

Fælles drift af netværk, kabelforbindelser over Nordpolen og andre internationale trends

DeIC Konference
Vingsted, November, 2021

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Nordic Polar Connect

A vision for a submarine cable system through the Arctic, on a short and unique route towards Asia and the West Coast of North America

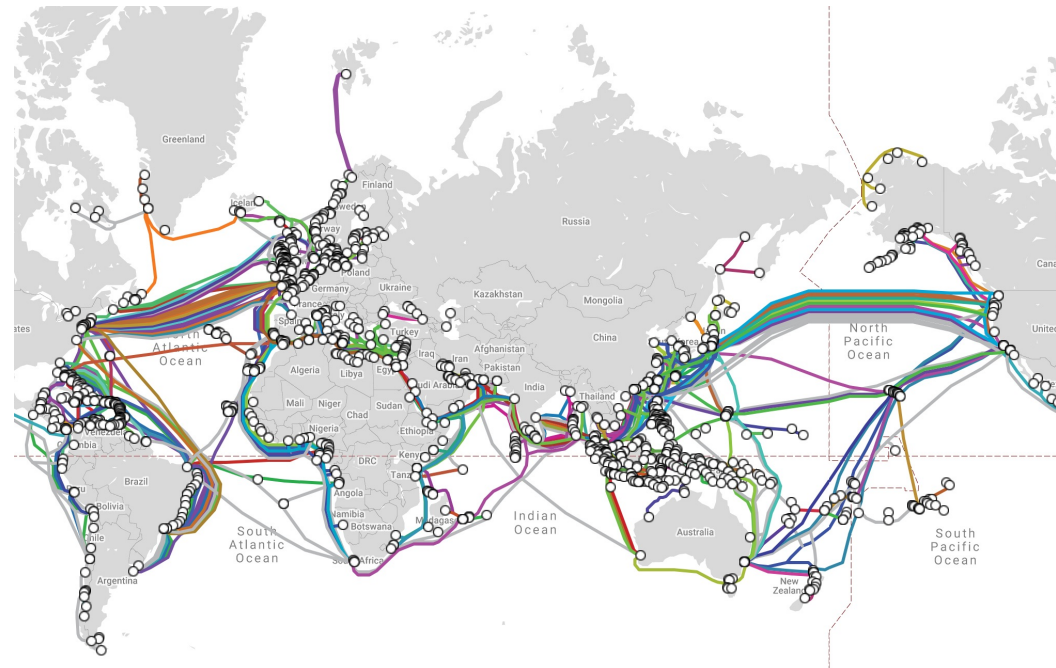
November 2021

Today, Europe's essential connectivity to both Asia and North America is concentrated along 3 main corridors:

- **Towards the West:** Terminating on the East Coast of the USA, where older cables are now being replaced by new cable systems, owned and operated by dominant foreign technology companies.
- **Towards Northern Asia:** Through Russia and China, with cable systems predominantly owned by companies under significant non-European government control.
- **Towards Southeast Asia:** Through Egypt, served by consortia, predominantly consisting of non-European telecommunications carriers with significant foreign government ownership and cable systems that exhibit regular outages.

