

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

Formal Complaint of)
)
Free Press and Public Knowledge)
)
Against Comcast Corporation) - _____
)
For Secretly Degrading Peer-to-Peer Applications)
)
To: Ms. Marlene H. Dortch, Secretary, FCC)

Formal Complaint

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November 1, 2007

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Summary

Network neutrality advocates have argued that legislation is necessary to ensure that network operators do not use their market power to block or discriminate among application or content providers on the Internet. The Internet should remain a neutral platform where consumers can continue to access and share any application or content online. Network operators and their defenders have responded that regulation is unnecessary because, first, there have been no substantial network neutrality violations and, second, because the FCC's *ex post* enforcement can address any violations. The moment of truth has come. A network operator, Comcast, is engaging in substantial network neutrality violations. Specifically, Comcast is secretly degrading innovative protocols used for transporting and sharing large files, like high-quality television programming and movies. This complaint asks the FCC to address this violation.

Comcast, the number two provider of high-speed Internet access, has been secretly degrading peer-to-peer protocols. Degrading these protocols undermines innovation and violates the FCC's Internet Policy Statement, whose four principles guarantee consumers access to the content, applications, and services of their choice, as well as access to competition among network, applications, and content providers. The FCC has vowed to enforce those principles: if "we see evidence that providers of telecommunications for Internet access or IP-enabled services are violating these principles, we will not hesitate to take action to address that conduct."¹

Comcast's actions not only violate the FCC's Policy Statement, they also consist of deceptive practices. Comcast deceived consumers by repeatedly denying that it was degrading

¹ See Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, 20 F.C.C.R. 14853, 14904 ¶ 96 (2005).

peer-to-peer applications (though it was degrading these applications) and by degrading the applications in ways designed to be secretive, including spoofing and jamming traffic.

The FCC should act immediately to enjoin Comcast's secret discrimination and, even before deciding the merits, issue a temporary injunction requiring Comcast to stop degrading any applications. Upon deciding the merits, the Commission should issue a permanent injunction ending Comcast's discrimination. The Commission should also impose the maximum forfeitures to deter Comcast and other network providers and to ensure society is fully compensated for the harms imposed by Internet discrimination.

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Formal Complaint

Free Press and Public Knowledge file this complaint regarding Comcast’s practices of secretly degrading applications on its broadband network. Comcast, the nation’s number two provider of high-speed Internet access, is blatantly violating the FCC’s Internet Policy Statement by degrading a range of peer-to-peer applications. Comcast has also engaged in deceptive practices and continues to do so. It falsely denied degrading peer-to-peer applications and now continues to degrade applications without informing users and while advertising access to the “Internet.” The FCC should immediately enjoin this discrimination and impose forfeitures on Comcast.

I. Facts

Comcast is secretly degrading peer-to-peer protocols, threatening to undermine the Internet’s open and interconnected character, discourage broadband use, and crippling the innovation the Internet has made possible.

A. Parties

Free Press is a national, nonpartisan, nonprofit organization. Through education, organizing, and advocacy, Free Press works to increase informed public participation in crucial

media policy debates. Free Press has over 300,000 members. Free Press and its members have been involved on a wide range of media policy debates and have played a lead role on network neutrality debates, including acting as the Coordinator of the SavetheInternet.com Coalition, which advocates for network neutrality and includes hundreds of nonprofit organizations, small businesses, church affiliations, educational institutions and scholars, video gaming groups, bloggers, and other organizations.

Public Knowledge is a group of lawyers, technologists, lobbyists, academics, volunteers and activists dedicated to fortifying and defending a vibrant information commons. The group monitors Congress, federal agencies, state legislatures and international bodies for any proposed legislation or policy that relates to intellectual property or technology policy and then engages in debate on these issues.

Many of Free Press's and Public Knowledge's members subscribe to Comcast for high-speed Internet access and many use peer-to-peer applications, through Comcast or another network provider.¹

Comcast Corporation is the nation's leading provider of cable television service and the number two provider of high-speed Internet connections, serving 12.9 million high-speed Internet customers.²

B. Network Neutrality Background

In the last fifteen years, the Internet has become one of history's greatest engines for innovation, value creation, and freedom of speech. It has done so because anyone with access

¹ See attached declarations.

² Deborah Yao, Comcast 3Q Profit Tumbles, Shares Slide, Associated Press, Oct 25, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/10/25/AR2007102500599.html>; Comcast, Corporate Overview, <http://www.comcast.com/corporate/about/pressroom/corporateoverview/corporateoverview.html>.

has been able to offer applications or content to the public through the Internet without being subject to gatekeeper controls. For many years, legal scholars, technology companies, independent Internet service providers, FCC Commissioners, and millions of Americans have been concerned that facilities-based Internet service providers, such as phone and cable companies, would attempt to restrict consumers' unfettered and nondiscriminatory access to high-speed Internet service.³ One primary concern was the phone companies providing DSL would have an incentive to block applications like VOIP that competed with legacy phone offerings, and that cable companies would have an incentive to block or degrade video applications.⁴

In 2002 and 2005, the FCC rejected imposing common carriage or open access rules for cable broadband and DSL.⁵ Rather, the FCC addressed the concern that cable and phone companies would restrict users' ability to access Internet applications, services, devices, or to otherwise undermine competition with a network neutrality policy statement. The same day the FCC adopted an order rejecting common carriage for DSL, it adopted an Internet Policy Statement setting out users' rights to access all lawful Internet content and applications, as well

³ See, e.g., LAWRENCE LESSIG, *THE FUTURE OF IDEAS* (2002); Remarks of Commissioner Michael J. Copps, Freedom to Connect 2006, April 3, 2006, http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-264765A1.pdf; Remarks of Michael K. Powell, Chairman, Federal Communications at the Silicon Flatirons Symposium, *Preserving Internet Freedom: Guiding Principles For the Industry*, February 8, 2004, http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-243556A1.pdf; Ex parte Submission of Tim Wu and Lawrence Lessig to the Declaratory Ruling & Notice of Proposed Rulemaking in Inquiry Concerning High-Speed Access to the Internet, CS Dkt. No. 02-52 (Aug. 22, 2003), available at http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6514683885; Tim Wu, *Why You Should Care About Network Neutrality*, Slate.com, May 1, 2006, <http://www.slate.com/id/2140850/>.

⁴ For a discussion of network providers' incentives to engage in discrimination, Barbara van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*, 5 J. Telecom. & High Tech. Law 329 (2007).

⁵ See *NCTA v. Brand X Internet Services*, 545 U.S. 967 (2005); *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, 20 FCC Rec. 14853 (2005).

as their right to competition in multiple Internet markets.⁶ That order specified that the FCC would “not hesitate to take action to address” conduct violating the Policy Statement.⁷

Just a few months after the adoption of the FCC’s Policy Statement, facilities-based broadband service providers began declaring their intention to block, degrade, or otherwise discriminate among providers of Internet content and applications.⁸ These declarations sparked outrage among millions of Americans—including every day citizens, consumer representatives, technology developers, and Congresspersons—who organized to demand that network neutrality be preserved, by legislation or regulation.⁹ The broadband service providers, primarily phone and cable companies, and their hired spokespersons claimed network neutrality advocates were being alarmist. They claimed network neutrality as “a solution in search of a problem,”¹⁰ and legislation was unnecessary because providers would not discriminate among applications or content and because *ex post* enforcement would suffice.¹¹ Comcast’s recent practices, however, belie the notion that network neutrality is still “searching” for a problem.

⁶ Federal Communications Commission, Policy Statement, Aug. 5, 2005, p. 3, http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf.

⁷ See Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, 20 F.C.C.R. 14853, 14904 ¶ 96 (2005).

⁸ See Jonathan Krim, *Executive Wants to Charge for Web Speed*, Washington Post, Dec 1, 2005, <http://www.washingtonpost.com/wp-dyn/content/article/2005/11/30/AR2005113002109.html>; *At SBC, It's All About "Scale and Scope,"* BusinessWeek, Nov 7, 2005, http://www.businessweek.com/magazine/content/05_45/b3958092.htm; Paul Kapustka, *Verizon Says Google, Microsoft Should Pay for Internet Apps*, InformationWeek, Jan 5, 2006, <http://www.informationweek.com/news/showArticle.jhtml?articleID=175801854>.

⁹ See, e.g., Save the Internet.com, <http://www.savetheinternet.com/>; Free Press, *Bad Telecom Legislation Defeated with End of 109th Congress*, Press Release, Dec. 8, 2006, <http://www.freepress.net/press/release.php?id=188>.

¹⁰ See, e.g., John P. Ourand, *Q&A With NCTA's Dan Brenner*, CableWorld, July 11, 2005, http://findarticles.com/p/articles/mi_m0DIZ/is_2005_July_11/ai_n14818305; see also *Big Lie of the Week: No. 3*, Save the Internet.com, <http://www.savetheinternet.com/=lie3>.

¹¹ Christopher S. Yoo, *What Can Antitrust Contribute to the Network Neutrality Debate?*, U of Penn, Inst for Law & Econ Research Paper No. 07-11, available at SSRN: <http://ssrn.com/abstract=992837>

C. Comcast Blocks Innovative Applications

For many months, tech-savvy consumers and members of the tech community had accused broadband service providers of limiting peer-to-peer applications, including BitTorrent. A peer-to-peer application exploits diverse “connectivity between participants in a network and the cumulative bandwidth of network participants rather than conventional centralized resources where a relatively low number of servers provide the core value to a service or application.”¹² Peer-to-peer applications are used for sharing content files containing audio, video, data or anything in digital format, as well as realtime data, such as voice-telephone traffic. The term BitTorrent refers to both a company and a protocol. BitTorrent is an open source protocol for cheaply and quickly distributing large files. BitTorrent Inc., is a company that was later founded by the original inventor of the BitTorrent protocol, in order to offer products and services (including licensed movie downloads) using it.

