June 5, 2008

CENTER FOR DEMOCRACY & TECHNOLOGY
Keeping the Internet Open, Innovative and Free

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Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554
VIA ELECTRONIC FILING

Re: Notice of *Ex Parte* Presentation in WC Docket 07-52

Dear Ms. Dortch:

On June 5, 2008, David Sohn, John Morris, and Vera Ranieri of the Center for Democracy and Technology (CDT) met with Amy Bender, Acting Legal Advisor to Chairman Kevin Martin. We discussed CDT's views on network management questions, as reflected on the attached outline. We provided Ms. Bender with a copy of the outline, as well as a copy of CDT's June 2007 comments in WC Docket 07-52.

In particular, we highlighted arguments made in CDT's comments in WC Docket 07-52 and offered a brief report on the Internet Engineering Task Force's (IETF) recent workshop on network congestion challenges posed by peer-to-peer (P2P) technology. We emphasized that we believe the Commission should not exert formal regulatory authority over network management practices in the absence of affirmative congressional authorization, but rather should offer additional principle-level guidance by augmenting its broadband Policy Statement. We further observed that the Commission's attention to network management issues has helped prompt some positive developments, including the current trials by Comcast and Time Warner of protocol-agnostic congestion control approaches that focus on throughput by individual users.

This letter and the associated attachments are being filed electronically, and a copy is being delivered via email to Ms. Bender.

Sincerely,

David M. Sohn
Senior Policy Counsel
Center for Democracy & Technology

Center for Democracy & Technology – Key Points re Network Management
June 2008

I. Summary of CDT's Comments and Reply Comments in WC Docket 07-52

A. "Network management" can refer to a variety of practices – some benign, some carrying real risks. Important to distinguish different kinds.

- Network management addressing spam or malware is different from network management addressing congestion.
- CDT's 6/07 Comments (attached) walked through different possible practices involving differential treatment of Internet traffic. Chart at end offers full list.

B. FCC should refrain from adopting formal rules regulating network management.

- Public interest best served by taking cautious approach to FCC's jurisdiction over broadband Internet.
- Asserting jurisdiction to regulate network management could set precedent for general FCC jurisdiction, and would lead to more battles in court.
- Principles from broadband Policy Statement are not rules, and CDT is highly skeptical that they can be enforced as if they were.

C. Instead, FCC should provide principle-level guidance by clarifying / augmenting broadband Policy Statement.

- Could add new principle regarding non-discrimination – since current principles could be read to address outright blocking only.
- Could issue statement about network management for congestion purposes. Say that FCC expects network management to be:
    - Much more transparent than it has been to date;
    - Evenhanded in its applicability to different protocols and applications;
    - Consistent with core internetworking standards.

D. Distributing content using P2P is not "cost shifting" in any nefarious sense.

- P2P content distributors such as Vuze avoid some costs by getting users to donate some transmission capacity.
- That may violate the user's agreement with the ISP. But often even that is not clear – for example, "no server" restrictions or non-specific volume caps provide little clear guidance about what is or is not permitted.
- Real problem is service plans that create the impression of unlimited usage and do not clearly say "no P2P."

II. Update re IETF Workshop on P2P Infrastructure

A. Importance of standards-based approaches to network management – individual negotiations between ISPs and P2Ps are no substitute for open protocols. Need standardized ways of signaling/sharing information, not just ad hoc cooperation deals.

B. Various approaches discussed: more efficient peer selection; localization/caching; prioritization/QoS.

C. Report and summary of workshop expected by end of June.

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

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

COMMENTS OF THE CENTER FOR DEMOCRACY & TECHNOLOGY

The Center for Democracy & Technology ("CDT") respectfully submits these comments in response to the Commission's Notice of Inquiry in the above-captioned proceeding. CDT is a non-profit, public interest organization dedicated to preserving and promoting free expression, privacy, individual liberty, and technological innovation on the open, decentralized Internet.

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Executive Summary

CDT strongly believes that the Internet's extraordinary success in facilitating independent innovation and speech is directly linked to the fact that any Internet user can provide content and services to any other willing Internet user, without getting permission from any "gatekeeper." There is currently an active debate about whether and to what extent there is a risk that network operators could engage in behaviors that would undermine this characteristic openness.

Current practices in the marketplace, however, may provide limited evidence one way or another as to the extent of this risk. The present legal framework is still only recently settled, and merger conditions and the political environment serve as significant but potentially temporary constraints on behavior. Meanwhile, the market for broadband is concentrated; there is evidence that network operators can sometimes be tempted to seek to exert more control over their users' activities than the Internet has typically afforded; and unraveling the effects of discriminatory deals on a purely after-the-fact basis could prove extremely difficult.

CDT believes it may be useful, therefore, to consider a range of possible behaviors and attempt to determine whether there are some that seem worth focusing on as likely sources of concern. The Appendix to these Comments sets forth CDT's effort to outline possible categories of behavior without expressing any judgments about them.

