Network Rules

by
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INTRODUCTION

Baby Bell executives and online companies have been holding a lively debate on the Hill and in the press over the past months. A BellSouth chief technology officer told reporters that his company should be able to charge Yahoo! for having its site load more quickly than Google.[1] The AT&T CEO said that "There seems to be a mentality [on the part of online companies] that they can put more and more through our pipes for free. . . We're the ones who built the network. You cannot make that sort of investment if you can't make a return on the capital. They're more than welcome to use our networks, but if they do, they're going to have to pay. It's not free."[2]

In response, Vint Cerf, one of the creators of TCP/IP, has called on behalf of Google for a "lightweight but enforceable neutrality rule."[3] A group of online companies has written to Congress claiming that "The incredible potential of broadband will be severely compromised if network operators are permitted to be the gatekeepers of the Internet, deciding what content, applications and services succeed or fail on the Internet."[4]

The telcos/cablecos claim that they have spent billions on building fiber-optic networks that can carry huge amounts of data, and that therefore they are entitled to give their own content (and the content of their paying

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1. Jonathan Krim, *Executive Wants to Charge for Web Speed*, Washington Post, Dec. 1, 2005, at D05.

2. The cable companies have (more quietly) been following the same line, and I will refer throughout this Article to "telcos/cablecos." There are differences between these categories of companies, and among the companies in each category, that I will ignore for purposes of this Article.

3. Letter Vint Cerf to Hon. Joe Barton, Nov. 8, 2005.

4. Amazon.com Inc., eBay Inc., Google and IAC/InterActive Corp. to House Commerce Committee.

partners) priority.[5] In the words of Ivan Seidenberg, CEO of Verizon, the Bells "have to make sure that [application providers] don't sit on our network and chew up bandwidth. We need to pay for the pipe."[6] Similarly, Verizon deputy general counsel John Thorne has said publicly that Google is "enjoying a free lunch that should, by any rational account, be the lunch of the facilities providers."[7]

The telcos/cablecos say that "ordinary" internet content can and will continue to flow at 2001 speeds, with high-speed access reserved for their own bits, or the bits of their content partners. This means that any web service that requires high speed access will have to pay off the network provider. But web businesses, and individuals sympathetic to these businesses, cannot imagine such a world.[8] They point out that high-speed networks in Japan and Korea have adequate bandwidth (a hundred times faster than common speeds here in the U.S.) to allow for all imaginable uses without the need to prioritize bits, and that the U.S. experience with Internet2 shows that a multi-tiered internet model is unnecessary to assure excellent quality of service.[9]

There is a rhetorical construction going on on the telco/cable side, and you can almost hear the hammers. It is an appeal to the ancient pull of property rights. We built this network; we own it. Without appropriate incentives, we will be unable to continue this great work that benefits America. Because this network is our property, we can exclude others from it. If we are unable to exclude others, you will be taking from us our property, and that is unlawful and un-American.

And it is not just the telco/cable companies who are interested in this rhetoric. Several powerful forces are working together to protect this construction and make it into a mighty edifice. One of those forces is

5. Hiawatha Bray, *Telecoms want their products to travel on a faster Internet,* Boston Globe, Dec. 13, 2005.

6. Paul Kapustka, *Verizon Says Google, Microsoft Should Pay for Internet Apps*, InformationWeek, Jan. 5, 2006.

7. Arshad Mohammed, *Verizon Executive Calls for End to Google's 'Free Lunch,'* Washington Post, Feb. 7, 2006.

8. So far, the online companies are not agreeing to this model. For example, Google has refused to "shar[e] the costs of broadband networks with any carrier," saying it believes "consumers are already paying to support broadband access to the Internet through subscription fees and, as a result, consumers should have the freedom to use this connection without limitations." Preston Gralla, Networking Pipeline, Jan. 18., 2006. Google's position may change over time, as it is forced to accede to deals ensuring access to telco/cableco customers.

9. Rep. Rick Boucher (D-Va.), *Saving the Internet*, The Hill, Feb. 9, 2006.

interested in maximizing intellectual property rights and ensuring that all uses of works are controlled and monetized—we can call this force the "content companies."[10] Having a controlled and monetized internet can only help this group, because the power to prioritize bits carries with it the power to know who is watching which bits.

Law enforcement is another force here, as it uses scare tactics to push for powers to dictate design and surveil data flows.[11] Having cooperative telephone companies in a better position to assist their efforts can only help them as well.[12] The packet inspection that will be necessary for the facilities providers to eat the lunch of the online companies will make the dreams of these other incumbents come true.

In all of this, the romantic figure of the "network builder" is being used to end the arguments about desirable social policy that otherwise should occur. It is as if a hardhatted young builder is standing before us, sleeves rolled up, a coil of fiber over his shoulder, muscles rippling, eager to achieve the American dream of property ownership and all its golden flowing benefits of leases, lending, and upward mobility. A perfect storm of incumbency, aided by the powerfully romantic vision of this builder, is upon us.

If only we had a more natural name for this network of networks than the internet; if only more people understood it to be a deeply human endeavor whose value comes from all of us; if only it were more visible as a social, self-reflected, self-entailed world that happens to be connected by machines. The internet needs a lobbyist. More importantly, however, it needs a new social theory.

The theory that will see us through focuses on the meaning and liveliness of "the network" (the name I will give the internet; the name for all the layers of the internet above the transport layer). This network is a

10. Susan P. Crawford, *The Biology of the Broadcast Flag*, 25 Hastings Comm. & Ent. L.J. 603 (2003) (describing content companies' battles to control devices through FCC mandate).

