NDGF view of networks

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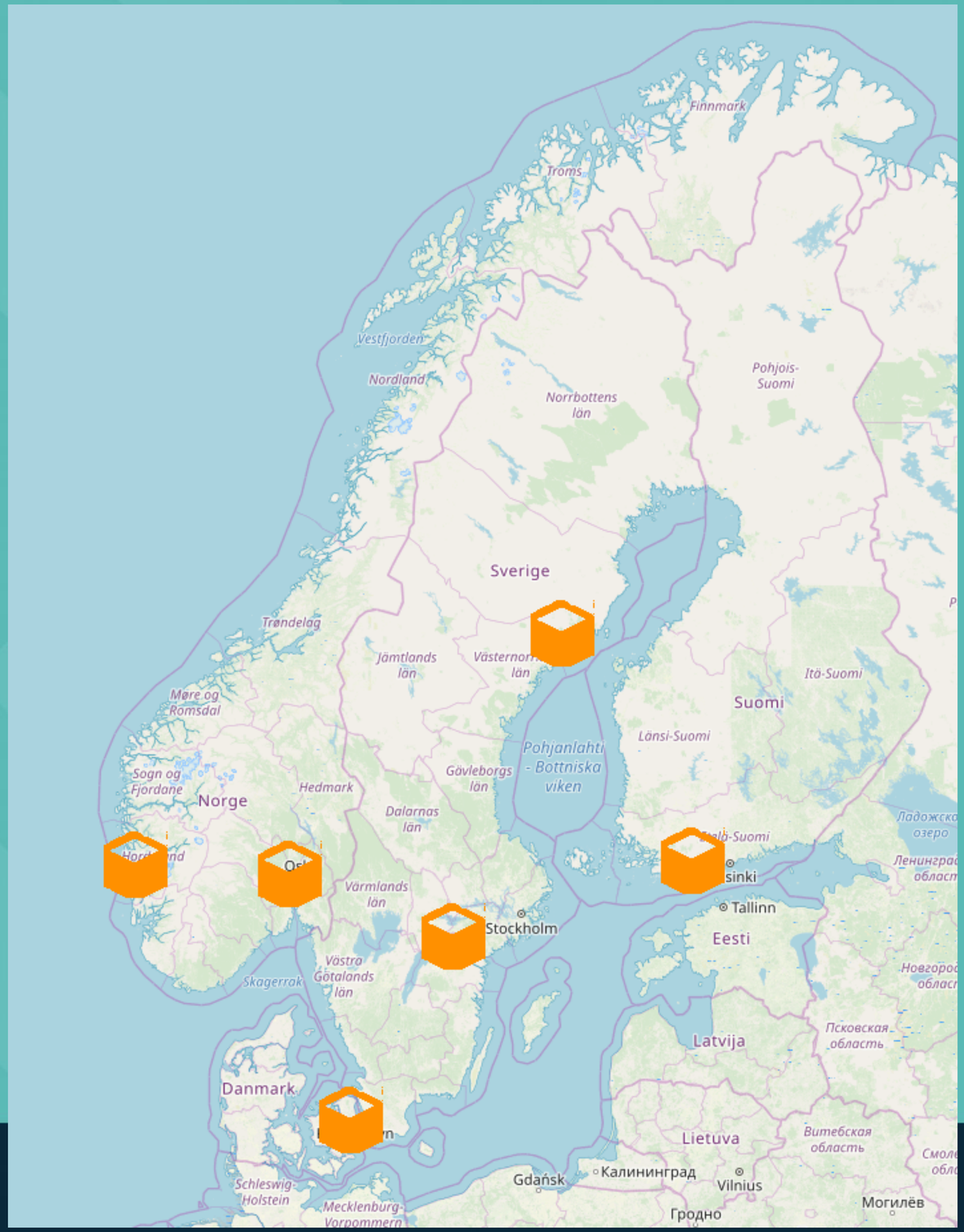
NORDIC E-INFRASTRUCTURE COLLABORATION