Taking the next step and actually evaluating these practices leads CDT to a number conclusions. Among possible packet management practices:

- Blocking or prioritizing selected traffic in accordance with express requests by subscribers seems unobjectionable.
- Blocking security threats, spam, or illegal content seems unobjectionable.
- Blocking specific applications or services, or blocking entire types of applications, would pose significant concerns.
- Affirmatively degrading selected traffic – to effectively provide less than "best efforts" delivery – would pose significant concerns, unless based on a generally applicable rule about bandwidth usage limits.
- Prioritizing traffic from senders that are affiliated or have exclusive deals with the ISP would pose significant concerns.
- Several other packet management practices would raise at least some concerns, but may present debatable scenarios.

Among possible pricing practices, meanwhile:

- Pricing plans tied to the network resources made available or used by a subscriber (whether measured in maximum transmission speed or actual throughput of bits) seem entirely unobjectionable.
- Varying broadband Internet charges based on the particular online content, services, or applications a subscriber accesses over that connection raises more difficult questions and could present some risks.

CDT believes there is a strong argument for a policy framework that addresses those practices that can be identified as likely harmful. The task of developing such a policy framework lies with Congress. The Commission could play a useful role, however, by:

- continuing to monitor the broadband marketplace – both for the types of practices identified as potentially harmful, and for any evidence of underinvestment in general purpose Internet capacity;

- considering whether there are steps it could take to promote greater transparency of any ISP policies favoring or disfavoring selected broadband traffic; and
- adding a new principle to its broadband Policy Statement relating to discrimination with respect to speed, service quality, or price.

Introduction

CDT strongly believes that the Internet's extraordinary success in facilitating independent innovation and speech is directly linked to its lack of "gatekeepers." In particular, the Internet's existing structure enables small innovators or independent speakers to offer content, services or applications to any interested Internet user without having to get any kind of permission from or enter into any kind of deal with that user's Internet service provider ("ISP"). The innovator or speaker buys a connection to the Internet from a single ISP and can then reach the whole of the Internet. This keeps barriers to entry low and makes the Internet uniquely open to innovation, competition, and speech.

As the Commission is well aware, there is an active debate about whether and to what extent recent legal and marketplace developments create a risk of network operator behaviors that would undermine this openness. The debate, however, has often been dominated by slogans, extreme rhetoric, and arguments that focus on attacking straw men rather than grappling with the real complexity of the issue.

The Commission in this proceeding can make an important contribution to the debate by focusing attention and analysis on specific practices that could favor or disfavor particular content. The policy discussion could benefit by getting more specific and concrete about what types of practices may and may not be of concern. For reasons discussed below, however, CDT would urge the Commission not to concentrate solely on practices that are currently observable in the marketplace, as these may provide limited insight into the types and extent of any risks. CDT believes it is possible to identify a variety of specific potential practices relating to packet management or pricing, some that seem perfectly benign and others that could be harmful. Attached at the end of these comments is an Appendix reflecting CDT's effort to list examples of concrete behaviors without expressing any judgment about them; sections 2 and 3 below evaluate which of those possible behaviors seem problematic.[1]

CDT believes that listing and analyzing concrete potential practices could help inform Commission action in several ways. First, it could provide an indication of the types of practices for which the Commission should be on the lookout in the future. Second, it could offer guidance as to what types of practices may warrant some kind of public disclosure obligation.

[1] CDT's focus in these Comments is consumer-class broadband Internet service. The market for broadband and related data services provided to large corporate customers is likely quite different in nature and would not be subject to the same analysis.

And third, it could be used to help structure an appropriately targeted nondiscrimination principle to incorporate into the Commission's broadband Policy Statement.[2]

1. Today's Practices Likely To Offer Limited Window into Risks

The Commission has asked commenters to describe "today's packet management practices" and "today's pricing practices" for broadband services.[3] While information about today's practices is certainly useful to know, the Commission should keep in mind that it also may paint an incomplete picture. In particular, there are several reasons why arguably harmful types of discriminatory practices might be rare in the current environment *regardless* of whether network operators have incentives or plans that could lead to such practices in the future.

First, **the key legal and administrative decisions exempting broadband from any potential application of common carrier rules are still quite recent**. The Supreme Court issued its *Brand X* decision in June 2005.[4] The FCC released the order making DSL services exempt from common carriage obligations in September 2005.[5] Any strategies for capitalizing on this legal freedom could be expected to take some time to develop, evaluate, and implement, particularly to the extent they would represent a significant departure from the ways ISPs have traditionally handled Internet traffic. New strategies and practices also might require deployment of new capabilities (e.g., for "deep-packet inspection") in routers and other network equipment, which network operators might choose to install gradually or in connection with existing equipment upgrade and maintenance schedules.

Meanwhile, the Commission's review of **merger agreements** has effectively resulted in the imposition of temporary constraints on significant segments of the broadband industry. In both the SBC/AT&T and MCI/Verizon mergers, the merging companies committed to abide by the principles in the Commission's broadband Policy Statement for a period of two years.[6] More recently, the FCC's approval of the merger of AT&T and BellSouth included a commitment by the merged company to operate a neutral Internet network with neutral routing along a

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

[3] *Broadband Industry Practices*, Notice of Inquiry, FCC 07-31 (rel. Apr. 16, 2007) ("Notice of Inquiry") ¶¶ 8,9.

