



**Testimony of Gigi B. Sohn, President
Public Knowledge**

**Before the
U.S. Senate Committee on Commerce, Science & Transportation**

**Oversight Hearing On:
“Video Franchising”**

**Washington, DC
February 15, 2006**

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Chairman Stevens, Co-Chairman Inouye and other members of the Committee, my name is Gigi B. Sohn. I am President of Public Knowledge, a nonprofit public interest organization that addresses the public's stake in the convergence of communications policy and intellectual property law. Public Knowledge promotes fundamental democratic principles and cultural values -- openness, access, and the capacity to create and compete -- that must be given new embodiment in the digital age. I thank the Committee for inviting me to testify on video franchising issues.¹

Introduction and Summary

Public Knowledge believes that competition provides consumers with the widest choice of video services at the lowest prices. While the local franchising model produced many important benefits over the past 40 years, it also created disadvantages both for incumbent and competitive video service providers.

Today, new market conditions require another approach. If consumers are to reap the benefits of competition, then Congress should create a national franchise for video service providers. We believe that, subject to certain conditions that preserve the best features of local franchises, permitting broadband video providers to avoid negotiating

¹ I would like to thank Public Knowledge interns Neil Chilson and Mike Larmoyeux for their assistance in researching and drafting this testimony.

thousands of individual franchise agreements will bring more competition to market faster, resulting in greater consumer choice and lower prices.

A national franchise also provides huge benefits to new broadband video service providers. These benefits include enormous cost savings and greater speed bringing services to market. The one step process of a national franchise would be a dramatic change from the way we have regulated video services for the past four decades.

As we undertake this discussion of video franchises, we must recognize that we are not only talking about a service -- we are talking about a technology and transport mechanism with capabilities far beyond ordinary video programming services. The decisions Congress makes regarding video regulation will impact the rollout of new, sophisticated broadband conduits that will carry not only video, but also data and telephone services. Rather than splitting hairs, or hair-thin fiber, Congress should recognize that it is opening the way not only for video into the home, but for advanced broadband offerings.

While considering the franchise issue, we suggest Congress balance the tremendous benefits that a national franchise would give to broadband video service providers with a requirement that those companies make their networks available to all applications, content and service providers on a non-discriminatory basis. This “net neutrality” requirement will ensure, in light of recent legal and policy changes, that the broadband Internet remains the most powerful engine of economic growth, education and communication on the planet.

A National Franchise Would Benefit Consumers

It is no mystery that more competition leads to lower prices and greater choice in the multichannel video market. According to a recent FCC report, average cable rates for basic and expanded basic service were 15.7% lower than in communities with a competing wireline overbuilder compared to those communities without a wireline overbuilder.² Similarly, in communities with a competing wireline overbuilder, the number of channels on basic and expanded basic increased by 4% in 2003 and by 5.5% for the period of July 1998-2004.³

Somewhat more surprising, however, is the severe lack of robust video competition, or at least what the FCC considers “effective” competition.⁴ According to the most recent video competition order, only 3.7% of areas served by cable meet the standard for effective competition based on the Commission's four-part test.⁵

A national franchise regime would quickly bring the benefits of competition to consumers, because competitive video providers would avoid thousands of individual

²See Report on Cable Industry Prices, 20 FCC Rcd 2718, 2721, at ¶12 (2005).

³Id at ¶11.

⁴“Effective competition exists where the Commission has found that a multi-channel video programming distributor (“MVPD”) meets one of the four tests within its franchise area: (1) fewer than 30% of households subscribe to service of the cable system (the “low penetration test”); (2) at least two MVPDs serve 50% or more of households and at least 15% of those households takes service other than from the largest MVPD (the “overbuild test”); (3) a municipal MVPD offers service to at least 50% of households (the “municipal test”); (4) a local exchange carrier or its affiliate (or any MVPD using the facilities of the LEC or its affiliate) offers video programming service other than DBS comparable to the service of an unaffiliated MVPD (the “LEC test”). *In re Implementation of Section 3 of the Cable Television Consumer Protection and Competition Act of 1992*, 20 FCC Rcd 3485 at n. 3 (2005).

⁵Since a cable operator must affirmatively seek certification from the FCC of the existence of effective competition, these numbers do not reflect the actual number of communities that might meet the test. However, even if the FCC’s numbers were multiplied by a factor of ten, nearly two thirds of the nation’s areas served by cable would still lack effective competition. In any event, we would ask the Committee to rectify this lack of data by requiring that the FCC undertake a study to determine how many cable service areas are subject to effective competition. Two of the current FCC Commissioners have noted this lack of data. *Report on Cable Industry Prices*, 20 FCC Rcd at 2753-4 (Joint Statement of Commissioners Michael J. Copps and Jonathan Adelstein, concurring) (“the Commission gathers less than adequate data and conducts less analysis than it did even a few years ago.”).

negotiations with localities. We already see the consumer benefits, in price and choice, in the brief rollout of Verizon's FiOS service. For example, a recent Bank of America analysis showed that in each of the three markets where Verizon has rolled out its service, incumbent cable operators have offered consumers prices far lower than their previously advertised prices. If, as discussed below, Congress maintains the best features of local franchising while implementing a national franchise regime, there is no good policy reason to keep this competitive benefit away from consumers nationwide. Nor is there any good policy reason not to prohibit incumbent video service providers from benefiting from this streamlined process after their current agreements have expired.

The Best Features of Local Franchising Should Be Retained

Should Congress choose to adopt a national franchise, it should retain some of the important and best features of local franchises. First, it should ensure that localities remain empowered to protect their streets and their citizens, and that they receive compensation for the grant of the franchise. Localities should have control over their rights of way for public safety or zoning purposes, and they should retain the ability to enforce consumer protection standards. However, these powers should *not* be used to recreate the local franchise agreement by permitting localities to make demands of broadband video service providers that go beyond those narrow purposes.⁶

⁶Public Knowledge believes that such local authority should mirror the narrowly tailored character of section 253 of the Communications Act. Section 253 preempts local regulation of telecommunication franchises, but provides specific exceptions including permission to "manage the public rights-of-way." 47 U.S.C. § 253. Various local franchise authorities have interpreted these exceptions as broad grants of authority, but the courts have consistently denied such interpretations. *See generally TCG New York, Inc. v. White Plains*, 305 F.3d 67 (2d Cir. 2002) (holding that a city ordinance permitting local authorities to reject an application based on any "public interest factors" was preempted by § 253). Instead, courts have generally required all regulations to be substantially related to the management of rights-of-way. *Id.* at 81-82. Additionally, local authorities may only levy fines, penalties and other sanctions to preserve the public welfare. *Auburn v. Qwest Corp.*, 260 F.3d 1160 (9th Cir. 2001). Similarly specific and narrow local

Second, Congress should require that broadband video service providers make adequate capacity available for public, educational and governmental uses, including institutional networks for local public safety. This capacity should, at a minimum, be no less than what the incumbent cable operator already provides.

Third, Congress should use the national franchise process to promote the goal of universal access to broadband. As discussed below, new broadband video service is interrelated to broadband Internet service. Thus, any mechanism that speeds access to broadband video service would also help speed access to broadband Internet service. This is a vital goal in a country which is ranked 16th in broadband adoption worldwide.

A Net Neutrality Requirement Should be Part of Any Effort to Codify National Franchising

While this hearing is intended to be limited to the relatively narrow issue of franchising for new broadband video services, I would urge this Committee to view broadband video not as a wholly separate entity, but as just one piece of telephone and cable companies' larger broadband network offerings. AT&T's Project Lightspeed service is delivered over its broadband network, and Verizon's FiOS video service is delivered through the same pipe as its broadband Internet service (albeit via a different laser). Indeed, both companies are making no distinction between their video, voice and data services, and instead are marketing their services as broadband services that are wholly different from traditional cable. Here is how Verizon CEO Ivan Seidenberg described his company's broadband offerings to the National Association of Broadcasters last year:

authority for video franchises will preserve the purposes of a national franchise yet enable appropriate local participation.

We also are the first communications company to make a major commitment to taking fiber all the way to homes and businesses. This network, which we call FiOS, delivers super-fast data and Internet access at speeds of up to 30 megabits downstream and 5 megabits upstream. Our system will deliver 100 megabits downstream and up to 15 megabits upstream... making FiOS the fastest, most interactive network being deployed in America today. ...

Both of these next-generation networks [FiOS and Verizon's wireless broadband network] are setting a new standard for broadband services in America. They provide a common protocol and a common infrastructure for voice, data and video services. They link to all kinds of interactive devices -- anywhere, anytime. They are built for multi-tasking, and they enable a whole new generation of innovative services -- from voice-over-IP to video messaging to multi-player games, shopping, interactive learning and lots of others.

Similarly, AT&T Executive Vice President Lea Ann Champion told the House Commerce Committee

In short, we are not building a cable network, nor do we have any interest in being a cable company offering traditional cable service. Instead, we intend to offer customers a new total communications experience, one that they can customize to suit their families' needs and tastes.

Skeptics may say that we have been talking about media “convergence” for the past 20 years, but as Mr. Seidenberg’s speech suggests, that convergence is happening, and it is happening now. Anyone who attended the International Consumer Electronics show saw currently available technologies, that blur the lines between broadcast, cable, and Internet video. The day when a consumer will not be able to distinguish whether her video service came from traditional cable or the Internet is fast approaching – and many would say it is already here.

Therefore, should Congress grant video providers the extraordinary regulatory relief represented by national broadband video franchises – turning nearly 40 years of local control of video services on its head -- Congress must also ensure “net neutrality.” Net neutrality requires the broadband Internet pipe to remain open to all applications and

services, including video, on a non-discriminatory basis.⁷ The Internet has become an extraordinarily popular engine of innovation, social networking and commerce because of, not in spite of, an enforceable obligation. That obligation required network providers to keep their networks open to all consumers, applications, content and service providers. Recent Supreme Court and FCC rulings defining broadband networks as unregulated “information services” removed that obligation. As a result, broadband network operators now have the same authority as traditional cable systems to control the content, services and equipment consumers receive or use, and to favor content and services in which they have a financial interest. And because the telephone and cable operators who own nearly all broadband networks in this country are what Consumer Federation of America Research Director Mark Cooper calls a “dynamic duopoly,” they have the ability and the incentive to abuse that authority to the detriment of competitors and consumers.

Opponents of net neutrality claim that it is a “solution in search of a problem.” But the search for a problem is brief when Executives of two of the largest broadband network providers announces publicly that his company intends to discriminate. AT&T CEO Ed Whitacre’s statement to Business Week that “for Google or Yahoo! or Vonage or anybody to expect to use [AT&T’s broadband] pipes for free is nuts,” is now legend. Similarly, Verizon Executive Vice President John Thorne’s statement last week that Google’s “free lunch”, *i.e.*, free transport over broadband networks, is about to end,⁸ demonstrates a very real intent to discriminate.

⁷Public Knowledge is not advocating “net neutrality” for video services regulated solely under Title VI of the Communications Act.

⁸Arshad Mohammed, “Verizon Executive Calls for End to Google’s ‘Free Lunch’”, *Washington Post*, February 7, 2005 at D1.

Moreover, in a white paper that Public Knowledge released last week, we document not only instances of blocking and degradation of certain applications and content by network providers, but also show that technologies are being marketed to network providers for such purposes. The white paper, entitled “Good Fences Make Bad Broadband: Preserving an Open Internet Through Net Neutrality” is appended to this testimony.

Opponents also claim that codification of “net neutrality” will lead to burdensome regulation that will stifle investment in broadband. But reserving the openness of the Internet and preventing it from become a closed system can be accomplished with a light regulatory touch. Public Knowledge believes that such a requirement should be very straightforward – preventing blocking or other degradation of content, application or services – while allowing network providers to handle legitimate legal, security and traffic issues. The FCC could enforce this requirement through a complaint process started by an aggrieved consumer, application, content or service provider.⁹ Under Public Knowledge’s plan, the network provider would bear the burden of showing that it either did not discriminate or that it discriminated for the legitimate reasons set out above. And any application, content or service that is the subject of the complaint would remain unimpaired until the matter is resolved.

Telephone and cable companies will derive enormous benefits from a national franchise for video services. Companies will realize significant cost savings by avoiding

⁹“What we need instead of ‘anticipatory’ regulation is a market-driven approach. This does not mean that there is no role for government. It’s simply an updated role. Instead of attempting to anticipate how the market will develop and then write the rules governing that market, government empowers consumers to shape the market and thereby set the rules of the game. Government is not on the field calling the plays, or is it writing the rules. Instead, it fills a referee-like role, observing the field of play, responding to complaints from any of the players, and addressing cases of market failure.”

expensive individual franchise agreement negotiations. Equally significant will be cost savings such as flat franchise fees and freedom from other financial obligations often provided for in franchise agreements. This one step process is a radical change from the way we have regulated video services over the past forty years. Congress should balance this benefit with a requirement that these very same companies make their broadband pipes available to all applications, content and service providers without discrimination or degradation.

Conclusion

In our increasingly broadband communications world, a national franchise for video services will expedite competition to the benefit of consumers. But a national franchise without a concurrent “net neutrality” obligation will give consumers far less than what they have come to expect in this new world. Thus, we urge this Committee and this Congress to balance any national franchise relief with a requirement that ensures that broadband networks are not subject to discriminatory gatekeepers. I thank you for inviting me to testify today, and I look forward to any questions you might have.

APPENDIX

Good Fences Make Bad Broadband

Preserving an Open Internet through Net Neutrality

A Public Knowledge White Paper
by John Windhausen, Jr.

Executive Summary

The genius of the Internet is its promise of unlimited accessibility. With very limited exceptions, any consumer with an Internet connection and a computer can visit any web site, attach any device, post any content, and provide any service.

While the openness of the Internet is universally praised, it is no longer guaranteed, at least for broadband services. Recent Supreme Court and FCC rulings define broadband networks as unregulated “information services,” which means that the operators of broadband networks are no longer under any legal obligation to keep their networks open to all Internet content, services and equipment.

Broadband providers now have the same authority as cable providers to act as gatekeepers: the network owner can choose which services and equipment consumers may use. Network operators can adopt conflicting and proprietary standards for the attachment of consumer equipment, can steer consumers to certain web sites over others, can block whatever Internet services or applications they like, and make their preferred applications perform better than others.

This concern is not just theoretical – broadband network providers are taking advantage of their unregulated status. Cable operators have barred consumers from using their cable modems for virtual private networks and home networking and blocked streaming video applications. Telephone and wireless companies have blocked Internet telephone (VoIP – Voice over the Internet Protocol) traffic outright in order to protect their own telephone service revenues. Equipment manufacturers are marketing equipment specifically designed to “filter” out (*i.e.* block) VoIP traffic. Wireless companies often write limitations into consumers’ service agreements that have nothing to do with excessive bandwidth consumption.

The problem is likely to become worse in the near future. One telephone company executive threatened to put a stop to on-line providers that use the telephone network “for free” (even though on-line providers pay to connect to the network). Another telephone company executive openly announced that his company intends to establish a higher-priced “tier” of service reserved *exclusively* for content providers chosen by the network operator. This raises the concern that consumers and start-up application providers will be relegated to the “slow lane” on the information superhighway.

These examples of discrimination, which this paper shows are greater in number than the network operators like to acknowledge, are on the increase because network operators have economic *incentives* to discriminate. Network owners today are more than just passive providers of transmission capacity (the “conduit”); they also own and provide services, applications and equipment (the “content”). By giving their own (or their affiliated) applications and content preferential access to the network, they can extract greater profits than if they operate the network on a non-discriminatory basis.

