Comcast

July 21, 2008

VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

> Re: **In the Matter of Broadband Industry Practices, WC Docket No. 07-52;**
> *Ex Parte Communication*

Dear Ms. Dortch:

On July 17, 2008, Free Press and others (collectively "Free Press") filed another ex parte letter that, yet again, mischaracterizes Comcast's network management practices; asserts that such practices are unreasonable, discriminatory, and deviant from Internet standards; and urges the Commission to find that Comcast violated non-existent rules.[1] Moreover, Free Press repeatedly accuses Comcast of misrepresentation, violating its duty of candor, and even lying; it goes so far as to suggest that the Commission should consider whether to refer the matter to the Department of Justice for criminal prosecution. This series of intemperate attacks by Free Press is beyond the pale and should not be countenanced by the Commission. We must respectfully correct the record on this score.

Contrary to Free Press's allegations, Comcast has consistently been forthright in its statements to the Commission, and what Free Press characterizes as material misrepresentations are in fact true statements.[2] The key facts -- as documented previously, further detailed in the attached declaration, and summarized below -- are:

---

[1] Letter from Marvin Ammori, Free Press, to Marlene H. Dortch, FCC, CC Docket Nos. 02-33, 01-337, 95-20, 98-10, GN Docket No. 00-185, CS Docket No. 02-52, WC Docket No. 07-52, at 1 (July 17, 2008).

[2] The vast majority of the assertions Free Press makes are based entirely on the unsupported allegations of a single person: their consultant, Robert Topolski. Mr. Topolski, to whom Free Press refers as an "expert," is not an engineer, has no apparent experience in designing or managing a network (his reported certifications and experience are in quality assurance and software testing), and has no first-hand knowledge of Comcast's network. *See* Robert Topolski, *HIRE ME! (My Resume)*, *at* http://www.funchords.com/Robert_Topolski-resume08-SQA_Testing.pdf (last visited July 21, 2008).

- First, Comcast's High-Speed Internet customers can and do access any content, run any application, and use any service that they wish.

- Second, our network management practices are similar to those deployed by other Internet service providers in the United States and around the world, and are reasonably designed to enable, not hinder, the high-quality user experience that the *Internet Policy Statement* contemplates and that competitive marketplace considerations require.

- Third, although Free Press and its consultants believe they know and understand Comcast's network and how it manages that network, they do not, and they have made no legitimate effort to gain such an understanding (as others have recently done).

- Fourth, Comcast's network management practices are not discriminatory and are entirely agnostic as to the content being transmitted, where it is being sent from or to, or the identity of the sender or receiver.

- Finally, Comcast's customer service agreements and policies have long disclosed that broadband capacity is not unlimited, and that the network is managed for the benefit of all customers. Comcast's disclosures have always been comparable to -- and are now far more detailed than -- almost any other Internet service provider's disclosures.

Rhetoric cannot hide the basic facts -- which Comcast has done its level-best to explain -- as demonstrated by the record here:

Comcast does not block peer-to-peer ("P2P") protocols. Comcast has many hundreds of thousands of High-Speed Internet customers who use P2P protocols routinely. We value these customers and try hard to deliver them a quality experience that makes them choose Comcast rather than other providers of broadband services.[3] The overwhelming majority of the billions of P2P sessions that are effectuated daily over Comcast's network are not delayed. And, when a P2P upload is delayed, in the vast majority of cases, that delay lasts less than a minute. By no reasonable definition of the word can this reasonably be considered to be "blocking."

Comcast's network management practices are reasonable, expressly designed to be minimally intrusive, and compliant with Internet norms. As confirmed by numerous other commenters, it is a legitimate and reasonable goal to manage congestion caused by P2P protocols. Doing so ensures that P2P use by some customers does not degrade the experience of

---

[3]   Mr. Topolski apparently chooses Comcast over DSL and wireless broadband. *See* Robert Topolski, *How To Handle the Comcast Case Without Heavy Regulation* (Apr. 28, 2008) ("I own a home where **my two choices** are DSL at 768/128 (no longer considered Broadband) and Comcast up to 8 Mbps/768 Kbps. I also rent an apartment here . . . where I have about 3 Mbps/256 as my DSL and the same Comcast choices. Beyond that, there are **no** broadband choices without prohibitive consumption caps (wireless).") (emphasis in original), *at* http://funchords.livejournal.com/ (last visited July 21, 2008).

other users. In fact, doing so directly benefits many voice and video services that compete with Comcast's own voice and video services. Comcast's current technique for managing P2P protocols is a minimally intrusive and surgical option for addressing the problem.

