Opening Bottlenecks: On Behalf of Mandated Network Neutrality

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Abstract

This paper calls for mandated "network neutrality," the principle that broadband service providers (BSPs) should generally treat all nondestructive data equally. Without such a mandate, BSPs will likely begin charging content providers for the right to send data at the fastest speeds available. The present frequency with which BSPs block some data entirely will also likely increase.

Neutral networks are preferable for two key reasons. First, they spawn innovation, as illustrated by the explosive online innovation to date. Second, neutral networks better distribute communication power, promoting First Amendment values. Extant and likely future acts of discrimination erode both goals. The danger is real in the highly concentrated broadband market; BSPs have the incentives and means to engage in a high degree of broadband discrimination.

This paper further demonstrates that ad hoc regulation is ineffective in dissuading even grossly anticompetitive network discrimination. Further, network congestion can be and is managed adequately without resorting to discrimination. Finally, it rejects Christopher Yoo's call for multiple special-purpose networks as both unrealistic and undesirable.

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I. Introduction

> 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 [*sic*] have made an investment and for a Google or Yahoo! (YHOO) or Vonage or anybody to expect to use these pipes [for] free is nuts![1]

In an interview last November, then-SBC Telecommunications CEO Edward Whitacre was exceptionally honest about his company's market position. Representing half of the broadband duopoly,[2] he confessed his industry's disproportionate market power and his intention to seek monopoly rents. SBC spokesman Michael Balmoris quickly insisted the company will not block consumer access to popular websites, but Whitacre's words—uttered the same week SBC won regulatory approval to buy AT&T—were and still are still frightening for many.[3] Other telecommunications executives have since stated either their intention or desire to charge online

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[1] Edward Whitacre, CEO, SBC Telecommunications, interview with Roger O. Crockett, *At SBC, It's All About "Scale and Scope"*, BUSINESSWEEK ONLINE, ¶ 25-26 (Nov. 7, 2005), *at* http://www.businessweek.com/@@n34h*IUQu7KtOwgA/magazine/content/05_45/b3958092.htm. Whitacre was then CEO of SBC Telecommunications, which has since merged with and adopted the moniker of AT&T; he is now at the helm of the merged company.

[2] While no one company provides broadband nationally, most customers are effectively forced to choose among two broadband providers—a telephone company that offers Digital Subscriber Line (DSL) service and a cable company that offers cable modem service. This concentration grants them economic power characteristic in noncompetitive markets. *See infra*, Section IV.A.

[3] Arshad Mohammed, *SBC Head Ignites Access Debate*, WASHINGTON POST, D01 (Nov. 4, 2005), *available at* http://www.washingtonpost.com/wp-dyn/content/article/2005/11/03/AR2005110302211.html.

content providers for the right to reach customers at the fastest speeds.[4] Coming from a firm that faces little competition as it delivers broadband access to the internet, a medium of increasing importance in interpersonal and mass communication, the threat of digital discrimination represents a danger to important national values. Congress would be misguided to sit idly by and allow broadband firms to begin demanding fees from content providers; that business model would erode the potential for internet communication to continue to foster innovation.

Nonetheless, some in Congress not only oppose such legislation, but seek to strip the FCC of any authority to create a generalized principle of network neutrality. A draft bill released on March 27, 2006 contains a network neutrality clause[5] that would specifically eliminate the Commission's rulemaking authority on the matter.[6] Democrats,[7] public interest groups,[8] and online content providers[9] are miffed. The bill's author, House Commerce Committee Chairman Joe Barton, blew off this criticism as he was bragging that the bill would pass this term and daring reporters to bet against him.[10] He later amended his proposed legislation to include more substantive penalties that the FCC may impose, but these penalties would probably only apply if the BSP completely or effectively blocks traffic, and neutrality proponents were universally

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[4] FreePress, *How Real Is the Threat?*, *at* http://www.freepress.net/netfreedom/=threat (last visited March 31, 2006).
[5] H.R. ____, 109th Cong. §2 (2006), Title II, *available at* http://static.publicknowledge.org/pdf/20060327-house-telecom-print.pdf.
[6] *Id*. § 715(b)(1).
[7] Anne Broache, *Democrats Attack New Bill Over Net Neutrality,* ZDNet News, *at* http://news.zdnet.com/2100-9588_22-6056156.html (Mar. 30, 2006).
[8] Martin H. Bosworth, *Net Neutrality Gets Short Shrift In Congress*, ConsumerAffairs.com, *at* http://www.consumeraffairs.com/news04/2006/03/telecom_bill.html (Mar. 30, 2006).
[9] Roy Mark, *'Clear and Present Danger' for Telecom Reform Bill*, InternetNews.com, *at* http://www.internetnews.com/bus-news/article.php/3595576 (Mar. 30, 2006).
[10] John Eggerton, *Telecom Bill? Bet on It, Says Barton*, Broadcasting & Cable, *at* http://www.broadcastingcable.com/article/CA6320349.html?display=Breaking+News (Mar. 29, 2006).

dissatisfied.[11] Barton's incremental improvement still leaves a bill largely dedicated to allowing BSPs to create a tiered internet in which some sites and applications get preferential treatment. If this bill becomes law,[12] the model that fostered breathtaking online innovation in the U.S. may become an historical artifact.

Broadband provision is an important national goal, and broadband service providers (BSPs) deserve the right to make a profit. Yet the noncompetitive foreseeable future of the industry is cause for concern. This lack of competitiveness raises a host of problems in the development of broadband-dependent content and applications. Broadband providers could unduly restrict what types of data may pass over their networks, and they are already threatening to charge content providers for the right to reach end users. Whether firms are restricting certain types of applications or blocking certain websites, their unique market power gives them the ability to unduly shape the direction of broadband use into the future.

In this paper, I argue on behalf of legislation mandating network neutrality, requiring BSPs to permit all legal, nondestructive uses of their internet service on the same terms. As Timothy Wu and Lawrence Lessig explain:

> Stated more technically, the criteria of discrimination that cause concern tend to be those of the shared network, or Internet, such as discrimination based on IP address, domain name, cookie information, TCP port, and others. Hence, the general principle can be stated as follows: absent evidence of harm to the local network or the interests of other users, Broadband Carriers should not discriminate in how they treat traffic on their

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[11] *See, e.g.* John Eggerton, *Network Neutrality Amendment Defeated*, Broadcasting & Cable, *at* http://www.broadcastingcable.com/article/CA6322494.html?display=Breaking+News (Apr. 5, 2006).

[12] Both the House Judiciary Committee and the Senate may play a role in preventing this outcome. *See* David Hatch, *Senate Telecom Bill to be Broader than House Counterpart*, National Journal's Insider Update, *at* http://www.njtelecomupdate.com/lenya/telco/live/tb-RHWT1143756614125.html (March 29, 2006).

broadband network on the basis of internetwork criteria.[13]

As part of this principle, BSPs would be permitted to prevent destructive transmissions, preserve network stability. BSPs could continue to charge varying end user prices based on neutral measures of bandwidth such as maximum bandwidth and total amount of uploads and downloads, but not for the right to use certain sites or applications. Additionally, BSPs could not demand fees from internet content providers for the right to reach broadband customers.

While many proclaim the value of a neutral internet platform and the legal requirements to ensure it,[14] few scholars defend BSPs' rights to discriminate among nondestructive data. Professor Christopher Yoo is the most vocal such author. In a forthcoming article,[15] Yoo argues BSPs should be permitted to restrict users in any way they see fit, though he contends that restrictions will primarily be intended to manage network congestion.[16] Elsewhere, he argues that a diverse set of specialized BSP networks would be preferable to a redundant set of general-purpose networks, and that this anticipated positive development is hindered by a neutrality regime.[17] Unless one subscribes to a Lochneresque view of private property rights[18] or buys into the mistaken notion that BSPs should exert some sort of editorial control over the internet,[19] these two arguments—congestion and network diversity—are two of the strongest arguments against a

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[13] Ex parte Letter of Timothy Wu and Lawrence Lessig, Inquiry Concerning High-Speed Access to the internet Over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking, 17 F.C.C.R. 4798, at 14 (2002) (Aug. 22, 2003) (CS Docket No. 02-52), available at http://faculty.virginia.edu/timwu/wu_lessig_fcc.pdf.
[14] The array of authorities cited *infra* represent but a small portion of those available.
[15] Christopher S. Yoo, *Network Neutrality and the Economics of Congestion*, 94 GEORGETOWN L.J. (forthcoming June 2006) [hereinafter "Yoo, *Congestion*"], *at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=825669.
[16] *Id*. at 6-34.
[17] Christopher S. Yoo, *Beyond Network Neutrality*, 19 Harv. J.L. & Tech. 1 (2005) [hereinafter, "Yoo, *Beyond*"], *available at* http://jolt.law.harvard.edu/articles/pdf/v19/19HarvJLTech001.pdf.
[18] *See* Julie E. Cohen, *Lochner in Cyberspace: The New Economic Orthodoxy of "Rights Management"*, 97 MICH. L REV. 462, 463 (1998).
[19] *Id*. at 58-61.

neutrality regime. In arguing for that regime, I will respond accordingly and take on Yoo throughout as the main voice of opposition.

In Section II, I present a generalized description and defense of the networking principles that under gird the calls for network neutrality. In Section III, I discuss some of the past and likely future instances of broadband providers placing undue restrictions on subscribers' network uses. Fourth, I argue that the present level of competition is insufficient to insure neutral networks. In Section V, I demonstrate that ad hoc regulation is inadequate to the task of stopping even the grossest anticompetitive acts of network discrimination. Section VI briefly details a regulatory option that could better preserve neutrality into the future. In Section VII, I rebut the alleged disadvantages, including the argument that a neutrality mandate would leave network administrators with too few tools to deal with network congestion. I conclude with a brief overview and a glimpse of how this debate fits into the broader discussion of internet policy.

II. In Praise of Neutral Networks

Computer networks can be designed either to discriminate between applications and data or to faithfully transmit all data regardless of content. While a neutral network is not necessarily desirable in every type of network architecture, society generally and internet users specifically should and generally do prefer a neutral network. In the first half of this section, I discuss the importance of a neutral network in encouraging and rewarding valuable, unpredictable online innovation. Second, I detail the role that neutrality serves in preserving important First Amendment values such as free speech and freedom of the press.

