



Comments of AT&T Global Network Services France: French Consultation Paper on Net Neutrality

May 17, 2010

Introduction

AT&T Global Network Services France SAS (“AT&T”) respectfully submits these comments on the Consultation Paper on Net Neutrality.

Operating globally under the AT&T brand, AT&T’s parent, AT&T Inc., through its affiliates, is a worldwide provider of Internet Protocol (IP)-based communications services to businesses and a leading U.S. provider of wireless, high speed Internet access, local and long distance voice, and directory publishing and advertising services, and a growing provider of IPTV entertainment offerings. AT&T Inc. operates one of the world’s most advanced global networks, carrying more than 18.7 petabytes of total IP and data traffic on an average business day, the equivalent of a 3.1 megabyte music download for every man, woman and child on the planet. With operations in countries that cover 97% of the world’s economy, AT&T Inc. has extensive global experience as an incumbent and a new entrant, as a fixed line operator and a mobile operator, and in the dynamic areas of converged technologies and services.

In the EU, AT&T Inc., through its affiliates, is a competitive provider of business connectivity and managed network services in EU Member States, and a leading provider of bilateral connectivity services between the U.S. and all the EU Member States.

AT&T appreciates the opportunity to express its views in this public consultation on Net Neutrality. AT&T hopes that its responses will be helpful in formulating a sound strategy for the development of the Information Society within France, allowing market players to invest in the infrastructures and services which will benefit both consumers and businesses. AT&T therefore welcomes the Secrétariat d’Etat à la Perspective et au Développement de l’économie numérique’s efforts to develop, in close cooperation with stakeholders, a comprehensive and ambitious digital strategy for the future of the Internet.



Consistent with the questionnaire guidance to respondents, AT&T responds as follows to the questions and issues raised in the consultation.

Answers to Questions 1 & 2: Definitions, current situations and existing policies

On the question of the definitions, AT&T would like to focus more on the goal of an Open Internet rather than on the restrictive term of “Net Neutrality.” In order to avoid any misunderstanding, AT&T supports an open and transparent broadband environment. We note, however, that a definition of “openness” is missing from this consultation and the questions related to the development of Next Generation Access (NGA) networks and services are difficult to address without a clearer understanding of what the concept of “openness” encompasses.

AT&T believes that the goal of an open Internet means an Internet ecosystem that enables users to exchange ideas and communicate freely, gives them freedom to access the lawful applications and content they wish to use, and affords them the ability to choose and assemble packages of services and equipment that meet their needs.

However, an open Internet does not mean or require implementing new, prescriptive net neutrality rules. There is no reason for such regulations to be imposed because there has been no market failure. We believe that with the new powers attributed to the National Regulators by the EU directive *on universal service and users’ rights relating to electronic communications networks*, potential problems could be solved easily by the National Regulatory Authorities in case any market failure actually does appear.

Additionally, restrictive net neutrality rules would undermine France’s most pressing objectives: expanding deployment of broadband facilities and investment in related technologies and services in order to increase not only availability, but adoption.

Moreover, users in France, as in the U.S., benefit from a highly competitive market place for broadband Internet access, choosing from a range of providers and options to access and use the Internet. Competition is driving users’ ability to access to content, applications and services they require, be it on fixed or mobile networks.



Europe has at its disposal a robust regulatory and competition framework for protecting consumers in case of anti-competitive behaviour. The revised EU framework for electronic communications, expected to be implemented soon in the French legislation includes additional transparency measures that will further enhance consumers' ability to make informed choices regarding their Internet service. In addition, National Regulatory Authorities such as ARCEP stand ready to prevent degradations in service quality to consumers.

In the world's highly competitive markets for fixed and mobile broadband, preemptive regulation that would restrict traffic management and service differentiation would undermine France's digital economy by excluding new business models, locking in today's technologies, and hampering necessary innovation.

We therefore encourage the French government to continue following its current policy approach to the open Internet under the new framework for electronic communications, in support of Europe's digital agenda.