Free Press claims that Comcast's approach for managing such congestion is unreasonable simply because it allegedly deviates from Internet standards. This erroneously suggests that there exists a comprehensive list of standards governing how the Internet operates. That is not the case.

- The openness of the Internet is about allowing anyone to try new ideas without having their innovations stifled by a long, drawn-out standards process. Ideas that become very popular *may* be adopted by any of a number of standards bodies (e.g., IETF, IEC, W3C, IEEE, etc.), but the Internet is subject to no "rule book" to which all service providers (including network operators) must conform.

- There is no IETF standard for BitTorrent, Gnutella, or any other P2P protocol. In fact, BitTorrent maintains its own "Proposed Standards Process" that is not part of the IETF.[4] As network engineer Richard Bennett pointed out in an article he filed in his February 28, 2008 reply comments, "If we stipulate, as most witnesses [at the Commission's Cambridge en banc hearing] did, that peer-to-peer uses the Internet's classical mechanism in a novel way, it's hard to sustain the argument that network operators must respond to the traffic streams it generates according to the dictates of official Internet standards. BitTorrent isn't an Internet standard and neither are the tools that manage it; they're gander and goose."[5]

- Far from unreasonable and deviant from "Internet standards," Comcast's network management practices are techniques that are employed by a large number of Internet service providers around the world.[6]

Although Free Press believes it knows and understands Comcast's network and how Comcast manages that network, it does not. Ever since Free Press first filed its pleadings, it has assumed that it knew more about Comcast's network and Comcast's management techniques than Comcast does. Its consultant, Mr. Topolski, has made baseless and unsupported allegations (often inconsistent with his own prior statements) about where in the network Comcast's management equipment is located, how the equipment operates, and the effects it has on P2P traffic. Despite having no first-hand knowledge of how Comcast's network management works, and despite Mr. Topolski's refusal to take the opportunity we offered him to learn how our

---

[4]   BitTorrent.org, *Proposed Standards Process*, *at* http://www.bittorrent.org/ (last visited July 20, 2008).

[5]   Richard Bennett, *Cool Rules for the FCC: In the Lion's* Den, The Register, Feb. 28, 2008, *available at* http://www.theregister.co.uk/2008/02/28/bennett_fcc_neutrality_hearing/, *filed in* Richard Bennett Reply Comments, WC Docket 07-52 (Feb. 28, 2008).

[6]   *See* Letter to Marlene H. Dortch, Secretary, FCC, from Michael Verhoeve, Vice President & General Counsel, Sandvine Corp. 1 (May 23, 2008).

network management operates,[7] Free Press and Mr. Topolski regrettably continue to perpetuate numerous inaccurate statements about Comcast's network management.

- For example, Free Press continues to assert its own incorrect view of where in the network Comcast's network management equipment is located -- a simple physical fact. Comcast's network management equipment operates at the CMTS level.[8] When Mr. Topolski cites "trace evidence" showing the number of hops a reset command traveled and concludes that the equipment that sent it was not at the CMTS, his analysis and conclusions are based on unsound tests and flawed assumptions about Comcast's network topology -- the decrease in the "time to live" (TTL) counters and the number of hops a reset packet travels do not indicate, and cannot be used to determine, where Comcast's network management equipment is located.

- Free Press also reveals its lack of technological knowledge when it makes reckless, uninformed, and unsupported charges about Comcast's "touted upgrades," calling them "window-dressing." Comcast's upgrades not only include increased modem speeds but also include increases in capacity, in many cases tripling or quadrupling upstream capacity. Again, if Free Press and its consultant had accepted Comcast's invitation to learn about Comcast's network and network management practices, its understanding of Comcast's network would not be so uninformed.

