

## Enabling Science & Education for the Global Village

**René Buch**

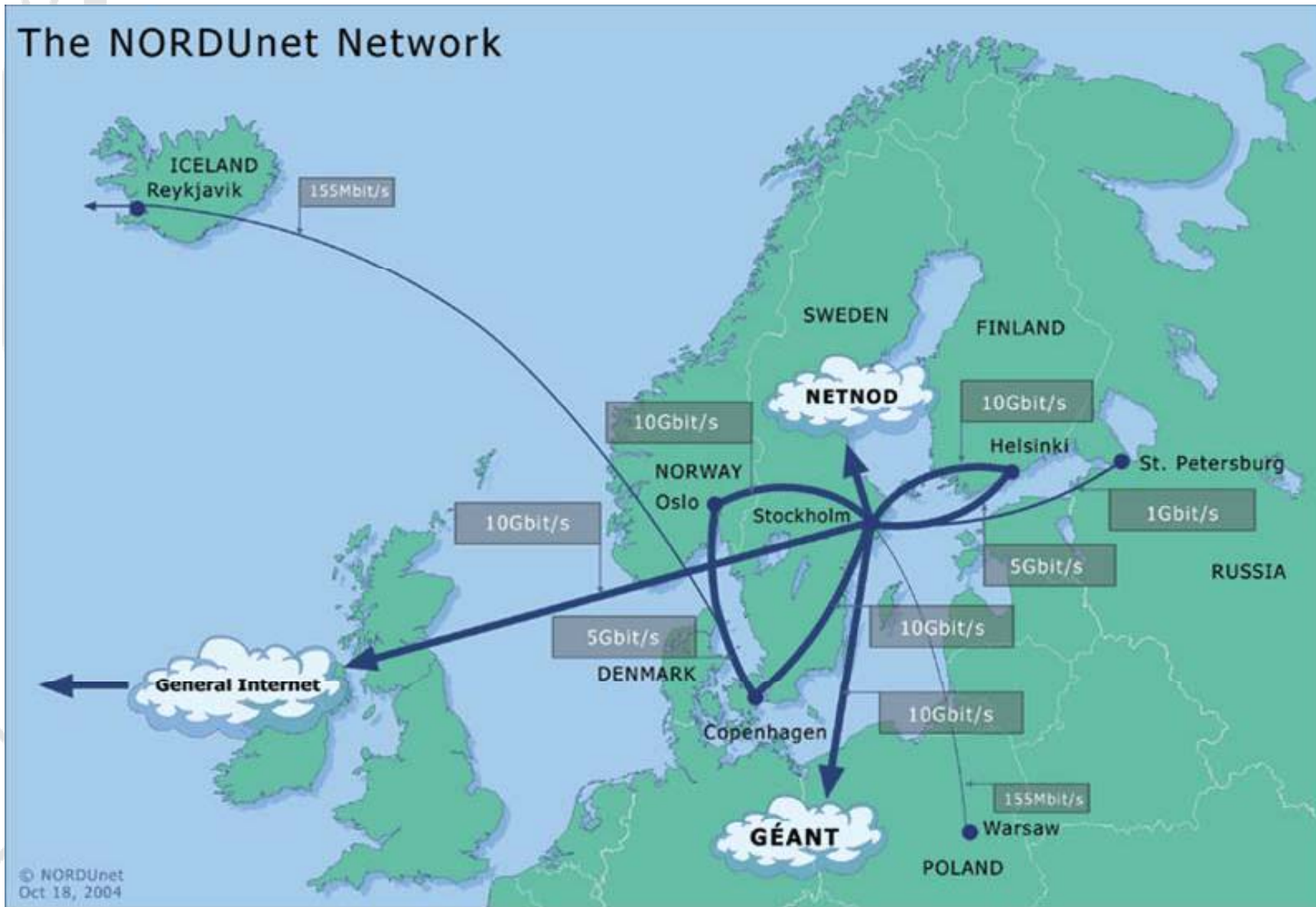
