

Next Generation Broadband in Ireland – A response from HEAnet to ComReg discussion document 09/56

Section 2: Next Generation Broadband – What is it and why does it matter?

Question 1: What speeds and other quality of service parameters will be demanded by businesses and consumers over the next 3 to 5 years? Please explain your reasoning. Do you believe the market itself will deliver these capabilities, and within what timeframe?

HEAnet, based on our work with other leading European and world-wide research networks, is convinced that **future telecom services in Ireland must be underpinned by a fibre-optic based open-access infrastructure**. This would provide the optimum platform where available leading to effectively unlimited bandwidth.

Our client base of 50+ education/research institutions is connected via Ethernet links at capacities of 100Mbps, 1Gbps and 10Gbps; so far, one is at the top end of the scale, with others to be upgraded soon. Total access capacity of all institutions has been doubling approximately every year since records began, and there has been no reduction in this rate of late. On that basis, we anticipate access capacity at 100Gbps within three years.

Within the HEAnet network, we sometimes physically separate functionally different types of traffic. In general, traffic associated with the “education” function of the network is aggregated as being due to many thousands of moderate streams of data. By contrast, some research users need high capacity point-to-point links for specialist applications. These might include the interoperation of distributed but tightly coupled high-performance computing and storage systems. For such users, we offer dedicated point-to-point circuits, originally at 1Gbps, but more recently at 10Gbps. This type of capacity is not yet available commercially.

The demand for data storage has escalated significantly in recent years. One project group, e-INIS, has hundreds of Terabytes of storage around the network. These and other strategic resources must be accessible at high bandwidth and low latency.

We see increasing demand, from institutions big and small, for greater availability and consequently for more resilience in the access network, as well as in the core. Typical SLA values are currently 99.9% uptime, but we will be moving to 99.99% for some clients. These levels of performance and availability are currently not available to government and the private enterprise sectors.

Aggregation is important for the schools network, which is operated by HEAnet. To connect all 4000 schools in the country, a range of providers - and of technologies - is required. Traffic from seven access providers must be aggregated for internal and onward connectivity and, crucially, for uniform and guaranteed implementation of the security policy of the Department of Education and Science. Without full central filtering, it would be extremely difficult and costly to manage this policy. Equally, the market is not yet in a position to deliver the requisite 25Mbps per primary school and 100Mbps for secondary schools; we are only in a position to rollout the de facto range of 2Mbps to 7Mbps in the access network.

Question 2: Do you agree that NGB network deployments can provide a socioeconomic benefit? If so, who are likely to be the greatest beneficiaries and why? Should the policy framework explicitly favour the development of NGB in Ireland, and with what specific socio-economic goals in mind?

Yes. In recent years, our NBE (National Backbone Extension) programme has helped to connect many off-campus sites and affiliates to HEIs. In several cases, this has entailed the deployment of broadband infrastructure in remote regions. The result is that many outlying facilities are now integrated with campus IT and e-learning services; this has had a significant impact in terms of outreach and inclusion.

A specific case has been the off-campus sites of several of our academic institutions in West Galway and Clare. These include academic centres of learning, resource centres, and research stations (both manned and unmanned). The requisite circuits were not available from the market, so HEAnet, on behalf of its clients and Udarás na Gaeltachta together funded the construction of a high-speed (NxSTM-1) wireless network. This now serves off-campus sites in Galway and Clare, fully integrating them within the campus LAN service and support infrastructure.

In many ways, the western wireless research and education network resembles California's high-performance wireless research and education network (HPWREN - see <http://hpwren.ucsd.edu>) in terms of genesis, function and capacity. Both were built and designed by the academic community in default of market availability, both are funded by the research/education budgets, and both have STM-1 capacities.