- In contrast to Free Press, a number of other interested parties have taken advantage of Comcast's offers to learn more about Comcast's network architecture and engage in a productive and constructive dialogue, including BitTorrent, Inc., Pando Networks, Vonage, and others.[9] Those discussions uniformly have resulted in a greater mutual understanding of Comcast's network and the way in which various protocols work on it today and can work even better on it in the future.

---

[7]   In an effort to provide Mr. Topolski with basic network information that would better inform his participation in this proceeding, Comcast invited him to the company's Philadelphia headquarters in May when he was on the East Coast. Mr. Topolski initially accepted, then declined at the last moment, and has failed to contact us to reschedule.

[8]   In his declaration included with Free Press's "Formal Complaint," Mr. Topolski correctly noted that Comcast's network management equipment "is located at th[e] user's Cable Modem Termination System (CMTS), which is the location where the user's cable connection, along with that of others [sic] users in the area is terminated and converted into an internet connection." *See In re Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications* Attachment 2, at 2 (Nov. 1, 2007) ("Declaration of Robert Michael Topolski"). Subsequently, and without explanation, he inaccurately claimed that Comcast's network management equipment "is at the metropolitan area's aggregation point." Letter from Robert Topolski to David Cohen, Comcast Corporation 4 (Apr. 3, 2008), *filed in* WC Docket. No. 07-52 (Apr. 4, 2008).

[9]   *See, e.g.*, Press Release, Comcast Corp. *Comcast and Vonage Form Collaboration To Address Network Management and Better Meet Customer Needs* (July 9, 2008); Press Release, Comcast Corp., *Comcast and Pando Networks To Lead Creation of "P2P Bill of Rights and Responsibilities" for Peer-to-Peer Users and Internet Service Providers* (Apr. 15, 2008); Press Release, Comcast Corp., *Comcast and BitTorrent Form Collaboration To Address Network Management, Network Architecture and Content Distribution* (Mar. 27, 2008).

Comcast's practices are entirely agnostic as to content and are not discriminatory. To determine whether any protocol should be managed, Comcast uses purely objective criteria that focus on the *effects* that *all* protocols have on network congestion and, correspondingly, its customers' use of the Internet. *No consideration is given to the content, applications, or services that use these protocols.* Currently, Comcast only manages those protocols that have already demonstrated, based on analysis by Comcast, third-party vendors, and industry technical organizations, a tendency to cause congestion that disrupts the network. In other words, Comcast's approach is to manage only those protocols that negatively affect the network and its users; this is entirely content- and identity-neutral, and certainly not discriminatory. Allegations that Comcast "discriminates" against P2P protocols fail to account for the fact that differential treatment of different things is not discriminatory, either in a legal sense or a practical one.[10] The accusations that Comcast's network management practices are not content-agnostic and are discriminatory are unsupported by a shred of evidence and are false.

Comcast's customer service agreements and policies have long disclosed that broadband capacity is not unlimited, and that the network is managed for the benefit of all customers. We have always advised our customers that the network is actively managed to ensure a quality experience for all customers. Our Terms of Service have long specified that Comcast High-Speed Internet service is subject to "speed and upstream and downstream rate limitations," and that the service may be used only for "personal, residential, non-commercial purposes."[11] Our Acceptable Use Policy has long prohibited use of the service in a way that "restrict[s], inhibit[s], or otherwise interfere[s] with the ability of any other person . . . to use or enjoy the [s]ervice, including . . . generating levels of traffic sufficient to impede others' ability to send or retrieve information," and has long required customers to ensure that their "use of the Service does not restrict, inhibit, interfere with, or degrade any other user's use of the Service nor represent . . . an overly large burden on the network."[12] Early in 2008, we published revised disclosures that provide increased transparency in this area, and that we believe to be among the most transparent of all U.S. broadband ISPs.

---

[10]   Comcast Reply Comments, WC Docket No. 07-52, at 25 (Feb. 25, 2008) ("The federal courts and the Commission have made clear that discrimination can occur only when 'like services under like circumstances' are treated differently, which is not the case when protocols that place unique burdens are treated differently than ones that do not." (quoting *American Trucking Ass'n, Inc. v. FCC*, 377 F.2d 121, 130 (D.C. Cir. 1966) and citing *Global NAPS, Inc. v. Verizon New England, Inc.*, 454 F.3d 91, 103 (2d Cir. 2006)).

