Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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

To: The Commission

REPLY COMMENTS OF NBC UNIVERSAL, INC.

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February 28, 2008

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I. INTRODUCTION AND SUMMARY

The record compiled in this proceeding confirms that fewer than five percent of Internet users consume at least 60 to 70 percent of broadband network capacity through peer-to-peer file-sharing and that some 90 percent of this traffic consists of illegal, pirated content. The resulting network congestion seriously impairs the ability of the remaining 95 percent of law-abiding subscribers to access the Internet for such routine, bandwidth-friendly tasks as email, web-browsing and legal downloading of music and video files. In short, ordinary, mainstream consumers, to their real detriment, are forced to facilitate and subsidize the illegal acts of a very small fraction of Internet users.

It is puzzling, therefore, that the petitioners and others in this proceeding, many of whom have long traditions of acting in the broad public interest, never address the 800-pound gorilla in the room: a tidal wave of unlawful conduct by BitTorrent users to the clear detriment of the majority of consumers – and the future carrying capacity of the Internet itself – particularly when pirated video moves from

standard definition files to high definition. Indeed, it is the appalling scale of this illegal conduct – which no one seriously disputes and which threatens to overwhelm at least those Internet access providers with shared ring or node infrastructures and potentially the Internet backbone itself – that the Commission must recognize in this proceeding. Unless the Internet is to be the province of the lawless, the Commission must allow the legitimate and good faith efforts of network operators to address both reasonable network management practices and also the very real harms this illegal traffic visits on the vast majority of their subscribers.

The Commission's 2005 Policy Statement appropriately embraced four principles governing the rights of consumers, three of which expressly addressed lawfulness in the use of the privately owned networks comprising the Internet:[1]

- Consumers are entitled to access the lawful Internet content of their choice.
- Consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.
- Consumers are entitled to connect their choice of legal devices that do not harm the network.[2]

The Commission's Policy Statement focuses, as it must, on lawfulness: Consumers are entitled to "lawful" Internet content – not the stolen content of others – and are entitled to use "legal" devices that do not harm the network and to run applications "subject to the needs of law enforcement." Thus, the Commission's own principles require the Commissioners to recognize the need to consider the flood of illegal

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

[2] *Id.* at 14988.

content on file-sharing services as they evaluate the scope of reasonable network management practices.

Simply put, there is overwhelming and undisputed evidence that massive copyright infringement takes place on peer-to-peer file sharing networks and that BitTorrent and other P2P technologies are today used primarily to facilitate the exchange of a tidal wave of illegal content. In her opening statement at the Commission's *en banc* field hearing held at Harvard University on February 25, 2008, Commissioner Deborah Taylor Tate eloquently observed that producers, writers and artists are watching their industries and their art "literally vanish into thin air" at the hands of those who "misuse the very infrastructure that we are here to discuss today."[3] She expressed the hope, which NBC Universal, Inc. shares, that the Commission does "not allow those who seek regulatory protection for illegal activities to prevail by hiding beneath the honored word of 'freedom.'"[4]

Commissioner Tate's concern is well-founded. It would be a terrible mistake – for consumers, for the future of the Internet and for the rule of law – if this proceeding were to result in the Commission shackling broadband network operators in their efforts to address through reasonable network management practices both the predominance of illegal content on P2P networks and the resulting disruptive congestion. We address this plea to the four Commissioners who did not mention the overwhelming and undisputed evidence of massive copyright infringement occurring through peer-to-peer file sharing:

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[3] Statement of Commissioner Deborah Taylor Tate at En Banc Haring on Broadband Network Management Practices, Cambridge, MA (Feb. 25, 2008).

[4] *Id.*

- The sheer scale of this illegal traffic should – and must – be at least one factor in your evaluation.

- The blatant illegality of this traffic takes it outside the consumer protection aspect of the Policy Statement and deserves clear condemnation.

- A complete failure to address the single most obvious characteristic today of peer-to-peer file sharing would call into question the validity of any Commission conclusion, not only from a simple common sense perspective, but also from the perspective of the Commission's obligations not to act arbitrarily and capriciously and to consider the whole record before it.

The Commission should enable and indeed applaud reasonable network management practices that carefully and appropriately address not only network congestion, but also the tidal wave of illegal file sharing. The record in this proceeding establishes that these are the only means by which all Internet subscribers can be assured the opportunity to enjoy reasonable access to all lawful applications and content.