11. Susan P. Crawford, *The Ambulance, the Squad Car, and the Internet*, Berk. Tech. L. J. (forthcoming, 2006) (evaluating E911 and CALEA battles).

12. The traditionally cooperative nature of the relationship between telcos and law enforcement is well-known, and has recently become the subject of broad public scrutiny. *See* Scott Shane, *Attention in N.S.A. Debate Turns to Telecom Industry*, New York Times, Feb. 10, 2006 ("Some [telecommunications] companies are said by current and former government officials to have provided the eavesdropping agency access to streams of telephone and Internet traffic entering and leaving the United States.").

commons, like the ocean. The vast majority of its value emphatically does not come from the access providers who now claim to "own" it. Instead, its value comes from the gifts and interactions and attention of the people who use it and whose minds it reflects. The central paradox of networks generally is that they are more than the sum of their parts; this network is even more than that. This network, the internet, is exponentially more than the sum of access plus computers because it allows and generates unpredictable interactions among groups. Once we reframe our theoretical approach to this network, we can move on to assert that access to it, like access to the oceans of this Earth, is essential to human flourishing. And our government has a duty to protect this access.

What the telcos/cablecos have is beachfront property, over which access to the sea—the internet—will be required by the public at whatever speed is widely commercially available. Such access will make it possible for humans to use and contribute to this resource into the future, always in unpredictable ways. If the telcos/cablecos degrade internet communications by slowing the rate at which humans can add to the value of this resource (the rate at which we can upload, rather than passively download) and degrading our access to the contributions of others and the global mind that the internet represents, the telcos/cablecos will be effectively damming rivers that would otherwise flow towards the ocean.

For the last ten years, a great deal of scholarly energy has been focused on ever-expanding intellectual property claims. James Boyle provided an important framework for this scholarship in his 1996 book,[13] and this Article is written in his honor. Boyle adumbrated for us the information vise-tightening and enclosure, the loss of balance, the growth in regulated uses, that has fascinated an entire generation of legal writers. He revealed the rhetorical construction in the background of the expansionist effort. He showed how the romantic figure of the author was being used to paper over otherwise irreconcilable theoretical tensions inherent in the notion of intellectual property.

But we now live in an age of an open, interactive network, and an open, interactive network is different. It has complex properties that are not fully captured by the words "information flow," because its networked, interactive, graphical screens make the formation of groups possible and

13. JAMES BOYLE, SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY (1996) [hereinafter BOYLE, SHAMANS, SOFTWARE, AND SPLEENS].

prompt the creation of unpredictable, self-referential, and lively online entities and activities that are new to us. In this new context, battling about what is owned and not owned, about what should be secure and what should be free, about what should be monopolized and what should be the subject of market energy, is just the clicking of a bead on the wire of an abacus. The bead goes back and forth, ceaselessly demonstrating the tug between two neatly opposed forces—property and innovation. But the bead, and the abacus, is not helping us decide what theoretical grounding will make one approach to this open, interactive internet more rational than another. We are stuck in debates about intellectual property and debates about ownership of network wires; with rare exceptions, we have not yet begun to think effectively about the network itself.

My goal in this Article is to convince a new generation of legal activists that communications law (that boring province of insiders citing section numbers and mumbling acronyms) is to the networked age as intellectual property law was to the information age and labor law was to the industrial age. It is our lense, and it is a hopeless one. It is scratched and cloudy, based heavily on antecedents from two hundred years ago drawn up by men who loved railroads; it knows all about telephony, with its centralized control and dependence on geographic referents; it knows nothing, reflects nothing, about the possibility of a network that has a life of its own. Our new direction must be to revolutionize this impoverished body of law, and we need a better set of theories than we now have to do the work.

Many of our usual tools are too puny to help us here. Economics provides checklists (as Boyle found it did for intellectual property) but no real assistance. Advocates on both sides can try to come up with empirical evidence supporting their claims, but numbers will always be less than helpful in some fundamentally undermining way. Democratic theory may help, but the best of us become muddled when we try to explain exactly how. This network is built on *relationships* that are, by and large, not those of individuals but of groups; these relationships are persistent, multidimensional and far richer than anything the sliding scale of property versus innovation can capture. The internet is nothing less than a new ecosystem, like the ocean—but instead of having its origins in nature, it has grown through the efforts and the attention of the people who use it.

My suggestion here is a large one, just as Boyle's was. It will force us to think about "governance" of this network in terms of collective values

guiding a collectively-owned commons. It may require law to intervene to protect that commons and to prohibit forms of private ownership that interfere unreasonably with access to it

This Article proceeds in four parts. Part I discusses the context in which the telco/cableco rhetoric is emerging. Part II lays out a basic social theory of the internet. Part III applies the social theory to the current battles, and suggests that we privilege access to the internet at the highest commercially-available speeds over the property rights of the telco/cablecos. We may need to ensure that their beachfront property does not unduly impede such access, and I discuss the relevant public trust and eminent domain theories. Part IV provides some guesses about the future in light of Boyle's work ten years ago.

I. THE BATTLEFIELD

After the AT&T executive claimed to own "the network," the ensuing uproar caused him to backtrack and "clarify," saying that he had been referring only to the company's "private internet" over which it plans to offer its new television service, and not the "public internet."[14] The concept of a "private internet" is central to the telco/cableco rhetoric. Some background may help.