As a result, several groups have called upon Congress to enact, or the FCC to adopt, an enforceable “Net Neutrality” rule to ensure the Internet remains open and accessible to all. Not surprisingly, the network owners object, arguing that such a policy is unnecessary and will delay their deployment of broadband technologies.

This paper analyzes the Net Neutrality debate in more detail. The paper is divided into four parts:

Part I is a reference guide on the Net Neutrality issue. It reviews the rights at stake, describes the terms used in the debate, provides a brief legal history of broadband network regulation, summarizes the positions of the parties, describes documented examples of discrimination or blocking, and includes matrices that compare the differences among parties and proposals for action.

Part II makes the case in favor of a Network Neutrality rule. It describes the enormous societal and economic benefits of keeping the broadband Internet network open to all users. Broadband networks are fast becoming the essential lifeline of our economy and society, carrying on-line commercial transactions, current events, local and national advertising, telemedicine and distance learning, music and entertainment, interactive games, and videoconferencing. Allowing the increasingly concentrated cable and telephone industries to have unchecked control over our access to these sources of information, entertainment and commerce is cause for great concern.

Net Neutrality is also important for our high-tech manufacturing industry. Billions of dollars are invested every year at the “edge” of the network by the high-tech computing industry, the on-line commerce industry, the gaming industry, the news and information industry, and the research community. A statutory Net Neutrality rule will give investors the confidence to support new, innovative

applications. On the other hand, giving network operators the *potential* to block competing applications from getting on the network may be enough to frighten investors away from otherwise worthy new Internet applications.

In short, open broadband networks are vitally important to our society, our future economic growth, our high-tech manufacturing sector, and our First Amendment rights to information free of censorship or control. Even if an openness policy imposes some slight burden on network operators, these microeconomic concerns pale in comparison to the macroeconomic benefits to the society and economy at large of maintaining an open Internet.

Part III responds to four arguments against Net Neutrality raised by the network operators:

- 1) *Network operators allege that Net Neutrality is a “solution in search of a problem” because there is only one documented case of blocking.* In fact, network operators have already engaged in at least 8 known cases of blocking in the U.S. and are likely to block or interfere with more traffic in the future. Network operators have incentives to leverage their control over the network to reap additional profits in upstream markets.
- 2) *Network operators allege that Net Neutrality will interfere with their ability to manage their networks, for instance, to prevent spam, viruses and congestion.* In fact, there is no reason to believe that a simple non-discrimination policy should interfere with the operators’ network management responsibilities. Telephone companies have always managed their networks to protect against unlawful use even under a much more onerous common carriage regime.
- 3) *Network operators allege that Net Neutrality will interfere with their ability to earn a return on their broadband investment and that it will stifle their deployment of broadband networks.* In fact, Net Neutrality *promotes* broadband deployment because it increases the value of services and applications over the Internet, which increases consumer demand for broadband networks. The greater the demand, the more network operators will invest in broadband to meet it. Furthermore, there remain many opportunities for network operators to profit from their broadband investment that do not involve blocking or discrimination. For instance, network operators can continue to develop their own content and/or enter joint marketing arrangements or other promotional arrangements with other content providers.
- 4) *Network operators maintain that Net Neutrality will prevent them from creating “tiers” of service, or a “private Internet.”* In fact, Net Neutrality does not necessarily prevent network operators from offering levels of access, at higher rates, as long as the tier is offered on a nondiscriminatory basis to every provider and as long as all broadband customers are offered a minimum

level of broadband service. A Net Neutrality principle does, however, prohibit the creation of a “private Internet” that grants *exclusive* access to the higher bandwidth levels to certain providers selected by the network operator.

Part IV provides an outline of a possible Net Neutrality rule or statute. Net Neutrality does not require detailed rules that require network operators to obtain government pre-approval to manage their networks. Network Neutrality can be enforced through a simple complaint process, as long as the network operator bears the burden of demonstrating that any interference with traffic is necessary.

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- Attachment B** Remarks of Michael K. Powell, Chairman, Federal Communications Commission, Voice on the Net Conference, Boston, Massachusetts, October 19, 2004 ("Chairman Powell October 19 VON Speech")
- Attachment C** NARUC Resolution Regarding Citizen Access to Internet Content, Sponsored by the Committee on Telecommunications, Recommended by the NARUC Board of Directors November 12, 2002, Adopted NARUC Convention November 12, 2002 ("NARUC November 12 Resolution")
- Attachment D** Remarks of Michael J. Copps, Commissioner, Federal Communications Commission, New America Foundation, Washington, D.C., October 9, 2003 ("Commissioner Copps October 9 NAF Speech")
- Attachment E** In re Madison River Communications, LLC and affiliated companies, Consent Decree and Order, March 3, 2005 ("Madison River March 3 Consent Decree")
- Attachment F** Kevin J. Martin, Chairman, Federal Communications Commission, Comments on Commission Policy Statement, August 5, 2005 ("Chairman Martin August 5 Comments")
- Attachment G** Letter dated May 7, 2003 from Ryan G. Wallach, Willkie Farr & Gallagher, to Marlene H. Dortch, Secretary, Federal Communications Commission ("Comcast May 7 *Ex Parte* Letter"); Letter dated May 15, 2003 from Ryan G. Wallach, Willkie Farr & Gallagher, to Marlene H. Dortch, Secretary, Federal Communications Commission ("Comcast May 15 *Ex Parte* Letter"); Letter dated April 7, 2003 from Alexander V. Netchvolodoff to Marlene H. Dortch, Secretary, Federal Communications Commission ("Cox April 7 *Ex Parte* Letter"); Letter dated May 1, 2003 from Alexander V. Netchvolodoff to Marlene H. Dortch, Secretary, Federal Communications Commission ("Cox May 1 *Ex Parte* Letter")

- Attachment H** SMS/800 News Flash, Bulletin No. NWS-05-40, Release 16.3 Implementation, December 7, 2005 ("SMS/800 December 7 News Flash")
- Attachment I** Qwest High-Speed Internet Subscriber Agreement ("Qwest Subscriber Agreement")
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- Attachment N** OpenNet Initiative: Bulletin 010, *Telus Blocks Consumer Access To Labour Union Website and Filters An Additional 766 Unrelated Sites*, August 2, 2005 ("Telus August 2 Article")
- Attachment O** Ben Charny, *Mexico Telephone Operator Under VoIP Fire*, CNET, April 25, 2005 ("Telmex April 25 Article")

Introduction

The genius of the Internet is its promise of unlimited accessibility.¹ With very limited exceptions, any consumer with an Internet connection and a computer can visit any web site, attach any device, post any content, and provide any service.

While the openness of the Internet is universally praised, it is no longer guaranteed, at least for broadband services. Recent Supreme Court and FCC rulings define broadband networks as unregulated “information services,” which means that the operators of broadband networks are no longer under any legal obligation to keep their networks open to all Internet content, services and equipment.

Broadband providers now have the same authority as cable providers to act as gatekeepers: the network owner can choose which services and equipment consumers may use. Network operators can adopt conflicting and proprietary standards for the attachment of consumer equipment, can steer consumers to certain web sites over others, can block whatever Internet services or applications they like, and make their preferred applications perform better than others.

As a result, Public Knowledge has joined with consumer electronic equipment providers, Internet content and application providers, VoIP providers, and consumer and public interest groups to ask Congress and the FCC to restore the rule that requires network operators to provide nondiscriminatory access to all lawful content, services and equipment. The call for legislation may be termed “net neutrality,” although other terms have also been used.²

Not surprisingly, the network operators, dominated by the cable and telephone companies,³ generally oppose any legislation or FCC rule. They maintain that such a rule will discourage investment, will create burdensome regulation, and is unnecessary because network operators already have incentives to keep their networks open.

¹ I would like to thank Public Knowledge interns Neil Chilson and Mike Larmoyeux for their assistance in researching and drafting this paper.

² The issue of “Net Neutrality” for broadband networks is one subset of the general principle of “openness” that Public Knowledge believes should guide policymakers as they consider a variety of communications issues in the future. *See*, Principles for an Open Broadband Future, a Public Knowledge White Paper, issued July 6, 2005, available at <http://www.publicknowledge.org/content/papers/open-broadband-future>.

³ As of 2003, 97% of broadband consumers received their broadband connections either from a cable modem or from DSL. *See*, A Nation Online: Entering the Broadband Age, a Joint Report of the National Telecommunications and Information Administration (NTIA) and the Economic and Statistics Administration, U.S. Department of Commerce, September, 2004. Available at <http://www.ntia.doc.gov/reports/anol/>

This paper examines these issues in more detail.⁴ Part I is a reference guide on the Net Neutrality issue. It reviews the consumer rights at stake, describes the terms used in the debate, provides a brief legal history of broadband network regulation, summarizes the positions of the parties, describes the documented examples of discrimination or blocking, and includes matrices that compare the differences among parties and proposals for action.

Part II makes the case in favor of a network neutrality rule. It describes the enormous societal and economic benefits of keeping broadband Internet networks open to all users. Even if an openness policy imposes some slight burden on network operators, these microeconomic concerns pale in comparison to the macroeconomic benefits of maintaining an open Internet to the society and economy at large.

Part III responds to four arguments against Net Neutrality raised by the network operators.

1. Though network operators maintain Net Neutrality is a solution in search of a problem, there are many documented cases of blocking and discrimination, and these problems are likely to increase because network operators have incentives to discriminate.
2. Though network operators claim that Net Neutrality will interfere with their ability to manage their networks, the history of telephone companies under much more onerous common carriage rules demonstrates that Net Neutrality does not conflict with network management.
3. Though network operators claim that Net Neutrality will delay their deployment of broadband, Net Neutrality actually increases the value of broadband networks and promotes broadband deployment.
4. Though network operators claim that Net Neutrality will prevent them from creating tiers of service, Net Neutrality can permit operators to create tier as long as they are not made available exclusively to parties selected by the network operator and as long as broadband consumers are guaranteed a minimum level of broadband service.

Part IV provides an outline of Net Neutrality legislation. Net Neutrality does not require detailed rules that require network operators to obtain government pre-approval to manage their networks. Network neutrality can be enforced through a simple complaint process, as long as the network operator bears the burden of demonstrating that any interference with traffic is necessary to support a lawful goal.

⁴ This paper does not address the issues regarding filtering or blocking access to indecent or obscene material.

PART I
A Reference Guide to Net Neutrality

A. Broadband Rights Under Net Neutrality

The discussion of Net Neutrality generally focuses on three rights:

1. the right (of users and providers) to use and attach equipment of their choice,
2. the right (of users) to access the content, services and applications of their choice, and
3. the right (of providers) to offer content, services and applications of their choice.

Some statements have included two additional rights:

4. the right to have access to service plan information, and
5. the right to have competitive choices.

Each of these rights is explained briefly below:

1. *Right to Attach Equipment:* This right ensures that consumers can purchase equipment off the shelf, or make their own equipment, and connect it to any broadband network. If network operators are allowed to set the standards governing what equipment can be used, they could easily adopt proprietary standards or designs that favor one manufacturer over another. Broadband network operators should not be allowed to set electronic design standards or require pre-approval before a consumer can attach any particular equipment.⁵

There are two models for this principle in current law:

- a) The “Carterfone” rules: “Carterfone” refers to the initial effort by Tom Carter to attach a device to the subscriber’s telephone. AT&T opposed the attachment of any non-AT&T manufactured device to the network on the grounds that it would harm the operation of the network. The FCC rejected AT&T’s argument in 1968 and the courts later affirmed that decision.⁶ The FCC then established equipment certification rules in Part 68 of its rules that allow any manufacturer to develop and sell equipment as long as it meets

⁵ Although the term “attach” is often used, it means more than simply plugging the device into the network. The equipment must be able to work and interact with other devices through the broadband network.

⁶ *Use of the Carterfone Device in Message Toll Telephone Service*, 13 F.C.C.2d 420(1968), *recon. denied*, 14 F.C.C.2d 571 (1968).

minimum technical requirements.⁷ The FCC's attachment rules laid the groundwork for a multi-billion dollar high-tech computing industry.

Because of the FCC's recent rulings (see subsection C below), the attachment principles for subscriber equipment no longer apply to broadband networks.

- b) The "set-top box" rule: Section 629 of the Communications Act directs the FCC to adopt regulations to ensure that consumers can purchase the cable set-top box of their choice and that the box will work with any cable system. The rules are intended to allow for competition among manufacturers of set-top boxes that convert cable or satellite programming signals into signals that can be displayed on consumers' television sets.

2. *Right to Access Content and Applications*: This right ensures that Internet users can reach any web site of their choice, without interference or degradation by the network operator. Under current law, telephone companies are obligated to allow consumers to make any phone call or use their dial-up Internet connection to reach any Internet Service Provider (ISP). But this obligation no longer applies to broadband services. Now that the FCC and the courts have defined broadband services as "information services", the telephone and cable companies are under no obligation to allow consumers to reach the web site of their choice over a broadband connection.

Codifying this right would give broadband consumers the same right as telephone and dial-up consumers to reach the destination and access the content and services they choose. According to this principle, network operators would not be permitted to re-direct traffic once a consumer chooses a certain web site, or block or degrade certain applications such as telephone calls over the Internet (VoIP). In other words, this right would prohibit network operators from blocking or unreasonably impeding the user's ability to obtain access to the information, applications and services that are made available over the Internet.⁸

3. *Right to Provide or Offer Applications and Services*: This right is similar to the right to use the Internet, as in 2. above, except that it addresses the issue from the perspective of a provider, rather than a user.⁹ "Providers" include VoIP companies

⁷ See, 56 F.C.C. 2d 593.

⁸ A commonly used example of potential discrimination was included in the *Washington Post* as follows: "Imagine the outcry if a local phone company started preventing customers from calling Lands' End to place an order and redirected their calls to L.L. Bean, which had paid the phone company to be the exclusive purveyor of down jackets to its customers." S. Pearlstein, Policy Watch, Wash. Post, Nov. 24, 2002, at H3.

⁹ This paper avoids characterizing principle 2. as the "consumer" principle and principle 3. as the "business" principle because consumers are increasingly posting their own content, running their own applications, and providing their own services on the Internet. So a residential consumer may be both a "user" of information/applications/services and a "provider". The same is true of business consumers.

such as Vonage, Pulver and Skype; on-line web portals such as Google and Yahoo; applications such as home banking, interactive gaming; news and information sites, and virtually any other service that offers interaction with the user.

Network operators may have even greater reason to discriminate against these application and service providers because they compete on a retail level with the services provided by the network operator. For instance, VOIP providers offer voice telephone service over the Internet that competes with the voice services offered by telephone companies and cable companies. Similarly, Internet-based video providers may soon be able to offer video services that compete with cable and telephone companies' video offerings. Any list of rights must specifically protect those who run applications or offer services in order to ensure that the Internet remains open to these uses.

4. *Right to Information about Service Plans:* This right would ensure that consumers have access to information about their broadband service plans. Broadband providers often impose service limitations on the proper uses of their broadband connection. Such restrictions could prohibit certain uses, limit the quantity of traffic or speed of service, impose premature termination penalties, specify compatible equipment, etc. These service limitations vary quite substantially from company to company, possibly creating significant customer confusion. This right would help consumers understand these service limitations.

5. *Right to Competition for Network Providers, Applications and Service Providers and Content Providers:* This right appears in the FCC's August 2005 policy statement,¹⁰ stating that consumers have a right to competition for network, application service and content providers.¹¹ Though the FCC provided no further explanation of its thinking in the Policy statement, it presumably refers to the FCC's asserted desire to promote the ability of power line companies, satellites and other wireless networks to provide facilities-based competition to the cable and telephone companies.¹²

¹⁰ Action by the Commission August 5, 2005, by Policy Statement (FCC 05-151). Chairman Martin, Commissioners Martin, Abernathy, Copps, and Adelstein, with Chairman Martin issuing a statement.

