Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Broadband Industry Practices	)	WC Docket No. 07-52
	)	

Reply Comments of the Advanced Communications Law & Policy Institute at New York Law School

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I. INTRODUCTION

The Advanced Communications Law & Policy Institute (ACLP) at New York Law School[1] submits these comments in reply to the record in a Petition for Declaratory Ruling of Free Press et al. and a Petition for Rulemaking of Vuze, Inc., which have been incorporated into the above-captioned proceeding.

The Vuze petition seeks Commission action to "determine the parameters of "reasonable network management" by broadband network operators and to establish that such network management does not permit network operators to block, degrade, or unreasonably discriminate against lawful Internet applications, content or technologies."[2] Similarly, Free Press et al. urge the Commission to "declare through a ruling or rules that network providers cannot engage in discrimination against particular applications and that network providers must disclose their network management policies."[3] Both Petitions rely, in part, on the Commission's *Internet Policy Statement*, which was issued in 2005 to ensure that "broadband networks are widely

[1] The ACLP is an interdisciplinary public policy program of New York Law School that focuses on identifying and analyzing key regulatory and legal issues facing the advanced communications marketplace.

[2] *See In re Vuze, Inc. Petition To Establish Rules Governing Network Management Practices by Broadband Network Operators*, at 1, WC Docket No. 07-52 (Nov. 14, 2007) (hereinafter "Vuze Petition").

[3] *See* Comments of Free Press et al. in WC Docket No. 07-52, at 2 (hereinafter "Free Press et al. Comments").

deployed, open, affordable, and accessible to all consumers."[4] These principles were adopted "subject to reasonable network management,"[5] a standard that was left purposefully flexible by the FCC. These Comments endorse the Commission's *Internet Policy Statement*. "Reasonable network management" is a necessarily flexible standard that ought not to be decided by regulatory fiat. Rather, such a determination should be left to the market unless and until there is a clear market failure that negatively impacts consumers. In particular, these comments are grounded in the following:

A "Hands Off" Regulatory Policy Works

- The current "hands off" regulatory approach by the FCC and Congress has resulted in a vibrant, competitive market.
- Intrusive and potentially counterproductive regulation would hinder, not support, the broadband market.

Network Owners[6] *Require Latitude to Manage Networks*

- Network management is necessary to assure the efficient flow of data over networks, preclude network congestion that leads to slow-downs and to maintain network reliability and security.
- Network management facilitates the efficient flow of data for all consumers.
- Imposing rigid network management regulation would compromise the flexibility needed to effectively manage networks.

Market-Based & Legal Remedies Exist to Address Alleged Harms

- As a number of federal agencies have recognized, consumers are the best regulators.
- Existing legal rights and remedies, grounded in contracts law and antitrust law, are preferable to the prescriptive *ex ante* regulation suggested by some.

[4] *In re Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Policy Statement, 20 FCC Rcd. 14986 (2005) (hereinafter "Internet Policy Statement").

[5] *Id.* at n. 15.

[6] In this filing, "network owners" refers to infrastructure owners (e.g., telephone and cable companies, wireless carriers, backbone providers, etc.) and any other participant in the broadband market that actively manages data and information within a network. This would include, for example, search engines like Yahoo! and Google, providers of browsers like Microsoft, and other application and service providers (*see infra* Section V for further discussion).

- The availability of these remedies, which would supplement the market-based approaches, cautions against government-mandated network management rules that would stifle competition in the broadband market.

Continued Regulatory Restraint is the Best Approach

- The Commission should continue to exercise regulatory restraint by examining cases of alleged "bad behavior" on a case-by-case basis.
- If regulation is ultimately necessary, any resulting rules should apply equally to all network owners – including content and application providers – that manage data and information within a network.

The current regulatory approach to broadband has proven to be enormously successful, resulting in widespread consumer welfare gains. Competition has spurred the development and deployment of broadband networks and broadband-enabled technologies, all to the benefit of consumers. Innovations in the delivery of broadband and in the services enabled by broadband have provided consumers with an unparalleled user experience. As such, the broadband marketplace requires the continued regulatory certainty of a "hands off" approach and of continued restraint by the Commission. Market-based and legal remedies exist to protect consumers in the event of actual harm. The imposition of rigid *ex ante* network management regulation would chill the marketplace, slow innovation and substitute the judgment of experienced network engineers with that of rigid a set of rules, ultimately to the detriment of consumers.

II. BROADBAND HAS THRIVED UNDER A "HANDS OFF" REGULATORY APPROACH

Throughout the history and evolution of the Internet, Congress and the FCC have been deliberate in their deregulatory approach to it. As demand for Internet access has exploded, regulation has remained consistently "hands off." This approach has been necessary in order to

promote continued development and deployment of networks across the country.[7] As this section will detail, the "hands off" approach has helped spur a robustly competitive marketplace that provides consumers with competitive prices, a growing number of choices for getting online, and innovative new services. There is no evidence that a change in this approach is needed.

A. The Evolution of the "Hands Off" Regulatory Approach to Broadband

In 1996, Congress made clear its intent to keep the regulatory hand off the Internet. In its overhaul of the 1934 Communications Act, Congress explicitly stated that "[i]t is the policy of the United States…to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation."[8] Regulatory authority for the Internet was delegated to the FCC, which has outlined a goal of "ubiquitous availability of broadband to all Americans."[9] To reach this objective, the FCC has fostered a "minimal regulatory environment" for Internet access technologies, especially those that deliver broadband service.[10] The primary tool that the Commission has used to facilitate continued innovation and build out has been the classification of broadband transmission technologies as "information services,"[11] an approach that has created a "consistent regulatory framework across broadband platforms by regulating like services in [a] similar manner."[12]

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[7] *See, e.g., Connecting the Globe: A Regulator's Guide to Building a Global Information Community*, at Section IX, FCC (June 1999), available at http://www.fcc.gov/connectglobe/sec9.html.

[8] 47 U.S.C. 230(b)(2).