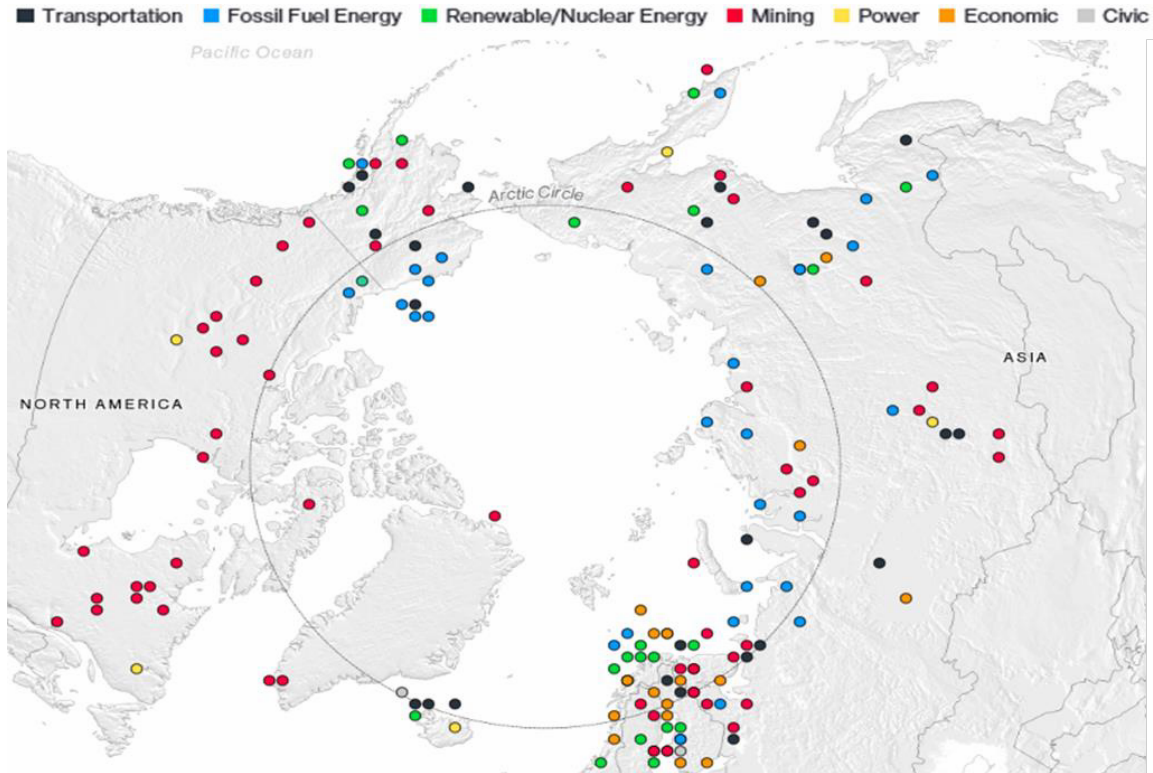
This current dependency on non-European cable systems is an area of major concern that needs to be addressed.

Countries in the European Union **do not have a Digital Connectivity Strategy**



- A route to Asia and the West Coast of North America:
 - Adding resilience to the global fabric of submarine cables
 - Lowering the latency towards Japan and West Coast of North America
 - Increasing the stability & availability
 - Adding to European Digital Independence
- But also, for the Nordics:
 - Transforming the Nordics from Internet stub to right on the highway
 - Stimulating infrastructure development in the High North
 - Tapping into renewable energy for data centers
 - Last but not least, bring unprecedented connectivity for R&E

*This is **Gravity North***



- Arctic areas can be a game changer for global connectivity and therefore infrastructure investments and growth plans should be planned and developed with both private and public interests
- There are 900 planned projects in the region requiring 1 trillion USD investments; need for infrastructure in the area is eminent
- Especially northern parts of Russia pursue a huge potential for economic growth and development
- Building data centers in areas with renewable energy provides growth potential with less environmental impact
- Data centers and cloud providers are an important part of the ecosystem together with operators

1. Enhancing European Digital Independence

Polar Connect will address the major concern that today Europe is served by many non-European cable systems

Polar Connect will enable a innovative new route creating increased stability and lower latency between Europe, Asia and North America

2. Strengthening Digital Europe

Polar Connect will help DIGITAL EUROPE to contribute to the creation of the right framework for Europe's evolution to a gigabit society interconnecting with high growth markets in Asia

3. European Impact on Global Research

Polar Connect will further improve:

- Interconnecting European Research Infrastructures and the European Scientist with their Global Partners
- Provide a Unique and highly scalable Communication infrastructure for EuroHPC

4. Strengthening European Innovation

Polar Connect will further improve:

- European Technology Knowledge in constructing Submarine Cable infrastructures in the artic Region
- Give European Companies increased access to High Speed Connectivity to Asia

“To be digitally sovereign, the EU must build a truly digital single market, reinforce its ability to define its own rules, to make autonomous technological choices, and to develop and deploy strategic digital capacities and infrastructure.”