A. A Stable Platform for Innovation

We have clear examples of both types of network architectures—intelligent networks designed to carry specific types of information and nondiscriminatory, stupid networks designed

to carry any information users send. An excellent example of the former model is the "smart" network administered by AT&T through most of the last century. "[A]t every layer in the AT&T distributional chain, the AT&T network had been optimized for voice telephony. But this optimization meant that any effort to change a layer in the AT&T distributional chain would disable other layers. … so change became impossibly difficult."[20] In contrast, those who built the internet organized it on the latter model.[21] The network is "stupid," faithfully carrying all data and placing the intelligence at the ends of the network.[22] While "smart" networks predestine certain uses, stupid—or neutral—networks liberate "large amounts of innovative energy."[23] Neutral networking protocols have unleashed the explosive growth of unforeseeable, symbiotic online innovation in the recent past. From email to the World Wide Web to wikis to peer-to-peer networking, the radical innovations in networking applications have been built upon neutral internet protocols.[24] It is therefore unsurprising that an informal survey of computer technologist websites reveals that the community is nearly unanimous in supporting network neutrality.[25]

Over two decades ago, Jerome Saltzer, David Reed, and David Clark authored a clearly articulated case for neutral networking,[26] which is still "amongst the most influential of all

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[20] LAWRENCE LESSIG, THE FUTURE OF IDEAS, 38.
[21] *Id*. at 39.
[22] See David S. Isenberg, *The Dawn of the Stupid Network*, ¶11 (June 6, 1998), *at*: http://www.isen.com/papers/Dawnstupid.html.
[23] *Id*. at ¶ 20.
[24] *See* LESSIG, *supra* note 20, at 41.
[25] *See, e.g*., Susan Crawford, *Network Neutrality v. Platform Competition* (Oct. 30, 2005), *at*: http://scrawford.blogware.com/blog/_archives/2005/10/30/1331319.html; Carlo Longino, *Verizon Wireless: Scrap Network Neutrality* (Nov. 10, 2005), *at*: http://techdirt.com/news/wireless/article/6123; *SBC CEO Slammed for Comments* (Nov 4, 2005), *at*: http://www.dslreports.com/shownews/69175 (featuring comments expressing particular offense at Whitacre's proposal and defending the norm of neutrality).
[26] Jerome H. Saltzer, David P. Reed, & David D. Clark, *End-to-End Arguments in System Design,* 2 ACM TRANSACTIONS IN COMPUTER SYSTEMS 277 (1984), *available at* http://web.mit.edu/Saltzer/www/publications/endtoend/endtoend.pdf.

communication protocol design guides."[27] Network engineers still defend this design. "Stupid Networks have three basic advantages over Intelligent Networks–abundant infrastructure; underspecification; and a universal way of dealing with underlying network details, thanks to IP (internet Protocol), which was designed as an 'internetworking' protocol."[28] Infrastructure is cheaper to add, accelerating expansion and creating abundance. Further, underspecified network architectures and a standard internetworking protocol empower innovation:

> If I have a Stupid Network and I get an idea for a communications application, I just write it. Then I send it to my buddy, and my buddy can install it, too. If we both like it, we can send it to more people. If people really like it, then maybe we can charge for it - or even start our own company. Yahoo![29]

Perhaps the most significant development on the internet was the World Wide Web, a user-friendly graphic user interface (GUI) and effective means for computers running different operating systems to communicate with each other. The creator of the World Wide Web, Tim Berners-Lee, developed the Web to perpetuate a neutral network built on end-to-end principles.[30] As neutral and therefore uncontrolled platforms, both the internet generally and the web specifically have spawned a dazzling rate and range of innovation.

Threats to network neutrality could reduce the level and variety of online innovation. Consider the worst-case scenario: a system where all innovation is channeled through—and therefore must meet the interests of—a major telecommunications firm. AT&T formerly

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[27] Jean-Patrick Gelas, *References: About "End-to-End" Arguments*, ¶ 2 (Feb. 2004), *at* http://www.cs.utk.edu/~gelas/references.html.
[28] *Id*. at ¶ 11.
[29] *Id*. at ¶ 20.
[30] TIM BERNERS-LEE, WEAVING THE WEB, 99 (1999). Berners-Lee writes:

> Whether inspired by free-market desires or humanistic ideals, we all felt that control was the wrong perspective. … Technically, if there was any centralized point of control, it would rapidly become a bottleneck that restricted the Web's growth, and the Web would never scale up. Its being "out of control" was very important.

Id.

prohibited the attachment of all unapproved external devices to the phone system. The effect "was to channel innovation through Bell Labs. Progress would be as Bell Labs determined it."[31] Broadband providers are unlikely to attempt to recreate the internet on this model. Yet even modest rollbacks of the end-to-end principle can greatly erode the creative power of the internet. "Whatever other closed and proprietary networks there might be, polluting the internet with these systems of control is a certain way to undermine the innovation it inspires."[32]

Consider the additional value of guaranteed neutrality from the standpoint of innovators and the investment capitalists who fund them. Wu and Lessig plead for a neutrality regime in order to guarantee a stable, predictable platform on which innovators can bank. "Their funding depends on the existence of a stable, addressable market for their products. Such developers would benefit the most from knowing that they can rely on a [consistent] broadband network."[33] Just as the electrical grid gives innovators a stable, consistent system on which one can count in developing applications,[34] a neutral broadband network permits innovators to plan based on stable expectations. This leads to greater investment in cutting-edge applications and thus more innovation. Even minor interruptions in the norm of neutrality, however, cause market uncertainty, leaving investors to wonder which applications or sites will be targeted next. This undermines the perceived future value for networking innovations and threatens to reduce investment in research and development and therefore reduce innovation itself.

Yoo insists BSPs will allow innovation because they are in a perfect place to capitalize on the value of any useful progress.[35] Under this model, however, broadband providers have a

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[31] LESSIG, *supra* note 20, at 30.
[32] *Id*. at 156.
[33] *Id*. at 4.
[34] *Id*. at 3.
[35] Yoo, *Congestion, supra* note 15, at 39-40.

direct incentive to allow only those innovations on which they *can* capitalize.[36] Yoo forgets that mandated nondiscrimination was the policy bedrock on which the internet revolution was built:

> Absent policy-mandated openness, the Regional Bell Operating Companies (RBOCs) and monopoly franchise CATV networks would certainly have explored only the paths of direct benefit to them. It is doubtful that without such policy-mandated openness the internet Revolution would have occurred. Indeed, many of the most successful paths challenged the very core of the phone monopoly business as well as the industry's technology and business assumptions. For example, the internet is largely distance price insensitive, … [which] forced profound change for the traditional telephone companies.[37]

If the then-current policy had permitted telephone companies to manage network congestion by blocking or surcharging dialup access numbers,[38] the internet as we know it may not have come to pass and certainly would not be nearly as revolutionary. This disadvantage also applies, if not as starkly, to a scenario under which telephone companies would have adopted Whitacre's policies of charging internet companies more than customary telephone interconnection fees.

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[36] If BSPs begin charging intermediary fees, they will have an incentive to disfavor nonmarket communication behind which there is no sender willing to pay for delivery. To borrow from Benkler's analysis of the cost that strong copyright protection creates for information inputs, major commercial content creators ("Mickeys") would be most able to pay intermediary fees, while individual and group creators who seek no direct market remuneration ("scholarly lawyers" and "Joe Einsteins") would be least able. This would directly favor commercial over noncommercial content. *See* Yochai Benkler, *Free As the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain*, 74 N.Y.U. L. Rev. 354, 401-412 (1999).

[37] Francois Bar, et. al, *Defending the internet Revolution in the Broadband Era: When Doing Nothing is Doing Harm*, E-conomy Working Paper 12, at 9 (August 1999), *at* http://e-conomy.berkeley.edu/publications/wp/ewp12.pdf.

[38] *See* Andrew Odlyzko, *Pricing and Architecture of the Internet: Historical Perspectives from Telecommunications and Transportation* (Aug. 29, 2004), 24, at http://www.dtc.umn.edu/~odlyzko/doc/pricing.architecture.pdf. He argues:

> [F]lat rates for local calling played a key role in the rise of the Internet, by promoting much faster spread of this technology in the U.S. than in other countries. (This, as well as the FCC decisions about keeping Internet calls free from access charges, should surely be added to the list of "the 10 key choices that were critical to the Net's success," that were compiled by Scott Bradner [28].)

Id.

Baby bells would have had every incentive to choke off ISPs at rates that gave the bells near-monopoly control of the ISP market, allowing them to charge excessive prices and/or deliver lower quality service. Despite the gains in online access and creativity that have already come to pass, the lack of a neutrality mandate could still today erode the potential for future innovation.

Yoo dismisses the applicability of precedents from the era of telephone monopolies, even while acknowledging that they helped spur useful innovations. As he sees it, broadband competition is too stiff for discrimination to occur in today's market.[39] The classic, decades-old telephone attachments cases, such as *Hush-a-Phone*[40] and *Carterfone,*[41] are indeed from a different technological era. Nonetheless, perhaps no regulatory lesson from today's telecommunications order rings louder than the resounding success of government-mandated common carriage in spurring online innovation over the past 15 years.[42] If we are to turn our backs on this successful strategy, we should do so only in the face of compelling evidence not merely that the market is different, but that things are so different as to require the exact opposite of what has worked in the recent past. Especially in light of these past successes, Yoo's description of "vibrant" broadband competition borders on laughable. In almost every zip code in the US, the broadband market is highly concentrated and certainly on no path toward meaningful competition. This point merits further discussion, which I provide below.[43]

B. An Open Channel for Communication

Most of the debates over network neutrality revolve around innovation, a neutral network is also socially valuable in that it does not discriminate based on the moral, political, or aesthetic value of content. A neutral network is free not only to technological innovation but also to

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[39] Yoo, *Congestion, supra* note 15, at 9-10.
[40] Hush-a-Phone Corp. v. United States, 238 F.2d 266 (D.C. Cir. 1956).
[41] Use of the Carterfone Device in Message Toll Telephone Service, 13 F.C.C.2d 420 (1968).
[42] Bar, *supra* note 37, at 6-10.
[43] *See infra*, Section IV.

controversial media content that would never be aired on older media platforms such as television and radio. When permitted, telecommunications companies have an incentive to restrict certain speech based exclusively on the claim that offensive content is bad for business.[44] Preserving a neutral network is therefore a clear means of furthering First Amendment values.

The First Amendment stands for more than prohibiting government censorship. First Amendment values are best upheld by ensuring media diversity—not merely content diversity, but a diversity of stakeholders who have editorial control over that content.[45] This is especially true in an era when gigantic firms with large shares of media markets can dictate the contents of our information ecosystem.[46] For decades, the Court has held that the health of our democracy demands "the widest possible dissemination of information from diverse and antagonistic sources."[47] While this is subject to other First Amendment values such as editorial discretion,[48] it is upheld as the guiding principle in the current case law regulating cable television.[49] Cable companies certainly have a reasonable claim to editorial discretion, yet they are forced to carry certain programs in the name of a healthy local news sector and greater net diversity of news outlets. The value of diversity is even clearer in the case of BSPs, who disavow any editorial control over the internet. Wu and Lessig also dismiss the idea of BSPs as editors.[50] This claim

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[44] C. Edwin Baker, *Merging Phone and Cable*, 17 HASTINGS COMMUNICATIONS AND ENTERTAINMENT LAW JOURNAL 97, 123 (1994) [hereinafter "Baker, *Merging*"].
[45] *See* C. Edwin Baker, *Media Structure, Ownership Policy, and the First Amendment*, 78 S. CAL. L. REV. 733, 734-739 (2005) [hereinafter, "Baker, *Ownership Policy*"]. Baker supports media diversity in the name of the democratic value of diffusing editorial power rather than the mistaken belief that more diverse ownership will inherently create more diverse content.
[46] *See, e.g.* ROBERT W. MCCHESNEY, THE PROBLEM OF THE MEDIA: U.S. COMMUNICATION POLITICS IN THE TWENTY-FIRST CENTURY (2004).
[47] Associated Press v. United States, 326 U.S. 1, 20 (1945).
[48] Miami Herald Publishing Co. v. Tornillo, 418 U.S. 241 (1974).
[49] Turner Broad. Sys., Inc. v. FCC, 520 U.S. 180, 189 (1997) [hereinafter Turner II].
[50] Wu & Lessig, *supra* note 13, at 9. "Primarily, it is the ends—the user of the Internet or a remote speaker—who decide on the content of transmission, not the broadband operator. The only influence the operator has over the content of what it carries is through the act of restricting usage or blocking content." *Id.*

can be extended into an even clearer argument for a neutrality regime. At least one First Amendment scholar believes the Constitution *requires* state intervention when state-created telecommunications monopolies obstruct the speech of their customers.[51]

In contrast, Yoo insists that First Amendment values are best upheld by permitting broadband providers to act as editors of the internet.[52] This elides the utter lack of either a general expectation or industry-wide practice of editorial discretion on the part of ISPs—not to mention the clause tucked into the Communications Decency Act specifically stating that ISPs are not editors.[53] It is more useful to view each content creator or end user as her own editor of the internet, subject to other non-ISP exceptions such as workplace norms and content-filtering software. Especially in light of the value that the court places on editorial diversity, the First Amendment claim of editorial control for broadband providers is strained indeed.

