

## **INTELLECT'S RESPONSE TO OFCOM'S STRATEGIC REVIEW OF TELECOMMUNICATIONS PHASE 1 CONSULTATION**

Intellect is the trade association for the information technology, telecommunications and electronics industries in the UK representing 1000 organisations spanning blue-chip multinationals to early stage technology companies. Intellect members contribute around 10% of UK GDP. Further information about Intellect can be found at [www.intellectuk.org](http://www.intellectuk.org)

Intellect welcomes the opportunity to comment on phase 1 of Ofcom's strategic Telecommunications review and offers the following general and detailed comments.

The main themes of Intellect's response are as follows:

### ***General principles***

*Intellect is of the view that a sustainable competitive telecoms market is a prerequisite for a successful knowledge driven economy, the growth of the UK and is good for the citizen consumer.*

*Innovation and investment will be encouraged through the development of open and competitive markets with minimal regulation, used only where sustainable competition has not been established or for issues such as number allocation which are beyond the scope of the market.*

*Innovation and investment will be encouraged by ensuring that a stable regulatory framework is established and that those making investments are appropriately rewarded for the risks they incur.*

*It is imperative that the regulatory regimes are sufficiently harmonised throughout the EU to allow economies of scale throughout the supply chain.*

### **Intellect's Vision**

*Voice telephony and narrowband internet access have established a near universal trend as more and more commercial and social activities come to be dependent on such services. There is every reason to believe that broadband will accelerate the trend because of the increasingly rich variety of activities that can be supported.*

*In the light of this, an essential enabler of a successful knowledge based economy will be the development of the necessary infrastructure to support freely available, affordable access to broadband services for all. The desire is for open and freely available access to fixed and mobile broadband infrastructure, for both users and service providers.*

*The underpinning broadband infrastructure must be capable of delivering adequate levels of availability, resilience and dependable quality of service.*

## **Technology theme and market requirements for Next Generation Networks**

### **General**

We are on the cusp of the rollout of Next Generation Networks (NGNs). Such networks enable the delivery of all the services previously provided by the disparate networks. The

intelligence associated with services is unbundled and now resides in servers that can be accessed by the services. NGNs can deliver significant capital and operational expense savings in comparison with the parallel deployment of separate, disparate networks.

Services may be provided by Next Generation Networks with differing qualities and grades of service, as well as differing security attributes e.g. voice telephony can be delivered through an appropriately engineered carrier class network with the quality of today's PSTN, or it can instead be delivered as a best-efforts service over the public Internet, for example.

Optical core infrastructure is already available with the capacity to implement the cores of NGNs. Carrier class products are now available to implement and control the packet and service layers required to sit above the optical layer. Multi Protocol Label Switching (MPLS) is emerging as the key tool to control Quality of Service (QoS). With edge devices providing the interface to the mobile and fixed access networks that connect end users to the core, and facilitating the provision of QoS and other key service attributes such as security, all the components are available to implement the cores of NGNs.

### **Mobile access to NGNs**

Universal Mobile Telecommunications System (UMTS) is set to provide always on, packet based, Third Generation (3G) mobile connectivity for mobile users. Because they are subject to the vagaries of radio propagation and interference, such wireless Wide Area Networks (WANs) will always lag behind wireline fixed access in terms of capacity and performance. The downlink data rate of initial UMTS deployments is limited to 384 kbit/s. Work is underway to evolve UMTS networks to progressively higher access data rates with time.

Wireless Local Area Network (WLAN) technology is rapidly being deployed and is currently based on the WiFi standards capable of delivering LAN speeds of up to 54 Mbit/s. WLAN technology is certain to evolve to provide extended reach higher bandwidths with time, as evidenced by the significant interest in WiMax. WLANs enable the use of laptop Personal Computers (PCs), at locations where it is feasible to deploy them. WLANs are complimentary to mobile standards, such as UMTS, which provide ubiquitous wide area access to meet the less demanding display and data entry requirements of the more mobile terminals.

### **Fixed Access to Next Generation Networks**

The fixed access networks deployed to large office locations must have sufficient bandwidth to eliminate the bottleneck between the LANs deployed in offices, which operate at rates between 100 Megabit/s to 1 Gigabit/s, and the core networks. It is certain that these LAN rates will increase with time, which means that enterprise access networks must be capable of being upgraded to support ever increasing data rates with time. Fibre all the way to large offices is virtually the only solution that can remove the bottleneck.