European Council Conclusions, 2 October 2020

All 27 EU Member States, Norway and Iceland signed the “European Data Gateways” Ministerial Declaration

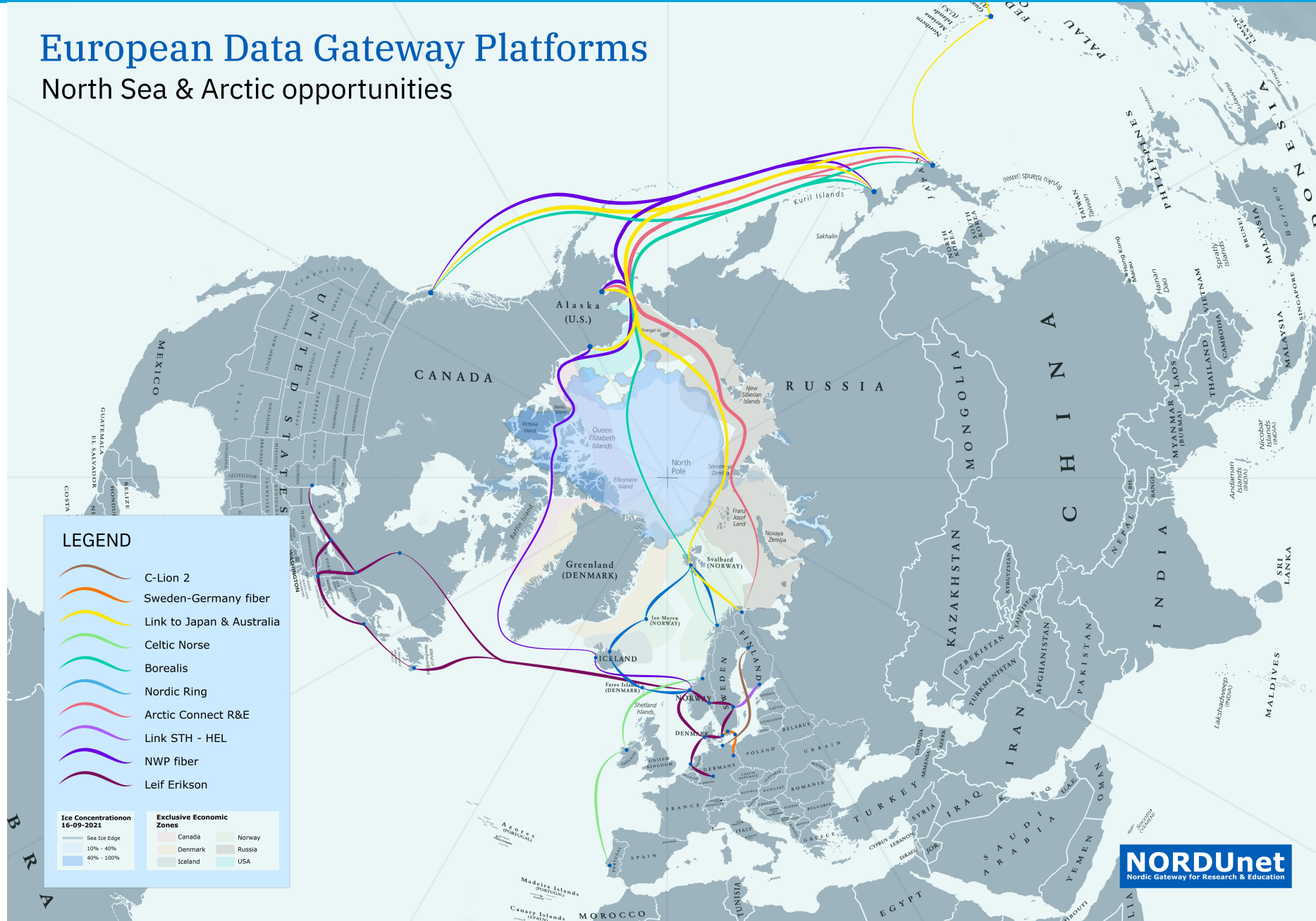
Four Platforms to secure Europe’s connectivity:

- The EU-Atlantic Data Gateway Platform
- The EU-Mediterranean Data Gateway Platform
- The EU-North Sea & Arctic Data Gateway Platform
- The EU-Baltic-to-Black Sea Data Gateway Platform



<https://digital-strategy.ec.europa.eu/en/news/digital-day-2021-europe-reinforce-internet-connectivity-global-partners>

European Data Gateway Platforms North Sea & Arctic opportunities



**Nordic Polar Connect
brings
*Gravity North***

November 2021



Building Networks together
NORDUnet NEXTgen Network

Legacy



- Accommodate a ladder architecture
- Adding real geographic redundancy out of Norway
- Adding redundancy $N+2(3)$
- ***Have topology protect against major city or regional infrastructure outages***
- Have one link from each NREN to Europe not touching any other Nordic NREN
- Using NREN spectrum where technically possible

"Redundancy to support 100% availability starts with the number 3"

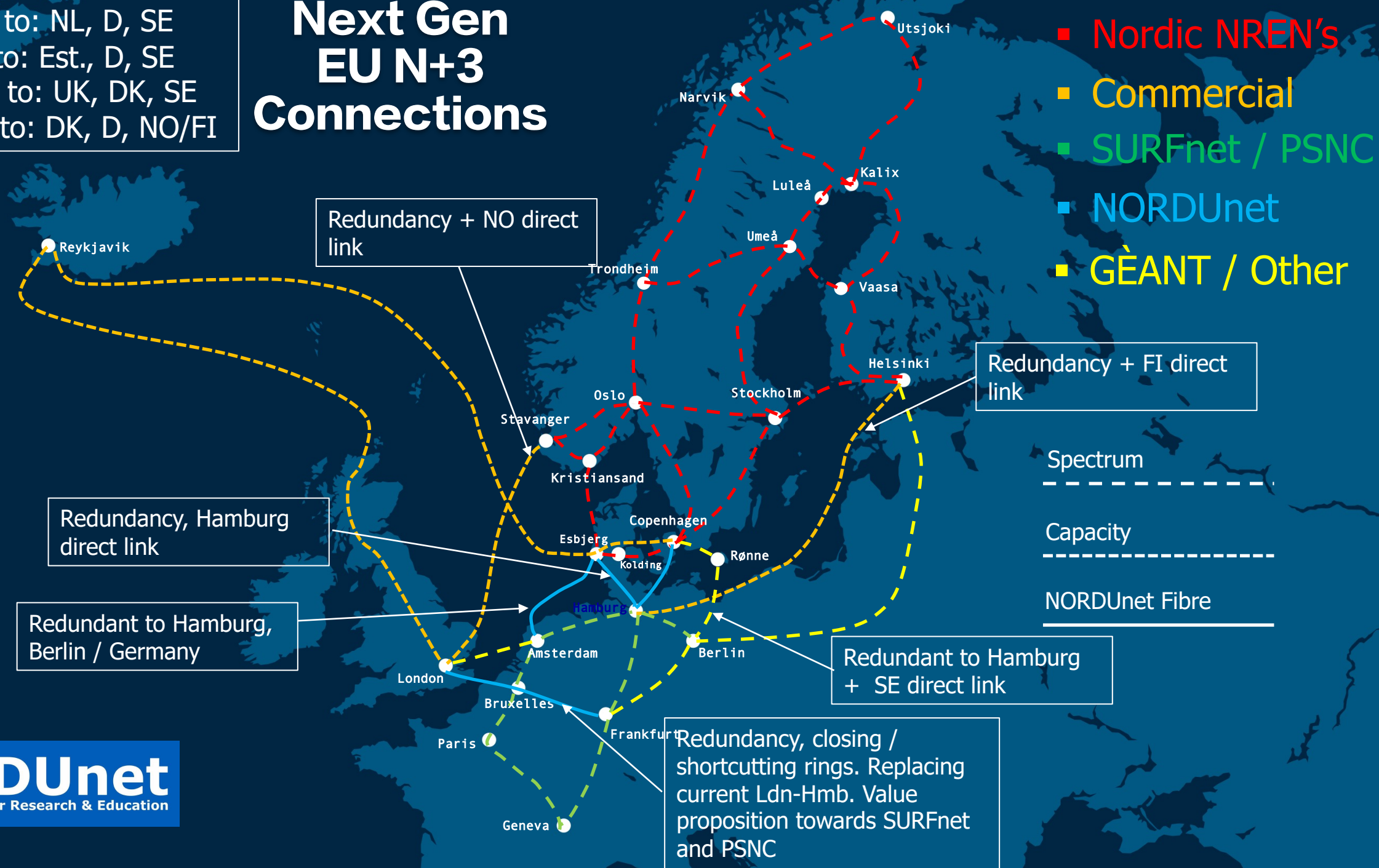


Resulting NORDUnet Nextgen architecture

DK connects to: NL, D, SE
 FI connects to: Est., D, SE
 NO connects to: UK, DK, SE
 SE connects to: DK, D, NO/FI

Next Gen EU N+3 Connections

- Nordic NREN's
- Commercial
- SURFnet / PSNC
- NORDUnet
- GÉANT / Other





▪ **Nordic NREN's**

▪ **Commercial**

▪ **SURFnet / PSNC**

▪ **NORDUnet**

▪ **GÉANT / Other**

Spectrum

Capacity

NORDUnet Fibre

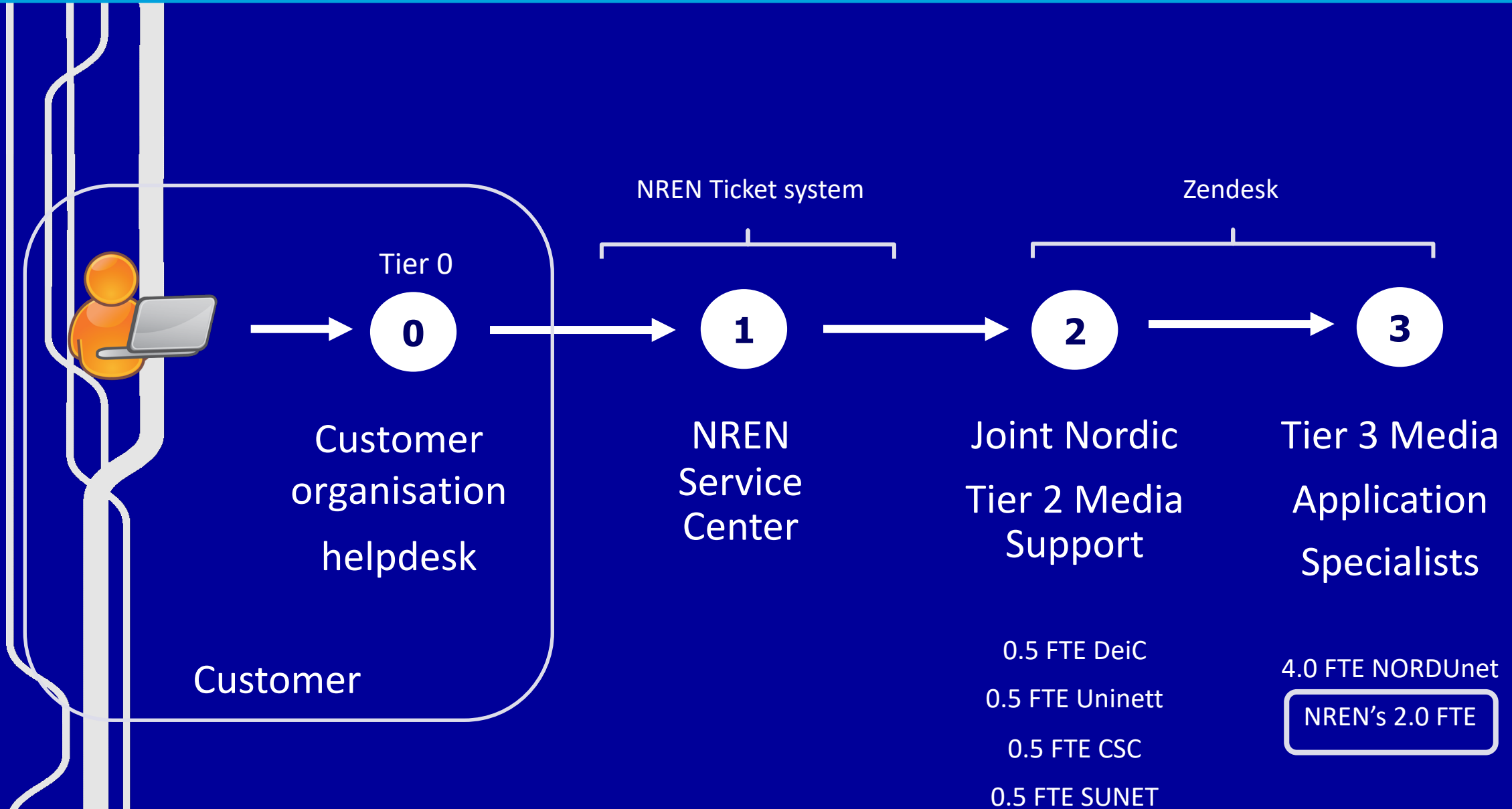
NORDUnet
Nordic Gateway for Research & Education