In August, a weblog dedicated to news about the BitTorrent protocol reported that some users of Comcast’s broadband service “had noticed that their BitTorrent transfers were being cut off and that they experienced a significant decrease in download speeds.”¹³ Comcast “serves” customers in 39 states and the District of Columbia, including 12.9 million customers subscribing to what is advertised as high-speed Internet access; it is the number two provider of such service and the number one provider of cable television service.¹⁴ Responding to these reports, Comcast flatly denied any blocking, degrading, or “filtering” any protocols. Speaking with a reporter in August, Comcast spokesman Charlie Douglas:

¹² Peer-to-Peer, Wikipedia, <http://en.wikipedia.org/wiki/Peer-to-peer> (visited Oct. 31, 2007).

¹³ Marguerite Reardon, *Comcast Denies Monkeying with BitTorrent Traffic*, CNet News.com, August 21, 2007, http://www.news.com/8301-10784_3-9763901-7.html.

¹⁴ Deborah Yao, *Comcast 3Q Profit Tumbles, Shares Slide*, Associated Press, Oct. 25, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/10/25/AR2007102500599.html>; Comcast,

flat-out denied that the company was filtering or “shaping” any traffic on its network. He said the company doesn’t actively look at the applications or content that its customers download over the network. But Comcast does reserve the right to cut off service to customers who abuse the network by using too much bandwidth.¹⁵

The spokesperson said, however, that Comcast would cut off a customer’s service (or merely “raise its eyebrows”) if the customer sends “roughly 250,000 photos” or downloads “more than 30,000 songs a month.” Nonetheless, he “firmly reiterated that the company doesn’t filter or throttle back traffic.” As the reporter noted, the issue of filtering traffic is a “hot one and goes right to the heart of the Net Neutrality debate, which has been raging for more than a year.”¹⁶ Comcast’s denials suggested that any problems with applications using the BitTorrent protocol were the fault of the BitTorrent protocol or its clients.¹⁷ In September, Comcast repeated these denials to the Electronic Frontier Foundation, a nonprofit that educates the public about and litigates over issues regarding free speech, privacy, innovation, and consumer rights online. Comcast “assured” the EFF that Comcast “isn’t deliberately blocking, degrading, interfering with, or discriminating against particular protocols or kinds of traffic ... [and] that it isn’t using network management techniques that are designed to disrupt anyone’s use of BitTorrent (or any other application).”¹⁸

On October 19, 2007, however, the Associated Press reported that Comcast was in fact degrading several peer-to-peer applications, including BitTorrent. The Associated Press’s own studies, and those of the Electronic Frontier Foundation, uncovered that Comcast has been

Corporate Overview,

<http://www.comcast.com/corporate/about/pressroom/corporateoverview/corporateoverview.html>.

¹⁵ Marguerite Reardon, *Comcast denies monkeying with BitTorrent traffic*, August 21, 2007, http://www.news.com/8301-10784_3-9763901-7.html.

¹⁶ *Id.*

¹⁷ *Id.*

degrading and blocking peer-to-peer applications, including those using the BitTorrent protocol.¹⁹ Subsequent studies provided evidence that Comcast is also degrading Gnutella and even Lotus Notes, a suite of software that many businesses use to share email, calendars and file sharing.²⁰ Unconfirmed reports suggest that other protocols, including the widely used FTP protocol, may also have been affected.²¹ The AP's tests showed that Comcast was jamming peer-to-peer traffic in a way that made it inconvenient—and extremely slow—for users:

In one case, a BitTorrent file transfer was squelched, apparently by messages generated by Comcast, only to start 10 minutes later. Other tests were called off after around 5 minutes, while the transfers were still stifled.²²

Comcast actions affect *all* Internet users—whether or not a user is a Comcast customer.

Comcast has only been reported to jam connections when they are initially made *to* a Comcast customer. The consequences of this kind of jamming depend on the protocol in question. In the case of BitTorrent, the primary harm is to prevent Comcast subscribers from publishing or republishing material using BitTorrent. In the case of Gnutella, Comcast's degradation reduces or even prevents a user's ability to find other Gnutella users and either upload or download material over the network.

¹⁸ Seth Schoen, *Comcast and BitTorrent*, Electronic Frontier Foundation Blog, September 13, 2007, <http://www.eff.org/deeplinks/2007/09/comcast-and-bittorrent>.

¹⁹ Peter Svensson, *Comcast Blocks Some Internet Traffic*, Associated Press, Oct. 19, 2007, http://ap.google.com/article/ALeqM5gxRiQSVfgK4sLbVRE_X4MO1M9q0AD8SCASPG0; Seth Schoen, *EFF tests agree with AP: Comcast is forging packets to interfere with user traffic*, Electronic Freedom Foundation Blog, Oct. 19, 2007, <http://www.eff.org/deeplinks/2007/10/eff-tests-agree-ap-comcast-forging-packets-to-interfere>.

²⁰ Eckersley, *Comcast is also Jamming Gnutella (and Lotus Notes?)*; Kevin Karnarski, *Comcast filtering Lotus Notes (Update)*, Kevin Karnarski Blog, Oct. 22, 2007, <http://kkanarski.blogspot.com/2007/09/comcast-filtering-lotus-notes-update.html>.

²¹ Peter Eckersley, *Comcast is also Jamming Gnutella (and Lotus Notes?)*, Electronic Freedom Foundation Blog, Oct 20, 2007, <http://www.eff.org/deeplinks/2007/10/comcast-also-jamming-gnutella-and-lotus-notes>; Stephen Wellman, *Comcast Is Blocking More Than BitTorrent, Including Lotus Notes*, Information Week, Oct. 22, 2007, http://www.informationweek.com/blog/main/archives/2007/10/comcast_is_bloc.html.

²² Peter Svensson, *Comcast Admits Delaying Some Traffic*, Associated Press, Oct 23, 2007, http://hosted.ap.org/dynamic/stories/C/COMCAST_DATA_DISCRIMINATION.

Caught red-handed after Comcast had “repeatedly denied blocking any Internet application, including ‘peer-to-peer’ file-sharing programs like BitTorrent,” the senior vice president of Comcast Online Services added a “nuance,” claiming it only “delayed” traffic. The vice president said, “we use several network management technologies that, when necessary, enable us to delay - not block - some peer-to-peer traffic. However, the peer-to-peer transaction will *eventually* be completed as requested.”²³ EFF’s staff technologist responded that, “[c]haracterizing that as delaying traffic I think is a stretch. What they are doing is spoofing traffic or jamming traffic.”²⁴ He wrote, further, that, if Comcast was honest and delaying traffic was “Comcast’s private intent, they were clearly making absurd and frequently incorrect assumptions about the protocols they were jamming.”²⁵ Comcast’s actions fit no reasonable definition of delaying:

[C]onsider the following analogy:

... Alice telephones Bob, and hears someone answer the phone in Bob’s voice. They say “I’m sorry Alice, I don’t want to talk to you”, and hang up. Except, it wasn’t actually Bob who answered the phone, it was Comcast using a special device to impersonate Bob’s voice. Comcast might describe this as ‘delaying’ Alice and Bob’s conversation, on the theory that perhaps they’ll keep calling each other until some day when Comcast isn’t using their special device. They may also invoke the theory that Alice will call other people who are a lot like Bob, but aren’t on Comcast’s network, so her conversation will only be delayed.²⁶

²³ *Id.* (emphasis added).

²⁴ *Id.*

²⁵ Peter Eckersley, *Comcast Needs to Come Clean*, Electronic Frontier Foundation Blog, October 25, 2007, <http://www.eff.org/deeplinks/2007/10/comcast-needs-come-clean>.

²⁶ *Id.*

Therefore, Comcast's actions do not merely deliberately delay peer-to-peer traffic. Its tactics are precisely those used by Internet censorship systems in China.²⁷ At any rate, even Comcast does not deny that its methods deliberately discriminate against peer-to-peer traffic.

Comcast also maintained a right not only to degrade applications, but to do so secretly.

D. Comcast's Methods are Deliberately Secretive

Comcast's method of "spoofing" and "jamming" applications is calculated and deliberately hidden from users. First, as the AP explained, "Comcast's computers masqueraded as those of its users to interrupt file-sharing connections."²⁸ Usually, when a user downloads information, the user's computer sends a request packet to the information source (here, an uploader); the information source responds by also sending packets. Analyses by the Associated Press, EFF, and bloggers demonstrate that, on Comcast's network, for some peer-to-peer traffic, the network operator sends an exact replica of the request packet back to *both* parties, the downloader and the uploader. This replica includes a "reset" command, which drops the entire connection between the computer users. In short, "[e]ach PC gets a message invisible to the user that looks like it comes from the other computer, telling it to stop communicating. But neither message originated from the other computer—it comes from Comcast."²⁹

According to the Associated Press, whose researchers attempted to download the King James Bible through BitTorrent, the download "failure was due to 'reset' packets that the two computers received, carrying the return address of the other computer."³⁰ The AP, like the EFF,

²⁷ See Seth Schoen, *EFF tests agree with AP: Comcast is forging packets to interfere with user traffic*, Electronic Freedom Foundation Blog, Oct. 19, 2007, <http://www.eff.org/deeplinks/2007/10/eff-tests-agree-ap-comcast-forging-packets-to-interfere>.

²⁸ Peter Svensson, *Comcast Blocks Some Internet Traffic*, Associated Press, Oct. 19, 2007.

²⁹ *Id.*

³⁰ These reset packets "tell the receiving computer to stop communicating" but the AP's "traffic analyzer software running on each computer showed that neither computer actually sent the packets." Quite simply, these packets

compared it to a telephone “operator breaking into the conversation, telling each talker in the voice of the other: ‘Sorry, I have to hang up. Good bye.’”³¹ As the EFF researcher explained, “[f]orged reset packets are normally the kind of thing that would only be present if a hacker was attacking your computer, but in this case, it’s the ISP you pay money to each month that is sending them.”³²

Second, to make its tactics even less transparent, Comcast only degrades applications when a Comcast user uploads content, rather than when the Comcast user downloads content. Indeed, a company selling the technology that performs these exact functions, called Sandvine,³³ touts this feature as a major selling point. Although Comcast has neither confirmed nor denied whether it uses Sandvine’s product to implement these tactics,³⁴ the business press has reported that Comcast is a Sandvine customer.³⁵

Neither Sandvine nor Comcast can deny that their low-level TCP RST forgery tactics are hidden from users. Indeed, Sandvine advertises one benefit of its product to be its secrecy,

“originated somewhere in between,” that is, by Comcast, “with faked return addresses.” Peter Svenson, *AP tests Comcast’s file-sharing filter*, Associated Press, Oct. 19, 2007,

http://news.yahoo.com/s/ap/20071019/ap_on_hi_te/comcast_data_discrimination_tests.

