Chapter 4

AMERICA'S BROADBAND PROBLEM: OPENNESS

OPENNESS: THE FCC'S FAILURE TO PROTECT AND PRESERVE THE OPEN INTERNET

At the turn of the century, broadband was present in about 2 percent of American homes. Today, that figure stands at nearly 60 percent. No other technology even comes close to competing with this pace of adoption — not the telephone, television, the automobile, cable TV, cell phone, or even the computer itself.

Broadband's meteoric rise illustrates the immense value that this technology brings to users. This value is made possible, in large part, because the Internet is an open platform for innovation, speech and commerce. The Internet's openness is responsible for completely eradicating the barriers to entry present in traditional communications markets. Content producers no longer need to negotiate with powerful cable providers, newspaper publishers or broadcasters to get their work out to the masses; the Internet has an unlimited number of "channels." A citizen wishing to express an opinion about a pressing issue no longer needs to write a letter to the editor; they can reach far more readers online. And politicians no longer need to rely on the short-attention-span mainstream media to get out their message; they can use the Internet to speak directly to voters. We are only beginning to see the vast potential of the Internet as a medium for civic engagement.

The Internet's openness is also responsible for fostering unprecedented economic growth. It is a conduit for near "perfect competition" — the holy grail model for free-market economics.[177] Barriers to entry are reduced. Buyers are empowered by almost unlimited information and unlimited choice. Sellers are empowered by the ability to cut out middlemen and interact directly with the customer. And innovators and entrepreneurs have a platform for launching new ideas globally. What makes all this so remarkable is that the explosion in communications

[177] Perfect competition is an abstract concept in microeconomics, one that really is impossible to attain in the real world. However, the Internet marketplace comes about as close as you can to realizing the concept in practice. The eBay marketplace exhibits most of the features required for perfect competition: perfect information such that consumers know all producers' prices, low barriers to entry and exit, many buyers and many sellers, such that no single entity can influence price, and there are no consumption or production externalities or homogeneous products.

and economic activity took root and grew out of an infrastructure controlled in important ways by monopolists that had every incentive to use their market power to control and monetize these innovations.

Nondiscrimination and Content Control

But the remarkable level of competition taking place on the Internet is no historical accident. It is the precise outcome envisioned by the FCC when it first acted 40 years ago to implement safeguards designed to protect the emerging networking industry. These safeguards are based on the principle of "nondiscrimination." Using nondiscrimination as a regulatory tool, the Commission ensured a level playing field for emerging ISPs like AOL and Earthlink, and prevented the monopoly phone company from interfering with any third-party data flowing over its network.

The principle of nondiscrimination is so important that Congress intended for it to apply even in markets with effective competition. This is because the outcome that nondiscrimination produces — openness — is so essential to maintain. Congress recognized that once competition developed in the Internet access markets, certain regulations (such as Section 251 unbundling) would no longer be necessary or productive. So it gave the FCC explicit power to decide when to lift certain regulations. But because Congress was not convinced that competition alone would be enough to preserve the open nature of communications platforms, it put a structure in place that would always require carriers to abide by the principle of nondiscrimination.[178]

So even if the FCC didn't bungle the implementation of the 1996 Act, and today's communications marketplace were sufficiently competitive to no longer require unbundling regulations, tariffs, or structural separation, nondiscrimination protections would still be needed to ensure consumer access to open platforms. This is necessary because network operators have strong incentives to exert power and control in adjacent markets.[179] In the case of the Internet, this obviously

[178] In Section 10 of Title I (47 U.S.C. 160) of the 1996 Act, Congress gave the Commission the authority to forbear from applying regulations on telecom carriers if a determination is made that "enforcement of such regulation or provision is not necessary to ensure that the charges, practices, classifications, or regulations by, for, or in connection with that telecommunications carrier or telecommunications service are just and reasonable and are not unjustly or unreasonably discriminatory, [or] enforcement of such regulation or provision is not necessary for the protection of consumers." Thus, Congress allowed the discontinuance of regulations so long as they were not needed to ensure a specific desired outcome — *just, reasonable and non-discriminatory treatment*. But the outcome itself remained paramount. Indeed, this is made quite clear in Section 332(c)(1)(A) of the Act (and in Section 10 itself, which refers to this specific passage), which gives the FCC the authority to selectively apply Title II regulations to commercial mobile service (CMRS) carriers, but specifically forbids the FCC from removing CMRS providers from an obligation to adhere to Sections 201, 202 and 208 of the Act.

[179] *See* Barbara Van Schewick, "Towards an Economic Framework for Network Neutrality Regulation," *Journal on Telecommunications and High Technology Law*, Vol. 5, pp. 329-391 (2007).

includes the ISP access and device markets, which were the core focus of the *Computer Inquiries*. But it also includes the applications and content markets.

There is a constant tension between the perspective that the Internet is a common good, as embodied in the 1996 Act, and the desire of the network owners to earn maximum profits from selling Internet access. The network owners' fights against nondiscrimination, their efforts to block competitive ISPs from entering the access market, and their push to exert control over the device, content and applications markets are all motivated by a fear of bandwidth commoditization. Without control over the content and applications flowing across its network — or the devices used to access it — a network owner risks becoming just a "dumb pipe" provider. Further, without the ability to control content, network owners can't monetize the content flowing across the network. That's not to say that simply selling access is a bad business. It remains very lucrative. And treating network traffic anonymously and without discrimination is consistent with the common carrier tradition.

These tensions have been exacerbated by rapid advances in computing power and network technology, which have led to a sharp decline in the cost of bandwidth. Just as home computers are faster, more efficient and much cheaper than they were a few years ago, so too are the components that make up the infrastructure of the Internet. These technological improvements have lowered the network operator's cost to transport a "bit" — the fundamental digital building block of all Internet content. Since the cost of transporting bits has dropped, those providing content over the Internet using bits can do much more. A decade ago, the average Web page was essentially black text on a white screen. Today's Web offers a variety of bit-intensive content such as flash animation, live audio and video streams, HD-quality movies, as well as the ability to conduct a high-quality two-way video telephone call.

The falling cost of transporting bits led to consumers' placing higher value in the network, which in turn increased demand for Internet access. But network operators such as AT&T, Verizon, Comcast and Time Warner Cable have not been able to capture as much of the increased value of the Internet as they would like. Innovators at the edges of the network such as YouTube, Apple and Netflix are responsible for bringing the new products to the Internet that increase the network's overall value. Even though they control Internet access, network operators can't hike prices to capture all of this value without driving away consumers. Thus network operators have a strong incentive to assert control over the content flowing across their infrastructure, and to try to capture "economic rents" from across the value chain of the network. These incentives are amplified when the network owner itself has a stake in the traditional content distribution business — like cable television — that the open Internet threatens to undermine.

These same factors are what drive cable TV providers to vertically integrate. Cable operators pick and choose what channels they will carry on their networks. They can demand payment for carriage from some of the smaller channels, but they are forced to pay for the right to carry the more popular channels. So to capture more of the total market value, cable companies buy a stake in the channels they carry. In some cases, they even own a stake in content production. They want a piece of every part of the chain: the production company that makes a show, the channel that carries the show, and the cable system that delivers the show to the viewer.

From the perspective of a network owner, the same economic logic applies to the Internet. They prefer the cable model: Controlling content, vertically integrating and using market power to crush the threat of competitive entry is the easiest way for network operators to capture value and increase their profit margins. They have a huge incentive to assert this control, and without nondiscrimination protections, they will do it. To expect otherwise is irrational and ignores history.

The FCC Abandons Openness

The FCC's entire history of intervention in communications and information services markets up until 2002 was based upon a deep understanding of network operators' natural incentive to control content. Keeping this incentive in check is what motivated the *Computer II* structural separation rules[180], and it is why to this day the Commission has yet to grant any telecom carrier forbearance from Section 201 (a requirement to provide reasonable access) and Section 202 (a requirement to not unreasonably discriminate in offering that access).[181] The Commission's recognition of the importance of nondiscrimination rules in preventing carriers from exercising control over content extends into other areas of law such as interconnection and pole-attachment rights.[182] And concern about control over

[180] See discussion beginning *supra* page 33. In general, structural separation in the Internet context is a regulatory regime in which the owner of the network infrastructure is required to form a structurally separate corporate entity for selling Internet access. This separate entity must purchase the network access from the parent company at the same rates and terms that are made available to other ISPs.