[4] *National Cable & Telecomm. Ass'n v. Brand X Internet Services*, 545 U.S. 967 (2005) ("*Brand X*"). Prior to *Brand X*, the regulatory framework for cable modem services was unsettled, as a federal court had ruled that cable modem services should be treated as "telecommunications services" subject to common carrier regulation, contrary to a 2002 decision of the Commission.

[5] *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Report and Order and Notice of Proposed Rulemaking, FCC 05-150 (rel. Sept. 23, 2005).

[6] *SBC Communications Inc. and AT&T Corp. Applications for Approval of Transfer of Control*, 20 FCC Rcd 18290 (rel. Oct. 31, 2005); *Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control*, 20 FCC Rcd 18433 (rel. Oct. 31, 2005).

substantial portion of the company's wireline infrastructure, again for two years.[7] Thus, these major carriers are limited in their present ability to engage in discriminatory practices.

Perhaps most significantly, **heightened political attention** to the issue of Internet neutrality makes it unlikely that an ISP would go public in the near term with any strategy that would depart significantly from the Internet's existing neutral attributes – regardless of what the ISP's plans or incentives may be over the longer term. Multiple versions of Internet neutrality legislation have been proposed and remain pending; there is significant public and "Netroots" interest in the issue; and both this Commission (in this very proceeding) and the Federal Trade Commission have been publicly investigating the issue.[8] Thus, the risks of negative publicity and a serious policy backlash may impose a significant current constraint. Like those stemming from merger agreements, however, this constraint is likely only temporary; when political attention is focused elsewhere, changes in the handling of Internet traffic, particularly if gradual, might draw less attention.

Finally, it is the network operators themselves who would have the closest knowledge of any specific types of packet management practices in use today. While they will surely report on some in the context of this proceeding, it is important to keep in mind that the network operators have a vested interest in emphasizing the most positive-seeming examples.[9] Examples of practices with arguably harmful effects or motives would be unlikely to be self-reported in a voluntary response to this kind of inquiry. Meanwhile, **outside parties are unlikely to be in a position to document the carriers' internal practices** relating to prioritization or discrimination.

CDT does not mean to suggest that ISPs necessarily have devised long term plans involving harmful discrimination or any other practice and are merely waiting to implement them. Indeed, ISPs in many cases may not have determined how best to respond to the evolving legal regime, technological possibilities, and broadband marketplace, and thus may have no clear sense of what new business or technical practices they may want to adopt several years from now. The point is simply that a span of two years under the current legal framework, with merger-related and political considerations operating as significant constraints, is not an adequate period for problematic forms of discrimination to make themselves evident. Accounts of current

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[7] *Review of AT&T Inc. and BellSouth Corp. Application for Consent to Transfer Control*, FCC 06-189 (rel. Mar. 26, 2007).

[8] The FTC held a two-day public workshop on the issue in February 2007 and solicited public comments. *See* http://www.ftc.gov/opp/workshops/broadband/index.shtml.

[9] One example that has sometimes been offered to emphasize the positive uses of prioritization is medical monitoring services. *See, e.g.,* Robert E. Litan, *Catching the Web in a Net of Neutrality*, The Washington Post (May 2, 2006). To the extent that this example seems to imply that prioritization could facilitate critical medical services that cannot tolerate minor delays or disruptions without jeopardizing someone's health, CDT is highly skeptical. The Internet is simply not well suited for applications that require fully reliable transmission because Internet traffic traverses the networks of multiple carriers, making it impossible for any one carrier to fully guarantee end-to-end quality of service. Any medical service that requires 100% reliability would need to be carried on dedicated and redundant facilities.

behavior may provide limited evidence one way or the other as to the magnitude of the risk that network operator policies favoring or disfavoring particular content could harm consumers or innovation.

Moreover, there are grounds for skepticism about overconfident pronouncements that marketplace forces will automatically preclude harmful behavior. The market for broadband access in most U.S. localities is at best a duopoly and is characterized by high barriers to entry.[10] For most Americans, a wide range of competitive broadband choices is a distant prospect, even if wireless or other technologies are eventually able to offer an additional choice or two in some localities.[11] In short, for the foreseeable future, broadband competition will be limited to a very small number of entities in each local market. Even where a few rivals may compete vigorously on price or speed, the market may not provide a reliable check on all possible behaviors – particularly where a behavior gives network operators an attractive measure of control or an additional possible revenue source.

Experience does suggest that private-sector owners of communications networks often prefer to retain some control over how those networks are used. AT&T famously resisted allowing customers to use non-AT&T telephone equipment until forced to do so by the FCC's *Carterphone* decision.[12] Mobile phone networks have generally not been open to unaffiliated applications and devices, as has been highlighted in a pending petition filed with the Commission.[13]

On the Internet, meanwhile, when cable modem providers introduced their service in the 1990s, they originally blocked steaming video applications.[14] Madison River Communications

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[10] The FCC's most recent report on high-speed services for Internet access revealed that 95% of residential broadband lines are either cable or DSL. The report also showed that residents of 37% of ZIP codes have only one of these choices, or neither. *See* Federal Communications Commission, *High-Speed Services for Internet Access as of June 30, 2006* (Jan. 2007) at 7, 22.