All policies at France and EU levels should also aim for a level playing field for competing in the Internet space, addressing issues of competition, openness and consumers' rights not only at the level of electronic communications networks and services but wherever they emerge in the Internet value chain.

France should work towards a sound policy framework for IP broadband networks and the Internet, balancing objectives such as the openness of the Internet, competition between all actors in the value chain and network and service innovation to the ultimate benefit of citizens.

Prior decisions by governments to avoid unnecessary regulation of the Internet are validated every day by the spectacular growth of the Internet and its remarkable contribution to culture, political discourse, and economic development throughout the world. The Internet has evolved from being a network that provided only file downloads and remote access to distant academic or government computers to being a vibrant global commercial network that now provides countless different services to millions of content and applications providers and billions of users.

The Internet has become the most powerful engine of economic growth in our time precisely because governments have allowed market forces to shape its evolution free from



regulation that would have locked in place certain specific technologies or business models. And there is no reason to believe that no further advances will exist. Rather, the Internet's next 40 years are likely to be just as dynamic as the past 40 years. In the absence of specifically demonstrated actual problems and harms, Internet regulation should remain restricted to protecting the basic customer freedoms associated with openness and customer value under which the Internet has always operated.

Therefore, AT&T believes that prescriptive "net neutrality" regulation is not justified by any real-world problem and would impede the continued development of broadband services and the future growth of the Internet. There is no basis to claims that Internet traffic management or prioritization practices threaten the historic "neutrality" of the Internet, since these and other network practices to ensure quality of service for particular Internet applications and content have been widely used for many years without controversy. Moreover, the rapid convergence of all electronic communications onto the IP platform and growing network congestion will make the continued use of these practices increasingly important in the future.

The adoption of broad "non-discrimination" rules prohibiting such practices would impede customers' use of quality of service sensitive applications like streaming video and VoIP and may prevent broadband providers from recovering any portion of network cost increases caused by bandwidth-intensive applications from purveyors of these applications, resulting in increased consumer rates and harming efforts to expand access to broadband services. Any such rules also would impede mobile operators' use of necessary network management techniques to avert or respond to network failures or congestion and to allow customer use of latency-sensitive applications. Instead, regulators should require adherence to consumer-focused principles such as those adopted in 2009 by the European Parliament and the European Council and should take further action only if real problems in fact develop – and not on the basis of speculation. Additionally, regulators should encourage industry collaboration to resolve network management issues.



Answers to Question 3 & 5: EU–U.S. analogies and potential policy recommendations

Whatever one thinks of the “network neutrality” debates, everyone agrees on the need for continued massive investments in fibre, wireless, and other network infrastructure to increase the bandwidth and Internet functionality available to all consumers. This substantial, new, and risky investment is needed to extend broadband networks to more people in more places at affordable prices and to support the unprecedented growth of Internet traffic and the increasing demands of its changing traffic mix. Moreover, investment in smarter broadband networks is needed to meet the evolving needs of end users and enable innovative high-quality services. Everything done by the industry and by policymakers should be measured against this overriding objective.

Indeed, even through this economic downturn, Internet traffic continues to grow at a tremendous rate. A recent report by Cisco notes that the amount of traffic on the Internet in 2012 will be 75 times larger than it was in 2002, six times larger than it was in 2007, and four times larger than last year. The nature of Internet traffic is changing as well, placing new and increasing burdens on underlying networks.¹ To meet this growth and extend broadband universally, network operators need to make enormous new investments, but they also need to recover the costs of these investments. And, in order to be able to fund these investments, network providers need also to price their services at levels that consumers can – and are willing to – pay.

