

Date issued:	9 September 2010
Source:	Open Spectrum Alliance and Open Technology Initiative
Subject:	Response to Ofcom Consultation on “Traffic Management and ‘Net Neutrality: A Discussion Document”
Summary:	The Open Spectrum Alliance and the New America Foundation’s Open Technology initiative respectfully submit this consultation response to address Ofcom’s preliminary view with the following perspectives: first, that transparency alone will be insufficient to ensure that the Internet remains a robust platform for free expression, information exchange and business; and second, that Ofcom should more pro-actively address increasing network capacity by opening access to more wireless spectrum.
Proposal:	For consideration by Ofcom

Introduction

The Internet can be best described as a series of networks connecting various types of users and creating new markets and types of communication. The Internet was developed on a neutral, end-to-end “best efforts” framework. In this system, users have been able to create, share, and access online content of their choice. In the same vein, producers of content, applications and devices for online use have been able to experiment with new technologies, given the relatively low barriers to entry to a market for their services.

Without sensible network neutrality rules from Ofcom and other regulators, however, ISP traffic management practices will undoubtedly have a severely harmful impact on this favorable platform for innovation, locking the Internet into 2010 usage patterns and potentially fragmenting what is currently a worldwide, interconnected communications network. Harmful traffic management has a similarly mitigating effect on the public’s ability to practice free expression and access a diversity of information online, which may cause tangible harm to, among others, disadvantaged communities who use the Internet to correct media

misrepresentations and share their untold stories. Unfortunately, consumer and citizen harm through such traffic management is already widespread in the UK market for mobile access to the Internet.

In its consultation document, Ofcom has recommended the policy tools of competition regulation and consumer transparency to address traffic management challenges. The Open Spectrum Alliance and the New America Foundation's Open Technology Initiative respectfully submit this response to Ofcom's consultation, to address Ofcom's preliminary view with the following perspectives: first, that transparency alone will be insufficient to ensure that the Internet remains a robust platform for free expression, information exchange and business; and second, that Ofcom should more pro-actively address increasing network capacity by opening access to more wireless spectrum.

The Open Spectrum Alliance (www.openspectrum.eu) is a coalition of companies, organizations, and individuals working to unlock the potential benefits of bandwidth for all. Current methods of spectrum regulation are based upon the assumption of scarcity reflecting the technologies of the early 20th Century. "Smart" radio technologies support far more efficient and productive methods of spectrum management. The Open Spectrum Alliance is united by the goal of realizing the potential social and economic benefits of this underutilized natural resource by promoting innovative public policies.

The New America Foundation's Open Technology Initiative (oti.newamerica.net) formulates policy and regulatory reforms to support open architectures and open source innovations and facilitates the development and implementation of open technologies and communications networks. OTI promotes affordable, universal, and ubiquitous communications networks through partnerships with communities, researchers, industry, and public interest groups and is committed to maximizing the potentials of innovative open technologies by studying their social and economic impacts – particularly for poor, rural, and other underserved constituencies. OTI provides in-depth, objective research, analysis, and findings for policy decision-makers and the general public.

1. Traffic Management Harms Consumer Choice, Innovation, and Free Expression

A policy framework that permits traffic discrimination provides broadband carriers a direct incentive to engage in unfair, anticompetitive practices. If discrimination is allowed, providers can decide to create artificial scarcity on their networks by, for instance, choosing not to invest in and upgrade those networks to support higher bandwidth capacity. They may then choose to request monetary payment or other benefits from content providers in exchange for providing them faster, higher quality access.

Such “paid prioritization” practices favor large online content providers that may be able afford to engage in such business arrangements with carriers. They are, however, harmful to smaller content and application providers with less available finances. Such practices are likely also to deter innovators from developing new content or applications, given that barriers to market entry are higher.