[9] *See, e.g., In the Matter of Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, ¶ 2, 22 F.C.C.R. 5901 (2007).

[10] *Id.*

[11] According to the Communications Act, an "information service" is defined as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service." 47 U.S.C. 153(20).

[12] *In the Matter of Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, ¶ 2, 22 F.C.C.R. 5901 (2007).

Classifying a technology as an "information service" exempts it from Title II common carrier regulation and places it under the FCC's Title I ancillary jurisdiction.[13] Over the past few years, the FCC has classified broadband cable modem service,[14] DSL broadband service,[15] broadband over power lines,[16] and wireless broadband[17] as "information services." Such regulatory harmony among broadband delivery technologies has provided the marketplace with certainty and parity, which has in turn spurred competition in the marketplace and has led to the deployment of more advanced networks. As a result, prices have dropped and the number of broadband users nationwide has increased dramatically.

The current investigation into broadband industry practices, which was initiated *sua sponte* by the Commission in April 2007, reflects the explosive growth of the broadband marketplace. By seeking to "enhance [its] understanding of the nature of the market for broadband and related services," the FCC has acknowledged that the broadband marketplace is growing faster than the speed of regulation.[18] The number and type of broadband access technologies, the number and type of broadband-enabled applications, and the number of broadband users have diversified and increased considerably over the last few years. A flexible "hands off" regulatory framework, deliberately established and implemented by the Commission, has created a competitive marketplace where consumer welfare is the primary concern.

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[13] *Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Serv.*, 545 U.S. 967, 968-969 (2005) (upholding the FCC's classification of broadband cable modem service as an "information service").

[14] *Id.*

[15] *In the Matter of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, CC Docket No. 02-33, Report and Order and Notice of Proposed Rulemaking (September 23, 2005).

[16] *Classification of Broadband Over Power Line Internet Access Service as an Information Servic*, 21 F.C.C.R. 13281 (2006).

[17] *In the Matter of Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, 22 F.C.C.R. 5901 (2007).

[18] *In the Mater of Broadband Industry Practices*, Notice of Inquiry, at ¶ 1, WC Docket No. 07-52 (released April 16, 2007).

B. Result of the "Hands Off" Approach: The Broadband Market is Competitive

According to the most recent FCC data, the broadband marketplace is robustly competitive. As of December 31, 2006 there were 82.5 million broadband lines in service across the U.S.[19] This represents a 61 percent increase (or 31.3 million) in subscribership over the twelve-month period ending December 31, 2006,[20] and a 1,100 percent increase from 2000 when there were 6.8 million broadband subscribers.[21] Supply of broadband is robust, with availability in 99% of zip codes across the U.S.[22] Over 80 percent of residents live in areas with four or more broadband providers.[23] Nationwide there are nearly 1,400 different broadband providers that provide service in an increasingly diverse number of ways – via cable modem, DSL, wireless (mobile and fixed), satellite, electric power lines, and fiber-optic cables.[24] And service providers continue to invest heavily in their networks in order to attain a competitive advantage on rivals.

Traditional telecommunications firms like Verizon and AT&T have invested billions of dollars in fiber-optic networks that can deliver voice, video and data services to customers. Verizon began building out its FiOS network in 2004, and by 2010 it will have invested $23 billion to bring its customers faster broadband and video.[25] To date, Verizon has signed up over

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[19] *High-Speed Services for Internet Access: Status as of December 31, 2006*, at 1, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-277784A1.pdf/ (hereinafter "FCC Broadband Stats").

[20] *Id.*

[21] *Id.* at Table 10.

[22] *Id.* at 1.

[23] *Id.* at Chart 12.

[24] *Id.* at Table 14; *see also Networked Nation: Broadband in America 2007*, at 13, Nat'l. Telecom. & Info. Admin. (NTIA) Report (January 2008) ("Perhaps the clearest evidence of the success of the Administration's pro-competitive, technologically-neutral approach lies in the sheer growth in the number of broadband service providers and the broad array of technological alternatives they represent."), available at http://www.ntia.doc.gov/reports/2008/NetworkedNationBroadbandinAmerica2007.pdf (hereinafter "Networked Nation").

[25] *FiOS Facts: Wrapping up 2007*, Verizon Policy Blog, Feb. 5, 2008, available at http://policyblog.verizon.com/PolicyBlog/Blogs/policyblog/CZBlogger1/420/FiOS-Facts-Wrapping-Up-2007.aspx.

one million customers.[26] Similarly, AT&T will invest some $5 billion over the course of the next year to continue the expansion of its fiber-based U-Verse system.[27] Thus far it is has attracted over 230,000 customers.[28] Combined, these new fiber systems have put pressure on cable companies and have begun to lure away traditional cable customers.[29] In response, the cable industry invested $13.7 billion for infrastructure maintenance and upgrades in 2007 alone.[30]

Increased competition between cable and telephone companies for voice, video and data customers has boosted competition and forced service providers to become more innovative and responsive to consumer demand. For example, Comcast recently unveiled a new broadband service that seeks to directly challenge the faster speeds offered by the telephone companies' new fiber systems.[31] Wireless carriers are also competing for broadband customers. According to the most recent FCC report on the broadband marketplace, over 21 million consumers receive broadband via mobile wireless systems.[32] The wireless industry invested over $20 billion to

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[26] *Verizon 4Q Profits up 3.9 Percent*, CNN MONEY (Jan. 28, 2008), available at http://money.cnn.com/news/newsfeeds/articles/newstex/AFX-0013-22585080.htm.

[27] Todd Spangler, *AT&T Ups U-Verse Spending Estimates by $500 million*, MULITCHANNEL NEWS, Nov. 6, 2007, available at http://www.multichannel.com/article/CA6497700.html.

[28] *Press Release: AT&T Delivers Strong Fourth Quarter, Reaffirms 2008 and Multi-Year Outlook*, AT&T, Jan. 24, 2008, available at http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=25073.

