

CTO Forum - 15 January 2018

Logistics

- date: 15.01.2018
- time: 10:00 - 17:00 CET
- venue: NORDUnet office Kastrup (tentative)
- VC room for remote participation:
<https://nordunet.zoom.us/j/8804330816> or see below agenda for other options
- Joint dinner w/ Nordic Optical Forum at 19:00

Restaurant Cap Horn

Nyhavn 21

1051 København K

Agenda

1. NORDUnet NGN
 - a. NORDUnet ideas - LLB, JQ
 - b. Requirements, wishes, ideas
 - i. SUNET
 - ii. UNINETT
 - iii. FUNET
 - iv. DelC
 - v. RHnet
 - c. Open Discussion
2. GN4-3 Idea process (if time allows)

Participants

- NDN: Lars Lange Bjørn, Jørgen Qvist, Lars Fischer
- SUNET: Per Nihlén, Börje Josefson, Valter Nordh (video)
- UNINETT: Vidar Faltinsen, Olaf Schjelderup, Kurosh Bozorgebrahimi, Havard Eidnes, Frode Storvik
- FUNET: Teemu Kiviniemi, Harri Kuusisto
- DelC: Martin Bech
- RHnet: Jón Ingi Einarsson (Video)

Notes

Presentations can be found here..... <https://nordunet.box.com/s/a9nm5uk48suhzl22mw28906yk4y783na>

- Presentation by LLB
 - NDN network high-level objectives
 - Current situation, issues, actions
 - Plans for 2018-2021 period. PN: FUNET then only on a single optical connection + 1x100G. TK: not entirely happy, looking for options
 - Short term objectives: OSL-CPH reroute, additional resilience w/ HEL-HAM, 100G version of Tundra.
 - Review of fibre and spectrum options beyond 2021, incl. GÉANT
 - Example topology scenarios / options
 - Technology trends.
 - PN: supporting Open Line Systems should be a requirement for any new network build.
 - LLB: technology vendors all build to support cloud / content centre providers.
 - LLB reports on NDN 200G / DCI trials. There has also been trials in GN4-2, at UNINETT, etc. Additional reports at the Optical Networking Forum meeting tomorrow.
 - LLB: the major change is that we can be, and will have to be, more Agile.
 - Review of South Core status and value. Geneva links upgraded to spectrum.
 - LLB: This was easy, PSNC & SURFnet know how to do this.
 - There is movement to "unify" the fibre footprint for north-west Europe, including GÉANT.
 - PN: In that case, then what is the value of NDN having fibre in Europe? Should we move back to using GÉANT.
 - LF: the important point is to move to sharing resources. Who should own is something we can discuss both strategically and in terms of cost to NORDUnet.
 - GÉANT decision of DCI box is "soon". The tender is done under the PRISM framework, which mean NDN can buy from it if we want.
 - KB: what is the ideal time for an IRU. All: it depends.
- FUNET
 - FUNET require dual optical paths out of HEL. If one Telenor link go away, FUNET want to see something to replace it. Option: Finish state own two fibre pairs i C-Lion cable.
 - FUNET require N+1 country redundancy, interested in N+2
 - FUNET may have a need for pure optical links for non-IP applications
 - FUNET would like to see a breakout in Mariehamn
 - FUNET is interested in additional Tundra links
 - FUNET fully support evolution of Baltic Ring