Traffic management also harms free expression and innovation online. The Internet does not operate as a two-sided market, where an ISP directly provides services to distinct groups of “consumers.” Rather, an ISP provides access to the Internet cloud, a network of over a billion devices that represent users, services, and businesses. Nicholas Economides explains that the Internet is a “billion sided market” in which “[a]ny user has the possibility of setting up content and engaging in a variety of downloads or transmissions such as email, video, pictures, and postings.”¹ Operating on an end-to-end architecture, any player on this “billion sided market” is connected. And as Chettiar and Holladay explain: “all users can access all content on the Internet.”²

¹See Nicholas Economides, “Why Imposing New Tolls on Third-Party Content and Applications Threatens Innovation and Will Not Improve Broadband Providers’ Investment,” NET Institute Working Papers #10-01, NYU Law and Economics Research Paper No.10-32, January 2010.

²See Inimai M. Chettiar and J. Scott Holladay, “Free to Invest: The Economic Benefits of Preserving Net Neutrality,” Institute for Public Policy, New York University Law School, Report No. 4, January 2010.

In other words, unlike traditional media outlets, such as the television, radio, and newspapers, on the Internet the lines between the passive user and the content creator are blurred. Low barriers to entry make it possible for anyone with an Internet connection and server space to become a producer and distributor of online content. However, this harmony of content development and access is disrupted by ISP traffic management practices, which can create different levels of service and online experience to different users and content providers, based on choices made not by themselves, but by third party ISPs.

Further, researchers Chris Riley and Robb Topolski have explained that ISP traffic management practices have three negative consequences, above and beyond harming free expression and causing economic disadvantage to smaller content and application providers.³

First, when an ISP decides which applications should be granted priority, such an action, by definition, reduces consumer choice and flexibility. For example, if an ISP designates a peer-to-peer (“P2P”) protocol as lower priority than a VoIP protocol, the user cannot make its own choice to re-upgrade P2P to a higher priority. The user has no alternative but to continue to use subpar services and applications, or switch to another carrier, provided that one is available and provided that the new carrier does not also discriminate against the consumers’ preferred service. This is unacceptably unfair market behavior by the broadband provider.

Second, ISP traffic management limits innovation at the edges of the Internet. In a neutral framework, Internet services and applications compete based on price, design, and engineering. If an ISP favors one type of service or application over another, that service or application will be prioritized based on today’s Internet usage patterns. Riley and Topolski use a hypothetical scenario of RealPlayer and YouTube to illustrate the potential consumer harm:

“Imagine if RealVideo, the video format used in RealPlayer, was classified as a priority application upon its original release in 1997. Upon its introduction in 2005, YouTube might not have received the same level of priority, because it uses a fundamentally different protocol and business model--YouTube hosts video itself, whereas RealVideo is hosted on individual websites.

³See M. Chris Riley and Robb Topolski, “The Hidden Harms of Application Bias,” Free Press/New America Foundation Policy Brief, November 2009.

After eight years of prioritized use, the video quality of RealVideo would have held a substantial advantage over the new entrant, YouTube, which would be effectively degraded by the imposition of priority for RealPlayer. Youtube would have faced an uphill battle to adoption, being required to compete as a video service without priority; it might well have failed, while on a level playing field, it flourished.”⁴

Riley and Topolski warn that “no engineer or policy maker can predict the future of innovation online, or even typical usage in 2014.” YouTube, Twitter, and BitTorrent have each had a transformational impact on web usage over the past several years; assuming which websites or services will dominate the Internet in the coming years is a fools errand.

Third, traffic management practices can actually decrease overall network performance. Two elements of network management -- Deep Packet Inspection (“DPI”) and traffic prioritization -- contribute to increased congestion or delays. DPI requires routing equipment to inspect a packet’s body rather than just its head, increasing time the packet spends on the network. Prioritization interrupts the neutral framework of the Internet, reducing delay for specified packets while increasing delay for, or ultimately dropping, de-prioritized packets. Yet as Riley and Topolski explain, “increasing standard deviation for the same average latency will result in more transmissions, causing more packets to traverse network routes multiple times, creating additional packet load and therefore additional congestion in the network.”⁵ In other words, the act of prioritization by definition leads to greater congestion.