¹¹ Public Knowledge has separately supported competition in a White Paper released in 2005. See, "Principles for an Open Broadband Future", available at <http://www.publicknowledge.org/content/papers/open-broadband-future>.

¹² At the time the FCC adopted this rule, Chairman Martin stated that these principles were not enforceable. The FCC may have initially included this "right" to competition in its Policy statement because of its belief that competitive supply of alternative network operators would make it unnecessary to adopt an enforceable openness rule. Since then, the FCC has decided that SBC and Verizon must comply with an openness requirement as an enforceable condition of their mergers with AT&T and MCI, respectively, possibly because of the diminution in competition resulting from those mergers. See, Action by the Commission October 31, 2005, by Memorandum Opinion and Order (FCC 05-183) SBC/AT&T Docket No. 05-65, Chairman Martin and Commissioner Abernathy, with Commissioners Copps and Adelstein concurring; and Action by the Commission, October 31, 2005, by Memorandum Opinion and Order (FCC 05-184)

(Subsection G below contains matrices comparing the positions of a variety of parties.)

B. The Terms of the Debate.

1. *Net Neutrality*

The term “Net Neutrality”, which Professor Lawrence Lessig is credited with coining, was first used at the FCC by the Coalition of Broadband Users and Innovators (CBUI), a coalition of on-line content companies and retailers, users and ISPs. (See Attachment A) The coalition filed its first comments with the FCC in November 2002 arguing that the FCC should adopt policies to prevent network owners from discriminating against web sites, applications, services or equipment that are not affiliated with the network operator. CBUI included several large on-line content companies, consumer groups and equipment manufacturers, including Yahoo!, E-Bay, Amazon, Microsoft, Apple, Radio Shack, Disney, the Information Technology Association of America (ITAA), the Consumer Electronics Association (CEA), the National Association of Manufacturers (NAM), the Media Access Project (MAP), and others.

Other terms have also been used to describe the problem of network discrimination. The origins of each term are explained briefly below:

2. *Connectivity Principles*

The term “Connectivity Principles” was first used in a filing to the FCC by the High-Tech Broadband Coalition (HTBC) in June 2002. The HTBC includes the Business Software Alliance (BSA), the CEA, the Information Technology Industry Council (ITIC), the NAM, the Semiconductor Industry Association (SIA), and the Telecommunications Industry Association (TIA). In brief, the HTBC said that consumers should have the right to:

- a. meaningful information about their service plans;
- b. access lawful content;
- c. run applications and services of their choosing;
- d. attach their choice of communications devices.

3. *Internet Consumer Freedoms/Four Freedoms*

The term “Internet Consumer Freedoms” (also called the “Four Freedoms”) describes the four principles laid out by then-FCC Chairman Powell in his speech to the Voice on the Net (VON) Conference in October 19, 2004. (See Attachment B) These “Four Freedoms” track almost exactly the four “Connectivity Principles” filed by the HTBC. Chairman Powell called for:

Verizon/MCI Docket No. 05-75. Chairman Martin and Commissioner Abernathy, with Commissioners Copps and Adelstein concurring.

(a) *Freedom to Access Content*: Consumers should have access to their choice of legal content;

(b) *Freedom to Use Applications*: Consumers should be able to run applications of their choice;

(c) *Freedom to Attach Personal Devices*: Consumers should be permitted to attach any devices they choose to the connection in their homes; and

(d) *Freedom to Obtain Service Plan Information*: Consumers should receive meaningful information regarding their service plans.

4. *Openness Principles*

The terms “Open Broadband Future”, “Open Attachment of Equipment” and “Open Network for all Applications and Content” were used in a White Paper issued by Public Knowledge in June 2005. The issue of “Net Neutrality” for broadband networks is one subset of the general principle of “openness” that Public Knowledge believes should guide policymakers as they consider a variety of communications issues in the future.¹³ Under this concept of “openness”, all communications networks should be open to all users and equipment and competitors, and spectrum should be open to both licensed and unlicensed uses.

5. *Bit Discrimination*

The term “Bit Discrimination” has also been used informally by some advocates to refer to the potential that network operators could give some types of (digital) traffic preferential treatment over other traffic on the network.

6. *Packet Prioritization*

Packet prioritization has emerged recently as an important new term of art. Network operators claim that packet prioritization is a standard business practice and is necessary to ensure that the network operates properly. For instance, they claim that network operators need to give priority to video streaming packets to avoid any degradation in the quality of the video received by the consumer, while e-mail traffic can encounter brief delays without degradation. Net Neutrality advocates, however, express concern that granting network operators unlimited authority to engage in packet prioritization could allow them to prioritize traffic based on the content of the traffic or the identity of the user and thereby sanction discrimination.

¹³ See, Principles for an Open Broadband Future, a Public Knowledge White Paper, issued July 6, 2005, available at <http://www.publicknowledge.org/content/papers/open-broadband-future>.

C. A Brief Legal History of Broadband Network Regulation

The United States became the world leader in high-technology industries under a common carrier legal regime that required network operators to keep their networks open to all uses and users that do not interfere with the operation of the network. Since its inception, the Internet has operated under a similar model of interconnection and open standards. Anyone may register for a domain name, connect a server and provide content, applications and services.

In 2005, however, the Federal Government reversed decades of successful communications policy by finding that most broadband services are “information services” instead of “telecommunications services.” These decisions effectively bring an end to the openness regime and allow broadband network owners to control who can connect and offer services over the Internet. The open, public and interconnected broadband networks of today could well become closed, private and potentially exclusive networks tomorrow.

The following section describes these regulatory changes in more detail.

1. The Nexus Between the Internet and the FCC’s Regulation of Networks.

When Congress first enacted the 1934 Communications Act, it granted the FCC authority to regulate all telephone companies as common carriers under Title II. Over time, as the telephone network came to be used for data or “value-added” communications as well as voice phone calls, the FCC needed a regulatory approach to distinguish between the underlying common carrier network and the services riding over that network.

In three *Computer Inquiry* decisions in the 1970’s and 1980’s, the FCC eventually settled on two categories of service: 1) “basic” services, such as transmission capacity and voice phone calls, would remain regulated under Title II, and 2) “enhanced services”, or value-added information services, would be defined as non-common carrier services and would only be subject to the FCC’s generic oversight authority under Title I. The FCC essentially maintained its regulation over the common carrier telephone network and deregulated the equipment and information services using that network. The FCC required the owners of telecommunications networks (AT&T and then the Regional Bell Operating Companies – the RBOCs) to unbundle their networks and provide the underlying basic transmission services to all enhanced service providers on a nondiscriminatory basis. In effect, the FCC strengthened its common carrier rules by requiring the telephone companies to make their common carrier telephone networks available to independent equipment manufacturers and to interconnection by Internet Service Providers (ISPs).

These *Computer Inquiry* decisions essentially gave birth to the Internet.¹⁴ Competition among ISPs flourished; thousands of entrepreneurs purchased “basic” telephone lines from the phone company, hooked them up to their own servers to provide connections to the Internet. According to Vint Cerf, known as the “father of the Internet”, the *Computer Inquiry* decisions allowed thousands of users to “unleash their creative, innovative, and inspired product and service ideas in the competitive information services marketplace, without artificial barriers erected by the local telephone companies.”¹⁵

The *Computer Inquiry* rules also had a dramatic impact on the equipment market. The FCC initially adopted equipment certification rules in 1975 (the Part 68 rules). The *Computer Inquiry* decisions added strength to these Part 68 rules by removing the telephone companies’ equipment from their regulated rate base so that the telephone companies could not cross-subsidize their equipment and thereby gain a regulatory advantage over competitive equipment suppliers. These decisions effectively launched the growth of computer networking, fax machines, answering machines, videoconferencing and many other hardware and software industries.

2. The FCC Defines Broadband Services as “Information Services.”

Under the *Computer Inquiry* decisions, basic transmission services were regulated under Title II as common carrier services regardless of transmission medium. The telephone companies’ transmission services, whether provided over copper, microwave, fiber optic cable, wireless or any other media, were all regarded as telecommunications services because their function was to act as a passive and neutral conduit for messages generated by others. In contrast, enhanced services were defined as those services that manipulate, store or alter the information. These same definitions were essentially adopted by Congress in the Telecommunications Act of

¹⁴ According to Robert Cannon, Senior Counsel for Internet Policy in the FCC’s Office of Strategic Planning and Policy Analysis, the *Computer Inquiry* rules were “a necessary precondition for the success of the Internet” because they involved “affirmative and aggressive regulation of communications networks, specifically for the benefit of the computer networks.” Jonathan Weinberg, Professor of Law at Wayne State University, notes that the *Computer Inquiry* decisions were “wildly successful in spurring innovation and competition in the enhanced-services marketplace” because “government maintained its control of the underlying transport, sold primarily by regulated monopolies.” Phil Weiser, Associate Professor at the University of Colorado Law School, writes that the FCC’s non-discriminatory access obligations ensured that the telecom network “could be used for a variety of services (e.g. Internet access) and that rival companies could market equipment like modems that could connect to the network.” (Quoted in “A Horizontal Leap Forward” by Richard S. Whitt in *Open Architecture as Communications Policy*, edited by Mark N. Cooper, Center for Internet and Society, Stanford Law School.)

¹⁵ Professor Lessig has observed that, without the government’s role in ensuring an open network, the design of the Internet would have been more like the French analogue – Minitel – a centrally-controlled information service whose usefulness was rapidly surpassed by the Internet. See, “The End of End-to-End,” by Mark A. Lemley and Lawrence Lessig, available in *Open Architecture as Communications Policy*, edited by Mark N. Cooper, Center for Internet and Society, Stanford Law School, pp. 41-91.

1996 (although the terms “basic services” and “enhanced services” were changed to “telecommunications services” and “information services”).

Nonetheless, after years of drawing this clear separation between conduit and content – a line that was relatively clear and enforceable – the FCC recently adopted a new boundary for broadband services. The FCC determined that both cable modem services and telephone company DSL offerings should be considered “information services” because they provide a bundle of both transmission services and access to the Internet.

Cable Modem Services

After the *Computer Inquiry* decisions and with the rise of the Internet, thousands of ISPs entered the market to provide dial-up local access to the Internet over local phone lines. When cable modem service was introduced in the late 1990’s, ISPs sought to have the same right to serve cable customers as they provided to telephone customers. The cable industry refused. Cable providers generally only permitted customers to connect to the cable companies’ own ISP affiliate. The cable industry argued that its cable modem services were inextricably intertwined with their Internet service. In 2002, the FCC agreed and classified cable modem service as an information service.¹⁶ After initially being overturned by the Ninth Circuit Court of Appeals, the FCC’s view was affirmed in 2005 by the Supreme Court in a split decision.¹⁷

Telephone Company DSL services.

Soon after the Supreme Court upheld the FCC’s decision to classify cable modem services as information services, the FCC reached a similar conclusion for phone company DSL services. In its *Wireline Broadband Order*, adopted in August 2005, the FCC found that facilities-based wireline broadband Internet access service is an “information service”, not a “telecommunications service”. The FCC ruled that the telephone companies were no longer required to offer the wireline broadband transmission service (*i.e.*, transmission in excess of 200 kilobits per second (kbps) in at least one direction) as a stand-alone telecommunications service under Title II of the Communications Act. As a result, most of the telephone companies’ broadband offerings are no longer subject to the FCC’s Title II and right to attach rules.¹⁸

¹⁶ See *In re 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, Declaratory Ruling and Notice of Proposed Rulemaking*, FCC 02-77 (2002) (“Cable Modem Decision”).

¹⁷ See, *National Cable and Television Ass’n v. Brand X Internet Serv.*, 125 S. Ct. 2688 (2005).

¹⁸ In the Matters of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, CC Docket No. 02-52, 02-33, 01-337, 95-20, 98-10, *Report and Order and Notice of Proposed Rulemaking*, FCC 05-150, released Sept. 23, 2005, para. 96

Effect of the FCC's Information Services Rulings

The competitive ISP and competitive telephone industries have already suffered under these decisions. Will the on-line content service provider industry be next?

The independent ISP industry flourished in the dial-up world. But the FCC's information services decisions mean that neither cable nor telephone companies are required to allow independent ISPs access to their customers. The cable and telephone companies have, in most cases, taken advantage of these decisions and have refused to allow independent ISPs to provide service over their broadband networks. As a result, while there are hundreds of independent ISPs offering dial-up access to the Internet, there are very few independent ISPs providing broadband connectivity.¹⁹ As consumers increasingly shift from dial-up service to broadband, the independent ISP industry is facing a difficult future.

The competitive local exchange carrier (CLEC) industry has encountered a similar downturn. The Telecommunications Act of 1996 required the Regional Bell Operating Companies (RBOCs) to permit competitors to lease component parts of the telephone network on an unbundled basis. Hundreds of CLECs entered the market in after the Telecommunications Act of 1996 providing lower-cost service to both business and residential subscribers. In a series of decisions between 2001-2005, the FCC and the courts ruled that telephone companies have no legal obligation to sell access to their broadband facilities to CLECs on an unbundled basis. As the telephone companies withdrew access to these facilities, many CLECs filed for bankruptcy, and others cancelled their expansion plans. The FCC's 2005 decision to classify DSL as an "information" service continues the trend to close the telephone companies' broadband services to interconnection by competitors.

The history of the independent ISP and CLEC industries is troubling to the VoIP, on-line and equipment industries. They are concerned that the network owners treatment of ISPs and CLECs may foreshadow the treatment that they will receive in the absence of a Net Neutrality rule.

3. The FCC Proposes Title I Ancillary Authority over Broadband Services.

Though the FCC has defined cable modems and DSL as exempt from Title II regulation, it has asserted that it retains authority to oversee, and perhaps regulate, both services under its Title I "ancillary authority". Title I allows the FCC to impose requirements "reasonably ancillary to the effective performance of [its] various responsibilities." The Supreme Court stated in dicta in the *Brand X* decision that the FCC has authority under Title I, although the full scope of its Title I authority has yet to be determined.

¹⁹ In the dial-up world, Dr. Mark Cooper found an average of 15 ISPs per 100,000 customers, while there are now less than 2 ISPs per 100,000 customers of broadband connections. For more discussion of the dominance of the phone and cable companies over the broadband ISP market, see section III.A below.

In its recent *Wireline Broadband Order*, the FCC sought another round of comment to consider whether to impose a variety of consumer protection requirements on broadband network operators under its Title I “ancillary” authority. The FCC specifically requested comment on whether it should apply its Title II policies for privacy, slamming, service discontinuance, truth-in-billing, network outages and others. The FCC did not, however, propose to apply its Part 68 rules regarding the attachment of network equipment or open access to Internet content/applications/services under its Title I authority.

The FCC has at times used its Title I authority to protect consumers and competition. For instance, it required voice mail to be accessible to persons with disabilities, and it required VoIP providers to provide E911.

Nonetheless, the scope of its Title I authority is in doubt. Title I authority is not unlimited; the Commission’s action must be “ancillary” to a specific statutory purpose. The Communications Act generally recognizes the FCC’s authority over “all interstate and foreign communications by wire or radio” in section 152(a), but Congress has not granted the FCC specific statutory authority to promote the openness of broadband networks.²⁰

Twice in the recent past, the FCC’s decisions based on Title I have been overturned by the courts. In *American Library Association v. FCC*,²¹ the court overturned the FCC’s “broadcast flag” rules, finding that the FCC had no authority under Title I to regulate receiver equipment after the transmission and receipt of the broadcast transmission had ended. In *Motion Picture Ass’n of America v. FCC*,²² the court found that Title I did not grant the FCC authority to regulate program content, given the First Amendment issues at stake.