Overview

- The NDGF site
- Unique networking issues and demands

NDGF

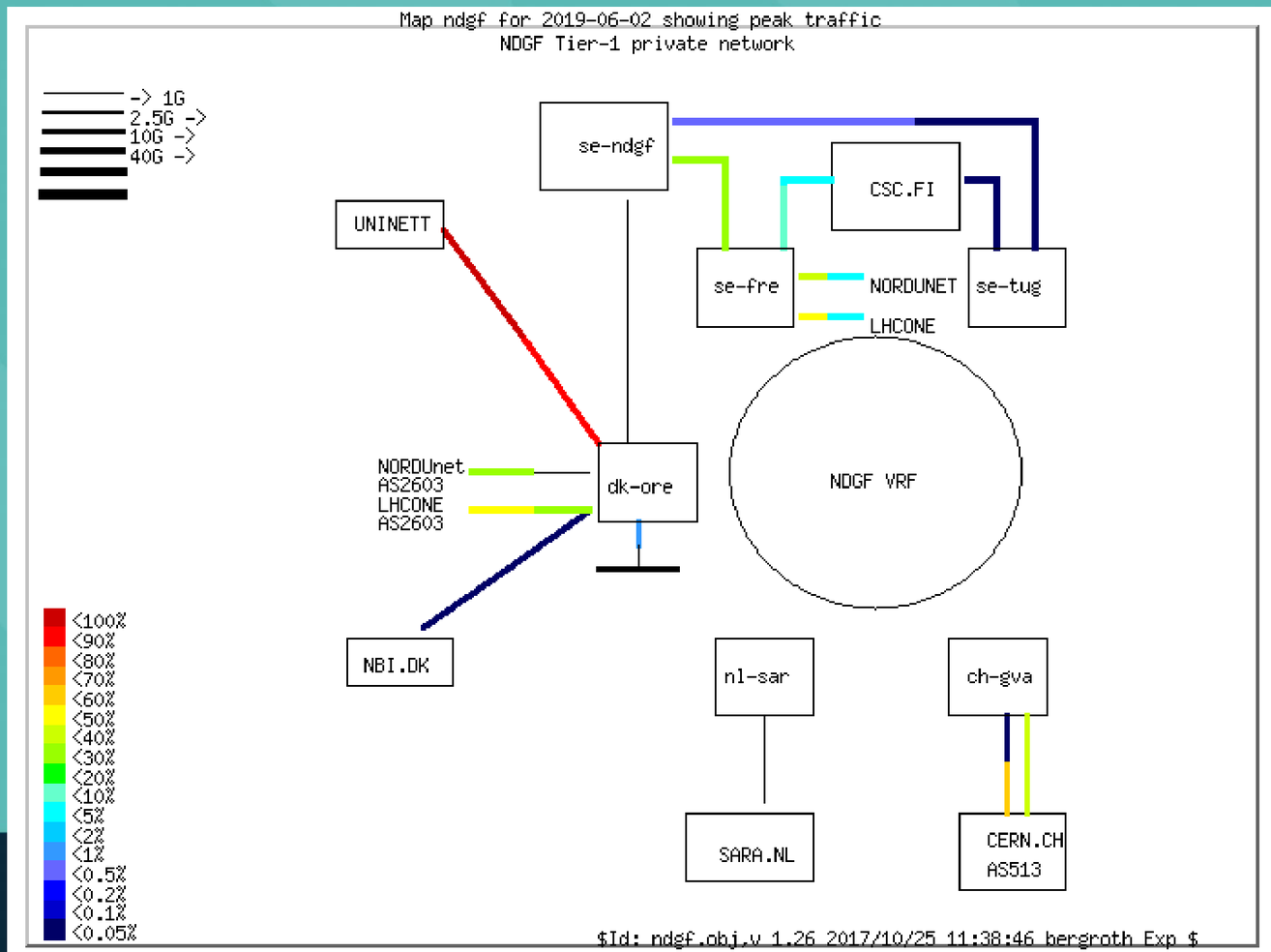
- A distributed Tier-1 site over 6 nordic cities
- Storage and computing at all sites
  - Plus storage in Slovenia
- Umeå-Copenhagen roughly same distance as Copenhagen-Geneva



SPEAKER | Mattias Wadenstein <maswan@ndgf.org>

NDGF Networking

- Internal networking from storage to compute is wide area networking
  - Provided by NORDUnet and the individual NRENs
  - Latency
  - Limited bandwidth
  - Upgrades takes time and many stakeholders
  - More expensive than a switch and some patch cables
  - But enables us to benefit from much competence and co-funding