This is why AT&T believes that regulators in the EU and U.S., and in the rest of the world should require adherence to consumer-focused principles, such as those adopted by the EU Institutions in 2009 and those adopted five years ago by the U.S. Federal Communications Commission (FCC) in its *Internet Policy Statement*:

- ⇒ *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to access the lawful Internet content of their choice;*

¹ For example, consumer video will be responsible for the majority of the traffic growth between 2007 and 2012. Cisco Systems, *Approaching the Zettabyte Era*, June 16, 2008. One minute of video requires 10 times the bandwidth as voice. Kleeman, Michael, "Point of Disconnect," University of California, San Diego, August 30, 2007, available at <http://cpe.ucsd.edu/assets/013/6535.pdf>



- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet*, consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement;
- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet*, consumers are entitled to connect their choice of legal devices that do not harm the network; and
- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet*, consumers are entitled to competition among network providers, application and service providers, and content providers.²

The FCC's oversight of industry adherence to the principles embodied in the *Internet Policy Statement* has been more than sufficient to ensure compliance with those principles and to foster an open Internet. Indeed, in the ensuing five years, the FCC has found it necessary to enforce the principles in the *Internet Policy Statement* only *twice*: first, to stop Madison River Communications, a small rural carrier, from unreasonably blocking the use of certain VoIP services by its customers; and second, to prevent Comcast from unreasonably interfering with certain peer-to-peer applications used by its customers.³ In both instances, FCC enforcement actions directly targeted the specific practices in question and resolved the issues rapidly and effectively.

Nonetheless, the FCC has recently proposed to adopt broadband provider-specific prescriptive rules including strict 'nondiscrimination' requirements, which AT&T believes are unwarranted for the reasons described in these comments and in AT&T's comments filed with the FCC.⁴ In contrast, European Commission Vice President Neelie Kroes has

² See Policy Statement, *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, 20 FCC Rcd. 14986 (2005) ("*Internet Policy Statement*"), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf.

³ See Memorandum and Order, *Formal Complaint of Free Press and Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications*, 23 FCC Rcd. 13028 (2008); Order, *Madison River Commc'ns, LLC*, 20 FCC Rcd. 4295 (2005).

⁴ See Comments of AT&T Inc., GN Docket No. 09-191, (filed Jan. 14, 2010), available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020377217>, <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020377218>.



advocated a more cautious approach to any such new requirement,⁵ an approach that AT&T supports.

Instead of adopting onerous new regulation based on no credible data-driven evidence of any market failure as the FCC proposes, AT&T supports an approach based on the principles in the *Internet Policy Statement*, perhaps together with adoption of a new, fifth principle to encourage greater consumer-oriented transparency about network-management practices⁶ as it was also proposed by the new adopted by the new EU Electronic Communications Framework. This approach preserves the openness of the Internet, while maintaining incentives for broadband providers to make the massive investments necessary to increase broadband deployment. It also encourages those providers to invest in the next-generation “smart” networks that are needed to support the innumerable new Internet applications that will not only enrich our daily lives, but make us healthier, safer, more energy efficient, and more prosperous.

In addition to explicating such principles, for now regulators need only monitor the market to see if real problems are developing. And if any corrective action is needed, such action should be informed on a case-by-case basis by the specifically-identified problems.

<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020377220> ,
<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020377221> ,
<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020377222> ; and Reply Comments of AT&T Inc., GN Docket No. 09-191, (filed Apr. 26, 2010), available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020437362> ,
<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020437363> ,
<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020437364> ,
<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020437365> .

⁵ Neelie Kroes, Vice President of the European Commission, Address at the ARCEP Conference, Paris, April 13, 2010 (“[S]ome are interpreting the non-discrimination principle as essentially preventing telecom operators from seeking commercial payments or agreements with content providers which deliver their highly capacity-consuming services through broadband networks and require a certain level of service for their transmission to be effective. That prospect raises a number of delicate and complex issues. These issues must be very carefully assessed before the EU gives any possible regulatory response.”), <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/10/153&format=HTML&aged=0&language=EN&guiLanguage=en>.