II. PEER-TO-PEER NETWORKS CONSUME HUGE AMOUNTS OF BANDWIDTH, PREDOMINANTLY THROUGH THE TRANSFER OF PIRATED MUSIC AND VIDEO FILES, AND IMPAIR INTERNET SERVICE FOR LAW-ABIDING CONSUMERS

Numerous parties have attested in this proceeding to the voracious consumption of bandwidth by P2P networks such as BitTorrent, the crushing burden this traffic places on the privately owned and operated networks that make up the Internet and the service degradation imposed by P2P traffic on the vast majority of consumers who do not engage in P2P file transfers. In its opening comments in this proceeding, NBCU provided statistics from third parties on the scope and scale of the problem worldwide:

- In 2005 CacheLogic, a tech company that provides traffic management services to ISPs in Europe, he U.S. and Asia, published "P2P in 2005" and presented its figures to the Federal Trade Commission in December of that year. It reported that "P2P represented 60% of internet traffic at the end of 2004" and "is still growing."[5]
- Another paper prepared by the company PeerApp, which specializes in peer-to-peer infrastructure, found similar volumes of P2P traffic: "the figure today may be as high as 60% of all internet traffic."[6]
- A third study conducted by the tech company Sandvine came to similar conclusions: "In Europe, where broadband adoption has steadily outpaced the United States, upstream [P2P] traffic represents up to eighty-five percent (85%) of all bandwidth consumed on broadband provider networks. Downstream P2P traffic represents about sixty percent (60%) of all bandwidth consumed. In contrast, file sharing in the UK and North America consumes about forty-eight (48%) of total downstream bandwidth and seventy-six percent (76%) of upstream traffic."[7]
- Time Warner Cable, the second-largest cable ISP in the U.S., recently publicly announced that it plans to test a new rate plan to address the problem of P2P consumption of network capacity.[8] According to Time Warner Cable spokesman Alexander Dudley, "a small group of super-heavy users of downloads, around 5% of the customer base, account for up to 50% of network capacity."[9]

The opening comments filed by other parties in this proceeding confirm these statistics. According to Time Warner Cable's opening comments, fewer than five percent of Internet users currently consume as much as 60 to 70 percent of all

[5] CacheLogic, "P2P in 2005," http://www.cachelogic.com/home/pages/studies/2005_01.php.

[6] PeerApp White Paper, "Comparing P2P Solutions," available at http://peerapp.com/solutions-managing-transit-link-growth.aspx.

[7] Discussed in Protecting Copyright and Innovation in a Post-Grokster World: Hearings Before the Senate Judiciary Comm., 109th Cong. (Sept. 28, 2005) (statement of Sam Yagan, president of parent company of P2P application eDonkey), available at http://judiciary.senate.gov/testimony.cfm?id=1624&wit_id=4689.

[8] *See* "Time Warner Links Web Prices With Usage," (Jan. 17, 2008), available at http://biz.yahoo.com/ap/080117/time_warner_cable_internet.html.

[9] *Id.*

available bandwidth through P2P applications.[10] Other commenters note that P2P consumption of bandwidth by these users reaches as high as 90 to 95 percent of capacity at peak periods.[11] In the absence of reasonable network management practices, this volume of P2P traffic in fact discriminates against the 95 percent of broadband subscribers who do not consume disproportionate network resources by forcing them to subsidize disproportionately heavy consumption by a small fraction of users. These are the very consumers – ordinary mainstream users of the Internet – one would logically assume the petitioners would want to protect. Ultimately, the burden imposed by this traffic, if not sensibly managed, threatens to overwhelm the Internet to the detriment of all users.

The record developed in this proceeding also establishes without dispute that the vast majority of the content exchanged through P2P networks is copyright-infringing pirated audio and video files. The Information Technology and Innovation Foundation states in its comments, for example, that "more than 90 percent" of the content exchanged on P2P networks consists of "copyright-protected content that

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[10] Comments of Time Warner Cable Inc. at 11 (filed Feb. 13, 2008) ("Time Warner Comments"); *see also* Comments of AT&T Inc. on Petitions of Free Press and Vuze at 14 (filed Feb. 13, 2008) ("P2P traffic 'constitutes approximately 60% of all traffic that traverses the public internet'") and 20 ("[t]he top 5% of users account for roughly 50% of all downstream traffic, indicating that it is these few 'bandwidth hogs' that are pushing the limits of network capacity through massive P2P file transfers") (citing David Vorhaus, *Confronting the Albatross of P2P*, Yankee Group (May 31, 2007)) ("AT&T Comments").

