

# LIBERTYGLOBAL



## **Liberty Global**

Liberty Global is an international provider of video, voice and broadband internet services with consolidated broadband communications and/or direct-to-home satellite (DTH) operations in 14 countries, primarily in Europe, Chile and Australia as of June 30, 2010. We operate broadband communications networks in 14 countries principally located in Europe, Chile, and Australia. In Europe, Liberty Global operates in the Netherlands, Belgium, Germany, Switzerland, Austria, Luxemburg, Ireland, Poland, Hungary, Czech, Slovak and Romania and includes the media and programming business Chellomedia<sup>1</sup>.

This response is provided by Liberty Global Europe BV on behalf of itself and the other companies in its group (together LGI).

## **Introduction**

LGI is pleased to submit its response to the European Commission's consultation on 'The Open Internet and Net Neutrality in Europe'.

We commend the Commission for framing this consultation around a pragmatic approach to questions of network congestion, bandwidth usage and drivers for innovation and investment into the constantly evolving internet.

In departing from a debate on fundamental rights and freedom expression which dominated the revision of the EU electronic communications framework in 2009, the Commission correctly recognizes how traffic management policies in the net neutrality context operate; namely to

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<sup>1</sup>For more information <http://www.lgi.com/>

appropriately channel the way internet services are delivered without recourse to the actual content of the data carried over the network. We also support the emphasis upon competition and transparency as fundamental regulatory principles to ensure the openness of the internet is maintained.

Nonetheless if it is to meet the regulatory effectiveness and proportionality tests obliged by its own impact assessment process, the European Commission must recognize the broader ecosystem which makes up the internet when considering the possibility of revising regulation in the electronic communications sector. Within the scope of net neutrality debate, traffic management and quality of service (QoS) enforcement measures are only valid with respect to ISP networks. Net neutrality is not an end-to-end concept applicable to all services since Internet-based content frequently needs to traverse multiple ISPs, content delivery networks, and public and private networks before reaching the customer.

The internet is a public and global system of interconnected computer networks, a network of networks consisting of millions of private, public, academic, business, and government networks linked by a broad array of electronic and optical networking technologies. The internet functions because all parties involved use the same standard internet core protocols, the standardization of which is undertaken by the Internet Engineering Task Force (IETF).

It has no centralized governance in terms of technological implementation or policies for access and usage; each constituent network sets its own standards. Within this global framework, LGI's hybrid-fibre-co-axial networks in Europe are one of approximately 50,000 networks which currently make-up the Internet.

As such it is important policy makers recognize the limited of scope of action operators of electronic communications networks, such as cable operators, have in the broader context of the internet. To date the EU policy debate associated with the practices of network management, traffic prioritization and service differentiation are linked *only* to traffic congestion on parts of ISP's networks.

We are therefore heartened that the questionnaire addresses the broader market structure of the internet and the commercial arrangements that currently govern the provision of access to it. The Commission is also correct to recognize the two-sided market nature of the internet in which network operators and content/application providers can both legitimately seek to derive revenue, either for carriage or for provision of content, without undermining the principle of the openness of the internet.

Our response to the questionnaire should be seen in this context.

**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?**

To the extent a common definition of network neutrality is agreed upon, it is important to underline that all electronic communications networks are managed and will continue to be managed. Indeed, unmanaged networks are not neutral in their treatment of content of services by definition. The internet's defining characteristic is of a network of interconnecting networks, a continuum, operating according to the end-to-end principle in which intelligence has been built into access networks to organize the best possible flow of data.

In this context - and in keeping with the analysis of OFCOM in their consultation on the matter<sup>2</sup> - we are not aware of any competition problems arising in the markets where we operate as a result of network management practices deployed, a key concern often raised in support of "net neutrality" regulation. Network management is also rightly recognized as a valuable tool for maintaining quality in the networks.

In addition, we observe that broadband markets in the EU are highly competitive, providing significant choice for end-users. As highlighted by Commissioner Neelie Kroes, it is not clear whether there is a market failure in Europe that requires any regulatory measures to safeguard the 'open internet'<sup>3</sup> as providers are disciplined by the competitive market. Efforts to retain existing customers and attract new ones by responding to consumer demand are a daily reality for network operators in Europe, and include the need to acquire high quality content and programming. Hence, there is no incentive for operators to block or degrade the quality of content and services we distribute over our networks.