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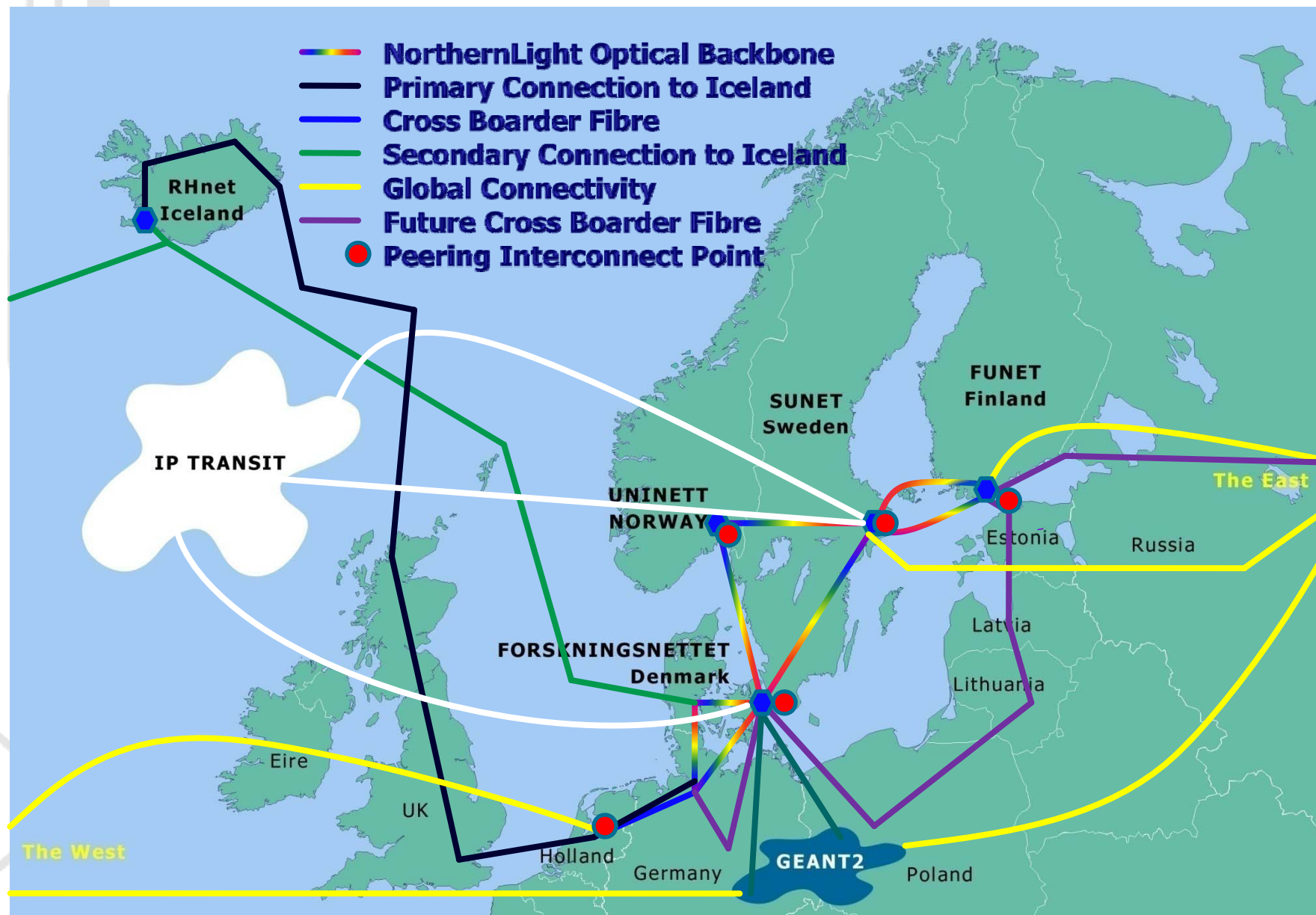
# NORDUnet