Any action taken by the FCC under Title I is certain to be challenged and, because the issue goes to the heart of the FCC’s governing statute and could impact many other industries, could well be heard by the Supreme Court. Thus, now that the FCC has found that cable modems and DSL services are classified as information services, it is unclear whether or not it has the authority to enforce a Net Neutrality requirement unless Congress specifically grants it such authority.

²⁰ Congress has recognized that the FCC should promote the Internet, but not necessarily the “openness” of the Internet. In section 230(b) of the Communications Act of 1934, Congress stated that it is the policy of the United States “to promote the continued development of the Internet” and “to preserve the vibrant and competitive free market that presently exists for the Internet.”

²¹ 406 F.3d 689 (D.C. Cir. 2005).

²² 309 F.3d 796 (D.C. Cir. 2002).

D. Government Actions and Statements of Government Officials Concerning Net Neutrality.

In general, the government has recognized that Net Neutrality is an important issue but has yet to establish a permanent and enforceable Net Neutrality rule. The following section reviews the government's actions and statements on Net Neutrality to date. The source documents for each of the following are contained in the attachments.

NARUC Resolution: On Nov. 12, 2002, the National Association of Regulatory Utility Commissioners (NARUC) adopted a resolution urging the adoption of certain openness principles. The resolution noted that providers of broadband services or facilities have the technical capability to create a "walled garden" or "fenced prairie" that is "designed to attract customers to preferred content but that also could keep consumers from reaching content other than those of the providers' choosing." The resolution did not request any action from the FCC. Rather, it issued a general resolution that consumers should be able to access the lawful content of their choice (including applications) without discrimination and that consumers should have the information they need about their service plans. The resolution also declares that nothing prohibits an ISP affiliated with a broadband facilities provider from promoting or preferring particular content. (See Attachment C)

Commissioner Copps Speech: On October 9, 2003, Commissioner Michael Copps gave an influential speech expressing his concern that the operators of broadband networks were lobbying the FCC to close down the Internet by exercising their control over the chokepoints in the network. He said that the founders' vision of the Internet was being exchanged for a constricted and distorted view of technology development, entrepreneurship and consumer preferences. He warned that the FCC appeared to be buying into the warped vision that open networks should be replaced by closed networks. If this vision were to become reality, he suggested, entrenched interests would have even greater power than they have today to design and control the Internet of the future. (See Attachment D)

Chairman Powell Speech: On October 19, 2004, then-FCC Chairman Powell gave a speech to the Voice on the Net (VON) Conference in which he endorsed the four "Internet Freedoms" and called upon the industry to adhere to these principles. He cited the enormous benefits that the IP revolution is bringing to the American economy and consumers and urged the broadband industry to abide by these openness principles. Chairman Powell, however, stopped short of declaring that the FCC would enforce these principles. (See Attachment B)

Madison River Blocking Complaint: In early 2005, Vonage alleged that Madison River Telephone Company was blocking consumers from obtaining access to Vonage's VoIP service. The FCC initiated an investigation of the allegations that Madison River had violated the requirement to interconnect and carry traffic in section 201(b) of the Communications Act. On March 3, 2005, the FCC's Enforcement Bureau reached a

settlement agreement with Madison River (See Attachment E). The agreement prohibits Madison River from blocking the “ports” for VoIP traffic, and Madison River agreed to pay \$15,000.

This is the only known enforcement action taken against any blocking of VoIP calls. Chairman Powell noted that it was an important demonstration of the FCC’s ability to enforce its “Internet Freedom” policy without the need for explicit FCC rules. However, the FCC did not affirmatively grant the complaint or make a precedential ruling. Madison River entered into the settlement agreement voluntarily and did not pursue an appeal of the order. Thus, the scope of the FCC’s authority to order a company to stop blocking has not yet been decided. (See Attachment E)

S.1504 (Ensign-McCain bill): On July 27, 2005, Senators Ensign and McCain introduced legislation to reform the nation’s communications laws. Section 7 of the bill contains an open Internet provision. Subsection (a) of the bill says that:

- a consumer shall not be denied access to “content,” and a broadband provider will not “willfully and knowingly block” access to content;
- a network operator may nevertheless engage in blocking if the content is illegal, the blocking is in compliance with state or federal law, or the denial of access is consistent with the subscriber’s service plan.

Subsection (a) allows broadband providers to customize a service offering for consumers that may include differential access to certain content, applications and service plans.

According to subsection (b), the FCC may take enforcement action against any broadband provider that “intentionally restricted access to content” in violation of the above policy. Broadband providers, however, will not be subject to enforcement if they are performing network management, or traffic prioritization, or taking other action to protect the security and integrity of the network, or preventing illegal conduct.

The provision says that nothing in the bill affects parental controls to block certain content of the user’s choosing. It specifically protects the consumer’s right to attach any device to the broadband network. Finally, the provision says that nothing in subsection (a) allows a broadband provider to prevent a customer from receiving VoIP from a competitor.

FCC’s Wireline Broadband Order: On August 5, 2005, the FCC explicitly refused to adopt a rule to enforce net neutrality. Although it agreed that active interference with consumer’s access to lawful Internet content would be “inconsistent with the statutory goals of encouraging broadband deployment,” it “did not find sufficient evidence in the

record before us that such interference . . . is currently occurring.” The FCC pledged that it would “not hesitate to take action to address” any action violating the four principles.²³

FCC Policy Statement: On August 5, 2005, the same day that the FCC adopted the *Wireline Broadband Order* classifying DSL services as information services, the FCC issued a “Policy Statement” articulating four principles to “encourage broadband deployment and preserve and promote the open and interconnected nature of public Internet.” The Four principles are: (1) consumers are entitled to access the lawful Internet content of their choice; (2) consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement; (3) consumers are entitled to connect their choice of legal devices that do not harm the network; and (4) consumers are entitled to competition among network providers, application and service providers, and content providers. The Commission pledged to “incorporate these principles into its ongoing policymaking activities.”²⁴

Chairman Martin’s statement issued the same day says “policy statements do not establish rules nor are they enforceable documents.” Chairman Martin expressed his confidence that “the marketplace will continue to ensure that these principles are maintained” and that “regulation is not, nor will be, required.” (See Attachment F)

FCC Merger Orders: On October 31, 2005, the FCC approved the two mergers of the major long distance companies with RBOCs (SBC and AT&T; MCI and Verizon). In approving the mergers, the FCC adopted a number of conditions, one of which was an “enforceable” condition that obligates the merging parties to comply with net neutrality rules for 2 years. The FCC’s Press release states:

The Commission also adopted in the Order **as enforceable conditions** certain voluntary commitments made by the applicants.

-
The applicants committed for a period of two years to conduct business in a way that comports with the Commission’s Internet policy statement [adopted in August and] issued in September.²⁵

Chairman Martin’s statement did not address this particular Net Neutrality condition (although he did say that he thought many of the conditions were not necessary).

²³ In the Matters of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, CC Docket No. 02-52, 02-33, 01-337, 95-20, 98-10, *Report and Order and Notice of Proposed Rulemaking*, FCC 05-150, released Sept. 23, 2005, para. 96.

²⁴ Action by the Commission August 5, 2005, by Policy Statement (FCC 05-151). Chairman Martin, Commissioners Martin, Abernathy, Copps, and Adelstein, with Chairman Martin issuing a statement.

²⁵ “FCC Approves SBC/AT&T and Verizon/MCI Mergers,” Oct. 31, 2005, SBC/AT&T Docket No. 05-65, Verizon/MCI Docket No. 05-75, p. 2-3.

Commissioner Copps, however, had much to say about Net Neutrality. He first noted the following:

Net Neutrality: Two years ago I urged the Commission to ensure that its policies protect the openness that makes the Internet such a vibrant place. Two months ago, I pushed for this Commission to approve an Internet Policy Statement outlining the freedoms consumers have a right to expect in the digital age. Today, we make these principles enforceable. As a result, consumers will have an enforceable right to use their bandwidth as they see fit, going where they choose and running the applications they want on the Internet.

Commissioner Copps later went on to explain why Net Neutrality was an important issue for the FCC to adopt in conjunction with the mergers:

No less a source than the *Wall Street Journal* pointed out less than two weeks ago that large carriers “are starting to make it harder for consumers to use the Internet for phone calls or swapping video files.” The more powerful and concentrated our facilities providers grow, the more they have the ability, and perhaps even the incentive, to close off Internet lanes and block IP byways. I’m not saying this is part of their business plans today; I am saying we create the power to inflict such harms only at great risk to consumers, innovation and our nation’s competitive posture. Because, in practice, such stratagems can mean filtering technologies that restrict use of Internet-calling services or that make it difficult to watch videos or listen to music over the web. The conditions we adopt today speak directly to this issue—*before* increased concentration of last mile facilities and the Internet backbone make it intractable. This is why stand-alone DSL, enforceable net neutrality principles, and peering in the Internet backbone are so vital.²⁶

E. Examples of Blocking or Discrimination by Network Operators.

The problem identified by network neutrality proponents has been described as theoretical or “a solution in search of a problem.” This pithy phrase cannot be reconciled with the growing evidence of blocking and discrimination. Significant examples of discrimination were first submitted to the FCC in 2002, and examples of blocking have continued to accumulate since then. While the first examples of discrimination or usage limitations principally involved cable companies, recent violations of openness principles have involved telephone and wireless companies. Moreover, technologies are being marketed to network owners to assist them in blocking or screening out certain undesirable traffic.

²⁶ *Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control, Memorandum Opinion and Order, WC Docket No. 05-75, Statement of Commissioner Michael J. Copps, concurring.*

Before turning to the specific examples, it is useful to review a survey of broadband operators taken in 2002 by Tim Wu, a law professor at Columbia University Law School who has been writing about Net Neutrality for several years. Professor Wu found that most broadband subscriber agreements imposed explicit limits on a consumer's use of his or her broadband connection. Professor Wu also found that both cable and telephone companies used their subscriber agreements to impose such limitations, although cable operators tended to impose more limitations than telephone companies. For instance, nearly every cable operator and one third of DSL operators barred consumers from using their broadband connection to operate a server and/or provide content to the public. Such restrictions allow consumers and businesses to be "consumers" but not "providers" of information. (In contrast, one service provider explicitly allowed users to run a web server, demonstrating that there was no technical reason to prevent users from operating their own servers.) Most cable and a few DSL providers also prevented "commercial" or "enterprise" use of residential broadband connections and also banned home networking, maintaining that such uses were a "theft of service."²⁷

The following discussion describes the specific examples of blocking known to date; the documentation for these examples is contained in the attachments.

a. Cable Companies

i. Virtual Private Networks

A few years ago, the Coalition of Broadband Users and Innovators (CBUI) brought to the FCC's attention that cable modem providers prohibited residential consumers from using their broadband connections to log into virtual private networks (VPNs). A VPN allows the residential consumer to have all the functionality of the workplace from the comfort of their homes. According to CBUI, these restrictions had little to do with concerns about excessive use of the network; CBUI filed an affidavit showing that VPN users do not generate significantly more traffic than other users. Nonetheless, this practice violated the terms and conditions of the cable companies' subscriber agreements concerning approved uses. Some cable operators banned VPN usage outright, or demanded additional fees. For instance, Cox Cable said that residential consumers who wished to use their broadband service for commercial grade purposes could purchase a different offering at a "slightly higher price point." The National Cable and Telecommunications Association (NCTA) attempted to defend the restriction by asserting that the VPN restrictions were necessary to differentiate between "static" and

²⁷ See, "Network Neutrality, Broadband Discrimination," by Tim Wu, available in *Open Architecture as Communications Policy*, edited by Mark N. Cooper, Center for Internet and Society, Stanford Law School, pp. 197-229.

“dynamic” IP addresses.²⁸ Expert witnesses brought forth by CBUI rebutted this defense. The cable operators later eliminated these VPN restrictions.²⁹

ii. Home Networking

One cable provider prohibited residential consumers of its broadband service from engaging in “home networking.” Home networking allows a consumer to connect several computers in the home to one broadband connection. In this case, the consumer used a Network Address Translator (NAT) that connects several computers to the one computer on the broadband network. This allows multiple computers to share the same IP address, so that the cable operator believes there is only a single computer. The cable provider, AT&T, considered this to be a “Theft of Service” under its contract with the consumer. According to Multichannel News, AT&T sent out letters to certain customers saying customers must either pay for the extra Internet-protocol address or AT&T would disable the second computer connection.³⁰ This policy was abandoned once AT&T sold its cable business.³¹

b. Telephone Companies

i. Madison River Settlement Agreement

In early 2005, Vonage alleged that Madison River Telephone Company was blocking consumers from obtaining access to Vonage’s VoIP service. The FCC initiated an investigation of the allegations that Madison River had violated section 201(b) of the Communications Act. On March 3, 2005, the FCC’s Enforcement Bureau reached a settlement agreement (See Attachment E). The agreement prohibits Madison River from blocking the “ports” for VoIP traffic, and Madison River agreed to pay \$15,000 to the U.S. Treasury.

²⁸ Letter from National Cable Television Association to FCC Secretary Marlene H. Dortch, FCC Docket 02-52, Sept. 8, 2003.

²⁹ Letters from Ryan G. Wallach on behalf of Comcast Corporation, stating that the VPN restriction had been removed from Comcast’s subscriber agreements as a normal course of transitioning its customers from the @Home network to its own network. *Ex Parte* letters in Docket 02-52, May 7 and May 15, 2003. Letters from Alexander Netchvolodoff of Cox Communications to the FCC, first defending the VPN restriction and then stating that Cox had changed the language in its subscriber agreements to delete the prohibition on using virtual private networks. *Ex parte* letters in Docket 02-52, April 7, 2003 and May 1, 2003 (included in Attachment G).

³⁰ Multichannel News, Sept. 23, 2002, as cited in a filing with the FCC made by the HTBC on Jan. 30, 2003 in CC Docket No. 02-52.

³¹ *See, Ex Parte* Letter from Professors Lawrence Lessig and Tim Wu in Docket 02-52, August 22, 2003, pp.7-8.

- ii. Bell Companies propose blocking of certain carrier codes.

On December 7, 2005, the Bell Companies' organization that administers the system used for routing toll free numbers (the 800 Service Management System, commonly referred to as SMS/800) announced that it intends to give its members a new system tool that would enable them to block certain 800 calls transmitted by competitive VoIP service providers.

If the FCC permits this plan to be implemented, carriers will be able to block calls of VoIP competitors that use the 0110 Carrier Identification Code (CIC). The Bell Companies claim that this 0110 CIC is their code, even though the Ordering and Billing Forum (OBF – a neutral industry organization) specifically states that the “0110” code is available to non-carriers. While some carriers have stated their intent to use the blocking functionality to demand that VoIP competitors pay access charges, one Bell Company has publicly announced that it intends to block the traffic of all non-affiliated companies irrespective of whether the VoIP competitors agree to pay access charges.

Many VoIP service providers that use this code provide enhanced services, and are thus not required to pay access charges under the FCC's rules. There are currently several unresolved FCC proceedings that will clarify whether, and under what circumstances, access charges might apply to other VoIP services. If the Bell Companies activate this feature, consumers that purchased conferencing services, prepaid calling cards, paging services and other services will likely find their calls blocked with no advance notice. Literally millions of consumers could be adversely impacted through service disruptions and higher rates if this feature is implemented.

Implementation of this new blocking feature is scheduled to take place in two phases, on February 5, 2006 and March 5, 2006.³²

- iii. Qwest imposes limits on broadband users.