[181] See discussion *supra* note 54. While it is true that no carrier has received forbearance from Sections 201 and 202, the Commission's complete removal of broadband Internet access service from Title II accomplished the same outcome. See *Petition of SBC Communications Inc. for Forbearance from the Application of Title II Common Carrier Regulation to IP Platform Services*, WC Docket No. 04-29, Memorandum Opinion and Order, 20 FCC Rcd 9361 (2005), at para. 17, stating, "The Commission has never forborne from applying sections 201 and 202 of the Act. In a 1998 order denying a petition for forbearance from sections 201 and 202 of the Act (among other sections), the Commission described those sections as the cornerstone of the Act. The Commission explained *that even in substantially competitive markets, there remains a risk of unjust or discriminatory treatment of consumers*, and sections 201 and 202 therefore continue to afford important consumer protections. Because the language of section 10(a) essentially mirrors the language of sections 201 and 202, the Commission expressed skepticism that it would ever be appropriate to forbear from applying those sections. Since then, the Commission has never granted a petition for forbearance from sections 201 and 202. If we were to grant such a petition now, we would have to provide a rationale for abandoning our own precedent" (emphasis added, internal footnotes omitted).

[182] *See* e.g., *AT&T Enterprise Forbearance Order* (*supra* note 151 at. paras. 67-68) where the com-

content is even present in Commission rules that govern cable leased-access regulations and program-access rules.[183]

Given this history, the Commission's series of decisions classifying broadband Internet as a pure "information service" is simply bewildering. The plain language of the 1996 Act makes clear that Congress intended for nondiscrimination to be the bedrock protection that preserved the open nature of *two-way* communications platforms, as opposed to *one-way* broadcast or cable TV platforms. But by declaring broadband Internet to be an information service without a telecommunications service component, the Commission removed America's most important two-way communications technology from the protections designed to keep it an open platform.

Just as the Commission was warned about the anti-competitive dangers of removing open access requirements, it was also strongly cautioned not to abandon nondiscrimination rules. In the *Wireline Broadband* proceeding that began in 2002, the FCC received numerous comments from ISPs, consumer groups and the public warning of the unintended consequences of leaving broadband outside of Title II's openness protections.[184] Even some advocates who urged the Commission to abandon unbundling and line sharing still urged the Commission to preserve minimal openness standards.[185] The fear was that without Title II protections,

---

mission stated, "For example, the protections provided by sections 201 and 202(a), coupled with our ability to enforce those provisions in a complaint proceeding pursuant to section 208, provide essential safeguards that ensure that relieving AT&T of tariffing obligations in relation to its specified broadband services will not result in unjust, unreasonable, or unreasonably discriminatory rates, terms, and conditions in connection with those services. ... In particular, many of the obligations that Title II imposes on carriers or LECs generally, including interconnection obligations under section 251(a)(1) and pole attachment obligations under sections 224 and 251(b)(4), *foster the open and interconnected nature of our communications system*, and thus promote competitive market conditions within the meaning of section 10(b)" (emphasis added).

[183] *See* e.g., 47 U.S.C. 536, "Regulation of Carriage Agreements" (establishing rules preventing cable operators from unfair treatment of programming vendors); 47 U.S.C. 548, "Development of Competition and Diversity in Video Programming Distribution" (establishing general non-discriminatory program access provision); and 47 U.S.C. 532, "Cable Channels for Commercial Use" (providing conditions for leased access).

[184] *See* e.g., Comments of Arizona Consumer Council, Center for Digital Democracy, Citizen Action of Illinois, Citizens Utility Board of Oregon, Consumer Action, the Consumer Federation of America, Consumers Union, Democratic Process Center, Florida Consumer Action Network, Illinois PIRG, Massachusetts Consumer Coalition, Media Access Project, New Jersey Citizen Action, Texas Consumer Association, Texas Office of Public Utility Counsel, U.S. Action, in the Matter of *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Universal Service Obligations of Broadband Providers,* CC Docket No. 02-33*,* Notice of Proposed Rulemaking, (2002) (*2002 Consumer Groups Comments*). *See also*, e.g., Letter from Gerard J. Waldron, Coalition of Broadband Users and Innovators, to Marlene H. Dortch, Secretary, FCC, CC Docket No. 02-33, at 1-2 (filed Aug. 27, 2003).

[185] *See* e.g., Comments of AT&T Corp, In the Matter of *IP-Enabled Services*, WC Docket 04-36, Notice of Proposed Rulemaking, at pp. 54-55 (2004)(*AT&T 2004 IP Service Comments*), Stating, "AT&T emphasizes that it is not seeking the "open access" leasing of last-mile broadband transmission facilities that the Commission is considering in its cable modem dockets. Rather, the Commission can directly prevent anticompetitive use of broadband transport facilities and foster

consumers would not be guaranteed unfettered access to all lawful Internet content and applications; and that the duopoly ISPs would act on their natural impulse to extend their last-mile market power into the adjacent content and applications markets. Furthermore, if the Commission intended to strip away open access rules that provided for competition in the access market, the nondiscrimination principles in Sections 201 and 202 were the last lines of defense for an open marketplace for ideas and commerce on the Internet.

These fears were tied to concerns about how reduced ISP competition in the access market would harm consumers through higher prices and reduced innovation. But the Commission was in somewhat uncharted territory and did not appear to grasp the gravity of the situation. At the time of the 2002 *Wireline Broadband NPRM*, the overwhelming majority of users connected to the Internet via dial-up and were afforded the protections of nondiscrimination in Title II, as well as the benefits of robust ISP competition. Among the few nascent broadband services in use at the time, cable modem service was largely governed by FTC or FCC consent decrees to provide unaffiliated ISP access. And DSL services were provided by ILECs still subject to Title II. Thus, there hadn't yet been efforts by network providers to discriminate against Internet content, both because of existing restrictions and because the market had yet to develop. At this time, network owners repeatedly promised never to engage in anti-competitive activity if they were granted deregulation.

Just because bad outcomes had yet to occur didn't mean they would never occur once the legal protections were eliminated. This possibility was certainly considered by consumer advocates and by Internet content companies, which all urged the Commission not to completely abandon nondiscrimination. In 2002, Amazon.com proposed a compromise "non-impairment" rule, which would have required network operators either not to interfere with consumers' access to all lawful Internet content, or to allow at least three unaffiliated ISPs to offer Internet access service over their facilities under terms no less favorable than those given to the incumbents' own ISP affiliates.[186] But the FCC chose to ignore these pleas for some baseline consumer protections. The predictions of bad behavior were not enough: The Commission wanted proof of *past* bad actions by network operators.

unimpeded access to IP applications with modest technology neutral conduct regulation that merely prohibits broadband carriers from discriminating against unaffiliated IP applications and content, while otherwise giving these carriers substantial flexibility over the scope and terms of their service offerings." *See* also Reply Comments of Communications Workers of America in the Matter of *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Universal Service Obligations of Broadband Providers,* CC Docket No. 02-33, Notice of Proposed Rulemaking, at page 5 (2002) (*2002 CWA Reply Comments*).

[186] *See* Letter from Paul E. Misener, Amazon.com, to Marlene H. Dortch, Secretary, FCC, CC Docket No. 02-52, at 1-2 (filed December 2, 2002) (*Amazon Broadband Non-Impairment Rule Ex Parte*).

But those bad actions were prohibited by the rules the agency was about to eliminate.[187] Even though the Commission declined to impose non-impairment rules, the FCC still agreed that network owners should not "actively [interfere] with consumer access to any lawful Internet information, products, or services" and that such behavior "would be inconsistent with the statutory goals of encouraging broadband deployment and preserving and promoting the open and interconnected nature of the public Internet."[188] In other words, the FCC endorsed the goals of the laws that it was busy eviscerating.

To paper over this obvious contradiction, the FCC sought a thin veneer of justification. So in the summer of 2005, on the heels of the Supreme Court's decision in the *Brand-X* case[189], a compromise was hashed out by a divided four-member Commission. In this compromise, firm nondiscrimination rules were jettisoned and replaced with the *Internet Policy Statement*.[190] The statement contained four principles designed to preserve the open nature of the Internet in the absence of Title II nondiscrimination rules. Those principles are:[191]

> To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled:
>
> 1. to access the lawful Internet content of their choice.
> 2. to run applications and use services of their choice, subject to the needs of law enforcement.
> 3. to connect their choice of legal devices that do not harm the network.
> 4. to competition among network providers, application and service providers, and content providers.

[187] See *Wireline Broadband Order*, *supra* note 124, at para. 96, "Some commenters request that we impose certain content-related requirements on wireline broadband Internet access service providers that would prohibit them from blocking or otherwise denying access to any lawful Internet content, applications, or services a consumer wishes to access. 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" (internal footnotes omitted).

[188] *Ibid.* at para. 96.

[189] See *supra* note 122.

[190] See Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, CC Docket No. 02-33, Policy Statement, 20 FCC Rcd 14986 (2005) (*Internet Policy Statement*).

[191] A footnote to the four principles of the *Policy Statement* stated: "The principles we adopt are subject to reasonable network management." This footnote would be the subject of much of the current ongoing debate surrounding Network Neutrality.