Nordic Infrastructure for Research & Education



## The NORDUnet Network





- Fibre distances
  - NORDUnet ~4200 Km (Completed - NUNOC)
  - SUNET ~7300 Km (Completed - NUNOC)
  - FUNET ~4300 KM (Operational 2008)
  - Danish Research NW ~1500 KM (Operational 2008)
  - UNINETT ~7000 KM (In Progress)
  - Rhnet 2,5 Gbit/s Lambda connection 2008
- Multiple Infrastructure Providers
- Multiple Management structure

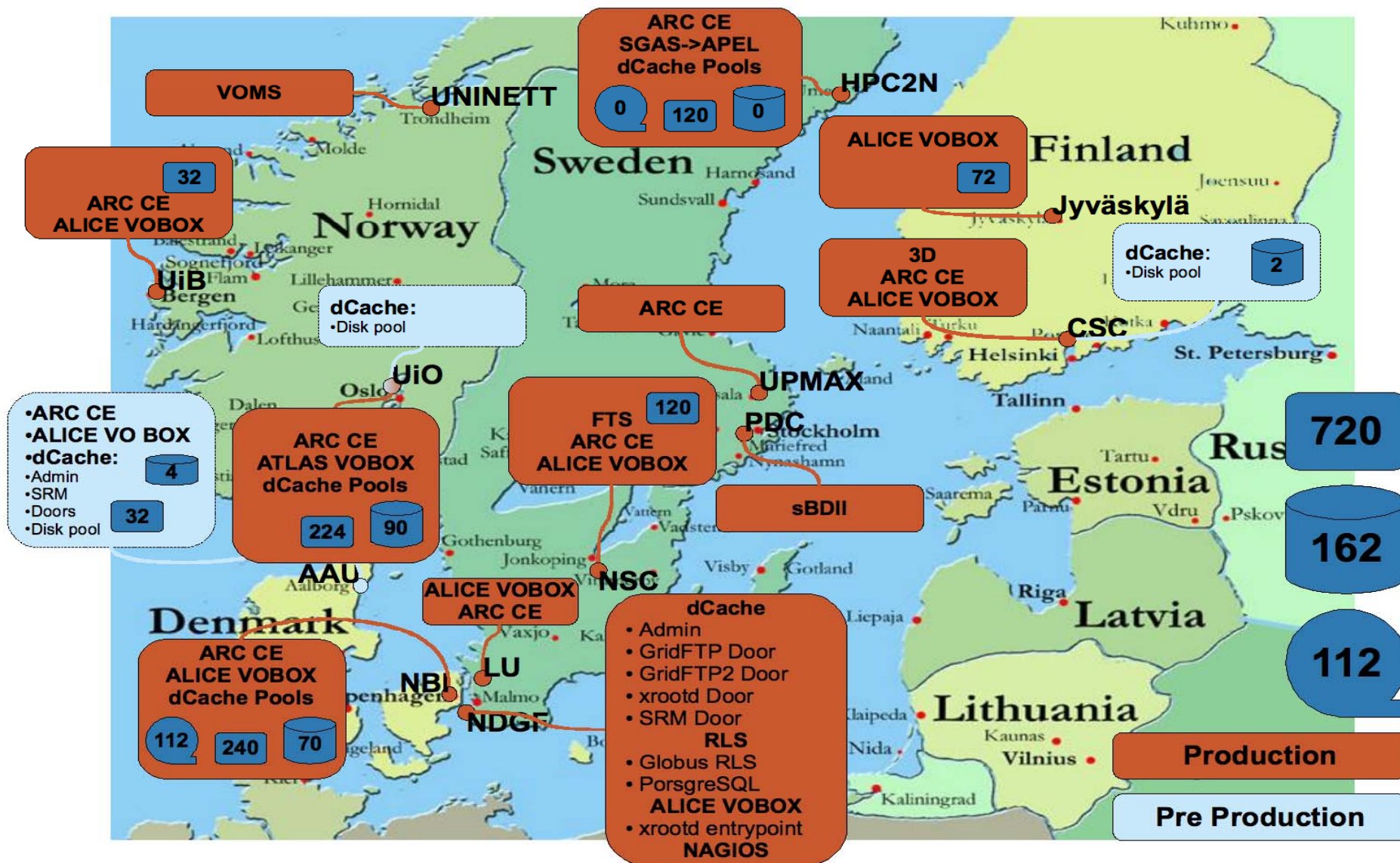
- **NORDUnet NorthernLight**
  - Pan Nordic Redundant Dark Fibre Optical Infrastructure
- **NORDUnet IP**
  - Pan Nordic Redundant IPv4 & IPv6 Infrastructure
- **NORDUnet NOX** (NorthernLight Optical X-Change)
  - Distributed Open Optical Exchange
- **NORDUnet NUNOC**
  - 24x7 eInfrastructure operation centre.
- **NORDUnet PORTAL** ([portal.nordu.net](http://portal.nordu.net))
  - WIKI and WWW Community services for Research & Educational projects
- **NORDUnet Project**
  - Project and Administration services to Nordic Research Communities
- **NORDUnet Meeting**
  - Meeting & AV Conferencing host facilities in Copenhagen & Stockholm
- **NORDUnet Training**
  - Workshops and Training on Network & Computer Technologies.
- **NORDUnet3** ([www.nordunet3.org](http://www.nordunet3.org))
  - Four year Internet Research Program – Nordic and the Baltic Countries
- **NDGF – Nordic Data Grid Facility** ([www.ndgf.org](http://www.ndgf.org))
  - Pan Nordic High Performance Computing GRID & Pentabyte Storage