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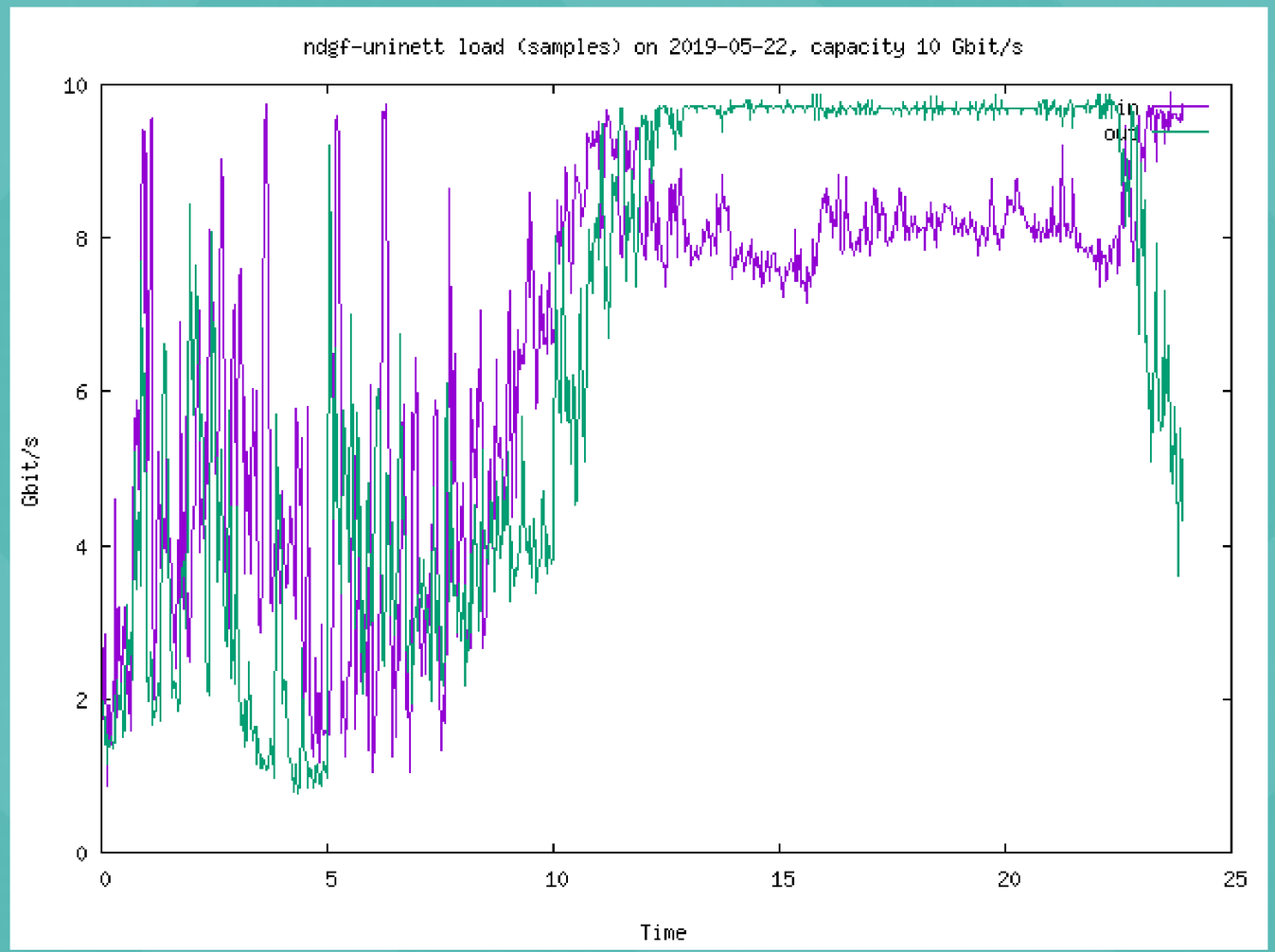
Networking concerns