Though the *Internet Policy Statement* was issued in the *Wireline Broadband* proceeding, it does not specify that the four principles are meant only to apply to broadband services provided by common carriers. In his concurring statement, FCC Commissioner Jonathan Adelstein wrote that he was pleased that the *Internet Policy Statement* "will inform the Commission's future broadband and Internet-related policymaking" and "apply across the range of broadband technologies."[192]

Policy statements are not uncommon in regulatory agencies, but the absence of firm rules creates a level of uncertainty. Clearly Commissioner Michael Copps, who was the driving force behind the statement, felt it was a strong set of principles that the Commission could use to protect consumers. In his concurrence, Copps stated that the *Internet Policy Statement* "lays out a path forward under which the Commission will protect network neutrality ... a line has been drawn in the sand."[193] (Worthy of note: Here we see Commissioner Copps using the term "Network Neutrality." By 2005, the term "Network Neutrality" or "Net Neutrality" became the preferred term used to capture the Internet content nondiscrimination protections in Title II. Though the vocabulary had evolved, the underlying principle of nondiscrimination had not changed.) Chairman Kevin Martin, who later aggressively enforced the statement in 2008, seemed more circumspect at the time, stating, "Competition has ensured consumers have had these rights to date, and I remain confident that it will continue to do so."[194]

The Early Network Neutrality Debate

The ink on the *Internet Policy Statement* was barely dry before incumbents started testing the FCC's resolve. This was hardly a surprise — indeed, it was a predictable outcome of the sweeping deregulation the FCC had just enacted. Free from the rules that prevented anti-competitive activity and the abuse of market power, network owners began to talk openly about their intentions. Just three months after the Commission adopted the *Wireline Broadband Order*, when asked about his

[192] See "Statement of Commissioner Jonathan S. Adelstein Concurring in FCC 05-150, Approving in FCC 05-153," in the *Wireline Broadband Order* (*supra* note 124).

[193] See "Statement of Commissioner Michael J. Copps Concurring," in the *Wireline Broadband Order* (*supra* note 124).

[194] See "Statement of Chairman Kevin Martin," in the *Wireline Broadband Order* (*supra* note 124). Martin also released a separate statement to the press when the order was voted, stating, "While policy statements do not establish rules nor are they enforceable documents, today's statement does reflect core beliefs that each member of this Commission holds regarding how broadband Internet access should function. Cable and telephone companies have led the way in bringing broadband to millions of Americans. The evidence today is that their Internet access consumers have the ability to reach any Internet content. Indeed, cable and telephone companies' practices already track well the Internet principles we endorse today. I remain confident that the marketplace will continue to ensure that these principles are maintained. I also am confident, therefore, that regulation is not, nor will be, required." *See* "Chairman Kevin J. Martin Comments on Policy Statement," August 5, 2005. Given that three years later Mr. Martin would vote with the two Democratic Commissioners to sanction Comcast for violating the *Policy Statement*, it's clear he was wrong about policy statements not being enforceable, and he was wrong that the marketplace would ensure that the principles would be maintained.

feelings on companies like Google, SBC CEO Ed Whitacre made comments that now live in infamy as "the shot heard round the Web":

> "How do you think they're going to get to customers? Through a broadband pipe. Cable companies have them. We have them. Now what they would like to do is use my pipes free, but I ain't going to let them do that because we have spent this capital and we have to have a return on it. So there's going to have to be some mechanism for these people who use these pipes to pay for the portion they're using. Why should they be allowed to use my pipes? The Internet can't be free in that sense, because we and the cable companies have made an investment and for a Google or Yahoo! or Vonage or anybody to expect to use these pipes [for] free is nuts!"[195]

This and other proclamations by incumbents[196] of their intent to turn the open Internet into their own private fiefdoms ignited public outrage and elevated the Network Neutrality debates from an insider D.C. policy matter to a bona fide grassroots campaign.[197] This outrage was directed through the Savetheinternet.com coalition, a large and politically diverse group lead by Free Press, with membership ranging from the Christian Coalition to Moveon.org. This campaign threw the old telecom lobby for a loop, as they had expected a compliant Congress to conduct business as usual and squash the Net Neutrality movement in its infancy. This campaign was also unique in that it was one of the first examples of a true online-grassroots campaign, one that harnessed the power of the Internet itself to get its

[195] When asked about his feelings on companies like Google, MSN and Vonage, Whitacre said, "How do you think they're going to get to customers? Through a broadband pipe. Cable companies have them. We have them. Now what they would like to do is use my pipes free, but I ain't going to let them do that because we have spent this capital and we have to have a return on it. So there's going to have to be some mechanism for these people who use these pipes to pay for the portion they're using. Why should they be allowed to use my pipes? The Internet can't be free in that sense, because we and the cable companies have made an investment and for a Google or Yahoo! or Vonage or anybody to expect to use these pipes [for] free is nuts!" *See* "At SBC, It's All About 'Scale and Scope,' " *Business Week*, Nov. 7, 2005. Whitacre's statement reflects a common theme among opponents of Network Neutrality — that content companies incur no cost in reaching end-users. However, this view reflects a complete misunderstanding of how these markets work. In the Internet world, unlike the long-distance telephone market, end-users have no direct financial relationship with a party in the middle transporting the "call" — as there are potentially dozens of network owners in the middle routing the data to its final destination. Content companies like Google pay extremely large sums of money to telecommunications companies to serve their content "up to the Internet." Those telecom companies in turn have financial relationships with other carriers to transport data across the country. So when SBC receives traffic originating from Google handed off by a long-haul network provider, they receive this data while also giving the long-haul provider data from SBC customers to carry back out across the Internet. Sometimes this interconnection of traffic is unbalanced and fees are paid, while at other times, the traffic going back and forth is roughly equivalent, and there is no money exchanged. But the point here is that there is a financial structure in place at every point in the network. If SBC is losing money by receiving traffic on its network, than it should revisit its peering and transport agreements.

[196] *See e.g.*, Jonathan Krim, "Executive Wants to Charge for Web Speed: Some Say Small Firms Could Be Shut Out of Market Championed by BellSouth Officer," *Washington Post*, Dec. 1, 2005.

[197] *See* Daniel W. Reilly, "The Telecom Slayers," *Salon.com*, Oct. 2, 2006.

message out and effect change. Even though dotcom companies like Google and Amazon were on the side of the grassroots, this was not a typical D.C. clash of one big industry against another (though the press often lazily portrayed it as a fight between Google and AT&T). It was a new political movement of ordinary Internet users — many of whom had previously been apolitical — against the narrow and well-funded interests of a few giant corporations.

And the grassroots helped turn a highly technical debate into something even non-Internet-using elder statesmen could understand: This was all about freedom, "Internet freedom." Thus, with this basic principle in mind, the debate on the Hill centered on whether Congress should restore Net Neutrality (putting it into Title I) to compensate for taking broadband services out from under Title II and its nondiscrimination protections.

But while the grassroots had a message of freedom, the arguments put forth by opponents of Net Neutrality were either based on empty rhetoric (that was later proven dead wrong, through statements such as,"Network Neutrality is just a solution in search of a problem"), or shaky economic arguments.[198] One of the network owners' constant refrains in the press and on Capitol Hill was that they needed to violate Net Neutrality in order to earn enough revenues to build out capital-intensive network infrastructure. Companies like AT&T openly contemplated a world of "pay-to-play," where they would speed up the content of affiliated Web sites for a fee. This proposition fueled the fierce grassroots backlash, with consumer advocates, networking professionals, Internet companies and small businesses all expressing concern that this scheme would create a divided Internet superhighway of "toll roads and dirt roads."[199] This concern was well placed. The routing of IP data is a zero-sum game: If a router speeds up one set of bits, by definition, all other bits are slowed down.[200]

But the ISPs' economic pleading never really made much sense. First, it assumes that there is a substantial potential market for guaranteed accelerated delivery — one so large that these potential additional revenues will be the difference between network buildout and network abandonment. But unless network

[198] This rhetoric was pioneered by David McClure, who stated shortly after the 2005 *Wireline Broadband Order*, "Network Neutrality is a solution in search of a problem — a hypothetical issue that cannot occur because of the stated commitments of industry, the Federal Communications Commission and the Congress to prevent any such harm." *See* "Network Neutrality and Tiered Broadband Services: A rational examination of the unintended consequences and detrimental effects of Network Neutrality legislation to prevent tiered broadband services," US Internet Industry Association, February 5, 2006.

[199] Timothy Karr and Craig Aaron, "Saving the Internet: Lessons from the Fight for Net Neutrality," *Journal of Netroots Ideas*, Summer 2007.