Residential access requirements are driven by the fact that a single PC is already capable of swamping a 10 Mbit/s LAN. With the potential for a number of PCs per residence, and the continuation in Moore's Law (the doubling in computing capacity with no increase in cost every eighteen months), it will not be long before the first generation of residential broadband access technologies, such as ADSL and cable modems will present significant bottlenecks for residential access. If the requirement for teleworking is coupled with home entertainment and educational services, residential access requirements will soon be measured in units of tens of Megabit/s. Similar access rates will satisfy the requirements of small offices. The requirement is for the deployment of a next generation of 'broaderband' residential and small office fixed access networks, capable of delivering some 5-10 Mbit/s to end locations initially and with the ability to progressively deliver ever increasing bandwidth in time.

There are a wide number of 'broaderband' technologies such as VDSL, wireless, co-axial cable and fibre can be utilised to provide the final drop to residential and small business

users. As access bandwidths increase with time, this drop point will move closer to the end user. The requirement is to start to drive fibre progressively closer to such users.

### **Ducting for Fixed access**

The installation costs of fibre fixed access networks are dominated by the costs of the civil works required to install ducting. These approach 85 per cent of the total network installation cost as the fibre gets closer to individual residences.

In many circumstances, wireless backhaul provides a viable alternative to fibre. A prerequisite to wireless being a cost-effective final drop technology is the release of sufficient spectrum for this purpose below 10GHz. However, there would be insufficient backhaul spectrum to satisfy the requirement of mass market wireless deployments. Wireless backhaul could be used in association with wireless final drops to serve the more sparse requirements of remoter end users. Here it could play a key role in eliminating the requirement for ducting to locations that would incur the greatest costs of civil works.

### **Wireless and Wireline Convergence**

Although PCs are used in business and in the home they have yet to become consumer friendly items. As the broadband bottleneck is removed, it will become possible for business and residential applications and data storage to be hosted from high availability data centres as carrier managed services. This will enable PCs to become consumer friendly devices.

An IP Multimedia Subsystem (IMS) architecture is currently being developed by 3GPP to address the most general case of terminal and service mobility in 3G networks such as UMTS. It is being defined in a way that will also encompass the nomadic requirements of wireline and wireless LAN access. Once deployed, this architecture will enable users to access their services, applications and data from any convenient wireless or wireline terminal. It will lead to a blurring of the distinction between today's wireline and mobile markets.

### **The Implications of Next Generation Networks**

NGNs enable services to be offered with a wide range of quality and service attributes. They remove many of the restrictions on 'who does what' and 'where'. They connect an end user to any server enabling services such as voice, multimedia, and authentication to be provided from anywhere in the network. . An individual teleworking from home, an hotel, or on the move and using mobile or nomadic wireless access, can receive service either from a carrier or from his or her own company network. Regardless of who provides the service, the server hosting it can be located in another country.

### **Conclusions**

Next Generation Networks are poised to revolutionise the way we live. They have the potential to create huge opportunities in terms of economic development, environmental efficiencies and social gains. They can enable teleworking, underpin economic growth and transform learning and leisure.

There are three imperatives if the UK is to gain these benefits to the full. The first is the rapid resolution of how to facilitate the roll-out of ducting to feed fibre ever closer to end users, the second is the release of sufficient spectrum below 10 GHz to roll out wireless access where ducting is not cost effective, and the third is the development of light touch regulatory policies that embrace the freedoms of service quality and of 'who does what' and 'where' implicit in Next Generation Networks.

**Intellect offers the following preliminary answers to Ofcom's first 5 questions:**

**Q1:** In relation to the interests of citizen-consumers, what are the key attributes of a well-functioning telecoms market?

Intellect: A well-functioning telecoms market is one that delivers sustainable choice, innovation and value.

Prices should not be regulated down to an extent that would inhibit investment in infrastructure and service innovation. Inhibition of investment would be to the detriment of furthering the longer term interests of the citizen in relation to communications matters.

**Q2:** Where can effective and sustainable competition be achieved in the UK telecoms market?

Intellect: The extent of competition in the UK telecoms market is often underplayed. Effective and sustainable competition is desirable and can be achieved in the UK telecoms market in both the wireless and wireline sector. The wireless 2G market in the UK is widely considered to be competitive with wide range of packages and choice of providers. However, competition in the provision of fixed services is still limited by the extent to which competitive infrastructures have been developed. More effective and sustainable competition is desirable in the access network.

**Q3:** Is there scope for a significant reduction in regulation, or is the market power of incumbents too entrenched?

Intellect: It is imperative that the choice of market definitions does not lead to distorted views of levels of competition. Alternative market definitions may result in an opportunity for significant reduction of regulation. Continued technology evolution is expected to challenge current market definitions.

**Q4:** How can Ofcom incentivise efficient and timely investment in next generation networks?

Intellect is of the view that innovation and investment would be encouraged by ensuring that a stable regulatory framework is established that ensures that those making investments are appropriately rewarded for the risks they incur.

It is imperative that the regulatory regimes are sufficiently harmonised throughout the EU to allow economies of scale throughout the supply chain.