[11] As CDT and others have argued, the 700 MHz spectrum auction proceeding may present an opportunity to promote at least some additional broadband choice. Comments of the Center for Democracy & Technology, *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands* (May 23, 2007).

[12] *Use of the Carterfone Device in Message Toll Telephone Service*, 13 FCC 2d 420 (1968).

[13] *See Skype Communications S.A.R.L. Petition to Confirm a Consumer's Right to Use Internet Communication Software and Attach Devices to Wireless Networks*, RM-11361 (filed Feb. 20, 2007); *see also* Tim Wu, *Wireless Net Neutrality: Cellular* Carterfone *and Consumer Choice in Mobile Broadband*, New America Foundation Working Paper #17 (Feb. 2007) (reviewing the specific ways wireless carriers "aggressively control[] product design and innovation in the equipment and application markets").

[14] Jonathan E. Nuechterlein and Philip J. Weiser, *Digital Crossroads: American Telecommunications Policy in the Internet Age* (2005) at 173. Marketplace pressures quickly forced cable modem providers to scuttle this policy, but in the early days of cable modem service DSL was still subject to common carriage rules and narrowband ISPs were still a significant factor in the market. It is an open question whether marketplace pressures would necessarily

blocked stand-alone VOIP service.[15] An Australian DSL provider reportedly favors selected content, including its own Web sites, by exempting it from monthly volume usage caps it establishes for all other traffic.[16] Several major cable providers in Korea reportedly either blocked or reduced bandwidth to a service delivering on-demand streaming video.[17] Telus, one of Canada's largest ISPs, blocked a Web site created by an employee labor union that displayed information about the union's contract dispute with Telus.[18] These may be isolated incidents, or they may reflect underlying temptations or incentives, at least under some circumstances, for network operators to try to establish a measure of "gatekeeper" control that the Internet has traditionally not afforded.

If practices to favor or disfavor particular Internet traffic were to evolve in directions that undermine the openness of the Internet, it is **not clear that the damage could be easily reversed** after-the-fact. Unraveling a web of discriminatory deals after significant investments have been made and business plans built would be a difficult and complicated undertaking both logistically and politically. It could also be difficult to document the specific competitive harms; nobody knows about small businesses and innovative applications that are lost before they make if off the ground.

In sum, current prioritization or discrimination practices in the broadband marketplace may not tell the full story. CDT believes it could be useful to focus as well on **what capabilities are being built into modern broadband networks**; for example, are new routers offering new functions for prioritizing, classifying, or inspecting network traffic? This would be an important area for further Commission inquiry, because the capabilities being developed and the investments being made to deploy them may offer a least as much insight into future plans and risks as any observable current behavior. An inquiry into technical capabilities would provide crucial factual background for serious policy analysis concerning the broadband market.

2. Possible Discrimination / Packet Management Practices

Given the limitations of a survey of current behavior, CDT believes it would be useful to outline specific categories of possible practices that may favor or disfavor certain traffic, and to distinguish those that seem unobjectionable or beneficial from those that could undermine the

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force the same result in a market where DSL is the only real competitor and is free to engage in similar practices itself.

[15] *Madison River Communications, LLC and Affiliated Companies*, 20 FCC Rcd 4295 (2005).

[16] OECD Working Party on Telecommunications and Information Services Policies, *The Implications of WiMax for Competition and Regulation*, DTSI/ICCP/TISP (2005)4/FINAL (Mar. 2, 2006) at 25.

[17] OECD working Party of Telecommunications and Information Services Policies, *Internet Traffic Prioritization: An Overview*, DSTI/ICCP/TISP(2006)4/FINAL (Apr. 6, 2007) ("OECD Prioritization Overview") at 20-21.

[18] *Telus Blocks Consumer Access to Labor Union Web Site and Filters an Additional 766 Unrelated Sites*, OpenNet Initiative: Bulletin 010 (Aug. 2, 2005) at http://www.opennetinitiative.net/bulletins/010/.

openness of the Internet. The Appendix at the end of these Comments represents CDT's effort to categorize, without expressing any judgment, specific ways that a network operator might manage or discriminate between packets traveling over its network. This kind of catalogue of possible practices could provide a basis for a focused policy discussion about what practices seem like legitimate network management techniques, what practices seem likely to undermine key characteristics of the Internet, and what practices could fall into either category and hence may warrant close monitoring.

Several packet management practices listed in the Appendix seem unobjectionable. In particular, **blocking certain traffic based on the request of the subscriber** poses no concern. For example, an ISP might offer parental controls that can be activated or deactivated by individual subscribers to block access to material unsuitable for children. Parents might likewise choose to block access to certain peer-to-peer file sharing applications to prevent their children from engaging in illegal downloading. Or the ISP might market itself from the start as a specialized "family friendly" ISP, so that all its subscribers recognize that their choice of ISP entails some limits on the content to which they will have access. So long as the blocking functions are clearly disclosed, respond to a real market demand, and are not the only choice consumers have, there would not seem to be any problem.