On the uncensored internet, "just about anybody could own a digital printing press ... and have worldwide distribution."[54] Internet communicators can bypass the inherently narrower editorial control of old media, a development embraced by authors of all political stripes.[55] Among other positive outcomes, this opens the political game to outsiders, creating several

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[51] Baker, *Merging, supra* note 44, at 124, n. 107.
[52] Yoo, *Congestion, supra* note 15, at 58-61.
[53] 47 U.S.C. § 230(c)(1) "No provider or user of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider." *Id*. The same paragraph does exempt ISPs from civil claims resulting from good-faith efforts to obstruct objectionable materials. *Id*. § 230(c)(2)(A). Especially when read in light of the immediately preceding clause, however, this content-specific protection from liability is clearly not to be confused with a recognition of editorial rights in general.
[54] DAN GILMOR, WE THE MEDIA: GRASSROOTS JOURNALISM, BY THE PEOPLE, FOR THE PEOPLE 13 (2004).
[55] *See, e.g.*, JOE TRIPPI, THE REVOLUTION WILL NOT BE TELEVISED: DEMOCRACY, THE INTERNET, AND THE OVERTHROW OF EVERYTHING (2004), HUGH HEWITT, BLOG: UNDERSTANDING THE INFORMATION REFORMATION THAT'S CHANGING YOUR WORLD (2005) (arguing that the internet uniquely permits the dissemination of their preferred brand of left- or right-wing views, respectively, and therefore facilitates widespread political change).

political outcomes in which government officials who expected little public resistance were suddenly restrained by popular campaigns.[56]

The point is not that we should allow unfettered online communication *merely* because that communication can and does permit those with relatively less power to shape political outcomes; this is just one of the most obvious positive results of a suddenly much more equitable spread of communication power. Cast in more general terms, we as a society should guarantee that every online communicator serves as his or her own uncensored editor because that best upholds the democratic values of free speech and freedom of the press. Now that we have a communication system with the technical capacity to support millions of independent media outlets, we should guarantee that the editorial control over that system stays as widely diversified as possible. A broadband provider should no more be able to stop a customer's email or blog post due to its political content than a telephone company should be permitted to dictate the content of their customers' conversations.[57] The guarantee that these speech acts be legally unconstrained "is a fundamental aspect of individual liberty."[58]

Yoo disagrees. He argues that the media diversity should, at least generally,[59] take a back seat to economic efficiency. Further, he accuses neutrality proponents of failing to help policymakers decide when we have "enough" diversity and the state should begin permitting the benefits of concentration such as economic efficiency.[60] For example, he acknowledges:

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[56] *See, e.g.*, BRUCE BIMBER, INFORMATION AND AMERICAN DEMOCRACY: TECHNOLOGY IN THE EVOLUTION OF POLITICAL POWER 2-4 (2003) (describing how libertarians used online communication to reverse FDIC policy), *and* MCCHESNEY, *supra* note 46, at 280 (discussing how multiple groups of online activists helped reverse FCC policy). The role of information in breaking up "iron triangle" political favoritism is well documented. *See, e.g.*, FRANK R. BAUMGARTNER & BRYAN D. JONES, AGENDAS AND INSTABILITY IN AMERICAN POLITICS (1993).
[57] *See* Baker, *Merging, supra* note 44, at 100 (1994).
[58] *Id*.
[59] I make this caveat on Yoo's behalf; he details no exceptions.
[60] Yoo, *Beyond*, *supra* note 17, at 53-57.

> There is noting [*sic*] incoherent about imposing regulation to promote values other than economic welfare. The problems ... are more practical than conceptual. Unless protecting the widest possible diversity of sources is a virtue in and of itself that trumps all other values, such a theory must provide a basis for quantifying the noneconomic benefits and for determining whether those benefits justify the economic costs.[61]

This is a straw-man representation of neutrality advocates specifically and those who support diversified media ownership generally. It is an artificially high burden of proof to expect them to defend media diversity in the face of *all* other values. Yoo has not demonstrated much risk to other constitutional values that are considered comparable to First Amendment values. His concern is for admittedly minor gains in economic efficiency, which is best achieved under a neutrality regime.[62] As far as the courts are concerned, efficiency weighs little compared to a genuine First Amendment claim. Second, the cited authors provide more than incoherent arguments on behalf of the belief that a diversity of voices is a more important value. For instance, in the article that Yoo cites,[63] Benkler references an earlier article[64] in which he argues:

> Justice Breyer recognized that [cable] regulation "extracts a serious First Amendment price." But, he wrote, that price can be justified by the "'basic tenet of [our] national communications policy, namely, that the widest possible dissemination of information from diverse and antagonistic sources is essential to the welfare of the public.'" That policy is not an economic policy, but rather "seeks to facilitate the public discussion and informed deliberation, which, as Justice Brandeis pointed out many years ago, democratic

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[61] *Id*. at 54.
[62] *See infra*, Sections IIA, IV.
[63] Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access*, 52 FED. COMM. L.J., 561, 565-68, 578 (2000).
[64] Yochai Benkler, *Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain*, 74 N.Y.U. L. REV. 354, (1999).

government presupposes and the First Amendment seeks to achieve."[65]

When weighing the First Amendment value of increased diversity against even other First Amendment values, communication diversity is the core value guiding communication policy and therefore wins in this highly analogous case. For neutrality proponents and for the Turner court, economic efficiency is an even less important value.[66] This is certainly true for other well-reasoned communication law and policy scholars who would gladly trade economic efficiency in favor of constitutional values such as a diverse information ecosystem[67] or privacy.[68] Benkler and the Turner court may be unpersuasive to Yoo, but many have argued quite coherently that economic efficiency is not our country's core value.

Perhaps Yoo finds those who believe in the primacy of a democratically diversified media system to be incoherent because he stubbornly refuses to speak their language. For instance, as he alleges elsewhere, "by valuing speech for its contributions to democracy, these theories adopt a consequentialist approach that is at odds with the autonomy-centered vision that has long dominated free speech theory."[69] Yet even the very footnote in which he makes this claim cites an article by Baker that contends that literally any incremental diversity is better due to the inherently more democratic diversification of editorial power:

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[65] *Id*. at 376-377 (citing Turner II, 520 U.S. 180, 226 (1997) (Breyer, J., concurring in part)).
[66] Additionally, note that economic efficiency is not necessarily the product of unconstrained market behavior; especially in the case of economically atypical products such as media content, a great degree of regulation is often required to maximize efficiency. *See* C. EDWIN BAKER, MEDIA, MARKETS, AND DEMOCRACY, 20 (2002) [hereinafter, "BAKER, MEDIA"].
[67] *See, e.g.* MCCHESNEY, *supra* note 46, at 236; Mark Cooper, *Open Access to the Broadband Internet: Technical and Economic Discrimination in Closed, Proprietary Systems*, 71 U. COLO. L. REV. 1011, 1020 (2000). *See also, generally,* NEIL W. NETANEL, COPYRIGHT AND A DEMOCRATIC CIVIL SOCIETY (JSD) (arguing that copyright law should be crafted to maximize the health of debate in civil society, drawing a contrast between himself and those who seek to maximize copyright's economic efficiency).
[68] OSCAR H. GANDY, JR., THE PANOPTIC SORT: A POLITICAL ECONOMY OF PERSONAL INFORMATION (1993).
[69] Christopher S. Yoo, *Architectural Censorship and the FCC*, 78 S. Cal. L. Rev. 669, 675 n. 17 (2005).

> For many people (and most theories), true democracy implies as wide as practical a dispersal of power within public discourse. Dispersal of ownership also may promote the availability and consumption of diverse content—but no theorist of whom I am aware believes that this will always be true. But democratic values mean that it makes a huge difference whether any lack of a particular type of diversity is imposed by a few powerful actors or reflects the independent judgments of many different people, for example, owners, with the ultimate power to determine content. The key goal, the key value, served by ownership dispersal is that it directly embodies a fairer, more democratic allocation of communicative power.[70]

As far as Baker is concerned, promoting maximally democratic control over the media is part of autonomy-enhancing democracy rather than a cog in some "consequentialist" belief; any diversification of communication power promotes procedural democracy. "Without more, and regardless of empirical investigations or controversial economic analyses, this value judgment provides a proper reason to oppose any media merger or to favor any policy designed to increase the number of separate owners of media entities."[71] Interpretations vary, of course, but that is not unique to the value of procedural democracy. The pseudo-objectivity that Yoo applies to the economic question of the BSP market's competitiveness, critiqued below, illustrates that both core values in this debate suffer from the same problem.

Epithets of incoherence aside, Yoo is really accusing neutrality proponents of failing to explain why their values outweigh his. On this count, Baker provides quite solid justifications for his reasonable policy stance: promote maximum media ownership wherever possible until and unless other considerations prove overwhelming.[72] On the other hand, Yoo himself fails quite

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[70] Baker, *Ownership Policy*, *supra* note 45, at 734-735.
[71] *Id*. at 735.
[72] *Id*. at 734-741.

ironically "to engage in even a minimally adequate normative or policy analysis of the issue."[73] Yoo's rhetorical move is a clever trick, inverting the burden of proof that he should face. Considering the almost incomparable value of the First Amendment in the US legal canon, and the current case law that defines that value as requiring diversity of opinion, Yoo should be proving why economic efficiency outweighs communications diversity in general or in this particular policy debate. As an even less supportable debate trick, he expects those who support diversity to prove their value claims on his terms—in a quantitative form that translates these values into a form that can be weighed in his economic calculus.[74] Yet he offers no such calculus.

Unless Yoo believes that the democratic value of diversified communication power could not possibly trump economic efficiency, he has also failed to provide a coherent means of deciding which values should win under which circumstances. He derides his opponents for

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[73] *Id*. at 741.

[74] Yoo, *Beyond*, *supra* note 17, at 54, as quoted above. Disappointingly, Yoo relies on economic analysis based in antitrust debates that happened in other industries. He argues, for instance, that, "Over time, courts and commentators began to recognize that because many industries are subject to economies of scale, preserving small producers has a price." *Id*. at 55. Yet this begs the question of whether, as a society, we should or do value diversity of control in media at a higher level than diversity in other industries—or whether communication should actually be entirely commodified. On this last point, see Baker, *Ownership Policy*, *supra* note 45, at 742-747.