Over the last ten years, the enormously high potential bandwidth of fiber has frequently been claimed to be key to America's future development.[15] Fiber optic would allow 45 Mbps symmetrical (download and upload speeds to be equal) service online, a service that would be some 50 times as fast as existing standard DSL or cable modem service.[16] The Clinton administration focused on ensuring that a fiber-optic network would connect everyone.[17] The Baby Bells announced that they would build these high-speed fiber networks, rather than having government take the lead, if adequate governmental support was made available through

14. Reuters, *No Action Needed Now on Net Neutrality: FCC Chief*, Dec. 14, 2005.

15. E.g., Gartner Group report, 1993, cited in Bruce Kushnick, The $200 Billion Broadband Scandal (2006), at 48.

16. DSL (digital subscriber line) access uses copper or cable lines, and commonly moves 1 Mbps of data – much faster than dialup, but still to slow to convey high-definition, bi-directional video. Kushnick at 85. A megabit is 1000 kilobits, or Kbps.

17. Al Gore had had this dream for some time. As he said in 1989, "...I genuinely believe that the creation of this nationwide network and the broader installation of lower capacity fiber optic cables to all parts of this country, will create an environment where work stations are common in homes and even small businesses with access to supercomputing capability being very, very widespread." http://www.firstmonday.dk/issues/issue5_10/wiggins/, October 2000

changes in state law. Some believe that the Baby Bells never intended to actually build these networks, and that their plan was always to simply get the money (amounting to $2,000 per each American, in the end) without providing 45 Mbps service.[18]

At any rate, Baby Bell promises to state public utility commissions that they would build these fiber-optic networks prompted the utility commissions' removal of "rate of return" regulation for the local telephone services provided by the Baby Bells. In exchange, the Baby Bells in the early 1990s obtained price cap regulation from the states (allowing higher prices to be charged for telephone services) in part so that these phone companies would have more money to pay for the installation of these highspeed networks.[19] These high-speed networks were not, at least initially, considered to be the same as the internet or the world wide web. Access to the internet was still through dialup connections in these early years, and from most users' perspectives the internet itself was primarily a collection of bulletin board services and walled garden proprietary areas like Prodigy and America Online. The notion was that the Bell companies were planning to themselves become providers of major video services for home entertainment, telemedicine, and long distance education over fiber optic connections (say, 500 channels of interactive services), with online services a seldom-mentioned subset.

The 1992 FCC/administration plan was that the broadband platforms developed to make these "video dialtone" (as they eventually became known) services possible would be common carrier services subject to nondiscrimination and tariffing obligations.[20] The point was that these platforms were supposed to be "unbundled" so that any service provider could use them to reach customers.[21] But when the Baby Bell companies

18. *See* Bruce Kushnick, *$200 Billion Broadband Scandal*, published online in January 2006; available at [URL] (estimating that Bell companies charged $205 billion from 1992-2004 for the building of fiber optic networks that in fact were never installed).

19. E.g., Ameritech, which used to be the phone company for Ohio, Illinois, Indiana, Wisconsin, and Michigan, and became part of SBC in [year], successfully petitioned the FCC for the authority to provide "video dialtone services" in these states, and then made commitments in each state to update their networks to fiber optic in exchange for removal of rate of return regulation in 1994. Ameritech dropped all fiber optic plans in 1996 following the passage of the 1996 Telecom Act.

20. See *In the Matter of The Bell Atlantic Telephone Companies Petition for Expedited Waiver of Part 69 of the Commission's Rules to Offer Video Dialtone Service in Dover Township, New Jersey*, rel. Jun 9, 1995 (reporting that Video Dialtone Order of 1992 established a common carrier basis for video dialtone).

21. Kushnick at 95.

received permission to go into long distance service in the 1996 Act, they promptly dropped their "video dialtone" plans.[22]

Meanwhile, the popularity of the internet (even absent video services) was growing exponentially. Although telephone companies were not initially enthusiastic about acting as internet service providers and connecting their subscribers to the internet, they prospered when subscribers bought extra lines to allow them to go online through other ISPs. Later, the phone companies prospered again when subscribers bought their proprietary DSL services to make higher speed access (one to two Mbps) to the internet possible.[23] (Both dial-up and DSL access run across traditional telephone copper wires.) The explosive growth of the internet took these phone companies by surprise, however, and they became unsatisfied with requirements to provide flat-rate, open access to this increasingly desirable network. They decided to compete with the internet.

The Baby Bells and the cablecos have worked very hard to ensure that their networks will not be subject to common carriage or nondiscrimination obligations that might force these network managers to carry competing voice or video services (such as Skype or GoogleVideo) at optimal speeds. Immediately following the summer 2005 BrandX decision,[24] which made clear that cable networks had no common carriage obligations, the Bells demanded that DSL services be similarly released from any requirement to connect to all ISPs or carry all services. In August 2005, they achieved this goal with the issuance of the FCC's Wireline DSL order.[25] Today, the

22. Id.

23. Digital subscriber line service (DSL) devotes certain frequencies on traditional copper phone lines to data transmission, and is faster than dialup because (in part) it does not need to go through a circuit switch but instead goes directly to the packet-switched network. There must be a DSL modem at each end of the phone line, which will transmit and receive all data (without conversion) as a digital signal. A subscriber's house must be close to the telephone office and its DSL modem. DSL speeds in the U.S. are about 1.5 Mbps, which is about 50 times the speed of a 28bps modem. Cable modem service, which competes head-to-head with DSL, uses home cable network pipes that are connected to ethernet network cards inside computers. Cable facilities are connected via highspeed links directly to the internet.

24. National Cable & Telecommunications Association et al. v. Brand X Internet Services et al., 125 S. Ct. 2688, __U.S.___ (S. Ct. Jun. 27, 2005).