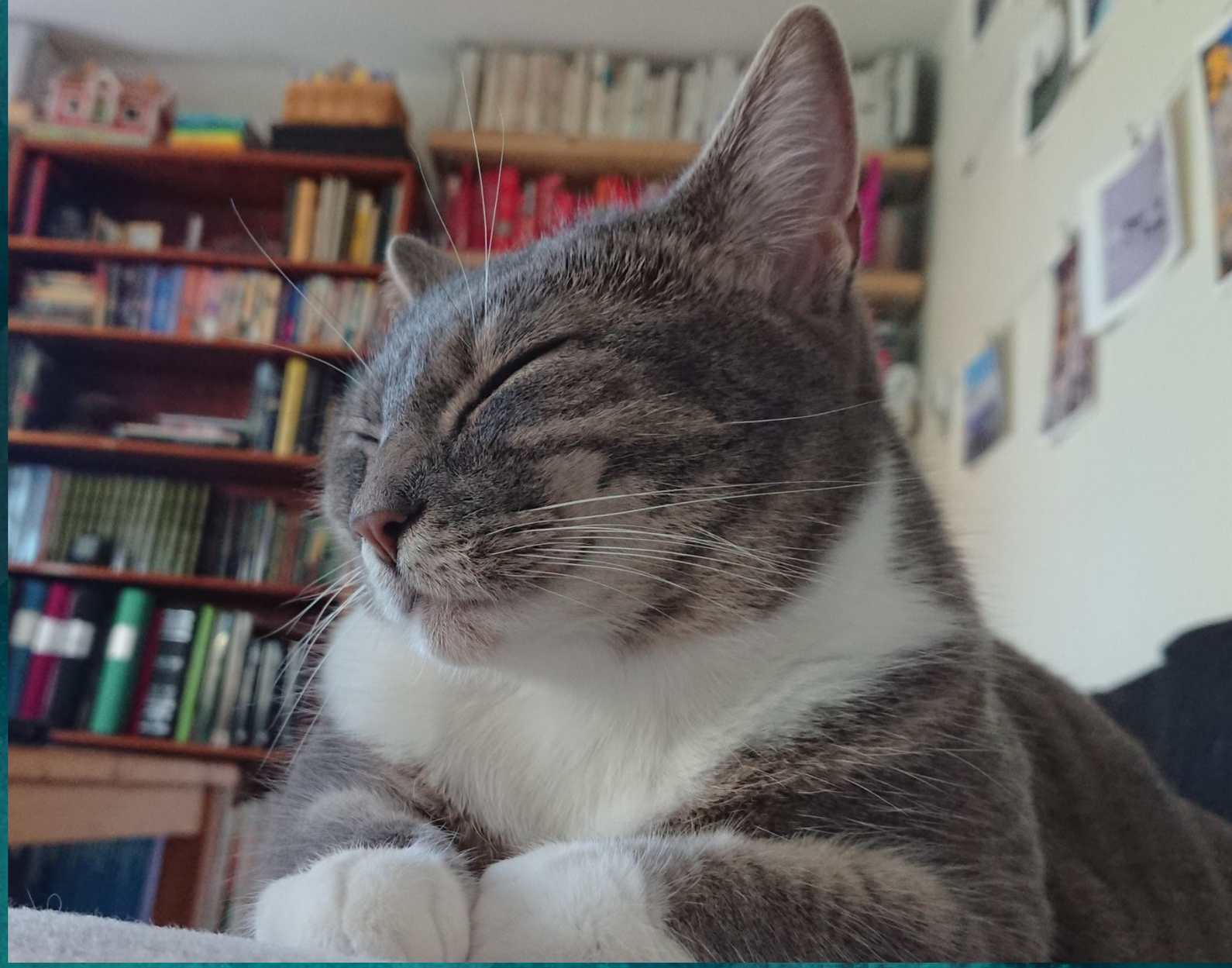
- Upgrades take a long time
  - The 10G links between all sites and the central router started to fill up in 2014
  - New design from NORDUnet in 2015
  - Half of the sites moved fairly quickly in 2016/2017
  - In 2018 the read and occasionally write throughput is clearly limited by saturated links to the remaining sites
  - 2019 NBI, Copenhagen University, DeIC, and NORDUnet manages to upgrade the Danish connection
  - The Norwegian sites “should” be upgraded “soon”
  - Slovenia stuck on 2x10G until ARNES upgrade next year

Networking concerns



Networking concerns

- International connectivity is pretty expensive
  - NORDUnet charges us at cost, but our “fair share” of for instance GEANT IP transit ends up a significant chunk of money
  - Unbounded traffic growth not realistic under flat or neat-flat budget if you have to pay for it
- The large diversity in network funding models might spell trouble
  - If networking is free for most sites, but storage is expensive, suboptimal choices might be made



Questions?

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