Providers have options beyond application-specific traffic management. As described by Ofcom’s Traffic Management Continuum, an ISP can implement various types of traffic management practices, which are carried out using certain technical approaches. Protocol specific traffic management prioritizes certain specific types of applications or content over others. For example, protocol specific traffic management may favor a VoIP application (e.g. Skype) over a peer-to-peer file sharing application (e.g. BitTorrent), or blocking a VoIP application altogether. Such practices target applications and services directly, and therefore provide carriers particular incentive for harmful discrimination. Protocol agnostic traffic

⁴Id.

⁵Id.

management, on the other hand, can de-prioritize or otherwise slow down general network traffic during times of heavy bandwidth use, to improve overall quality of service to all users. As such, this practice mitigates congestion without discriminating against specific applications or content. Such practices should always be disclosed upfront to users, and while they are ultimately not desirable, they provide an alternative to direct, protocol-specific discrimination against particular types of content.

2. Transparency is Not Enough to Protect Free Expression and Consumer Choice

Under its own mandate, Ofcom bears responsibility for consumers and citizens.⁶ British taxpayers are both consumers and citizens - their needs cannot be separated. The limitation of transparency rules, as the Ofcom consultation document establishes them, is that consumer choice is presented as an option of either remaining with a carrier or switching to another one. It assumes that transparency of network management practices is sufficient because it permits users to choose the provider with the “best” network management practices.

It does not consider, however, that network management and the creation of artificial scarcity can become dangerously common practice, providing a false choice for the consumer who is looking to escape from bandwidth throttling. Network operators worldwide already complain that without being able to engage in network management, they will lack the resources necessary to invest in infrastructure upgrades. But carriers’ portrayal of network management as a substitute or complement for capacity upgrades is incorrect. As Benjamin Lennett explains, traffic prioritization “does not create capacity -- it only rations existing capacity among competing network users or uses. At best, it serves as a short-term means to defer capacity upgrades, and at worst, a way for ISPs to increasingly control the flow of bits over their networks.”⁷ Further, policymaking that forgoes the prevention of harmful network management does not provide any guarantee that providers will choose to invest in upgrade even as they are able to throttle or block traffic.

⁶ Communications Act 2003 c.21 pt. 1§3 cl.1. (2003).

⁷See Benjamin Lennett, “Dis-Empowering Users vs. Maintaining Internet Freedom: Network Management and Quality of Service (QoS),” *CommLaw Conspectus*, 18:1 (2009), available at <http://commlaw.cua.edu/res/docs/articles/v18/18-1/06-lennett-final.pdf>.

The consultation document also does not recognize that, as mentioned above, Internet end-users are not passive consumers, nor is the interactive Internet strictly comparable to a cable television service.

All Internet end-users are potential innovators. They are, as von Hippel argues, “prosumers” whose media practices included both production and consumption. For prosumers, upload speeds are as important as download speeds. As well, Internet end-users are also citizens. They use public services including health services, employment services, and pay taxes. All of these services can be offered more efficiently and effectively using Internet services, or through mobile services. Innovation without permission can also improve public services; innovation without permission can also serve citizens.

The current situation whereby operators limit bandwidth to specific applications, at specific periods of time, has the potential to constrain innovation as the creator of a third-party application using a connection supplied by a retail ISP would have to negotiate between different traffic management policies that apply to different applications. Even the most thorough rules about transparency would not relieve the undue burden on the end user - the future innovator.

2.A. Outcomes of Transparency Measures Alone - International Contexts

Canada’s voluntary regulations on transparency require ISPs to make traffic management practices visible to end users, including why the practices were introduced, who will be affected, when it will occur, and how it will impact users' Internet experiences (down to the specific impact on speeds). Months after the measures were put in place, according to Michael Geist, “[t]wo of the six providers -- Telus and Vidéotron -- do not have explicit network management practice disclosures, since neither currently uses throttling or traffic shaping technologies that limit the speeds of some applications. Of the remaining four providers, none make it easy to find the disclosures, and at least two may not be compliant with the new CRTC requirements.”⁸

⁸ See Michael Geist, “Canadian ISPs and Net Neutrality Rules,” 2010, available at <http://www.p2pnet.net/story/35784>.