25. *In the Matters of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Universal Service Obligations of Broadband Providers, Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services, Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements, Conditional Petition of the Verizon Telephone Companies for Forbearance Under 47 U.S.C. § 160(c) with Regard to Broadband Services Provided Via Fiber to the Premises; Petition of the*

telco/cablecos are claiming in legislative debates that to the extent they have built high-speed fiber optic networks in the U.S. (based on the "video dialtone" plans they initially shelved), they should be allowed to have complete dominion over what content is seen over them.[26] They are pushing very hard[27] to ensure that Congress blesses the FCC's "deregulation" of all broadband access, so that the telco/cablecos can ensure that only their content (in particular, their television shows and movies) is available at the high speeds that these networks will allow. More broadly, this enormous lobbying energy now being devoted to ensuring the deregulation of broadband access and the removal of any obligation not to discriminate against applications and devices is in turn part of a global attempt on the part of broadband providers to turn their networks into something much more like the what mobile phone carriers have—completely monetized services, with networks built to allow deep packet inspection and the possibility of blocking or degrading undesirable services.

The telco/cablecos can enable this discrimination by marking their content with priority tags that their routers can read, thus gating the flow of all other (untagged) bits. This is what the AT&T executive meant when he talked about a "private internet," and what Verizon means by the tagline "It's the Network" in its advertising.[28] The notion is that traffic that flows over the networks these companies control can be subject to "shaping" and prioritizing. Other sources of online bits (individuals as well as companies)

Verizon Telephone Companies for Declaratory Ruling or, Alternatively, for Interim Waiver with Regard to Broadband Services Provided Via Fiber to the Premises, Consumer Protection in the Broadband Era, CC Docket No. 02-33, CC Docket No. 01-337, CC Docket Nos. 95-20, 98-10, WC Docket No. 04-242, WC Docket No. 05-271, Report and Order and Notice of Proposed Rulemaking, rel. Sept. 23, 2005 [DSL Order] (classifying wireline broadband Internet access service (DSL) as an information service under Communications Act).

26. (Verizon is the farthest ahead, with its "FiOS" ("fiber optic service") network offering speeds of up to 30Mbps (download speed) in about 250 communities in the U.S–about 20% of the potential customers in Verizon's territory. Marguerite Reardon, *Verizon hits the gas on fiber campaign*, News.com, May 9, 2005. The 30Mbps service allows only 5Mbps upstream speed, and costs $199.95/month. http://www22.verizon.com/fiosforhome/channels/fios/root/package.asp. *See also* Karen Brown, *Verizon CEO Boosts Broadband Prospects*, Multichannel News, Jan. 9, 2006.

27. "In January 2004, the Bells, through [their trade association] USTelecom, began a reported $30-million-to-$40-million multiyear lobbying and media campaign. The simple but consistent message to the 535 lawmakers in Congress and the five FCC commissioners has been: 'Deregulate.'" Bara Vaida, *The Clash of the High-Tech Titans*, National Journal, Sept. 28, 2005. See also Kushnick, supra n. __. According to the Center for Responsive Politics, the Baby Bells have given more than $44 million since 1999 to federal candidates and parties (almost 60 percent to Republicans). New Jersey Record, *Untangling Telecom,* Aug. 7, 2005.

28. E.g., http://estore-origin.vzwshop.com/migo/.

will not get priority for their communications unless they pay the relevant telephone company for this value-added service.[29] The prioritized communications are being called a "private internet" by the telephone and cable companies.

Many non-Bell VoIP and video application providers also want to reach the telco/cableco subscribers, of course, and there is a tussle now over whether the telco/cablecos can either insist that these other application providers pay the providers for the privilege of being accessed by end-users or subtly discriminate against non-telco/cableco applications by degrading the quality of service experienced by users when using these other applications. Because end users who themselves create content do not have a paid lobbyist in Washington, their own concerns about whether their creations will reach their peers have not yet been heard.[30]

The nation's desire for greater broadband penetration has fueled the telco/cablecos' efforts to have control over their networks. Whether because of the lack of competition for broadband provision or because of the peculiar physical characteristics of the wide-open U.S. landscape, the U.S. is falling behind in ensuring that its citizens have highspeed access to the internet. Studies by the Organization for Economic Cooperation and Development and the International Telecommunication Union have found that the U.S. is either 12th (OECD) or 16th (ITU) in the world in terms of the percentage of people having broadband access to the internet.[31] And broadband speeds in other countries are often four to five times (or even ten times) higher than they are in the U.S.[32] The telco/cablecos argue that

29. This is a broad introduction to a much more nuanced story. For example, Verizon's plans are different from AT&T's, and the plans of cable services may differ from the Bells. Verizon plans to have one laser within its glass strands provide IPTV, phone, and "internet" service to homes, while a separate laser within the same strand will provide video services from Verizon. Thus, if users watch IPTV or use the phone, their "internet" speeds will be lower, and some have estimated that Verizon's IPTV and phone services will take up 80% or more of the available bandwidth. Catherine Yang, *Is Verizon a Network Hog?*, BusinessWeek Online, Feb. 2, 2006. AT&T plans to use a single pipe to "pump" video, data, and "internet access service" to homes. Their video packets will be prioritized, and data and "internet access service" packets will not be. Comcast plans to have "internet access" share a single pipe with (now) analog video and, later, digital video services. But the overall "shaping" and "prioritizing" point is true for all of the large incumbent providers of broadband services.

30. *See* Lawrence Lessig, Testimony before the Senate Committee on Science, Commerce, and Transportation, Feb. 7, 2006, at 2 (citing user-created content available through Google Video, YouAre.tv, and youTube.com); *see also* Yochai Benkler, *From Consumers to Users: Shifting the Deep Structures of Regulation Towards Sustainable Commons and User Access*, 52 Fed. Comm. L. J. 561 (2000).