**Q5:** At varying times since 1984, the case has been made for structural or operational separation of BT, or the delivery of full functional equivalence. Are these still relevant questions?

Intellect: It would be inappropriate to comment as this question addresses the specific business of one of our member's.

**Intellect offers the following answers to Ofcom's questions 6 to 21:**

**Q6.** How successful is the UK telecoms sector currently in delivering benefits to citizens and consumers?

Intellect: As far as the legacy networks and services are concerned, the UK telecom sector has been successful in bringing down prices for consumers, however, investment in infrastructure in the UK is significantly lower compared with other countries.

The challenge is now shifting on how to build on this success to deliver innovative new services that will be required in the next decade of the 21<sup>st</sup> century. The main issue is how to attract the very large

investment that is required to upgrade the access network to be able to deliver the bandwidth that will be required towards the end of the decade.

The measures of success should include benefits that telecoms and broadband offers to the knowledge economy. These benefits are far greater than direct short term price benefits to the consumers.

**Q 7. How rapidly & extensively will fixed and mobile networks become substitutes for one another?**

Intellect: To some extent, and for some categories of users particularly younger people, mobile voice is already a substitute for fixed. It is expected that the trend towards fixed-mobile convergence will significantly blur the currently clear distinction between fixed and mobile services, bringing further pressure on the view that mobile and fixed voice market can continue to be viewed as distinct.

Data & Future Multimedia -

- Technology is making the boundaries between fixed and mobile less clear,
- Investments are underway
- User centric services are becoming more important
- User mobility is more important than mobile i.e. ability to access the same services from different locations, not necessarily on the move

The various fixed and mobile access technologies have different characteristics and are more likely to complement each other rather than to compete with each other

From a consumer point of view, the ability to switch as required.

**Q 8. What impact will Voice over IP have on the telecoms market?**

Intellect: There is industry consensus that voice services will progressively migrate to NGNs which exploit Voice over IP (VoIP) technology. VoIP over broadband provides a major discontinuity and lowers barriers to entry such that voice may become perceived as a free service.

The EU framework demands that a PATS service is universally available. This will increasingly be achieved via VoIP. It is necessary that we have a clear and Europe-wide definition of PATS in the context of NGNs. There is currently no common Europe-wide interpretation of what constitutes PATS. In defining this PATS requirement the limitations on line powering and location information with VoIP must be addressed. Any regulatory constraints on non-PATS services should also be applied Europe-wide. It is imperative that the nature of the service being provided is clear to the customer.

**Q 9. How rapidly and extensively will broadband be taken up in the UK, and what are the regulatory implications of such growth?**

Intellect: Given the importance of broadband it is important that regulation enables rather than thwarts its rollout.

**Q 10. What scope is there for new, competing broadband platforms to be rolled out, and which technologies are most likely to be used?**

Intellect: There are fundamental barriers to investment that need to be removed. Current regulation does not encourage infrastructure investment,. For “broaderband” significant investment will be needed to roll-out fibre progressively closer to the customers. Investment will not be forthcoming should unbundling of fibre be a foreseeable requirement.

It is expected that consumers will view multiple broadband platforms as complementary choices of access, at any one time the platform will be chosen depending on the circumstances

**Q 11.** When are operators likely to move towards 'all IP' architectures, if at all?

Intellect: Rollout of 'all IP' architecture is under way and will be commonplace in 3 to 5 years.

**Q 12.** What are the implications of 'all IP' networks for the way networks interconnect with one another, and for the scope of competition?

Intellect: Bearing in mind that 'all IP' networks are being implemented, it is imperative that interconnect standards are urgently defined:

It will be necessary to ensure that standards referenced and used are open and are prepared in an acceptable manner without variants & alternative options. Development of open interconnect standards is also necessary to encourage an open market and portability across platforms.

As 'all IP' networks are capable of offering services with a wide range of quality and service attributes, ways must be found to offer such services over different networks with the requested end to end quality of service assurance.

Numbering - should numbering be geographic or non-geographic (a recent Ofcom consultation proposed to allocate the 056 non-geographic numbering range to VOB; will IP consumers retain their geographic numbers?) There is a need to establish a long term numbering policy as well as a shorter term policy which concentrates on geographic number conservation

Although not an Ofcom issue, legal interception may also be a concern specially if networks provide IP conveyance only and intelligence / control migrates to the edge of the networks (i.e. consumer terminals)

The routing names and addresses required must be managed and allocated in a fair and non-discriminatory way

**Q 13.** Is there likely to be widespread demand for services that require 'broaderband' networks to be rolled out and, if so, how will such infrastructure be supplied?