³¹ Peter Svenson, *Comcast Admits Delaying Some Traffic*, Associated Press, Oct 23, 2007.

³² Peter Eckersley, *Comcast is also Jamming Gnutella (and Lotus Notes?)*; Stephen Wellman, *Comcast Is Blocking More Than BitTorrent, Including Lotus Notes*, Information Week, Oct. 22, 2007, http://www.informationweek.com/blog/main/archives/2007/10/comcast_is_bloc.html.

³³ See Sandvine Inc., *Peer-to-Peer Element – Optimizing P2P Traffic in your Network*, http://www.sandvine.com/products/p2p_element.asp; Sandvine Inc., *Meeting the Challenge of Today’s Evasive P2P Traffic*, Industry White Paper, September 2004, <http://www.sandvine.com/general/getfile.asp?FILEID=16>; Sandvine Inc., *Session Management: BitTorrent Protocol – Managing the Impact on Subscriber Experience*, December 2004, <http://www.sandvine.com/general/getfile.asp?FILEID=21>.

³⁴ “Comcast spokesman Charlie Douglas would not confirm that the company uses Sandvine equipment. ‘We rarely disclose our vendors or our processes for operating our network for competitive reasons and to protect against network abuse.’” Peter Svenson, *AP tests Comcast’s file-sharing filter*, Associated Press, Oct. 19, 2007, http://news.yahoo.com/s/ap/20071019/ap_on_hi_te/comcast_data_discrimination_tests.

³⁵ “Sandvine already counts top U.S. cable provider Comcast Corp among its customers, Barron’s said.” *Easing network debate may aid Allot/Sandvine-paper*, Reuters, April 8, 2007, <http://www.reuters.com/article/companyNewsAndPR/idUSN0826692320070408>. Also see, Bill Alpert, *Here’s How the Drama Over ‘Net Neutrality Ends*, Technology Trader, Barron’s Online, April 9, 2007,

touting that, “subscribers have no indication of what is happening.”³⁶ Comcast similarly admits that its consumers have no indication of what is happening. Comcast’s own spokesperson:

compared it to making a phone call and getting a busy signal, then trying again and getting through. In cases where peer to peer file transfers are interrupted, the software automatically tries again, so the user may not even know Comcast is interfering.³⁷

While it may be true that *some* software automatically tries again, there is no guarantee that this is true of the many dozens of programs that communicate using protocols that are affected by Comcast's packet forgery.³⁸ Even in cases where software does automatically retry its connection attempts, and assuming that Comcast does actually cease jamming connections after a certain period, there is no guarantee that the human subscriber will have waited that long.

The full extent and methods of Comcast’s discrimination remain unknown because, , Comcast has repeatedly lied or failed to come clean on its actions.³⁹ One representative for the tech industry commented, “What applications work, what don’t, and at what speeds? Only Comcast really knows.”⁴⁰ This representative, however, is probably being optimistic, as Comcast likely does *not* know. While only Comcast knows the algorithm they use to decide when to forge RST packets, it is unlikely that they ever tested the plethora of applications that are potentially broken by that algorithm.

http://online.barrons.com/public/article/SB117580779221361422-Cca3FuJ1x90hZC2ZmNbXdHPB6bc_20070513.html.

³⁶ Sandvine Inc., *Meeting the Challenge of Today’s Evasive P2P Traffic*, Industry White Paper, September 2004, p. 14, <http://www.sandvine.com/general/getfile.asp?FILEID=16>.

³⁷ Brad Stone, *Comcast: We’re Delaying, Not Blocking, BitTorrent Traffic*, New York Times Blog: Bits, Oct. 22, 2007, <http://bits.blogs.nytimes.com/2007/10/22/comcast-were-delaying-not-blocking-bittorrent-traffic/>.

³⁸ According to Wikipedia, there are over 50 programs that implement the BitTorrent protocol alone; http://en.wikipedia.org/wiki/BitTorrent_client.

³⁹ Cade Metz, *Comcast throttles BitTorrent users*, The Register, Aug 22, 2007, http://www.theregister.co.uk/2007/08/22/comcast_throttles_bittorrent_users/.

⁴⁰ Peter Svensson, *Comcast Admits Delaying Some Traffic*, Associated Press, Oct 23, 2007, http://hosted.ap.org/dynamic/stories/C/COMCAST_DATA_DISCRIMINATION.

II. Legal Argument

Comcast is violating the FCC's Internet Policy Statement by degrading applications and is deceiving consumers about its practices.⁴¹ The FCC should impose an immediate injunction and the maximum forfeitures.

A. Degrading Applications Violates the Commission's Internet Policy Statement, Which the FCC Has Vowed to Enforce

Comcast is violating the FCC's Internet Policy Statement. In this Policy Statement, the FCC adopted four principles to "preserve and promote the open and interconnected nature of the public Internet" and "to encourage broadband deployment."⁴² In the FCC Order classifying wireline broadband service, adopted the same day as the Policy Statement, the FCC explained that it would not hesitate to enforce these principles:

While we agree that actively interfering with consumer access to any lawful Internet information, products, or services would be inconsistent with the statutory goals of encouraging broadband deployment and preserving and promoting the open and interconnected nature of the public Internet, we do not find sufficient evidence in the record before us that such interference by facilities-based wireline broadband Internet access service providers or others is currently occurring. Nonetheless, we articulate principles recognizing the importance of consumer choice and competition in regard to accessing and using the Internet: the Internet Policy Statement that we adopt today adopts such principles. We intend to incorporate these principles into our ongoing policymaking activities. *Should we see evidence that providers of telecommunications for Internet access or IP-enabled services are violating these principles, we will not hesitate to take action to address that conduct.*⁴³

⁴¹ Federal Communications Commission, Policy Statement, Aug. 5, 2005, http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf.

⁴² *Id.* at 3.

⁴³ See Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, 20 F.C.C.R. 14853, 14904 ¶ 96 (2005).

Since then, during the past two years' Congressional, FCC, and public debates over network neutrality, the FCC's Chairman, an opponent of new network neutrality legislation, has repeatedly reaffirmed that the FCC will enforce the Policy Statement. For example, Chairman Martin testified to the Senate Committee with jurisdiction over the FCC, the Committee on Commerce, Science & Transportation on February 1, 2007, telling the Committee:

Recently, concerns about preserving consumers' access to the content of their choice on the Internet have been voiced at the Commission and Congress. In its Internet Policy Statement, the Commission stated clearly that access to Internet content is critical and the blocking or restricting consumers' access to the content of their choice would not be tolerated. Although we are not aware of current blocking situations, the Commission remains vigilant and stands ready to step in to protect consumers' access to content on the Internet.⁴⁴

Two months later, the Chairman reiterated this commitment in an interview with Broadcasting & Cable.⁴⁵ A frequently-cited argument against network neutrality legislation, in fact, is that the FCC can and will enforce network its Policy Statement.

Comcast is harming consumers, including Free Press and Public Knowledge members, by violating three of the Policy Statement's four principles. First, consumers are "entitled to run applications and use services of their choice, subject to the needs of law enforcement." Second, consumers are "entitled to access the lawful Internet content of their choice." Third, consumers "entitled to competition among network providers, application and service providers, and content providers." Comcast violates all three principles by blocking consumers' access to applications, content, and competition.

⁴⁴ Statement of Federal Communications Commission Chairman Kevin J. Martin before the Committee on Commerce, Science & Transportation, Feb 1, 2007, http://commerce.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=1809&Witness_ID=1951.

⁴⁵ John Eggerton, *FCC's Kevin Martin on the Hot Seat*, Broadcasting & Cable, April 9, 2007, <http://www.broadcastingcable.com/article/CA6431598.html>

1. Violation 1: Consumers are Entitled to Run Applications and Use Services of Their Choice

Comcast undermines users' ability to run applications and use services of their choice. Degrading applications that consumers want to use blocks consumers' ability to "run applications" of their choice. Consumers cannot properly run BitTorrent, Lotus Notes, FTP, and Gnutella because of Comcast's actions.⁴⁶ Comcast would be wrong to claim that consumers can still "run" the application, only with delays and resets.⁴⁷ First, the delays and resets are not part of the "application" that the user seeks to run. Indeed, the user does not (and would not) choose these delays and rests. Second, if intentionally "delaying"⁴⁸ an application conformed to the Policy Statement, the Policy Statement would mean nothing. Comcast could "delay" applications until the year 2009, or 3009, without violating this principle of the Policy Statement, even though consumers would turn off their computer (or die) before "running" the application.

Comcast is harming consumers by undermining several valuable applications and services that consumers would choose to use. The FTP protocol is one of the Internet's oldest protocols for sharing information. Lotus Notes provides telecommuters and businesses with email, calendar, and file-sharing services. BitTorrent also provides enormous, and increasing, consumer benefits.

BitTorrent. BitTorrent is a content-neutral mechanism for downloading files efficiently. It has attracted some media attention on account of the fact that some people use BitTorrent for illegal purposes (such as those violating copyright), but the same observation would be true of

⁴⁶ The FCC's specified an exception to this principle, "for the needs of law enforcement," do not apply here, and Comcast has not claimed that the law-enforcement exception applies.

⁴⁷ Cf. Peter Svensson, *Comcast Admits Delaying Some Traffic*, Associated Press, Oct 23, 2007, http://hosted.ap.org/dynamic/stories/C/COMCAST_DATA_DISCRIMINATION.