31. CQ Weekly, *supra* n.9; *see also* n.6, *supra*.

32. "Internet services in South Korea, Japan and Italy can transfer data at 8 to 10 megabits

without having control over who has access to their networks, they will have no incentives to maintain or improve those networks and thus improve America's standing in the race to hook up citizens to the high-speed internet—and the Bells and the cable companies together control the market for broadband access in America.[33] So the telco/cablecos implicitly and explicitly suggest that the quid pro quo for improving the American broadband story should be control over their networks and the ability to force competing services to compensate the network manager for "prioritized" carriage.[34]

Legislation discussed in late 2005 would have allowed providers of high-speed "broadband video services" to offer "enhanced quality of service to subscribers through the [network provider's] utilization of network and routing management or customized hardware."[35] "Broadband video services," were in turn defined as those services "delivered directly to subscribers over facilities the service provider owns and controls."[36] Now, this may sound perfectly rational: we built the high-speed network, we can use it to provide enhanced services for subscribers. And, indeed, the draft legislation goes on to provide that broadband video services "may not block or unreasonably impair or interfere with . . the use of any lawful content, application, or service provided over the Internet."[37]

But the telcos/cablecos do not believe that "the Internet" is what they will be selling. Instead, they will be offering a "private Internet" that

per second and are delivering sophisticated interactive games, online video and television programs to subscribers. In the United States, cable users can download information from the Internet at about 3 to 6 megabits per second; DSL users typically are limited to about 1.5 megabits per second." CQ Weekly, *supra* n.9; *see also* n.6, *supra*.

33. At the moment, broadband access is provided by just two categories of actors in the U.S.: More than 95% of U.S. broadband subscribers are served by cable and telephone companies. Cable has more subscribers than the Baby Bells do, with 21.1 million subscribers to the Bells' 14.7 million. CQ Weekly, *supra* n.9. As of the end of 2004, only 53% of Americans had a choice of broadband carriers available to them. FCC, "High-Speed Services for Internet Access," as of 12/31/04, available at http://www.fcc.gov/wcb/iatd/comp.html. The Bells have consolidated greatly: By the end of 2005, SBC (having purchased AT&T) dominated the western U.S. as the largest telecommunications company in the country, with about $110 billion in annual revenue, and Verizon (having purchased MCI) dominated the eastern portion of the country as the second largest telecom entity, with about $90 billion in annual revenue. USAToday, *supra* n.7.

34. Verso is already providing Skype blocking software to network providers. Ted Shelton, *Verso Appliance Lets Enterprises Block Skype*, InformationWeek, Sept. 21, 2005.

35. Draft Barton-Upton bill, Nov. 3, 2005, at Title I, Sec. 104(b)(3). [note: Sen. Jim DeMint (R-S.C.) introduced a bill Dec. 15 that would overhaul the FCC's role.]

36. Draft Barton-Upton bill, Nov. 3, 2005, at Title II, Sec. 2(a)(5).

37. Draft Barton-Upton bill, Nov. 3, 2005, at Title I, Sec. 104(b)(3)(A).

includes (at high speeds) the "broadband video" offerings of the network owner plus particular paying web sites ("information derived from the Internet,"[38] in the words of the bill). This private Internet will allow other, non-paying services to be reached by subscribers, but these communications will not be prioritized and will therefore arrive whenever they can. Non-prioritized "services" will not be blocked or interfered with—but they will be slower than prioritized services (services for which priority is paid for by the source).

The telephone and cable companies argue strenuously that the idea of a "private internet" is not a major change from the current state of affairs. They point out that online content providers already pay for value-added delivery services as part of the current architecture of the internet. And it is true that because the existing internet architecture does not guarantee that packets will necessarily arrive at their destinations at any particular rate, and because streaming video needs high speeds and some predictability, many sites work with intermediaries such as Akamai. These intermediaries turn buy up strategic bandwidth from ISPs all over the world. As things work now, a site presenting streaming video (say, Fox News) sends its content to a cache. Akamai takes the content and distributes it to servers that are close to ISPs. From the user's perspective, all of this is invisible. He makes his request of Fox, and, unbeknownst to him, he gets (for example) text from Fox and streaming video from a different route (a closer route) coming from an Akamai cache. Akamai helps Fox create a better user experience. This all costs money. Akamai has to pay for servers and additional ISP connections, and Fox has to pay Akamai to provide these services.

The argument in favor of a legislatively-blessed "tiered internet" is that paying for good service is nothing new. Fox.com pays now to make sure that its users are happy. Similarly, if a telephone company begins to prioritize the video packets of its paying partners, in order to get this value-added service Fox will have to pay for it. The telephone and cable companies' point is that they should be allowed to charge for special services, that Fox and others pay for these kinds of services all the time, and that no one will be hurt by the mere offering of these services.

There are two solutions to end-user inability to use applications that require high-speed connections. When there is a slowdown, it is either because the user's local network is slow or because the source server is

38. Draft Barton-Upton bill, Nov. 3, 2005, at Title II, Sec. 2(a)(5)(B)(ii).

having network problems. In the first situation, broadband access providers (the telco/cablecos) can provide higher-speed access. In the second situation, the source needs to upgrade their network access or their servers, and this is where Akamai and its competitors are useful to sources of content. There seems to be ample bandwidth available at the network backbone level to continue making possible the speed-enhancement services that Akamai and its competitors are collectively selling. Akamai makes its business buying up access from ISPs (including, of course, the telco/cablecos' ISP services). So the solution to a "too-slow-internet" could be to merely provide higher speed broadband access generally, without prioritizing any particular bits (much less inspecting their payload). The telco/cablecos plan instead to solve the high-speed "problem" by controlling both aspects of the situation: (1) charging end-users for higher-speed download access (at high prices relative to the rest of the world, and without concomitant high-speed *upload* access), and (2) charging application providers for Akamai-like prioritization services that only the network manager will be in a position to furnish. These prioritization services will be made possible through the use of marking/signaling practices and router control within the telco/cableco networks.

