

BT Response to European Commission Consultation on Net Neutrality

30th September 2010

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This response is positioned in the context of broadband communications rather than the “Internet”. Typically a broadband connection will be used for a range of services and applications – some of which will be handled by the Internet while others will be additional services commissioned or operated by the broadband service provider and distributed from servers, caches, or content delivery networks located or terminating close to the end user. Any discussion of net neutrality or potential traffic management rules should be focussed on the public Internet service and not on additional broadband services or on business VPNs. Moreover if there is to be any regulation, it should be technology and market neutral, applying to wired and wireless networks and to undertakings of all sizes.

A precondition for any discussion of net neutrality policy in a specific country context is a general appraisal of market conditions at retail and wholesale level in that country. Where there is effective wholesale access there is likely to be competitive retail supply (this is the case in the UK, and the EU Framework provides the basis for competition elsewhere in Europe too). Coupled with appropriate transparency around traffic management and with reasonably straightforward migration between competing broadband service providers this should allow the market to develop freely in response to changes on the demand and supply sides without any need for traffic management rules.

Traffic management is necessary at various points in the network; to guarantee an appropriate experience for customers, to offer a range of tariffs based on different levels and types of expected usage, to control overall costs and to ensure compliance with contractual terms and conditions. In a competitive retail market broadband service providers should be free to select additional services to offer to their customers, with or without traffic management, as long as the basic Internet service remains fit for purpose given the access network capability and service tier subscribed to by the customer. The fiercely competitive market we have today will ensure that this is the case in the EU.

The technologies and applications for broadband connectivity are evolving so rapidly that it would be premature to attempt to specify acceptable limits for discrimination or traffic management, beyond the general requirements of competition law.

As a contribution to the debate, we are proposing a set of principles or commitments for ISPs to end users which is attached as Annex 1. We have disseminated this document widely in recent weeks to gauge industry appetite for making such commitments jointly. We would support continuation of this activity within a suitable forum.

Question 1: Is there currently a problem of net neutrality and the openness of the internet in Europe? If so, illustrate with concrete examples. Where are the bottlenecks, if any? Is the problem such that it cannot be solved by the existing degree of competition in fixed and mobile access markets?

We do not believe there is currently a significant problem of net neutrality in Europe. This issue emerged in the USA where the lack of wholesale access regulation has made the retail market far less competitive than in Europe. But even in the USA, examples of net neutrality problems have been few and far between, showing that

consumer pressure and the threat of possible regulatory action can avoid significant problems.

The new EU regulatory framework gives NRAs the power to impose minimum QoS standards if necessary and requires operators to be more transparent about any limitations imposed or resulting from traffic management procedures. Consumers also have a right to change providers if any significantly detrimental changes are made to their service. These factors make it highly unlikely that any broadband service provider would risk the regulatory interventions, increased churn and reduction in new customers that would result from any significantly detrimental changes. We strongly agree with the Economist editorial of Sept 4th 2010 which concluded “Rivalry between access providers offers the best protection against the erection of new barriers to the flow of information online”. We also agree with Commissioner Kroes’ comments at the ETNO/FT conference on Sept 23rd where she indicated that broadband competition could remove the need for further net neutrality regulation.

Question 2: *How might problems arise in future? Could these emerge in other parts of the internet value chain? What would the causes be?*

Broadband technologies, standards, and architectures are still evolving. The costs of different elements of the infrastructure are changing at different rates. A wide range of new services and applications are being developed and various business models are being tested in the marketplace. Thus it is premature and difficult to attempt detailed speculation in this area.

Nevertheless, it may be worth flagging the potential problem of market power being leveraged by undertakings controlling a significant share of premium content – particular where these undertakings are vertically integrated with distribution channels. In this situation, it may be necessary to enact regulation to provide wholesale access to premium content.