- FUNET require NDN to provide connectivity at much lower cost than before, without sacrificing quality or foregoing "unlimited capacity". Option: NDN could dramatically reduce optical footprint in the Nordic area, use national optical footprint.
 - Suggested scope: outside the Nordics: peering, IP transit, NREN connectivity. Nordic: high capacity MPLS/IP + coordination of Nordic optical infra. Suggested optical scope: Iceland, DK to EU, HEL-HAM, HEL-Baltic. Everything else on federated NREN optical platform.
 - Federation require coordination of channel use etc across on Nordic networks and end-to-end cross-border lambdas. There must be information sharing and joint planning, and there must be federated operations. Doing the federated approach will imply some limitations on the freedom to plan for each network (how much a restriction will have to be understood). LF: Internet2 and US regional networks have started a "joint planning process" to investigate a similar option. TK: It requires commitments from all. NREN may commit spectrum to joining Nordic / NORDUnet use for network builds and / or swaps. TK: Such spectrum should be committed "for free" / as in-kind contribution.
 - Role of NDN: 1) Global IP / research network connectivity 2) network broker & coordinator.
 - FUNET is prepared to contribute a fixed portion of spectrum of its fibre footprint.
 - PN: ditto SUNET.
 - JQ: we probably can't have a model that works for everyone day one.
 - PN: agree, but we should have a model.
 - LLB: how important are time-sync and similar applications. LF: we should have a commitment to support research applications that require spectrum as open line systems, and we should expect advanced research applications to adhere to that.
 - JQ: one outcome of the current process should be to define minimum requirements.
 - JQ: at the end of the day, this comes back to a cost and organizational evaluation.
 - TK: we should do scenario evaluations for this and other options.
- UNINETT: New fibre initiatives
 - Options / ongoing projects
 - Tampnet: Extensive North Sea fibre footprint. Some questions about support for coherent on (old) fibre
 - Skagenfiber: Two new DK-NO fibre fibres. Expected go-live summer 2019.
 - Midgaardsormen: 8 fibre pairs. Need to sell two more to start projects. There's tentative plans for a "nordic fibre" on this infrastructure. Status is unknown. There's some NO state budget for supporting initiatives like this.
 - Arctic Connect - initiative by Troms fylke, to connect NO, FI, RU, JP. Cenia is driving for this to get from Europe through HEL & Kirkenes and onwards to Asia.
 - Borealis (secret, details to come)
 - Idea to promote: north atlantic ring (NO - Svalbard - Jan Meyen - Iceland - FO - NO)
 - There might in the future be far more NO CBFs with SE & FI. LF: if we think of Nordic spectrum as a joint resource, NRENs will ultimately think in terms of joint network resources, not borders, when planning.
 - PN: Östersund - Trondheim is a good example.
 - JQ: There's some low-hanging fruit.
 - Vidar: Svalbard is important for global research. NORDUnet should push for connectivity.
 - Vidar: caching / storage may be critical. Ditto latency.
 - JQ: there's a clear link to PRP.
- UNINETT
 - Reducing overall line cost is critical. Increasing use of NREN fibre is critical. This means closer collaboration and joint engineering is a must.
 - UNINETT require improvements to overall topology.
 - For IP, should there be direct NREN-NREN peering? Or should we extend the NDN footprint to cover many more Nordic sites? PN: NDN IP is there to support transit. Or do restrict NDN IP to the capitals.
 - BJ: we should be flexible and put routers where it makes sense to us.
 - TK: if we have a federated optical footprint, we can be more flexible.
 - MB: we should optimize wherever possible to reduce latency. Implementation can be flexible.
 - BJ: in the end, NDN can be just the backup route between UNINETT and SUNET.
- SUNET
 - BJ supports the general points made by VF and TK
 - Target design: make sure all NRENs can withstand *at least* one segmentation fault, each NREN to have at least one way out that does not traverse others, have overlapping infra, make GÉANT adopt similar policy.
 - Principle: If both endpoints is in Fennoscandia, make it NREN business. If one endpoint is outside Fennoscandia, make it NDN business
 - SUNET "Oslo project" - increasing resiliency and reducing latency for both SUNET and UNINETT.
 - Suggesting a "ladder design" for NO / SE / FI CBFs, to avoid impact of segmentation errors. Meets all the four requirements listed.
 - Example: extra FI-SE sub-sea link. Provides segmentation protection, multiple routes out of FI, direct NO-FI links, etc.
 - Overview of multiple CBF options for the ladder approach.
- DeIC
 - Additions to fibre footprints (Frederikshavn, Skagen).
 - Ambition to have 3 paths to each site.
 - Possible mutual backup path w/ DFN (Flensburg), SUNET+DFN (Bornholm).
 - Faroe Island, Greenland. Moving up priority.
 - DeIC support a NDN router in Jutland. Costly, but longterm good for RTT & resilience, for both DK and NO.
 - If it can be achieved on NREN (DeIC) infra, it should be. We should do this for financial reasons, but also to strengthen collaboration, drive open standards, being a showcase for the rest of the world
 - SLA is not really a problem (If it's OK for NREN 1, it probably good for NREN 2)
 - NDN is essential for inter-NREN connections and for international connections, coordination, operational attention, etc
 - Remember that every cost sharing model create incentives. We should be sure to extrapolate effects.
 - PN: realistically, we can't see 5 years into the future, We should be prepared to re-plan and re-do agreements.
 - JQ: so far the NDN BoD has "no appetite" for taking cost of national investment.
- Discussion
 - Draft Agenda for 6-7 Feb
 - Summary of NREN Req
 - NREN round
 - JQ summary
 - Long-Term Vision
 - Scalability
 - N+2(3)
 - Federated networks
 - Reuse, joint spectrum

- collaborative network planning
 - Northern gravity, global networking
 - organizational implications
 - High-Level Design Principles and Criteria
 - Why, not how
 - list of high-level objectives (BJ slides)
 - Collaborative networking, simple cost sharing, contributions to spectrum commons
 - Topology Scenarios
 - Ladder model
 - current network on CBF
 - LLB proposal
 - ...
 - 1-3 year steps / cost
 - 5 year steps / cost
 - 10 year steps / cost
- Net Steps
 - Follow-up meeting: 2 March, 9:30 - 14:30.

You are invited to a Video Conference meeting by Jørgen Qvist, NORDUnet

Join meeting using Zoom

Meeting ID: 880 433 0816

Join from PC, Mac, Linux, iOS or Android: <https://nordunet.zoom.us/j/8804330816>

Or iPhone one-tap (US Toll): +14086380968,8804330816# or +16465588656,8804330816#

Or Telephone:

Dial: +1 408 638 0968 (US Toll) or +1 646 558 8656 (US Toll)

+358 800 102 188 (Finland Toll Free)

Meeting ID: 880 433 0816

International numbers available: https://nordunet.zoom.us/join?m=s4B8oYHq_xJHPPIoB-nK123DPme5Ano6

Or a H.323/SIP room system:

H.323: 109.105.112.236

Meeting ID: 880 433 0816

SIP: 8804330816@109.105.112.236

Note: Mobile Apps is available on Apple app store and Google Play.

Notes

Actions