[200] This is why the analogies between packet delivery and package delivery are not apt. If the Post Office carries my package via next-day air delivery, it has no impact on the quality of delivery for your package sent via first-class mail. But since routers operate on a "first-in-first-out" basis, prioritizing packet A by definition de-prioritizes packet B. The practical effect of this is greatest when an entire class of packets, such as P2P, is de-prioritized.

owners are blocking certain Web sites outright (and thus extracting blackmail revenues), it isn't clear at all that content providers would be willing to pay for this form of accelerated delivery, when services like local caching are sufficient to deliver low-cost, quality streaming video.[201] Furthermore, since prioritization is a zero-sum game, the corresponding degradation in non-prioritized content could be substantial enough to devalue the utility of the broadband connection itself. In other words, consumers would be less willing to pay for broadband, and the revenue gains from prioritization arrangements might not be enough to offset the losses stemming from user defection.

Second, the argument that revenue from prioritization is needed to pay for network upgrades is not intellectually consistent. Content providers only have an incentive to pay for prioritization if it makes a substantial difference in the quality of their product as delivered to the end-user. This incentive only becomes real when network congestion is the norm. Under this economic model, a network owner actually has every incentive *not* to upgrade their network — for if they did, they would undermine the entire rationale for prioritization. Thus Net Neutrality actually encourages deployment, because without it, network operators would have substantial incentive to delay upgrades in order to profit from artificial scarcity.

The rhetoric about Net Neutrality discouraging investment was just a general outgrowth of the reflexive belief at that time that *any and all* regulation discourages investment. This is a belief espoused by most industry trade associations and their hired economic experts, but it has little basis in reality. In network industries, regulations have only a minor influence over investment decisions. More important are considerations about future growth potential and fear of competition eroding profits. In fact, fear of potential regulations can actually encourage capital investment and counteract the most important factor discouraging investment — short-term shareholder concerns.[202] This mistaken belief about the relationship between regulation and investment is not supported by evidence from the past decade — a period that saw the imposition of substantial regulation, followed by a period of equally substantial deregulation. During the years following the implementation of the 1996 Act, ILEC capital expenditures as a percentage of

[201] Local content-caching services like those provided by Akamai Technologies are able to deliver content such as streaming video with a high degree of reliability because the content is hosted ("mirrored") in multiple locations, and end-users are able to pull content from servers that are geographically close to their location. This results in higher quality, as there are fewer network "hops" between the user and the server.

[202] Many stock analysts actively frown upon any capital investment. Verizon took a beating from Wall Street when it began deploying fiber-to-the home technology. Wall Street analysts panned this investment strategy while hailing the strategy of companies like Qwest and AT&T, which have had many years of higher capital depreciation than capital expenditures. However, the decision to stick with a copper-to-the-home DSL solution in the face of a rapidly declining access line market now appears to have been short-sighted. In the fourth quarter of 2008, Verizon was the only RBOC with positive in-region consumer revenue growth. As cable companies continue to offer higher and higher advertised download speeds, DSL companies like Qwest are often only able to offer a relatively slow 1.5 or 3 Mbps connection.

revenues rose dramatically. However, investment declined in the period following the FCC's dismantling of this regulatory regime.[203]

So while the impact of Network Neutrality obligations on network investment is likely negligible — or positive — the absence of nondiscrimination protections will have a large impact on investments made in the application and content markets. Currently, the Internet is an open platform, governed by a universally accepted and agreed-upon set of technical standards. This open platform provides online innovators with a high degree of predictability about a major segment of their business. An innovator knows that she can develop a new idea or application, and that it will work on any end-user's Internet-connected device. The innovator does not need to go to every ISP and ask for "permission to innovate."[204]

But without Network Neutrality, this certainty is destroyed. A particular network provider might already have an exclusive deal with the innovator's competitor — a deal stipulating that the ISP block or degrade all competitive traffic. Or the ISP may treat the innovator's underlying network protocol differently than other ISPs, making it almost impossible to design an application that is guaranteed to work properly. This potential for discriminatory treatment and nonstandard network management could destroy investor confidence in the applications market, stifling growth in the one segment that drives the information economy. The Internet would become balkanized, whereby applications that work on one network would not work on another. The entire premise of a globally interconnected system of communications that is fully interoperable with all content and applications would be undermined.

The congressional debate over Net Neutrality ended in a stalemate in 2006. It was a major defeat for the network operators that had spent hundreds of millions of

[203] *See* Testimony of Blair Levin, Stifel Nicolaus & Company Inc., Before the United States Senate Committee on the Judiciary, on the matter of Reconsidering Our Communications Laws: Ensuring Competition and Innovation, June 14, 2006 (*2006 Levin Testimony*).

[204] *See* Prepared Statement of Vinton G. Cerf, Vice President and Chief Internet Evangelist Google Inc., before the U.S. Senate Committee on Commerce, Science, and Transportation, on the matter of Network Neutrality, Feb. 7, 2006. "In the zone of governmental noninterference surrounding the Internet, one crucial exception had been the nondiscrimination requirements for the so-called last mile. Developed by the FCC more than a decade before the commercial advent of the Internet, these 'Computer Inquiry' safeguards required that the underlying providers of last-mile network facilities — the incumbent local telephone companies — allow end-users to choose any ISP, and utilize any device, they desired. In turn, ISPs were allowed to purchase retail telecommunications services from the local carriers on nondiscriminatory rates, terms and conditions. The end result was, paradoxically, a regulatory safeguard applied to last-mile facilities that allowed the Internet itself to remain open and 'unregulated' as originally designed. Indeed, it is hard to imagine the innovation and creativity of the commercial Internet in the 1990s ever occurring without those minimal but necessary safeguards already in place. By removing any possibility of ILEC barriers to entry, the FCC paved the way for an explosion in what some have called 'innovation without permission.' A generation of innovators ... [was] able to offer new applications and services to the world, without needing permission from network operators or paying exorbitant carrier rents to ensure that their services were seen online. And we all have benefited enormously from their inventions."

dollars to push a friendly Congress toward their desired outcome. Their defeat was largely the result of growing grassroots opposition and millions of people contacting Congress. A technical debate over telecommunications law took place in the mainstream media and was mocked on *The Daily Show*. By the time then-Senate Commerce Committee Chairman Ted Stevens of Alaska gave his widely derided "series of tubes" speech, attempts to permanently legislate away Network Neutrality were dead. The elections in November of that year flipped Congress to the Democrats and crystallized the stasis. Neither side had the votes in Congress to permanently end or to re-establish nondiscrimination protections on the Internet, let alone overcome the possibility of a veto from President Bush.

The incumbents themselves, which had first escalated the debate with their "using my pipes for free" rhetoric, also seemed willing to retreat to fight another day. In order to gain FCC approval to merge with AT&T, SBC committed to abide by the *Internet Policy Statement* for two years following the closing of the merger.[205] Verizon made the same commitment in order to secure Commission approval for their merger with MCI.[206] At the close of 2006, the newly reconstituted AT&T made a further 24-month commitment to the *Internet Policy Statement* and also agreed to abide by more specific Network Neutrality provisions in order to gain FCC approval for its merger with Bell South.[207]

The Evolution of the Network Neutrality Debate

By 2007, the fallacies in the economic arguments of Net Neutrality opponents were quite apparent, leading the network operators to change their rhetoric. Now they claimed discrimination was needed in order to manage networks and protect users from imminent network brownouts.[208]

As the debate evolved, the leading opponents of Net Neutrality were not the phone companies, but the vertically integrated cable companies, whose financial interests

[205] *See* Letter from Thomas F. Hughes, Vice President, Federal Regulatory, SBC, to Marlene H. Dortch, Secretary, FCC, In the Matter of *SBC Communications, Inc. and AT&T Corp. Applications for Approval of Transfer of Control*, WC Docket No. 05-65, Attach. (filed Oct. 31, 2005) (*SBC Oct. 31 Ex Parte Letter*).

[206] *See* Letter from Ann D. Berkowitz, Associate Director, Federal Regulatory, Verizon, to Marlene H. Dortch, Secretary, FCC, In the Matter of *Verizon Communications, Inc. and MCI, Inc. Applications for Approval of Transfer of Control*, WC Docket No. 05-75 (filed Oct. 31, 2005) (*Verizon Oct. 31 Ex Parte Letter*).

[207] In addition to agreeing to conduct business in a manner that comports with the *Policy Statement*, AT&T/BellSouth agreed "not to provide or to sell to Internet content, application, or service providers, including those affiliated with AT&T/BellSouth, any service that privileges, degrades or prioritizes any packet transmitted over AT&T/BellSouth's wireline broadband Internet access service based on its source, ownership or destination." This commitment ended on December 29, 2008, two years from the merger completion date (the commitment to the *Policy Statement* continues until May 29, 2008). *See* Letter from Robert W. Quinn, Senior Vice President, Federal Regulatory, AT&T, In the Matter of *AT&T Inc. and BellSouth Corporation Application for Transfer of Control*, WC Docket No. 06-74 (filed Dec. 28, 2006) (*AT&T Dec. 28 Ex Parte Letter*).

in cable programming distribution created a large incentive to discriminate against a specific type of Internet content — online video.