⁶ Transparent disclosures of the terms and conditions applicable to a customer’s service are critical to create the conditions for genuine competition because they enable consumers to make educated choices based on real differences among service providers. Under this principle, a broadband network operator can and should tell consumers, at an appropriate level of detail, about any material restrictions or limitations on their broadband Internet service so that they can make informed choices about which providers and service plans best meet their needs. The European Union has adopted transparency requirements regarding traffic management procedures in the 2009 telecoms package. See Directive 2009/136/EC, Nov. 25, 2009, Art. 20. However, in connection with such requirements, broadband providers should not be required to divulge the technical and often highly proprietary details of their underlying network-management techniques that may assist their broadband competitors or those who may seek to evade those techniques to the detriment of the network and consumers



Indeed, it is completely wrong-headed for regulators to adopt prescriptive “net neutrality” rules that are not based on credible data-driven evidence of any current market failure but solely on the basis of speculation that a market failure *might* arise someday in the future. As the Organisation for Economic Co-operation and Development (OECD) and economists across the board have observed, regulation based on speculation of future harm is premature and potentially damaging.⁷ Similarly, European Commission Vice President Neelie Kroes noted at the ARCEP Conference in Paris on April 13, 2010 that “we should avoid taking unnecessary measures that may hinder new efficient business models from emerging.”⁸

Question 4: Potential Net Neutrality Problems in the French Market

To AT&T’s knowledge, there have not been any significant problems linked to net neutrality, either in France or in the U.S., and certainly none that have not been quickly resolved. Indeed, the speculation at the root of the current “net neutrality” debate rests on deeply flawed premises, including that the Internet has always been an inherently “neutral” collection of “dumb pipes” that cannot distinguish among packets based on their associated applications or content, and that new tools allowing operators to prioritize particular data now threaten the Internet’s supposed historic “neutrality.” As described below and in the attached Engineering Background, each of these premises is mistaken, and the strict “nondiscrimination” requirements proposed by net neutrality advocates to address this purported “threat” are not only unnecessary, but would have severe adverse effects on broadband providers and consumers, by prohibiting longstanding network management practices, inhibiting the provision of widely used applications and services, increasing consumer rates, and limiting the deployment and adoption of the broadband services that are increasingly important to all countries’ future growth and prosperity.

⁷ Organisation for Economic Co-operation and Development, *Internet Traffic Prioritisation: An overview*, at 5 (Apr. 6, 2007), available at <http://www.oecd.org/dataoecd/43/63/38405781.pdf> (concluding that it would be “premature for governments to become involved at the level of network-to-network traffic exchange and demand neutral packet treatment for content providers”).

⁸ See EUROPA Press Releases, <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/10/153&format=HTML&aged=0&language=EN&guiLanguage=en>.



The Internet has never been merely a collection of “dumb pipes,” and has never been “neutral” in its treatment of different applications and content. Rather, content providers with capital resources have long purchased specialized network services in order to distinguish their traffic from other Internet traffic and to offer their end users far better Internet experiences than would be possible without those quality-of-service enhancements.

Nearly three decades ago, the Internet Engineering Task Force (IETF) – the Internet’s standard-setting organization – first included a “type of service” field within the Internet Protocol to enable prioritization of real-time and other performance-sensitive applications.⁹ The IETF expanded upon that capability in 1994 and 1998 by creating the “differentiated service code point” field (“DSCP” or “DiffServ”), and it has now incorporated an even more advanced version of this capability into IPv6.¹⁰ “Net neutrality” advocates that contend that no Internet packets should be provided with any transmission quality superior to that given every other packet – regardless of whether this extra quality derives from guaranteed bandwidth or reduced packet loss, latency or jitter – are, in effect, trying to re-write the open, IETF-approved standards that have made the Internet such a tremendous success.

Broadband providers have long sold prioritized capabilities to enterprise customers, including content providers, to ensure proper handling of performance-sensitive Internet content through a broadband provider’s network. Such services can make use of packet-prioritization techniques on several protocol layers, including DiffServ on the IP layer and analogous mechanisms on other layers, such as the ATM, Ethernet, and MPLS protocols. Broadband providers use the same service-differentiation technologies in the residential market to guarantee quality of service for performance-sensitive IP applications and content, such as IPTV and VoIP, that are offered to consumers over the same physical infrastructure as best-effort Internet access. In addition to these longstanding prioritization techniques, application and content providers with the capital resources to purchase services from third-party content-delivery networks (“CDNs”) such as Akamai or Limelight – or to build CDNs of their own, as Google and other large content providers have done – enjoy huge performance advantages over rivals without those resources.