[11]   Comcast Corp., *Residential Subscriber Agreement* §§ 4, 7, *available at* http://www6.comcast.net/terms/subscriber/ (last visited July 21, 2008).

[12]   Comcast Corp., *Comcast High-Speed Internet Acceptable Use Policy*, *at* http://www.comcast.net/terms/use.jsp (last visited July 21, 2008).

We have presented these facts on numerous occasions, and on the record, over the past five months. Meanwhile, Free Press continues to offer its own characterizations which, as we have shown, have almost invariably been skewed and often erroneous. We emphasize that our repeated offers to the Commission to address any questions or concerns regarding our practices or disclosures remain open.

Please let me know if you have any questions.

Sincerely,

/s/ Kathryn A. Zachem
Kathryn A. Zachem
Vice President, Regulatory Affairs
Comcast Corporation

cc: Amy Bender
Scott Bergmann
Matthew Berry
Amy Blankenship
Catherine Bohigian
Scott M. Deutchman
Angela E. Giancarlo
Daniel Gonzalez
John W. Hunter
Greg Orlando
Dana Shaffer

Enclosure

Attachment A

Declaration of Mitch Bowling

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C.

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

DECLARATION OF MITCH BOWLING

1. My name is Mitch Bowling. My business address is One Comcast Center, Philadelphia, Pennsylvania 19103.

2. I am the Senior Vice President and General Manager of Online Services and Operations for Comcast Cable Communications, LLC ("Comcast Cable" and, together with its affiliates, "Comcast"). Before I was promoted to my current position, I was the senior operations executive of Online Services from 1997 until early 2006. The statements made herein are based on personal knowledge or information I gained during my employment in these positions with Comcast, and my review of certain documents.

3. In my current position at Comcast, I am responsible for all aspects of Comcast's online business, including the provision of our High-Speed Internet service. My primary responsibilities at Comcast involve generating subscriber growth and minimizing subscriber churn. In other words, my primary goal is to put forward a state-of-the-art product that consistently attracts new subscribers and retains existing subscribers. These responsibilities inform my decisions about how the network is structured and managed. I must account for and minimize any potential negative effects

such decisions would have on Comcast's subscribers' Internet experiences and the attractiveness of our product.

4. Comcast was among the first companies in the United States to develop and deploy residential broadband service. We have made that service available to over 49 million homes, and we have attracted over 14 million customers in an intensely competitive environment. In order to remain competitive, we must deliver an exceptionally high-quality service that provides consumers with the capabilities that they expect, including access to all lawful Internet content, applications, and services.

5. Comcast engages in reasonable network management, as does almost every major U.S. and international broadband Internet service provider ("ISP") of which I am aware. Comcast must manage its network to ensure that it runs effectively and efficiently to ensure that all of our customers have a quality experience. This includes using state-of-the-art technologies that do *not* prevent consumers from using peer-to-peer ("P2P") protocols but *do* ensure that such uses cannot degrade our customers' broadband experience and their ability to access content, applications, and services, whether they are simply trying to surf the web, watch streaming video, play real-time online games, or make voice-over-IP ("VoIP") calls. Importantly, as I describe in detail below, we manage the use of certain P2P protocols in a minimally intrusive way, and only when necessary based on objective criteria. These management techniques are not based on the content of the files users are sharing or the identity of the users who are doing the sharing; and Comcast does not censor Internet content, applications, or services.

6. Comcast fully recognizes the importance of providing our customers with appropriate disclosures about the services they purchase. Comcast's customer service

2

agreements and policies have long disclosed that broadband capacity is not unlimited, and that the network is managed for the benefit of all customers. These disclosures were comparable to, or more robust than, the disclosures used by other ISPs. Early in 2008, we published revised disclosures that provide increased transparency in this area, and that we believe to be among the most transparent of all U.S. broadband ISPs.