We do not yet know what effect the telco/cablecos' efforts to create a "private internet" will have on the traditional internet. These companies may have a right to provide their own video services over their "own" wires (although there is a strong argument that the people of the United States paid for these wires and fibers), and they seem to be willing to promise not to "block or unreasonably impair or interfere with the use of any lawful content, application, or service provided over the Internet." Web companies and individuals have expressed deep concerns as to whether this promise can be trusted.[39] From their perspective, this is not just about who gets to collect rents for streaming video services. First, if a telco makes an exclusive deal with any high-speed application source, agreeing to prioritize its packets, then the rest may be second-best and may fail.[40] Second, new businesses and individuals with ideas for new online interactions may not be able to pay for any of these value-added services. Thus, the risks to as-yet-unborn technologies and interactions may be great. They may never be discovered because they will not be accessible at the high speeds their use requires.

39. Amazon, Google, others.

40. At a public meeting in Washington, D.C. on Feb. 8, 2006, the general counsel of BellSouth, Barrett Ross, stated that BellSouth would want to retain the latitude to make just this kind of exclusive deal with a source of content. [I was present and took notes.]

Because the current batch of broadband providers has tacitly agreed that because they "own their networks" charging for value-added services (in other words, charging sources of content for speed) is an appropriate business practice, "naked" broadband service will not be available in this country. Although cable and telephone companies are competing fiercely for residential attachments, they are not competing for the right to provide unfettered, un-monetized internet access. Nor are any of these players enthusiastic about allowing individuals and companies to upload materials at the same speeds that they can download.[41]

Given the deeply entrenched nature of the extraordinarily large Baby Bells and cable companies that exist in this country, there is little hope that real competition to these high-speed broadband providers in the market for unfettered internet access (both up and down) will emerge.[42] In the meantime, the old copper wires that were required to serve as common carriage platforms in the past, with their equal dial-up or DSL access to ISPs and thence to the internet, are being taken out of service.[43] End-users will have no choice but to sign up to whatever limitations the providers of fiber decide make sense.[44] Competitive ISPs who used dial-up or DSL

41. Large telephone company and cable company broadband access services uniformly throttle uploading speeds, and all plan to continue doing so. For example, AT&T claims a 20 Mbps download speed for its Lightspeed service, but will provide only 1 MBps for uploading; Verizon claims a 30 MBps download speed for the top bracket of FiOS, but will provide only 5 MBps for uploading; and Comcast claims a 6MBps download speed for its basic service but provides only 384K for uploading (Marguerite Reardon, *Ups and Downs of Consumer Broadband*, Aug. 1, 2005, News.com).

42. But there is a little hope. Data can be sent over power lines that bring electricity into houses ("broadband over power line," or BPL), and plans are proceeding in Texas to provide broadband access in this way. Steve Donohue, *Powerline Outfit's Talking Triple Play, Firm Backed by Google to Light Up in Texas*, Multichannel News, Jan. 2, 2006. Satellite broadband is very expensive, but continues to be discussed as an alternative. Satellite News, *Teles MD Has High Hopes for U.K. Satellite Broadband Offering*, Aug. 15, 2005. WiMax is a wireless networking standard that can transfer data over a distance of about thirty miles, but may not work well in crowded city standards—and may not be able to compete effectively with enormously popular ordinary wifi access. Dave Bailey, *Is WiMax On Course for Success?*, IT Week, Apr. 11, 2005. Community wireless mesh networks (with a single connection to the internet shared by multiple devices) are coming into rapid use. Wireless Review, *The 2006 Wireless Industry Technology Preview*, Nov. 1, 2005 (citing analyst report claiming that the market for wireless mesh infrastructure will be worth $974 million by 2009).

43. See Verizon FiOS TOS, Sec. 8.4: "Conversion from DSL Service to Verizon Fios Internet Service. If your local Verizon telephone company provisions transport service to your location utilizing fiber optic technologies, we may in our discretion terminate your DSL Service and no longer make DSL service available to your location. In cases of such termination, we will offer to you Verizon Fios Internet Service and we will disclose to you applicable rates and additional terms, if any, that may differ from the DSL Services provided under this Agreement."

44. The Verizon home Terms of Service already outlaw hosting servers,Verizon FiOS TOS,

connections provided by the telcos to sell services to their customers are going out of business. And the telcos/cablecos are fighting any government-owned or otherwise alternative access networks that might provide unfettered broadband connections to the internet at lower rates.[45]

The telco/cablecos' interests here align with those of several other incumbents who would welcome "private" internets as a lever to attain their own goals. With perfectly tracked communications—the same routers that know to speed a first-run movie along its way will also know who is watching that movie, and from what chair—law enforcement's surveillance challenge is lessened. We have learned in the U.S. that law enforcement has an insatiable appetite for data (even if it cannot construe the data once it receives it). Hollywood would also like to know who is watching what movie, and whether the right license fee has been paid. Even if users are actually not endangered by using the internet (and there is little empirical evidence either way), these incumbents are endangered by the internet's continued existence; distressed by change, they use fear to claim a need for incentives and control. A long list of fears of the internet, supported by constant negative mass media articles, provide justifications for these incumbents' desires and, in turn, for the notion that all access should be carefully watched and paid for.[46] All of these fears would be (from the telco/cableco/law enforcement/content perspective) addressed and assuaged by the chokepoints for access and use that would be created if the telco/cableco "romantic builder" rhetoric is blessed by Congress and their dominion over "their networks" is legalized..