In the 1996 Act, Congress promoted a vision and goal of a broadband marketplace where users could send and receive high-quality video. Though we are still far from realizing that goal, there is a clear demand for online video. YouTube released its first beta version in May 2005. A little more than a year later, the company was serving up 100 million video views per day.[209]

YouTube's five-minute, low-quality clips increased user comfort with using their Internet connections to watch "television." But with their appetites whetted, consumers wanted more. So programmers like Viacom and Fox began to make entire television episodes available via the Internet. Companies like Vuze, Netflix and Apple pushed the envelope even further by offering "set-top box" devices that pull high-quality video content from the Internet and play it directly on the living room TV set. And innovators like Boxee are now offering software that makes all this Internet video content available from one simple user interface.

In just a matter of months, online video has gone from being a niche application to being one of the most common Web activities. Nearly 80 percent of U.S. Internet users now report viewing online video at least once a month, with the average user consuming six hours per month.[210] Consumers are increasingly using their broadband connections to watch video content that had been offered exclusively by multichannel video distributors and broadcasters. This presents a potential headache for cable companies, and for the ILECs that are increasing their stake in the video delivery business. Consider Time Warner Cable CEO Glenn Britt's recent statement to investors: "People will choose not to buy subscription video if they can get the same stuff for free. … I think the cable network business will suffer mightily if this trend continues."[211]

[208] For example, NCTA stated, "[b]andwidth usage has grown exponentially and will continue to do so. As a consequence, significant additional investments by broadband providers will be needed. If certain business models are outlawed, the ability of broadband providers to make the necessary investments and of customers to have varied service plans that will meet their pocketbooks will be compromised." *See* "Letter from Kyle McSlarrow to the Honorable Joe Barton," April 25, 2006. The general meme of the "exaflood" began in 2007, based on a marketing campaign started by the Discovery Institute, best known for cooking up the anti-evolution "intelligent design" meme. *See* Bret Swanson, "The Coming Exaflood," *Wall Street Journal*, January 20, 2007. *See also* Karl Bode, "AT&T Front Group Claims Internet End Is Nigh," *DSLreports.com*, November 20, 2008.

[209] *See* "YouTube Serves Up 100 million Videos a Day Online," *Reuters*, July 16, 2006. By January 2009, this number had risen to nearly 200 million, despite the proliferation of numerous other online video sources. *See* "YouTube Surpasses 100 Million U.S. Viewers for the First Time," *ComScore*, March 4, 2009.

[210] *Ibid*. However, these numbers don't fully capture the extent of Internet video consumption, as they only include video Web sites like Hulu and YouTube, and do not include video delivery networks such as those used by Netflix's View Instantly and Apple's Apple TV services.

[211] *Time Warner Cable, Inc. Q4 2008 Earnings Call* (Feb. 4, 2009), *available at* http://seekingalpha.com/article/118521-time-warner-cable-inc-q4-2008-earnings-call-transcript?page=8

With the Internet now a viable platform for video distribution, we have the troubling situation where cable companies are now in control of two major delivery platforms, as well as much of the production of the programming itself. In addition to controlling a substantial percentage of broadband Internet connections, cable companies also own the primary platform for video distribution — a platform that is completely locked down. Independent programmers have little chance of getting their channels carried, and content producers must work with the established horizontally integrated programming studios to get their content out to viewers. In many cases, the cable companies also have a large stake in these cable programming networks and content production studios. There are gatekeepers at every step of the production chain.

But now the Internet is emerging as a platform that threatens to break this entire cable model apart. Independent content producers can reach their audiences directly through the Internet. Production studios can establish their own Internet "channels" and reach a larger audience than if they had to rely on the multichannel platform alone. Much of this content is advertiser-supported, as is cable TV content — but the ads are fewer in number and the viewer who just wants to watch a few specific shows doesn't need to pay $100 per month for 500 channels. And distribution platforms like Apple TV allow a viewer to pay per episode and avoid advertising altogether. It is the ultimate à la carte marketplace for video content — a consumer paradise that also frees content producers from relying on the traditional distribution platforms to reach large audiences.

Though there is no sign yet that the proliferation in available online video content is actually leading consumers to "cut the cord" with their cable TV completely, this prospect is obviously troubling to the cable cartel.[212] Only a small percentage of customers will actually have to drop cable TV before the companies will be forced to offer more attractive programming packages at lower prices. Such competition is great for consumers, but it eats into cable's healthy profit margins and is a drain on its stock prices. An entire generation of kids is growing up in the Hulu/YouTube world, and it's hard to imagine them being willing to pay $100 per month for content they've grown accustomed to getting for free and watching whenever they want. So cable companies have a strong incentive to crush or limit online video in its infancy.

[212] *See* "Online Video Usage Continues to Grow, Yet Online Video is Having Little Impact on Traditional TV Viewing and Services," Leichtman Research Group, Feb. 23, 2009. This survey found that "the impact [of online video viewing] on traditional TV viewing and multi-channel video subscriptions has been negligible." The survey also found that only 3 percent of adults who use the Internet would seriously consider "cutting the cord" to their cable or satellite TV provider. But some cable companies are clearly worried about what current behavior among young users portends for the future. On a recent earnings call, a TWC executive said, "[t]he reality is we are starting to see the beginnings of core cutting where people, typically young people, are saying 'all I need is broadband. I don't need video,' and obviously they are already saying they don't need wire line phone. So the impact of that potentially over time is to reduce the number of customers." *See* Time Warner Cable, Inc. Fourth Quarter 2008 Earnings Call Transcript, *Seeking Alpha*, Feb. 4, 2009.

Cable's incentive to weaken the growth of a competitive online video market is especially troubling given that cable companies control more than half of all residential broadband connections. The situation is further complicated by two other factors: the bandwidth intensity of online video and structural engineering weaknesses inherent in the cable broadband architecture. Though most cable modem users are unaware of it, they actually share their broadband connection with hundreds of their neighbors. A typical cable modem system uses one cable "channel" to deliver approximately 38.8 Mbps in downstream bandwidth — which is shared between 100 and 500 subscribers. The bandwidth shared upstream is even less.

To grow their business and differentiate their product from standard DSL (which has maximum speeds of 7.1 Mbps downstream), cable providers have been offering faster services. However, though cable modem subscribers are getting "bigger slices of the pie," the pie hasn't actually gotten any bigger. A neighborhood with 200 customers each subscribing to 6 Mbps service from a shared 38.8 Mpbs "pipe" has just become a neighborhood with 200 customers each subscribing to 16 Mbps service from the same pipe. In a world where all broadband subscribers do is load Web pages, this level of sharing would not be a problem. But users are increasingly using these faster connections for "always on" applications like streaming video. 15 subscribers watching HDTV streams from Hulu will use all the available cable modem bandwidth for an entire neighborhood.[213]

Fortunately for cable providers, this bandwidth crunch is easily relieved. Cable operators can easily and inexpensively split the number of homes sharing a connection in half (via so-called "node splits"). They can assign some customers to a certain bandwidth "channel" and put other customers on other bandwidth channels. And they can upgrade their systems to DOCSIS 3.0, a new cable modem standard that increases the size of the shared downstream pipe from 38.8 Mpbs to 155.2 Mbps. This upgrade provides the most bang for the buck, as the bulk of the costs arise from the new end-user modem, a cost paid for by the customer multiple times over via monthly rental fees. The major issue here isn't the difficulty of upgrading. The issue is the business model of over-subscription. The more customers share a single node — even if the sharing is causing congestion and reducing the quality of the consumer experience — the more revenue the operator can extract from existing facilities. This may be a rational business practice, but it is deeply problematic for a broadband infrastructure, sacrificing the public good for short-term private gain.