"Q3-2021"

- Create sufficient redundancy to lower the operational cost by;
 - Minimising the need for 24/7 support in the classic sense
 - Lowering the on site support levels and spare parts to NBD (Next Business Day)
 - Establish a federated operations model
 - NREN engagement in Planning, Engineering and Operations.
 - Focus has been on completing the Optical nextGEN infrastructure,, IP and more stuff to come.

Media Services

1. NREN support structure
2. Automated monitoring - status.nordu.net
3. Zoom distributed setup
4. Fun facts....



- Dashboard
- Incidents
- Maintenance
- Notifications
- Infrastructure
- Metrics
- Design
- Settings
- Team
- API

Dashboard New Incident New Maintenance Preview Status Page

Incidents 0

Maintenances 0

Subscribers

Current Status

- Network
- Zoom
- Kaltura
- Mediasite
- Panopto

Select a component to toggle the status

External Services

✓	AWS CloudFront
⚠	Zoom

Recent Activity

Source	Time	Status	Component	Container
Pingdom	September 28, 2021 7:23:34AM	Operational	Mediasite	Mediasite On-Premise
Pingdom	September 28, 2021 12:05:33AM	Service Disruption	Mediasite	Mediasite On-Premise
Dashboard	September 16, 2021 2:41:35PM	Operational	Zoom	Zone 1 - Backup
Dashboard	September 16, 2021 2:41:11PM	Planned Maintenance	Zoom	Zone 1 - Backup
Incident	September 7, 2021 2:46:40PM	Operational	Panopto	Panopto - On-Premise
Incident	September 7, 2021 2:45:25PM	Service Disruption	Panopto	Panopto - On-Premise
Component Created	September 7, 2021 2:24:33PM	Operational	Network	Denmark

All Systems Operational
Updated a few seconds ago

For detailed Network status please visit: nunoc.org/nunocweb/open_trouble_tickets.html

Network Operational

Denmark Finland Iceland Norway Sweden

Zoom Operational

On-Premise Recording Zone 2 - DK #1 Zone 3 - SE #1 Zone 4 - SE #2 Zone 5 - DK #2
Zone 6 - FI Zone 7 - NO