⁹ See Information Sciences Institute, *Internet Protocol DARPA Internet Program Protocol Specification, RFC 791*, at 11 (Sept. 1981), available at <http://www.ietf.org/rfc/rfc0791.txt>.

¹⁰ See generally James F. Kurose & Keith W. Ross, *Computer Networking: A Top-Down Approach* 367 (5th ed. 2010).



Content providers are exploring even more advanced, cost-efficient new ways to distribute bandwidth-intensive, performance-sensitive content, including CDN collocation, where a content provider stores content on cache servers located within access/aggregation networks, and multicasting, where a distant access network's routers instantaneously replicate and route multiple copies of packets to many different points within its access/aggregation network.

Just as there is nothing new about network practices that ensure quality of service for particular Internet applications and content, neither is there any basis for concern that such practices pose some new threat to the Internet's openness. To the contrary, such practices have proliferated for years without controversy, and the Internet has never been healthier, more functional or more open. For example, just in the last few years, new social networking applications and multimedia sites have exploded in popularity:

- ⇒ The video giant YouTube did not even exist in January 2005, but now delivers nearly 10.5 billion videos each month in the United States, and has recently begun offering high-definition video with a resolution of 1080p.¹¹
- ⇒ The social networking site Facebook, which was created in 2003 and was confined to college campuses until 2005, now claims over 350 million users and a valuation over \$10 billion.¹²
- ⇒ Twitter, which did not exist in 2005, is now the third most-used social network, with 55 million monthly visits.¹³
- ⇒ And Amazon.com, which sold its first Kindle in late 2007, has altered the way that millions of people obtain and read books, periodicals, and blog content and has already bred several competing services.¹⁴

¹¹ See *1080p HD Is Coming to YouTube*, YouTube Blog, Nov. 12, 2009,

<http://youtubeglobal.blogspot.com/2009/11/1080p-hd-comes-to-youtube.html>

¹² Facebook, Press Room, Statistics, <http://www.facebook.com/press/info.php?statistics>;

Douglas McIntyre, *Facebook gets funding offer from Russian private equity firm*, Daily Finance, May 23, 2009, <http://www.dailyfinance.com/2009/05/23/facebook-gets-funding-offer-fromrussian-private-equity-firm/>.

¹³ Andy Kazeniak, *Social Networks: Facebook Take Over Top Spot, Twitter Climbs*, Compete.com, Feb. 9, 2009, <http://blog.compete.com/2009/02/09/facebook-myspace-twittersocial-network/>.

¹⁴ See Mellissa J. Perenson, *Amazon Kindle Review: Igniting Interest in E-Books?*, PC World, Nov. 21, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/11/21/>



These content and application providers and others have changed the face of the Internet and society at large—all without any impediment from broadband providers or any need for government regulation. Indeed, the Internet has succeeded largely because broadband providers invested scores of billions of dollars into broadband network infrastructure to accommodate demand for these applications. Similarly, 3G wireless broadband services have surged, and the wireless marketplace also boasts a range of wireless platforms that have spawned literally hundreds of thousands of wireless applications from third-party developers.

Question 6: “Net Neutrality” Requirements Would Have Significant Adverse Effects on Mobile Providers

The imposition of “net neutrality” non-discrimination requirements on mobile broadband services would cause significant damage. Mobile operators must contend with mobility, spectrum constraints, interference, and other unique issues in a dynamic environment that is changing even more rapidly than its wireline counterpart. While it is impossible to predict which business models and engineering solutions will best meet consumers’ diverse needs in this environment, subjecting the mobile industry to nondiscrimination rules would preclude many service-enhancing business arrangements and practices altogether, undermine efforts to manage scarce spectrum resources, chill sensitive engineering and business decisions through endless regulatory second-guessing, and deter investment in new network technologies.