Similarly, as soon as Swedish regulator PTS suggested transparency as a way to protect net neutrality, at the beginning of 2010 both leading mobile operators Telia Sonera and Telenor introduced restrictions on mobile use (of IP telephony in particular).

French regulatory authority ARCEP also "recommends that the traffic management practices that ISPs employ to ensure Internet access remain exceptional and comply with the general principles of relevance, proportionality, efficiency, transparency and non discrimination".⁹

3. Open Access in Wireless, Mobile and Fixed Contexts

Consumers - and innovators - use the web seamlessly between mobile and wireline devices. Ofcom must ensure that open access to the web is not unduly constrained by mobile operators. The recent Google-Verizon position on net neutrality, which presumes that wireless carriers should be exempt from network neutrality obligations, is short-sighted.

⁹ Autorité de régulation des communications électroniques "Discussion points and initial policy directions on Internet and network neutrality," May 2010, p. 17, available at www.arcep.fr/uploads/tx.../consult-net-neutralite-200510-ENG.pdf.

	3 ¹⁰	Vodafone ¹¹	T-Mobile ¹²	O2 ¹³	Orange ¹⁴
VoIP	No restrictions	Surcharge	Prohibited	No restrictions (tbc by Telefonica)	Prohibited
Special charge for VoIP	No	Min. £25 / month	X		X
Other restrictions	None	P2P	P2P filesharing, instant messaging (except T-M's Sidekick product)	(unclear: apparently restrictions to be removed on P2P, audio & video streaming, filesharing)	Tethering , non-Orange Internet-based audio/ video streaming, P2P, filesharing

Mobile operators also make price distinctions based on applications and services, rather than on the amount of data these applications and services transfer. Current mobile phone plans, with differential pricing for text messages, telephony, and data access highlight how consumers can be subject to greatly inflated prices for even low bandwidth uses. Text messages, for example, are limited to 160 characters yet can cost 1,000 times the price per megabit of mobile telephone call.¹⁵

Congestion problems are certainly more likely on wireless networks where bandwidth is limited; but this fact does not imply that a movement should be made toward application-based traffic management or throttling. Instead, opening more radio spectrum might be a means of increasing capacity.

¹⁰http://www.three.co.uk/Help_Support/Terms_and_Conditions?content_aid=1220463479907

¹¹http://help.vodafone.co.uk/system/selfservice.controller?CMD=VIEW_ARTICLE&ARTICLE_ID=2331&PARTITION_ID=1&CONFIGURATION=1000&CURRENT_CMD=BROWSE_TOPIC&SIDE_LINK_TOPIC_ID=1048&SIDE_LINK_SUB_TOPIC_ID=1162&SIDE_LINK_TOPIC_INDEX=null&SIDE_LINK_SUB_TOPIC_INDEX=null

¹² <http://www.t-mobile.co.uk/services/uk/fairuse/#fup1>

¹³ <http://www.o2.co.uk/termsandconditions/tariffsandboltons>

¹⁴ http://shop.orange.co.uk/mobile-phones/terms#paym_animal_new

¹⁵ See Andrew Odlyzko, "The Delusions of Net Neutrality," University of Minnesota, August 2008, available at www.dtc.umn.edu/~odlyzko/doc/net.neutrality.delusions.pdf

4. Recommendations

Ofcom should clearly affirm its support for the open Internet. It should assert its willingness and duty to preserve the “open and neutral character of the Internet” – the expression also used by the European Commission¹⁶ – whereby users are able to access and distribute the information and run the applications of their choice on the global, public Internet (as defined at Art. 8.4(g) of the Better Regulation Directive). There are a number of measures that Ofcom could usefully take to alleviate congestion concerns, including further facilitating spectrum allocation, and importing good practices from elsewhere in the EU. Managing congestion should not result in discriminating against particular types of online content, services and applications, and traffic management should not be a substitute to adding capacity.

4.A. Ex post competition approaches to dealing with the harm caused by unconstrained traffic management are likely to prove ineffectual. Harmful discrimination should be clearly prohibited and prevented. Beyond putting in place measures that will alleviate congestion fears, such as around spectrum allocation, Ofcom can play a useful role in clarifying the scope of what is considered reasonable traffic management, and when and how it will step in to prevent arbitrary discrimination.

