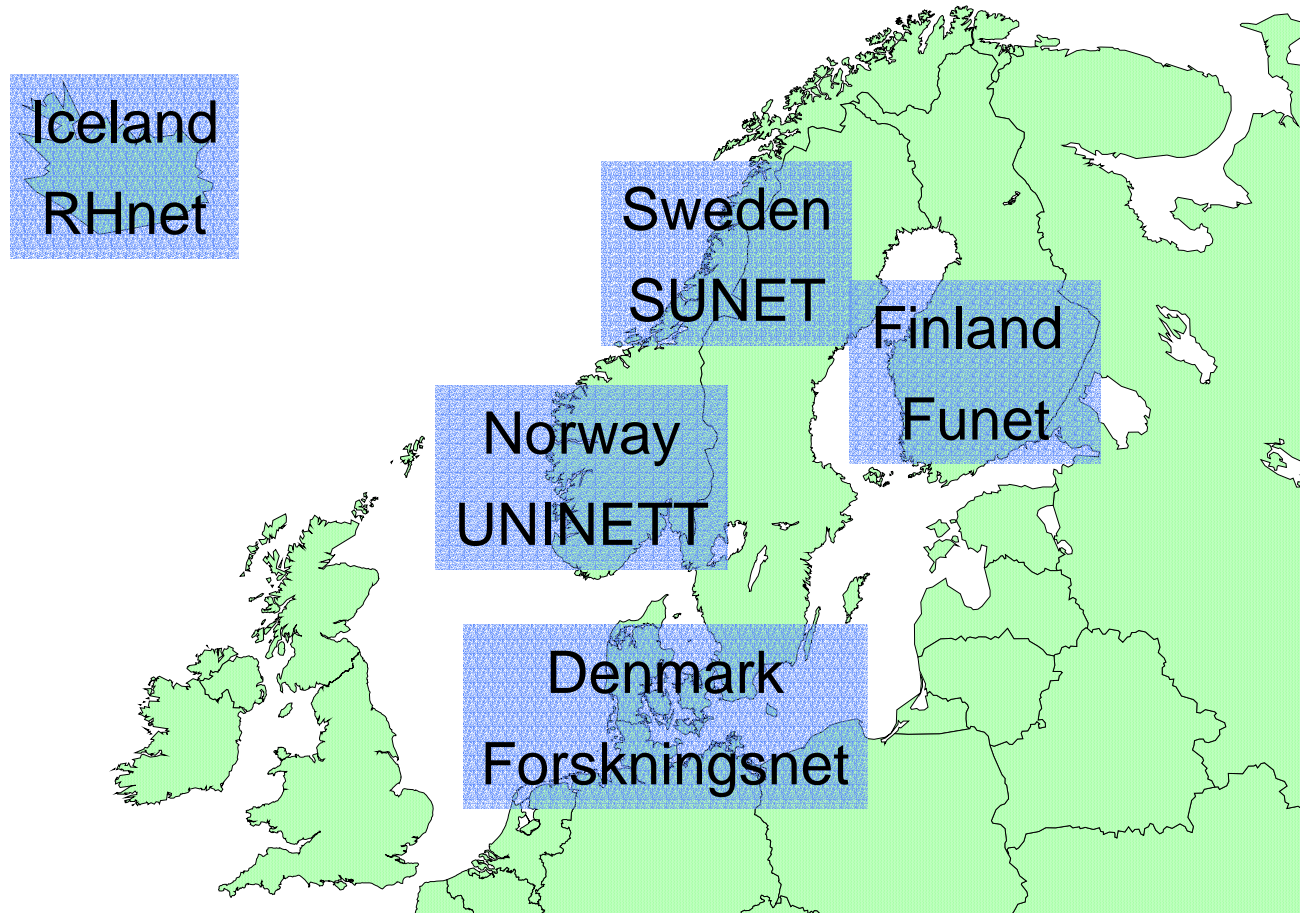


Networking for NDGF LHC Tier1

Lars Fischer, NORDUnet

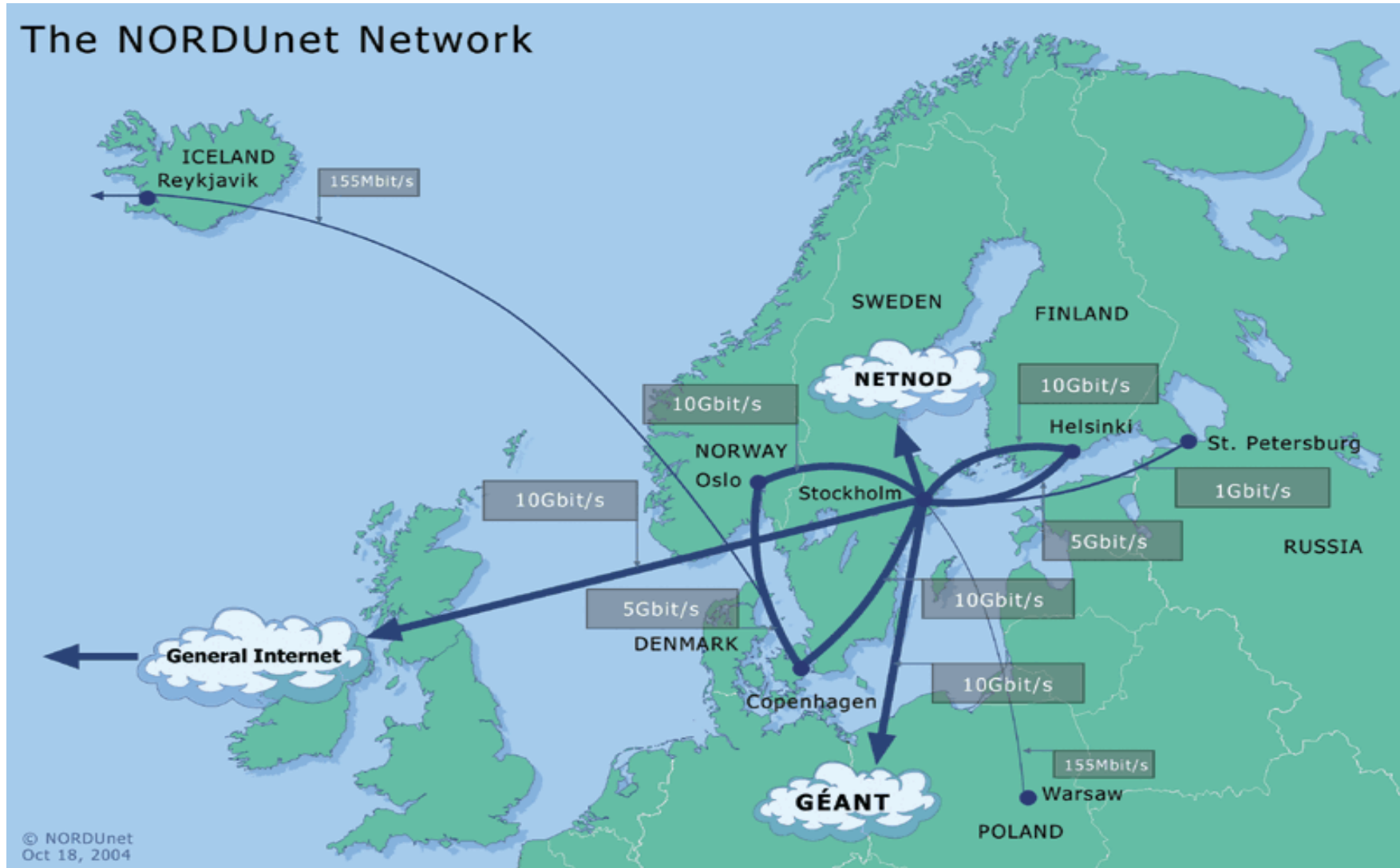
T0/T1 Network Meeting
19 July 2005

NORDUnet



NORDUnet IP network

The NORDUnet Network



NorthernLight

- Currently provides GbE links to Nordic Capitals and Amsterdam
- Connects to GLIF community via NetherLight exchange in Amsterdam
- Will Connect to GEANT2 lambda service in Copenhagen from December 2005



NORDUnet on Fiber

- NORDUnet is currently in the process of procuring fibre and DWDM equipment for a next generation NORDUnet network
- Network will provide OC192 / 10 GbE / 1 GbE service between Nordic capitals
- Interface to GEANT2 in Copenhagen (10 GbE / 1 GbE)
- NORDUnet IP service will remain as is (10G), but on OC192 circuits provided by own DWDM
- Expected service launch: July 2006
- Synchronized with efforts of Nordic NRENS (i.e., SUNET, Forskningsnet)

NDGF Tier-1

- Collaboration of Nordic research centres
 - Collaborates under NDGF (Nordic Data Grid Facility) umbrella
 - Each partner has local clusters, storage
 - Each partner connected to NREN (shared IP)
 - Dedicated network services (1 GbE / 10 GbE) will be available from NRENs in 2006.
- Currently three partners
 - PDC (Paraleldatacentrum), Stockholm, SE
 - NSC (National Supercomputing Centre), Linköping, SE
 - NBI (Niels Bohr Institute), Copenhagen, DK
- Additional partners expected
- Currently participating in SC3
- Status and more at <http://www.ndgf.org/sc/>

Interconnect NDGF T1 – T0/1 Network

- **Currently situation**
 - NORDUnet and NRENs shared IP for Inter-T1 traffic, NORDUnet and GEANT shared IP for T1 - CERN traffic