Question 3: *Is the regulatory framework capable of dealing with the issues identified, including in relation to monitoring/assessment and subsequent enforcement?*

Yes – the regulatory framework as currently defined in the EU Directives, coupled with competition law provisions, is fully capable of dealing with the issues identified.

Question 4: *To what extent is traffic management necessary from an operators' point of view? How is it carried out in practice? What technologies are used to carry out such traffic management?*

Network operators must be able to balance the cost of supply against demand for bandwidth.

In the last few years, a set of traffic management solutions have been implemented by network operators to address a number of major network topics, in particular uncertainty over short time scale traffic demand and the need to monitor and control compliance with service tiers. Most operators have opted to explore traffic management techniques that limit the impact of certain bandwidth-hungry applications while prioritising traffic flows associated with time-critical applications.

Broadband service providers typically implement Deep Packet Inspection (DPI) solutions to address some of the issues of traffic management. Traffic passes through DPI hardware which attempts to identify and then restrict (or potentially prioritise) specific types of traffic, as well as the bandwidth consumption of individual users (where a service cap applies). This approach normally requires all the traffic to flow through a few central sites in a network but may not be scalable as traffic volumes increase.

DPI can identify protocols used by different applications and services. In particular DPI has the ability to identify protocols such as Bit Torrent a popular P2P protocol used to transfer large quantities of data. Popular peer-to-peer applications open multiple simultaneous connections to different hosts. These multiple connections behave as multiple applications all consuming bandwidth at the same time – The traffic consumption of a P2P client can be 1000 times higher than a user performing in the same period a VoIP call or simple Internet browsing. This high traffic intensity of P2P applications is one of the reasons why broadband service providers have filtered or shaped this traffic at peak times. Shaping is achieved by limiting the speed that a specific P2P service can reach on a user's line during certain peak times of the day. Note that encryption and other techniques will make it increasingly difficult to detect specific protocols in future.

Traffic may also be prioritised as it flows through the network and this may be beneficial for time critical applications which require low latency and jitter. There are various technical methods to deal with prioritisation which either guarantee the necessary performance or provide a very high probability of it being achieved. There is little or no traffic prioritisation in the general Internet at this stage so the maximum benefits are achieved where traffic flows remain in networks under the control of or affiliated to the broadband service provider. This may change in future.

Internet bandwidth has a significant cost associated with it at all points in the network and thus commercial service providers will endeavour to match supply with demand reasonably closely. The evolution of network management practices will depend on the future economics of the network and the evolution of demand for different applications. As we set out in our principles in the Annex, we do not believe that any legal services operating over the basic Internet connection should be blocked on either fixed or mobile networks; and within the limits of the access speed / service tier purchased there should be a satisfactory basic level of service.

Question 5: To what extent will net neutrality concerns be allayed by the provision of transparent information to end users, which distinguishes between managed services on the one hand and services offering access to the public internet on a 'best efforts' basis, on the other?

It is likely that net neutrality concerns of some sort will be a permanent feature of broadband services. They may be difficult to allay completely given the complexity of the issues and the wide range of potential contributory factors. New concerns may arise as technologies and markets change. However, we believe that clarity over which traffic management techniques are being deployed and the reasons for their use will go a long way towards allaying user concerns. Regulators should resist the temptation to deal with these concerns via ex-ante rules because of the risks of market distortion and disproportionate or unforeseen consequences.

The distinction between managed services and the Internet is a very important one. Typically a customer will purchase a broadband connection which will be used to

deliver both a connection to the public Internet and other connections to managed services delivered from servers, caches, and content delivery networks located or terminating within the broadband provider's own network. It will often be appropriate for these managed services to be assigned prioritised transmission – particularly over the final link to the home where this only supports low speeds. Services arriving over the public Internet are less likely today to benefit from prioritised transmission – but this may change and some broadband service providers may wish to offer this.

Making public an ISP's traffic management principles and practices will allow consumers and businesses to make informed decisions about where to place their business. This will encourage competitive differentiation based on an ISP's traffic shaping practices, thereby allowing market segmentation to meet the needs of different consumer and business groups.