Further, adding the production of media content to the list of economic activities that enjoy economies of scale is more than mere understatement; it elides properly economic reasons that justify media exceptionalism and challenge the applicability of general economic regulatory strategies. For almost every type of media product, the "first copy" costs of developing and marketing something to reproduce and distribute greatly overwhelms the costs of reproduction and distribution. Unlike almost every other type of product imaginable, media products as a rule feature marginal costs that are almost always lower than average costs. GILLIAN DOYLE, UNDERSTANDING MEDIA ECONOMICS, 13-14 (2002). This public good characteristic of media leads to underproduction of "some media content that an audience wants—content whose value as measured by willingness to pay is greater than its cost." BAKER, MEDIA, at 20. It can also lead to ruinous competition. *Id*. at 30-31. It is careless for Yoo to apply rebuttals to populist antitrust reasoning without discussing these fundamental economic differences between media products and most other products. Further, considering the disproportionately high degree of externalities in the media industry, *id*. at 10-11, drawing on precedents primarily reached in other industries is arguably a substantial straw-manning of those who support media regulation that exceeds the antitrust regulation appropriate in other sectors.

making such decisions based on an approach that "has remained decidedly ad hoc,"[75] but not even two accurate, valid systems for measuring these abstract values[76] separately could (or should) determine which is more important under which circumstances. A human intermediary would still have to decide upon the exchange rate between the two currencies. Yoo's demand for a quantifiable *a priori* means of resolving interminable value debates is therefore misguided at best. After all, "it is harder to get agreement about which things are ugly or which actions evil than about which things are rectangular."[77] If Yoo expects media policy scholars to solve the problem of moral objectivity and create objective justifications for First Amendment principles, he is asking them to solve a philosophical problem deemed insoluble by some of the greatest American philosophers of the last century.[78] There may be no *quantifiable* or even *objective* reason why Comcast should not be granted editorial discretion over their customers' online speech, but there are still plenty of *coherent* reasons.

III. Bottlenecks and Roadblocks: Actual and Potential Threats of Discrimination

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[75] Yoo, *Beyond*, *supra* note 17, at 55.

[76] Even antitrust suits that consider only the economic efficiency end of Yoo's proposed two-value equation are notoriously unpredictable. *See*, *e.g.*, James B. Speta, *FCC Authority to Regulate the Internet: Creating It and Limiting It*, 35 LOY. U. CHI. L.J. 15, 19-20 (2003).

[77] RICHARD RORTY, PHILOSOPHY AND SOCIAL HOPE, 51 (2000).

[78] Rorty, *id*., for instance, approvingly describes John Dewey's defense of democracy:

> Dewey offered neither the conservative's philosophical justifications by reference to eternal values nor the radical's justification by reference to decreasing alienation. He did not try to justify democracy at all. He saw democracy not as founded upon the nature of man or reason or reality but as a promising experiment engaged in by a particular herd of a particular species of animal. … Dewey's conservative critics denounced him for fuzziness, for not giving us a criterion of growth. But Dewey rightly saw that any such criterion would cut the future down to the size of the present.

Id. at 119-120.

There are several well-documented past and current instances of BSPs preventing their users from making nondestructive uses of their connections; augmenting them is a reasonable fear of content discrimination. In perhaps the only such empirical work to date, Tim Wu "surveyed the network designs (to the extent that the information was available) and usage restrictions in subscriber agreements and incorporated acceptable use policies"[79] of the nation's 10 largest cable modem and 6 largest DSL service providers as of 2002. Technical and policy constraints have changed since then, but one thing remains: threatened and actual discrimination are still endemic. In the first subsection, I summarize and offer brief updates of what Wu found in 2002. Next, I detail the continuing discrimination against Voice over Internet Protocol, or VoIP. Third, I examine how the threat to block specific applications such as VoIP and peer-to-peer networking distorts the market for online innovation. Finally, I consider content-specific threats to neutrality that may erode customers' right to serve as their own editors.

A. Broadband Discrimination in 2002

After studying the contractual and technical constraints of the 16 largest broadband providers, Wu paints a picture of widespread discrimination in 2002, both contractual and architectural.[80] In the part of his argument that is most relevant today, he notes three[81] types of common, controversial restrictions that are embedded in "terms of use" policies and enforced contractually.[82] First, all cable operators and one third of DSL operators restrict users from acting

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[79] Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141, 156-57 (2003).

[80] *Id*. at 143. "[O]perators indeed had implemented significant contractual and architectural limits on certain classes of applications. Operators showed an unfortunate tendency to want to ban new or emerging applications or network attachments, like WiFi devices or Virtual Private Networks, perhaps out of suspicion or an (often futile) interest in price-discrimination." *Id*.

[81] As described below, Wu breaks restrictions on wired and wireless home networks into two classes of restrictions; I consider them jointly here, thus collapsing his four categories into three.

[82] *Id*. at 158. "The following pages provide further details on the language of the most controversial restrictions: (1) providing information to the public or operating a server, (2)

as servers or in other substantive ways from acting as providers of content. "This restriction has the greatest potential significance because it affects the broadest class of applications—those where the end-user shares content, as opposed to simply downloading content."[83] This reinforces a model of the internet that looks like a million-channel television, favoring one-to-many communication over many-to-many communication, eroding the internet's power to facilitate democratic communication. After surveying many BSPs' terms of service, this appears to be at least as applicable today as in 2002.[84]

Even more commonly, BSPs often restrict commercial uses of broadband internet connections.[85] "The broadest and most controversial of such restrictions barred home users from using 'Virtual Private Network' (VPN) services, which are used by telecommuters to connect to their work network through a secure connection."[86] This restriction on commercial activities is generally enacted in an effort to price discriminate; if customers use their home connections for business-class activities, BSPs would like to charge them business-class prices.[87] Yet this restriction, to the extent that it is enforced, discourages a new employment model that permits increased productivity for those who work at home,[88] not to mention the increased job satisfaction from the ability to telecommute.[89] Again, this is endemic today,[90] though none of the

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commercial uses, (3) Home Networking, and (4) WiFi network operation." *Id*.

[83] *Id*. at 159.

[84] *See, e.g.*, "Terms and Conditions," § 8b (May, 2005), *at* http://www.att.net/general-info/terms-dsl-data.html#useserv [hereinafter, "AT&T Terms"]; "About Cox: Policies and Agreements," § 6 (Feb. 22, 2005), *at* http://www.cox.com/policy/default.asp [hereinafter, "Cox Terms"]; "Comcast High-Speed Internet Acceptable Use Policy," § A.xiv (April, 2004), *at* http://www.comcast.net/terms/use.jsp [hereinafter, "Comcast AUP"].

[85] Wu, *supra* note 79, at 160.

[86] *Id*.

[87] *Id*. at 153.

[88] *Id*.

[89] Yoo and others might object that this is mere wealth transfer, with users upgrading to commercial-class connections according to their perceived value. Yet as discussed below in Section IV, most broadband providers are in monopoly or duopoly markets. This suggests that pricing for broadband generally and business-class connections specifically will be fixed at

current cited terms of service specifically ban VPNs, which are now much more commonly used.[91] Further, some BSPs still do not prohibit commercial applications that meet the remainder of the acceptable terms of service.[92]

A third common contractual restriction in 2002 was the restriction of home networking. Wu breaks this into wired[93] and wireless[94] restrictions, but they are similar and I will treat them jointly. Because a user owns two computers and wants to network them to the same broadband connection, some BSPs hypothesize that the connection is more valuable to the subscriber and seek to charge accordingly. While Wu's study does not systematically examine enforcement, he notes that the then-current AT&T contract described unauthorized home networking as theft of service and threatened to invoke criminal punishment.[95] This restriction is largely extinct.[96]

B. Voice over Internet Protocol (VoIP)

Since Wu's article, perhaps the most anticompetitive discrimination has been BSPs' blocking of VoIP traffic. VoIP allows one to make and receive phone calls over a broadband connection without paying interstate long distance fees. Vonage, for instance, offers a VoIP

Cournot equilibrium prices, which are higher than competitive equilibrium prices and therefore feature inefficient underproduction. *See* ROBERT S. PINDYCK & DANIEL RUBINFELD, MICROECONOMICS (6th Ed.) 431-433 (2005). Simply, BSPs deliberately set prices beyond the reach of many customers in an effort to maximize profits in a noncompetitive market.

[90] *See, e.g.*, AT&T Terms, *supra* note 84, § 8b; Cox Terms, *supra* note 84, § 5; Comcast AUP, *supra* note 84, §A.ix.

[91] This lack of explicit VPN blocks does not mean that the practice has died. See "NetBIOS Blocked from UCI's Network" (July 23, 2004), *at* http://www.nacs.uci.edu/security/netbios.html (describing the mechanisms by which VPN administrators can circumvent ISPs' port blocks).

[92] *See*, *e.g.*, "Terms of Service" (2005), *at* http://www2.verizon.net/policies/tos.asp? [hereinafter "Verizon Terms"] (regrettably requiring one to login as a Verizon customer).

[93] Wu, *supra* note 79, at 161-162.

[94] *Id*. at 162.

[95] *Id*. at 161.

[96] *See*, *e.g.,* AT&T Terms, *supra* note 84; Cox Terms, *supra* note 84; Comcast AUP*, supra* note 84; Verizon Terms, *supra* note 92.

package that includes free long distance to the US and Canada for $24.95 per month.[97] For BSPs in the voice telephony business, this is a clear cause for concern. Even Yoo objects to this type of discrimination. "Another anticompetitive problem [that] can arise in a convergent world is when a broadband provider bars access to an Internet application that competes directly with its core business. Consider Madison River Communication's attempt to protect its long distance telephone business by blocking its DSL customers from using VoIP."[98] In the ensuing case,[99] the FCC cited Madison for failing to fulfill its duties of common carriage.[100] Madison settled the case for $15,000 and promised to stop blocking VoIP traffic on its networks.[101] While Madison appears to be holding to its end of the bargain, other telephone companies appear to be preventing or discouraging VoIP use on their networks. Vonage insists that two other BSPs were still blocking their calls,[102] a point to which I return later.[103]

C. Threatened Innovation

Until the last few years, BSPs relied on simple port blocking to degrade or restrict disfavored applications; today, network managers have much more sophisticated tools at their disposal. "Since sophisticated, packet-level network-management tools allow administrators to determine the types of traffic flowing across their networks, it's possible for network operators to 'block' or otherwise degrade the service for specific types of traffic."[104] Blocking VoIP is just

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[97] Vonage, *Vonage: Leading the Internet Phone Revolution* (2006), *at* http://www.vonage.com/products_premium.php.
[98] Yoo, *Congestion, supra* note 15, at 49. (2006)
[99] Madison River Communications, LLC, Order, 20 F.C.C.R. 4295 (2005).
[100] *Id*. (citing 47 U.S.C. § 201(b)).
[101] *Id*. at 4297.
[102] Ben Charney, "Vonage Says Its Calls Are Still Being Blocked" (Mar. 21, 2005), *at* http://news.com.com/Vonage+says+its+calls+are+still+being+blocked/2100-7352_3-5628564.html?part=rss&tag=5628564&subj=news.
[103] *See infra*, Section V.
[104] Paul Kapustka, "Clearwire May Block VoIP Competitors," ¶ 14 (March 25, 2005), *at* http://www.networkingpipeline.com/showArticle.jhtml?articleID=159905772.

one such threat. In another, several BSP executives have publicly threatened to block the ports over which peer-to-peer networks run.[105] The threat to block peer-to-peer traffic is just one example of the general problem of threatened innovation. As soon a new application increases the value of network resources (e.g., VPNs) or disproportionately draws upon those resources (e.g., peer-to-peer), BSPs may intervene either to seek rents or to minimize their own expenses. They can demand fees from end users in relation to the perceived value of the new technology or block bandwidth-hogging tools in lieu of upgrading their networks. This systematically favors the status quo, reducing the competition between applications that led to innovations such as VoIP and peer-to-peer networking in the first place.