HPWREN topology, August 2008

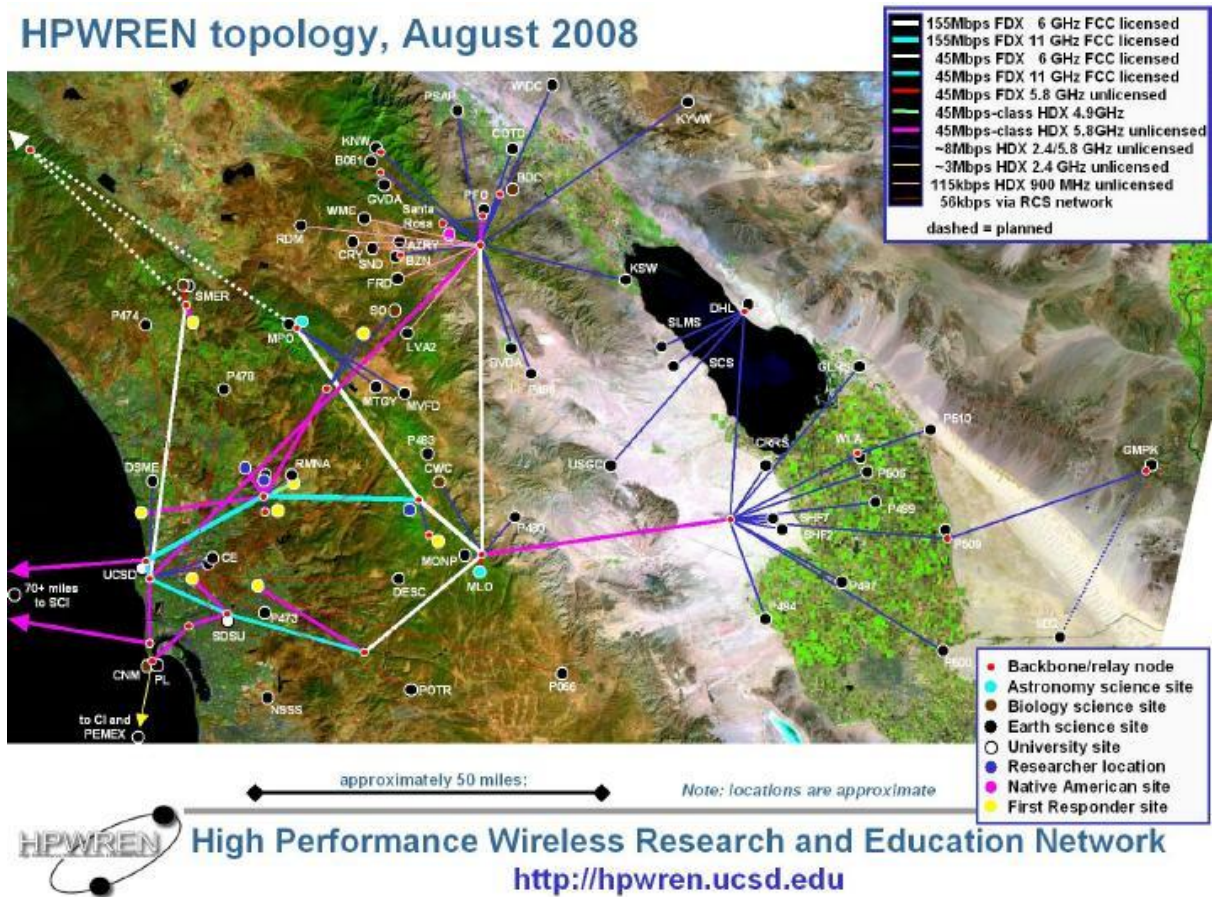


Fig 1. HPWREN, California, USA

This network has helped to rectify the digital gradient somewhat in this part of the country. Market forces were not sufficient to provide the necessary infrastructure, whereas HEAnet and Udarás na Gaeltachta were able to deliver on this particular socio-economic objective.