Qwest (one of the four RBOCs) recently issued an acceptable use policy (AUP) that imposes limits on its DSL customers, including those who receive service from third party ISPs. Qwest prohibits, among other things, the use of a DSL line by a business to provide a wireless hotspot for its customers. It also prohibits all users from setting up any sort of server at all, either for personal or commercial use. (See Section 7(a) of the AUP in Attachment I). These limits apply even if Qwest is merely providing the line, and the consumer's Internet service is coming from a third party. The AUP also states that the user agrees to be liable for \$5.00 for each spam message sent from his or her machine even if the machine was taken over by a worm or by spyware.

³² See SMS/800 Bulletin No. NWS-05-40, released Dec. 7, 2005, concerning Release 16.3 Implementation (contained in Attachment H).

c. Wireless Companies

i. Clearwire reserves right to block Vonage

The service agreement used by Clearwire, a start-up Wi-Max company owned by Craig McCaw, allows it to block large bandwidth uses, which might include VoIP and streaming video. Clearwire maintains that such reservations are necessary to allow it to manage its network so that large uses by some users do not overwhelm its capacity to serve all its customers. However, Clearwire also is preparing to offer its own VoIP service after signing an agreement with Bell Canada. (See Attachment J).

ii. Verizon Wireless

Verizon Wireless appears to block customers from using its wireless services for VoIP, streaming video and other uses. The following Acceptable Use Policy applies to Verizon Wireless's wireless broadband users:

Unlimited NationalAccess/BroadbandAccess:

Subject to VZAccess Acceptable Use Policy, available on www.verizonwireless.com. NationalAccess and BroadbandAccess data sessions may be used with wireless devices for the following purposes: (i) Internet browsing; (ii) email; and (iii) intranet access (including access to corporate intranets, email and individual productivity applications like customer relationship management, sales force and field service automation).

Unlimited NationalAccess/BroadbandAccess services cannot be used (1) for uploading, downloading or streaming of movies, music or games, (2) with server devices or with host computer applications, including, but not limited to, Web camera posts or broadcasts, automatic data feeds, Voice over IP (VoIP), automated machine-to-machine connections, or peer-to-peer (P2P) file sharing, or (3) as a substitute or backup for private lines or dedicated data connections.

NationalAccess/BroadbandAccess is for individual use only and is not for resale. We reserve right to limit throughput or amount of data transferred, deny or terminate service, without notice, to anyone we believe is using NationalAccess or BroadbandAccess in any manner prohibited above or whose usage adversely impacts our network or service levels. Verizon Wireless reserves the right to protect its network from harm, which may impact legitimate data flows. We also reserve the right to terminate service upon expiration of Customer Agreement term.

d. Network Equipment Manufacturers

i. Verso

On September 14, 2005, Verso Technologies, Inc. (Nasdaq: VRSO) introduced a new carrier grade application filter that offers a bandwidth optimization and content management specifically for telecom carriers. The company advertised that its product allows cable operators and Internet service providers (ISPs) to “selectively disable undesirable network traffic” such as Skype, Peer-2-Peer (P2P) messaging, streaming media and instant messaging.

The company noted that Skype calls consume large amounts of bandwidth and can cause congestion and interrupt or degrade service for other critical applications. The company says that “[t]his traffic runs outside the traditional carrier revenue generation models and is therefore highly undesirable for them. Furthermore, carriers currently do

not have a feasible way to separately monitor and restrict this type of traffic on their network. Verso's new technology would fill this void."

The company's President and COO, Monty Bannerman, notes "[t]he application should be of great interest to any facilities based carrier in the world." (See Attachment K).

ii. OvisLink

A company called OvisLink currently advertises a VPN Router that provides a variety of security features including a firewall and "bandwidth management." The company is headquartered in Taiwan and has several offices around the world, including one in the U.S. (City of Industry, California). The company's promotional materials explicitly state that the product can be used to block MSN messenger, Yahoo Messenger, Skype and other traffic. (See Attachment L).

Messenger and Skype Blocking

One of the biggest headaches for system administrators is to block messenger and Skype traffic. Because these applications use dynamic ports that are hard to block, it is usually difficult to block those particular applications. With the RS-2000, it can block MSN messenger, Yahoo Messenger, ICQ, QQ messenger, and Skype traffic with a click of a button.

e. *Consumer Equipment*

It is not yet clear whether consumers will enjoy the freedom to attach their own equipment to broadband networks in the future. Network operators sometimes require equipment providers to undergo significant pre-approval processes before permitting the attachment of equipment. In addition, at least nine states have enacted laws that would permit broadband providers to restrict the types of equipment that consumers could attach to a broadband line.³³ These examples are provided below:

i. Xbox

Microsoft cites its experience with its Xbox gaming device as an example of the need for principles to ensure the ability to attach equipment to broadband networks. Xbox is a piece of equipment that consumers use at home to play an interactive, multi-subscriber game, generally over broadband networks. Microsoft told the FCC that, before introducing the product, it had to negotiate with cable operators individually to obtain their approval, despite the fact that Xbox already met established industry standards. Microsoft believes that the burdensome process of clearing technology through the cable companies delays the rollout of new products, stifling innovation and harming consumers.³⁴

³³ See, <http://www.freedom-to-tinker.com/superdmca.html>.

³⁴ Letter from the Coalition of Broadband Users and Innovators to FCC Secretary Marlene H. Dortch, FCC Docket 02-52, July 17, 2003.

ii. State Laws Limiting Consumers' Right to Attach Equipment

State laws have been enacted in Arkansas, Delaware, Florida, Illinois, Maryland, Michigan, Pennsylvania, Virginia and Wyoming to curtail consumers' use of equipment. While these laws differ in the details, these bills have been enacted at the request of industry to protect against the "theft" of their service or copyrighted material. In so doing, however, these overly-broad laws prevent consumers from making legitimate and lawful use of their equipment. For instance, many of these statutes make it illegal to use customer equipment for virtual private networks, for firewalls, or for networking multiple computers.³⁵ The language of these statutes often puts the communications provider, not the consumer, in control of the uses of the broadband network. For instance, in Michigan, it is illegal to possess a device with the intent to receive or transmit any telecommunications service without the express authority of the telecommunications service provider. In effect, this statute prohibits consumers from attaching devices to the network without permission of the provider.³⁶

f. International Examples

This paper provides several examples of blocking in foreign countries. These examples of abuse are obviously beyond the jurisdiction of U.S. laws. The paper nevertheless includes them for three reasons. First, they provide additional evidence that network operators have the ability and incentive to block traffic. Second, many U.S. companies, and certainly most major Internet companies, operate worldwide. These practices in foreign countries are sure to affect the ability of American companies to do business outside the U.S. Third, to prevent the practice of blocking undesirable traffic from spreading around the world, the U.S. should set an example for the rest of the world by adopting a Net Neutrality policy today. The U.S. will be in a poor position to convince other nations that they should allow American Internet-based companies to operate in those foreign markets if the U.S. does not adopt a Net Neutrality policy of its own.

In the examples below, the actors are all privately owned network operators that are either blocking or engaging in exclusive bundling that prevents other providers from obtaining the same quality of access to the network.³⁷

³⁵ For instance, several state bills make it illegal to delete the information showing where a communication originates, despite the fact that deleting this information is an extremely common service provided by firewalls to prevent unauthorized users ("hackers") from gaining access to proprietary computer networks.

³⁶ See, [http://www.legislature.mi.gov/\(zavxobjt2avdpx55zta3zv55\)/mileg.aspx?page=GetMCLDocument&objectname=mcl-750-540c](http://www.legislature.mi.gov/(zavxobjt2avdpx55zta3zv55)/mileg.aspx?page=GetMCLDocument&objectname=mcl-750-540c)

³⁷ This paper does not include the many examples of foreign governments engaging in censorship to control the information available to the citizenry. Several studies of foreign government censorship are available at <http://www.opennetinitiative.net>.

i. E-Plus bundling Skype, excluding other VoIP providers.

Skype recently announced a partnership with E-Plus, the third largest mobile network in Germany, in which Skype VoIP services are to be bundled with E-Plus' mobile data network. Most significantly, the press release states that "Skype will be the only company offering calls over the Internet on the E-Plus mobile network." (See Attachment M). This language appears to mean that E-Plus will not allow other VoIP providers to use its data network.

ii. Canadian ISP blocks labor union web site, and others.

On July 25, 2005, Canadian Internet Service Provider (ISP) Telus unilaterally blocked a Web site set up by an employee labor union intended to publicize the union's views about its contract dispute with Telus. Telus is one of Canada's largest ISPs, with over one million customers. According to one analysis, Telus's decision to block traffic to the Internet Protocol (IP) address of the labor union site caused collateral damage to at least 766 additional, unrelated Web sites. Telus restored access to the IP address hosting the sites on July 28, 2005. (See Attachment N)

Telus claimed that it blocked the site because of illegal material on the web site that threatened or intimidated workers if they broke the strike. The parties later reached a court-supervised agreement in which Telus agreed not to block the web site as long as the union removed any photographs or information threatening workers.³⁸

iii. Mexico's Telmex Blocks VoIP web sites and degrades VoIP calls.

In March 2005, the U.S. Trade Representative (USTR) accused Mexico's dominant telephone company, Telmex, of taking "inappropriate" action against VoIP companies. Several VoIP consumers complained that Telmex was degrading the voice quality of their VoIP calls, while Skype alleged that Telmex was blocking its web site, possibly in order to discourage consumers from signing up for service. While it was unclear at the time whether or not the actions were deliberate, the evidence was apparently strong enough for the USTR to cite the Mexican telephone company's actions as "inappropriate" in a report it issued in March, and for an unidentified USTR official to suggest that Telmex's action was "anticompetitive." (See Attachment O)

F. Positions of the Parties.

Retail equipment manufacturers want to ensure the commercial availability and nationwide portability of devices that attach to broadband services and video services in particular. Their concern is that network owners may adopt conflicting proprietary standards and protocols that limit manufacturers' ability to build and market devices

³⁸ The court settlement is available at http://www.voices-for-change.com/documents/vfc_settlement.pdf.

that attach to the network. For this reason, the Consumer Electronics Association (CEA) supports legislation ensuring the commercial availability of video devices manufactured by parties unaffiliated with any network operator. It believes the same protection currently codified in the FCC's right-to-attach rules and Section 629 of the Communications Act that ensures the commercial availability of set-top boxes for cable services should be extended to broadband video services.

Network equipment manufacturers support keeping the Internet open, but generally oppose legislation or FCC rules. Network equipment manufacturers, including Intel and Cisco, are concerned that burdensome regulations on network owners may discourage them from purchasing and constructing broadband networks.

VoIP Providers, such as Vonage, Skype and Pulver, support legislation and/or FCC rules that will prevent broadband network operators from blocking VoIP traffic. VoIP providers are concerned that network owners will block or degrade VoIP "ports" in order to protect their revenues from their own telephone services. Early in 2005, the FCC reached a consent agreement with one telephone company (Madison River) to stop blocking VoIP traffic, but other companies have alleged that they have the right to block VoIP traffic, both domestically and overseas. Furthermore, it is not clear whether the FCC has authority to impose penalties for blocking VoIP traffic (which is generally considered an information service, not a telecommunications service).

Retail On-line Content and Service Providers, such as Google, Yahoo!, E-bay and Amazon, support legislation or FCC rules to ensure that network owners do not discriminate against unaffiliated on-line providers. These companies are concerned that network operators may slow down the transmission speeds to unaffiliated providers, or otherwise degrade the consumers' access to certain web sites in order to favor the web sites in which the network operator has a financial interest. On-line providers are also beginning to develop their own voice services, which may also cause them to share the concerns of VoIP providers (above).

Competitive Local Exchange Carriers (CLECs) support a broad definition of net neutrality to ensure that network operators are required to serve every user and interconnect with other network providers on a nondiscriminatory basis. They express concern that a narrow approach that only requires the network operators to treat all bits fairly will still give network operators the freedom to deny service or interconnection altogether to certain providers or customers.

Consumer and public interest organizations support the unlimited right of consumers to access information, applications and services of their choice over the Internet. These organizations believe that consumers and application providers, not the network operators, should control how the Internet is used. These organizations generally believe that the Internet is a vehicle for many lower-cost, higher-value services for consumers, and they are concerned that network owners will try to limit the availability of these choices in order to protect their own services. The Internet

provides consumers with enormous freedom and choices, and thereby promotes democracy and freedom of speech.

The Regional Bell Operating Companies (RBOCs) (Verizon, BellSouth, SBC and Qwest) argue that they already have incentives to keep the Internet open and legislative or regulatory requirements are unnecessary. Each RBOC wrote to the FCC in the fall of 2003 to support the High-Tech Broadband Coalition's principles, but no company supported rules to enforce those principles. The companies claim that new rules could impose additional costs on them and discourage their broadband deployment. One RBOC (Verizon) is working to develop an agreement among the other industry members to abide by the principles of Net Neutrality on a voluntary basis, but the company also expressed its opposition to legislation.³⁹

Cable companies, much like the RBOCs, oppose a Net Neutrality rule. They suggest it is a "solution in search of a problem" – that there is insufficient evidence of blocking or discrimination to warrant any government action. Cable companies are concerned that government legislation or rules could interfere with how they manage their networks. Furthermore, since cable modem services have not historically been subject to regulation, they argue that new rules would be especially burdensome.

³⁹ See, <http://www.pff.org/issues-pubs/pops/pop12.29netneutrality.pdf> and <http://nitelecomupdate.com/lenya/telco/live/tb-PGMG1138652004049.html>.

G. Matrices Summarizing Parties' Positions and Rights.

The following matrix summarizes the consumer rights included in various parties' proposals:

Consumer Rights ⇒					
Party ↓	Right to Attach Equipment	Right to Access Lawful Content	Right to Run/Offer Applications/ Services	Right to Information About Service Plans	Right to Competition for Network, App'n, Serv., & Content Providers
Net Neutrality (CBUI)	×	×	×	×	
Connectivity Principles (HTBC)	×	×	×	×	
Internet Consumer Freedoms (Ch. Powell)	×	×	×	×	
Nat'l Ass'n Reg'y Util'y Comm'ers (NARUC)		×		×	
Broadband Policy Statement (FCC)	×	×	×		×
S.1504 (Ensign)	×	×			

The following matrix summarizes some of the specific protections and exceptions included in various parties' proposals:

Specific Prohibitions and Exceptions ⇔	Network Operator May Not Impair or Interfere	Individual Service Plans Permitted	Exception for Network Management	Exception for Network Integrity/ Security/ Traffic Prioritiz'n	Exception for Theft of Service	Complaint Must Show that Broadband Operator "Knowingly" or "Intentionally" Blocked Access
Parties ↓						
Net Neutrality (CBUI)	×	×	×			
Connectivity Principles (HTBC)		×	×		×	
S.1504 (Ensign)		×	×	×	×	×

The positions of the parties on the range of government actions is summarized in the following chart:

FCC should monitor industry and only take further action if the policy is violated.	Cable companies, RBOCs, network equipment manufacturers
Net Neutrality requirements should be imposed on large companies as a condition of their merger.	FCC
FCC should enforce the policy on a case-by-case process through the complaint process.	Some VOIP Providers, some on-line providers
FCC should establish specific rules and standards of interconnection.	Some VOIP providers, some application providers, some retail equipment manufacturers
Congress should clarify FCC's Title I authority to ensure it has enforcement/rulemaking authority to correct any problem that arises.	Some network equipment manufacturers.
Congress should codify Net Neutrality.	VOIP providers, retail equipment manufacturers, on-line content providers, consumer organizations.