While choice of providers engenders strong competition, the other essential element in the mix is the ability of consumers to make informed choice about providers offerings based on useable, understandable and comparable information. Our response to questions 5 and 14 set out our consumer transparency design principles.

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

Network congestion will remain a significant challenge as total bandwidth usage is increasing. This process is accelerated by rapidly increasing consumer broadband speeds, precipitated by the widespread migration of cable broadband customers to EuroDOCSIS 3.0 technology and the increasing roll out of VDSL and FTTH networks allowing for high broadband services. This means that today we are offering our end-user customers up to 120 Mb/s on their broadband internet products. Cisco has forecasted a fourfold increase in web traffic by 2014, to 63.9 exabytes per month — or more than three-quarters of a Zettabyte each year — according to its

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<sup>2</sup> Ofcom, "Traffic Management and 'Net Neutrality': a Discussion Document," rel. 24 June 2010 at 3.50, page 24.

<sup>3</sup> Neelie Kroes Vice President of the European Commission Commissioner for the Digital Agenda 'Net neutrality in Europe' speech at the ARCEP Conference (L'Autorité Régulation des Communications Electroniques et des Postes) Paris, 13th April 2010. SPEECH/10/153.

annual Visual Networking Index<sup>4</sup>. At that point, 91 percent of the traffic will be video. In the meantime, 2010 is forecast to be the first year that that volume of all other video traffic surpasses the volume of peer-to-peer video as the largest source of web traffic, the implications of which in terms of traffic management technologies are discussed in our response to question 4.

To some extent congestion is a natural consequence of the massive increase in usage as well as the differing types of usages that are now occurring on electronic communications networks. Policy makers should seek to foster a regulatory environment which promotes continuous and ongoing investment in network infrastructure and links, so that congestion is managed and alleviated. Regulation should also abstain from second guessing future trends in either network usage or new business models that are evolving. In this respect, we would commend the work of Bain & Company in their report 'Next Generation Competition'<sup>5</sup> whose analysis shows that countries with greatest availability of two competing fixed access infrastructures (the Netherlands, Belgium and Switzerland) spur innovation with on average 30% higher bandwidth offers, and 29% greater penetration of broadband. Further, where dual fixed infrastructures exist each infrastructure owner has an incentive to invest (either selectively or nationwide) in next generation technology to provide consumers with superior bandwidth performance in order to acquire or retain customers, stimulating a counter-wave of investment. Finally, Bain concluded that bandwidth is expected to grow most rapidly where there was strong competition between alternative fixed line infrastructures complemented by wireless networks.

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

Given the strength of competition and the commitment to consumer transparency in the European broadband market, in general we believe the existing ex-ante regulatory framework is well suited to its purpose. The provisions in the Universal Service and Framework Directives provide national regulators with recourse to powers to ensure consumers are fully informed of the use of traffic management measures with respect to their services. In addition NRAs also have powers to correct network management practices considered to be anti-competitive or those serving to degrade customers' experience through the ability to set minimum quality of service parameters.

However we are strongly of the view that at the current time regulation to restrict traffic management or to prohibit service differentiation would be a retrograde step, and would undermine operators' ability and willingness to invest in modern, effective and innovative

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<sup>4</sup> <http://gigaom.com/2010/06/02/the-zettabyte-era-is-getting-closer/>

<sup>5</sup> Next Generation Competition – Driving Innovation in Telecommunications', Bain & Company. Published under Liberty Global's Policy Series, October 2009. Download available from: [http://www.lgi.com/ir\\_public\\_policy.html](http://www.lgi.com/ir_public_policy.html)

technologies. In this respect we support OFCOM's conclusion that ex ante regulation for this purpose is at this time unnecessary.

Regulation should not prohibit network operators from offering prioritization based on tiered product offerings, quality-of-service guarantees, or other enhancements to particular content or application providers in a manner that promotes innovation and enhances consumer welfare. Premium consumer and business connectivity products should be encouraged given their ability to stimulate investments and competition between networks. This process occurs without degrading the basic level of internet access services nor undermining the essential 'openness' of the internet. Indeed, premium differentiated offerings improve the consumers ability to navigate the internet so that their content and service preferences are best met.