⁴⁸ Again, Comcast's actions do not consist of mere "delay."

the World Wide Web. Consumers use BitTorrent for a wide range of valuable and legal uses.⁴⁹ Hollywood studios – perhaps the most avowed skeptics of P2P technology – have begun licensing their movies for download using BitTorrent.⁵⁰ BitTorrent has so many legal uses because BitTorrent benefits content consumers with quick downloads of large files and benefits content providers with cheap distribution. It is emerging as the future of online video, including television- and HD-quality video,⁵¹ and the distribution of high quality music.⁵² BitTorrent is used to transmit such content in downloads, streamed media, or podcasts.⁵³ Recent articles in the Wall Street Journal⁵⁴ and Forbes⁵⁵ have highlighted this newfound success of BitTorrent in the video realm and Wall Street has taken an interest.⁵⁶

BitTorrent enables content consumers to quickly download large files. Cable and phone companies provide “high-speed” Internet service that permits users to download content at far higher speeds than users can upload content. So, ordinarily, when one user downloads information from another user, as with peer-to-peer applications, the download cannot go faster than the uploader’s slower upload speed. For example, though the downloader might be able to receive content at 6 Mbps, the upload is providing the content at 200 Kbps. BitTorrent, however,

⁴⁹ The Gnutella protocol is similarly used for legal activity, as well as, by some people, for activity that may infringe copyright.

⁵⁰ See <http://www.bittorrent.com/about/partners>.

⁵¹ See, e.g.,: *Now Playing*, BitTorrent, <http://www.bittorrent.com/nowplaying>; *Featured Customers*, Bright Cove, <http://www.brightcove.com/customers/index.cfm>; Vuze, *About Azureus*, <http://www.vuze.com/About.html>.

⁵² See, e.g., *SubPopRecords*, BitTorrent, <http://www.bittorrent.com/users/subpoprecords>.

⁵³ For streaming, see *Streaming Delivery Services*, BitTorrent DNA, <http://www.bittorrent.com/dna/streamingservices.html>. For podcasting BitTorrent clients, see *Overview*, Juice, <http://juicereceiver.sourceforge.net/overview/index.php>; *Broadcast Machine*, Miro, <http://www.getmiro.com/create/broadcast/>.

⁵⁴ Peter Grant, *Companies Try New Ways to Boost Web Video Quality*, Wall St. J., Oct 9, 2007, <http://online.wsj.com/article/SB119189097794952908.html>.

⁵⁵ Andy Greenberg, *Brightcove Unleashes A BitTorrent Stream*, Forbes, Oct 9, 2007, http://www.forbes.com/home/technology/2007/10/08/brightcove-fox-paramount-tech-cx_ag_1009bittorrent.html.

⁵⁶ Paul R. La Monica, *Is BitTorrent the NextBbig IPO?*, CNNMoney.com, March 28, 2007, <http://money.cnn.com/2007/03/28/commentary/mediabiz/index.htm>.

enables the downloader to download pieces of a larger file from many different users simultaneously.⁵⁷ This process permits several users to max out their slow upload speeds in providing pieces of a file, and at the same time permit the downloader to use its full download speed in downloading from several uploaders.⁵⁸ Once a user begins downloading, that user also becomes a distributor of the content.

For content-providers, the BitTorrent protocol is an inexpensive way to distribute content. The standard, more costly, method of distributing content is to rely on central servers, which distribute content to each user. In the central-server model, all the strain of the download process is placed on a single source. The content creator must bear the entire costs of hardware, hosting and bandwidth to host the content. For example, if an individual creates an hour-long movie and is seeking to distribute it to anyone willing to watch it, they would need to pay a hosting company to store the movie, and then pay for the upload bandwidth so that others can download the movie. BitTorrent creates efficiencies that allow the content provider to pay

⁵⁷ See Rys Boyd-Farrell, Comment, *Legal Analysis Of The Implications Of MGM v. Grokster For Bittorrent*, 11 Intell. Prop. L. Bull. 77, 78-79 (2006): “[T]he program is not used to search for files to download because the program requires the use of a separate file, referred to as a ‘tracker,’ in order to locate the desired file to download. A tracker is an extremely small file that contains the addresses of servers that indicate people, called ‘seeders,’ who have pieces of the file or the complete file available for download. A tracker serves simply as a signpost, directing people through the Internet to computers that are offering the file, and contains nothing of the actual file within it. In order to get a tracker, people usually go to ‘torrent websites,’ which are websites whose primary purpose is to enable users to upload and download trackers. Torrent websites are where seeders have uploaded trackers for files they wish to offer for downloading. A person can try to find a tracker for a specific file or browse all of the trackers available. These websites are not affiliated with the official BitTorrent website created by Cohen or with one another.”

⁵⁸ See *id.* at 78: “Typical plans from internet service providers (‘ISP’) strictly limit the speed at which files can be uploaded. The consequence of the ISP limitations is that an internet user may be capable of downloading at a very fast speed but is not able to utilize that full potential because he is downloading from a single person with a limited upload speed. BitTorrent helps eliminate this problem by breaking the file into a multitude of small pieces that can be downloaded separately from many different people at the same time. ... The limited upload speeds of multiple people are aggregated in order to utilize the full potential of an individual's download speed. This impediment on customers becoming content creators is also limited by the use of dynamic IP addresses. Both these issues are discussed in the comments of Consumers Union, Consumer Federation of America and Free Press. In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, GN Docket No. 07-45, May 16, 2006.

significantly less. His downloaders also become his distributors, as consumers can download from other consumers. Indeed, the more popular the movie becomes, the more users will possess it to make it available, and so the faster it will download to new users.

Legal Video Programming. Content providers rely heavily on BitTorrent for distributing video such as movies and shows. Of course, because BitTorrent helps content-providers distribute movies and shows, these applications may compete with Comcast's traditional cable television offerings. First, one service called Vuze uses BitTorrent to distribute high-quality and high-definition video content.⁵⁹ Vuze has garnered 10 million users⁶⁰ and inked agreements with several content-providers, including Showtime, BBC, A&E, the History Channel, the Biography Channel, National Geographic, and Starz.⁶¹ In fact, G4 TV, which is owned by Comcast itself, also has an agreement with Vuze.⁶²

Second, while BitTorrent is a widely licensed protocol, the protocol's developer has a company named BitTorrent, which has forged agreements to distribute video with 20th Century Fox, G4 TV, Lionsgate, Palm Pictures, Paramount, Starz Media, MTV Networks (including Comedy Central, MTV, MTV2, Nickelodeon, Nicktoons Network, SpikeTV, The N, TV Land and VH1),⁶³ and the CW.⁶⁴

⁵⁹ See Cyril Roger, *High Definition Movies and Downloads to Your PC*, Softonic, <http://azureus-zudeo.en.softonic.com/>.

⁶⁰ *Vuze Passes an Installed Base Milestone of 10 Million Viewers and Opens Its Internet Publishing Platform to Networks, Studios, and Content Creators*, Business Wire, Oct 9, 2007, http://money.aol.com/news/articles/_a/vuzetm-passes-an-installed-base/n20071009002209990022.

⁶¹ See *About Azureus*, Vuze, <http://www.vuze.com/About.html>

⁶² *Id.* See also G4, *About-Ownership*, <http://www.g4tv.com/g4/about/ownership/index.html>

⁶³ BitTorrent, *BitTorrent Strikes Digital Download Deals*, Press Release, Nov. 29, 2006, <http://www.bittorrent.com/about/press/bittorrent-strikes-digital-download-deals-with-20th-century-fox-g4-kadokawa-lionsgate-mtv-networks-palm-pictures-paramount-and-starz-media>.

⁶⁴ Ben Fritz, *WB Sails with Tech Pirate: Warner Bros. Partners with Bit-Torrent*, Daily Variety, May, 2006, http://findarticles.com/p/articles/mi_hb5143/is_200605/ai_n18585829; BitTorrent, *The CW*, <http://www.bittorrent.com/users/the-cw>.

Third, an innovative new company named Brightcove offers streaming of broadcast-quality content through the BitTorrent protocol. Brightcove is the first client of BitTorrent DNA, a new service that allows for the utilization of the BitTorrent protocol when streaming audio or video.⁶⁵ Brightcove's customers include CBS Corporation, BET, the Discovery Channel, General Motors, MTV Networks, New York Times, Time, Reuters, the Washington Post, Sky, Warner Music Group, and Sony BMG Music Entertainment, and About.com.⁶⁶

Beyond these services, BitTorrent is used to distribute Internet-only content. Peter Jackson's *King Kong* website used BitTorrent to distribute development movies they released semi-weekly in creating that film.⁶⁷

Legal Music. BitTorrent is widely used to download music legally.⁶⁸ For example, users can download from bands such as Iron & Wine and The Postal Service from Sub Pop Records⁶⁹ or from the band Ween from Brown Tracker.⁷⁰

Legal Software Distribution and Development. Developers use BitTorrent to distribute diverse software applications. Many open source applications are distributed through BitTorrent, including Linux Operating systems and patches,⁷¹ Open Office, NetBSD, Fedora, Mandriva, Ubuntu, CentOS,⁷² and Sun Microsystems' Open Solaris. Similarly, gaming software relies on BitTorrent for distribution, including for games such as Valve Software's Steam,⁷³ World of

⁶⁵ See *BitTorrent's Delivery Network Accelerator (DNA) Service Improves the Online Experience for Streaming Video, Downloadable Software and Video Games*, Press Release, Oct. 9, 2007, <http://www.streamingmedia.com/press/view.asp?id=7645>.

⁶⁶ See *Featured Customers*, Bright Cover, <http://www.brightcove.com/customers/index.cfm>.

⁶⁷ See *Production Diary*, Kong is King, <http://www.kongisking.net/torrents/>.

⁶⁸ See *How to Download Free, Legal, High Quality Music*, Of Zen and Computing, <http://www.ofzenandcomputing.com/zanswers/420>.