The telco/cableco power to render unfettered high-speed internet access unavailable to sources of "content" is contingent on the present

sec. 3.6.5., and Verizon blocks ports that are used for incoming requests for web pages and services. The FiOS service includes a clause stating that if a subscriber abandons Verizon's local phone service, Verizon may in its discretion terminate the FiOS service. Verizon FiOS Terms of Service, sec. 8.3. And Verizon's Terms of Service do not guarantee internet access (sec. 15.2). It can be expected that other forms of discrimination against user-created content or content that has not paid for access to Verizon's subscribers will be put in place when the legal status of Verizon's service is clearer.

45. Wall Street Journal, *Phone Giants are Lobbying Hard to Block Towns' Wireless Plans as Cities Try to Build Networks, SBC and Other Companies Say It's Unfair Competition,* June 23, 2005. Washington Post, *Fast Internet Service for the People, Telecoms Fight Plans for Public Networks*, Dec. 2, 2004 at A01. Nov. 5, 2005 BITS bill would require registration of all broadband providers. Suggestions re dangers of mesh networks.

46. Viruses, DDOS, spam, fraud, NYT front page article re exploitation of children, Rabbi example, DOJ list of internet crimes, Dave Clarke, media claiming internet is full of mistakes, fear of inhuman workplace, antisocial impacts, unbalanced search engines, piracy.

tightly-controlled duopoly marketplace for high-speed broadband access.[47] But what Americans mean by the word "internet" is what the telco/cablecos would call the "public internet"–the network of user-created blogs, email transmissions, local news, community groups, and online work and publications that has caused millions of Americans to buy broadband DSL and cable access (not to mention second phone lines) over the last few years. Users are increasingly producing their own "content," and this trend will undoubtedly continue. Thus, individuals are "sources" for online value that may be affected by the prioritization and upload-throttling practices of broadband access providers. Because we have been moving at a crawl online in comparison with Asian countries, and because we have experienced only the services presently commonly available on the internet, we have no idea what other user-generated experiences might be possible with an unfettered high-speed connection.

The growing discomfort with the idea of a multi-tiered internet is not based only on concerns that prices will be kept artificially high through the absence of competition. It is about public access to the internet at the going speed—not the speed that the duopoly chooses to provide in its discretion—and for all purposes. The internet is not (yet) viewed by the public as a proprietary-content-delivery mechanism. The cable/telcos see all of their actions as entirely consistent with the "network neutrality" so earnestly sought by online companies. In a nutshell, the telcos/cablecos would be happy to keep basic "public" internet access at 2001 speeds, and they would likely allow use of these speeds without discriminating in any way. But their plan is that high-speed access—anything above the current DSL 2Mbps, which does not allow for viewing of video, much less uploading of video or use of other applications that are as yet unknown to us—will be "private," expensive, and tightly prioritized to favor content that has paid its way onto "their network."[48]

At the same time, however, there is no evidence that sites or applications have actually been blocked or degraded by network providers.[49] Fear alone is not a good enough reason to take on this battle; no environmental harm has occurred, as far as anyone can tell, and the self-governed internet is thriving. But we need to be ready. If the

47. Supra n.__.

48. FCC Chairman Martin agrees with this approach; 010606 Tech Daily.

49. At a public conference in Washington, D.C. on February 8, 2006, Vint Cerf (Google's Chief Internet Evangelist) suggested that rights to monitor degradation of internet access might be valuable, rather than moving immediately to regulate the network providers' access controls. [I was present and took notes.]

telco/cablecos break their promise not to interfere with the internet, we will need a new social theory to help us go to war.

II. CONSTRUCTING A NEW SOCIAL THEORY OF THE INTERNET

In Shamans, Software, and Spleens, James Boyle writes about an online group that is enthralled with complexity:

> [The group talks about] the delights of chaos theory, full of mystifying anecdotes about dripping taps and butterfly effects. The scientists interviewed show uncharacteristic enthusiasm for their discoveries. They talk of 'patterned randomness' and 'familiar haphazard arrangements.' Behind the oxymorons, one can sense the missionary zeal of a new paradigm, the excitement of reimagining everything from the performance of the stock market to the behavior of gas-turbine blades as a series of data-packets, clustered in some elegant fractal geometry.[50]

Boyle does not stay with this discussion, and his tone is somewhat snarky. But in fact a more fully-worked-out version of precisely these thoughts (which are ultimately about complex, self-entailed systems) will provide us with the beginnings of a social theory of the internet.

Protection of property and innovation are always viewed as competing goals or interests in contrast to one another, over and over again. By favoring one, we potentially injure another, even if the law does not step in to help us. It is always a zero sum, two-dimensional game that is a battle of unprincipled strength and one-off engagements. In this policy realm, telco/cablecos will win using their romantic builder figure and lobbying heft: property will win over innovation.

But these limited categories of property and innovation do not capture what happens (or what should happen) with respect to a complex network that makes possible collective creation and appropriation of value[51] and collective generation of order.[52] The internet is made up of many interacting agents (including innumerable non-state communities) whose

50. BOYLE, SHAMANS, SOFTWARE, AND SPLEENS 2.

51. Yochai Benkler, *Coase's Penguin*.

52. Susan P. Crawford, *Shortness of Vision*.

dynamic engagements produce elaborate and decentralized order and value.[53] We need a theory that focuses on *why* this system must be accessible, not on how access itself must be treated.