PART II

The Case for an Enforceable Net Neutrality Principle

A. Interpreting the Evidence: Is there a Net Neutrality Problem?

The following points summarize the information presented above and explain why Public Knowledge believes a Net Neutrality statute or rule is necessary:

1. Network providers have blocked or limited consumers from making legitimate uses of the Internet in at least 8 known cases in the U.S. alone. The cases involved cable companies, telephone companies, and wireless companies.
2. These examples appear to be unrelated to excessive bandwidth usage causing congestion on the network. The examples involve limits on streaming video, home networking, VoIP, and attachment of a server at the end user's premises. The blocking appears to be motivated by the network operator's desire to prevent users from competing with the network operators' own services.
3. It is unknown whether or not the FCC has authority to enforce a Net Neutrality rule under current law (except with respect to two companies for a limited amount of time).
 - i. The FCC has classified both cable modem services and telephone company broadband services as "information services". Broadband providers now have no obligation to serve all users and have no obligation to treat all traffic in a nondiscriminatory manner. In other words, broadband network operators may pick and choose which users to serve and which content to carry over their broadband networks.
 - ii. The FCC's Madison River decision does not provide "proof" that the FCC has authority to enforce net neutrality. The Madison River case was a consent decree that Madison River entered voluntarily. Furthermore, the case was decided before the FCC issued its Wireline Broadband Order classifying wireline broadband services as information services.
 - iii. While some allege that an aggrieved party can always file a complaint at the FCC, the FCC has not established any Net Neutrality rule. It is difficult for a user to complain successfully that the network operator has committed a violation if there is no rule to violate.

- iv. AT&T and Verizon agreed to abide by a Net Neutrality rule as an enforceable condition of approving their mergers, but this provision was adopted for only two years and expires in September 2007.
- v. The FCC's authority to impose a Net Neutrality principle under its Title I authority is uncertain. Two recent questions have overturned the FCC decisions based on its Title I authority.

4. Blocking and Discrimination are Likely to Worsen over time.

- i. At least two equipment manufacturers are actively marketing equipment that permits blocking of "undesirable" traffic.
- ii. Several economic studies point out that the network operators have increasing incentives to block traffic in order to reap additional profits in upstream markets (this point is addressed in more detail in Part III, Section 1 below).
- iii. Two RBOC executives have given public statements that they intend to change their open Internet policies. (See Part III, Section 1 below).

B. The Benefits of Net Neutrality.

Some observers may yet ask, "Why should we care?" One answer is that broadband networks are quickly becoming the essential lifeline of our economy and society, carrying on-line commercial transactions, interactive games, news and information on current events, local and national advertising, telemedicine and distance learning, and videoconferencing.⁴⁰ Broadband service providers increasingly provide many of the same services as public libraries, local and national

⁴⁰ Jon Liebowitz, a Commissioner at the Federal Trade Commission, describes the benefits of an open Internet this way:

In this day and age, Internet access is even more vital than some traditional government services because the Internet is both a repository of information, like a library, and a shared public space, like a park, to which everyone should have access. However delivered, inexpensive or free high speed Internet access is essential to bridge the digital divide and boost technological literacy. High speed access, particularly wireless access, benefits students, parents, small businesses, emergency workers and anyone else who values the enhanced portability, flexibility and speed that comes from not having to be tethered to a modem. And as the *New York Times* noted just this weekend, a Wi-Fi mesh could be the most promising and reliable emergency communications technology in the wake of a disaster like Hurricane Katrina. Finally, the economic benefits of more broadband are potentially enormous: computer, hardware, software and e-commerce businesses would grow exponentially if we could increase penetration by, say, 50 percent. "Municipal Broadband: Should Cities Have a Voice?," Remarks to NATOA, Sept. 22, 2005, available at <http://ftc.gov/speeches/leibowitz/050922municipalbroadband.pdf>.

newspapers, banks, and broadcasters.⁴¹ Allowing the dominant cable and telephone industries to control our access to these sources of information, entertainment and commerce could endanger our First Amendment rights as well as our high-tech economy.

The following discussion highlights the primary benefits of maintaining an open Internet:

a. *Expanded E-Commerce and Economic Growth:* The nation's future economic growth is clearly linked to the expansion of the Internet and the information technology (IT) industry. Former NTIA chief Michael Gallagher cited the following statistics recently to demonstrate the link between U.S. economic growth and the IT sector:

- U.S. productivity grew 4.7% in Q3-2005 and grew 3.1% over the prior four quarters.
- From December 2000 to December 2004, [U.S.] productivity grew at its fastest 4-year rate in over 50 years.
- From 1Q03-1Q05, major segments of IT investment spending grew between 22% and 48%.
- IT contributed 8.0% in 2003 and 12.0% in 2004 to the rise in GDP.
- During the period 1995-2003, US average labor productivity (ALP) increased at an average annual growth rate of 3.06% - more than double that of the previous 22 years (1973-1995).⁴²
- Nearly half (47%) of ALP growth was due to IT contributions to capital deepening and total factor productivity (TFP).⁴³

Furthermore, a recent study presented to the Telecommunications Policy Research Conference by four economists found a direct link between broadband adoption and economic growth. The study concludes:

[We find evidence that] broadband positively affects economic activity in ways that are consistent with the qualitative stories told by broadband advocates. Even after controlling for community-level factors known to influence broadband

⁴¹ At the University of Texas, nearly all of the 90,000 volumes contained in the undergraduate library have been removed to other libraries on the campus to make room for an on-line library-- a growing trend at colleges and universities around the country.

⁴² Federal Reserve Chairman Alan Greenspan said "arguably, the pickup in productivity growth since 1995 largely reflects the ongoing incorporation of innovations in computing and communications technologies into the capital stock and business practices." Remarks by Chairman Alan Greenspan, *Productivity*, at the U.S. Department of Labor and American Enterprise Institute Conference, Washington, D.C. October 23, 2002, <http://www.federalreserve.gov/boarddocs/speeches/2002/20021023/default.htm>.

⁴³ Speech by NTIA Administrator Michael Gallagher to the European American Business Council, 2005 Digital Economy Workshop, Dec. 19, 2005, available at http://www.ntia.doc.gov/ntiahome/speeches/2005/MGallagher_DEW_12192005_files/frame.htm.

availability and economic activity, we find that between 1998 and 2002, communities in which mass-market broadband was available by December 1999 experienced more rapid growth in (1) employment, (2) the number of businesses overall, and (3) businesses in IT-intensive sectors.⁴⁴

If broadband network operators are permitted to limit the user's choice of computers or ability to network computers, as they have in the past, many of the productivity benefits from computing and communications technologies could disappear.

b. *Enhancing the Marketplace of Ideas and Information:* From video updates, to blogs, to newsgroups, to e-mail updates, to RSS feeds, to on-line journals, more and more Americans obtain their information about the world over the Internet rather than through newspapers or through broadcast TV. According to one recent study by the Pew Internet and American Life Project, the percentage of Americans who "regularly" get their news from the Internet rose to 29% from virtually 0% one decade ago. At the same time, the percentage of people who receive their news from broadcast TV fell to 59% from near 70% in 1994, while newspaper usage declined to 42% from 58%.⁴⁵ If these trends continue, the owners of the broadband connections into our homes could exert greater control over the news and information we receive than broadcasters and newspaper-owners do today.

c. *Increased Investment in Innovative Applications:* New applications of broadband technology are being developed every day. One analyst has predicted that businesses need to be prepared for the coming of a second Internet revolution based on podcasting and blogging.⁴⁶ Furthermore, a Net Neutrality rule would provide a level of certainty for the future that encourages new investment today. Professors Lessig and Wu have argued that the clarification of the rules of the road concerning broadband technologies will itself stimulate even greater investment in new applications, as investors will have greater certainty that their new services will have access to the network.

⁴⁴ "Measuring Broadband's Economic Impact," by William Lehr, Carlos A. Osorio, Sharon E. Gillett, Massachusetts Institute of Technology, and Marvin A. Sirbu, Carnegie Mellon University, Presented at the 33d Research Conference on Communication, Information and Internet Policy (TPRC) Sept. 23-25, 2005, Arlington, VA, available at <http://www.tprc.org/TPRC05/Sat1040Sess05.htm#BroadDeploy>.

⁴⁵ Americans' Consumption of News & Information, April 1, 2005, available at http://www.pewinternet.org/PPF/r/38/presentation_display.asp.

⁴⁶ "During the next year, chief information officers (CIO) should pay acute attention to how technologies such as blogging and podcasting will affect their businesses and be ready for innovation with those technologies by their competitors, Gartner analysts said Thursday. Those innovations are driving a second Internet revolution, a time when businesses can't afford to be content that they are simply online, said Mark Raskino, a research fellow at Gartner. Podcasting and blogging are affecting businesses both internally and externally, he said." Quoted in "Gartner: CIOs should prepare for 'second' Internet: CIOs need to pay attention to innovations using technologies such as blogging, podcasting." By Jeremy Kirk, IDG News Service, December 08, 2005.

The question an innovator, or venture capitalist, asks when deciding whether to develop some new Internet application is not just whether discrimination is occurring today, but whether restrictions might be imposed when the innovation is deployed. If the innovation is likely to excite an incentive to discrimination, and such discrimination could occur, then the mere potential *imposes a burden on innovation today* whether or not there is discrimination now. The possibility of discrimination in the future dampens the incentives to invest today.⁴⁷

d. *Increased Investment in Consumer Devices and Equipment:* An open Internet policy pushes the opportunity for innovation from inside the network to the “edge” of the network. As the cost of processing power, storage and transmission have decreased, entrepreneurs have invested huge sums of capital in innovative devices, equipment and software, outside of the control of the network owners. The consumer electronics (CE) industry has enjoyed consecutive years of double-digit growth, and the impact on the U.S. economy is huge. Sales to dealers of all CE products reached \$113.5 billion in '04, an 11 percent increase over 2003. Sales in 2005 are projected to top \$125 billion.

Open attachment protects the consumers’ ability to obtain the most innovative equipment at the most competitive prices. Broadband equipment can empower consumers to control their broadband experience. MP3 players, like the iPod, allow consumers to be their own record producers; personal video recorders (PVRs), like TiVo, allow consumers to become their own network-programming executives. If broadband service providers are free to dictate which equipment can be connected to their networks or require customers to use only equipment purchased from the broadband provider, the equipment market will be less diverse, less innovative, and less responsive to the needs of customers.

e. *Expanded Educational Opportunities:* Educational institutions are among the most direct and innovative beneficiaries of broadband technologies. Colleges are increasingly exploring applications such as blogs, courseware sites, electronic facebooks, calendaring, Web conferencing, digital repositories (e.g., DSpace), e-portfolios, and peer networking to enable greater student collaboration and learning. According to the Economist magazine, a new technology called “collaborative filtering”, when applied to peer-to-peer services, can be used to share links to reference sites, sources, and research tools.

Educational institutions are not just beneficiaries of broadband innovation; they are also driving it. For instance, the Internet2, a consortium of over 200 universities, is developing and testing new revolutionary Internet applications such as digital libraries, virtual laboratories, distance-independent learning and tele-immersion. A primary goal of Internet2 is to ensure the transfer of new network technology and applications to the broader education and networking communities.

⁴⁷ *Ex Parte* filing by Professors Lawrence Lessig and Tim Wu, Aug. 22, 2003 to the FCC in CS Docket No. 02-52, pp.8-9.

Why would a Net Neutrality rule benefit educational institutions? At first blush, it might seem counter-intuitive that network operators would block usage by schools. But consider this: many private, for-profit schools compete with non-profit schools. An educational institution might seek to expand its reach, and its revenues, by reaching an exclusive arrangement with the network operator to distribute its educational materials to the disadvantage of other schools. Arguments for efficiency might lead to plans to replace our network of local and regional schools with a single nationwide school with preferential broadband access. Losing this diversity of thought and research would be disturbing and threatening to our democracy.

f. *Increased Video Programming and other Entertainment:* The letters “VoIP” usually translate into Voice over the Internet Protocol, but in the near future they could stand for something much more exciting – Video. Some telephone companies are now expanding their service offerings to include video – either as a cable-like programming service or as video on demand. What will happen when the technology arrives to allow competitive video providers to send programming over the Internet? Phone companies have already tried to block Voice over IP. Will the cable companies exercise their control over the network to stop cable modem subscribers from obtaining competitive cable service? Will the phone companies?

These questions are largely theoretical today, given the capacity limitations of today’s broadband networks. Yet, many telephone and cable companies are deploying fiber and are otherwise upgrading their systems to make bandwidth available at upwards of 100 Mbps, far beyond the FCC minimum of 200 kbps designation for “high speed” Internet. As bandwidth increases, questions involving discrimination in broadband service will move to the forefront.

While the most well known application for video streaming is cable-like programming service, there are also many educational uses of video streaming. Old Dominion University (ODU), located in Norfolk, Virginia, operates TELETECHNET, one of the largest university distance learning programs in the country. Though it began as a satellite based program, TELETECHNET now offers live courses over the Internet via video streaming. Distance-learning students unable to attend a class at its regular time may access the archived transmission two days after the session.

The above discussion reviews only some of the many benefits of broadband technologies. The growth of broadband Internet services stimulates phenomenal economic growth, especially in the high-tech sector; provides a world of information and current events; enhances educational opportunities for on-campus and off-campus students; and creates new opportunities for entertainment and video services. The cable and telephone industries are becomingly increasingly concentrated, which could allow them to increase their control over the information carried over their broadband facilities. Without a firm Net Neutrality policy, the network owners could curtail the economic, social, and educational benefits summarized above.

PART III
Responses to the Objections of Network Operators to an Enforceable Net Neutrality Principle

Network operators raise a variety of arguments against Net Neutrality. The following section analyzes and responds to these arguments.

A. Do Network Operators Already Have an Incentive to Keep Their Networks Open, Making a Law or Regulation Unnecessary?

Some network operators maintain that no legislation or regulation is necessary because they have no incentive to discriminate. They maintain that discrimination will drive away customers, reducing the network operators' subscriber base and producing fewer profits. The telephone and cable companies argue that market forces, without regulation, will drive them to keep their networks open.

This argument has not resonated in part because of a recent statement made by one of the leading Bell Company executives. Edward Whitacre, the Chief Executive Officer of AT&T (formerly called SBC) gave the following statement in a BusinessWeek interview:

How concerned are you about Internet upstarts like Google, MSN, Vonage, and others?

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!⁴⁸

While Mr. Whitacre did not directly state his intention to block on-line companies from using his company's network, his comments clearly reveal that he is frustrated that on-line companies are not paying a more for the use of his company's networks. On-line companies responded vigorously to the notion that they use the networks for free; they point out that they pay significant amounts to connect to the network. Whether or not AT&T acts on Mr. Whitacre's sentiments is yet to be seen, but it certainly reveals the company's desire to stop on-line content and service providers from riding his network.

⁴⁸ "At SBC, It's all About 'Scale and Scope': CEO Edward Whitacre talks about the AT&T Wireless acquisition and how he's moving to keep abreast of cable competitors." BusinessWeek Online, Nov. 7, 2005.