Question 6: *Should the principles governing traffic management be the same for fixed and mobile networks?*

In general, we believe that the principles should be the same for fixed and mobile. There is clearly a somewhat greater potential for congestion in the mobile network (partly offset by the lower chance of multiple users on a single connection) but the traffic management principles, if any, should be the same. We do not believe that any legal services operating over the basic Internet connection should be blocked on either fixed or mobile networks; and within the limits of the access speed / service tier purchased there should be a satisfactory basic level of service.

Question 7: *What other forms of prioritisation are taking place? Do content and application providers also try to prioritise their services? If so, how – and how does this prioritisation affect other players in the value chain?*

This is a complex issue. Depending on the available bandwidth and the mix of services carried there can be a case for prioritising applications that are time critical – but there may be less point in doing this when packet streams have arrived over the public Internet where they may already have been affected by congestion. At present little traffic prioritisation is undertaken in the core Internet. Most prioritisation takes place at the edges in the broadband service providers' distribution networks.

In many cases content and application providers are already prioritising their services through caching techniques and content delivery networks that allow them to connect close to the end users. These techniques and networks may be self provided or purchased from intermediaries and there is a substantial industry dedicated to providing such facilities.

Clearly only a proportion of traffic can be prioritised and the network operator needs to be closely involved in monitoring and assigning traffic priorities and bandwidths in order to balance the performance of each stream.

Question 8: *In the case of managed services, should the same quality of service conditions and parameters be available to all content/application/online service providers which are in the same situation? May exclusive agreements between network operators and content/application/online service providers create problems for achieving that objective?*

At wholesale level, if there is significant market power, the network operator should make network management tools available on a non-discriminatory basis.

At retail level in a competitive market, the choice of which managed or prioritised services to host or promote on its platforms should be left to the commercial judgment of the broadband service providers. They will take account of the mix and loading of traffic on their networks and hence the scope for prioritisation. Other factors will also be relevant such as whether customers have paid a premium for a high quality service. It would be an inappropriate market distortion in a competitive market, and probably impractical, to demand that all managed content/application/service providers in the same situation should have access to non-discriminatory QoS conditions on all retail broadband platforms.

Question 9: *If the objective referred to in Question 8 is retained, are additional measures needed to achieve it? If so, should such measures have a voluntary nature (such as, for example, an industry code of conduct) or a regulatory one?*

It is not appropriate to mandate the objective referred to in Question 8. Some broadband service suppliers may choose to offer it, and if customers value it then it is likely that more providers will offer it. This is an issue best left to the market.

Question 10: *Are the commercial arrangements that currently govern the provision of access to the internet adequate, in order to ensure that the internet remains open and that infrastructure investment is maintained? If not, how should they change?*

The commercial arrangements today involve peering, paid transit and variations on these. They are largely left to the market and that is likely to be the best way to ensure the Internet remains open and infrastructure investment is maintained. Excessive regulation, particularly restricting the commercial models that service providers can adopt, would be prejudicial to these objectives. It is unclear how the market will evolve and how the balance of negotiating power will shift between content providers, ISPs, and end users. Any attempt to second guess market development by mandating a specific commercial arrangement will almost certainly yield a suboptimal outcome.

It may be necessary to address the issue of wholesale access to content – in particular where this is restricted by a vertically integrated undertaking with market power.

Question 11: *What instances could trigger intervention by national regulatory authorities in setting minimum quality of service requirements on an undertaking or undertakings providing public communications services?*

In general, it is right that users should be able to select a service quality/price mix that suits their needs. It is difficult to see why regulators would be justified in setting a minimum level. In a competitive market in which users have the ability to switch between suppliers in the event of a significantly detrimental change to their service there should be no need for regulatory intervention.