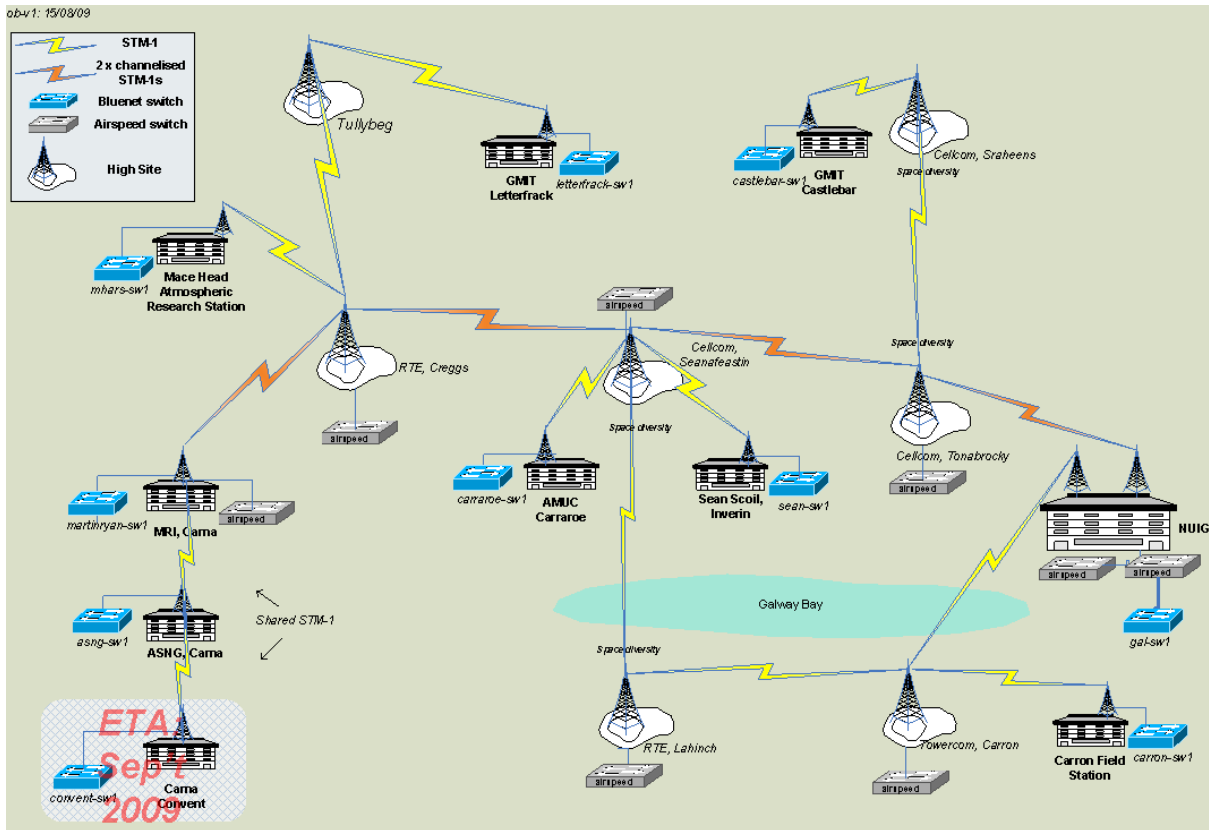


Fig 2. HEAnet' wireless network in Galway and Clare

Section 3: Broadband Developments in Ireland

Question 3: How important will cross-platform competition be to the development of NGB Networks? Do you consider that all broadband platforms are capable of supporting NGB? In what circumstances might some such platforms be more suitable than others in providing timely and efficient NGB?

For fixed broadband to business, to the institution and to the home, our preference has been for fibre connections. By virtue of its capacity, and more significantly, because of the capabilities of optical transmission technology, **dark fibre is far ahead of other technologies in the scale and scope of services it can deliver.** This has been recognised most recently in Australia, where the federal government has taken the initiative to build a nationwide fibre network at a cost of 25 billion euro – see <http://www.guardian.co.uk/world/2009/apr/07/broadband-internet-australia>

Wireless technologies offer alternatives in many locations for point-to-point circuits. They also enable, in one-to-many mode, the basics of ubiquity and mobility. Our

experience with satellite confirms that it **does not meet the requirements for next generation broadband**. Long latency is perhaps the most salient of its shortcomings, but it is not the only one.

Even without satellite technology, there is scope for healthy intra- and cross-platform competition. However, conformance with agreed standards and metrics is important, so that choice is real and inter-operability is not an issue.

Question 4: Do you consider that substantial (both in cost and coverage terms) private sector led investment in the development of NGB networks is likely over the next 3-5 years? If not, and should a gap occur in comparison to other European countries, what will be needed to encourage such private sector investment in Ireland?

By itself, the private sector has not provided the requisite investment on a national scale, and regardless of the current climate it is unlikely that the business case will exist in the foreseeable future, in the private telecom sector.

Our own experience with the schools network has shown the need for structural initiatives. Due to lack of investment, there were large gaps in the physical infrastructure. This led to a predominance in numerical terms of satellite connections in the first phase, and this was a frustration for many and an inhibitor of uptake and progress in primary schools in particular. Access to fibre-optic based infrastructure on a scale needed for our higher education and research networking, and indeed for the development of NGB networks, is limited in the current market and this situation is unlikely to improve if we must rely on private sector led investment.

The practice of public-private partnership (PPP) has potential for the next generation broadband. It has had significant impact on the roads infrastructure, in cases where it was well planned and managed. Tax reductions and other incentives also have a role to play. The Australian initiative (see above and see also <http://www.guardian.co.uk/world/2009/apr/07/broadband-internet-australia>) of state development followed at a later stage by selling assets to the commercial sector, should also be borne in mind.

Section 4: International Approaches on Next Generation Broadband

Question 5: In what circumstances would any of the above (or other) approaches be appropriate in stimulating NGB roll-out in Ireland? How might such interventions safeguard the development of competition?