Non-discrimination rules to preserve the openness of the Internet are needed. This could take the form of the adoption in legislation and/or regulation of a short set of principles on openness and/or traffic management such as have been adopted in Norway and Canada, and suggested in France, combined with unequivocal powers for Ofcom (which would become available by a judicious implementation of the revised EU Framework) to enforce, if necessary, that these principles are effectively upheld at the level of the retail [*Internet access*] offers.

Traffic management is only a subset of the debate around net neutrality: it is a tool that can be misused to affect negatively the Internet. It should therefore not translate into arbitrary

¹⁶ See European Commission, “Questionnaire on the open Internet and net neutrality in Europe,” available at http://ec.europa.eu/information_society/policy/ecomm/doc/library/public_consult/net_neutrality/nn_questionnaire.pdf.

discrimination against certain Internet content, applications or services, and should also be deployed only on an exceptional basis (adding capacity should remain the preferred solution).

4.B. Ofcom should explicitly state that it is not acceptable for network access providers to block, degrade or surcharge for the use of content, applications or services on the Internet. In particular, like its French counterpart ARCEP, Ofcom should state unequivocally that it is not legitimate to block or otherwise hinder Skype and VoIP usage. Ofcom should also clearly state that traffic management practices will be deemed ‘acceptable’ or ‘reasonable’ only if they can be explained as being relevant, proportionate, necessary, and non-discriminatory; and that traffic management techniques should also not be substitutes to an increase in capacity whenever possible: increasing Internet take-up and use remains a top socio-economic priority, in the UK and Europe, and the authorities should obviously avoid that the best efforts Internet becomes a low speed, low capacity ‘dirt road’.

4.C. Increasing consumer transparency is not the right way of encouraging net neutrality, risks of consumer harm or network fragmentation are too great. As services converge on mobile Internet, such as the ability to use VoIP on mobile phone, transparency alone will not ease concerns that a mobile provider will continue to block applications that can offer competing services. Further, as Jordan documents, the differences in necessary network management for mobile versus fixed Internet delivery exist largely at or below the network layers and are largely “protocols that respond to wireless signal variation, that limit interference, that limit active real-time users, that schedule transmissions, and that reserve or prioritize resources.”¹⁷ These protocols do not exclude the ability for mobile Internet to offer an open platform for competing applications.

Instead we suggest that Ofcom help the UK to develop a robust open network above the retail level, including opening more radio spectrum for use to deliver connectivity in the last mile.

4.D. We suggest that Ofcom should expand its annual Broadband Speeds study, and the associated consumer awareness raising campaigns, to encompass limitations of service. In line

¹⁷See Scott Jordan, “The Application of Net Neutrality to Wireless Networks Based on Network Architecture,” *Policy & Internet* 2:2, Article 6 (2010).

with the Citizens' Rights Directive, ex ante minimum quality of service should be imposed, whereby an end-user should always be able to access the best efforts, global public Internet through the device of their choice, whichever other services they may also be subscribing to.

Conclusion

Relying on self-regulatory commitments to transparency will not be sufficient to serve the public interest when broadband market offerings do not offer real consumer choice. In the UK, many broadband carriers block or degrade certain forms of traffic, based on applications. The wide range of time periods for traffic management and the distinct differences between the types of applications blocked by each operator mean that consumers will not be able to predict how their choice of Internet content will be controlled by their operator. The incentives, usually commercial, for arbitrary discrimination do not only exist but have already led to widespread harmful discrimination in practice. The Open Spectrum Alliance and the Open Technology Initiative believe that, despite transparency obligations, a policy framework that provides carriers the incentive to create a pay-to-play system based on artificial scarcity is harmful to end users, free expression, consumer choice, and innovation in online commerce.

Contact Information

Alison Powell
Open Spectrum Alliance
a.powell@lse.ac.uk

Kamilla Kovacs
Open Spectrum Alliance
kkovacs@mediaaccess.org

James Losey
Open Technology Initiative, New America Foundation
losey@newamerica.net