For similar reasons, **prioritizing traffic selected by the subscriber** seems perfectly benign.[19] For example, an ISP could offer to let the subscriber designate one or more applications for priority treatment (perhaps for a fee). If an application like VOIP works best with some priority, a subscriber could direct the ISP to prioritize his VOIP traffic, no matter what VOIP provider he happens to use. The ability to prioritize, under this scenario, can help selected applications work better – but because the prioritization is effectively "portable," it should not in any way distort a subscriber's choice between competing application or online service providers.

Blocking security threats, spam, and illegal content also should pose little concern. In some cases, such as certain anti-spam tools, this kind of blocking might be activated by individual users. But the ISP might also need to block some traffic on its own initiative, so that the traffic is barred from the entire network rather than just from a subset of subscribers. Examples could include phishing scams and efforts to flood the network as part of a distributed denial of service attack or spam campaign. There is, however, some risk of disputes over an ISP's characterization of certain traffic as a security threat or spam. This issue could be best addressed by ISPs disclosing their general security blocking policies and criteria, as well as offering a reasonable process for considering the claims of those who feel they have been wrongfully blocked.

Another practice that seems unobjectionable is the provision of **caching services**. These services differ from the other practices discussed in this section in that they are available from

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[19] "Prioritization" in this context would mean that packets associated with certain traffic get priority routing treatment in the case of congestion. Favored packets could enjoy shorter queuing delays, lower probabilities of dropped packets, and more efficient routing pathways than if the routers handled all packets equally on a first-in, first-out basis. *See* OECD Prioritization Overview at 7-15.

companies like Akamai rather than (or in addition to) ISPs themselves. In addition, caching services do not cause some packets to be prioritized over others during the transmission process; rather, they speed delivery by storing certain content closer to potential recipients. It is as if, rather than giving one company's vehicles the right to cut in front of others on crowded roads, the company simply established more local offices so its vehicles would have shorter drives. Unlike prioritization in routing, therefore, caching services improve the delivery of some traffic without having any negative impact on other traffic. The only possible concern CDT could envision would be if a network operator were to try to exclude third party caching providers by denying them convenient local interconnection for their data storage facilities, and perhaps then offer its own caching service on a selective basis.

In contrast to the generally benign practices discussed above, some types of practices would pose major concerns. **Blocking traffic based on the identity of the specific application or service** could clearly have anticompetitive effects. This would put the network operator in a true "gatekeeper" role, able to control which particular content and services will be accessible to its subscribers and which will not. **Blocking based on application type** (e.g., blocking all VOIP or all peer-to-peer traffic) would not allow quite such fine-grained control, but would still carry serious implications for innovation because it would make the network operator's approval essential for the introduction of new types of applications. Innovative applications that could prove disruptive to existing business models might find themselves blocked.[20]

Affirmative degradation also seems likely to be harmful in most instances. This practice would involve detaining or dropping some packets even when there is sufficient available bandwidth to transmit them onward – with the result that the affected traffic streams get <u>less</u> than "best efforts" delivery. (This type of practice has also been termed "active prioritization."[21]) When such degradation is based on the content of the traffic or identity or type of the associated service or application, it could be used to disadvantage competitors or innovators and make network operator approval a precondition for good transmission quality. One possible exception could be affirmative degradation based on a generally applicable bandwidth-related rule. For example, a rule stating that no application may consume more than 20% of available bandwidth at any time could result in delays for some packets of bandwidth-intensive applications, but it would not unfairly skew competition so long as the rule is evenly applied and suitably disclosed.

Also of concern would be practices that, in times of congestion, **grant increased priority** to packets from particular application or service providers who are **affiliated or have struck an exclusive deal with the ISP**. Such prioritization would enable the ISP to distort competition among applications and services by giving its own offerings a technical advantage. Moreover, it

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[20] Of course, network operators might argue that they need to block (for example) peer-to-peer applications because of bandwidth usage concerns. But bandwidth issues would be better addressed by adopting policies that focus directly on actual bandwidth usage, either by user or by application, rather than barring entire categories of applications.

[21] OECD Prioritization Overview at 12. *See also* Edward W. Felten, *Nuts and Bolts of Network Neutrality*, Princeton University (Jul. 6, 2006) at 3 (using the term "non-minimal discrimination" to describe the same practice).

is important to consider that granting priority would not just improve the performance of the ISP's favored traffic. It would also degrade the performance of all other traffic – because in a congested network, where packets are lining up in crowded buffers awaiting their turn, moving some packets to the head of the line inevitably entails a longer wait for the others.

Other packet management practices could raise more debatable scenarios. Prioritizing packets from application or service providers who have paid for special treatment, where the ISP offers such treatment to **anyone willing to pay**, would result in less ISP control than if the deals for priority were exclusive. CDT would be very concerned, however, if purchasing priority from ISPs were to become necessary, as a practical matter, to obtain reasonable quality delivery of traffic. Innovators and new entrants in applications markets would then have to enter deals with multiple ISPs in order to roll out their products on a broad geographic basis, creating the very kind of barriers to entry that the Internet has so far avoided. In addition, the risk of any impact on innovation or competition could be reduced by, as noted above, making prioritization portable – in other words, letting individual subscribers pay for priority treatment for the applications or services <u>of their own choice</u>. Application and service providers could even offer rebates to their customers for the cost, so end users need not foot the bill.