The Need For Reasonable Network Management

7.   Network management is, always has been, and likely always will be, an essential part of providing high-speed Internet access -- or any other network-based service, for that matter. How a service provider manages its network is an important factor in the quality of service it provides. Customers expect their service providers to protect them from spam, phishing, computer viruses and worms, Trojan horses and denial-of-service attacks. Although the disruptive potential of spam, viruses, and worms receives the most media attention, the potential for service degradation caused by network congestion is also a major concern for any broadband ISP trying to ensure a positive Internet experience for all its users.

8.   Consumer demand for Internet content, applications, and services has grown dramatically since the introduction of broadband, and by all indications that growth will continue. The content, applications, and services consumers use today consume vastly greater quantities of bandwidth than they did just a few years ago. On average, each Comcast High-Speed Internet customer uses over 40% more bandwidth today than one year ago.

9.   To meet growing demand and rising customer expectations, Comcast has invested billions of dollars and continues to invest hundreds of millions more annually to

make Comcast High-Speed Internet even faster and more reliable. These investments ensure that our customers are able to use or access any Internet content, application, or service they choose, even as demand for bandwidth continues to grow.

10.   Across our footprint, we are increasing both the speed and capacity of our high-speed Internet product. Comcast recently made a considerable investment to increase the upstream capacity across our network at no additional cost to our customers. We expanded our network capacity in different ways, including the allocation of additional bandwidth and the addition of upstream network equipment, some of which uses DOCSIS 2.0 instead of DOCSIS 1.1. This is in addition to the nearly daily network upgrades that are performed as a normal course of business.

11.   In April 2008, Comcast announced that we were taking the first step in the evolution from broadband to wideband -- rolling out DOCSIS 3.0 in the Twin Cities Region. In this market, Comcast is now offering consumers download speeds of up to 50 Mbps and upload speeds of up to 5 Mbps. We plan to make wideband service available to up to 20 percent of our footprint by the end of the year, and to many more systems in 2009. Again, these changes entail increases in capacity, not just speed (i.e., Comcast is providing better roads, not just faster cars).

12.   Even with continuous upgrades and constant investment, however, the fact remains that network capacity is not, and never will be, unlimited. That is why all broadband networks -- including those of non-U.S. broadband ISPs that offer significantly more capacity -- must be, and are, managed in appropriate ways. Absent such management, network congestion would inevitably degrade the experience for all users and thwart them from enjoying the full panoply of content, applications, and

services they enjoy today. For a variety of reasons, most notably the fact that certain P2P

protocols can consume as much bandwidth as is available and can be used in a manner

where the computer can be available as a source of upstream file transfers 24 hours a day,

seven days a week, regardless of whether the user is actively participating, it is not

possible to build one's way out of the need for reasonable network management.

13.   Content, applications, and services that are sensitive to latency and packet

loss, such as VoIP, streaming video/audio, and online gaming, are particularly susceptible

to degradation resulting from network congestion. This means that users of competitive

services, such as Vonage, as well as customers seeking to watch streaming video or play

real-time online games, may be unable to do so -- or may suffer a degraded experience --

if the network is not properly managed to avoid congestion.

14.   A disproportionately large amount of the traffic currently on broadband

networks originates from a disproportionately small number of users employing certain

P2P protocols to share files. P2P protocols are expressly designed to shift the burden of

distribution (and its associated costs) from a content provider's central servers to

individual users' computers (acting as mini-servers). By utilizing numerous individual

users' computers to distribute files to others who wish to make use of those files, P2P

protocols effectively shift the load on network bandwidth from what would have been

extremely high-capacity facilities used by the content provider to the "last-mile"

networks connecting individual users, with the result that P2P usage -- though clearly

beneficial in many ways to many people -- places large demands on the capacity

(especially upstream capacity) of last-mile networks. Solutions to these challenges are

now being pursued through constructive engagement in bilateral and multilateral

discussions, as reflected in our collaboration with BitTorrent, Inc., Pando Networks, Vonage, and our participation in the Distributed Computer Industry Association ("DCIA") and the Internet Engineering Task Force's ("IETF's") P2P Infrastructure Workshop.