[11] Comments of the Fiber-to-the-Home Council on the Petition for Declaratory Ruling Regarding Internet Management Policies and on the Petition for Rulemaking to Establish Rules Governing Network Management Practices by Broadband Network Providers at 14 & n.34; Comments of Verizon and Verizon Wireless at 31 &n.46; *see also* Comments Comcast Corporation at 22 (quoting Vodaphone as stating that "80[%] of the congesting traffic [on its network] was P2P") ("Comcast Comments").

subscribers download and upload without paying for it."[12] Time Warner correctly observes that Free Press and Vuze "do not seriously dispute that the overwhelming majority of P2P traffic currently represents illegal transfers of copyrighted music and video files."[13] Even the Distributed Computing Industry Association – a trade group promoting the use of P2P for lawful purposes – acknowledges that P2P has been considered a "rogue technology, more associated with copyright infringement" than with efficient and secure distribution of lawful digital content.[14]

Numerous parties also offered clear and cogent explanations of the unique characteristics of P2P applications that cause them to consume disproportionate amounts of network resources and cause disruptive congestion.[15] With traditional content-distribution methods, a complete copy of a content file, such as a TV program or movie, is stored on a centralized server and downloaded from the server to end users who request it. Content providers and their distribution partners have traditionally borne the costs of installing and maintaining enough centralized storage

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[12] Comments of the Information Technology and Innovation Foundation at 3 ("ITIF Comments"); *see also Metro-Goldwyn-Mayer Studios, Inc., et al. v. Grokster, Ltd.*, CV 01-08541, Order Granting Plaintiffs' Motion for Summary Judgment on Liability Against Defendant Streamcast Networks, Inc. (U.S.D.C. Central District of Calif., entered Sept. 27, 2006) (court on remand ruled that plaintiffs' undisputed facts showed "massive" infringement involving 97 percent of the content downloaded via defendant's P2P networks).

[13] Time Warner Comments at 18 (emphasis added); *see also* AT&T Comments at 13 ("To be sure, P2P technology has been used (and continues to be used) by some parties for the unlawful distribution of pirated content").

[14] Comments of the Distributed Computing Industry Association at 5. Free Press and Vuze also acknowledge in passing that BitTorrent is used to infringe copyrights, albeit in statements that are noteworthy primarily for their remarkable understatement. *See* Formal Complaint of Free Press at 14 ("BitTorrent . . . has attracted some media attention on account of the fact that some people use BitTorrent for illegal purposes (such as those violating copyright) . . . ."); Vuze Petition for Rulemaking at 8 ("While peer-to-peer software is sometimes associated with illegal file-sharing of copyrighted materials . . . .").

[15] *See, e.g.,* AT&T Comments at 12-15; ITIF Comments at 4-6.

and server capacity to distribute their content to end users. In contrast, P2P applications disassemble the content into small files and widely distribute those files to different end-user computers for storage and subsequent retrieval and distribution by other end users. The result is the functional equivalent of a massively distributed server network, in which each end user's computer acts as an individual server for a portion of the content being distributed.[16]

A user of BitTorrent or a similar application who is seeking a file first downloads a "torrent," which is a small file that describes the desired content and includes tracking information. The user then connects either to a server that tracks torrents or to other users' computers that act as trackers. This function identifies for the seeker's computer other users who have the pieces of the file necessary to assemble a complete file. For the seeker to obtain the complete file, others must upload or "seed" bits of the file to the P2P network. Because P2P networks send and receive huge files, congestion results, particularly for upstream traffic on cable networks. In addition, some P2P protocols reward users who seed more files, which means that network operators who try to expand their capacity to accommodate the heavy traffic instead become targets for even more P2P traffic.[17]

Other characteristics of P2P networks exacerbate the congestion. For example, these applications generally are not "TCP-friendly."[18] When congestion occurs on a network, P2P applications do not reduce their rate of transmission to

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[16] AT&T Comments at 12.

[17] ITIF Comments at 4-5.