Question 12: *How should quality of service requirements be determined, and how could they be monitored?*

Quality of service requirements should be left to the market place. Users will give their business to service providers who are able to offer the right quality of service for their needs. This may result in some providers catering at low cost for people who only want to use fairly basic applications while others will provide high bandwidth, low latency, services for gamers and video conferencing.

It is difficult to specify QoS since the user is really only concerned with the performance of the applications – which may be only loosely related to technical characteristics such as packet loss and latency. Furthermore, the minimum standard for all users may increase with time, and for individual users may fluctuate in both directions as their needs change.

There are numerous online tools and techniques today that monitor the technical performance of networks and these will be increasingly deployed by users, regulators, 3rd party consumer advisers, and others to provide biased or impartial advice to users.

Question 13: *In the case where NRAs find it necessary to intervene to impose minimum quality of service requirements, what form should they take, and to what extent should there be co-operation between NRAs to arrive at a common approach?*

We are unable to envisage any circumstances at present where the imposition of a minimum quality of service would be appropriate. In a competitive marketplace consumers will switch suppliers if the basic QoS is inappropriate for their needs. There may be significant demand for a cheap low QoS service from people with basic needs and it is unclear why they should be denied the opportunity to buy this. Imposition of a minimum quality could damage competition using service as a differentiator. Customers should be able to decide if the service level provided by a broadband service provider is sufficient for their needs. Furthermore, focussing on a minimum QoS could divert attention from the need for ongoing general improvements in network performance.

If there is a most important metric of interest in characterizing the "quality" of broadband service it is speed. It is likely that any imposition of a minimum QoS would be made on a predefined level of speed. However, as we have seen in the recent Ofcom report speed measurements from the same service can vary significantly. These differences are not only due to differences in test conditions and methodologies. For any possible measurement it is technically challenging to understand where congestion is present in the network. While the access network can be the bottleneck, significant bottlenecks also arise in home networks, end users' computers, and Internet side systems and networks.

Consequently, the definition and measurement of a minimum quality of service would have to be monitored with careful attention to the testing methodologies employed. Not only do we believe that many speed-testing methodologies are inappropriate for the purpose of assessing minimum QoS but we also believe that the process could add additional costs without clear long-term end-user benefits.

- Different device settings and applications can play a significant role in determining the speed that is measured. User initiated speed tests tend to be biased as users run these tests most frequently when they are experiencing service or network issues.
- Special test infrastructure and tools such as the ones deployed by SamKnows and EpiTiro can provide accurate views. The deployment of measurement

servers and attention to broadband isolation in the access connection is a significant step forward in network measurement. While control and accuracy are increased there are still limitations. Due to the special arrangements required this approach can only cover a limited proportion of the population.

- Measurements averaged across the entire country also have limited value. They can be used for benchmarking between ISPs or access technologies but do not provide a view on specific issues or regional requirements. More accurate measurements may often be required at regional or local levels.

As broadband speeds are increasing, new and more sophisticated services will appear such as 3D TV, HD Streaming, Gaming and HD conferencing and we expect the debate to shift away from just speed. The quality of an entire broadband package will have to be measured on different metrics such as latency, jitter and packet loss. In addition, metrics such as service reliability and subjective opinion scores of services and applications at peak times will become more important.

To conclude we believe that the imposition of minimum quality of service requirements will not deliver value at this stage. However, we support multiple testing methods that can provide unique insights and deliver better value for customers in this competitive market place.

Question 14: *What should transparency for consumers consist of? Should the standards currently applied be further improved?*

A layered model would be appropriate here so that sufficient detail is widely available for the typical customer but allowing any subsets of the customer base who are interested in actively monitoring their service set-up and performance to access the necessary information separately.

Good examples are any industries such as banking and insurance with extensive product specifications. Independent publications or internet information sites are frequently expert at rearranging information into a straightforward and easy to interpret format. A degree of governance is required which makes sure independent performance benchmarking organisations with a vetted methodology are awarded the necessary accreditation to show customers they are valid and to prevent a multitude of varying points of view from unsubstantiated sources causing confusion for customers. We would support the extension of an Ofcom accreditation¹ scheme for independent sites and would have concerns about the impartiality of sites operating outside any such scheme.