It is not clear that deference to competition is not carried too far in some cases, to the detriment of the development of NGB services. At a national level, for instance, utilities such as ESB, CIE and An Bord Gais have been used by the State and by the private sector to leverage the rollout of dark fibre at a macro level. At a metro level, the State's franchise has been used to deploy dark fibre in certain urban areas. More generally, though, local authorities, which have the greatest domestic ubiquity, have been reluctant to take any meaningful initiative here.

It would seem entirely appropriate for the State to intervene as it has successfully done in the instances above, since Ireland as a whole would be the beneficiary in terms of the economy, foreign direct investment, education and Ireland's reputation of having the fibre based infrastructure to delivery the ICT needs for a modern economy.

The open access approach could extend the remit of e-Net to roll out fibre to pass a target percentage of homes. Moreover, at a national level, there is already demand for managed services from e-Net to include backhaul and interconnection of the MANs. At the same time, uptake must also be incentivised at consumer and provider levels.

There needs to be a change in position with the configuration of the previous incumbent as the operator with significant market power (SMP), if we are to improve competition in the marketplace. This should be functionally split into wholesale and retail operations, so that wholesale fibre will be more readily available nationwide in the commercial market.

Section 5: Next Generation Broadband Enablers and Inhibitors

Question 6: Do you consider that the issues identified are the main enablers and inhibitors of NGB developments or are other issues of greater relevance? Who are the key stakeholders who might be in a position to influence these issues and how might they best do so?

The enablers and inhibitors identified in the discussion paper are indeed salient. We would see geography or demography – however one wants to consider it – as a major inhibitor. The lack of business cases in many areas adds to the digital

gradient. Existing and new methods of encouraging private sector investment are needed.

Other drivers to be considered, such as:

- HEAnet, as the national education and research network, has been central to network research and development in the past decade. It has delivered gigabit service to its member institutions around the country, and has helped to stimulate the Internet market. This role needs to be sustained as the new broadband evolves.
- Cloud computing and storage, as enablers of low entry cost and scaled access to IT resources for domestic and business markets
- Developments such as e-goods and e-services, use of sustainable power and cooling, reduction of greenhouse gas emissions through teleworking and videoconferencing can provide synergies and drive the green agenda.
- There are barriers due to market segmentation, product differentiation, and the lack of trust model for recognised authentication. The need to consider single sign-on, with a scalable model for federated access, must be considered, and with it the area of identity management.

Key stakeholders in the years ahead will continue to be ComReg itself, as well as the Department of Communications, Energy and Natural Resources, IBEC-TIF as the collective voice of the industry, INEX on the operational side, and the government as a whole, which as stated, would be a key beneficiary.

Section 6: The Role of Regulation in Facilitating Next Generation Broadband Development in the Irish Market

Question 7: Are the areas identified the relevant tools available to ComReg for accelerating NGB investment in Ireland, or could other regulatory levers be as or more effective? What might be the impact of these activities on both the level and timing of NGB developments?

The role of ComReg is a positive and important one. It has seen the importance of communicating with industry. Closer and more interactive cooperation with the market should be developed, in addition to the more formal channels of publishing position papers and inviting input. For instance, focussed workshops with TIF would provide a one-to-many channel that could leverage the collective expertise of the industry.

Question 8: Do you see a role for collaborative industry approaches in seeking to agree wholesale models for open access to SMP operator NGB networks? Will infrastructure sharing be critical for early deployment of NGB in Ireland? What do you see as being the appropriate regulatory response in such circumstances, particularly in light of the need to promote effective competition, innovation and incentivise investment?

Yes, there is a role for collaborative industry approaches in operational terms. And yes, sharing of infrastructure will be a vital part of the equation. We would iterate the need to give effective recognition to the two separate functions of the SMP, and thus enabling to give the market access to national infrastructure.

Question 9: What role has the regulation of investment incentives such as wholesale pricing to play in stimulating the development of NGB networks?

This is a very important to optimising the market for technological advance. It is all the more important in a small country like Ireland, where the telecoms industry is more exposed to external forces with different agendas than NGB in Ireland. The European Commission can sometimes manifest itself as such an external force, and we need to make sure that their rulings make sense in the Irish context.

Question 10: Is there a case for allowing a differentiated regulated rate of return for Eircom in relation to risky NGA investments, and would this in fact be effective in encouraging early and widespread development of NGB fixed line networks?

There is a case, provided Eircom functions are separated, and their wholesale and retail operations are split.

31st August 2009