⁶⁹ See *SubPopRecords*, BitTorrent, <http://www.bittorrent.com/users/subpoprecords>.

⁷⁰ *Recent News*, Brown Tracker, <http://browntracker.net/>.

⁷¹ *Linux BitTorrents*, Linux Tracker, <http://linuxtracker.org>; *Get openSUSE Distribution*, openSUSE, <http://software.opensuse.org/>.

⁷² See *OpenOffice.org P2P Downloads*, OpenOffice, <http://distribution.openoffice.org/p2p/index.html>.

⁷³ See *Peer-to-Peer Files Released*, The Steam Review, Aug. 19, 2007, <http://steamreview.org/posts/p2pfiles/>.

Warcraft and its updates (which has over 2 million North American subscribers and 9 million worldwide),⁷⁴ and Gunz: The Duel.⁷⁵

Software developers also use BitTorrent. For example, Amazon.com offers Simple Storage Service, which provides unlimited data storage for software developers ranging from Microsoft to SmugMug. This Service employs BitTorrent “to lower costs for high-scale distribution.”⁷⁶

Where a network provider blocks access to the BitTorrent protocol, it cripples these highly valuable, and lawful, applications. The FCC should declare that the Policy Statement forbids providers from doing so.

2. Violation 2: Consumers are Entitled to Access the Lawful Internet Content of their Choice

Comcast is prohibiting Internet users from accessing “the lawful Internet content of their choice.” Simply, if a user seeks to access certain content—such as a film available on a BitTorrent client—Comcast impedes the user accessing that content.

Comcast could try to claim, incorrectly, that it is permitting users to “access” content because it blocks peer-to-peer uploads not downloads. And uploads, the argument would go, are not means of “accessing” content; they are means of sharing content. But this argument fails. If a network provider blocks uploads, others cannot access the content. On BitTorrent and other peer-to-peer applications, for example, when one user is uploading content, another user is attempting to download (or “access”) the content. Taken to the extreme, if the only users who have a certain file are Comcast customers, and those customers make the files available on the

⁷⁴ See *World Of Warcraft Surpasses 8 Million Subscribers Worldwide*, Press Release, Jan. 11, 2007, <http://www.blizzard.com/press/070111.shtml>; *World Of Warcraft Surpasses 9 Million Subscribers Worldwide*, Press Release, July 24, 2007, <http://www.blizzard.com/press/070724.shtml>.

⁷⁵ See *Download GunZ: The Duel*, GunzFactor, <http://www.gunzfactor.com/downloadgunz.php>.

Internet through BitTorrent, downloaders would be unable to access that file because Comcast would block the uploads.⁷⁷ This situation is more likely for users' original content, so blocking uploads burdens original content more than (perhaps "pirated") Hollywood movies. Blocking uploads also burdens the uploader's access to content; for example, BitTorrent users who upload less content—such as those whose connections terminate when they begin to upload—may be cut off by BitTorrent clients for not sharing.

⁷⁶ See Amazon Simple Storage Service, <http://www.amazon.com/gp/browse.html?node=16427261>.

⁷⁷ There is apparently a narrow exception: if the downloader resides in the same local network community as one of the uploaders, the transaction may go through.

3. Violation 3: Consumers are Entitled to Competition among Network Providers, Application and Service Providers, and Content Providers

Comcast's practices are undermining consumers' right to competition among application and service providers, among content providers, and among network providers.

First, Comcast is undermining competition among application and service providers. Historically, the Internet permitted all service and content providers the ability to compete without seeking a permission slip from Comcast, Verizon, AT&T, or any other network provider.⁷⁸ Degrading certain applications undermines competition in applications. A network provider need not block competing applications to undermine the applications' ability to compete. All a provider needs to do is render those applications sufficiently unreliable that people stop trying to use them.⁷⁹ Users will be frustrated by the delays and terminations and use other applications. As a result, the network provider would be hand-selecting which service and applications providers can provide their services and applications, and which providers are sabotaged and unable to compete.

Second, Comcast deprives users of competition among content-providers. Degrading applications thwarts competition among Internet content. Peer-to-peer protocols benefit distributors of large files. If these protocols are burdened, content-providers that use server-client distribution and provide brief, low-quality clips (like YouTube), will receive a skewed competitive advantage unrelated to consumer preferences. Comcast is also undermining competition between Internet services and non-Internet services, such as Internet video and cable television. A network provider has the incentive to stifle competition with its own services.

⁷⁸ LAWRENCE LESSIG, THE FUTURE OF IDEAS (2002).

Comcast, the number one provider of cable television service, has an anticompetitive incentive to discriminate against Bright Cove and other BitTorrent clients providing high-quality video programming. Some consumers would prefer Bright Cove, if it worked, to Comcast's television offering, but Comcast is undermining this cross-platform competition.

Third, Comcast's discrimination undermines competition among network providers. Clandestine discrimination makes competition—to the extent it exists—less effective, as costumers who do not notice that applications are being delayed or blocked do not have enough information to consider switching to a competing provider that does not delay or block the application in question.⁸⁰

B. Secretly Degrading Applications Constitutes a Deceptive Practice

Comcast has engaged in and continues to engage in deceptive practices by secretly degrade particular applications. The Commission has ancillary jurisdiction under Title I of the Communications Act “to impose additional regulations to protect consumers from fraudulent and deceptive practices associated with the provision of interstate information services.”⁸¹

As an initial matter, Comcast deliberately misled the public about its own service offering by repeatedly denying that it was interfering with BitTorrent when it was, in fact, interfering with BitTorrent. Amid online rumors and reports, Comcast lied to both the press and the EFF,

⁷⁹ For a more detailed discussion, Harold Feld, *Look! My Solution Found A Problem! Comcast Degrades BitTorrent Traffic Without Telling Users*, WetMachine, Oct. 27, 2007, <http://www.wetmachine.com/item/912> (discussing Microsoft's tactics).

⁸⁰ Barbara van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*, 5 J. Telecom. & High Tech. Law 329, 376-377 (2007).

⁸¹ Policies and Rules Implementing the Telephone Disclosure and Dispute Resolution Act, 9 FCC Rcd. 6891, ¶16 (1994) (citing *Computer and Communications Industry Ass'n v. FCC*, 693 F.2d 198 (D.C.Cir.1982)).

claiming it did not interfere with peer-to-peer traffic.⁸² Lying to the public about consumer allegations is inherently deceptive.

Beyond Comcast's public lies, secretly degrading particular applications constitutes a deceptive practice in several ways. First, network providers, like Comcast, advertises access to the "Internet."⁸³ The Internet includes access to peer-to-peer file-sharing applications. The Commission should declare that companies cannot offer "Internet" service if they block or degrade applications. Second, network providers advertise Internet connections available for downloading and sharing large media files. Indeed, Comcast's spokesperson recently stated that "[m]ore than 99.99 percent of our customers use the residential high-speed Internet service as intended, *which includes downloading and sharing video, photos and other rich media.*"⁸⁴ Here, of course, Comcast never told anyone that it was deliberately degrading peer-to-peer applications—not its consumers, the press, or the FCC—and issued repeated denials.

Third, degrading applications misleads the public about the value and service of the degraded applications. For example, by denying its role in delaying and terminating peer-to-peer transactions, Comcast was suggesting that the peer-to-peer applications, not Comcast, were to blame for the applications' faults.

Fourth, Comcast is being deceptive by forging messages from users' computers. Forging messages that users did not send is deceptive to the recipient and the "sender."

⁸² Marguerite Reardon, *Comcast denies monkeying with BitTorrent traffic*, August 21, 2007, http://www.news.com/8301-10784_3-9763901-7.html. Seth Schoen, *Comcast and BitTorrent*, Electronic Frontier Foundation Blog, September 13, 2007, <http://www.eff.org/deeplinks/2007/09/comcast-and-bittorrent>.

⁸³ See Comcast, <http://www.comcast.com>.

⁸⁴ Marguerite Reardon, *Comcast denies monkeying with BitTorrent traffic*, August 21, 2007, http://www.news.com/8301-10784_3-9763901-7.html (emphasis added).

Finally, secretly degrading applications undermines consumers' faith in Internet products. Consumers will have no idea who or what the network provider is secretly degrading, and therefore not know what product the consumers are paying for.

III. Remedy

Before ruling on the merits, the FCC should issue an immediate preliminary injunction. When ruling on the merits, the FCC should impose a permanent injunction and the maximum forfeitures.

1. The FCC Should Immediately Issue a Preliminary Injunction

A preliminary injunction should issue right now. This injunction should forbid Comcast from degrading any applications until this Complaint has been resolved.⁸⁵ Preliminary injunctions are granted where (1) there is a substantial likelihood that the moving party will prevail on the merits; (2) the moving party will suffer irreparable injury if the injunction is not granted; (3) the threatened injury to the moving party outweighs the threatened harm the proposed injunction may cause the opposing party; and (4) the injunction, if issued, would not be adverse to the public interest.⁸⁶

Substantial Likelihood of Success for Free Press. There is a substantial likelihood that Free Press will win on the merits. The FCC's Internet Policy Statement is designed to forbid conduct such as discrimination against particular applications. The FCC has stated it will step in

⁸⁵ At the least, the FCC should require Comcast to disclose the algorithm it uses to determine when to degrade applications and advertise that it is degrading applications. This disclosure would enable the technical community to review the algorithms, explain when it breaks protocols rather than jamming their operation, and make informed suggestions to network providers about how to do their network management without hindering third party innovation.

⁸⁶ Richard R.W. Brooks & Warren F. Schwartz, *Legal Uncertainty, Economic Efficiency, and the Preliminary Injunction Doctrine*, 58 Stan. L. Rev. 381, 389 (2005).

address violations. Comcast's apparent argument that such discrimination constitutes reasonable network management does not pass the laugh test.