More significant than this anecdote is that several analysts disagree with the argument that network operators have economic incentives to keep their networks open. They note that, in the absence of specific rules requiring openness, network operators have significant economic incentives to promote certain users, web sites, or content providers. The following summarizes three papers that find network owners are likely to engage in discrimination unless Congress or the FCC adopts a Net Neutrality policy:

Dr.-Ing. Barbara van Schewick, an economist, has written a thoughtful theoretical paper on the incentives of network operators to discriminate in upstream markets in order to maximize profits. She begins by noting that, in most cases, a monopolist has no incentive to monopolize a complementary product in a competitive market because it can capture all the monopoly rents by charging a high price for its primary good. She then identifies several reasons why the traditional “one-monopoly-rent” theory does not apply to the Internet market. For instance, she notes that there are significant upstream profits, such as selling advertising on web sites, that cannot be captured simply by raising the price of network access. She finds that the network owner may also have incentives to discriminate in order to protect a favorable market position in the upstream market (for instance, a network owner has incentives to discriminate against a VoIP provider to protect its telephone service revenue). She further finds that a network operator has an incentive to discriminate against an application even if the provider does not manage to drive all other applications providers from the market. This makes “the threat of discrimination more relevant than commonly assumed.”⁴⁹

Mark A. Lemly and Lawrence Lessig offer another reason why network operators may discriminate. They note that even if rational economics would dictate that a network operator should open the network to all comers, network operators may nonetheless discriminate because signing contracts and selling service to lock in large customers are standard, if perhaps irrational, business practices.

The rationality assumption has historically been central to law and economics, but it has recently come under fire even within the discipline of economics. . . . Rather, systematic biases can infect decision making. In the business context, these biases often take the form of what might be called a “corporate endowment effect.” Businesses have core competencies – areas in which they are experienced and in which they know how to make money. They may discount the value of radically new ideas that would require them to move their business in a new direction, particularly when the proposed shift would cannibalize an existing revenue stream.⁵⁰

⁴⁹ “Towards an Economic Framework for Network Neutrality Regulation,” Paper presented at the 33d Research Conference on Communication, Information and Internet Policy (TPRC) 2005) Sept. 23-25, 2005.

⁵⁰ “The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era,” by Mark A. Lemly and Lawrence Lessig, in *Open Architecture as Communications Policy: Preserving Internet*

Dr. Mark Cooper, Research Director for the Consumer Federation of America, found that broadband network providers have used their control over broadband facilities to decimate what used to be a competitive ISP industry. He traces the history of the independent ISP industry from its beginnings in the dial-up world to the growth of broadband. In the dial-up world, he found an average of 15 ISPs per 100,000 customers, but he found fewer than 2 ISPs per 100,000 customers of broadband connections. He also notes that “[a]pproximately 95 percent of high-speed Internet access service customers are served by ISPs affiliated with either cable companies or telephone companies. [footnote omitted] This dominance is not the result of winning in a competitive market; it is the result of leveraging control of physical facilities.”⁵¹

Dr. Cooper warns that independent providers over the Internet face the same dangers of discrimination as the independent ISP industry. He concludes as follows:

After repeated efforts by telecommunications facility owners to assert control over access to the Internet, it is hard to imagine they will willingly adopt an open architecture. The leverage they enjoy in a blocking technology and the interest they have in related product markets disposes them to maximize profits by maximizing proprietary control over the network. “One strategy, which is profitable for a dominant firm but wrecks the benefits of the net, is, for instance, to take advantage of network externalities to ‘balkanize’ the Internet by reducing connectivity.” [footnote omitted] Facility owners demand a level of vertical control that creates uncertainty about future discrimination, whose mere existence is sufficient to chill innovation.⁵²

B. Will Net Neutrality Prevent Network Operators from Managing their Networks?

The network operators often assert that any rule to ensure the openness of the Internet would interfere with their right to manage the traffic on their networks. Furthermore, they claim that onerous rules governing their operation of the network could ensnare them in such complex regulatory proceedings that their deployment of broadband technologies would be delayed.

Freedom in the Broadband Era, edited by Mark N. Cooper, p. 62-63. The article notes that free market economists argued that cable providers had economic incentives to open their cable networks to competing ISPs in the so-called “open access” debate. The article explains that cable providers, in fact, have not opened their networks to independent ISPs, and offers a variety of explanations why the free market economists were incorrect in predicting that cable operators would do so.

⁵¹ “Anticompetitive Problems of Closed Communications Facilities,” by Mark N. Cooper, in *Open Architecture as Communications Policy: Preserving Internet Freedom in the Broadband Era*, edited by Mark Cooper, page 172.

⁵² *Id.*, pp 176-177.

Network operators cite the following network management activities:

- They must monitor and perhaps limit illegal traffic, such as spam or viruses.
- They must limit excessive use of the network by certain users so that traffic congestion does not degrade service to all other users.⁵³
- They must have the right to store (“cache”) the most popular web sites at locations closer to the consumer in order to provide back-up and improve customer service speeds.
- They must have the right to offer different speeds of service to customers, at different rate schedules to reflect the consumers’ needs.⁵⁴

An openness rule need not conflict with these legitimate network management functions. Network management is perfectly compatible with Net Neutrality:

- Telephone companies have for decades capably managed their networks for telephone (and, more recently, dial-up Internet) services despite operating under common carriage rules that are much more demanding than a simple openness requirement. The telephone companies simply built these common carriage requirements into their business plans and designed their networks accordingly.
- An openness rule does not mandate that the network operator give access to illegal or harmful traffic. Users generating spam, viruses, or excessive congestion can be blocked or shut down just as the telephone companies have always been allowed to block prank telephone calls. The FCC’s Part 68 rules, for instance, allow the attachment of any equipment as long as the equipment does not harm the operation of the network. Critical network management capabilities can be built into any rule to enforce openness.

⁵³ For instance, Cox Communications claimed in its first response to the CBUI that “[d]ue to the shared nature of Cox's network, excessive use by one or a small group of customers can have a negative impact on the quality of service that other customers receive. As a consequence, Cox must have the right to make adjustments to its network and service from time to time to address these issues.” Ex Parte Letter from Alexander Netchvolodoff to the FCC, April 7, 2003, in CS Docket No. 02-52,p. 5.

⁵⁴ “When [customers] are connected to the Internet, moreover, they can run any applications they want, play games, or do whatever else they choose, subject only to content-neutral usage management by cable operators to make sure that customers are not exceeding the capacity they have paid for, running a business over a residential connection, or impeding the quality or speed of service of other paying subscribers.” Letter from NCTA President and CEO Robert Sachs to the FCC Commissioners, December 10, 2002, in CC Docket Nos. 02-52 and GN Docket No. 00-185.

An openness rule does not necessarily require that the network operator provide every user or provider with the exact same quality of access. The operator should be permitted to offer different types of access, at different price levels, to users and providers, as long as these options are made available equally to all consumers and providers. The customer should be able to make this choice for him or herself, not the network operator on the customer's behalf. For instance, particularly heavy users of the broadband connection may be willing to pay an additional fee to transmit or receive a greater quantity of traffic or at faster speeds. A Net Neutrality rule does not necessarily preclude differential pricing as long as the prices are made available equally to all users and as long as the service provider ensures a minimum level of service (See Part III. Section 4 below).

A Net Neutrality regime certainly will affect the business practices of a network operator in one way -- Net Neutrality will prevent network operators from giving preferential access to some users over others. This is exactly the point. Network operators should not be permitted to give exclusive access to certain users or certain web sites; should not give faster access speeds to some providers and not others when both providers have paid for the same level of access; and should not block or degrade service providers that compete with the services offered by the network owner.⁵⁵ These limitations are not unfortunate by-products of an openness regime; they are the intended result.

In short, an openness requirement does not conflict with network management. The history of both telephone and cable operations demonstrate that network operators can continue to manage their networks while ensuring that others can use their networks in a nondiscriminatory manner.

C. Will a Net Neutrality Rule Create Burdensome Regulation that Discourages Deployment of Broadband Networks?

Network operators allege that a Net Neutrality rule will discourage them from deploying broadband networks. They maintain that any regulation of their networks imposes costs that will reduce their economic incentives to deploy broadband. They argue that the FCC removed broadband networks from Title II (common carriage) regulation in order to promote broadband investment, and that Network Neutrality would effectively reverse that decision.

This argument makes the false assumption that Net Neutrality would replicate Title II (common carrier) regulation. Net Neutrality can instead be enforced through one simple rule and a streamlined complaint process (See Part IV below) that would impose minimal, if any, costs on the operator. There would be no need for detailed rules governing network management, no need for pre-approval by the regulators for technology deployment, and no need for tariff filings – all of which are required

⁵⁵ To give one hypothetical example, a network operator should not be permitted to give MovieLink enhanced, higher-speed access to its customers while denying a competitor such as Netflix the same opportunity.

under Title II. It is difficult to see how an FCC complaint process – with short time deadlines for a decision – would impose such tremendous costs as to delay broadband deployment.

Telephone companies and cable companies have invested substantially in broadband networks over the past decade, even while under various degrees of regulation. Telephone companies invested billions of dollars in capital to deploy telephone wires under a much more onerous common carriage regime during the past century.⁵⁶ As a result, the U.S. telephone system is regarded as one of the best in the world.

Today, both the cable and telephone industries are making substantial investments in fiber and wireless broadband technologies in part to keep up with each other. In fact, telephone company executives acknowledge that fiber optic networks are cheaper to operate than the old copper networks.⁵⁷ In other words, companies are likely to make the decision to deploy broadband networks for economic reasons, regardless of whether they must abide by Net Neutrality rules. Thus, there is no reason to think that Net Neutrality will discourage broadband investment.

In fact, Net Neutrality is likely to promote – not retard – broadband deployment for several reasons. First, Net Neutrality increases the value of the broadband connection. If the consumer can truly reach any web site, use any equipment, and access any service he or she wants, then the value of the connection is more valuable than if the consumer can only reach the services and use the equipment that the network owner chooses. If the consumer sees the connection as valuable, consumer demand for broadband networks will increase, and network operators will have incentives to build networks to meet that demand. Second, Net Neutrality increases the investment in applications and services delivered over the Internet. The existence of a Net Neutrality rule provides certainty to innovators and entrepreneurs who will be more willing to invest to develop new services if they have confidence that, once developed, access to the network will be available. Increasing innovation

⁵⁶ In fact, economists frequently maintained that rate of return regulation encouraged the telephone companies to over-invest in their network. Rate of return regulation was largely replaced by price cap regulation at both the federal and state level in the early 1990's at the request of the large telephone companies.

⁵⁷ The Washington Post recently quoted a senior Verizon executive about their fiber deployment program: [Verizon's] second-ranking official, Lawrence T. Babbio Jr., the vice chairman and president, said Verizon has made significant progress in cutting the cost of installing fiber -- which it initially estimated at \$1 billion for the first 1 million homes. Babbio said this fell by about 30 percent last year and is likely to drop another 15 to 20 percent this year, so that by the end of 2006, "we will probably have cut the cost in half" from the start of 2005. He also said many investors do not grasp how much cheaper a fiber-optic network is to run than the old copper-based system, in place for decades.

"Verizon Lays It on the Line: CEO Sticks By Costly Rollout of Fiber-Optic Network" By Arshad Mohammed, Washington Post, P. D01.

will also increase the value of the broadband network, stimulating greater demand and deployment.

Nevertheless, the operators claim that the U.S. lags behind the rest of the world in investment in broadband and frequently cite the statistic that the U.S. ranks 16th worldwide in broadband deployment. Network operators claim that only by deregulating broadband services will they have the proper incentives to invest more funds into building broadband networks.

This argument misinterprets the data. The International Telecommunications Union (ITU) ranks the U.S. 16th in the world based on level of broadband adoption, not deployment. Broadband services are currently available to over 90% of consumers' homes today, largely via either the cable or telephone company. Yet only about 30% of American consumers currently subscribe to broadband services. Many consumers do not have a computer, and many others believe that the price is not affordable.⁵⁸ These figures suggest that the U.S. policymakers should focus less of their energy on deployment issues and more of their energy on ways to increase the value of existing broadband connections to consumers.

Nevertheless, to the extent that broadband investment is a concern, several revenue opportunities are available to network operators that do not involve blocking or discrimination. Network operators may offer differential pricing for different access speeds, engage in joint marketing agreements, or other promotional agreements. These agreements would not violate Net Neutrality as long as operators make network access available under nondiscriminatory terms to all users and guarantee a minimum level of broadband service.

D. Will Net Neutrality prevent network operators from creating different tiers of service, or creating a “private Internet”, that will allow them to earn a return on their broadband investment?

Finally, network operators maintain that Net Neutrality will interfere with their ability to maximize revenue from the use of their broadband networks. In particular, one RBOC publicly stated its desire to implement a “pay for performance” system that allows the network operator to strike deals to give certain Web sites or services priority in reaching computer users. The executive said that this enhanced access speed for certain web sites would be on top of a baseline service level that all content providers would enjoy. The concept could be described as differentiating

⁵⁸ A Nation Online: Entering the Broadband Age, a Joint Report of the National Telecommunications and Information Administration (NTIA) and the Economic and Statistics Administration, U.S. Department of Commerce, September 2004, available at <http://www.ntia.doc.gov/reports/anol/>.

between a “private” Internet – available to a few companies selected by the network operator – and a slower-speed “public” Internet that is available to everyone else.⁵⁹

Net Neutrality, however, does not necessarily prevent network operators from offering different levels of access, at different rates. In fact, the offering of different levels of services, at different rates, is a traditional practice in the telecommunications industry. Telephone companies have offered a variety of services, such as basic local service, DSL, and T1 access services under tariff.

On the other hand, the notion of a “private Internet” is potentially quite disturbing. The term, which has not been defined but has often been used by representatives of the network operators, may reflect a desire on the part of the industry to grant exclusive access to a portion of the Internet to certain parties. This would be a radical departure from the historically public nature of the Internet. An “intra-net” is a legitimately private network by which members of a closed group – employees of a corporation or students attending a certain university – can communicate among themselves. The Internet, however, is something different – it is by definition a public resource for all users. Those who seek to wall off portions of the Internet to create a “private Internet” may effectively appropriate a portion of this public capacity for the exclusive benefit of parties chosen by the network operator. The notion of a “private Internet” is fundamentally in conflict with the Internet and should not be permitted.

If network operators create tiers of service, they must also ensure that there is enough bandwidth for customers who choose the “basic” tier. If many providers choose to pay for the faster tier, the capacity on the basic tier available to the general public could be squeezed out. According to one report, Verizon is seeking to use 80% of its broadband capacity for its own video service, leaving its customers to fight for the remainder.⁶⁰ Verizon vigorously disputes this claim and argues that, in fact, its video and data streams of traffic ride on two separate lasers on its fiber cables and that these lasers do not interfere with each other. Verizon further maintains that its fiber network can be “upped” to carry unlimited amounts of traffic because its fiber runs all the way to the home. Even if this is true of the Verizon network, other network operators are not deploying fiber to the home, and their capacity is inherently

⁵⁹ “Executive Wants to Charge for Web Speed: Some Say Small Firms Could Be Shut Out of Market Championed by BellSouth Officer,” *By Jonathan Krim*, Washington Post, Thursday, December 1, 2005; Page D05

⁶⁰ “According to Marvin Sirbu, an engineering professor at Carnegie Mellon University who examined [Verizon’s documents filed with the FCC], more than 80% of Verizon’s current capacity is earmarked for carrying its service, while all other traffic jostles in the remainder. PAYING FOR PRIORITY. Leading Net companies say that Verizon’s actions could keep some rivals off the road. As consumers try to search Google, buy books on Amazon.com ([AMZN](#)), or watch videos on Yahoo! ([YHOO](#)), they’ll all be trying to squeeze into the leftover lanes on Verizon’s network.” *Is Verizon a Network Hog? The telecommunications giant wants to devote most of its capacity to its own traffic, to Internet companies’ dismay.* By Catherine Yang, BusinessWeek, Thursday, Feb. 2, 2006, available at http://www.businessweek.com/technology/content/feb2006/tc20060202_061809.htm.

limited. Copper, coaxial cable and fiber to the node systems, which are the technologies used by virtually every cable and telephone company except Verizon (and even includes those Verizon territories that have not yet been upgraded to fiber to the home), have limited capacity and could suffer congestion as usage grows.