Yoo denies that application suppression will likely lead to decreases in welfare. He insists instead that network owners are in an ideal position to capture all of the marginal value of increases in the worth of their networks.[106] Yet, even if BSPs allow all innovations to pass and seek only to capture any increased value in the network,[107] this eliminates the profitability of future innovations, destroying the economic incentive to innovate. Even if BSPs can perfectly predict the extent to which these innovations will eventually increase the value of their networks, the attempt to capture all of the positive value of online progress constitutes a "socially perverse"[108] tax on innovation with unforeseeable and unacceptable deadweight losses. By urging

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[105] *E.g.*, Cynthia Brumfeld, "BellSouth: We Might Want to Block Ports," ¶ 1-3 (Oct. 25, 2005), *at* http://www.ipdemocracy.com/archives/000656bellsouth_we_might_want_to_block_ports.php.
[106] Yoo, *Congestion, supra* note 15, at 43.
[107] This is a dubious claim, considering their historical willingness to suppress innovations such as VoIP that challenge their current business model.
[108] Baker, *Ownership Policy, supra* note 45, at 748. Baker highlights the difference between welfare-based economics, which seeks to optimize total social value, and enterprise-based economics. To wit:

> Of course, the enterprise's economist might be sensitive to some of these [broader welfare values] for instrumental, but sometimes socially perverse, reasons. The economist might check for newly created opportunities to externalize costs cheaply or identify someone from whom to collect (internalize) some of the enterprise's otherwise positive

regulators to permit discrimination, Yoo turns his back on the very policies that led to the internet's success. The threat to peer-to-peer is merely emblematic of what, if left unchecked, will be a looming thundercloud over the head of generations of online innovations to come.

D. Restrictions on Content

In a final violation of network neutrality, broadband providers explicitly reserve the right to censor the content uploaded or downloaded by their customers. This policy statement by Cox Communications is typical. "Cox reserves the right to refuse to post or to remove any information or materials from the Service, in whole or in part, that it, in Cox's sole discretion, deems to be offensive, indecent, or otherwise objectionable."[109] AT&T takes it up a notch, reserving the right to block any content for any reason. "AT&T and its designees shall have the right (but not the obligation) to monitor any and all traffic routed though the Service, and in their sole discretion to refuse, block, move or remove any Content that is available via the Service."[110] Further, in July 2005, "Telus, Canada's second largest telecommunications company, actively blocked access to Voices for Change, a website supporting the Telecommunications Workers Union."[111] While such censorship is fortunately sparse, it remains the disheartening case that ISPs face no civil liability for even willful acts of censorship.[112]

In the not-too-distant past, ISPs exercised fairly censorious powers over private online

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> externalities. Neither of these, however, and certainly not the first, should be treated as welfare enhancing or efficient even though beneficial to the firm.

Id.

[109] Cox Terms, *supra* note 75, ¶ 6.

[110] "Welcome to AT&T DSL Service—Terms and Conditions," § 10 (May 2005), *at* http://www.att.net/general-info/terms-dsl-data.html#worldnetiquette.

[111] Michael Geist, *Telecommunications Policy Review Submission*, 5 (August 2005), *at* http://www.telecomreview.ca/epic/internet/intprp-gecrt.nsf/vwapj/Geist_Michael.pdf/$FILE/Geist_Michael.pdf.

[112] *See* 47 U.S.C. § 230 (2005).

speech; they regulated the content of forums,[113] private chat, and email.[114] The fact that BSPs universally reserve the right to exercise that authority over any type of online communication carried over their pipes is unsettling, whether they exercise that right frequently or rarely. "The system of freedom of expression requires institutional arrangements that promote rather than impede people's opportunities to communicate. Censorship, whether by governmental, private, or structural forces, is presumptively objectionable."[115] Further, infrequent exercise of this power does not disprove the essential point. As Baker observed in relation to the abuses of media concentration generally, "[a]lthough this power may seldom or never be exercised, no democracy should risk the danger."[116] Even competition in the market is insufficient to guarantee that last mile providers not engage in censorship. "The owner of the second wire is often likely to engage in the same censorship, for the same reasons, as the owner of the first wire."[117] In that light, the mere threat of BSP censorship of constitutionally protected speech is simply unacceptable.

IV. Current Broadband Competition Guarantees Little

Yoo insists that competition in the broadband market is adequate to prevent anticompetitive discrimination on the part of broadband providers.[118] FCC Chairman Kevin J. Martin supports the belief that the last-mile broadband market i, though he reserves the right to mandate neutrality should broadband providers begin placing restrictions on users for reasons

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[113] Mike Taylor, "Conversations with Fred" (Nov. 6, 1990), *at* http://www.eff.org/Censorship/Online_services/?f=prodigy_roosevelt_dimes.article.txt.
[114] "Home: Censorship: Online Services," http://www.eff.org/Censorship/Online_services/?f=aol_secret_tos.manual.txt (last visited Dec. 6, 2005).
[115] Baker, *Merging*, *supra* note 44, at 122.
[116] Baker, *Ownership Policy*, *supra* note 45, at 735.
[117] Baker, *Merging*, *supra* note 44, at 123.
[118] Yoo, *Congestion, supra* note 15, at 61.

other than network management.[119] Both further insist that even greater competition is just around the corner due to technologies such as wireless (wifi) and Broadband Power Line (BPL) transmission, even though Yoo's best-case future scenario features at most three wireline broadband providers for most US households.[120] Any effort to label the broadband market as competitive is wildly optimistic, to say the least. In most of the country, one or two providers dominate the market and therefore enjoy substantive market power over price and quality of service. While new technologies are expected to dent this system of regional duopolies, the era of truly vibrant competition is many years ahead under the best scenario if it is to come at all—a condition that is hardly guaranteed.

In this section, I first demonstrate that the broadband market is far from competitive and explain how the system of regional duopolies discredits Yoo's primary mechanism—consumer choice—for restraining monopolistic behavior. Second, I argue that the only free market mechanism that could preserve a generalized norm of neutrality is the competitive pressure of regional broadband competition at the consumer level—and not, as Yoo suggests, the quest by website and application developers for national market share. Third, I co-opt Yoo's cable television analogy, as it provides an excellent policy precedent for regulation to preserve content diversity.

A. Reigning Duopolies Gaining Speed

The first and only two vehicles for home broadband to enjoy widespread adoption are coaxial cable, which was first deployed to carry television signals, and Digital Subscriber Line (DSL) service, carried over telephone lines. These vehicles currently serve almost the entire

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[119] FCC Chairman Kevin J. Martin, Comments on Commission Policy Statement 1 (Aug. 5, 2005), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-260435A2.pdf [hereinafter Martin Comments on Policy Statement].

[120] *Id*.

broadband market. "Today, cable and DSL providers control almost 98 percent of the residential and small-business broadband market."[121] Over one quarter of consumers have just one choice—cable (23%) *or* DSL (5%).[122] Even in well-populated markets with both services available, most residential customers currently or will soon face just one choice for each type of service. "In many markets, consumers face a duopoly, forced to choose between a single cable provider and single DSL provider—many of which bundle broadband with television or telephone service for a pricier package."[123]

As measured by objective economic standards, nearly every regional broadband market is very highly concentrated. In measuring market concentration, the Justice Department and the Federal Trade Commission use the Herfindahl-Hirschmann Index (HHI). To obtain the HHI, square each firm's percentage market share and sum the squares. For instance, consider a very optimistic scenario where four broadband firms in a region each have one quarter of the market. By taking the square of each firm's market share (that is, 25 squared, or 625) and adding them all up (625 + 625 + 625 + 625), one obtains an HHI score of 2500. Note that this is the lowest possible HHI for four firms. If two had 40% market share each and the others had 10%, the HHI would be 3400. An HHI between 1000 and 1800 indicates moderate market concentration; a market over 1800 is highly concentrated.[124] The broadband market in a typical region is over 5000, explained by the FCC:

> If we assume that a typical residential (and small business) market consists of the ILEC provider, one cable provider, and one other non-ILEC, and assume that the national figures can be used to represent a typical local market, the HHI is approximately 5200. If

[121] S. Derek Turner, *Broadband Reality Check: The FCC Ignores America's Digital Divide*, 3 (Aug. 2005), *available at*: http://www.freepress.net/docs/broadband_report.pdf.
[122] *Id*. at 15.
[123] *Id*. at 15.
[124] See United States Department of Justice, The Herfindahl-Hirschman Index, at http://www.usdoj.gov:80/atr/hhi.htm (last visited Dec. 8, 2005).

> we don't allow for an additional non-ILEC and again assuming that the national numbers of ILEC/RBOC and cable non-ILEC can be used to calculate market shares representative of a typical local broadband market, the HHI ranges between approximately 5500 and 5800.[125]

This is three times the level of competition required for a market to be considered highly concentrated.[126] "Measures of typical local broadband markets, moreover, understate the problem because they ignore the fact that in some local markets there is no competition at all or, where it does exist, it is only available to some of the customers within the market."[127] If there are any, there are certainly no more than a handful of residential broadband markets that are truly competitive. Making policy decisions based on the vigor of competition is therefore foolish.

The tepid competition in the broadband market will soon be even weaker. It is technically possible for cable and telecommunications firms to allow other BSPs to offer service over the same set of wires. As part of the common carrier regulatory legacy of telephony provision, telecommunications firms that sell DSL had been required to provide access to competing BSPs. Cable companies, in contrast, were classified as providing "information services" and were therefore free to block competitors from using their lines. An independent BSP, Brand X internet Services, challenged this classification in federal court in an effort to secure access to customers via cable lines.

Overruling the Ninth Circuit, the Supreme Court ruled that the FCC was within its statutory rights to classify cable as an information service and therefore exclude cable companies

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[125] *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Notice of Proposed Rulemaking, 18 F.C.C.R. 6722,* para. 124 (2003).

[126] This makes Chairman Martin's claim of a competitive market utterly indefensible.

[127] Harvey Reiter, *The Contrasting Policies of the FCC and FERC Regarding the Importance of Open Transmission Networks in Downstream Competitive Markets,* 57 FED. COMM. L.J. 243, 292 (2005).

from common carriage regulation.[128] Within weeks, the Commission then ruled that DSL was also an information service; less than one year from today, current common carrier regulations requiring access to these lines will expire and telecommunications firms such as Verizon and AT&T will be free to exclude competitors.[129] "Now that these rules have been abandoned, consumers in even the largest markets will be restricted to two choices — the local cable provider or the local DSL provider. This duopoly ensures higher prices, slower connection speeds and poorer customer service."[130] Considering that unregulated cable BSPs have historically imposed more restrictions on consumers' use of broadband connections,[131] this deregulation also escalates the likelihood that DSL operators will engage in similar discrimination.