Prioritizing traffic based on application type might be beneficial in some cases, since certain applications have greater sensitivity to the timing and reliability of packet delivery than others. For example, since VOIP applications can be impaired by "jitter" – the delivery of packets in a bursty, inconsistent rhythm – it might make sense to prioritize VOIP packets over less sensitive functions like Web browsing. But there remains the possibility for abuse, such as an ISP favoring a "type" of application that has been defined so narrowly as to effectively apply only to a specific, ISP-affiliated VOIP provider. Public disclosure of prioritization practices would be an important safeguard against possible abuse.

Finally, **delivering some traffic over dedicated or segregated channels**, separate from general Internet traffic, could be a useful way to handle certain high-volume content. This is what happens today on cable systems; television programming is delivered on separate channels from the broadband service. CDT's view is that delivery of some content over the non-Internet portion of broadband networks will generally not be harmful. The only risk is that a broadband provider could devote most of its expansion efforts to building more non-Internet capacity, while allowing the bandwidth allocated to general purpose Internet to stagnate and lose utility over time. As noted below, CDT believes this risk warrants ongoing monitoring.

3. Possible Pricing Practices

Network operators potentially could seek to favor or disfavor particular traffic not only through the technical handling of packets, but also through pricing policies. Broadband charges that vary based on what subscribers do with their broadband connections could be used to steer subscribers towards particular services and away from others.

There should not be any concern, however, with charging broadband subscribers different amounts based on the quantity of network resources they use, receive, or have available.

It is common in the United States for service tiers to be based on maximum **transmission speeds**. Thus, a broadband subscriber may pay more for a connection that can deliver downloads at up three megabits per second than a connection that can handle only one, and more still for a connection that can handle ten. There is nothing inappropriate about a network operator adopting this kind of pricing regime. This approach does, however, create a risk of "bandwidth hogs" who burden the network by continuously transmitting data at or near the maximum speeds. A subscriber with a one megabit connection who is constantly engaged in high-volume gaming or file sharing, for example, pays the lower fee but actually is a much more intensive user of network resources than many three megabit subscribers with more sporadic usage patterns.

Another valid approach that could help address the "bandwidth hog" problem would be to base charges on **actual usage or throughput**. Usage could be fully metered, with subscribers paying based on the number of bits transmitted. Or subscribers could pay a flat rate entitling them to transmit up to a certain number of bits per month, with surcharges for excess usage. (Many current mobile phone subscription plans take a comparable approach.) Broadband providers could even charge different rates for usage at different times, an approach economists refer to as "congestion pricing." CDT is not aware that U.S. broadband providers currently tie fees to actual usage or establish explicit usage caps, but such practices reportedly are relatively commonplace in other countries.[22]

All of these pricing practices, and other varieties of usage-linked pricing plans that could be developed, pose no problem so long as the terms are sufficiently clear for subscribers to understand the parameters and limitations of the service they are purchasing. That does not mean the terms need to be complicated; for example, there could be a high enough usage cap that only a tiny fraction of users ever have to worry about bumping up against the limit and incurring extra charges.[23]

Broadband charges that vary based on the **particular content, services or applications a subscriber chooses to use** over that broadband connection raise a more difficult question.[24] Network operators might seek to offer a variety of cross-promotional deals that involve discounts for subscribers using particular online services, and such deals might well be attractive to individual consumers. Aggressive use of content-based pricing, however, could put an ISP in a position to exercise a substantial degree of control over effective access to its subscribers. For

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[22] OECD Prioritization Overview at 25.

[23] Some ISPs currently address the valid concern about a small number "bandwidth hogs" through contractual terms setting vague limits on excessive use or prohibiting specific uses assumed to be bandwidth-intensive. An express cap on usage could offer a more direct and predictable way of addressing the issue.

[24] CDT is referring here to pricing practices that make the price of broadband service itself dependent on the particular online applications or content a subscriber chooses to access over that service. Making the price for broadband service vary depending on whether a subscriber also buys other, non-Internet services – as when ISPs "bundle" broadband with cable television or wireline telephone service – is an entirely separate question that CDT does not address here.

example, suppose a network operator imposed surcharges for using Internet applications other than those on a list of "favored partners." Alternatively, if broadband fees were based on usage, the ISP could charge a higher per-bit rate for "off-list" applications or content. The risk is that such practices could make being "on the list" a practical necessity for effectively reaching the ISP's customers, creating a barrier to entry that has not typically existed on the Internet. Thus, CDT has questions about whether and when content-based pricing practices could conflict with the vision of a "no gatekeeers" Internet.