Degrading an application cannot be considered reasonable network management. If it could, then China's extensive blocking technologies constitute reasonable network management. The FCC's Policy Statement would mean nothing. The Statement's language and context make abundantly clear that the Statement meant squarely to ensure network providers did *not* discriminate against specific applications.⁸⁷ For example, one of the Commissioners released a separate statement with the Policy Statement explaining why he voted for the Statement: "we must state clearly that innovators, technology companies, and consumers will not face unfair *discrimination* on the Internet by network providers."⁸⁸ He stated further that the Policy Statement:

lays out a path forward under which the Commission will protect network neutrality so that the Internet remains a vibrant, open place where new technologies, business innovation and competition can flourish. We need a watchful eye to ensure that network providers do not become Internet gatekeepers, with the ability to dictate who can use the Internet and for what purpose. Consumers do not want to be told that they cannot use their DSL line *for VoIP, for streaming video*, to access a particular news website, or to play on a particular company's game machine.⁸⁹

⁸⁷See, e.g., *FCC Adopts a Policy Statement Regarding Network Neutrality*, Techlaw Journal, <http://www.techlawjournal.com/topstories/2005/20050805.asp> (listing reactions to the Policy Statement reflecting the accepted understanding of its purpose). See also Remarks of Michael K. Powell, Chairman, Federal Communications at the Silicon Flatirons Symposium, *Preserving Internet Freedom: Guiding Principles For the Industry*, February 8, 2004, http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-243556A1.pdf.

⁸⁸Statement of Commissioner Michael Copps Concurring, Aug. 5, 2005, at 1 (emphasis added), http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-260433A4.pdf.

⁸⁹*Id.* at 2 (emphasis added).

The Chairman, in his statement, similarly discussed his belief “that consumers should be able to use their broadband internet access service to access any content on the internet.”⁹⁰

Comcast’s other arguments here, which other network providers may raise, are similarly flawed. First, degrading specific peer-to-peer applications does not become reasonable merely because peer-to-peer applications comprise much of a network provider’s traffic. Their popularity makes blocking them, in fact, perhaps less reasonable. More importantly, if Comcast is concerned that the collective set of users running P2P applications are affecting quality of service for other users on a cable loop, they could readily set dynamic quotas for each user on the loop, so as to ensure that there is always bandwidth available for users who are not running P2P applications – and they could do so without interfering in protocol choice. Or they could charge by usage, provide more bandwidth for all users, or actually offer high *symmetric* broadband speeds.⁹¹ Second, degrading specific applications is not tailored to targeting high-bandwidth users. Comcast does not just block those sending roughly 250,000 photos or downloading “more than 30,000 songs a month”; it blocks access to download just one file, even one as small as the King James Bible, if the download is over a peer-to-peer network. As one report noted, “It’s clear that Comcast is actively interfering with peer-to-peer networks even if relatively small files are being transferred.”⁹² Third, a network provider is not attempting, in Comcast’s words, to “provide a quality experience for *all* [its] subscribers.” Rather, it is specifically degrading the

⁹⁰ Statement of Chairman Kevin Martin, Aug. 5, 2005, at 1, http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-260435A2.pdf.

⁹¹ Consumers Union, Consumer Federation of America and Free Press. In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, GN Docket No. 07-45, May 16, 2006.

⁹² Peter Svensson, *Comcast Admits Delaying Some Traffic*, Associated Press, Oct 23, 2007, http://hosted.ap.org/dynamic/stories/C/COMCAST_DATA_DISCRIMINATION.; Declan McCullagh, *Comcast Really Does Block BitTorrent Traffic After All*, CNet News.com, Oct. 19, 2007, http://www.news.com/living-with-the-iphone/8300-13578_3-38-0.html.

experience of at least some subscribers. Indeed, degrading BitTorrent may *increase* network congestion on the Internet as a whole because, as online video becomes more popular, users could have to use protocols that are less efficient than BitTorrent, leading to more congestion and inferior performance. Comcast's actions also could increase the congestion on other networks; the other networks' users would have to do much of the uploading that Comcast's users would have performed.

Finally, no economic argument supports the notion that degrading applications is reasonable network management. The most sophisticated economic argument has been advanced by Chris Yoo,⁹³ a law professor at the University of Pennsylvania who writes white papers for the cable industry lobby.⁹⁴ Yoo argues that blocking an application is the best real-world solution because high transaction costs foreclose the best theoretical solution. Under the theoretical solution, network providers would most efficiently manage their networks not by blocking applications, but by charging users for the users' bandwidth use. If users must pay for the bandwidth they use, then the users will better internalize the costs and benefits of their use. If the users do not pay per-bandwidth of use, then the users have no incentive to conserve their bandwidth. Professor Yoo speculates, however, that the transaction costs associated with metered usage are high. As a result, cable and phone companies could avoid these transaction costs and still reduce network congestion by using proxies for heavy use of bandwidth; these proxies would be particular applications, which the network operators would block or extort.⁹⁵

⁹³ See Christopher S. Yoo, *Promoting Broadband Through Network Diversity*, at 43, (2006), available at <http://www.ncta.com/DocumentBinary.aspx?id=286>.

⁹⁴ See *Cable Lobby's Net Neutrality White Paper*, Center for Digital Democracy, http://www.democraticmedia.org/current_projects/net_neutrality/nn_white_paper

⁹⁵ See Christopher S. Yoo, *Network Neutrality and the Economics of Congestion*, 94 Geo. L.J. 1847 (2006)

Yoo's argument is wrong, as demonstrated most forcefully by scholars at Stanford and Loyola law schools.⁹⁶ First, use of BitTorrent (or another peer-to-peer protocol) is an inaccurate proxy for heavy use of bandwidth. For example, many BitTorrent users make few BitTorrent downloads. And BitTorrent may use considerable bandwidth on a network simply because consumers particularly value the protocol. Second, no evidence suggests that network providers Yoo's "theoretical" ideal of metering usage is subject to high transaction costs. Yoo points to no evidence. Indeed, in many nations, network providers do meter, and bill their customers on the basis of amount used.⁹⁷ So the transaction costs of doing so must not be prohibitively high. Indeed, a network provider can apparently meter cheaply because, in most networks, users' traffic to and from the Internet passes through a single gateway, the network access server.⁹⁸ Third, it does not matter, from a social perspective, if network operators' executives could make a little extra money using BitTorrent blocking as a proxy—just as it does not matter if they could make more money by insider trading or violating trade sanctions. What matters is whether citizens can exercise their right to access the lawful content and applications of their choice and whether the public interest is served by permitting Comcast and other network providers to degrade innovative new applications and undermine competition. In its Internet Policy Statement and elsewhere, the FCC has answered these questions; the public interest is served by Internet freedom.

⁹⁶ See Brett M. Frischmann & Barbara van Schewick, *Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo*, 47 *Jurimetrics* __ (2007), available at <http://ssrn.com/abstract=1014691>. See also Bill D. Herman, *Opening Bottlenecks: On Behalf of Mandated Network Neutrality*, 59 *Fed. Comm'n L. J.* 107 (2006), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=902071.

⁹⁷ See for instance, Broadband Choice, <http://bc.whirlpool.net.au/>, which provides a tool to compare plans offered by Australian broadband ISPs, including whether they meter usage, and whether they respond by charging a per-gigabyte fee or by shaping traffic once a subscriber has used up their initial quota. See also Frischmann & van Schewick, *Network Neutrality*, at 12 (discussing German network providers).

⁹⁸ Frischmann & van Schewick, *Network Neutrality*, at 12.

Irreparable Harm. Free Press (and almost all American consumers and businesses) will suffer irreparable harm. Irreparable harm exists in at least three situations present here.

One, harm may be in “a practical sense irreparable because the court has no way of determining the appropriate amount” for an *ex poste* fines.⁹⁹ Courts often find, for example, that patent harms are irreparable “because patent harms are difficult for courts to value.”¹⁰⁰ Here, as with patents, the cost of discriminating among classes of applications yields harms that are difficult to value. The costs *to consumers* are nearly impossible to value. The Internet’s history demonstrates that nobody can predict the radical innovations that a nondiscriminatory network makes possible—from the Internet browser to open source applications like Linux to Youtube to Facebook to BitTorrent. In this case, for example, more perhaps than with most patent litigation, one cannot predict the harm that Comcast causes by undermining BitTorrent, Gnutella, Lotus Notes, and other peer-to-peer applications and protocols. These innovations result in huge productivity gains for the society, though these gains are difficult to measure; for example, Lotus Notes supports telecommuting;¹⁰¹ BitTorrent supports more cost-effective software development.¹⁰²

Similarly, the harms *to applications-providers* are similarly difficult to value. These harms are likely very high, however, where an application competes in a market where network effects matter. If Comcast can degrade an application such that users use the application less, its value will diminish as fewer users use the application. BitTorrent experiences network effects in

⁹⁹ See, e.g., Douglas Lichtman, *Irreparable Benefits*, 116 Yale L.J. 1284, 1292 (2007) (collecting cases). See also Douglas Lichtman, *Uncertainty and the Standard for Preliminary Relief*, 70 U. Chi. L. Rev. 197, 200-02 (2003) (arguing that valuation difficulties are the main reason why courts authorize preliminary relief).

¹⁰⁰ See Lichtman, *Irreparable Benefits*, 116 Yale L.J. at 1288.

¹⁰¹ See, e.g., Reed E. Hundt & Gregory L. Rosston, *Communications Policy for 2006 and Beyond*, 58 Fed. Comm. L. J. 1, 7-8 (2006);

¹⁰² See, e.g., note 76 above (regarding Amazon Simple Storage Service).

at least two ways. Because users provide content to other users, BitTorrent can provide users more content (and more diverse content) the more users it has. In addition, BitTorrent enables faster downloads based on how many users have the same file; so the more users, on average, the faster the downloads. In cases of discrimination against applications competing in markets subject to network effects, such as many Internet markets, courts and the FCC cannot easily predict whether discrimination will tip the market.