So even though cable's bandwidth capacity issues are simple to overcome, the industry has every incentive to exaggerate the technical threat posed by online video. The bandwidth scarcity created by oversubscription allows cable operators

[213] Hulu's HD streams require 2.5 Mbps of bandwidth. And since Hulu's service is a true real-time stream (and not a progressive download stream like YouTube), a user cannot build up a buffer — they need a guaranteed 2.5 Mpbs to watch the content without jitter.

to justify practices that squelch the rise of online video. Because the four principles of the FCC's *Internet Policy Statement* are "subject to reasonable network management," a carrier can get around these consumer protections by building up the perception of a threat and then using network management as an excuse to justify discriminatory practices. This is the situation that gave rise to the first test case of the *Internet Policy Statement*.[214]

The Case Against Comcast

In fall 2007, users of peer-to-peer (P2P) applications based on the BitTorrent software protocol began to notice that these applications were not working properly.[215] These users had one thing in common: They were all Comcast high-speed Internet subscribers. One of these users — a network expert and Tin Pan Alley-era music fan named Robb Topolski — noticed he couldn't use the BitTorrent-protocol software Gnutella to share his favorite (public domain) turn-of-the-century music files. Topolski launched his own investigation, posted his findings to user forums at DSLreports.com, and quickly discovered many others who were having similar problems.[216] Thus, just a few months after an army of industry lobbyists and their friends in Congress had all begun describing Network Neutrality as a "solution in search of a problem," a big problem reared its ugly head. Independent tests, including one conducted by the Associated Press, confirmed what Topolski and others already knew to be true: Comcast was indeed interfering with all uploads using the BitTorrent protocol.[217] Comcast was using a technique known as "forged reset packet injection," which blocks a user's ability to upload via P2P by sending the user and the host a signal to terminate the connection.[218]

Comcast's discrimination against P2P applications was particularly troubling, given that P2P is a video distribution platform[219] that could undermine Comcast's

[214] See *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices, Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* File No. EB-08-IH-1518, WC Docket No. 07-52, Memorandum Opinion and Order, 23 FCC Rcd 13028 (2008) (*Comcast Order*).

[215] *Ibid.* at para. 6, note 14.

[216] *See* Craig Aaron, "Cracking down on Comcast: The FCC's Proposal to Punish America's Largest Cable Company for Blocking Internet Traffic Is a Major Victory for Net Neutrality," *The Guardian*, July 16, 2008.

[217] Peter Svensson, "Comcast Blocks Some Internet Traffic, AP Testing Shows," Associated Press, Oct. 19, 2007. *See also* Seth Schoen, "EFF Tests Agree with AP: Comcast Is Forging Packets to Interfere with User Traffic," *Electronic Freedom Foundation Blog*, Oct. 19, 2007.

[218] This interference breaks the P2P application, because in some instances, if users cannot upload (or "seed"), then they are eventually unable to download with the application.

[219] P2P is increasingly used as a method for the legal distribution of video content; however, it is also used to facilitate the illegal sharing of copyrighted material. Nevertheless, the fact that a protocol is used in some instances for illicit purposes is irrelevant to whether discrimination

domination of the video programming market. However, Comcast denied that worries about competition motivated their actions. The company claimed its sole purpose in interfering with BitTorrent was to reduce network congestion caused largely by P2P-using "bandwidth hogs."[220] But if controlling network congestion was the sole motivation behind Comcast's targeting of P2P networks, then the company chose a very poor method for alleviating congestion. First, Comcast's methods were not narrowly tailored, as all BitTorrent uploads were affected, regardless of time of day, user location or file size, and thus had no relationship to actual network congestion.[221] Second, the company's technique affected all users of the P2P protocol, whether or not they were heavy users disproportionately contributing to network congestion. And the targeting of BitTorrent ignored other bandwidth-intensive applications, such as streaming video from Comcast's own online programming service.[222]

Free Press and Public Knowledge brought a formal complaint against Comcast before the FCC in November 2007[223] and also requested a declaratory ruling that Comcast's actions violated the sections of the Communications Act that underlie the *Internet Policy Statement*.[224] Comcast's primary defense was that its network

against that particular protocol constitutes reasonable network management. Further, illicit online markets often presage the development of robust legal online markets, once industries realize the benefits of adopting new business models. For example, the music file-sharing software Napster was used by some to obtain copyrighted works for free. However, once the recording industry "freed" the music by allowing it to be legally downloaded (by the song) from online retailers like iTunes and Amazon.com, the online music sales thrived. The lesson here is that users will find their way to content. If content distributors make content easily available through legitimate outlets, users that might have otherwise committed piracy will instead legally purchase or view the content via an advertising supported portal.

[220] Andy Patrizio, "Comcast Suspected of Limiting BitTorrent Use," *InternetNews.com*, October 19, 2007.

[221] Prior to the AP test, Comcast completely denied interfering with any applications. After the tests, Comcast admitted interfering with BitTorrent uploads, but claimed to do so only in specific geographic locations during times of congestion. However, subsequent tests demonstrated this was yet another falsehood. Faced with this evidence, Comcast admitted using this interfere system regardless of congestion, location or time of day. See *Comcast Order*, para. 9.

[222] Blocking P2P uploads also had the benefit of reducing off-network traffic flows, a potential source of increased transport costs for the cable operator which would then be shifted to customers of other ISPs in the same area (in other words, since Comcast customers could not upload files to be downloaded by others, the downloaders of these files likely pulled content from geographically proximate non-Comcast customers. Depending on Comcast's transport carriage arrangements, this could have saved them money on transport expenses.

[223] *See* Formal Complaint of Free Press and Public Knowledge against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications, File No. EB-08-IH-1518 (Nov. 1, 2007) (*Free Press Complaint*).

[224] See *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services, 1998 Biennial Review—Review of Computer III and ONA Safeguards and Requirements; Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities; Broadband Industry Practices*, CC Docket Nos. 02-33, 01-337, 95-20,

management technique delayed but did not completely block P2P applications, and thus purportedly did not constitute a violation of the *Internet Policy Statement*. The distinction between delaying and blocking is important, because none of the four principles preclude discriminatory treatment outright; they only overtly preclude blocking of content and applications. The *Internet Policy Statement* says, "Consumers are entitled to *access* the lawful content of their choice" and "*run* applications and *use* services of their choice" (emphasis added). Arguably, if a network operator targets a specific application but just delays it, the consumer is still able to *use* or *run* the application to *access* content, even if the application is not designed to function optimally under such nonstandard network management.[225]

In the end, by a 3-2 bipartisan vote, the FCC ruled that Comcast was blocking end-users' ability to run applications and access the lawful content of their choosing — a violation of the first and second principles of the *Internet Policy Statement* — and that this practice did not constitute reasonable network management.[226] Comcast was ordered to cease its illegal network management technique and fully disclose future network management practices. The company proceeded to implement a congestion control system that only targets the heaviest users during times of peak network congestion.

But the fact that Comcast's anti-competitive and wholly unnecessary actions might have been permissible if they were found to be "delaying" and not "blocking" illustrates the precarious nature of the FCC's *Internet Policy Statement*.[227] Moreover, Comcast appealed the FCC's baseline authority to even adjudicate this decision (despite fully complying with it), and the matter is pending in court.[228] Consumers and innovators need regulatory certainty that network operators will not be permitted to engage in *any* discriminatory behavior, whether that behavior is

98-10, GN Docket No. 00-185, CS Docket No. 02-52, WC Docket No. 07-52, Petition for Declaratory Ruling of Free Press, Public Knowledge, Media Access Project, Consumer Federation of America, Consumers Union, Information Society Project at Yale Law School, Professor Charles Nesson, Co-Director of the Berkman Center for Internet & Society, Harvard Law School, Professor Barbara van Schewick, Center for Internet & Society, Stanford Law School (Nov. 1, 2007) (*Free Press Petition*).

[225] The fourth principle states, "Consumers are entitled to competition among network providers, application and service providers, and content providers." It is possible that a network operator delaying one specific protocol for online video and not others would cause the content providers using the targeted protocol to suffer competitive harm, thus depriving consumers of their right to competition. However, the Commission found Comcast in violation of principles one and two and did not consider whether there was a violation of the fourth principle.

[226] See *Comcast Order*, paras. 43-45.

[227] In this particular case, Comcast's actions were on their face equivalent to outright blocking, and the outcome of its management technique exerted such a substantial negative impact on the end-user's experience that the semantic debate was largely a distraction. However, recent uses of protocol-discriminating, non-standard network management techniques like those of Cox Communications illustrate that the distinctions between "delay" and "block" are real and may have profound implications on the FCC's ability to protect consumers under the existing four principles.

[228] See *Comcast Corp. v. FCC*, No. 08-1291, D.C. Cir. filed Sept. 4, 2008.

considered to be outright blocking of content or subtler discriminatory conduct such as delaying an application.