4. Suggestions for Commission Action

To the extent that some discriminatory practices can be identified as very likely harmful, CDT believes there is a strong argument for a policy framework that sends a clear signal in advance that such practices will not be permitted. Purely after-the-fact enforcement may sound fine in theory, but behaviors and practices could be hard to reverse once they become entrenched. Unraveling a web of discriminatory deals after significant investments have been made and business plans built could be complicated both logistically and politically. Addressing some basic questions in advance also would give better notice to network operators, so they do not waste resources developing and deploying systems and capabilities only to later have them ordered disabled. Certainty could also be important from the perspective of innovators and start-ups, who could benefit from some assurance that they will remain able to reach all Internet users without needing to cut special deals with each ISP.[25]

In CDT's view, the task of developing an appropriate overall policy framework lies with Congress. Carefully targeted rules should be set forth in legislation, with the Commission (or other administrative agency) primarily playing an enforcement role.[26] In the absence of such legislation, the Commission's authority over the broadband Internet is open to question. Nonetheless, there may be some steps the Commission could take without waiting for further legislative direction.

A. Ongoing Monitoring

The ability to offer content, applications, and services to all Internet users without entering deals with the ISP of each user is a big part of what makes the Internet uniquely open to innovation, competition, and speech. The Commission should watch for any evidence that network operators are failing to preserve and maintain this open version of the Internet in favor of models that allow the ISP to monetize effective access to its subscribers. In particular, the

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[25] *See, e.g.*, Written Statement of Blair Levin before U.S. Senate Judiciary Comm. hearing on *Reconsidering Our Communications Laws: Ensuring Competition and Innovation* (June 14, 2006) ("[F]rom the perspective of investing in Internet applications and content, knowing that such access will continue to be available would be a critical variable in the investment decision. Without some basic guarantee of an improving, not degrading, open lane, investors in Internet applications would be less willing to invest in new applications.").

[26] *See* Center for Democracy & Technology, *Preserving the Essential Internet* (June 2006) at 9-11.

Commission should be alert for any signs of the behaviors identified above as posing substantial concerns. It should keep track as well of any new capabilities that broadband operators are deploying that could facilitate differential treatment of traffic.

In addition, if broadband operators develop new revenue streams based on selling either priority treatment (on the shared Internet bandwidth) or dedicated delivery channels (separate from the Internet bandwidth) to online application and service providers, the Commission should monitor the amount of network capacity that broadband providers continue to dedicate to the general purpose Internet. These new traffic delivery options could create an incentive to underinvest in general Internet capacity – because congestion on the Internet bandwidth would tend to drive up the popularity and value of the ISP's prioritization and/or dedicated bandwidth products. Therefore, it would be important for the Commission to track how well both downstream and upstream Internet capacity keep pace with the demands of Internet users as Internet applications and technologies evolve.

B. Promoting Disclosure / Transparency

While there is an ongoing debate about whether market forces alone can protect against potentially harmful practices in the broadband market, it should be clear that market forces will not provide much protection if the practices in question are not transparent. Simply put, consumers cannot exert pressure against practices they do not know are occurring.

Many of the practices discussed in these comments, particularly those involving prioritization of some packet streams over others, will not be readily transparent without ISP disclosure. In the absence of such disclosure, the average broadband subscriber has no way to evaluate the cause of observed differences in the quality and speed of different Web sites, online services, or applications. Many likely would assume that such differences stem from factors related to the Web sites, services, or applications themselves: how much server capacity they have purchased, the quality of their software or their own Internet connection, etc.

If in fact the subscriber's own ISP has caused the difference by agreeing to prioritize certain selected traffic, subscribers should have an accessible means for finding this out. There may be a role for government, therefore, to press for disclosure of ISP policies and practices regarding prioritization, blocking, or degradation. Industry efforts to develop sound "best practice" standards could be helpful also. In the case of prioritization, disclosure should include, where applicable, the names of the specific entities favored by prioritization deals. In the case of blocking and affirmative degradation, disclosure should explain what legitimate security or network management purpose is served and what the basic criteria are for selecting the traffic to be blocked or degraded (without going into sufficient detail to allow bad actors to determine how to avoid being blocked).

CDT is not certain whether the Commission is best positioned or even has jurisdiction to address this transparency issue. The Federal Trade Commission would be another possible candidate, or perhaps Congress should determine where to assign responsibility.

In any event, public disclosure of policies favoring or disfavoring selected traffic could help consumers make more informed choices and exert some pressure against any practices they perceive as excessive ISP meddling in their selection among competing Internet content, service, and applications. Transparency also is important with respect to pricing policies, so purchasers can understand and compare different broadband service plans. If there are steps the Commission can take under its existing statutory authority to promote transparency, it should consider doing so.

C. Adding a Nondiscrimination Principle

The principles set forth in the Commission's broadband Policy Statement say that broadband consumers are entitled to access and use the Internet content, services, applications, and devices of their choice.[27] Of the possible ISP practices discussed in these Comments, outright blocking of Internet traffic seems most clearly inconsistent with these principles (unless, as noted above, blocking of certain content has been requested by the consumer).

