

To: KAREN Architecture Working Group, Steve Cotter (REANNZ), Tim Chaffe (ITS)

A brief report from Trondheim, where I've spent the last six weeks doing research work at UNINETT. UNINETT is the Norwegian equivalent of KAREN. Except that UNINETT got started before they had a REN - so UNINETT was set up to support networking for all the Norwegian Universities and Colleges. Here are a few topics to consider:

1. They started in the early 1990s as a purchasing group, buying network equipment, and evolved from there as the people who build, operate, monitor and develop the Norwegian REN. Just after the dot com crash (early 200s) they were considering moving to a dark fibre backbone. They didn't do it - instead they found a service provider who had laid lots of fibre, and was willing to work with them in a co-operation agreement. The idea was that instead of simply buying IRUs, and having to buy and operate all the fibre multiplexing gear themselves, they simply buy capacity. They did this by running a special tender, asking simply for capacity (along with shared access to fibre, repeaters and multiplexing gear), making the clear statement that they would not attempt to onsell such capacity. It seems to have worked well for them - they say they've saved lots of money - maybe we could do something similar?
2. Concerning 40 vs 100 Gb/s on fibre: they feel that 100 Gb/s is definitely the way to go now, and are running experiments with Cisco gear on one of their long-haul routes.
3. UNINETT, alas, have no interest in user-requested lightpaths. Their attitude is "we have lots of bandwidth available, it doesn't take us long to configure a lightpath when some research group needs it." They concede that of course that only works well when you're setting up paths within your own network, it's just something they haven't yet felt a need for. They do agree that something like OpenFlow could be useful for creating paths with specified QoS in a congested network, but, well, they don't have that situation.
4. Network monitoring. UNINETT have produced an elaborate network management package call NAV, "Network Administration Visualized." It's Open Source, and available for free. If you don't already have a monitoring package, it's definitely worth a look.
5. One of their current research projects is PerfSONAR NC. In their opinion, lots of different organisations around the world's RENs have set up PerfSONAR Measurement Archives (MA), but those all have different internal architectures, which makes it difficult to create tools to download and visualise the data from them. Arne Oslebo here has created a new version of PerfSONAR that uses the IETF netconf Working Group's methods of accessing data - he finds netconf provides a much faster way to get measurement data, and is currently working on a generalised GUI interface to PerfSONAR MAs. I think we should work towards creating an MA for KAREN network data (once Arne releases the source code for PerfSONAR NC).
6. Best Practice Documents. They did these over about five years, so that the small Colleges could share the experience of the big Universities. After that, TERENA picked up on the idea, so now UNINETT are leading a European project to extend the series to cover different countries, and to produce English-language versions. The URL is <http://www.terena.org/activities/campus-bp/index.ph>

If you have any questions about any of the above, I now have good contacts to answer them.

Nevil Brownlee, 1 March 2012