Net Neutrality and the Need for a Fifth Principle

The *Internet Policy Statement's* four principles allow the FCC to prevent network operators from engaging in the most egregious forms of discrimination. The FCC clearly has the authority to prevent a DSL carrier from only allowing HP-branded laptops to connect to their network, for example. Likewise, the Commission would certainly intervene if a broadband provider blocked all access to CNN.com. And if a carrier implemented network management techniques that disabled third-party VoIP applications like Skype, FCC intervention would be fully supported by any reasonable reading of the law. But the four principles alone are not enough to fully protect and preserve the Internet as an open platform for innovation. The *Internet Policy Statement* lacks affirmation of the principle of nondiscrimination for all content, applications and services on the Internet.[229]

Perhaps in 2005 the FCC believed the four principles alone could ensure the preservation of the open Internet.[230] During the Internet's early days, the technologies that enabled network discrimination were not very sophisticated. The electronics equipment used to manage the network could not examine packets in real time to make routing decisions on the basis of content, applications or services. But recently, advances in "Deep Packet Inspection" (DPI) equipment have made it possible to monitor packet flow in real time, and to exert discriminatory control to prioritize or degrade certain types of traffic.[231] Network operators are increasingly using DPI to monitor and control Internet access services, though the most egregious initial attempts have been abandoned. Comcast's discrimination against BitTorrent was made possible by DPI equipment.[232] Charter Communications struck up a (brief) relationship with an advertising company called NebuAd to use DPI to insert targeted advertising directly into a user's Internet communications.[233] However, Charter abandoned this idea in the face of congressional and public outrage over gross violations of consumer privacy.[234] Indeed, DPI technologies compound the problems of network discrimination with

[229] The author wishes to acknowledge and thank M. Chris Riley for his extensive contributions to this section and the section on managed network services.

[230] Indeed, the preamble to each of the four principles is "to encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet."

[231] *See* M. Chris Riley and Ben Scott, "Deep Packet Inspection: The End of the Internet as We Know It?" *Free Press*, March 2009.

[232] *See* Nate Anderson, "Comcast FCC Filing Shows Gap Between Hype, Bandwidth Reality," *Ars Technica*, Feb. 13, 2008. *See also* Comcast Corporation, "Description of Current Network Management Practices," p. 8, available at http://downloads.comcast.net/docs/Attachment_A_Current_Practices.pdf.

[233] *See* "Charter Hires NebuAd to Make Online Ads More Relevant," *IAB SmartBrief,* May 16, 2008.

[234] *See* Steven Musil, "Charter Drops Controversial Customer Tracking Plan," *CNet*, June 24, 2008.

violations of privacy — creating a virtual wiretap that permits surveillance of all communications to and from end-user computers.

But other network operators continue to explore the possible discriminatory uses of DPI technology, perhaps in more subtle ways. Cox Communications is currently testing a network management system that uses DPI to identify and slow down certain types of traffic — such as P2P.[235] Cox's technique is based on a value judgment. If the DPI router identifies a particular packet of data as "time sensitive," it is routed normally. However, if a particular packet is among the protocols that Cox deems *not* to be time sensitive, it is assigned a lower priority, and ordered to go to the back of the line. Thus, Cox is inserting its own value judgment in place of a user's judgment. This fundamentally breaks the end-to-end nature of the Internet and goes against the principle of nondiscrimination that is at the core of the Communications Act. Furthermore, it is yet another example of a network provider using a nonstandard and over-reaching technique to manage network congestion that is largely the result of that provider's own making. By marketing higher and higher "up to" speed offerings without performing the required level of upgrades or allocating more channel space to Internet content, cable companies like Cox are largely responsible for the congestion issues now supposedly being "solved" by violating nondiscrimination principles.

If extended to a network-wide practice, Cox's system would set an alarming precedent in which the ISP, not the marketplace, gets to pick winners and losers on the Internet. This development would throw the entire Internet ecosystem into chaos, as other providers could adopt their own prioritization systems with different value judgments about what protocols are and are not "time sensitive." Thus, Internet applications and services may or may not work properly depending on the network. Such a move would devastate the applications and content markets, as developers would have to make guesses as to how a particular network might treat any given application. This possibility is far from hypothetical — in Canada, Primus Telecommunications has announced a system similar to Cox's using different priority classes and classifications.[236]

Nondiscrimination is in jeopardy as a guiding principle of the Internet. Armed with DPI, Internet access providers will develop business models based on discrimination that allow them to increase revenues while reducing investment.[237] Insufficient ISP competition means consumers will have little ability to "vote with their wallets" against this new form of discrimination. And even more competition

[235] *See* generally Cox Communications, *Congestion Management FAQs*, available at http://www.cox.com/policy/congestionmanagement/.

[236] "Primus Introduces New Internet Traffic Shaping System," *Digital Home,* March 18, 2009.

[237] See e.g. "Cloudshield Subscriber Services Manager," Cloudshield Technologies, 2009, available at http://www.cloudshield.com/applications/cs_ssm.asp ("By shaping traffic at the subscriber-level, bandwidth is made available for new revenue generating services. Rate limiting traffic allows network infrastructure build-out to be deferred, thereby reducing capital expenditures").

might not be enough to prevent network operators from testing the boundaries of discrimination, as consumers are often unaware of network management practices.

Policymakers must intervene and take a stand against discrimination. The FCC must recognize that the four principles contained in the *Internet Policy Statement* are not enough to preserve and promote the open and interconnected nature of the public Internet. Adding a fifth principle of nondiscrimination can reverse some of the damage done by past reckless Commission actions, especially the completely misguided decision to remove the Internet from under the nondiscrimination protections of Title II.

How should the FCC design a nondiscrimination principle or rule? Past congressional and FCC action provide some guidance. As a condition for approval of the AT&T-Bell South merger, the FCC required the new company to "maintain a neutral network and neutral routing in its wireline broadband Internet access service," a requirement that would be met if AT&T did not degrade or prioritize any packets on the basis of source, ownership or destination.[238] However, the AT&T/BellSouth condition speaks only to "source, ownership or destination" and does not directly address application or content type. Early congressional attempts — none enacted — went further. Legislation introduced in 2006 in the House of Representatives created a duty to "not block, impair, degrade, discriminate against, or interfere with the ability of any person to utilize their broadband service to ... access, use, send, receive, or offer lawful content, applications, or services over broadband networks, including the Internet."[239] A similar Senate bill required Internet access providers to "enable any content, application, or service made available via the Internet to be offered, provided, or posted on a basis that... is reasonable and nondiscriminatory, including with respect to quality of service, access, speed, and bandwidth."[240]

In these early FCC and congressional actions, we see the essential components of nondiscrimination rules. These rules must ensure equal treatment for all communications on the Internet regardless of their source, ownership, destination, application or content. No Internet packets should be given priority over others — whether the priority comes in the form of access, latency or bandwidth.

First, nondiscrimination rules must prohibit Internet access providers from blocking, discriminating against or otherwise degrading any lawful content, applications or services. Under the guise of managing congestion, many providers have blocked or degraded high-bandwidth uses of the Internet, including P2P applications. But nondiscrimination rules must go further than prohibiting blocking; they must prevent degrading and other forms of discriminatory

[238] *Supra* note 207 at "Net Neutrality condition #2."

[239] H.R. 5273, 109th Cong. (2006).

[240] S. 215, 110th Cong. (2007).

treatment, such as setting selective bandwidth caps on disfavored applications or services. Slowing, capping or selectively charging for the use of P2P or other high-bandwidth applications and services cripples innovation on the Internet and must not be allowed.

Second, nondiscrimination rules must prohibit network operators from selling or offering any capacity to prioritize some Internet packets over others, whether to a third party or to an affiliate. Selective prioritization is harmful for two separate reasons. Prioritizing some uses of the Internet increases the cost of entry into the market for new applications and services, because developers must either pay for prioritization or compete against established applications and services that have favorable arrangements with certain ISPs. Worse, as discussed above, prioritization is a zero-sum game. If some packets are sped up, by definition, others are slowed down. Ultimately, if enough applications and services are accelerated, every other use of the Internet will be forced to share the leftover bandwidth; the only usable Internet will be the prioritized Internet. Every application provider would be forced to pay for special prioritization to reach consumers — and the Internet would look like cable TV rather than the open platform it is today. Nondiscrimination rules must prevent the creation of two separate lanes of traffic for Internet packets, particularly when access to the "fast lane" is available only to the network owner's affiliated content or to the highest bidders.

Finally, nondiscrimination rules must prohibit Internet access providers from charging additional fees to allow specific types of Internet content, applications or services to be used. As with prioritization of Internet packets, charging special fees for certain uses of the Internet – for example, selling two subscription levels, where a "basic" level does not allow P2P communications but a "premium" level does — raises the costs of entry, increases costs for consumers, and turns the Internet into a form of pay-for-play media like cable TV. To avoid limiting innovation and consumer choice, nondiscrimination rules must prohibit any discriminatory fees for specific content, applications or services.

Enshrining nondiscrimination into the *Internet Policy Statement* and codifying these principles into rules for all technologies delivering Internet access — including wireless technologies — should be a top priority for the FCC. It should also be a top priority for Congress. Though the Commission has the clear authority to directly deal with this issue, it would be a cleaner process if Congress were to put Network Neutrality explicitly back into the law. This would give the Commission a mandate to proceed, and would ward off the eventual legal process that will follow Commission action.

The notion that discrimination is needed to encourage investment has been completely discredited. Carriers have generally come to realize that Ed Whitacre's pay-to-play model is unworkable, and that in the long run, they are better off selling the product consumers want: the open Internet. Of course, the network

operators will continue to preach the evils of a neutral network, but they too will benefit from the regulatory certainty of having this issue settled once and for all.