Similarly, congestion and bandwidth management techniques and standards have been developed and will be continued to be developed with the objective of making networks work better for the operator and ultimately the end consumer. Regulation in this area should not prohibit nor inhibit development and roll-out of balanced technical solutions (see answer to question 4)

**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? Traffic management is necessary not only from an operator's point of view but is also important as it is the optimum environment in which new business models are most likely to emerge.**

Some net neutrality proponents suggest that the model for managing the internet should be to treat 'all content packets equally'. However, this mistakenly characterizes how the internet is operated and managed.

We believe there is a developing acceptance that traffic management is part of routine network operation and management and a practice that is critical to maintaining a well functioning internet. The use of these techniques also help to optimize efficient use of the network which can reduce consumer internet access costs, as well as mitigate the need for expensive bandwidth expansion to handle peaks of traffic at certain times of the day.

Modern traffic management is also necessary regardless of the evolution of fibre network upgrades, as congestion occurs regardless of investment in core architecture. No matter how large or powerful a network becomes operators will, amongst other issues, need to manage denial -of-service, security threats, jitter, and latency issues on a continuous basis. By way of example, the growing use of bandwidth hungry applications, such as video streaming is putting considerable pressure on both cable and dsl based platforms.

Congestion is a phenomenon that is present in every ISP's network. While each ISP strives to provide adequate capacity, congestion can occur in various parts of the network for various reasons.

For example, all ISP networks are designed to be 'oversubscribed'. This means that, if all internet subscribers would be on-line at the same time, requiring the maximum provisioned speed to be available to them at the same time, they would not be able to achieve it. This planning model has its origins in telephony networks and services and has been used, and continues to be used, for internet services.

Congestion can occur on parts of the network where the traffic demand is higher than the available capacity. An ISP would generally upgrade its network to avoid such situation. However, this is not always possible as traffic and network utilization is not 100% predictable. In the event of congestion, IP packets are dropped equally on the congested part of the network irrespective of the nature of the service or content (e.g. voice, video streaming, web browsing or file sharing).

Traffic management techniques can therefore be deployed to ensure, for example, that IP packets for real time service (voice, video streaming etc) are not dropped, while other non-real time services could be impacted (Peer-to-peer streams). This would ensure an elevated Quality of Experience on the subscriber side. In addition traffic management could be used to ensure IP packets of premium, and differentiated, business services are not dropped. To implement this would require activation of QoS (Quality of Service) on the network, optimized so that each type of service is assigned to a different QoS queue.

Traffic management practices also create competition amongst fixed and mobile broadband operators. In an effort to differentiate service offerings to consumers to match their needs, operators are using network management practices to develop different products. High speed internet products based on flat-rate monthly plans are now the default offering in the majority of our footprint, with the exception of Belgium and Ireland, and these complement existing types of internet service plans. This demonstrates the important role traffic management plays in facilitating an environment where new business models emerge, and is therefore positive.

By contrast mobile operators are moving away from this type of product to ensure that revenue streams remain aligned with the costs of serving the customer, the development of which requires operators to differentiate between the traffic of individual subscribers, and between applications. Mobile operators are using different approaches for this, including the use of data limits, speed differentiation and application differentiation. Over time we anticipate that fixed broadband operators will also move away from flat-fee products to deal with ever increasing consumption.

Some consumers may wish to have a service package which links their monthly fee to the bytes they consume. Others will rank their Internet connection by the quality of experience they

receive for their favorite applications, like latency-sensitive Internet video gaming or VoIP. Network providers could offer a Premium Video Gaming or Premium VoIP service plan that delivers exactly the type of Internet.

Managing the performance levels of the network are also about more than simple bandwidth control. Given the explosion of data traffic, and in particular the nature of the growth toward video consumption as the primary facet of network usage<sup>6</sup>, in the future ensuring high quality video distribution performance will be an essential element of traffic management. In this context, performance criteria linked to the speed and quality of video delivery are at least as important as bandwidth management for consumers and network operators.