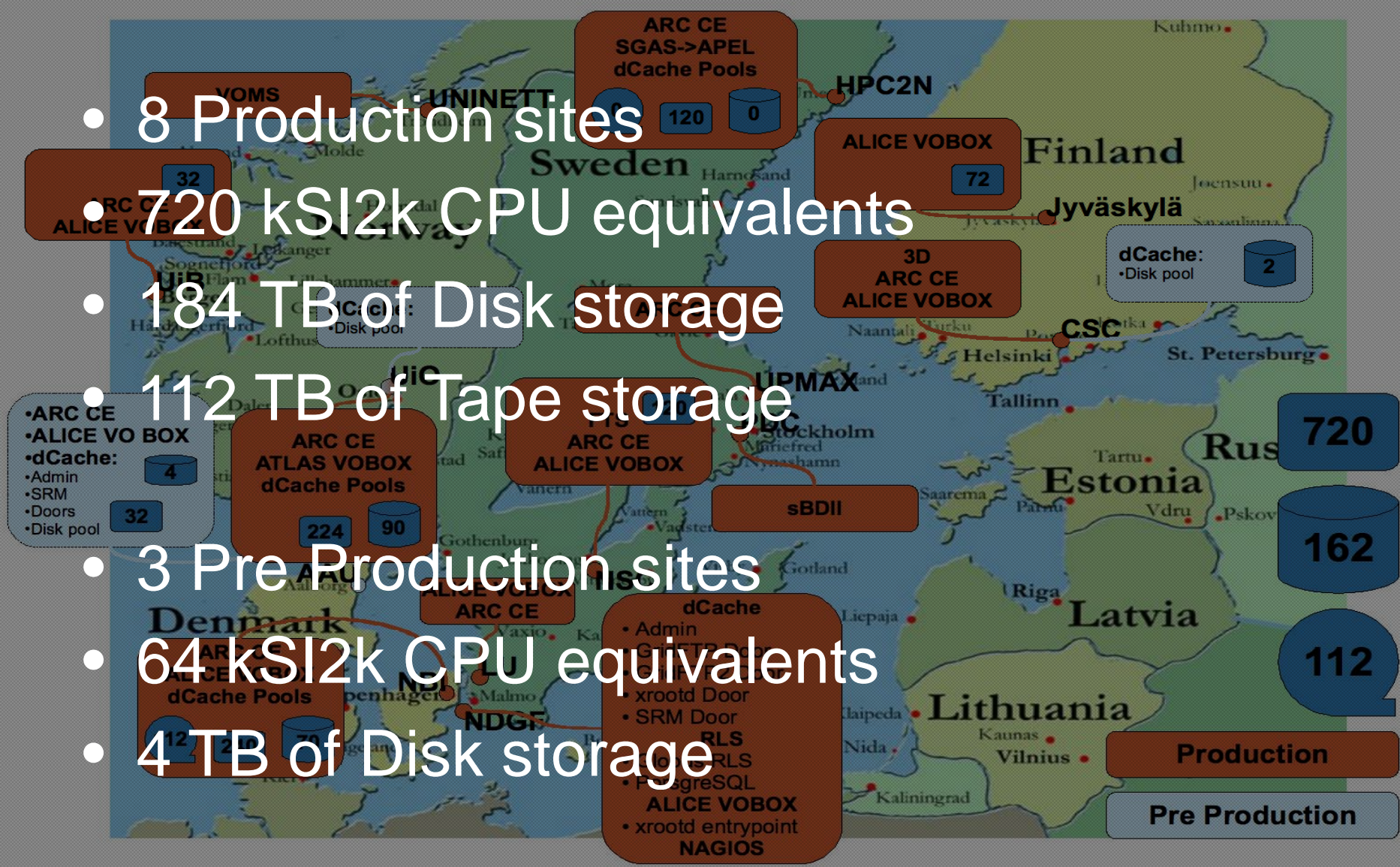
- **General Users**
  - Researchers,
  - Staff,
  - Students (Including Dormitories)
- **Special Need User Communities:**
  - GRID
    - High Energy Physics (Nordic Tier 1)
      - LHC (Alice, Atlas, CMS)
    - Atmospheric Science
    - BIO Informatics
  - DEISA
  - eVLBI
  - . . .