Dealing with Managed Services

Cable and telephone companies make billions selling "broadband Internet access" using a variety of physical conduits — coaxial cable, twisted copper pair, fiber optic cables, electrical wiring and spectrum. But these physical conduits are capable of delivering services other than Internet access — such as video programming, which can generate considerable revenues. Consequently, network owners are very concerned about nondiscriminatory regulation on one set of services like Internet access spilling over into other services that have never been subject to nondiscriminatory treatment.

This issue is relatively straightforward in the context of coaxial cable modem and television services. Cable TV services are one-way communications services that use radio frequency technology to transmit programming. Programming for every channel is sent to every home through the coaxial cable, whether or not the TV is turned on. Users then "tune" their televisions to a particular channel to receive the programming. Conversely, cable modem service segregates a particular channel or set of channels and devotes them to two-way communications using the TCP/IP protocol. This is a clear dividing line for regulatory purposes. Cable TV services are clearly "cable communications" subject to Title VI of the 1996 Act, while cable modem services are "information services." [241]

However, traditional common carriers like Verizon and AT&T are beginning to deploy subscription television services using Internet Protocol technology. Obviously, if the carrier is selling monthly television service, they are going to want to ensure that service is delivered with the highest possible quality to compete with cable and satellite. Being able to earn revenues from "triple play" service offered over a single pipe is a big factor driving network investment decisions. Undermining this ability by requiring Net Neutrality would appear to be contrary to the goals of Section 706 of the 1996 Act.

Fortunately, technology and network design have already solved this potential conundrum. So-called "IPTV" services like those of AT&T's U-Verse use IP protocols for their TV service but do not connect with the public Internet. This is by design, as no single network operator could ensure their TV content would receive the required level of quality across all parts of the Internet. IPTV providers instead host programming content on servers located entirely within their network. Users "flipping the dial" are served up a requested channel using IP, but that IP request

[241] 47 U.S.C. 522(6) defines "cable service" as "the one-way transmission to subscribers of video programming, or other programming service; and subscriber interaction, if any, which is required for the selection or use of such video programming or other programming service."

never reaches the wider public Internet. Thus, it is clearly a Title VI cable service, and is regulated as such.[242]

But while it is easy to draw lines between pure public Internet services and pay-TV services, new services might come along and blur this line. The future possibilities for non-Internet broadband services range broadly, from direct connections between rural hospitals and urban medical research facilities to allow for rapid remote diagnosis and consultation, to high-performance video games. These so-called managed services can share last-mile connections and other infrastructure elements with the Internet. If this market develops in a fair and consumer-friendly fashion that does not restrict the continued growth of the Internet, these services will clearly bring benefits that far exceed any harms resulting from their receiving favorable (i.e., discriminatory) treatment.

An essential part of managed services is that they do not connect to the Internet. These services do not receive content from, or send content to, the Internet at any point in the middle of the network (although a single user's computer could connect both to a managed service and to the Internet). This distinction is essential to allow for prioritization where it is truly necessary, yet avoid the anti-consumer harms posed by prioritization of Internet traffic. Managed services should be permitted to replace other forms of communication such as traditional RF cable television or the telephone (through VoIP), and managed services can create new forms of direct, high-performance communication between two parties established in advance. However, if managed services are allowed to directly replicate all of the functionality of the Internet, their impact will be a reduction in consumer choice, innovation and competition.

Thus the FCC has to confront the issue of managed services directly and close any loopholes. The first and foremost objective of managed services policy should be to ensure that the development of managed services does not squash the Internet. Because both will share a common architecture, service providers may have strong incentives to allocate a disproportionate share of capacity to managed services, as these allow the service provider to offer a value-added service above and beyond pure transit. Allowing some capacity to be used by managed services can increase efficient use of the broadband network and provide additional incentive for providers to expand capacity and coverage. But providing insufficient bandwidth to the Internet would reduce consumer choice, innovation and competition, offsetting other gains. Therefore, the FCC and Congress should require ISPs to allocate *enough* capacity to maintain a robust Internet access service.

[242] The Network Neutrality conditions in the AT&T-Bell South merger conditions specifically exempted AT&T's IPTV services.

But the concept of what bandwidth or relative allocation of bandwidth is sufficient to maintain robust Internet access is elusive. Given the history of the Internet, what might be considered robust Internet access now may not be sufficient in five years. Creating an arbitrary fixed number, or even a sequence of evolving numbers, could easily result in overestimates or underestimates of growth. The best measurements must be contemporary, and should compare U.S. Internet capacity to capacities available in other countries or to capacities of other services.

The FCC or Congress could use two separate mechanisms to protect robust Internet access. The first method is the creation of a rule directly requiring the allocation of sufficient capacity to allow for robust Internet access. The rule could include evolving standards for the concept of sufficient capacity (as measured by individual average actual Internet bandwidth, or by some combination of maximum bandwidth and oversubscription or "contention" ratio), or it could leave the concept undefined. A complaint process to resolve cases where an individual or an application developer identifies a service provider engaging in excessive restriction could accompany this rule.

Second, or in addition, the FCC could tie the bandwidth of managed services to Internet services, to ensure that capacity is added to both at a comparable rate. In practice, this would mean that no single managed service would be able to be offered at higher bandwidth than any consumer Internet access service offered by the same provider in the same area. In other words, the Internet should be able to compete with any individual managed service. Collectively, the sum of all space allocated for managed services should not be substantially more than the capacity allocated for broadband Internet services, to ensure a comparable growth rate between the Internet and managed services. Such a rule would ensure that Internet access capacity grows at a healthy rate, and that the Internet remains a locus of innovation.

In addition to protecting robust access to the Internet, managed services policy should create a competitive and fair environment for both ISPs and for independent developers of managed services. Without rules in place to promote competition, exclusive arrangements and tying practices will develop that promote incumbents and their affiliates to the detriment of new entrants — the very problems that currently plague the cable TV market. The Internet access market is already heavily concentrated, and major ISPs are in a position to strike exclusive deals with a few vendors of managed services and exclude others.

Fortunately, there are off-the-shelf policy solutions to stave off these dangers and to develop consumer-friendly managed services. One approach is to adopt a system derived from Title II of the Communications Act. Specifically, agreements between managed services operators and network operators should be on reasonable and nondiscriminatory rates, terms and conditions. At a minimum, negotiations between managed services providers and ISPs must not be anti-competitive,

unfair or deceptive. Frameworks such as these are necessary safeguards to allow for the operation of discriminatory and prioritized communications over the same broadband systems that carry the Internet, while avoiding the problems that have developed in comparable markets for cable programming and wireless communications.

Getting Back to Basics: Preserving the Open Internet Should Be a Top Priority

The Internet is a common good that will continue to play a critical role in America's economic and social prosperity. But no one single person, government or corporation owns the Internet. Much of the Internet's early development was carried out using public funds, and much of its private development was and continues to be funded by consumers who participate in markets with little meaningful competition. Private companies like AT&T and Comcast build and deploy infrastructure that provide end-users with access to this common good, and they make substantial profits doing so. But consumers don't hand over money to companies like Comcast because they value the connection itself; they are willing to pay $50 per month for the things that connection enables them to do. It's the applications, services and content that give the connection value. ISPs provide *access* to the Internet, and when they engage in behavior such as blocking, they alter the fundamental nature of how the Internet is expected to work.

This threat is why all four of the FCC's *Internet Policy Statement* principles contain the phrase "promote the open and interconnected nature of the public Internet." But the current protections are tenuous. The four principles do not affirmatively preclude discrimination. This omission leaves the door wide open to carriers looking to implement discriminatory practices in the name of reasonable network management. This omission allows carriers to use the myth of looming broadband brownouts and capacity crunches to stifle the use of the very applications that are driving innovation and progress on the Internet. The lack of firm nondiscrimination rules creates market uncertainty and sends a signal to carriers that it might one day be permissible to profit from artificial scarcity.

The Internet was born in an environment where innovation and ingenuity were set free. This environment was made possible because the FCC was proactive in ensuring that owners of critical communications facilities behaved properly and stayed out of the way. Discrimination was not an option, and that was never a point of controversy. It is frustrating that there is even a debate over Network Neutrality, because neutrality is the very lifeblood of the network; it is what made the Internet into a service that companies like AT&T and Comcast could get rich selling. The only reason the fight over Network Neutrality exists is because the FCC left consumers without the basic protections guaranteed in the Communications Act that have been part of the Internet since its inception.

As the Obama administration begins to chart its own course on broadband policy, the first stop must be restoring the basic nondiscriminatory protections that were so recklessly thrown aside. The new FCC needs first to preserve the Internet before it can move forward with a national broadband strategy promoting the Internet.