[29] *See, e.g.*, Peter Grant & Dionne Searcey, *Verizon's FiOS Challenges Cable's Clout*, WALL ST. JOURNAL. Oct. 24, 2007.

[30] *NCTA Industry Statistics*, available at http://www.ncta.com/Statistic/Statistic/Statistics.aspx.

[31] *See* Ryan Kim, *Comcast Takes on AT&T with Faster Net Service*, SF GATE, Feb. 11, 2008, available at http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/02/11/BUQ5USL6E.DTL.

[32] FCC Broadband Stats at Table 1, *supra*.

upgrade and expand next-generation networks in 2007,[33] and bidding in the most recent 700 MHz spectrum auction was expected to reach nearly $20 billion.[34]

Demand for broadband is similarly strong, increasing in line with network build-out and investment. According to the Pew Internet & American Life Project, nearly half of all adult Americans have a broadband connection at home.[35] This represents a five percent increase from 2006 and is nearly double the penetration level of three years earlier.[36] Moreover, the Consumer Electronics Association recently reported that 75 percent of households that are connected to the Internet rely on broadband.[37] The Pew Internet & American Life Project contextualized these trends when it stated that "with home broadband penetration poised to surpass 50% this year, it will have taken 9 years from the time the service became widely available for home high-speed to reach half the population. To put this in context, it took 10 years for the compact disc player to reach 50% of consumers, 15 years for cell phones, and 18 years for color TV. Each of those technologies, like broadband, represented an upgrade from a good or service with which most consumers had experience."[38]

C. Conclusion: The Broadband Market Has Thrived Under the "Hands Off" Approach

The broadband marketplace is vigorously competitive and continues to thrive for three interrelated reasons. First, policy makers have kept the regulatory hand off the broadband

[33] *Wireless Quick Facts: Mid-year Figures*, CTIA – The Wireless Association, available at http://www.ctia.org/advocacy/research/index.cfm/AID/10323.

[34] W. David Gardner, *FCC 700 MHz Auction Bids Top $19.3 Billion*, INFORMATION WEEK, Feb. 12, 2008, available at http://www.informationweek.com/news/showArticle.jhtml?articleID=206501363.

[35] John Horrigan, *Home Broadband Adoption 2007*, at 1, Pew Internet & American Life Project (June 2007), available at http://www.pewinternet.org/pdfs/PIP_Broadband%202007.pdf.

[36] *Id.*

[37] *Press Release: CEA Research Finds 72% of U.S. Adults Have Broadband Access*, Consumer Electronics Association, July 23, 2007, available at http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=11319.

[38] John Horrigan, *Commentary: U.S. Lags Behind*, at 1, Pew Internet & American Life Project (August 2007), available at http://www.pewinternet.org/pdfs/Broadband_Commentary.pdf.

market. A flexible regulatory framework that was developed with regulatory certainty and parity in mind has sent a clear signal to the market that there will not be any undue intrusion by regulators. Second, broadband providers have responded to this signal and to intensifying competition by investing tremendous resources into their networks. This strategy not only seeks to position companies favorably among each other, it also seeks to offer current and potential customers with reliable and affordable services. Third, consumer demand for broadband continues to increase as a result of intermodal competition. They can choose from among a number of intermodal competitors for physically accessing the Internet; they can choose which technology to use when accessing it; and, they can choose from among a variety of service plans depending on their usage.

As the demand for broadband and broadband-enabled technologies and applications continues to both increase and diversify, it is critically important that network owners are given wide latitude to effectively and efficiently manage their networks. Increased use of bandwidth-intensive applications[39] by a small percentage of users, for example, can result in network congestion and slow-downs for the majority of users. As discussed below in Section III, network management is thus a key tool for network owners to ensure that all consumers receive quality broadband Internet access.

III. NETWORK OWNERS SHOULD BE AFFORDED WIDE LATITUDE TO MANAGE THEIR NETWORKS

Concomitant to the surge in demand for broadband Internet access has been a rise in demand for innovative broadband-enabled applications. More advanced broadband networks have spurred application innovation, which has ushered users into a new digital world where

[39] Innovative new products like streaming Internet video and peer-to-peer (P2P) file-sharing services have become enormously popular among one segment of users.

VoIP service, Internet video, e-commerce, e-government, immersive gaming, multimedia research, telemedicine and infinitely more services are available at the click of a button. Demand for these increasingly bandwidth-hungry services requires that network owners employ certain basic data management techniques to ensure that all users can enjoy a seamless web experience.

The Vuze petition argues that some network owners are "deliberate[ly] degrading and blocking" content, leading to the "arbitrary discrimination against traffic carried on their networks."[40] Vuze invokes the Commission's *Internet Policy Statement* and calls on the Commission to "determine the parameters of "reasonable network management" by broadband network operators."[41] The petition bases its call for network management rules on the argument that "[t]he public interest is harmed whenever network operators restrict innovation and access to content, censor political speech, or unreasonably discriminate against or frustrate the legitimate efforts of their competitors."[42] Similarly, Free press et al. cast the debate over network management as a "clash of civilizations," pitting "all citizens" against a handful of "network providers" in the battle for the future of the Internet.[43] *Hyperbole aside, the rulemaking called for by Vuze, Free Press and others is premature, unnecessary and anathema to continued robust competition in the broadband market.*

As discussed in this section, *ex ante* regulation is not necessary and would not be effective in the highly dynamic field of network management. Such regulation would serve only to handcuff network engineers who must adjust network management in a real-time manner depending on network traffic, congestion, time of day and any number of other variables.

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[40] Vuze Petition at 2, *supra*.

[41] *Id.* at 1.

[42] *Id.* at 12-13.

[43] Free Press et al. Comments at 2, *supra.*

"Reasonableness" is a subjective measure of behavior and will change from situation to situation and from case to case. What is "reasonable" on one network at a given point in time on any given day might vary sharply from what is "reasonable" on another network at that same time. Network traffic is unpredictable and oftentimes volatile, which cautions against establishing rigid management standards.