[18] Jon M. Peha, *The Benefits and Risks of Mandating Network Neutrality and the Quest for a Balanced Policy* at 7, 34th Telecommunications Policy Research Conference (Sept. 2006).

allow the congestion to subside. Instead, the application will continue to send out data as fast as it can, while the TCP-friendly applications are programmed to send fewer and fewer packets until the congestion is reduced.[19]

By effectively transforming end-user computers into servers, P2P applications fundamentally alter two key assumptions that informed the design and engineering of the networks comprising the Internet. First, by converting end user computers into content storage devices for other end users, P2P applications shift the costs of centralized storage and distribution to end users and their broadband network providers. Many of these end users might not even be aware that their computers are being used to take the place of commercial servers and that their personal broadband subscriptions will be used by third parties to transmit copies of the content in question.[20] Nor are many consumers aware that unmanaged P2P usage can slow down the processing speed of their computers, open up the contents of their hard drives to third parties and expose them to potential copyright liability.[21]

Second, P2P applications invert a key engineering assumption about the direction and volume of traffic flows on the Internet.[22] Most residential broadband networks were built on the assumption that end users would download far more data than they would upload. P2P applications, however, are more likely to result in symmetrical traffic patterns or, worse, heavier upload data streams, which puts a

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[19] *Id.*

[20] Time Warner Comments at 19.

[21] *Id.; see also* Prepared Statement of Federal Trade Commission before the Committee on Oversight and Government Reform, U.S. House of Representatives, Washington, D.C. (July 24, 2007) at 1-2.

[22] AT&T Comments at 12-13.

much greater strain on available upstream bandwidth than network engineers anticipated and built for.[23] BitTorrent in particular consumes disproportionate amounts of upstream capacity by opening up multiple connection streams to seize capacity.[24] Nor do P2P networks operate efficiently from the standpoint of network management. According to AT&T, today's P2P technologies are "inefficiently network-oblivious" because they do not place any premium on proximity when choosing routes for the exchange of data:

> Someone in Philadelphia who wishes to share files using a P2P application, for example, is just as likely to be paired with users on other networks in Hong Kong or Berlin as with other users on the same network in Philadelphia. . . . [T]his "network-oblivious peering strategy . . . may cause traffic to scatter and unnecessarily traverse multiple links within a provider's network, leading to much higher load on some backbone links" and producing "inefficiencies for both P2P applications and network providers.[25]

Without doubt, some of these same characteristics make P2P applications very attractive for businesses that seek to engage in the lawful distribution of large files, such as full-length movies and television programs. But these legitimate uses of P2P will be thwarted if broadband network operators are not permitted to manage their networks in a manner that allows them to accomplish two clearly desirable objectives: (1) to address and deal with the flow of network traffic, including priority communications, in an increasingly congested environment; and (2) to allow them to distinguish illegal content from legal content and to adopt reasonable practices to deal appropriately with the illegal content. Only by removing the vast quantities of

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[23] *Id.*

[24] *Id.* at 14.

[25] *Id.* at 15-16 (quoting Haiyong Xie *et al.*, *P4P: Explicit Communications for Cooperative Control Between P2P and Network Providers*, Distributed Computing Industry Ass'n at 1 (May 2007).

copyright-infringing content from P2P networks can these applications be used effectively and efficiently for the distribution of legal video files without adversely affecting Internet service for non-P2P users.

III. BROADBAND NETWORK OPERATORS MUST HAVE THE AUTHORITY AND FLEXIBILITY TO EMPLOY REASONABLE NETWORK MANAGEMENT TECHNIQUES TO ENSURE THAT ALL SUBSCRIBERS HAVE MEANINGFUL ACCESS TO THE INTERNET FOR LAWFUL APPLICATIONS AND CONTENT

A. The Record Reflects That Broadband Network Operators Face Enormous Challenges In Addressing The Growing Congestion Caused By Peer-To-Peer Networks Used Predominantly To Share Illegal Content

The petitions filed by Free Press and Vuze appear focused only on benefiting the very small percentage of users who are the most voracious consumers of broadband capacity, without regard to whether these users are engaging in legal or illegal activities. The record compiled in the opening comments, however, reflects that broadband network operators face enormous challenges in addressing the constantly increasing congestion caused by P2P file-sharing networks, which are used predominantly for the exchange of illegal, pirated music and video files. To address these challenges, network operators must have the flexibility and authority to employ reasonable network management techniques to ensure that mainstream broadband subscribers can gain access to the Internet at acceptable levels of service for legal content and applications.