It is also significant that state-of-the-art network management centres distinguish between 'bandwidth usage management' and 'congestion management'. Traditional traffic management shaped bandwidth hungry applications during peak hours, without taking into account customer behavior. These are over time progressively being phased out and replaced by protocol and application agnostic congestion management which shares available internet capacity more evenly, based on real-time information of actual utilization ratios of a given node. This technique seeks to minimize the effect of congestion for the majority of users caused by the consumption patterns of the few, by restricting the bandwidth available to the highest using customers only whilst leaving overwhelming majority of customers untouched.

Traffic management thus encapsulates bandwidth management and congestion management set against performance criteria that a network must meet for a specified customer or service. These criteria include: best-effort bandwidth, packet loss, latency, and jitter. Best-effort bandwidth, or throughput, can include minimum, average and peak guarantees of bandwidth availability. Packet loss is the number or percentage of packets sent but not received, or received in error. Latency refers to the end-to-end delay of packets, and jitter is the delay variation for consecutive packets.

**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?**

Customer transparency is a critical element – together with competition, choice and openness – in ensuring net neutrality concerns do not develop. Meaningful transparency is important and useful insofar as it allows the user to make informed choices about real alternatives for the provision of Internet access services.

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<sup>6</sup> The global online video community will include more than 1 billion users by the end of 2010. Advanced video traffic, including 3DTV and HDTV is projected to increase 13 times between 2009 and 2014. See <http://gigaom.com/2010/06/02/the-zettabyte-era-is-getting-closer/>

Consumers need to be able to form an opinion if traffic management practices apply to them, when, what applications or services it will apply to, and what specific impact it is likely to have on their user experience (in particular the impact on speed).

In simple terms, transparency is a primary means of ensuring reasonableness of bandwidth congestion management. Given the technical aspects of congestion management over EURO-DOCSIS based cable networks (latency, loss, jitter, shared access etc) transparency disclosure requirements should not be overly prescriptive. It is therefore necessary only to disclose what is material to understanding traffic management policy.

For example, similarly to other access technologies, cable broadband networks are susceptible to malicious attack, such as denial of service attacks, phishing, spam, and other evolving threats. For network and subscriber security, it is important that any requirement for disclosure of network management practices be balanced by the need to defend against such attacks. If transparency obligations were overly prescriptive providers may be required to reveal information that would leave their networks vulnerable to such attacks.

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

We recognize that mobile networks, and in particular the delivery of wireless broadband services over these networks, poses different operational and traffic management challenges in comparison to fixed networks. However, any assessment of whether traffic management techniques or service differentiation require regulatory intervention on anti-competitive grounds should not distinguish between different access technologies, be they fixed or mobile.

Differentiation of this type reinforces the view that services over networks can and should be treated differently. In our view, the appropriate frame of reference for assessing traffic management techniques or service differentiation offerings of all operators must be in terms of the consumer experience. Accordingly the policy principles of choice, competition, openness and transparency should apply universally to all access platforms. To create an exception to these principles for a certain type of network - as proposed by some players in the US public policy debate - runs the risk of consumer harm.

However, we do not preclude that the application of the same regulatory principles to different access technologies may lead to different outcomes as to the need to intervene.

**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?**

In terms of the business models supporting prioritization of content and services, we believe there should be ample scope for innovation on both sides of the value chain, i.e. from network operator to consumer, and toward content and application service providers. In general, commercial agreements that reflect the two sided nature of the internet services market are, at this point, far from the norm. Today the market functions with consumers paying for their internet access subscription, service and content providers largely benefiting from settlement free peering arrangements, and network operators entirely responsible for network upgrades to accommodate for the exponential increase in data flows.

In order to strike a better balance between the various actors in the internet value chain the promotion of new innovative commercial agreements is critical. The form of these arrangements, and any experimentation in their use, should not be prescribed or limited by regulation. Some models under development include greater use of targeted advertising, revenue sharing between network operator and content/application providers; and additional consumer carriage fees (tiered access offers) reflecting specific quality of service parameters an end consumer desires

While the development of these new and innovative commercial arrangements should be left to the economic actors in the value chain, policy makers should be aware of the imbalances in the internet value chain when devising the policy framework for the sector(s) involved.