In dynamic markets, *ex ante* regulation, however well-intentioned, cannot keep pace with innovation. The minute the ink dries, the regulations will likely be outdated. As demands on the networks evolve, as new devices, new applications and new content emerge, as new security issues threaten networks, and as a host of other variables come into play, network engineers need the flexibility – and the ability to utilize their academic and professional training, *i.e.*, their judgment – to act reasonably according to the totality of the circumstances at any point in time.

A. Rising Demand for Bandwidth-Hungry Applications Spurs the Need for Effective Network Management

The evolution of the broadband market has empowered consumers in a number of ways. First, it has delivered to them broadband access to the Internet, which allows for a high-speed, always on connection to a universe of information. Second, by increasing the capacity of networks, service providers have enabled cutting-edge innovation in the applications and content delivered over these pipes. As a result, innovations at the network and applications layers have transformed the user experience from a passive, text-based one to an immersive, multimedia, interactive one that is luring more people online for longer periods of time. For example, the average adult American Internet user will spend approximately 31 hours per month online, participating in a wide range of activities, all of which consume varying amounts of bandwidth.[44]

[44] *Press Release: comScore Releases First Comprehensive Review of Pan-European Online Activity,* comScore, June 4, 2007, available at http://www.comscore.com/press/release.asp?press=1459.

For some users, the most popular bandwidth-intensive broadband-enabled application currently in the marketplace is Internet video, which can either be streamed or downloaded. Streamed video can be found on websites like You Tube, by far the most popular video site with over 30 percent market share.[45] To get a sense of how popular Internet video is, consider that in December 2007 U.S. users viewed 10 billion videos online, a new record.[46] And the amount of bandwidth consumed just by You Tube – a for-profit venture – is staggering. It uses as much bandwidth as the entire Internet did in 2000[47] and currently accounts for approximately seven percent of all U.S. Internet traffic.[48] Videos can also be downloaded, either in the "conventional" way (i.e., directly from a website) or by using a P2P file-sharing system. These systems are not new and have been around since the early days of the Internet. However, a new approach to P2P file-sharing has enabled larger videos to be trafficked more quickly to more users.

Decentralized or "torrent" P2P systems "make use of resources — bandwidth, storage, and processing power — on a decentralized basis, allowing large data transfers to be made more efficiently and cost-effectively than ever before."[49] Unlike traditional online data transfer (i.e., files are downloaded directly from the hosting site), "torrent" P2P systems distribute large files by breaking them up into much smaller pieces and routing them to the end user via a number of intermediary users. This model shifts the burdens and costs associated with data transmission away from the distributor and to the broadband infrastructure providers and to the intermediary

[45] *Press Release: U.S. Internet Users Viewed 10 Billion Videos Online in Record-Breaking Month of December*, comScore, Feb. 8, 2008, available at http://www.comscore.com/press/release.asp?press=2051.

[46] *Id.*

[47] FCC Commissioner Robert M. McDowell, *Text of Luncheon Address at the Broadband Policy Summit III*, at 13, June 7, 2007, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-273742A1.pdf (hereinafter "McDowell Speech").

[48] *See* Bret Swanson & George Gilder, *Estimating the Exaflood*, Discovery Institute Report (Jan. 2008), available at http://www.discovery.org/a/4428 (hereinafter "Discovery Report").

[49] Vuze Petition at 7, *supra.*

and end users.[50] Despite the decentralized nature of these systems, they require substantial amounts of bandwidth to transfer files, which are usually very large (e.g., full-length high-definition movies, video clips and music files).

Even though only a minority of consumers uses these types of P2P applications, participants tend to be among the most active downloaders online. For example, while more than half of all U.S. Internet users have watched videos online,[51] less than 20 percent of this group is considered "heavy users." Indeed, those who are "heavy users" of such sites average 841 minutes of video viewing per month, compared to an average of 77 minutes for "moderate users" and just 7 minutes for "light users."[52] Even as more people view videos online, there continues to be a wide disparity between casual viewers who watch only a couple of minutes per day versus a minority of users who consume the vast majority of minutes. Over the past year, the number of videos being uploaded or downloaded online has increased 1,000 percent.[53] Across the board broadband customers are using 40% more bandwidth each year. [54] Yet according to Time Warner Cable, only five percent of its users account for more than 50 percent of bandwidth usage.[55]

Unlike P2P file sharing systems, a number of less bandwidth-intensive applications rely on a steady Internet connection for optimal use. These applications include VoIP telephony and streaming applications like telemedicine services. VoIP does not require a lot of bandwidth but it

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[50] Wikipedia, BitTorrent (protocol), available at http://en.wikipedia.org/wiki/BitTorrent_%28protocol%29.

[51] Mary Madden, *Online Video*, Pew Internet & American Life Project (July 2007), available at http://www.pewinternet.org/pdfs/PIP_Online_Video_2007.pdf.

[52] *Press Release: comScore and Media Contacts Study Highlights Behavioral Differences Among Online Video Viewer Segments*, comScore, Feb. 14, 2008, available at http://www.comscore.com/press/release.asp?press=2063.

[53] McDowell Speech at 13, *supra*.

[54] Amy Schatz, Dionne Searcey & Vishesh Kumar, *Officials Step up Net-Neutrality Efforts*, WALL ST. JOURNAL, A4, Feb. 13, 2008.

[55] *Id.*

is very sensitive to service degradation. Being a voice service of increasing popularity for the mainstream customer,[56] any drop in quality (e.g., a transmission delay) would be immediately apparent to both callers and might lead to a drop in demand. Similarly, streaming applications like telemedicine services require a steady connection in order to assure service quality and speedy transmission of time-sensitive material.[57]

Service degradation has a discernible negative effect on these types of real-time applications. Degradation stems from network congestion, which is often caused by the heavy data traffic associated with bandwidth-intensive applications like P2P file-sharing systems. Network managers have had to respond to increasingly congested networks by implementing a number of traffic management protocols to ensure that bits associated with a VoIP call or a telemedicine application travel to their destination more quickly than bits associated with a video download or email in order to sustain service quality for all customers.