Mobile broadband networks must contend with spectrum constraints, a shared “last mile” radio access network, interference sensitivity, and other concerns that make it far more challenging to provide mobile broadband than fixed wireline broadband. Capacity and quality-of-service challenges for wireless broadband providers are particularly acute in the “last mile” radio access network, where spectrum is shared among both users and cell sites; bandwidth can fluctuate based on interference and other issues; the number of users located

AR2007112100030.html; BBC News, *Plastic Logic e-reader aims to challenge Kindle*, Jan. 7, 2009, <http://news.bbc.co.uk/2/hi/technology/8446959.stm>.



in particular cells and their dispersion within those cells at any given time is variable; and the spectrum available for use is not infinitely (or even readily) expandable. These factors make it exceedingly difficult for carriers to ensure a constant supply of sufficient bandwidth to provide high-quality data transmission for broadband Internet access customers. Because of this, providers must have access to a range of dynamic network-management techniques to respond to or avert network failures or severe congestion and to ensure that customers can enjoy latency-sensitive applications. Any prohibition on traffic differentiation would adversely impact the ability of mobile operators to address these significant challenges.

Question 7: The Continued Importance of Service Differentiation Technologies in Addressing Increased Network Congestion on Today's Internet

Banning all differential treatment of packets on the Internet, as some “Net Neutrality” advocates propose, would prevent services, applications, and content from obtaining the quality of service they need to function efficiently and effectively. Under this view, latency-sensitive applications like streaming video would have to be given the same priority as email; an Internet VoIP emergency call could be treated no differently than a YouTube download; and a telemedicine application would need to be handled in precisely the same manner as the contents of a Web page. Any such effort to impose this form of “neutrality” on the Internet would have decidedly non-neutral results by discriminating against quality of service-sensitive applications like streaming video and VoIP that will not function properly in periods of congestion unless they are accompanied by quality of service enhancements that non-performance sensitive applications do not need in order to continue to function well.

Carried to its logical conclusion, prohibiting all differential treatment would also mean the abolition of content-delivery networks like Akamai or Limelight that leverage edge networks to provide online customers with lower latency and higher quality of service than the competition. Likewise, claims that all Internet communications must receive “equal treatment” regardless of their “application or content” would require *all* application and content providers to design their applications and content using the same transport protocol – so that, for example, UDP-based applications that lack the ability to automatically “self-



throttle” when faced with congestion do not arrogate priority over TCP-based applications that can “self-throttle.”¹⁵

In addition, the rapid convergence of all electronic communications onto the IP platform allowing the integration of voice, video and text into new multi-media applications for consumers raises the critical engineering challenge of making applications with different quality of service needs function as well as possible over a shared and sometimes congested network infrastructure. This problem cannot be addressed through greater investment in broadband infrastructure alone, which would dramatically raise both network costs and end-user rates. Reliance on greater investment alone also would be inadequate for a further reason – because experience shows that Internet usage, particularly in the form of peer-to-peer file transfer applications, rapidly expands to fill new capacity. Instead, the solution to this engineering challenge lies not only in more networks and higher-capacity pipes, but in greater network intelligence as well, including an ability to identify and provide the appropriate level of performance required by different applications traversing the network so that users can receive the service quality they desire.

In an environment of increasing network congestion, broadband providers have a critical need to use the various techniques and technologies available to manage competing demands on finite bandwidth. However, a broad “nondiscrimination” rule could prohibit or limit such arrangements, particularly insofar as they involve payments by content providers for especially efficient and high quality distribution of their content.