Kaltura Operational

Mediaspace Transcoding Live streaming

Mediasite Operational

Mediasite On-Premise

Panopto Operational

Panopto - On-Premise

0

Upcoming Maintenances

0

Incidents Last 30 Days

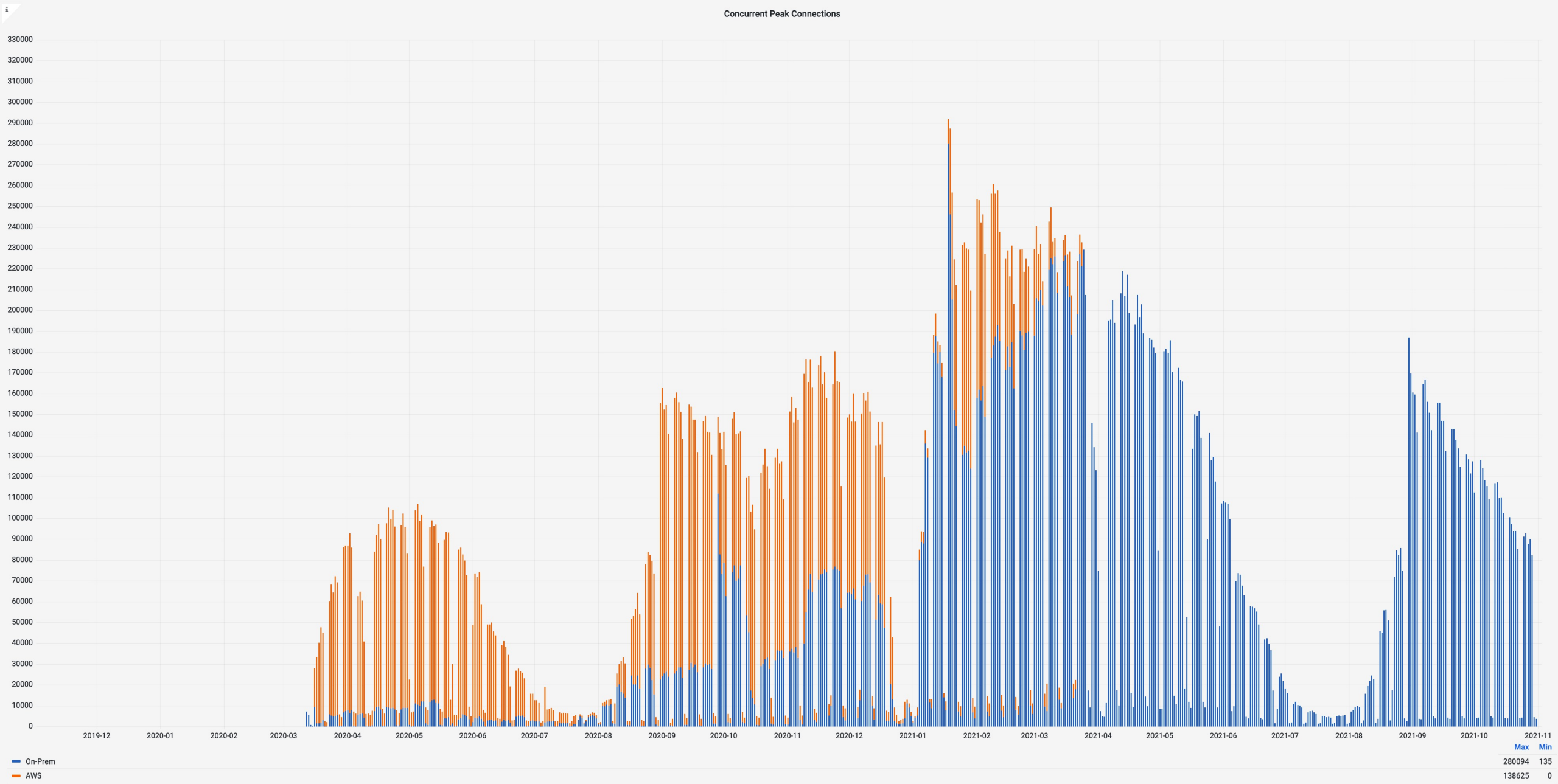
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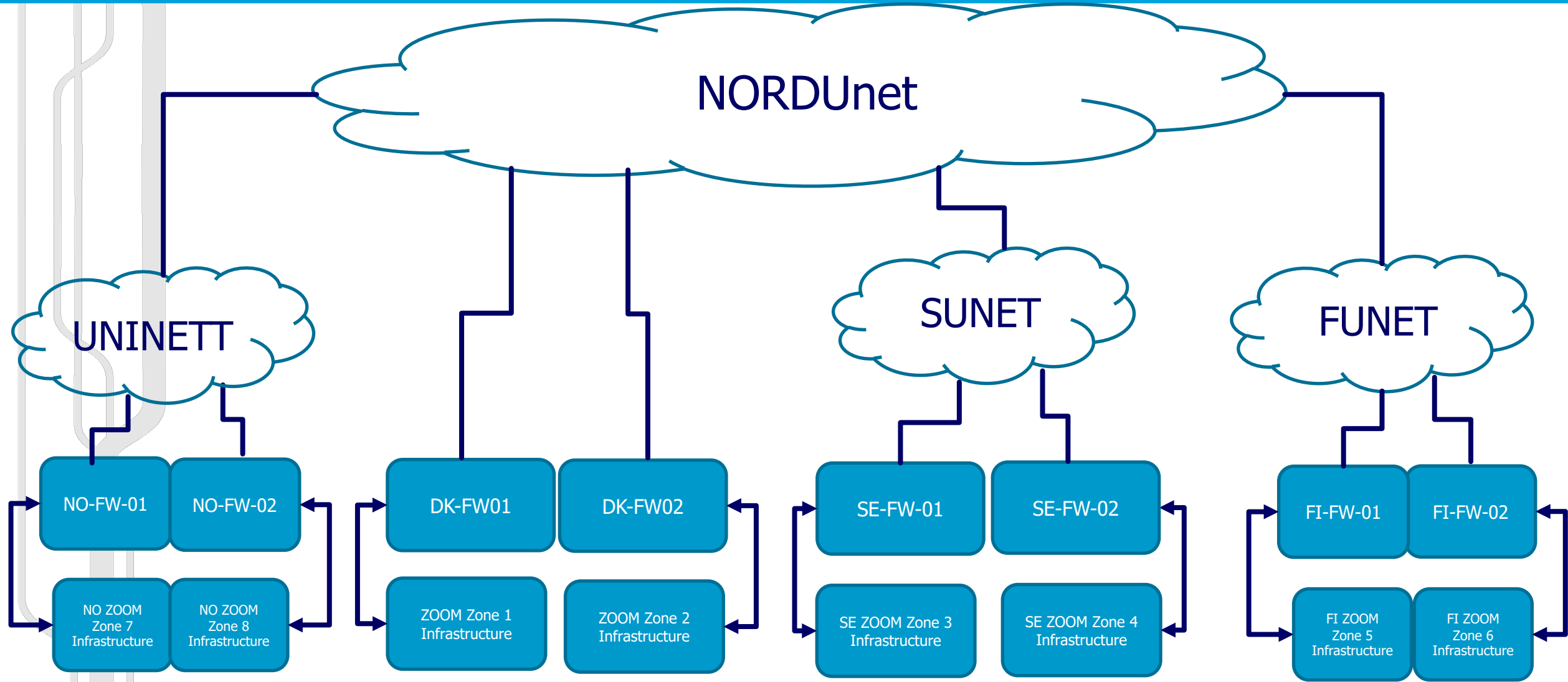
Maintenances Last 30 Days

External Services

✓ AWS CloudFront

✓ Zoom





2.000 host's installed (more or less)

2019

Total minutes	111.117.900
Total hours	1.851.965
Total days	77.165

211 YEARS!

2020

Total minutes	7.960.260.573
Total hours	132.671.009
Total days	5.527.958

15.145 YEARS!

2021

Total minutes	11.915.775.326
Total hours	198.596.255
Total days	8.274.843,97

22.670 YEARS!



KALTURA

2019

- **400.000 VIDEOS UPLOADED**
- **PLAYED 30.000.000 TIMES**
- **1.200.000 GIGABYTES STREAMED**

2020

- **630.000 VIDEOS UPLOADED**
- **PLAYED 70.000.000 TIMES**
- **2.300.000 GIGABYTES STREAMED**

2021 (ytd - October)

- **620.875 VIDEOS UPLOADED**
- **PLAYED 67.378.259 TIMES**
- **2.200.000 GIGABYTES STREAMED**



Questions