B. Network Management Facilitates the Efficient Flow of Information to the Benefit of all Consumers

On the most basic level, network management entails monitoring the flow of data over a network, correcting for congestion at various nodes throughout the network, and ensuring that all consumers have a reliable connection to the Internet. All networks share resources at some point in the network. Network managers use a number of tools to monitor data flows and to provide solutions in cases where a network is overwhelmed or too congested. While strategies and approaches differ from network to network and evolve as networks evolve, common management tools include deep packet inspection (DPI) and traffic shaping protocols.

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[56] According to TeleGeography, by mid-2007 there were 11.8 million VoIP subscribers in the U.S., up from 6.5 million in mid-2006. *See U.S. VoIP Market is Growing Fast – but Europe is Growing Faster,* available at http://www.telegeography.com/wordpress/?p=59.

[57] *See Report: e-Health and America's Broadband Networks,* U.S. Internet Industry Association (Aug. 2007), available at http://www.usiia.org/pubs/eHealth.pdf.

DPI allows network managers to identify and inspect each data packet traveling over the network regardless of type or origin.[58] Oftentimes DPI is used to scan packets for viruses, spam and other nefarious elements that might compromise network security.[59] DPI is especially helpful in prioritizing traffic so that data packets associated with sensitive applications like VoIP are given a priority over the data packets of a video download. Ultimately DPI allows network managers to better understand the data flowing over its network, model traffic and devise strategies for routing traffic in such a way that alleviates congestion.[60]

Once the data flowing over a network is analyzed with a tool like DPI, network managers usually employ another set of tools to actually manage the traffic. This is where an approach like traffic shaping is utilized. Traffic shaping tools can analyze the data packets flowing through a network and they can also "shape" or manage network traffic[61] by imposing a delay on some types of traffic in order to control traffic volume, transfer speeds or other aspects of data flow.[62] Moreover these tools have a variety of uses, which make them attractive to network managers. They can "identify and categorize specific types of network traffic," "set per-user traffic limits to ensure that network traffic is shared fairly among all users," and "define the relative importance, or priority, of different types of traffic."[63] Such tools can, for example, help ensure that a voice

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[58] *See Deep Packet Inspection: Introduction*, LIGHTREADING, Dec. 14, 2006, available at http://www.lightreading.com/document.asp?doc_id=111404.

[59] *See* Wikipedia, Deep Pack Inspection, http://en.wikipedia.org/wiki/Deep_packet_inspection.

[60] *See Deep Packet Inspection: Introduction*, LIGHTREADING, Dec. 14, 2006, available at http://www.lightreading.com/document.asp?doc_id=111404.

[61] *See* Rachelle Chong, *The 31 Flavors of the Net Neutrality Debate*, at 7, ACLP Scholarship Series (Dec. 2007), available at http://www.nyls.edu/pdfs/Rachelle%20Chong%20-%20Net%20Neutrality%20Essay%20-%20December%202007.pdf (hereinafter "Chong 31 Flavors").

[62] *See* Wikipedia, Traffic Shaping, http://en.wikipedia.org/wiki/Traffic_shaping.

[63] *See* Joe St. Sauver, *Understanding the Basics of Traffic Shaping*, COMPUTING NEWS (Univ. of Or., Winter 2002) *available at* http://cc.uoregon.edu/cnews/winter2002/traffic.html.

communication or telemedicine application takes priority over a simultaneous upload of five videos.

These and many other management tools have quickly become indispensable to service providers as more and more data flows through their networks. Without wide latitude to use these tools, networks would be more susceptible to crashing under the weight of congestion and data bottlenecks that often result from bandwidth-hungry applications like P2P file-sharing. Conversely the unmanaged flow of data risks depriving many users of a reliable Internet connection, as a consequence of the bandwidth-heavy activities of a few.

C. Wide Latitude to Manage Networks is Required to Protects All Consumers

Managing a network to ensure the efficient flow of data is fraught with uncertainty. For example, there are often surges in bandwidth demand and data traffic during the online release of new games, software, music and videos.[64] In addition, new converged wireless devices like the iPhone, which offer users an unparalleled mobile Internet experience, are driving "unheard-of levels of mobile internet usage" around the world.[65] With Internet usage and demand for applications like Internet video continuing to skyrocket, and with the marketplace for similar applications poised to explode over the next five or ten years,[66] service providers should be afforded wide latitude to manage their networks in order to assure the efficient transmission of data and ensure that all users have a reliable Internet connection.

The capacity-related criticisms made against network owners are not persuasive. In response to the regulatory clarity given by Congress and the FCC, and in response to increasing

[64] *See, e.g., Sandvine: Xbox, iTunes Grow*, LIGHTREADING, Dec. 5, 2006, http://www.lightreading.com/document.asp?doc_id=112037.

[65] *See Vodafone, 02Test Femtocells*, LIGHTREADING, Feb. 11, 2008, available at http://www.lightreading.com/document.asp?site=gsma&doc_id=145618.

[66] A recent report predicts that "[t]he U.S. Internet of 2015 will be at least 50 times larger than it was in 2006" and Internet traffic will increase by 50-60% over the next few years. *See* Discovery Report, *supra.*

demand for broadband, network operators – including traditional telecom firms, cable companies, wireless companies and others – have invested and continue to invest billions in risk capital to increase the capacity and functionality of broadband networks. *Whatever the capacity of the networks at any point in time, there will always be applications, content, innovations and usages that, under certain circumstances, challenge networks.* As recent data cited above makes clear, the heavy demands of a few users can sometimes outstrip supply of available bandwidth on networks. As such, there will always be a compelling need for network engineers who have the ability and the flexibility to maintain reliable and safe networks for consumers. To this end, network management benefits all users in three fundamental ways.