Among the widely used services and arrangements that could be adversely affected by such a prohibition are services sold to business customers such as: Virtual Private Network (VPN) services providing network security and end-to-end quality of service

¹⁵ UDP applications “send out data as fast as [they] can,” even when they encounter congestion, “while [conventional] TCP-friendly applications deliberately send fewer and fewer packets” and may thus end up “starved of network resources.” Jon M. Peña, *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*, 1 Int’l J. of Comm’n 644, 651 (2007), available at <http://www.ijoc.org/ojs/index.php/ijoc/article/viewFile/154/90>. Nonetheless, when properly managed, UDP’s attributes can be beneficial for a range of purposes, including Domain Name System (DNS) queries. By the same token, some applications that use TCP can and do aggressively consume disproportionate amounts of subscriber bandwidth simply by opening up multiple streams (or “torrents,” as featured in some P2P technologies) to seize capacity for themselves. See, e.g., Bob Briscoe, *Flow Rate fairness: Dismantling a Religion*, 37 Computer Comm’n Rev. 63 (2007), available at http://www.cs.ucl.ac.uk/staff/bbriscoe/projects/2020comms/refb/fair_ccr.pdf (“Flow Rate Fairness”). Under a requirement to provide “equal treatment” of all Internet communications, the disparate characteristics of these and other transport protocols would need to be homogenized to ensure that no packets receive priority over others.



enhancements; paid peering arrangements enabling content providers to peer directly with broadband networks for fast and cost-efficient delivery of their traffic to end-users; IP multicast arrangements under which a broadband network configures its routers to replicate a content provider's packets instantaneously to the end users that have selected the multicast content; and CDN collocation arrangements under which a content provider stores its content in cache servers near or within a broadband provider's network. Any limitation on these and other business-to-business quality of service arrangements would not only cause significant inefficiencies for the customers purchasing those arrangements, but would also force broadband providers to recover from consumers alone all of the network costs caused by bandwidth-intensive applications, resulting in increased consumer rates and harming efforts to expand broadband access.

Conclusions: Regulators Should Encourage Industry Collaboration to Resolve Network Management Issues

Certain applications “on unmanaged networks can use a disproportionately high amount of bandwidth and cause network congestion.”¹⁶ This is a classic tragedy-of-the-commons dynamic, in which each network user has strong incentives to hoard shared bandwidth for itself at the expense of others. Left unchecked, the resulting congestion and degradation of Internet service for other users would impose deadweight losses on the industry and consumers alike. And those who use and need only moderate amounts of bandwidth would suffer the most, since they would both see their service quality suffer *and* be forced to subsidize higher system-wide costs attributable to those users with the greatest bandwidth needs.

To date, however, network providers have been forced to cope with network congestion on their own. The goal should be to engage all stakeholders in a cooperative effort to tackle the real-world congestion-management problems that ultimately harm the entire Internet economy. Achieving this goal will require all parties to recognize that, in

¹⁶ George Ou, The Information Technology and Innovation Foundation, *Managing Broadband Networks: A Policymaker's Guide*, at 3 (Dec. 2008), available at http://www.itif.org/Network_Management.pdf.



addition to their own rights, each has responsibilities to help ensure a healthy and open Internet.

Just as one example, AT&T has been part of an industry-wide working group, composed of representatives from BitTorrent, Joost, LimeWire, Cisco, Verizon, Verisign, and researchers from Yale and Washington Universities, among others, that is trying to develop an efficient, network-aware, peer-to-peer technology. Known as “P4P,” this new generation of technology is being developed to optimize network resources rather than hoard them.¹⁷ In addition, some in the technical community are considering how to improve the Internet’s transfer protocols. Researchers at BT and University College London, for example, have suggested that there are some inherent problems in TCP’s focus on “relative flow rate” fairness, for example, and that “cost fairness” – a concept that would judge transport control mechanisms by how well “they share out the ‘cost’ of each user’s actions on others” – would be more appropriate.¹⁸ Regulators should seek to promote these and similar cooperative efforts to find overarching technical solutions going forward, which would be far more productive than continued disputes over different policy positions.

AT&T would be pleased to answer any questions concerning these comments.

Respectfully submitted,

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¹⁷ See Distributed Computing Industry Association, *DCIA P4P Working Group Mission Statement*, available at http://www.dcia.info/documents/P4PWG_Mission_Statement.pdf.

¹⁸ See, e.g., *Flow Rate Fairness* at 63-74.