PLG response to OFCOM: Future broadband - policy approach to Next Generation Access

November 2007

Introduction

The Photonics Leadership Group (PLG) is pleased to have this opportunity to respond to the Ofcom NGA consultation

The PLG is an industry-led group representing the photonics industry in the UK and having a membership composed of leading industrial companies, academic institutions and government.

The UK has been at the forefront of optical communications technologies since their initial invention here and roll-out in the core network over thirty years ago. The photonics industry in the UK remains strong and collectively believes that it is of critical importance to the future of the UK economy that the UK has a broadband access network capable of delivering the sort of services that are presently constrained by access network limitations. Without such a network it is felt that the UK will not be able to maintain its position as one of the world's most developed economies. It is for this reason that we fully support all measures that will lead to the rapid deployment of a broadband access network capable of delivering at least 1Gbps per connection at the time of initial installation, with an upgrade capability to 10Gbps as demand develops.

It is important to understand that the drivers of demand for bandwidth are unlikely to be simply a few high-speed services (although next-generation High Definition TV is being trialled in Japan that runs at 225Mbps even in its compressed form). Rather, the demand comes from an aggregation of many services running simultaneously over the network. Some of these services will place critical performance requirements on the network such as that required for low-jitter in video services and low packet-loss for Voice over IP. Detailed experience and research at the network proving level shows that much more raw bandwidth is required to meet these specifications that is at first apparent.

The capability to deliver these speeds in an economic fashion is available now and, given that even in the most optimistic scenario, the NGA network will not be available for several years, it is important to project forward both the demand and the supply-side capabilities and not to install systems that will be out-of-date almost before they come into use

In fact, since the cost of deployment is dominated by the civil engineering, the backhaul and the service provision, the cost differential in using the latest technologies in the high-speed physical layer is small. In this case the question that should be asked is " why would you want to artificially constrain bandwidth to 100s of Mbps when Gigabits are available?"

Answers to specific Ofcom consultation questions

Q1 *When do you consider it would be timely and efficient for next generation access investment to take place?*
As soon as possible. Any 'knowledge based economy' is fundamentally dependent on the infrastructure underpinning it. Data traffic and demand for bandwidth have historically been

increasing by between 50 and 100% per year and there is no evidence of any slackening of demand. We believe that on top of this there is very significant unmet demand which is obscured from view by the severe limitations of the current access networks. On that basis, the existing copper-based infrastructure is not capable of delivering the bit rate demanded by subscribers, and we expect there to be demand of 1Gb/s to premises within the next 10 years. From a technology perspective, there are now well proven approaches designed for implementation of fibre networks in an economical manner (so-called long reach access). 1Gb/s should be the initial aim, but with upgrade capability to 10Gb/s. This will impact particularly the network topologies deployed.

Enterprise networks are upgrading to Gigabit Ethernet and even a simple USB2.0 connection on the desktop runs at 700Mbit/s. It seems very unlikely that the Wide Area Network should not expect to follow these trends and capabilities.

New applications, many including video, such as "Facebook" and "YouTube" have provided a paradigm shift in the way that broadband access is used. Other applications such as back-ups for multimedia devices, pico-cinemas, IPTV, and utility computing will also require high bandwidths. With the current broadband offering, even standard definition video is poor and much higher bandwidths will be required for next generation HDTV. Compression technologies have largely already achieved the benefits that they will supply and little further is expected from this source.

Many households now have multiple computers, multiple televisions and multiple other devices such as iPods, requiring higher bandwidth connections. Evidence from the take up of services in other countries suggests that the time is now ripe for investment. With higher bandwidths, services using remote applications will also grow. As stated above, at the present time it is reasonable to conclude that there is significant suppressed demand.

A simple example will illustrate some of the current positions: Providing network back-up for an 160GB iPod device is an attractive service offering (you can insure the hardware but the content will in fact have cost much more than the device). Even over a 1Gbit/s connection after accounting for overheads in the protocols, security etc. this would take about 30 minutes to complete. As a device of this specification is a 2006 standard, planning for the future will need an order of magnitude greater speed to continue to be effective.

Furthermore, Next Generation Access is not only required for fixed connectivity high-density fibre access will be needed for the evolution of mobile, WiMax and WiFi networks. As micro-cell and pico-cell basestations proliferate and the bandwidths demanded by mobile users increase, the problem of backhaul becomes severe. The topology and density of this demand maps quite closely over that for fibre to the premise and could be served by exactly the same infrastructure thus improving the business case considerably for any service provider.