First, network management ensures the safety and security of the network. By using techniques such as DPI and traffic shaping, network managers can protect consumers from virus infiltration, reduce the amount of spam and foster a safe environment for the transfer of information and applications. Second, network management guarantees a uniform user experience regardless of how much or how little bandwidth the consumer uses. This will ensure that the heavy uploading and downloading of a minority of users will not impair the online experience of a majority of more casual users. Finally, for those using applications sensitive to data latency (e.g., VoIP telephony and telemedicine), network management will prioritize these packets over the packets of less time-sensitive applications like email.

The overall consumer benefits associated with reasonable network management outweigh the likely harm to consumers that would result if network engineers were deterred from implementing the network management strategies they consider to be appropriate under the circumstances. However, in the event that there are abuses by network owners, a number of

market-based and legal remedies exist for users to avail themselves of rather than saddling a robustly competitive marketplace with unnecessary regulation.

IV. MARKET-BASED AND LEGAL REMEDIES SHOULD BE EXHAUSTED BEFORE THE IMPOSITION OF PRESCRIPTIVE REGULATION ON THE BROADBAND MARKET

Effective market monitoring and enforcement can occur without the need for the prescriptive regulation suggested by some. Perhaps the most significant consequence of a competitive broadband marketplace has been the empowerment of consumers to regulate the market. Market forces will address consumer needs in a more efficient and more targeted way than rigid regulation. Furthermore, well-established legal regimes – grounded in contracts law and in antitrust law – provide additional layers of protection against allegedly improper conduct.

The availability of these multiple layers of consumer protection establishes a high burden of proof required for making the case that regulation is the only remedy. It is respectfully suggested that such burden has not been met.

A. In a Competitive Marketplace, Consumers are the Best Regulators

The rise of intermodal competition between cable and telephone companies, and the advent of additional broadband competitors in the wireless realm, has given consumers enormous power to regulate the broadband marketplace. The availability of ready substitutes for broadband service, along with decreasing switching costs, has made customer retention a critical part of a network owner's business strategy. Bundling services into an affordable "triple play" has long been a key point of competition when luring customers to a specific service provider. But with more firms able to offer substitutable bundles, network owners are competing ever more fiercely on price, speed, technological innovation and, most importantly, customer service. To this end, service providers are beginning to cater to more individualized user needs and focusing more attention on resolving consumer complaints. For example, a growing number of

service providers are offering users tiers of service based on their bandwidth needs. Basic packages cater to the more casual user while enhanced packages target more avid users like online gamers and P2P participants. Robust competition, evident in the broadband market, leads to better customer service,[67] thus empowering consumers.

Recent analyses of consumer welfare in the broadband market by a number of government agencies support the conclusion that the consumer is the best regulator of the marketplace. The Department of Justice (DOJ), which shares regulatory oversight of the broadband market with the Federal Trade Commission (FTC) and the FCC,[68] stated in an *Ex Parte* filing in this docket that "free market competition, unfettered by unnecessary governmental regulatory restraints, is the best way to foster innovation and development of the Internet…Past experience has demonstrated that, absent actual market failure, the operation of a free market is a far superior alternative to regulatory restraints."[69]

Similarly the FTC recently issued a staff report on broadband competition policy, which found that, given the recent inquiries and press attention on "net neutrality" issues, "many consumers are now aware of such issues," making them even more vigilant to how they are treated by network owners.[70] The report concluded that "[c]onsumers – particularly online consumers – have a powerful collective voice that should not be ignored by businesses."[71] In

[67] *See* Robert D. Atkinson, *The Role of Competition in a National Broadband Policy*, 1-3, 5, The Info. Tech. & Innovation Foundation (Oct. 2007), available at http://www.itif.org/files/BroadbandCompetition.pdf.

[68] FTC Staff Report, Broadband Connectivity Competition Policy, at 2 (June 2007) available at http://www.ftc.gov/reports/broadband/v070000report.pdf (hereinafter "FTC Staff Report").

[69] *See Ex Parte Filing of the United States Department of Justice*, In the Matter of Broadband Industry Practices, WC Docket No. 07-52 (Sept. 6, 2007), available at http://www.usdoj.gov/atr/public/comments/225767.htm (hereinafter "DOJ Filing").

[70] FTC Staff report at 161, *supra.*

[71] *Id.*

other words, empowered consumers have the ability to correct adverse network owner behavior more quickly and much more directly than regulation.

Finally, the National Telecommunications and Information Administration (NTIA), the principal adviser to the United States President on telecommunications and information policy, recently echoed these findings in its *Networked Nation* report: "Experience teaches that when government tries to substitute its judgment for that of the free market, or otherwise anticipate consumer demand by favoring one product or vendor over another, it can easily distort the marketplace, resulting in the diversion of investment and/or discouraging the research and innovation necessary to bring new and better products or services to market."[72]

Competition in the broadband market has empowered consumers and made them the most effective regulators, including by providing them with the ability to switch providers or plans. While consumer action offers a strong check on alleged improper conduct, this power is augmented by the existence of various legal regimes geared to addressing actual harm.

B. Contract Law Offers a Viable Alternative to Additional Regulation

In addition to the market-based solutions available to consumers described above, contract law provides parties with a comprehensive set of both rights and remedies. It offers a well-established legal regime for responding to real world problems with fact-specific and narrowly tailored remedies. Such is preferable to the prescriptive *ex ante* regulation suggested by some.

As is the case with the purchase of much in the hi-tech world (e.g., computers, software, communication devices, service plans and website access), purchasers of broadband typically agree to a specific set of obligations, often forth in a Terms of Service agreement, when signing

[72] Networked Nation at 5, *supra.*

up for service with any network owner. These agreements describe the terms and conditions that every user must comply with during the length of the contract. Many users also have the ability to choose, as a matter of contract, between varying service plans. In some instances, casual users who go online to check email and read the news can purchase less expensive, more basic bandwidth plans from some providers. More active users, like avid gamers, might purchase more expensive service plans to accommodate their heavy use of bandwidth-hungry applications. Further, large or enterprise users, like a telemedicine service provider, a community college, a government agency, or an IP video company can negotiate key terms and conditions of service with a provider.