As one commenter noted, the harms that broadband operators seek to prevent or address with network management techniques are not harms to

inanimate networks.[26] They are harms inflicted on ordinary consumers who likely have no idea why their broadband Internet connections have slowed down, causing web pages to load as if through a dial-up connection. The costs of accommodating bandwidth-intensive applications thus fall squarely on the vast majority of users who do not have the enormous bandwidth appetite of P2P users. Network operators, however, must be concerned with making broadband capacity available for all consumers. Reasonable network management techniques allow operators to accomplish this successfully and without government intervention.

The necessity for network management – while more pressing than ever before – is not new. From the earliest days of the Internet, network managers have used various tools to manage the flow of traffic within the backbone and in the last mile.[27] Such tools have been essential for avoiding paralyzing congestion at peak periods of usage and for giving priority to especially time-sensitive applications, such as telemedicine, emergency/public safety communications, voice over the Internet and real-time streaming of sports, news and other video programming. These applications are particularly vulnerable to jitter and latency. While a five-second delay in receiving a data packet through a P2P network would be imperceptible to the user, a five-second delay could be critical in a real-time online medical procedure. Network management techniques enable the Internet to be used effectively for all of these purposes. Emerging new applications, such as streaming video, networked multi-user gaming and video teleconferencing, are growing in popularity and

[26] Comments of CTIA – The Wireless Association at 2 (filed Feb. 13, 2008).

[27] Jason Kowal, "The Never-Ending Rush Hour: Internet Traffic Requires Continual Investment in Capacity and Innovation in Network Management," Analysys Research, Ltd. (Aug. 9, 2007).

feasibility, but they will require even more sophisticated network management techniques to ensure that legitimate users can benefit from these new services.

B. Network Management Practices Should Be Measured By A Reasonableness Standard, Which Is Better Suited To The Kinds Of Decisions Facing Operators Than A Non-Discrimination-Type Standard

There is no dispute in this proceeding that the operation of the many networks comprising the Internet must be managed for the benefit of all subscribers. The only real issues are the standard by which network management practices should be measured and whether the Commission should prescribe detailed regulations governing these practices. For the reasons discussed below, the standard by which network practices should be measured is reasonableness, as envisioned by the Policy Statement. A standard based on reasonableness, rather than a non-discrimination-type standard, is much better suited to the multitude of decisions that broadband network operators must make on a daily, hourly and minute-by-minute basis. Given the complexity and dynamic nature of the Internet, the Commission should not attempt to prescribe detailed network management regulations, which are likely to become obsolete almost immediately.

1. Network Operators Must Constantly Make Decisions That Involve Drawing Distinctions, And Evaluations Of Network Management Practices Should Not Rest On Whether Such Lines Have Been Drawn

The petitioners claim that broadband operators use network management practices to discriminate improperly among applications and content, including by

favoring the operators' own competitive services.[28] As a threshold matter, there is no support whatsoever in the record for the allegation of anti-competitive discrimination. More importantly, all network management techniques involve some form of discrimination or line-drawing, which occurs whenever a network treats some traffic or uses differently from other traffic and uses. It is an inherent feature of network operation that operators must constantly make distinctions and draw lines with regard to a multitude of network elements, including the level of congestion, the size of files, the presence of security threats, the priorities and vulnerabilities of different types of traffic, the availability of evolving technology (both for network management and for consumer use of the network) and a host of other considerations. Limitations of available technology and other resource issues may mean that some types of problems can be addressed more effectively than others, but the evaluation of the reasonableness of the network operator's approach cannot rest on whether lines have been drawn and distinctions made in addressing these problems.

According to Professor Jon Peha of Carnegie Mellon University, one obvious use of differential treatment is to protect network security.[29] A network operator may use deep packet inspection and other network management techniques to determine whether a packet stream is carrying a dangerous virus or spyware, to reveal that a particular user is engaging in denial-of-service attacks on other users or to identify

[28] Free Press Formal Complaint at 52-55; Free Press Comments at 21-22; Vuze Petition for Rulemaking at 14-15.