**Comcast's Network Management Practices Are "Reasonable"
As Set Forth In The Internet Policy Statement**

15.   Based on our experience, Comcast estimates that from 6 to 7 percent of our customers use P2P protocols to share files at any time during a given week. Data collected at various points on Comcast's network confirm that approximately half of all upstream traffic is P2P traffic, even with Comcast's network management in place, and, in some locations, P2P traffic is as much as *two-thirds* of total upstream bandwidth.

16.   Several years ago, P2P protocols began to consume vast quantities of network resources. As this consumption continued to increase, Comcast's customers began to experience degraded service. For example, some users complained that their over-the-top VoIP calls were interrupted and their online gaming suffered significant latency and interference. Comcast set about trying to find a way to address these problems. Our goal was to ensure that our customers could continue to access and use the applications, services, and content of their choice, including those that use P2P protocols, without negatively affecting the experience of their neighbors. Because we knew many other broadband ISPs, in the United States and around the world, were already managing their networks for P2P, we believed it was important that we followed suit. In particular, we needed to maintain the quality of our customers' experience by avoiding a situation where our customers would become the most attractive source of

6

P2P uploads, thereby increasing the burden on network capacity and exacerbating the risks of congestion to our customers.

17.   Comcast considered a variety of potential strategies and tactics to address these congestion issues, but ultimately chose the one described below. These techniques were not chosen in lieu of continued investment in capacity. To the contrary, we have continuously invested in expanded network capacity, but we were concerned that every new investment was put at risk by the unique bandwidth demands of P2P traffic. The other options we considered did not meet our dual goals of adequately addressing the problem while still allowing our customers to access the full panoply of Internet applications, services, and content.

18.   For example, we considered whether some form of metered usage could adequately address the problem. Metered usage would allow us to ensure that we are appropriately distributing the costs of the network usage to those who use the network most. However, metered usage has not been widely accepted in the marketplace, and, in any event, doesn't directly address the issue of congestion in the network. Combined with what we saw as the significant benefits of the network management practice we ultimately chose, we decided not to pursue metered usage at the time. Now, in response to the continued evolution of customer usage patterns, discussions in public policy settings, and other factors, we have reopened the discussion, and are considering whether metered usage is a viable option and compliment to congestion-focused network management.

19.   Upon information and belief, the network management technique that we ultimately chose is widely used by broadband ISPs and installed in a variety of

networking equipment in the United States and around the world. We looked at other providers that offered similar capabilities, but we ultimately chose Sandvine, which scores of other broadband ISPs have chosen and has a track record of successfully managing network congestion in a minimally intrusive way. Comcast has not made a unique or unusual choice in how it is managing bandwidth on its network.

20.   Our network management of P2P focuses exclusively on unidirectional P2P *uploads*, which use a disproportionate amount of upstream capacity. When P2P unidirectional upload sessions reach a pre-determined threshold in a particular geographic area (our metric indicating network congestion likely to lead to service degradation for our customers), the Sandvine service delays initiation of any new unidirectional upload sessions until the number of active sessions drops below that threshold. In a further effort to minimize impact on our customers, we only manage the P2P protocols whose usage has a history of generating disproportionate burdens on the network, and only manage unidirectional upload sessions. In other words, our network management practices only affect the P2P protocols that, in Comcast's experience (as confirmed by independent third-party data) place exceptional burdens on the network, only manage unidirectional uploads (that is, an upload in which a user is "seeding" a file to another user, and not simultaneously downloading a file from the other user in a single TCP flow), only delays uploads in that geographic area where P2P uploads are threatening to cause congestion, and only delays uploads until usage drops below an established threshold of simultaneous unidirectional sessions.

21.   To effectuate our management practices, our network issues instructions called "reset packets" -- which involve a communication between two IP addresses -- to

8

temporarily delay the initiation of new P2P file uploads. This technique has been

described as "the only machine language [P2P protocols] understand [and] this type of

technique is common in the networking and software industry where alternatives don't

exist."[1] This is the same message that the computer receives when any number of

problems occur during a P2P file transfer, and the P2P protocol installed on the computer

(by the user) requesting the file automatically knows how to process this message and to

retry its request (assuming it has not already downloaded the file from other computers)

without the user having to take any additional action.[2]