Information should be structured to show the following:

- What categories of network management process are being used?
- Which precise management processes?
- Why are they used?
- How do they affect customer experience?
- How are they likely to affect me?
- How do they compare with other ISPs?

All traffic management aspects should be categorised and quantified in terms of impact. The information should always bring it back to performance and customer experience.

¹ <http://stakeholders.ofcom.org.uk/consultations/ocp/statement/guidelines/>

Service providers could offer an online tutorial to improve understanding.

Broadband service providers could potentially offer additional information on their service for example:

- Product performance. Information telling the customer the level of performance they can expect against an objective industry standard (e.g. bandwidth, contention levels, time of day performance)
- Traffic specific controls. Information explaining how ISPs manage the traffic on the network for everyone (e.g. peer to peer restrictions, QoS traffic protocols).
- Customer specific controls. Restrictions that affect the speed \ performance of the line (BRAS profiles and potential speed)

Finally, it may also be helpful for customers to have access to a portal showing various levels of information about their service. The basic level could include connection speed and total data downloaded/uploaded (as percentage of allowance that month – with indication of chance of exceeding allowed limit). Advanced levels could include, by time of day, dropped packets, jitter and latency, as well as currently operative traffic management policies, whether interleaving is on or off, etc. In the future, some broadband service providers may also allow their customers, within limits, to set the QoS management parameters for their upstream and downstream traffic.

There will of course always be a problem disentangling effects of throughput problems before traffic arrives in a broadband service providers network (e.g. slow servers, congestion at peering points etc) and after it leaves it (e.g. in a domestic LAN).

Question 15: *Besides the traffic management issues discussed above, are there any other concerns affecting freedom of expression, media pluralism and cultural diversity on the internet? If so, what further measures would be needed to safeguard those values?*

We are concerned that there is a growing expectation by some policy makers and stakeholders that broadband service providers should monitor network traffic and take technical measures within the network to restrict content deemed to be illegal or which is in breach of copyright. The e-Commerce Directive has a clear statement that no obligation may be imposed by Member States on operators to monitor traffic. This principle should be respected.

There may be an issue with vertically integrated content owners restricting availability of content to competing retail distribution channels – effectively leveraging dominance from one market into another. This is an area where regulators should maintain careful surveillance and intervene when necessary.

In general, we do not believe any special measures are needed to safeguard freedom of expression, media pluralism, and cultural diversity on the Internet.

Annex 1 - BT Proposal for Traffic Management Principles

We are committed to:

- **Transparency** - we will give customers meaningful information on their usage and on the network management techniques we deploy. We will provide an indication of the minimum and general level of experience our customers can expect – subject to their available access speed and the applications simultaneously using their connection.
- **Open access** –customers should be able to use their internet connection to access and run the content and applications of their choice (provided they are legal). We will not block any legal service or seek to charge content or applications providers for basic service. An individual user's experience will depend on the access level/technology purchased and any relevant contractual conditions.
- **Fair competition** – A competitive market is the best way to protect everyone's interests rather than regulation. Customers should have a wide choice of internet access providers and should be able to switch between providers without penalty subject to their contracts.
- **Adaptable networks** – internet access providers should be free to deploy techniques to manage congestion and optimise the performance of the various applications using their networks. We may limit throughput of non time-critical applications in order to provide a better experience for all customers. We may also prioritise time-critical applications where this is necessary to deliver an acceptable performance. Network upgrading will be a continuous process in response to demand. A variety of commercial models will develop, some of which may include customers or application providers paying for enhanced capability, such as prioritised delivery.
- **Freedom of expression** – we will not interfere with our customers' freedom of expression (other than as necessary to deal with legal requirements).
- **Commercial activity with no undue constraints to innovation** – Internet actors should be free to develop new services and new business models which may differ from today's.