In all of these instances, users can avail themselves of the rights and remedies under their contracts, and under the law, to protect against allegedly wrongful conduct. If a service provider were to violate the Terms of Service agreement, then a user has a viable contract claim. Conversely, if the service provider has clearly outlined the parameters of accepted use in its Acceptable Use Policy,[73] and the user breaches those terms, then the service provider can enforce the terms of the contract to ensure that the actions of one or a small number of users do not jeopardize the network or unduly degrade the Internet connection or online experience of the majority of users.[74]

The petitions of both Vuze and Free Press et al. call on the Commission to require network owners "to disclose their network management tactics" in addition to the disclosures

[73] Most broadband service providers have Acceptable Use Policies. *See, e.g.*, Comcast Acceptable Use Policy for High-Speed Internet Services, at http://www6.comcast.net/terms/use/; AT&T Acceptably Use Policy, at http://my.att.net/csbellsouth/s/s.dll?spage=cg/legal/att.htm&leg=aup; Time Warner Cable, Operator Acceptable Use Policy, at http://help.twcable.com/html/twc_misp_aup.html.

[74] This sort of enforcement precipitated the current petitions at issue here. *See* Peter Svensson, *Comcast Blocks Some Internet Traffic*, AP, Oct. 19, 2007, available at http://www.msnbc.msn.com/id/21376597/. Comcast enforced its "Acceptable Use Policy" when it slowed certain P2P traffic in order to alleviate network congestion that was affecting the connections of a majority of users.

already make in the Terms of Service.[75] Many broadband providers currently disclose customer use limitations. Further, many also provide in their Terms of Service that, while they do actively manage their networks in order to provide all users with reliable connections, they do not block or degrade service.[76] To the extent that network owners have not publicized such customer-oriented standards, policies encouraging them to do so are appropriate.

It is respectfully suggested that the Commission should not require network owners to disclose the actual network management practices they utilize. Specific network management tools and strategies relate inherently to the architecture of the infrastructure and to the security and functionality of the infrastructure. Requiring disclosure of specific, proprietary network management information could threaten to compromise network security by providing third parties with the information needed to skirt security protocols. Such information also risks network congestion by enabling third parties to bypass necessary data traffic management that is occurring for the benefit of all consumers.

The current level of specificity included in many Terms of Service agreements puts users on ample notice and provides them with sufficient remedies should the terms of the contract be breached. Remedies available include monetary damages, if any are incurred or equitable remedies (e.g., getting one's service restored or being released from a contract). In many instances, Terms of Service agreements and other service contracts between the user and the network owner include arbitration clauses, which seek to facilitate effective dispute resolution. The speed and lower costs associated with arbitration benefit the consumer and network owner

[75] Free Press Comment at 59, *supra.*

[76] *See, e.g.*, Comcast's High-Speed Internet Acceptable Use Policy, Prohibited Uses and Activities, at http://www.comcast.net/terms/use.jsp; Verizon Online – Terms of Service, at http://www.verizon.net/policies/vzcom/tos_popup.asp; AT&T High Speed Internet and Dial Terms of Service, at http://my.att.net/csbellsouth/s/s.dll?spage=cg/legal/att.htm&leg=tos.

equally. And in the rare instances where arbitration fails or provides an inequitable solution, more formal court proceedings are available.

The existence of these types of contract-based rights and remedies further empowers the consumer. Service providers are increasingly tailoring their service offerings to the individual needs of users. And they are doing so in a competitive environment in which customer satisfaction and retention is paramount. The threat of formal enforcement of contract provisions should not be disregarded. If nefarious behavior by a network owner is widespread and the network owner has done little to correct it, consumers will likely flock *en masse* to another provider or could band together for further legal action. In either case, the network owner is motivated to remedy any wrongful conduct. The "collective voice" of consumers, in the market, the public square or the privacy of a court room is an increasingly powerful force that can successfully regulate the broadband market.[77]

C. The Additional Remedy of Enforcing Antitrust Laws is Available to Correct Anticompetitive Behavior that is Harmful to Consumers

A number of government agencies, including the U.S. Department of Justice and the Federal Trade Commission, charged with monitoring competition in markets, have the authority and the ability to enforce our nation's well-developed antitrust laws on a case-by-case, fact-specific basis. In the event of a clear market failure or an abuse of market power, such agencies have the jurisdiction to determine whether the particular conduct at issue is anticompetitive and harmful to consumers within the meaning of the antitrust laws.

Antitrust laws are "grounded in the principle that competition – "that state of affairs in which output is maximized, price is minimized, and consumers are entitled to make their own

[77] FTC Staff report at 161, *supra.*

choices"– serves to protect consumer welfare."[78] The FTC, in its staff report on broadband competition policy, outlined its approach to enforcing antitrust laws in the broadband market: "In conducting an antitrust analysis, *the ultimate issue would be whether broadband Internet access providers engage in unilateral or joint conduct that is likely to harm competition and consumers in a relevant market*."[79] The relevant questions in such an analysis would include: has the conduct at issue harmed competition generally and diminished consumer welfare; is there a legitimate business justification for the conduct at issue; do pro-consumer efficiencies result from the conduct in question; etc.

Consistent with the FCC's prior endorsement of "reasonable network management," an antitrust inquiry would focus on whether the conduct at issue was reasonable under the circumstances. In the case of network management, conduct on the part of a network owner that was alleged to be anticompetitive and that lessened overall consumer welfare could be examined under established laws and rules. For example, if the hypothetical network owner with market dominance employed certain network management tactics with the intent of lessening competition (e.g., by consistently blocking a popular application without any legitimate justification) and such conduct in fact harmed competition, the nation's antitrust laws provide a comprehensive legal framework for dealing with such conduct.[80]

Antitrust enforcement thus represents yet another buffer of protection for consumers in the broadband marketplace. As such, the Commission should continue to exercise regulatory restraint and examine alleged harmful conduct on a case-by-case basis, leaving regulation as an ultimate last resort.