Intellect: As our technology & market theme indicates, Intellect believes that a requirement for small business and residential customers of 5 -10 Mbit/s will materialise in the future. In order to be able to provide such bandwidth, it is essential to resolve how to facilitate the roll-out of ducting to feed fibre ever closer to end user and the release of sufficient spectrum below 10 GHz to enable roll-out of wireless access. For details see also our “Technology theme and market requirements for Next Generation Networks”

**Q 14.** How rapidly are broadband content businesses likely to emerge, and what factors will affect their viability?

Intellect: There are many examples where content is self-generated. Take-up of broadband does not depend on provision of content.

Good content exists today. Its owners are often reluctant to allow it onto electronic networks because of the fear of piracy. The key factor is therefore effective digital rights management. We are working with industry partners to standardise technical solutions that content owners can have confidence in. However neither legal measures nor technical measures are likely to be effective on their own.

**Q 15.** How will future network evolution, such as growth of intelligence at the edge of networks, and the increased importance of control over technical standards and interfaces, affect the requirements of telecoms regulation?

Intellect: Whether intelligence at the edge of the network is a long term trend is difficult to predict. Should migration of intelligence to the edge occur, legal interception may be a concern. If the network only provides IP conveyance, it has no knowledge of the communications details and routing.

Consumers wishing to receive services that depend on customer location within the network could subscribe for those services regardless of whether most of the control is at the edge. Of course the cost of such network services may be higher as the result of the migration to the edge.

We do expect some intelligence to remain within networks. For example, for any real time service, voice or video, service quality issues make that necessary

**Q 16.** Will it become uneconomic for operators to maintain the existing circuit-switched architecture at some point and, if so, when? What regulatory issues will this transition to IP networks raise?

Intellect believes that there will be a point when it will not be cost effective to maintain circuit switched networks when the majority of customers will be opting for IP services and / or when operators will find it uneconomic to maintain circuit switched architectures. There will also come a time when suppliers will not be able to supply spares for the maintenance of outdated & obsolete circuit switched equipment. Some manufacturers indicate that the “last time to buy” for some spares is already on the cards giving network operators up to 10 years to upgrade their networks.

Given that IP networks are being deployed and will become widespread in 3-5 years, it is essential that the regulatory issues surrounding service provision by such networks are urgently addressed to obviate the need to maintain legacy networks beyond the point they become non-viable.

**Q 17.** Are consolidation, alliances, market entry or other forms of market evolution likely? What will their implications be for telecoms regulation?

Intellect: Such market evolutions are inevitable. Necessary safeguards are already in competition law and no sector specific regulation should be necessary.

**Q 18.** What impact do different regulatory approaches have on investment decisions in telecoms, and what regulatory approaches does this imply that Ofcom should adopt?

Intellect: The market for telecoms services is increasingly becoming more competitive, consequently the returns for investors more volatile, with a result that this increased investment risk requires increased returns. If these returns cannot be realised, investment will suffer at the expense of other geographic markets or industry sectors.

A new regulatory framework needs to take in to account this changing environment in the following respects:

- The regulatory framework needs to be stable such that regulatory risk does not place an undue additional burden on investment decisions.
- The regulatory framework needs to balance appropriate levels of risk-return between those making substantial infrastructure investments and those competing via access to existing infrastructure.

If the UK is to take a leading role in the knowledge driven economy, it needs to attract the large scale investment that is required to build next generation networks. Investors in these networks need to be rewarded for the risks they are making. In this respect, regulation providing access to essential facilities should not discourage infrastructure investment and competition, it should be time bound where appropriate, such that infrastructure competition has the potential to develop in support of more sustainable service level competition.

**Q 19.** What is the right role for consumer policy? What impact do different approaches have on telecoms companies' perceptions of risk and return?

No Intellect comment.

**Q 20.** What role should Ofcom take in signposting, providing, or ensuring that the market provides clear information to consumers, enabling them to make effective choices?

Intellect: The implementation of NGNs will provide a wide variety of different services and service characteristics and Ofcom should ensure that consumers are not wilfully misled.

**Q 21.** How may universal service arrangements need to evolve in response to changes in the telecoms market?

Intellect: As our technical theme indicates, Intellect believes that data rate requirements will increase with time. However, it is too early to judge whether the increase in data rates should be linked with the universal service obligation. In the long run, universal service in "all IP" networks should be data connectivity.

Bearing in mind issues related to powering and location identification in IP access networks, Ofcom must clarify what are the universal service obligations in the era of all IP networks.

A significant migration to non-PATS services will add a large overhead PATS services and could render PATS services nonviable.

Given that IP networks are being deployed and will become widespread in 3-5 years, it is essential that the regulatory issues surrounding service provision by such networks are urgently addressed to obviate the need to maintain legacy networks beyond the point they become non-viable.

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(end of Intellect's response document)

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