22.   This action is nothing more than the system saying that it cannot, at that

moment, process additional high-resource demands without becoming overwhelmed, just

as a traffic light regulates the entry of additional vehicles onto a freeway during rush

hour. One would not claim that the car is "blocked" or "prevented" from entering; rather,

it is briefly delayed, then permitted onto the freeway in its turn while all other traffic is

kept moving as expeditiously as possible. Without such management, our experience

shows that some users will take full advantage of the capabilities built into certain P2P

---

[1]   George Ou, *EFF Wants To Saddle You with Metered Internet Service*, Real World IT, ZDNet Blogs, Dec. 3, 2007, *at* http://blogs.zdnet.com/Ou/?p=914&page=3 (last visited July 20, 2008). "Of course it would be nice if there were a dynamic network management protocol built in to the cable modems that actively manage traffic without the use of ugly TCP reset to manage excessive traffic, but such a mechanism doesn't exist and the Free Press is being ignorant about reality. Not only are they reckless for demanding the FCC shut down the current traffic management system, their proposed solutions simply have no effect on the RTS collision problem and their solution harms the consumer." George Ou, *A Rational Debate on Comcast Traffic Management*, Real World IT, ZDNet Blogs, Nov. 6, 2007, *at* http://blogs.zdnet.com/Ou/?p=852&page=1 (last visited July 20, 2008).

[2]   *See*, *e.g.*, AT&T Corp. Comments, WC Docket No. 07-52, at 25 (Feb. 13, 2008) ("AT&T, like many other providers, uses TCP reset packets -- openly and uncontroversially -- as part of a firewall . . . ."). As AT&T explains, "[t]he 'reset' command has been [around] for more than a quarter century" and "is commonly used to enable one computer to abort a TCP connection with another computer for any of a number of reasons, such as when the communications between the two computers become unsynchronized." *Id.*

protocols to maximize their usage of shared network resources, thereby degrading the experience of other users.

23.   Comcast's network management is undertaken by equipment typically located adjacent to the cable modem termination system ("CMTS"), which is often referred to as a data node. In some circumstances, two small CMTSes located near each other may be managed by a single device. Suggestions to the contrary that have been placed on the record are based on unsound tests and flawed assumptions about Comcast's network topology.

24.   Comcast has not found it necessary to manage traffic associated with downloads. This kind of network management provides maximum consumer benefits with minimum intrusion, which is the reason that we (and presumably many other broadband ISPs) chose this approach in preference to other approaches. Focusing on unidirectional upload traffic ensures that it will have the least intrusive impact on our customers because Comcast does not manage customers' downloads. From the perspective of the Internet user who is downloading files using P2P protocols, there will likely be no discernible effect because the P2P protocol being used by the downloader will automatically seek out other copies of the file from hundreds or thousands of other participating computers around the world, including from Comcast customers in other areas where the congestion threshold has not been reached.

25.   Even in the exceptionally rare case where a desired file is available exclusively from a single computer connected to the Internet, any disruption would normally be minimal; the network management tools will allow the Comcast customer's computer to begin an upload once the number of P2P unidirectional uploads drops below

the pre-determined threshold, which could be in fractions of a second, a few seconds, or a few minutes. Data recently collected from our network show that any delay caused by our management practices is frequently less than a minute. The data also show that even for the two most popular P2P protocols, Comcast's current network management practices manage less than 10 percent of uploads. This kind of network management does not deny consumers access to content, applications, services, or devices of their choosing. To the contrary, it helps to ensure a satisfactory Internet experience for *all* users, *including* those who use P2P protocols.

26. Network management practices do and must change over time. The guiding principles, however, will not change -- including most particularly maximizing the customer experience for all users.

**Comcast Has Engaged Interested Parties
To Address These Issues In a Collaborative Manner**

27. In March 2008, Comcast entered into an agreement with BitTorrent. As part of that agreement, Comcast announced that, by year-end 2008, we will migrate all of our systems to a protocol-agnostic network management technique to address network congestion issues. In June 2008, Comcast began trialing several protocol-agnostic techniques, and Comcast has developed a webpage on Comcast.net that provides information to consumers regarding Comcast's network management policies, including our progress in deploying a protocol-agnostic management technique.