Two, independently, harm may be “irreparable” because the wrongdoer lacks the funds to compensate the harm it causes.¹⁰³ Internet discrimination likely costs society billions in lost innovation in applications, lost consumer value in garnering the products and content of their choice, deadweight loss from network providers exerting or protecting market power (such as in the video programming market by blocking Internet video applications), and in stifling deployment of and access to high-speed Internet service. Comcast’s actions affect the entire Internet, as Comcast users are burdened by the clandestine blocking and non-Comcast users are burdened when they attempt to download from Comcast users. Even though Comcast is a billion dollar company, it cannot compensate society for these losses; the gains to Comcast from discrimination pale compared to the harms society suffers from such discrimination.

Three, burdens on some fundamental rights are simply irreparable, even if the burdens do not last forever. As the Supreme Court has stated: “[L]oss of First Amendment freedoms, for even minimal periods of time, unquestionably constitutes irreparable injury.”¹⁰⁴ Consumers’ First Amendment freedoms are burdened where Internet service providers degrade or block users’ ability to access or share content, as much of that content consists of speech, including

¹⁰³ See Lichtman, *Irreparable Benefits*, 116 Yale L.J. at 1292.

¹⁰⁴ *Elrod v. Burns*, 427 U.S. 347, 373 (1976).

movies, music, and books like the Bible. Here, if the FCC permits Comcast to block applications and content, it is burdening the First Amendment freedoms of users.¹⁰⁵ This burden constitutes irreparable harm.

Harms to Consumers Are Great. The threatened injury to consumers, applications-providers, and content-providers far outweighs the harm of a proposed injunction to network providers. The harm to network providers is minimal; the harm to society is so great that the network provider could not afford to pay it.

Injunction Serves the Public Interest. Granting an immediate preliminary injunction would not be adverse to the public interest; in fact, it would serve the public interest. First, if Comcast and other Internet service providers are permitted to degrade particular applications, innovation in Internet applications will plummet. New entrants hoping to create innovative Internet applications would have face higher uncertainty costs than they do now, because the entrants are not assured of access to Internet users. Moreover, even if an entrant is assured of initial access to consumers, it would face two possible outcomes, neither of which would be worth pursuing. Either the application is unpopular and fails. Or the application is popular—perhaps, like BitTorrent, eventually accounting for much of the network traffic—and so is degraded or blocked. As the EFF researcher studying Comcast’s actions wrote:

When an ISP starts arbitrarily zapping some of the protocols that its customers use, they instantly endanger the cascade of innovation that the Internet has enabled. Before this kind of traffic jamming, anybody — huge businesses, small start-ups, college

¹⁰⁵ Cf. *Denver Area Educational Telecommunications Consortium, Inc. v. F.C.C.*, 518 U.S. 727, 773 (1996) (Stevens, dissenting and concurring) (noting that a provision would “inject federally authorized private censors into fora from which they might otherwise be excluded, and it would therefore limit local fora that might otherwise be open to all constitutionally protected speech.”).

students and children in their bedrooms — could build new, innovative protocols on top of the Internet's TCP/IP platform.¹⁰⁶

Not only will all innovators face higher uncertainty costs and the risk of being blocked or degraded once an innovation succeeds, particular innovations could be off limits. For example, “[t]echnologies like BitTorrent and Joost, which are used to distribute licensed movies and are in direct competition with Comcast’s cable TV services, will be at Comcast’s mercy.”¹⁰⁷ To protect its market power delivery of video through its cable television service, Comcast has the incentive to block innovation in video services, even though consumers demand Internet video and though innovation in the delivery of Internet video would provide the public with services the public values.

Indeed, an application provider would have no incentive even to provide a viable edge-based means of reducing traffic flow. An efficient protocol, such as BitTorrent, is likely to be popular. If popular, the protocol would likely be degraded or blocked. At “best,” application providers would design core-based applications to the liking of particular Internet service providers, resulting in de facto proprietary standards or wasteful standards wars or both.¹⁰⁸ Either result would cripple potential innovation on the Internet.

2. Discrimination among Applications Should be Subject to a Permanent Injunction

Once the complaint against the Internet service provider is resolved, a permanent injunction should issue. The standard for a permanent injunction is similar to that of a preliminary injunction. For a permanent injunction, a plaintiff must demonstrate: (1) that it has

¹⁰⁶ Peter Eckersley, *Comcast is also Jamming Gnutella (and Lotus Notes?)*, Electronic Freedom Foundation Blog, Oct. 20th, 2007, <http://www.eff.org/deeplinks/2007/10/comcast-also-jamming-gnutella-and-lotus-notes>.

¹⁰⁷ Peter Eckersley, *Comcast is also Jamming Gnutella (and Lotus Notes?)*.

¹⁰⁸ Harold Feld, *Look! My Solution Found A Problem! Comcast Degrades BitTorrent Traffic Without Telling Users*, WetMachine, Oct. 27, 2007, <http://www.wetmachine.com/item/912>.

suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.¹⁰⁹

These factors mirror factors discussed above. First, consumers, applications-providers, and content-providers suffer irreparable harm because the harm is difficult to measure, larger than an Internet service provider can compensate, and burdens fundamental rights. Second, remedies at law are inadequate because network operators cannot afford to pay all citizens for the loss of unpredictable innovation and inability to share content and speech with other citizens. Moreover, many users would not even know if Comcast had secretly degraded their services. Nor are damages sufficient because they are impossible to specify where Internet innovation cannot be predicted. Third, the balance of hardship clearly favors consumers, applications-providers, and content-providers. Finally, a permanent injunction would serve the public interest, as it would encourage innovation in Internet applications and content, as well promoting the deployment and uptake of high-speed Internet access.

3. The FCC Should Order Forfeitures

The FCC should also impose forfeitures. Under Section 503(b)(2)(D) of the Act, the FCC may assess an entity that is neither a common carrier, broadcast licensee or cable operator a forfeiture of up to \$11,000 for each violation or each day of a continuing violation, up to a statutory maximum forfeiture of \$97,500 for any single continuing violation. The Commission must take into account “the nature, circumstances, extent, and gravity of the violation and, with

¹⁰⁹ See *eBay, Inc., v. MercExchange, LLC*, 126 S.Ct. 1837, 1839 (2006).

respect to the violator, the degree of culpability, any history of prior offenses, ability to pay, and such other matters as justice may require.”¹¹⁰

The Commission should impose the maximum forfeiture per violation. The extent and gravity of the violation and the degree of culpability are sky high. Comcast is blatantly violating the FCC’s Internet Policy Statement. Comcast is degrading revolutionary applications that could be the future of Internet video, and which could compete with cable television offerings. It also repeatedly denied degrading these applications and was degrading them secretly. Similarly, Comcast’s ability to pay suggests no downward adjustment.

Assuming Comcast has degraded peer-to-peer applications more than nine times per subscriber, the maximum continuing forfeiture should be imposed on Comcast’s discrimination (\$97,500) and for its deception (\$97,500) per harmed subscriber. This equals \$195,000. Comcast has committed these continuing violations against each Comcast subscriber whose service was degraded.¹¹¹ The FCC should investigate to determine how many consumers suffered Comcast’s discrimination and then assess the forfeiture per subscriber.

The forfeiture should naturally be large, to deter network providers from treat fines from discrimination as just a cost of business. First, forfeitures can help make society “whole” (or less worse off) by forcing Comcast to internalize the social costs of its discrimination. By discriminating against applications, Comcast is imposing huge negative externalities on applications-providers, content-providers, and all consumers. Comcast is gutting the value of the

¹¹⁰ See, e.g., Trans World Entertainment Corporation DBA F.Y.E., File Number EB-07-RK-009, NAL/Acct. No. 200832460002, 2007 WL 3005244, & nn. 25-26 (October 15, 2007) (citing 47 U.S.C. § 503(b)(2)(D); 47 U.S.C. § 503(b)(2)(E); 47 C.F.R. § 1.80(b)(4), Note to paragraph (b)(4): Section II. Adjustment Criteria for Section 503 Forfeitures).

¹¹¹ Non-Comcast subscribers to broadband are also affected by the discrimination, though not necessarily the deception.

degraded applications—which, as with BitTorrent, likely consists of millions or billions in social surplus—and undermining the future of Internet innovation, deployment, and productivity gains.

Second, large forfeitures should account for the likelihood of Internet service providers getting caught or not. Network providers are more likely to engage in discrimination if they do not get caught. Network providers can secretly interfere with traffic in subtle ways, making it difficult to decipher such activity. In this case, for example, Comcast has engaged in discrimination designed to be clandestine—from its repeated denials to its spoofing packets to triggering its activities only for peer-to-peer uploads. Because network providers may attempt—as Comcast has—to fool society and deciphering instances of broadband discrimination may be difficult, the FCC should impose even heavier forfeitures.¹¹² Otherwise, network providers could rationally determine that discrimination is worth the gamble, as the chance of getting caught is low.

IV. Conclusion

The Commission should issue a preliminary injunction requiring Comcast to stop degrading peer-to-peer applications. The Commission should then decide the merits, find that Comcast is violating the FCC's Policy Statement and engaging in deceptive practices. It should then impose a permanent injunction and maximum forfeitures.

¹¹² See, e.g., Richard Posner, *Deterring Identity Theft*, The Becker-Posner Blog, Sept. 17, 2006, http://www.becker-posner-blog.com/archives/2006/09/deterring_ident.html.

Respectfully Submitted,

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Julie Schwartz
Free Press
501 Third Street NW
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Washington, DC 20001
Phone 202-265-1490

November 1, 2007

ATTACHMENTS

Declaration of Peter Eckersley

My name is Peter Eckersley. I am a Staff Technologist for the Electronic Frontier Foundation (EFF). I am also finishing a PhD with the Intellectual Property Research Institute of Australia and the computer science department at the University of Melbourne.

In the fall of 2007, EFF performed tests on Comcast's network to determine if Comcast was interfering with users' ability to run peer-to-peer applications over Comcast's network. EFF and I have published some preliminary conclusions from those tests in several posts on EFF's weblog.¹ These conclusions agreed with the conclusions derived from tests performed by the Associated Press.² These tests underlie factual assertions in this Complaint.

I am familiar with the contents of the foregoing Complaint. The factual assertions regarding Comcast's actions are true to the best of my knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 31, 2007.