[29] Peha, *supra*, at 7.

and address the use of an unauthorized or illegal device, such as equipment that allows one user to observe a neighbor's Internet traffic.[30]

No one in this proceeding, including the petitioners, disputes that network operators must have the ability to identify and deal with spam, viruses, worms, phishing, Trojan horses, denial-of-service attacks and other malware. Comcast, for example, reports that it catches 500 million spam messages each day, while AT&T reports that 80 percent of email bound for its network consists of spam.[31] Network management techniques allow operators to distinguish between the wanted and the unwanted, the benign and the harmful and the legal and illegal. Consumers unquestionably benefit from network operators' vigilant use of these techniques to protect them from unwanted, potentially harmful and possibly illegal content.

The same analysis must be applied to network management techniques that seek to identify and respond appropriately to the transmission of copyright-infringing content and the resulting disruptive congestion. A growing percentage of infringing content consists of video files that are hundreds of megabits in size. These are not short clips or excerpts, but rather complete, full-length movies and television programs. These file sizes will only increase as more and more of the video content is presented in high definition format. As Time Warner notes in its opening comments, network operators must have the tools – and the authority and flexibility to use those

[30] *Id.*

[31] Comcast Comments at 12 & n.29; AT&T Comments at 24.

tools – to combat both the congestion and the preponderance of illegal content on the Internet.[32]

While the small minority of Internet users who use P2P networks to obtain valuable content without paying for it may derive an advantage by breaking the law in this manner, most law-abiding consumers would prefer to take advantage of the growing number of legal web-based video programming services.[33] However, paralyzing congestion resulting from the massive scale of file-sharing of infringing content threatens the viability of these new services. If these illegal uses of the Internet – and particularly of P2P networks – can be substantially reduced or eliminated, however, then the benefits of this technology can be developed and enjoyed by mainstream users for a variety of exciting new applications, including delivery of video for entertainment, education, telemedicine, video teleconferencing and other services. Accordingly, network operators must not be shackled in their efforts to use various technical methods to identify and address pirated music and video files.

To the extent there is any ambiguity on this key point, the Commission should clarify in this proceeding as a matter of public policy that network management techniques that result in identifying copyright-infringing files should be considered reasonable and must be permitted. Because the Commission's Policy Statement protects only lawful applications, content and devices, this clarification is fully

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[32] *See* Time Warner Comments at 14 n.37 ("[T]he prevalence of pirated material provides a justification for traffic management even apart from the congestion and network performance issues that are paramount to broadband providers").

[33] *See* Part IV *infra*.

consistent with and in furtherance of the principles articulated by the Commission in the Policy Statement.

2. Given The Diversity, Complexity And Dynamic Nature Of The Internet, The Commission Should Not Impose Detailed, Prescriptive Regulations That Limit The Ability Of Broadband Operators To Manage Their Networks

The technical diversity, complexity and rapidly changing nature of the Internet make it exceedingly difficult for the Commission to adopt regulations that would not be rendered obsolete and ineffective almost immediately. The Internet is an extremely complex, constantly changing "network of networks" comprised of a multitude of technically distinct yet interconnected platforms, including cable, fiber, DSL, satellite and wireless networks. The techniques for managing the operation of the Internet on these various platforms, of necessity, must vary to take into account their technical differences. For example, cable broadband is particularly susceptible to the excessive upstream usage characteristic of P2P, which may consume 80 percent or more of upstream bandwidth,[34] while wireless broadband has its own special demands and requirements. Under these circumstances, one-size-fits-all regulations simply won't work.

Of even greater concern, Internet technology changes constantly. Indeed, network operators must address changes on a daily, hourly and minute-by-minute basis and therefore must have the authority and flexibility to respond to the constantly changing online environment. Internet users are all too aware of the lightening speed with which a virus or worm can spread through broadband

[34] *See* Comments of United States Telecom Association at 17 (filed Feb. 13, 2008); ITIF Comments at 2; AT&T Comments at 6-7.

networks worldwide. As the owners of these private networks, broadband operators are highly motivated and far better positioned than the Commission to identify and deal with the daily changes in and threats to the Internet's complex ecosystem. On the other hand, a set of static regulations administered by the Commission will hamstring the ability of network operators to respond quickly and effectively to the next bad act inflicted on consumers through the Internet. Accordingly, the Commission should refrain from adopting detailed, prescriptive regulations that tie the hands of network operators in managing their networks for the benefit of all consumers and that will become obsolete virtually upon adoption.