Denmark, Finland, Iceland, Norway,  
Sweden, The Baltic States, (Slovenia)





- 8 Production sites
- 720 kSI2k CPU equivalents
- 184 TB of Disk storage
- 112 TB of Tape storage
- 3 Pre Production sites
- 64 kSI2k CPU equivalents
- 4 TB of Disk storage

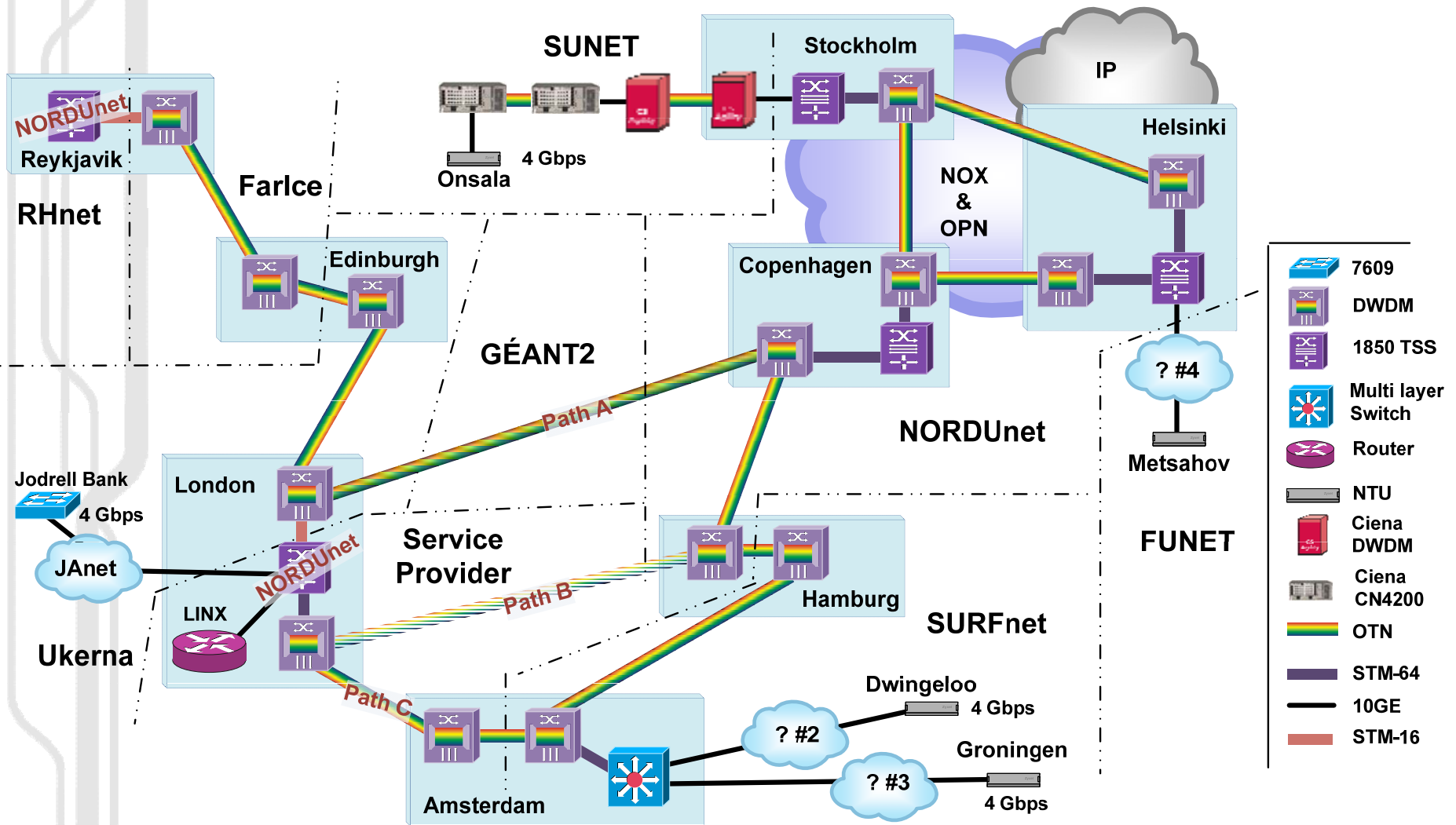


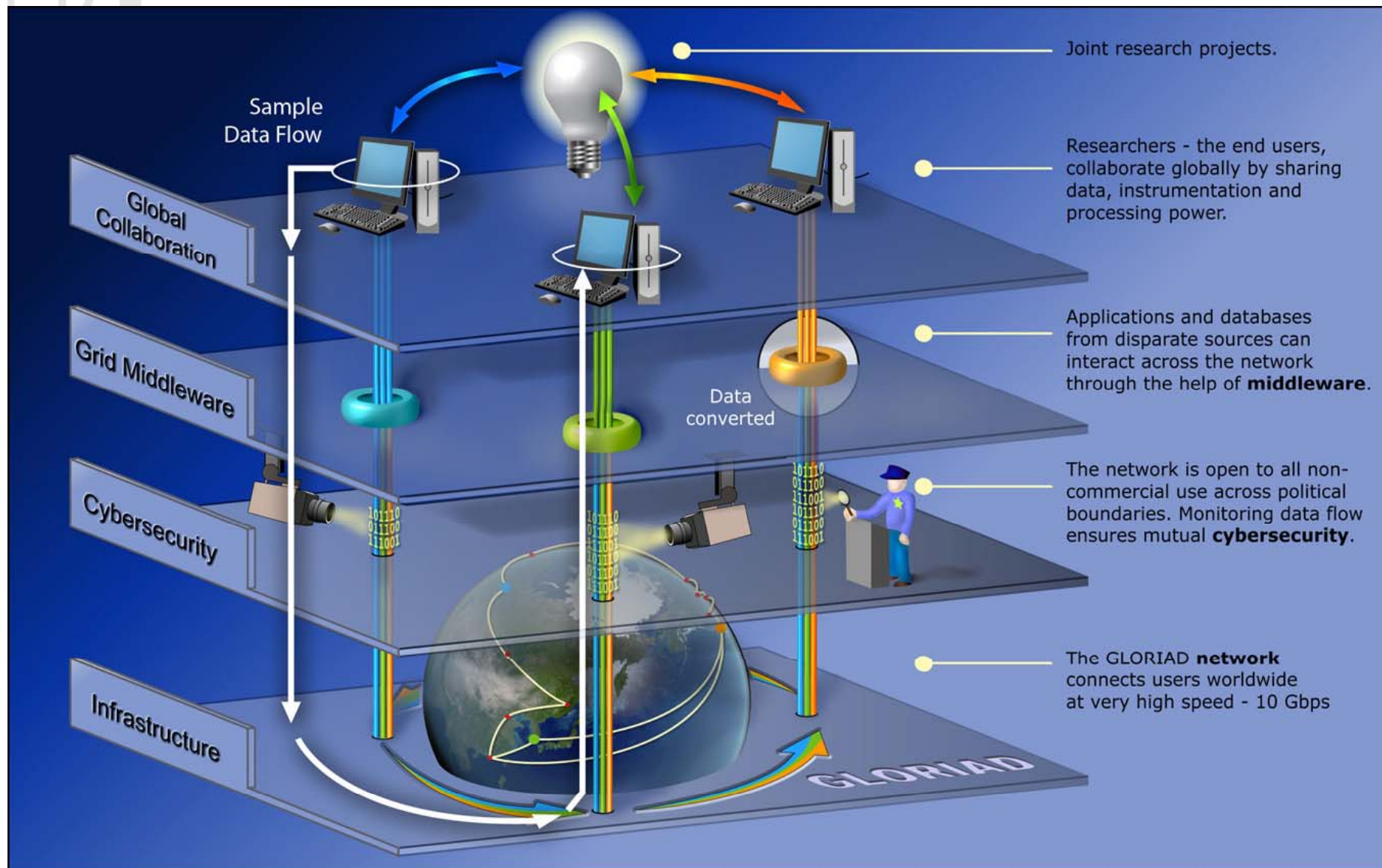


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Nordic infrastructure for Research & Education

# eVLBI Speed Trials





- Important Core user Communities:
  - HEP
  - Astronomy
- BUT we need to unleash the potential of:
  - Medical Science
  - Social Science
  - Oceanography
  - Agricultural Science
  - Atmospheric Science
  - Remote Lectures etc.
  - ..

- **Global Network Infrastructure**
  - Open – No artificial borders
  - High Capacity
  - On Demand (Low Threshold) - Cross Regional Provisioning
- **GRID**
  - Global Interoperability
  - Pluggable – Low usage threshold
- **Storage**
  - Pluggable – Low usage threshold
- **AAI**
  - Global Identities for Global Resources
  - DRM
- **Global Communication Outreach**
  - Virtual Video, Audio Conferencing & Presentation facilities



- 1 Recommendation:
  - eScience is not about technology. It's an attitude and way of exchanging knowledge and working together globally and virtually.
  - Programs must be in place to support this, not just for scientist and academic but starting in Primary and High School learning the next generations how to be a Citizen in the global village
- 2 Recommendation:
  - Secure funding for User Centric technology infrastructure within Networking, GRID, Storage and AAI.
  - Contribute these resources to other Globally Shared Resources to create virtual capabilities beyond what is achievable on local / institutional level.

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