B. Regional Market Concentration Matters

In developing the case against mandated neutrality, one of Yoo's main arguments is that competition between broadband providers removes the need for a neutrality mandate. He portrays a broadband market "in which competition among providers checks anticompetitive conduct."[132] But to draw this conclusion, he relies on the premise that concentration in the broadband market should be based on national market share:

> [A]pplication and content providers care about the total number of users they can reach. So long as their total potential customer base is sufficiently large, it does not really matter

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[128] National Cable & Telecommunications Assn. v. Brand X Internet Services, 345 F.3d 1120 (9th Cir. 2003), *rev'd*, No. 04-277 (U.S. Jun. 27, 2005).
[129] Appropriate Framework for Broadband Access to the internet over Wireline Facilities, Report and Order and Notice of Proposed Rulemaking, FCC 05-150, slip op. (rel. Sept. 23, 2005) [hereinafter DSL Ruling], available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC05-150A1.pdf. *See also* Marilyn Geewax, *Bells Win Ruling on DSL Service*, ATLANTA JOURNAL-CONSTITUTION, Aug. 6, 2005, at 1F.
[130] Turner, *supra* note 121, at 17
[131] Wu, *supra* note 79, at 157. (2003)
[132] *Id*. at 8.

> whether they are able to reach users in any particular city. This point is well illustrated by a series of recent decisions regarding the market for cable television programming. As the FCC and the D.C. Circuit recognized, a television programmer's viability does not depend on its ability to reach viewers in any particular cities, but rather on the total number of viewers it is able to reach nationwide. … This in turn implies that the relevant geographic market is a national one, not a local one.[133]

Yet earlier in the same article, Yoo acknowledges that it is customer choice is required to drop anticompetitive behavior. "As long as consumers have the option of switching to alternative broadband providers, any attempt to use exclusivity to harm competition will prove futile, since any frustrated end user will simply reallocate their purchases to another provider."[134] Yoo makes this argument despite the clear evidence that in many areas, consumers have one or two choices for home broadband service. The cable-DSL duopoly shows no signs of abiding; their share of the broadband market has *grown* from 94.5% in 1999 to 97.5% in 2004.[135] This leaves customers with little recourse even in light of egregious customer service,[136] let alone BSP efforts to block specific applications or websites.

Whitacre's threat to extort access fees from profitable web businesses is also a reasonable disproof of Yoo's belief that competition will restrain this sort of rent-seeking behavior. High-value websites are increasingly dependant on broadband service from regional cable and telecommunications monopolies. If superimposed into different contexts, Whitacre's threat is

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[133] *Id*. at 45.
[134] *Id*. at 11.
[135] Turner, *supra* note 121, at 12.
[136] *See id*. at 17. I personally suffered three weeks without a dial tone or DSL this summer, despite dozens of hours speaking with Verizon customer service representatives and supervisors. An informal survey of friends, colleagues, and consumer-review websites led me to believe that I would be as likely to suffer comparably bad service at the hands of any of Verizon's competitors—even in the relatively competitive Philadelphia market. I would have preferred to have switched providers entirely; my next best option to punish them for poor service was to choose their cheapest DSL plan.

laughable. After allowing access to the general internet, no dialup provider could have made this threat credibly. Ten full years ago, when dialup was king and the ISP business was therefore easily entered and fiercely competitive, America Online (AOL) was forced to allow consumers out of their walled garden and offer general access to the internet. AOL could no more have demanded a cut of the profits from those whose websites were reached by their customers than Texaco could demand a cut of the automobile industry. Like gasoline, internet access is a homogenous commodity and if one provider blocked access to Google (or Toyotas), customers would simply go elsewhere. But Whitacre himself notes that he controls one of just two major routes to broadband access in his territory.[137] In those circumstances, the threat has real teeth.

Yoo claims that it does not really matter to companies like Yahoo! and Amazon, but those companies have vocally proclaimed that it matters a great deal to them and the future of the internet. Along with several other major online firms and technology trade associations, they have formed the Coalition of Broadband Users and Innovators explicitly and solely to lobby for network neutrality.[138] For the startup VoIP companies who have fought bitterly for access each and every time they are port blocked by broadband firms guarding their telephony share, every user in every market is important.[139] It is further mistaken to lump all internet content into one national market. Several prominent regional websites exist within the boundaries of any given regional bell or cable company; giving those broadband providers the power to choke off some of the most lucrative customers would kill or cripple most of these sites. Most daily newspaper

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[137] Again, cable BSPs are not and soon DSL BSPs will not be required to interconnect with other would-be broadband providers as common carriers. *See* DSL Ruling, *supra* note 129. This lack of common carrier regulation permits infrastructure providers to price other BSPs out of existence.

[138] *See* Press Release, Coalition of Broadband Users and Innovators, Broadband Group Urges FCC to Ensure Consumer Freedom on the internet (Nov. 18, 2002), *at* http://aeanet.org/governmentaffairs/gamb960_CBIU_PressRelease.asp.

[139] *See* Charney, *supra* note 102.

websites, for instance, are of little interest to a broader national audience and could easily lose a substantial portion of their most lucrative audiences at Whitacre's whim.

Finally, Yoo underestimates the destructive threat that losing even a minority of the national audience represents for application and website developers. The computer industry is rife with network externalities, or changes "in the benefit, or surplus, that an agent derives from a good when the number of other agents consuming the same kind of good changes."[140] In other words, the computer industry is filled with applications (e.g., Microsoft Office, Adobe Photoshop) and networking systems (e.g., eBay, AOL Instant Messenger) that become more valuable to users as more users join.[141] This creates successions of "serial" monopolies in each application or service type.[142] Once enough users decide to use such an application or service, it enjoys near-monopoly status for years and new competitors face a steep uphill climb, substantially undermining Yoo's claim that the market for applications and content is of no competitive concern.[143] Even if AT&T or Verizon controls only a substantive fraction of the national broadband audience, this may be enough to decide who does—or does not—enjoy short-term success as the serial monopolist of the day. In this context, exclusivity arrangements are particularly likely to have anticompetitive implications and should therefore be avoided on economic grounds alone. The FCC recognized as much in the AOL-Time Warner, and this economic theory "seems well within the confines of antitrust in the new economy."[144]

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[140] S. J. Liebowitz & Stephen E. Margolis, Network Externalities (Effects), ¶1, *at* http://www.utdallas.edu/~liebowit/palgrave/network.html (last visited March 31, 2006).
[141] Gerald R. Faulhaber, *Access and Network Effects in the "New Economy": AOL-Time Warner (2000)*, in JOHN E. KWOKA, JR., & LAWRENCE J. WHITE, THE ANTITRUST REVOLUTION: ECONOMICS, COMPETITION, AND POLICY, 4TH ED. (2004), at 453-475.
[142] *Id*. at 472.
[143] *See* Yoo, *Beyond, supra* note 17, at 16-17.
[144] *Id*. at 473.

C. The Cable Television Precedent

As part of Yoo's argument for measuring concentration based on the national broadband market, he draws an analogy to cable television. The statutory and economic reasoning that actually underlies that argument, however, suggests greater rather than weaker government protection of diversity. Citing *Time Warner v. FCC*,[145] he contends that a network's ability to reach a substantive national audience is all that matters. Yet applying this case to a rebuttal of network neutrality is misguided. First, as the *Time Warner* court notes, communication policy has long been sensitive to the needs to ensure media diversity:

> Statutory authority flows plainly from the instruction that the Commission's regulations "ensure that no cable operator or group of cable operators can unfairly impede, either because of *the size of any individual operator* or because of joint actions of operators of sufficient size, the flow of video programming from the video programmer to the consumer."[146]

Yoo leans on the FCC ruling in this case to argue that, so long as content providers can reach a sizable national audience, local acts of discrimination should be unproblematic.[147] Yet the statute[148] on which the court relies comes to almost exactly the opposite conclusion, demanding that no cable system provide preferential treatment to networks in which the cable system has a stake. Specifically, it requires that the FCC "ensure that cable operators affiliated with video programmers do not favor such programmers in determining carriage on their cable systems or do not unreasonably restrict the flow of the video programming of such programmers to other

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[145] Time Warner Entm't Co. v. FCC, 240 F.3d 1126 (D.C. Cir. 2001).
[146] *Id*. at 1131, citing 47 U.S.C. 533(f)(2)(A) (emphasis added by the court).
[147] Yoo, *Congestion, supra* note 15, at 45. "As the FCC and the D.C. Circuit recognized, a television programmer's viability does not depend on its ability to reach viewers in any particular cities, but rather on the total number of viewers it is able to reach nationwide." *Id*.
[148] 47 U.S.C. 533(f).

video distributors."[149] Yoo is defending a broadband policy that takes the exact opposite stance, permitting network owners to discriminate in favor of affiliated content. This reverses the precedent that common carriers of media content must provide nondiscriminatory access for multiple diverse sources. Here as in other cases, the federal government can be, should be, and is even more vigilant against anticompetitive exclusion than in non-media industries.

V. Ad Hoc Regulation Is Inadequate

In light of admittedly problematic discrimination, as in the Madison River case, Yoo suggests targeted FCC regulations to punish the worst instances of discrimination.[150] Others might argue that antitrust enforcement would provide an adequate remedy, but both Yoo[151] and James B. Speta, who strongly supports neutrality,[152] conclude that antitrust regulation is inadequate. Any network neutrality regulation should go through the FCC. The Commission can regulate either in an ad hoc fashion or by enforcing a generalized regime of neutrality, especially one backed new legislation. In this section, I argue ad hoc regulation is inadequate.

Despite Yoo's enthusiasm for the Madison River case, the best and most obvious example of the inadequacy of ad hoc regulation actually stems from the settlement. First, consider that the implicated companies did not fit the stereotype of VoIP port blocker. Madison River is a telecommunications company, so blocking VoIP traffic preserves their long distance telephone business. The two newly implicated companies, however, are recent entrants into the voice telephony game, to say the least. The first company accused by Vonage is Clearwire, a company that sells long-distance wireless broadband (WiMAX[153]) in a handful of states.

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[149] 47 U.S.C. 533(f)(2)(B).
[150] Yoo, *Congestion*, *supra* note 15, at 50.
[151] Yoo, *Beyond*, *supra* note 17, at 69-70.
[152] Speta, *supra* note 76, at 17-21.
[153] *See generally* "About the WiMAX Forum" (2005), *at* http://www.wimaxforum.org/about.

Clearwire reached an exclusivity agreement this March with Bell Canada to provide internet telephony over its networks.[154] The other is an unnamed cable company, which was allegedly still successfully interfering with VoIP traffic a month after the Madison settlement.[155] Cable companies are increasingly becoming players in the VoIP market,[156] giving them an incentive to degrade or cut off VoIP service from their competitors. In other words, a BSP does not need to be a traditional phone company to have an incentive to block VoIP traffic; the desire to be the only VoIP provider on their broadband networks is incentive enough.

These companies clearly fail to meet Yoo's test for targeted intervention, in which "a broadband provider bars access to an Internet application that competes directly with its core business."[157] Rather, these incumbent BSPs seek to extend their market power in the broadband business to capture potential rents in profitable adjacent markets. Even the potential for such rent seeking is a deterrent to the investment in and development of innovative online applications.[158] The continued discrimination against VoIP traffic by companies that are not themselves telephone companies shows the potential for such rent seeking in markets that are new to a given BSP; the list of such markets will only grow.