28. In April 2008, Comcast and Pando Networks, Inc. announced plans to lead an industry-wide effort to develop a P2P Users' Bill of Rights. This latter effort is now progressing as the P2P Best Practices Initiative under the aegis of the DCIA.

29.   In May 2008, Comcast and dozens of other interested parties, including

users, P2P developers, and network engineers, participated in the IETF's P2P

Infrastructure Workshop to discuss some of the technical issues arising in the context of

P2P applications and services. This meeting has paved the way for additional sessions at

this month's IETF gathering in Dublin.

30.   In July 2008, Comcast and Vonage announced a collaborative effort to

ensure that any network management technique Comcast chooses to deploy effectively

balances the need to avoid network congestion with the need to ensure that VoIP services

like Vonage work well for consumers.

**Comcast Gives Consumers Reasonable And Useful Information
About Our Network Management Practices**

31.   Comcast fully recognizes that clear communication with our customers is

an important part of a successful long-term relationship. We properly inform our

customers that our High-Speed Internet service is subject to network management.

Experience suggests that we need to be mindful of ensuring that our disclosures are

timely and in sufficient detail to ensure transparency while not providing a roadmap to

those who would seek to defeat such management. To that end, in January 2008,

Comcast posted a revised version of our Acceptable Use Policy ("AUP") and associated

Frequently Asked Questions ("FAQs") that pertain to network management.

32.   Although Comcast's new disclosures provide enhanced transparency, we

have always advised our customers that Comcast actively manages its network to ensure

a quality experience for all of its customers. Our Terms of Service ("TOS") have long

specified that Comcast High-Speed Internet service is subject to "speed and upstream and downstream rate limitations."[3]

33.   For years, the AUP has prohibited the use of the service that "restrict[s], inhibit[s], or otherwise interfere[s] with the ability of any other person . . . to use or enjoy the [s]ervice, including . . . generating levels of traffic sufficient to impede others' ability to send or retrieve information."[4] This, of course, includes P2P protocols that have the effect of impeding others' use of their preferred applications by occupying huge amounts of bandwidth.

34.   For years, the AUP has required customers to ensure that their "use of the Service does not restrict, inhibit, interfere with, or degrade any other user's use of the Service nor represent . . . an overly large burden on the network."[5] Again, this plainly includes certain P2P protocols that have the effect of overburdening the network.

35.   Although bandwidth constraints have long been highlighted in Comcast's customer agreements and notifications, the applicable documents have not provided details of our network management practices. In the interest of addressing any credible consumer concerns regarding this issue, we revised our AUP and FAQs in January of this year to provide even greater transparency on these subjects.

36.   The marketplace response to Comcast's service continues to be very positive. Even as the debate over Comcast's network management practices has

---

[3]   Comcast Corp., *Comcast Agreement for Residential Services* §§ 4, 7, *available at* http://www6.comcast.net/terms/subscriber/ (last visited July 21, 2008). The TOS also prohibits use of the service for operation of "a server site for ftp, telnet, rlogin, e-mail hosting, 'Web-hosting' or other similar applications." *Id.* § 7.b.

[4]   Comcast Corp., *Comcast High-Speed Internet Acceptable Use Policy*, *at* http://www6.comcast.net/terms/use/ (last visited July 21, 2008).

[5]   *Id.*

proceeded before the Commission, Comcast added almost half a million new high-speed broadband customers in the first quarter of 2008, more than any other broadband provider in the United States. Those customers are using their service more and more to access the full panoply of content, applications, and services the Internet has to offer, including applications and services that utilize P2P protocols.

[Remainder of the page intentionally left blank.]

I declare under penalty of perjury that the foregoing is true and correct. Executed
on this 21st day of July, 2008.
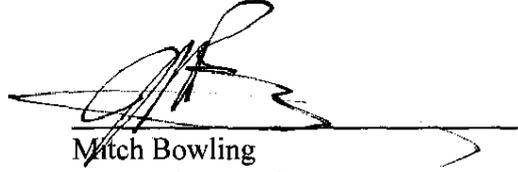
Mitch Bowling
Senior Vice President &
General Manager of Online Services and Operations
Comcast Cable Communications, LLC