Peter Eckersley

¹ Seth Schoen, *Comcast and BitTorrent*, Electronic Frontier Foundation Blog, September 13th, 2007, <http://www.eff.org/deeplinks/2007/09/comcast-and-bittorrent>; Seth Schoen, *EFF tests agree with AP: Comcast is forging packets to interfere with user traffic*, Electronic Frontier Foundation Blog, October 19, 2007, <http://www.eff.org/deeplinks/2007/10/eff-tests-agree-ap-comcast-forging-packets-to-interfere>; Peter Eckersley, *Comcast is also Jamming Gnutella (and Lotus Notes?)*, Electronic Freedom Foundation Blog, Oct 20, 2007, <http://www.eff.org/deeplinks/2007/10/comcast-also-jamming-gnutella-and-lotus-notes>; Peter Eckersley, *Comcast Needs to Come Clean*, Electronic Frontier Foundation Blog, October 25, 2007, <http://www.eff.org/deeplinks/2007/10/comcast-needs-come-clean>

² Peter Svensson, *Comcast Blocks Some Internet Traffic*, Associated Press, Oct. 19, 2007, http://ap.google.com/article/ALeqM5gxRiQSVfgK4sLbVRE_X4MOIM9q0AD8SCASPG0.

Declaration of Robert Michael Topolski

My name is Robert Michael Topolski. I live at 2345 Southeast 55th Ave., Hillsboro, Oregon. I am a Software Quality Engineer with 15 years of experience. In addition, I have 25 years of network experience, both as an amateur and professional computer engineer. I have been certified as a Software Quality Engineer by the American Society of Quality, and have been awarded Most Valuable Professional status in the area of networking by Microsoft.

In March 2007, I noticed that I was unable to upload data on the Gnutella peer-to-peer (P2P) network through an account with Comcast. At the same time, I began to read reports of Comcast interfering with various P2P file transfers on their customers' internet connections. I first verified these reports and identified Comcast's actions which caused these problems in May 2007. Since this time, I have read numerous reports and performed extensive testing of network behavior on Comcast and non-Comcast networks.

My research has led me to the conclusion that Comcast is utilizing a device produced by Sandvine, Inc., in order to selectively cause disconnections on several P2P networks including Bittorrent, eDonkey, and Gnutella. I have been informed by other users that the same disconnections are affecting client/server protocols including FTP and Lotus Notes, although I have not tested these claims myself.

The P2P protocols I tested utilize the underlying Transmission Control Protocol (TCP). TCP's behavior is defined by the Internet standard document RFC 893. In a normal Internet connection TCP, connections between users can be terminated by one user sending the other a packet which contains either FIN or RST flag. A FIN packet indicates that the user is done with the connection, and after it is sent and received, both users close the connection. An RST packet is typically sent when an error (such as a computer crash) occurs and one user's computer no longer recognizes the connection the other user is attempting to communicate on. According to the RFC, when this happens, "the data arriving ... is unacceptable because no such connection exists, so [the disconnected user] sends a RST. The RST is acceptable so [the other user] processes it and aborts the connection." Thus, a computer receiving an RST packet will assume the remote computer has experienced an error and will abort the connection.

When conditions determined by Comcast are met, the Sandvine device injects a forged RST/abort packet to each user. This packet is designed to impersonate and simulate an error by the other user, and as a result, the TCP stacks which handle incoming data each interpret the packet as an error condition on the other side and both drop the connection.

The Sandvine devices only terminate connections when the Comcast user is initiating an upload to another user, and always terminate the connection at the same point in the protocol, indicating that Comcast are analyzing some of the content of the data passing between the Comcast user and the peer user. I have found that Comcast will forge these resets for some percentage of the connections on which a user attempts to upload data. This fraction of connections which are reset has been consistent across tests on Comcast connections; for Bittorrent, it is generally around 40%. In tests on non-Comcast networks, roughly 3% of

connections are reset. This suggests that over 35% of data connections were effectively cancelled by the Sandvine device when they would otherwise have continued.

In further tests, some working with a technical consultant assisting the Electronic Frontier Foundation (EFF) and using a network analysis tool called WireShark, I have verified that the forged RST packets do not originate from and are not seen by the side which is supposed to have sent them. These tests also indicate that the Sandvine device which monitors a given user's connections and injects these packets is located at that user's Cable Modem Termination System (CMTS), which is the location where the user's cable connection, along with that of others users in the area is terminated and converted into an internet connection. A given CMTS can serve thousands or even hundreds of thousands of users.

I have personally experienced both forged RST packets and the resulting degradation in performance.

I am familiar with contents of the foregoing Complaint. The factual assertions made in the complaint are true to the best of my knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on October 31, 2007.

Robert Michael Topolski

Declaration of Ben Scott

My name is Ben Scott. I am the Policy Director of Free Press.

Free Press is national, nonpartisan, nonprofit organization. Through education, organizing, and advocacy, Free Press works to increase informed public participation in crucial media policy debates. Free Press has over 300,000 members. Free Press and its members have been involved on a wide range of media policy debates and have played a lead role on network neutrality debates, including acting as the Coordinator of the SavetheInternet.com Coalition, which advocates for network neutrality and includes hundreds of nonprofit organizations, small businesses, church affiliations, educational institutions and scholars, video gaming groups, bloggers, and other organizations. Many of Free Press's members subscribe to Comcast for high-speed internet access, including Adam Lynn, whose declaration is attached to this complaint. Many members, also like Adam Lynn, use peer-to-peer applications, through Comcast or another network provider.

I am familiar with the contents of the foregoing Complaint. The factual assertions made in the Complaint are true to the best of my knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 1, 2007.

Ben Scott

Declaration of Adam Lynn

My name is Adam Lynn. I live at 875 N Larrimore St. Arlington, VA 22205. I am a member of Free Press, and the organization's Policy Coordinator.

I subscribe to Comcast's high-speed Internet offering and have been a subscriber since October 2006. I use this connection to check my email, surf the web for news, music, and video. I also use peer-to-peer services, which use the BitTorrent protocol such as Azureus to legally download high quality music videos such as from the Gorillaz, movie trailers of movies such as Spiderman 3 or Transformers, music mixes, and anything else that looks entertaining or informative.

On October 19, 2007, Comcast has been disconnecting me with those I am trying to share content with over peer-to-peer services. I had previously seen information on DSL reports accusing them of engaging in this practice and saw that Comcast had consistently denied degrading these services. I figured if they were doing this they would let me know and explain why they were crippling the open Internet connection I believed I had been paying for. Unfortunately, it turns out my Internet provider had been taking me and millions like me for a ride down the misinformation highway.

I live in an area with some choices in broadband service. While my choices are few, they include Verizon's DSL offering and its FIOS offering. Given the difficulty and inconvenience that comes with switching service providers, I am unsure what I will do when it comes to my future Internet provider but will be in the hunt for an unhindered Internet connection. Had I known Comcast was blocking peer-to-peer applications earlier, I would have begun my hunt earlier.

I am familiar with the contents of the foregoing Complaint. The factual assertions made in the complaint are true to the best of my knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on November 1, 2007.

Adam Lynn

Declaration of Gigi B. Sohn

My name is Gigi B. Sohn. I am the President and Co-Founder of Public Knowledge.

Public Knowledge is a public-interest advocacy organization based in Washington, D.C. The organization is involved in a range of policy issues, including playing an integral role in the effort to secure a non-discriminatory Internet, to make set policies that will allow affordable broadband service is available nationwide, and that increase competition so that consumers can benefit from greater choice and lower prices.

Public Knowledge has published white papers on these topics and written extensively about them in numerous publications. We are a member of the Save the Internet.com coalition and the Open Internet Coalition.

Jef Pearlman, an Equal Justice Works fellow on our staff, until recently subscribed to Comcast's high-speed Internet service. His declaration is attached to this complaint. Other of our members and staff also subscribe, or formerly subscribed, to Comcast and use peer-to-peer applications.

I am familiar with the contents of the foregoing Complaint. The factual assertions made in the Complaint are true to the best of my knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 31, 2007.

Gigi B. Sohn

Declaration of Jeffrey Pearlman

My name is Jeffrey Pearlman. I currently live at 1724 V. St. NW in Washington, DC. I hold Bachelor's and Master's degrees in Computer Science from MIT, and I am currently a Equal Justice Works Law Fellow at Public Knowledge.

From February 1, 2007 to October 15, 2007, I lived at 233 Dorland St., San Francisco, CA, where I had Comcast cable internet service. During this period, I used my service for numerous purposes, including several with utilize the Bittorrent protocol. First I used the Azureus Bittorrent client to legally download Linux distributions, several versions of the free OpenOffice software suite, and several full-length DVD's produced and freely distributed by friends. I also used the Vuze Bittorrent-based service to download and watch various movie trailers and music videos which were placed on the service by the owners to allow legal, efficient distribution. Finally, I used software provided by Blizzard, Inc., which uses the Bittorrent protocol, to download the client for their World of Warcraft online game as well as numerous updates to that game. In fact, when the DVD version of the game I purchased was damaged, I found it more efficient to download the full DVD using Bittorrent than to get it replaced by the store.

Because I am trained in and familiar with networks and networking protocols, I hand-configured my home router to provide the best possible performance when using these applications. Over the course of this year, there have been several occasions where Bittorrent connections would appear to start, both in Azureus and Blizzard clients, but soon slow to a crawl. In several cases, I found that while there was ample bandwidth available on the network, my client was unable to upload the normal amount of data and download speeds were significantly reduced, potentially as a result of the inability to effectively upload.

Although I performed a thorough troubleshooting of my network, I was unable to find the cause of these problems at the time. However, as I have recently become aware of Comcast's practices regarding the Bittorrent protocol, I strongly suspect that those practices were hindering my ability effectively use Bittorrent-based services, secretly and through the use of forged data.

I am familiar with the contents of the foregoing Complaint. The factual assertions made in the complaint are true to the best of my knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on October 31, 2007.

Jeffrey Pearlman