Second, consider the utter failure of the Madison River settlement to deter these BSPs from obstructing Vonage's calls for competitive reasons. At least one online commentator

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[154] Bernard Simon, "Canadian Telecoms Rivals Agree Wireless Venture," FINANCIAL TIMES, 27 (Sep. 19, 2005).
[155] Charney, *supra* note 102.
[156] Marguerite Reardon, "Cable Goes for the Quadruple Play" (Nov. 7, 2005), *at* http://news.com.com/Cable+goes+for+the+quadruple+play/2100-1034_3-5933340.html.
[157] Yoo, *Congestion, supra* note 15, at 49. (2006)
[158] Wu & Lessig, *supra* note 13, at 3-5. The authors argue:

> A network that is as neutral as possible is predictable: all applications are treated alike. Since the Commission wants to maximize the incentives to invest in broadband applications, it should act now to eliminate the unpredictability created by potential future restrictions on network usage. The value of network neutrality can be seen clearly in another context: the nation's electric system. Because it remains neutral, the electricity network has served as an important platform for innovation.

Id. at 3.

believed that Clearwire's certification program was an excuse to continue to block or degrade voice traffic from competitors,[159] a credible claim since Vonage appears to have gotten its voice data through by hiding it from Clearwire.[160] Vonage has not brought complaint to the FCC over these two latest incidents, though this may be due to a fear of setting an unfavorable precedent. "Since Clearwire is not a traditional telephone service provider, it is unclear what, if any, legal recourse Vonage might have. In fact, Clearwire's terms of service claim that its service is 'not a telephone service,' and as such may limit users' 'rights of redress before federal, state or local telecommunications regulatory agencies.'"[161] Unlike telephone companies such as Madison River, WiMAX and cable companies fall into the relatively unregulated category of "information services" providers and are therefore not subject to common carrier regulations.[162] There is certainly no guarantee that the FCC will force them to carry competitors' voice traffic; in light of the *Brand X* case, it even seems fairly unlikely. These BSPs are acting accordingly, seeking to extent their market power into adjacent markets.

This example alone demonstrates at least the continued potential for discrimination, which serves as a deterrent to investment in online innovation even if actual discrimination remains rare. Without a generalized norm of a stable platform for innovation, provided so well by the electric grid, for instance,[163] planning and investment is less rational. The diminished potential for online innovations that improve our collective welfare is an excellent example of a market failure that warrants statutory and regulatory intervention. Since unpredictability is a key

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[159] Carlo, "Clearwire To VoIP Providers: Get Certified Or, Oops, You Might Get Blocked" (Sept. 21, 2005), *at* http://www.techdirt.com/articles/20050921/2128243_F.shtml.
[160] Mike, "Getting Around Blocks By Playing Packet Hide and Seek" (Apr. 22, 2005), at http://techdirt.com/articles/20050422/0946236_F.shtml.
[161] Kapustka, *supra* note 104, ¶ 13.
[162] *See* Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking, 17 F.C.C.R. 4798, 4819-39 ¶¶ 33-71 (2002); Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs., 125 S. Ct. 2688 (2005).
[163] Wu & Lessig, *supra* note 13, at 3.

element of that failure, a principled regulatory stance is a key part of the solution.

VI. Mandating Neutrality

Wu and Lessig propose a straightforward neutrality mandate to be adopted by the FCC. They believe the Commission has clear legal and constitutional authority to do so.[164] The regulation, which I believe would be best implemented via new legislation, would mandate neutrality except in a specific set of circumstances:

> Broadband Users have the right reasonably to use their Internet connection in ways which are privately beneficial without being publicly detrimental. Accordingly, Broadband Operators shall impose no restrictions on the use of an Internet connection except as necessary to:
>
> (1) Comply with any legal duty created by federal, state or local laws, or as necessary to comply with any executive order, warrant, legal injunction, subpoena, or other duly authorized governmental directive;
>
> (2) Prevent physical harm to the local Broadband Network caused by any network attachment or network usage;
>
> (3) Prevent Broadband users from interfering with other Broadband or Internet Users' use of their Internet connections, including but not limited to neutral limits on bandwidth usage, limits on mass transmission of unsolicited email, and limits on the distribution of computer viruses, worms, and limits on denial-of-service—or other attacks on others;

[164] *Id*. at 10. "Whether restricting use of the network amounts to speech doesn't ultimately matter, for the Commission's authority is secure in either case. The bans on discrimination that at the center of any neutrality regime are a textbook case of a content neutral regulation of conduct, supported by substantial government interests." *Id*.

(4) Ensure the quality of the Broadband service, by eliminating delay, jitter or other technical aberrations;

(5) Prevent violations of the security of the Broadband network, including all efforts to gain unauthorized access to computers on the Broadband network or Internet;

(6) Serve any other purpose specifically authorized by the Federal Communications Commission, based on a weighing of the specific costs and benefit of the restriction.[165]

The increased predictability from a generalized norm of neutrality would greatly facilitate online innovation, and BSPs would not even be tempted to censor speech with which they disagree. Under this mandate, network administrators would still be permitted to prevent harmful activity, comply with legal duties, and neutrally manage bandwidth. Considering the deep, abiding constitutional and economic values that flourish under a neutrality regime, it would take a firm belief in substantive disadvantages to dissuade most from agreeing that this regime would be a good idea—at least in a market as concentrated as the broadband market.

VII. Rebutting Alleged Disadvantages

A. Network Congestion

Recall that BSPs' supposed inability to effectively manage network congestion is the first of Yoo's two major objections to a neutrality mandate. He acknowledges that managing bandwidth congestion is ideally done via usage sensitive pricing, but he concludes, "the case for usage-sensitive pricing becomes somewhat less compelling once transaction costs are taken into

[165] *Id*. at 13.

account."[166] As recently as ten years ago, transaction costs represented a major portion of a telephone company's expenses, leading to generalized flat-rate pricing.[167] Yoo assumes the same is true of metering bandwidth, concluding that it may be more efficient for BSPs to manage bandwidth by discriminating based on application type.

This parallel is riddled with holes. First, he never quantifies the expense of bandwidth metering, an ironic failure from a scholar who expects his opponents to quantify a trade-off in political values. He cites no networking literature to hint that metering is cumbersome. Considering that BSPs already log their users' web activities, this claim requires empirical support. Second, even if the analogy with telephone metering holds, telephone companies continue to bill by the minute for long distance and to offer plans with cost-per-call rather than flat-rate local calling. Third, recall that mandated neutrality for telephone users remained a good idea despite the "unfair" network burden created by dialup internet users. If Yoo's reasoning had ruled the day fifteen years ago, telephone companies would have been permitted to reduce network congestion by discriminating against dialup ISP numbers, either preventing residential internet use entirely or seeking additional rents from internet-using customers.[168]

Yoo does, however, acknowledge that metering costs may not be prohibitive; if they are not, then network restrictions are unwarranted. "This is not to say that all exclusivity arrangements on the Internet are innocent. Indeed, under my approach such restrictions would

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[166] Yoo, *Congestion*, *supra* note 15, at 7.
[167] *Id*. at 27-29.
[168] Yoo would object to this characterization, at least in part; he insists that the era of healthy broadband competition is upon us and we therefore need not bother with legal precedents set in the era of Regional Bell Operating Company monopolies. Recall from above, however, that local broadband markets are anything but competitive; Yoo's hypothetical objection would therefore need to explain why a near-total broadband duopoly is sufficiently different from total monopoly to guarantee that the next "unfair," revolutionary use of networking resources is permitted to thrive without threat of discrimination.

not be justified when the transaction costs of metering bandwidth usage are relatively low."[169] Both Yoo and neutrality proponents believe that a metered regime is preferable to one that throttles or surcharges specific applications. Payments should ideally reflect objective measures of bandwidth, based on total bandwidth use and/or maximum down/upload speeds. Maximum speed is a good substitute for total use—much more so than application-specific port blocking. Application-specific blocks can be creatively engineered around, as demonstrated by Vonage in their dealings with Clearwire. In contrast, instant bandwidth capacity is an effective means of price discrimination. "[S]ervice providers can keep endlessly upgrading their customers' connections, and use increasing speeds as a market segmentation device. The significance of the low utilization of data networks is that what matters to users is not getting lots of bits, but getting a moderate amount of bits quickly, in other words low transaction latency."[170]

Network owners already can and do price discriminate based on maximum speed and/or total per-month usage. Instant bandwidth is the more common basis for price discrimination and is becoming nearly ubiquitous. Verizon offers DSL service at two tiers of connection speeds,[171] as does AT&T.[172] Comcast offers two separate speeds of service via cable modem.[173] Verizon has also begun to deploy fiber optic networking in limited areas, featuring three tiers of download speeds at prices starting at $34.95 per month[174] for a total of five Verizon tiers.

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[169] Yoo, *Congestion, supra* note 15, at 49 (2006).
[170] Odlyzko, *supra* note 38, at 28, specifically lectures BSPs for mistakenly seeking to create vertically integrated streaming media centers when ever-faster broadband pipes serve the clearest route to finely detailed price discrimination.
[171] Verizon, *Packages and Prices, at* http://www22.verizon.com/ForHomeDSL/channels/dsl/packages/default.asp (last updated 2006).
[172] AT&T, *Internet Services, at* http://www.usa.att.com/dsl/plans/index.jsp (last updated 2006).
[173] Comcast, *Savings and Services at My Address, at* http://comcast.com/Buyflow/default.ashx?PromoID=20439 (last updated 2005).
[174] Verizon, *Verizon FiOS: Packages and Prices, at* https://www22.verizon.com/FiOSForHome/channels/FiOS/root/package.aspx (last updated 2006).

As Odlyzko argues, networks are generally underutilized;[175] the problem is therefore not total bandwidth use but congestion during online rush hours. Yet even if total bandwidth use matters greatly, then network congestion can be and is managed along those lines as well. Several BSPs, especially cable companies, enforce caps on the total bandwidth usage per billing period. Cox Communications, for instance, provides three tiers of service that distinguish users based on instant bandwidth *and* total per-month usage.[176] While Comcast is less explicit up-front with their customers, they also enforce caps on total bandwidth used by their customers. The trouble of monitoring total bandwidth cannot be beyond the budgets of many BSPs; University of Connecticut students who live in the residence halls are subject to caps of five gigabytes of total per-week bandwidth usage on their residential T1 lines.[177] These are profoundly captive "customers" whose service fees are built into their boarding charges, so the school could block specific applications such as peer-to-peer applications with little economic loss, yet they find it perfectly feasible to enforce reasonable network usage via a per-week bandwidth cap. Therefore, since "the transaction costs of metering bandwidth usage are relatively low,"[178] Yoo's own reasoning leads us to conclude that BSP-imposed limits on specific applications are unwarranted.