It is also the case that the availability of high bandwidth connectivity will create the applications and associated businesses that run over it. If we do not build this infrastructure in the UK the development of these services and uses will naturally migrate to other parts of the world. The UK is a world-leader in creative industries and similar activities that are totally dependant on telecommunications connections for their growth and survival. As we have learned from the Internet itself the development of these uses takes place <u>after</u> the infrastructure is available and is due to a large number of developers having access to the customer base (see answer to question 4 below)

New applications, many including video, such as "Facebook" and "YouTube" have provided a paradigm shift in the way that broadband access is used, and we note that these applications were developed in an environment where high speed internet access was readily available. A significant amount of value has been generated by these applications, for instance, YouTube was bought by google last year for $1.65Bn.

Q2 *Do you agree with the principles outlined for regulating next generation access?*
We support Ofcoms policy on having the minimum regulation necessary. It is important not to over-regulate and thereby stifle investment and so deny our citizens access to the many benefits NGA can offer. Regulation should be seen in the context of encouraging innovation and new service offerings. We have been unable to identify any new technologies that would enable multiple physical networks to be economically built – it is probably not efficient to have more than one NGA network in any one location. However this is not to say that various parts of the service build could not be separated; e.g laying ducts could be done by real-estate developers who would then pass these on in a variety of commercial forms to the layer-1 service provider

The regulatory principles for a next generation network require a different approach to those applied to largely existing infrastructure where deployment costs have been fully amortised. We therefore support the view expressed in the document that the existing regulatory environment needs to change to ensure that the competing interests of return on investment and open competition are properly balanced, though we understand that this is far from straightforward.

Q3 *How should Ofcom reflect risk in regulated access terms?*
At present there is "market failure" with everybody waiting for someone else to build the NGA network, because they fear that Ofcom would make them provide access to their competitors at unattractive rates, without due consideration of risk. A single physical network seems to be the only viable and efficient solution. One option that might be considered is for an independent utility company to build and operate a national network, with others providing competing services. Alternatively, different organisations could build in different geographical areas (examples include the network being built currently by the Walsall Urban Regeneration Company and the Digital Region Network, South Yorkshire). If this were to work, then Ofcom would have to act as a design authority and lay down minimum standards to ensure compatibility. It would also have to oversee a universal service obligation to ensure that no part of society misses out on the broadband revolution. The risk of not investing in the Next generation broadband while the rest of the world moves ahead is larger than any risk implied in maintaining artificial competitive business environments. The approach suggested of anchor products may offer a lighter degree of regulation that would not stifle investment and innovation. It is important that Ofcom should reflect risk in future investments.

Q4 *Do you agree with the need for both passive and active access remedies to promote competition?*
We consider that future fibre networks are fundamentally different to existing copper infrastructures. This is due to many factors including the very different topologies required, the timing of the build versus deployment of services etc. Fibre To The Cabinet (FTTC) options look limited due to space and power restrictions in street cabinets. In FTTH solutions, involving Passive Optical Network (PON) architectures there is no suitable point for handover in the passive network itself, therefore passive access remedies at this

physical layer should not be considered. However we strongly believe that competition should be at the lowest possible layer in the network and certainly no higher than the sharing of the PON access. Consideration should also be given to creating competition by other means such as overlaying Wavelength Division Multiplexing (WDM) on a fibre infrastructure and using a wavelength per service or service provider.

We also consider that a viable business case will only exist (given the aggregation of service demand noted above) if the access layer provider carries all available traffic from whatever source.

Q5 *Do you consider there to be a role of direct regulatory or public policy intervention to create artificial incentives for early investment in next generation access?*
Yes. This is the experience in the rest of the world. Government support and incentives have accelerated the early investments, with faster than predicted take up then providing the subsequent business drivers.

Evidence from overseas suggests that UK Government incentives and an approach to regulation that rewards early investors who take on the high upfront risk of initial network deployment will do much to accelerate the rate of progress towards the creation of a broadband access network in the UK. In particular, some form of incentive will almost certainly be required to ensure uniform deployment of network coverage to all areas, not just those where population densities are high.

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Photonics Leadership Group, November 2007

For further information on the PLG see:

http://www.photonics-leadership.org.uk/