The need for detailed, prescriptive oversight is also ameliorated by the increasingly competitive nature of the broadband marketplace. Consumers have multiple choices for broadband service even within a given market. These choices include competing networks offered by multiple providers over cable, DSL, fiber, satellite and wireless. To attract subscribers, these providers must compete through price, quality, service differentiation, mobility and other characteristics. Consumers are able to switch providers quickly and easily if they become dissatisfied with their current provider or are attracted by the price or service offerings of a competitor.

3. Consumers Are Entitled To Information About Their Broadband Subscriptions And Services, Taking Into Account The Need To Maintain Network Security

A number of parties in this proceeding have called for greater disclosure of network management techniques, and network operators have explained in detail the need for a careful balancing in disclosing pertinent information to consumers and

maintaining network security.[35] We agree that consumers are entitled to know what they are paying for and to be informed that bandwidth-limiting techniques may be employed to address congestion and facilitate time-sensitive applications. It is self-evident, however, that any policies on disclosure must take into account that the primary purpose of many network management practices is to maintain network security. Common sense dictates that disclosure should not undercut the reason for the existence of these practices or compromise network security.

IV. LEGAL ONLINE VIDEO OPTIONS WILL SURVIVE AND THRIVE ONLY IF NETWORK OPERATORS HAVE THE TOOLS AND FLEXIBILITY TO MANAGE THEIR NETWORKS

As technological innovation and growing broadband access have made online video a reality, major video content providers have seized the initiative and developed a growing number of websites where video programming (including full-length television programs and movies) can be accessed easily, affordably and legally by consumers. All of the major television networks offer free, ad-supported streaming of full-length episodes of their programs on their websites. For example, at NBC.com, a viewer can watch free, ad-supported episodes of network programs through a video stream or download the episodes at no cost and keep them for seven days. In addition, television programs and movies are being presented as ad-supported or for modest download fees on a wide assortment of other websites and Internet portals.

Full video on the Internet is in its infancy, however. Full-length episodes of television programs first became available on the Internet during the fourth quarter

[35] *See, e.g.,* AT&T Comments at 32-34; Comcast Comments 41-42; Comments of the Institute for Policy Innovation at 2 (filed Feb. 13, 2008).

of 2005. Since then, growth has been explosive, and content owners have responded by providing consumers with an abundance of legal video content on the web. The success of these legal online video options has created expectations among consumers that an Internet connection should be able to deliver video content just like a television set: smoothly, in clear, crisp and bright colors and with no jitter, bursts or latency. Network operators – in cooperation with content providers – are working hard to fulfill these expectations consistently and reliably. But their efforts will be derailed if network operators are prohibited from using network management tools to address the serious congestion problems facing their networks, particularly from the staggering levels of copyright-infringing music and video file-sharing that indisputably congest the Internet, as the record in this proceeding so forcefully demonstrates.

V. CONCLUSION

The Commission's Policy Statement confirms, among other important principles, that consumers are entitled to use the applications of their choice to gain access to lawful content on the Internet. This proceeding was launched because the Commission was concerned that broadband network operators used network management techniques to improperly deprive consumers of access to such content. The record compiled in this proceeding establishes that the applications of concern to operators – peer-to-peer file sharing – are used by a very small minority of users and create massive congestion on the networks, which degrades service for the majority of subscribers and threatens to overwhelm the carrying capacity of the Internet. Network operators are right to employ reasonable network management

tools that help to alleviate the congestion caused by a few so that all subscribers are able to benefit from their access to the Internet. The Commission should not hamper network operators' ability to do so by imposing static, one-size-fits-all rules.

The record also establishes that almost all of the content exchanged on these P2P networks is copyright-infringing, pirated music and video files. Network operators should not be hampered in their efforts to address a problem of such enormous proportions and economic impact, and many, such as AT&T, are courageously taking steps to do so. It is essential for the Commission to acknowledge that proper network management also encompasses efforts to identify

and respond appropriately to illegal content on the Internet. Other governments, such as France and the United Kingdom, have recognized that broadband network operators must have the tools – and the legal authority to use those tools – to combat the scourge of Internet piracy.[36] Our government must do the same.

Respectfully submitted,

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[36] *See* Comments of NBC Universal, Inc. (filed Feb. 13, 2008).