**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?**

N/A

**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?**

N/A

**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?**

As set out in our response to question 7, in terms of the business models supporting prioritization of content and services, in order to strike a better balance between the various actors in the internet value chain the promotion of new innovative commercial agreements is key. The form of these arrangements, and any experimentation in their use, should not be prescribed nor limited by regulation.

Network operators, including cable operators are also experiencing a significant growth in traffic as a result of growth in unbalanced peering relationships with organizations delivering bandwidth intensive services e.g. high quality streaming video services. This trend is likely to intensify as new organization request peering whose services by their nature are inherently unbalanced.

Traditionally, in order to deliver internet connectivity to subscribers, a cable ISP would peer with individual networks on a 1:1 basis, settlement fee. Alternatively, a content creator or ISP could buy 'transit' from another ISP to gain connectivity with networks that it does not have a peering relationship with.

To address the significant growth in traffic from these parties and to improve economic equilibrium with peering partners, there is currently a great deal of innovation taking place in this area with regard to commercial arrangements. At this stage, commercial entities should not be constrained by regulation to experiment and innovate in this area. Rather we would encourage regulators to promote commercial negotiations between ISPs and content delivery networks to better establish a competitive marketplace at all tiers of the internet value chain. This, combined with a clear commitment to, and delivery of, meaningful consumer transparency makes the prospect of anti-competitive conduct remote.

**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?**

Given the strength of competition, choice and the commitment to consumer transparency in Europe LGI does not believe the conditions for regulatory intervention to set quality of service requirements exist. Indeed, strength of competition compels operators to provide a minimum QoS in order to maintain their market position.

Moreover, rapid technological developments will undermine NRAs ability to set future-proof QoS definitions, with inappropriate regulatory decisions likely to act as barriers to innovation.

The most effective means of ensuring consumer quality of service is maintained is strong commitment to transparency of traffic management practices. In addition tiered offerings which feature limitations to the flexibility or utility of an internet connection according to consumer preference, and available real time, are important to maintaining quality of service.

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

As per our response to question 11, we believe that competition, choice and strong consumer transparency practices in Europe make the setting of QoS requirements by NRAs at best superfluous, and at worst potentially market distorting.

**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?**

From a network architecture perspective, today's public internet is a broad collection of inter-connecting, multi-national public and private networks. Content is delivered by routing the request for content delivery from the end customer to the server of the content, or hosting provider. Request received, the content is sent towards the end customer in the same manner. There is no specialized mechanism for content delivery and standard routing and IP-interconnection applies. All of this happens on a "best effort" basis.

As a result an NRA's ability to enforce meaningful quality of service (QoS) standards is limited to the electronic communications networks as defined by the EU electronic communications framework, and not the broader internet. Local regulation from NRAs to set QoS levels will not help deliver substantial quality of service benefits for end consumers.

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

We share the general consensus that greater transparency benefits consumers, and to a large degree we endorse the discussion and proposals made in the OFCOM consultation paper on this matter<sup>7</sup>. Meaningful transparency will allow consumers to decide what practices, services, or devices best suit their needs, and allow them to identify which practices they object to.

Intense competition and choice of broadband access providers in Europe also creates a strong incentive to maintain a reputation for providing clear and accurate information that is material to consumers making their choice of broadband access service or plan. This is made more important by the intense public scrutiny from regulators, trade press and user community interests in operators' congestion and bandwidth management policies, and any changes to these over time.

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<sup>7</sup> Ofcom, "Traffic Management and 'Net Neutrality': a Discussion Document," section 5.

By contrast, overly prescriptive disclosure requirements would be counterproductive and would inhibit our ability to respond to consumer feedback on the most meaningful and clear transparency practices. Disclosures need also to be flexible enough to deal with changes in security threats, traffic patterns etc.

We also favor a broader commitment to transparency from other operators in the internet ecosystem allowing network operators to improve their services as a result of increased visibility into the demands of new applications, and vice versa.” For example, it would be useful for consumers to be aware as a result of informational campaigns by application or service providers that a particular application or services is bandwidth intensive, and may likely degrade the service levels and response times of other applications or services used simultaneously.

**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?**

N/A

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