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[78] *Id.* at 120.

[79] *Id.* (emphasis added).

[80] *Id.* at 161.

V. THE COMMISSION SHOULD CONTINUE TO EXERCISE REGULATORY RESTRAINT, EXAMINING ALLEGED HARMFUL CONDUCT ON A CASE-BY-CASE BASIS, AND IF REGULATION IS ULTIMATELY IMPOSED ON BROADBAND PROVIDERS, IT SHOULD APPLY EQUALLY TO ALL NETWORK OPERATORS, APPLICATION/CONTENT PROVIDERS, AND OTHER NETWORK OWNERS

The point that a diverse array of conditions precedent must be satisfied before regulation is even considered has been laboriously argued because of the real consumer costs associated with premature and unnecessary regulation. By one estimate, the cost of *ex ante* "net neutrality" regulation would be upwards of $24 to $32 billion in consumer welfare losses over the next few years.[81] Another study found that the restrictions on price, product and service differentiation associated with "net neutrality" rules would result in the loss, by consumers, of $69 billion in potential benefits over the next 10 years.[82] In the absence of overwhelming evidence of a broad market failure that cannot be rectified by the market-based and legal remedies available in the American legal system, the Commission should continue investigating allegedly anticompetitive behavior by network owners on a case-by-case basis.

The Commission has an established precedent of using regulatory restraint for examining alleged harmful behavior by a network owner. In 2005, for example, the FCC opened an inquiry to investigate claims that Madison River Telephone Company was blocking ports for VoIP applications, thus precluding consumers from using an alternative voice service. The FCC, after issuing a Letter of Inquiry, brokered a Consent Decree among the parties to solve the problem.[83] The deliberate process established by this case reflects the dynamic nature of the broadband market and cautions against the adoption of sweeping yet rigid policies in the absence of a

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[81] *See Consumer Gram: Internet Regulations Would Harm Consumers*, American Consumer Institute (ACI), available at http://www.aci-citizenresearch.org/NN2.pdf.

[82] *See* Stephen B. Pociask, *Net Neutrality and the Effect on Consumers*, at 2, ACI (May 2007), available at http://www.aci-citizenresearch.org/ACI%20NN%20Final.pdf.

[83] *See Madison River Commc'ns*, 20 F.C.C.R 4295 (Enf. Bur. 2005).

critical mass of complaints against network owners.[84] One need only look at the 1996 Telecommunications Act to see how fast policies that are intended to be forward-looking can become antiquated.

If an additional layer of rules and regulations is ultimately deemed necessary, notwithstanding the advances in and competitive nature of the broadband market, then regulatory parity and notions of fundamental fairness dictate that any such rules apply with equal force to any entity that manages the flow of Internet-related data over a network. A user's Internet experience is impacted by a number of networks, including the user's web browser, hardware (e.g., device, chipset, memory, etc.), software, broadband connection, search engine, online applications and content, etc. Each of these networks is managed by the respective network owners, and none of these networks is subject to prescriptive government mandates.

The network management practices at issue here are not unique to the broadband service market. Indeed virtually every network that delivers, or impacts the delivery of, information over the Internet is managed. For example, Google manages, organizes and prioritizes the data delivered over its network to end-users. Indeed, the express mission of Google is to "organize the world's information and make it universally accessible and useful"[85] – a laudable and extremely profitable goal[86] but one that is grounded nonetheless in manipulating and prioritizing the content delivered to users. Although Google does provide minimal information regarding

[84] Chong 31 Flavors at 14, *supra.*

[85] Google Corporate Information – Company Overview, at http://www.google.com/corporate/.

[86] *See, e.g.*, JOHN BATTELLE, THE SEARCH: HOW GOOGLE AND ITS RIVALS REWROTE THE RULES OF BUSINESS AND TRANSFORMED OUR CULTURE 75 (2005). Google has "created a ranking system rewarding links that come from sources that were important, and penalizing those that did not." The breakthrough was "to create an algorithm – dubbed PageRank … - that manages to take into account both the number of links into a particular site, and the number of links into each of the linking sites." This system is monetized by pricing the terms and keywords that lead to search results, *at* 106.

how it actually organizes information,[87] it is not required to treat all content equally or is it required to disclose the protocols and algorithms it uses to manage traffic. Requiring Google or any search firm to disclose its exact algorithm (i.e., how it manages its network) would compromise its network, just as requiring any other network operator to disclose the specifics of its network management would jeopardize that network.

If broadband providers, however, were ultimately subjected to prescriptive network management rules, then regulatory certainty and parity would require that any such rules be applicable to all network operators – including content and application providers – that manage data and information within a network. Given all the networks involved in a user's online experience (*i.e.*, web browser, hardware, software, broadband connection, search engine, online applications and content), a rational basis does not exist for concluding that a broadband access provider should be subject to data management rules but that providers of other online services and content should not be.

However, as the preceding comments have made clear, regulation is not required at this point in the broadband market's evolution. The imposition of reporting requirements, more detailed disclosures of network management techniques and related rules on network owners would simply reflect the substitution of the judgment of network engineers with a set of static, prescriptive rules that run counter to hands-off approach that is driving innovation, investment and consumer choice. Rather than risk chilling the vibrant innovation in the broadband marketplace by levying rigid network management rules, the Commission should continue to investigate and address complaints within its jurisdiction on a case-by-case basis.

[87] Google Corporate Information – Technology Overview, at http://www.google.com/corporate/tech.html.

VI. CONCLUSION

Network owners require wide latitude to manage their networks in order to ensure that all users have a reliable Internet experience. Management techniques vary from provider to provider, from network to network, and often change from day to day. A competitive marketplace will police itself and correct behavior that does not contribute to overall consumer welfare. Any effort to impose unnecessary *ex ante* regulation would chill the broadband market, resulting in certain consumer welfare losses. Accordingly, the petitions for declaratory ruling and rulemaking should be denied.

Respectfully submitted,

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