The principles do not, however, say anything about the quality, speed, or reliability of a user's access to her chosen content. Thus, with the exception of outright blocking, the Commission's broadband principles arguably do not address the practices identified above as potentially harmful – involving, for example, affirmative degradation, certain types of prioritization, and content-based pricing.

The Commission should therefore consider adding an additional principle to those set forth in the Policy Statement. Taking a parallel form to the other principles, a new principle could read:

- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet,* consumers are entitled to access and use the content, applications, services, and devices of their choice without unreasonable discrimination by their network provider with respect to speed, service quality, or price.

CDT believes the addition of a new principle along these lines would help the Policy Statement better reflect the full range of characteristics that have made the Internet uniquely open to innovation, competition, and speech. At a minimum, it would send a significant signal to network operators and investors as they contemplate future business plans. It is important to note, however, that the principles do not have the status of enforceable rules.[28] They therefore do not provide clear legal protection even to those qualities they expressly reference.

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[27] *See* Policy Statement ¶ 4.

[28] *See* Policy Statement ¶5 & n.15 (stating that "the Commission will incorporate the above principles into its ongoing policymaking activities" and that "we are not adopting rules in this policy statement").

CDT welcomes the Commission's attention on these important questions and appreciates the opportunity to comment.

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APPENDIX:
Potential ISP Practices To Distinguish / Discriminate Among Traffic on Internet

The following is CDT's effort to list possible ISP practices that may involve some form of differential treatment for different traffic. It is not intended to imply any judgment about whether specific listed practices would be benign or objectionable, nor about how likely they may be to occur.

I. Outright Blocking
ISP blocks subscriber access to certain Internet locations, applications, or devices

A. Blocking initiated / requested by subscriber
1. Via individually activated tools
2. Via ISP blocking policy marketed to customers

B. Blocking based on security, spam, illegal content

C. Blocking based on type of application/service

D. Blocking based on specific identity or content of application/service

Examples

- parental controls
- "family friendly" ISP service marketed on that basis
- block all VOIP or p2p traffic
- block traffic associated with a particular VOIP provider or p2p application

II. Discriminatory Routing
Some packet streams get more favorable routing treatment than others (e.g., shorter queuing delays, lower probability of dropped packets, more efficient routing pathway, etc.)

A. Affirmative Degradation
Certain traffic is slowed or degraded independent of any actual congestion constraints; receives less than "best efforts" transmission
1. Degradation based on generally applicable bandwidth-related rule
2. Degradation targeting specific type or identity of content/application

B. Prioritization in Case of Congestion
Where congestion requires that some packets will be delayed or dropped, priority may determine which packets get transmitted first
1. Prioritize specific traffic chosen by subscriber (perhaps for fee)
2. Prioritize all traffic associated with particular type of application/service
   a. Increased priority
   b. Decreased priority
3. Prioritize traffic based on identity of application/service provider
   a. Increased priority for ISP-affiliated services
   b. Increased priority for those entering commercial deals with ISP
      i. Generally available deal (anyone can pay for priority)
      ii. Exclusive deal (priority available only for selected partners)
   c. Decreased priority for purposes of congestion management
   d. Decreased priority for competitive/commercial motive
4. Prioritize/deprioritize content expressing viewpoint favored / disfavored by ISP

C. Providing Segregated Channel / Bandwidth
Selected traffic is sent over specially reserved channel/bandwidth, rather than bandwidth carrying general Internet traffic
1. ISP sells access to reserved channels on nondiscriminatory basis, space permitting
2. ISP limits access to reserved channels

- bit rate limits for applications or users
- subscriber buys "priority boost" and can use it with application of own choice
- prioritize all VOIP packets
- deprioritize all p2p packets
- target identified bandwidth hogs, applications that tolerate delay
- target competitor of ISP affiliate or party that fails to enter into deal with ISP
- special channels for affiliates and exclusive deals only

Examples

III. Variable Pricing to Subscribers

A. Charges Based on Quantity / Quality of Network Connection

1. Capacity/speed of connection
2. Actual throughput used
3. Quality of service, prioritization offerings

B. Charges Based on Particular Services / Content Used by Subscriber

1. Type of application/service used
2. Identity or content of specific application/service used

charges based on number of bits transmitted per month

network operator offers subscriber options for boosting QoS or priority for certain purposes

pay extra for using VOIP or p2p

pay extra for using a particular brand of VOIP

IV. Other Possible Issues

These issues are likely tangential but are sometimes raised in discussions about ISP discrimination

A. Caching Services

Copies of specific content stored on servers at multiple locations, enabling quicker response time to requests

1. Provided by third parties – available to any willing purchaser
2. Provided by ISP – available to any willing purchaser
3. Offered on exclusive/discriminatory basis – with ISP precluding competitive alternatives by limiting access to necessary interconnection

B. Discriminatory / Limited Interconnection Among ISPs

1. ISP refuses to interconnect with certain other ISPs
2. ISP interconnects with other ISPs on varying terms
   a. Based on objective criteria
   b. Based on individual negotiation (discrimination possible on any basis)

interconnect only with ISPs of certain size

C. Failure to Invest in Adequate Internet Bandwidth

ISP underinvests in Internet capacity as a means to drive traffic to its other services