To summarize, a properly tailored Net Neutrality rule would not allow network operators to create an exclusive “private Internet” but would allow network operators to offer different tiers of service on two conditions:

1. The company could not offer *exclusive* access to the higher bandwidth levels to providers selected by the network operator. Allowing network operators to grant premium capacity on the network by contract to a few parties could be disastrous to the public nature of the Internet. The network operators should be required to offer access to the faster tiers of service on the same terms and conditions that it makes such capacity available to its own services. Otherwise, the a nondiscriminatory basis to all users.
2. The company must provide enough bandwidth so that those entities that do not subscribe to the higher bandwidth levels receive a sufficient level of service. If permitted to do so, network operators could easily allocate such a large amount of capacity on the network to its higher-paying customers that the remaining public users of the Internet suffer congestion and diminished quality of service. If a company is going to offer tiers of service, the company should be required to offer a minimum level of broadband service in order to ensure that the general public does not get squeezed out.

Of course, ideally, the network operators would enhance their networks to such a degree that there are no shortages of capacity. The incremental costs of adding the electronics to move from 1 megabit to 1 gigabit are small compared to the public benefits. Policymakers should make every effort possible, including the use of financial incentives, to encourage network operators to build the largest, highest-capacity network available, in order to ensure that the benefits of an open Internet are available to everyone without discrimination.⁶¹

⁶¹ Such financial incentives can include tax credits for the deployment of broadband infrastructure, expensing of broadband equipment, streamlining the franchise process for using the rights-of-way, and others.

PART IV

A Model for Net Neutrality Legislation

Net Neutrality does not require detailed rules or require network operators to obtain government pre-approval to manage their networks. Network neutrality can be addressed with three relatively straightforward provisions:

1. A statement of the network operators' obligations on a nondiscriminatory basis to carry any traffic, to permit any use and provision of any applications and services, and to allow the use of any equipment.
2. A statement that recognizes the legitimate needs of the network operator to prevent harm to the network, comply with laws regarding access to unlawful content, and engage in legitimate network management.
3. A statement that the principle in 1. shall be enforced through a complaint process and that the network operator has the burden of proof of justifying within a few days of a complaint being filed that any blocking or discrimination is necessary to comply with 2.

Statement 1 is necessary to establish the principle of nondiscriminatory service and use. This principle establishes the general obligation to keep the broadband network open to all providers, content, and equipment. It also would require the network operator to offer service on a non-discriminatory basis; this means that, if the network operator offers different levels of access connections at different prices, it must offer the same levels of access equally to all users. Statement 1 does not reinstate the common carrier regulatory regime; that regime included over 90 pages of detailed statutory provisions in Title II and called for extensive FCC rules. Statement 1 simply states the network operators' obligations in order to allow the complaint process to be used.

Statement 2 recognizes that network operators retain the authority to manage their networks. Network operators will continue to have the responsibility to design their networks to operate efficiently, protect against unlawful uses, and prevent congestion. The responsibilities that are recognized in Statement 2 are not exceptions to the principle in Statement 1 because they are not inconsistent. Technically, Statement 2 may not even be necessary because the principle established in Statement 1 does not conflict with these important network management functions. Nonetheless it is helpful to recognize them by statute. At the same time, the scope of the network management authority recognized in Statement 2 must not be drafted so broadly as to undermine the principle set forth in Statement 1.

Statement 3 recognizes that the principle established in Statement 1 shall be enforced through a complaint process at the FCC. The FCC will interpret statement 1 on a case-by-case process as complaints are filed (much like the "common law" system used by the courts).

Once a complaint is filed, it is vitally important for the network operator to bear the burden of proving that any blocking or discrimination is justified. Without such a burden, network operators might be emboldened to discriminate based on a purported need for network management when its real purpose might be to discriminate against a competitor. Placing the burden of proof on the consumer or on-line service provider is unworkable because the complaining party generally does not have access to the information to determine whether or not the blocking was justified. Furthermore, by the time the FCC could gather this information through its investigative process, the harm to the consumer or service provider may be irreparable. In the fast paced world of the Internet, a service that is shut down for 60 or 90 days could well be put out of business. Placing the burden of proof on the network operator to demonstrate the need for the blocking within a short amount of time (i.e. 3-10 days) places the burden on the party with the best ability to provide an explanation for the blocking.

Any legislation should begin by assuming that any Internet traffic is legitimate and lawful, in part for the simple reason that most of it *is* legitimate and lawful. The presumption should be that the traffic should flow, that the network is open and available to all. It provides greater certainty and confidence to potential innovators and entrepreneurs that the deck is not stacked against them as they begin to develop new services and applications. The network operator should not be permitted to decide on its own what is in the best interest of the consumer or provider. The provision requires the FCC to act as an independent check to make sure that the network operator does not abuse its network management rights. As long as the network operator satisfies its burden of proving that the network operator's action is justified, its network management rights remain fully intact.

It is important to understand what this approach would NOT do:

1. This approach does NOT require the network operator to obtain pre-approval from the FCC before blocking/impairing/interfering with traffic. The FCC review is only triggered upon the filing of a complaint.
2. This approach does NOT prevent the network operator from blocking spam, viruses, or threats to national or network security. The network operator can take immediate action to block unlawful traffic as long as it can justify its action to the FCC within days of the day a complaint is filed.
3. This approach does NOT prevent network operators from providing their own content and applications or engaging in promotional arrangements with or providing enhanced services to certain application, service or content providers. It only prevents them from discriminating in favor of their proprietary content or services in their operation of the network.
4. This approach does NOT bar the network provider from providing different tiers (access speeds) at different price levels, as long as these tiers are made

available equally to all users and the network operator provides a minimum level of broadband service. If the network operator chooses to make different tiers available, this provision requires that it may not discriminate for or against certain users, or choose who is eligible to purchase those tiers.

CONCLUSION

At its best, the Internet is an enabling and empowering technology – it enables consumers to use whatever equipment they desire to access whatever information, services, and applications they choose, and it enables innovators and entrepreneurs to invest in new equipment, content and applications. But the openness of the Internet is no longer guaranteed. Network operators have already blocked some traffic and are likely to block more in the future. Economic studies indicate that network owners can reap additional profits by favoring their own or their affiliated traffic, and some companies are marketing equipment to make blocking or discrimination even easier in the future. The longer policy-makers wait before adopting a Net Neutrality rule, the harder it will be to do so because existing forms of discrimination will become entrenched. If net discrimination becomes a standard business practice, the Internet as we know it will become effectively disabled.

GLOSSARY

ANALOG

Information represented by a continuous electromagnetic wave encoded so that its power varies continuously with the power of a signal received from a sound or light source.

APPLICATION

Used interchangeably with program and software, this is a general term for a program that performs specific tasks, such as word processing, database management, e-mail sending or retrieval, or Web browsing. Unlike system software, which maintains and organizes the computer system (such as the operating system), an application is an end-user program.

BANDWIDTH

Bandwidth describes the capacity of a data-transfer connection. Usually measured in bits-per-second (bps). A full page of English text is about 16,000 bits. A fast modem can move about 57,000 bits in one second. Full-motion full-screen video would require roughly 10,000,000 bits-per-second, depending on compression.

BIT

Contraction of the term binary digit. The smallest unit of information a computer can process, representing one of two states (usually indicated by "1" or "0").

BIT DISCRIMINATION

Network operators giving preferential treatment to specific digital traffic over other traffic on the network.

BLOG

Contraction of the term web log. A blog is basically a journal that is available on the web. "Blogging" denotes the activity of keeping a blog, and someone who keeps a blog is a "blogger." Blogs are typically updated daily using software that allows people with little or no technical background to update and maintain the blog. Postings on a blog are almost always arranged in chronological order with the most recent additions featured most prominently. Blogs are often available as RSS feeds.

BROADBAND

Broadband is a descriptive term for evolving digital technologies that provide consumers a single switched facility offering integrated access to voice, high-speed data service, video-demand services, and interactive delivery services. Generally refers to connections to the Internet with much greater bandwidth than you can get with a modem. There is no specific definition of the speed of a "broadband" connection but in general any Internet connection using DSL or via Cable-TV may be considered a broadband connection.

CHANNEL

A signal path of specified bandwidth for conveying information such as voice, data and video.

COALITION OF BROADBAND USERS AND INNOVATORS (CBUI)

A coalition of the National Association of Manufacturers, the Consumer Electronics Association, and the Information Technology Association of America teamed up with individual companies including Microsoft, Apple Computer, Amazon.com, the RadioShack Corp., and the Walt Disney Corp, in addition to the Media Access Project.

CODEC

Contraction of the term coder-decoder. A video codec converts the analog video signals from a video source to digital signals for transmission over digital circuits and then converts the digital signals back to analog signals for display. An audio codec converts the audio signals to digital signals for transmission over digital circuits and then converts the digital signal back to analog for reproduction.

COMMON CARRIER

The term "common carrier" or "carrier" means any person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio or interstate or foreign radio transmission of energy, except where reference is made to common carriers not subject to this chapter; but a person engaged in radio broadcasting shall not, insofar as such person is so engaged, be deemed a common carrier.

CONTENT

A somewhat bland name for the creative contribution of the writers, artists, animators, and musicians whose work makes up the text, artwork, animation, and music on the Net. Usually thought of as simply the textual and graphical information contained in a Web site, content also refers to the structure and design in which the information is presented. Content is one of the three big C's (content, commerce, and community), and Web sites often get judged and rated on the quality, quantity, and navigational flow of this information. A favorite quote in the industry is "content is king" because without the content, there would be nothing to read or view on the Internet.

DIGITAL

Digital refers to discrete bits of information in numerical steps. A form of information that is represented by signals encoded as a series of discrete numbers, intervals or steps, as contrasted to continuous or analog circuits.

DIGITAL SUBSCRIBER LINE (DSL)

DSL describes a method for transmitting data over regular phone lines. A DSL circuit is much faster than a regular phone connection, and the wires coming into the subscriber's premises are the same (copper) wires used for regular phone service. A DSL circuit must be configured to connect two specific locations, similar to a leased line (however, a DSL circuit is not a leased line.). A common configuration of DSL allows downloads at speeds of up to 1.544 Mbps, and uploads at speeds of 128 Kbps.

DIGITAL TELEVISION (DTV)

A new technology for transmitting and receiving broadcast television signals. DTV provides clearer resolution and improved sound quality.

DOMAIN NAME

The unique name that identifies an Internet site. Domain Names always have 2 or more parts, separated by dots. The part on the left is the most specific, and the part on the right is the most general (*i.e.*, publicknowledge.org).

FEDERAL COMMUNICATIONS COMMISSION (FCC)

An independent US government agency charged with regulating interstate and international communications by radio, television, satellite and cable.

FIBER OPTICS

A communications medium utilizing laser or "light" transmission. Uses a glass or plastic fiber carrying light to transmit voice, data and video signals. Each fiber can carry from 90 to 150 Mbps.

HIGH DEFINITION TELEVISION (HDTV)

An improved television system that provides approximately twice the vertical and horizontal resolution of existing television standards. It also provides audio quality approaching that of compact discs.

HIGH TECH BROADBAND COALITION (HTBC)

A coalition including The Business Software Alliance, the Consumers Electronics Association, the Information Technology Industry Council, the National Association of Manufacturers, and the Telecommunications Industry Association.

INFORMATION SERVICE

The term "information service" means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.

INTERNET

The vast collection of inter-connected networks that are connected using the TCP/IP protocols and that evolved from the ARPANET of the late 60's and early 70's. The Internet connects tens of thousands of independent networks into a vast global Internet and is probably the largest Wide Area Network in the world.

INTERNET PROTOCOL (IP)

IP is a term used to describe a packet-based protocol for delivering data across networks.

INTERNET SERVICE PROVIDER (ISP)

An ISP is an institution that provides access to the Internet.

IP TELEPHONY

A set of technologies that enables voice, data and video collaboration over existing IP-based LANS, WANs, and the Internet. IP technology uses open IETF and ITU standards to move multimedia traffic over any network that uses IP.

KILOBITS PER SECOND (KBPS)

A unit of measure of data of 1,000 bits per second.

LOCAL AREA NETWORK (LAN)

A computer network limited to the immediate area, usually the same building or floor of a building.

MEGABITS PER SECOND (MBPS)

A unit of measure of data of 1,000,000 bits per second.

NETWORK

Any connection of two or more computers that enables them to communicate. Networks may include transmission devices, servers, cables, routers and satellites. The phone network is the total infrastructure for transmitting phone messages.

PACKET

The name for a unit of data sent across a network. Information is sent over the Internet (and many other networks) in packets.

PACKET SWITCHING

The method used to move data around on the Internet. In packet switching, all the data coming out of a machine is broken up into chunks, each chunk has the address of where it came from and where it is going. This enables chunks of data from many different sources to co-mingle on the same lines, and be sorted and directed along different routes by special machines along the way. This way many people can use the same lines at the same time. You might think of several caravans of trucks all using the same road system to carry materials.

PART 68

Part 68 of the FCC rules (47 C.F.R. Part 68) governs the direct connection of Terminal Equipment (TE) to the Public Switched Telephone Network (PSTN), and to wireline carrier-owned facilities used to provide private line services. Terminal Equipment must meet certain technical criteria to prevent four proscribed harms:

1. Electrical hazards to operating company personnel
2. Damage to network equipment
3. Malfunction of billing equipment
4. Degradation of service to customers other than the TE user and that person's calling and called parties

Part 68 empowers the Commission (through the FCC Enforcement Bureau) to conduct hearings and proceedings based on formal complaints for alleged violations of Part 68.

PIPES

A term used to describe the physical connection to the Internet. Usually used in regard to any type of high bandwidth connection via high-capacity wiring, fiber-optic cable, cable modems, or DSL.

ROUTER

A special-purpose computer (or software package) that handles the connection between two or more Packet-Switched networks. Routers spend all their time looking at the source and destination addresses of the packets passing through them and deciding which route to send them on.

SERVER

A computer, or a software package, that provides a specific kind of service to client software running on other computers. The term can refer to a particular piece of software, such as a WWW server, or to the machine running the software, e.g. "Our mail server is down today, that's why e-mail isn't getting out." A single server machine can (and often does) have several different server software packages running on it, thus providing many different servers to clients on the network.

SLAMMING

"Slamming" is the illegal practice of changing a consumer's telephone service without permission.

TELECOMMUNICATIONS SERVICES

The term "telecommunications service" means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

UNBUNDLED NETWORK ELEMENTS

The FCC requires incumbent phone companies to make their network facilities available to competitive phone companies at rates determined by state public utility commissions. The general theory behind the requirement is that it maintains fair competition among local carriers. The elements includes any "facility or equipment used in the provision of a telecommunications service," as well as "features, functions, and capabilities that are provided by means of such facility or equipment."

VIRTUAL PRIVATE NETWORK (VPN)

Usually refers to a network in which some of the parts are connected using the public Internet, but the data sent across the Internet is encrypted, so the entire network is "virtually" private.

VOICE OVER INTERNET PROTOCOL (VoIP)

A specification and various technologies used to allow making telephone calls over IP networks, especially the Internet. Just as modems allow computers to connect to the Internet over regular telephone lines, VoIP technology allows humans to talk over

Internet connections. Costs for VoIP calls can be a lot lower than for traditional telephone calls. Because the IP networks are packet-switched this allows for vastly different ways of handling connections and more efficient use of network resources.

WIDE AREA NETWORK (WAN)

Any network that covers an area larger than a single building or campus.

WIRELESS FIDELITY (WI-FI)

A popular term for a form of wireless data communication, basically Wi-Fi is "Wireless Ethernet."

Sources:

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