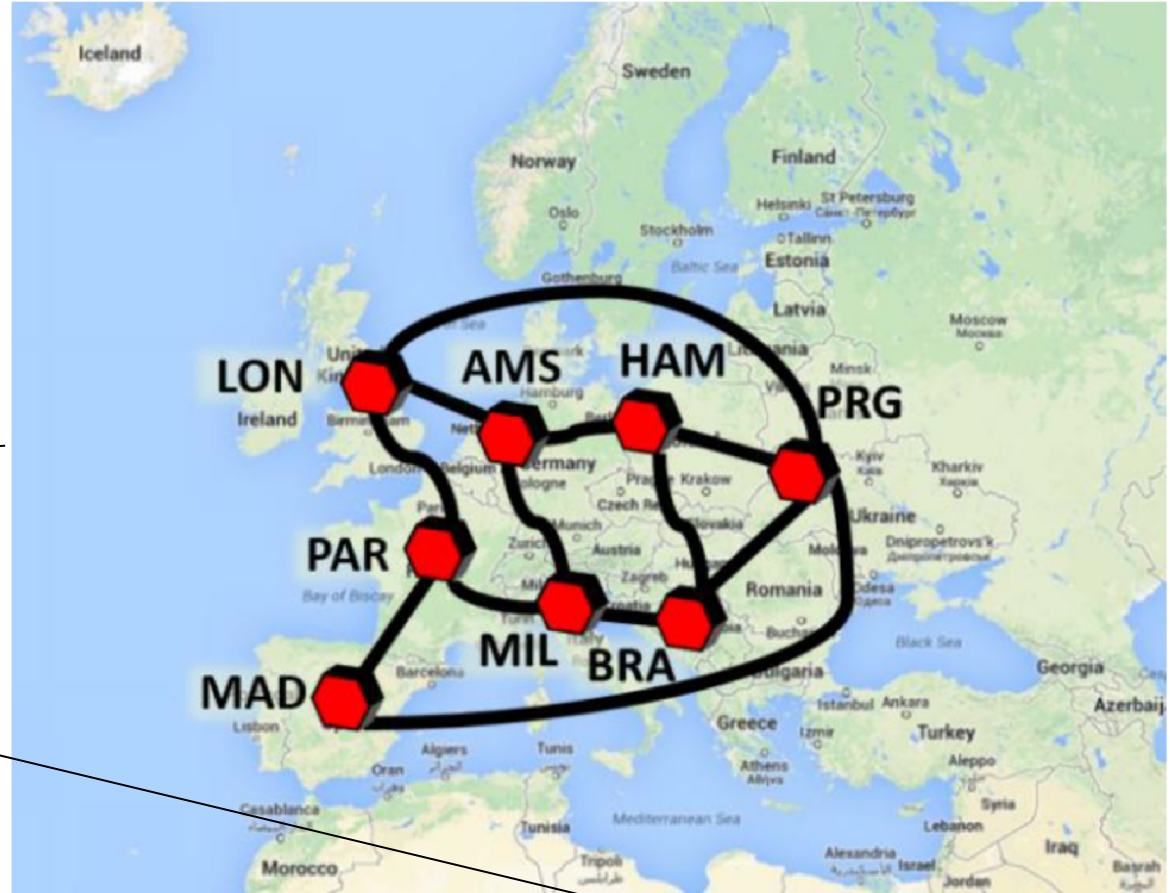
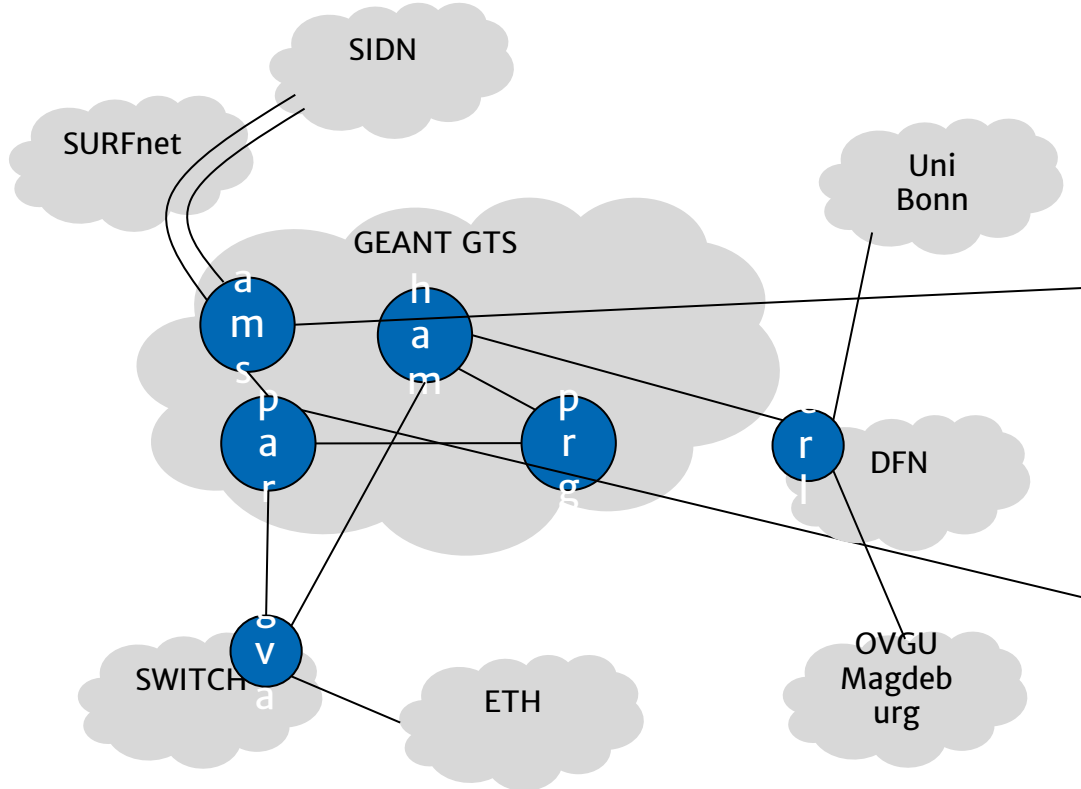