 - NRENs, NORDUnet, GEANT 10 Gbps, local access 1 Gbps (dedicated GbE)
 - Local networks 1 GbE
- **Short-term plans**
 - NorthernLight + SURFnet dedicated GbE to CERN for one of the sites, for experimental purposes - maybe during SC3, maybe during SC4
 - Possible upgrade of local access to 10 Gbps for some sites
- **Long-term plan (summer 2006 onwards)**
 - NORDUnet + NREN dedicated 10G links between sites (OPN)
 - GEANT2 dedicated 10G link between Copenhagen and CERN

Network for NDGF Tier-1 (**proposed**)

- OPN built on NORDUnet and NREN 10 GbE service
- Star network, centered in Copenhagen
 - (10G) links terminated on L2/L3 device on each site and on L2/L3 device at NORDUnet PoP in Copenhagen
 - 10G link from CERN (GEANT2) to terminate on central L2/L3 device at NORDUnet PoP in Copenhagen
 - Backup: considering direct (10G) link to European Tier-1
- OPN L2 and L3 Management, Security
 - NORDUnet Monitoring, Management tools (SNMP)
 - No Firewalls, minimal filtering at network level
 - Will co-operate with reasonable LHC requests
- Detailed design TBD
 - IP plan not decided (site-local prefixes used for SC3)
 - AS number, announcements not decided.
 - Equipment not yet selected

NDGF Network – from SC3 to Production

- Initial runs on Shared IP both between NDGF sites and towards CERN
 - Running now with good performance
- Experimentes with GbE dedicated links
 - fall 2005
- Detailed network design fall 2005
 - Routing, IP plan, general purpose internet connections, site interfaces, equipment
 - Phased design
- Dedicated link Copenhagen - CERN, Shared IP between sites
 - spring 2006
- Implementation of NDGF OPN fall 2006
 - Phased implementation

Thank You