B. Network Diversity

Yoo insists that the internet of the future may be more innovative if networking resources are divided into a set of separate functions. He acknowledges that the norm of the neutral network has caused the exponential innovation of the recent past, but insists that changes in the internet require rethinking neutrality. "There can be no question that the Internet's meteoric

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[175] Odlyzko, *supra* note 38, at 28.
[176] Cox Communications, *Limitations of Service, at* http://www.cox.com/policy/limitations.asp (last updated 2006).
[177] University of Connecticut, *Bandwidth Usage, at* http://www.security.uconn.edu/guides/bandwidth.html (last updated May 26, 2004).
[178] Yoo, *Congestion, supra* note 15, at 49.

success invites treating the status quo as the relevant baseline and to place the burden on those who would deviate from it. In recent years, however, the environment in which the Internet operates has changed radically."[179] In light of these changes, Yoo anticipates a plethora of network designs among last-mile providers, each optimized to a different niche market:

> Indeed, it is conceivable that network diversity might make it possible for three different last-mile networks to coexist: one optimized for traditional Internet applications such as e-mail and website access, another incorporating security features to facilitate e-commerce and to guard against viruses and other hostile aspects of Internet life, and a third that prioritizes packets in the manner needed to facilitate time-sensitive applications such as streaming media and VoIP. [180]

Yet Yoo references little if any technical literature to support this vision of special purpose last-mile networks.[181] Quite the contrary, one of his sources, the Blumethal and Clark piece that describes the internet's recent changes,[182] sounds a call to preserve neutrality, not to create multiple, special-purpose networks. Here is the very last sentence of their article: "We argue that the open, general nature of the Net, which derived from the end-to-end arguments, is a valuable characteristic that encourages innovation, and that this flexibility should be preserved."[183] Blumenthal and Clark are two of most established internet architects and researchers in history,[184]

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[179] Yoo, *Beyond*, *supra* note 17, at 21.
[180] *Id*. at 31.
[181] Having consulted innumerable online resources and several current or former IT professionals in preparation for this paper, I concluded that the vast majority of those with the technical skills to develop—or even implement—the next great online innovation support a generalized internet protocol and fear rather than welcome BSP violations of network neutrality.
[182] Marjory S. Blumenthal & David D. Clark, *Rethinking the Design of the Internet: The End-to-End Arguments vs. the Brave New World*, 1 ACM TRANSACTIONS ON INTERNET TECH. 70 (2001) (cited in Yoo, *Beyond*, *supra* note 17, at 21, n. 59).
[183] *Id*. at 99.
[184] From 1987 to 2003, Blumenthal was Executive Director of the Computer Science and Telecommunications Board of the National Research Council. National Academies of Science, *CTSB People: Marjory S. Blumenthal*, at

and they draw exactly the opposite conclusion as Yoo, pleading for the preservation of the architectural norm of a generally neutral internet.

While supporting neither the legal nor the technical regime described by Yoo, Blumenthal and Clark do acknowledge that deviations from that principle can also be useful. "[F]rom the beginning, the end-to-end arguments revolved around requirements that could be implemented correctly at the end-points; if implementation inside the network is the only way to accomplish the requirement, then an end-to-end argument isn't appropriate in the first place."[185] For instance, the authors note that locally cached, two-stage delivery via intermediate servers is particularly useful for streaming media content.[186] Yet the potential benefits of deviations from the end-to-end principle seminally developed by Saltzer, Reed, and Clark[187] do not disprove the value of the neutrality regime proposed by Wu and Lessig. The proposed rules would prevent BSPs from obstructing nondestructive communications, whether by blocking packets entirely or relegating them to the slow lane (especially due to a failure to pay for priority delivery). These rules certainly would not prevent BSPs from adding additional, useful functionality such as intermediate caching. The text of the ban itself is clear enough on this point, but Wu and Lessig's fourth exception is even clearer. It specifically grants network providers the power to "[e]nsure the quality of the Broadband service, by eliminating delay, jitter or other technical aberrations."[188] Within this power, BSPs would certainly be permitted to introduce minor impurities into the end-to-end architecture so long as they do not degrade the general availability

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http://www7.nationalacademies.org/cstb/people_blumenthal.html (last updated 2004). Clark is currently a Senior Research Scientist at the Massachusetts Institute of Technology Computer Science and Artificial Intelligence Laboratory. From 1981 to 1989, he acted as Chief Protocal Architect in the development of the internet and chaired the Internet Activities Board. Massachusetts Institute of Technology, *David Clark*, at http://www.csail.mit.edu/biographies/PI/bioprint.php?PeopleID=7 (last visited April 15, 2006).

[185] Blumenthal and Clark, *supra* note 182, at 80.

[186] *Id*. at 83.

[187] *Supra* note 26

[188] Wu & Lessig, *supra* note 13, at 13.

of a neutral communication platform. If BSPs want to introduce tools like intermediate caching, they certainly may do so as long as the tools are open to all senders without charge.

Blumenthal and Clark believe BSPs, in seeking vertically integrated business models, are perhaps the single greatest looming threat to online innovation. "The concern here, however, is that investment in closed islands of enhanced service, combined with investment in content servers within each island, decreases the motivation for investment in the alternative of open end-to-end services. Once started down one path of investment, the alternative may be harder to achieve."[189] This sincere fear rebuts Yoo's reasoning nicely; online innovation will not be fostered by, but rather slowed by any attempt by BSPs to create and market competing packages of "closed islands" of services. BSPs will have tremendous incentives to invest in the delivery of content inside their "closed island" and to neglect their delivery of the general-purpose internet. Even worse, this may become a positive feedback loop. The sharper the difference in quality, the more BSPs can charge online providers for access to the top tier of delivery; the more they can charge for the right to send information quickly, the more incentive they have to neglect the general-purpose internet.

Yoo also insists that, regardless of their ultimate shape, more BSP networks will grow out of inefficient restrictions placed on network traffic by incumbents.[190] Yet this analysis is flawed for at least three reasons. First, he incorrectly assumes that new BSPs will enter and succeed due to unique packages of proprietary content and applications. Yet as Odlyzko explains:

> [T]here is far more money in providing basic connectivity, [which] people have always valued far more, and have been prepared to pay more for. (The far greater revenues of

[189] Blumenthal & Clark, *supra* note 182, at 73.
[190] Yoo, *Beyond*, *supra* note 17, at 48-53.

> cellular carriers in the U.S. than of cable TV providers is just one example…) But while content delivery does lend itself to a closed network, connectivity does not.[191]

This is related to the point about network externalities; users are far more likely to use a service or application that connects them to their fellow users.

Second, Yoo incorrectly believes that network neutrality requires regulated pricing.[192] But this argument conflates network neutrality with mandated interconnection of the type that was rejected by the FCC in the *Brand X* decision. Note that the proposed neutrality regime excludes mandated interconnection.[193] The FCC would not estimate the fair market price that Google would pay for the right to be used by AT&T's customers. Whitacre's wishes notwithstanding, this price would be zero, because AT&T would be forbidden from obstructing or degrading access. In that sense, this policy would prevent the imposition of prices where none are paid now, but BSPs new and old would continue to charge their paying customers whatever the market will bear.

Third, Yoo elides a substantial first-mover advantage. If a firm enters a market first, serving as a monopoly, a second firm faces a substantive disadvantage in entering that market.[194] Because there is far greater money in connectivity, that will always provide the greatest incentive for new market entrants. Yet the first one or two firms in a regional broadband market will always already have a vast majority of the market locked up, even at inefficient prices. New entrants can erode those profits, but they can rarely afford to charge low enough prices to

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[191] Odlyzko, *supra* note 38, at 28. While Odlyzko explains why open networks will tend to win, note that the reasoning above, *infra* Section I and II, demonstrates why the exceptions are both common enough and, even when rare, bad enough to warrant intervention.
[192] Yoo, *Beyond*, *supra* note 17, at 38.
[193] Several of the authors cited here also support mandatory interconnection for all ISP comers, imposed on last mile infrastructure owners such as telecommunications and cable firms. While that debate is also worthwhile, it is a separate debate.
[194] ROBERT S. PINDYCK & DANIEL RUBINFELD, MICROECONOMICS (6th Ed.) 447-448 (2005).

achieve a market share comparable to that of the current monopolist.[195] This is even more problematic in industries such as the broadband market that involve substantial sunk costs. Verizon has already laid the cables and must only maintain them; a new BSP faces substantial build-out costs, and Verizon can likely afford to match or beat their prices. This built-in disincentive to new market entry erodes the potential for new market entrants to discipline inefficient monopolistic practices. Decades of bipartisan FCC policymaking recognized this:

> Indeed, under both Republican and Democratic Administrations, the FCC respected the efficiency and possible inevitability of natural monopoly in the market of physical, fixed wire links to households. ... The FCC's goal has routinely been not to insist that competitors always bypass bottlenecks, such as by building redundant local access, but instead that bottlenecks be shared where that would be a means to the end of competition in services offered to end users.[196]

Yoo's prediction, an immediate future populated by a diverse array of broadband networks featuring highly customized features and content, defies both history and economic logic.

VII. Concluding Bits

The principle of generalized network neutrality is responsible for the internet revolution, and to allow BSPs to erode that principle in the name of better profit margins is shortsighted and anti-democratic. The continued and varied forms of discrimination are noteworthy and regrettable. By prohibiting customers from serving content, BSPs increase the cost of participating in online discourse, a tax on speech. Through prohibiting commercial applications such as VPNs (or the next innovative equivalent), BSPs drag down overall economic growth in a partially effective attempt at price discrimination. If we permit exclusivity arrangements with

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[195] *Id.* at 448.
[196] Reed Hundt, *The Ineluctable Modality of Broadband*, 21 YALE J. ON REG. 239, 249 (2004).

products such as VoIP, we are explicitly allowing competition-destroying maneuvers by incumbent utility monopolists. Through unpredictable ad hoc bans on innovative applications such as peer-to-peer networking, BSPs reduce the economic incentives to create powerful new networking technologies. Finally, even if seldom exercised, the mere possibility of content censorship on behalf of BSPs is stomach-churning for any fan of free speech.

In the face of such actual and potential discrimination, it would be wonderful if consumers could switch providers in a competitive market; unfortunately, the broadband market is characterized by regional duopolies, a problem that is going to get worse over the next several years. Ad hoc regulation by the FCC is already failing to discourage blatantly anticompetitive discrimination; unless the Commission shifts policy, innovators and consumers will not be guaranteed predictable, consistent access to broadband lines. As outlined above, however, the Commission could provide a reasonable guarantee that BSPs will not interfere with nondestructive communication. This policy will not prevent BSPs from successfully managing their networks; it provides reasonable and explicit exceptions for preventing destructive uses, and it does not preclude useful deviations from a pure end-to-end design such as local caching. In an era where BSPs ranging in size from major telecommunications firms to state universities already monitor their users' total per-week or per-month bandwidth usage, BSPs should be expected to impose bandwidth limits neutrally rather than picking technological winners and losers. Further, we should set aside the unsubstantiated hope that a diverse array of specialized BSPs will begin to challenge incumbent duopolies with highly differentiated products.

By almost all accounts, broadband service is a commodity market characterized by natural monopolies that serve as bottlenecks. Decades of bipartisan regulatory tradition have forced these bottlenecks to provide access on a nondiscriminatory basis, doing so for purposes both economic and democratic. Among other unexpected advantages, this tradition brought us

the widespread adoption of the internet, widely hailed as an unprecedented source of uncontrolled innovation and uncensored speech. If Congress and the FCC do nothing to preserve net neutrality—or, even worse, if Representative Barton's bill becomes law—the future of the internet may be channeled through the short-term interests of a few powerful broadband companies. In contrast, if strong regulation forces broadband companies to leave their bottlenecks open to all data, regardless of application or content, the unexpected innovations in applications and content will continue to astound us for years to come.