GÉANT Global Connectivity

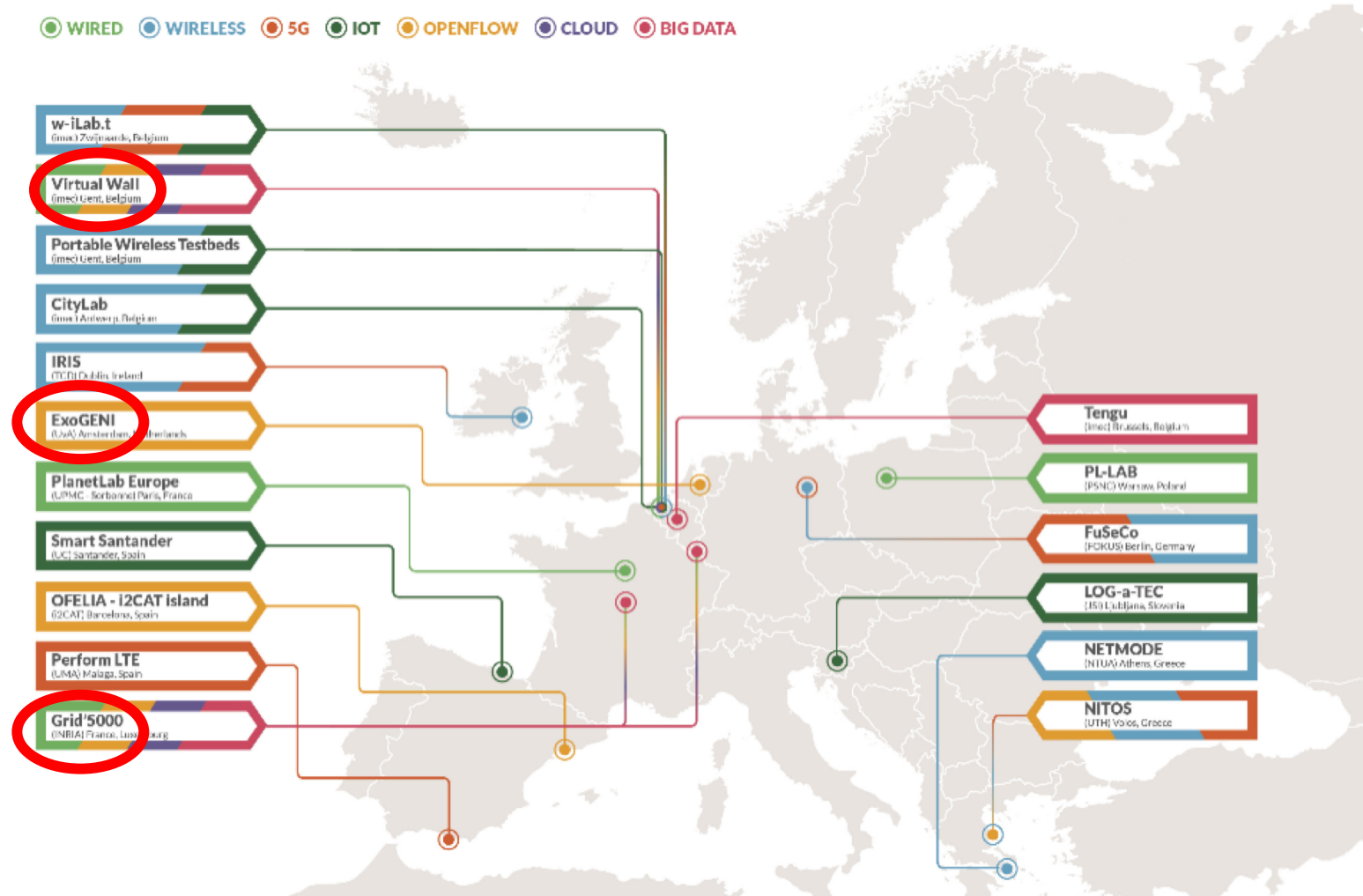


GÉANT-SCION Deployment

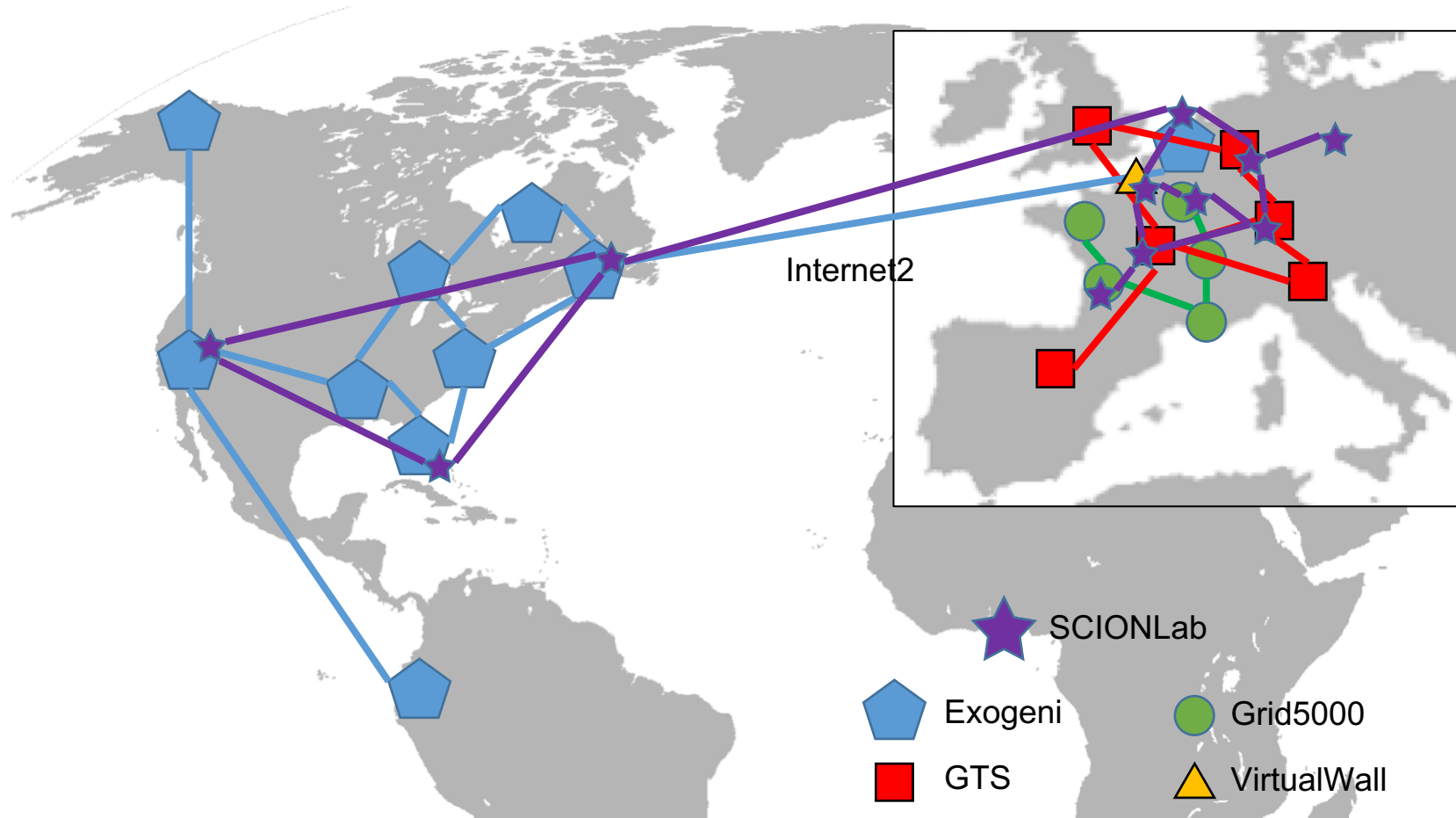
- Use of GÉANT GTS (GÉANT Testbed Service)



Fed4FIRE Testbeds



Fed4FIRE-SCION Deployment



Potential Use Cases

- Collaboration with global research networks
 - High-speed data transmission
 - Reliable path-based inter-domain networking
 - Exciting opportunities for multi-path communication
 - E.g. better utilization of network resources through usage of backup links

4th Generation of SCIONLAB

Available
From

Spring 2020

Thank you for your attention!

- SCIONLAB team
 - Michael Farb
 - Matthias Frei
 - Claude Hähni
 - David Hausheer
 - Mateusz Kowalski
 - Jonghoon Kwon
 - Juan A. Garcia Pardo
 - Adrian Perrig
 - François Wirz