A. *Responses to the Ownership Claim*

Both the telcos and the cable companies often begin any speech about their ownership of "their network" with a claim as to how much they have spent building it. Comcast claims to have spent $100 billion, and will say "We took a flyer on it."[54] Verizon claims to have invested $15 billion in building its FiOS service.[55] AT&T (formerly SBC) claims to have spent $5 to $6 billion on its Project Lightspeed fiber-optic network.[56] All three companies have said publicly that in order to recoup this investment they will need to be able to monetize their networks.[57] "We built it, and so we

53. Generally, a complex system is understood as a set of interacting elements in which the interactions are nonlinear. A complex adaptive system (or CAS) is a complex system that has the capacity to modify its own state (through, e.g., evolutionary change). In CAS, patterns at higher levels emerge from local processes and selection operating at lower levels. Complexity as a field is associated with the Santa Fe Institute. See Ted Fuller & Paul Moran, Small Firms as Complex Adaptive Systems: A Review <http://www sbaer.uca.edu/Research/1999/ICSB/99ics052.htm>. The study of CAS is focused on how complicated structures and patterns of interaction can arise from random actions. The essential elements of any CAS are: different and diverse parts (sustained diversity and individuality of components); localized interactions among those components; and an autonomous process that selects from among those components, based on the results of local interactions, a subset for replication or enhancement. Simon A. Levin, Ecosystems and the Biosphere as Complex Adaptive Systems, 1 Ecosystems 431, 431-436 (1998).

54. Joe Waz, Comcast, at CDT roundtable, Jan. 25, 2006. [I was present and took notes.]

55. Link Hoewing, Verizon, at CDT roundtable, Jan. 25, 2006. [I was present and took notes.]

56. *AT&T Rolls Out Lodi Plan*, TMC.net, Dec. 31, 2005.

57. The leading non-corporate voices in support of this claim are well-respected and extremely able. They include Adam Theirer of the Progress and Freedom Foundation, who has often said that vertical integration of network pipes with higher layers of the protocol stack will both lead to more robust competition for the provision of broadband access and ensure that consumers have a wide array of service choices (e.g., Adam Theirer, *Are Dumb Pipes Smart Public Policy? Vertical Integration, Net Neutrality, and the Network Layers Model*, 3 J. Telecomm. & High Tech. L. 275 (2005)), Chris Yoo, who has noted that network managers' ability to manage congestion will bring great economic benefits to consumers who are not themselves high-bandwidth users (see, e.g., Christopher Yoo, *Network Neutrality and the Economics of Congestion*, 94 Geo. L. J. (2006) ("allowing unfettered access to content, applications, and devices may actually harm consumers"); James Speta, *Handicapping the Race for the Last Mile?: A Critique of Open Access*, 17 Yale J. on Reg. 39, 76-88 (2000) (suggesting open access rules may be harmful; consumer demand for broadband access platform will force providers to make available open networks); and Phil Weiser, *Paradigm Changes in Telecommunications Regulation*, 71 U. Colo. L. Rev. 819, 832-37 (2000) (suggesting limited regulation). The economic assumptions of some of the opponents of network neutrality have been sharply questioned by Barbara van Schewick in *Towards an Economic Framework for Network Neutrality Regulation* (September 20, 2005), available at

own it, and we won't block access to the internet," the telco/cablecos say. "We built it," means "We built high-speed access." "We own it," means "We own our high-speed access fiber networks." "We won't block access to the internet," means "This high-speed network will let you see information derived from the Internet on a prioritized basis from partners who have paid us. It isn't purporting to carry 'the internet' on an equal basis with our partners' packets, and so we aren't blocking access to 'the internet.'" AT&T, in particular, will say that it is not possible to assume the existence of broadband access service in this country without assuring that the network builder will be paid back for it, and the "private internet" approach is essential to providing this payment.

There are at least two responses to the investment/ownership claim. The first is factual, and the second relies on assessing the internet as a complex system.

First, it may be that we, the people of America, paid for whatever high-speed broadband access to the internet exists in this country.[58] Indeed, we may have paid for it several times over, given the complexities of cross-subsidization and impossible-to-decipher telephone bills. The telephone companies' video dialtone plans may very well have been paid for through state subsidies of various kinds. This issue requires further factual exploration that is beyond the scope of this Article.

Second, the telephone and cable companies' claim is not merely that they own their networks, but also that that ownership dictates that they participate in whatever profits flow from use of their networks at high speeds.[59] But the value of the internet does not stem primarily from the

http://ssrn.com/abstract=812991 (arguing that potential for discriminatory activities by network providers is greater than commonly assumed). My focus here is on the non-economic, social, and environmental aspects of internet access that are not captured by the current debate over property rights and the facilitation of competition.

58. Kushnick, supra n. ___. *See* Dan Mitchell, *A Rant. All 406 Pages of It*, New York Times, Feb. 11, 2006 (reviewing Kushnick book).

59. In the 1890 article that launched privacy law in the U.S., Samuel D. Warren and Louis D. Brandeis said: "The possibility of future profits is not a right of property which the law ordinarily recognizes." (in The Right To Privacy, 4 Harv. L. Rev. 193 (1890)). These authors were trying to persuade their readers of the existence of a general right in individuals to be let alone. They didn't think this right to be let alone was a property right, because (in part) they didn't believe that the concept of property was broad enough to cover privacy. For example, if true but private facts were published about a man, and that publication made his life difficult (or ruined him), Warren and Brandeis felt that property law wouldn't necessarily protect him -- because "the possibility of future profits is not a right of property which the law ordinarily

existence of these incumbent access valves.

Talking about cyberspace is difficult, because we are fundamentally ill-equipped to understand it. Because the internet is made up of computers, people often forget that it is a non-mechanical social world, full of patterns that have arisen from decentralized local behaviors. It is a constantly shifting kaleidoscope of energy and attention. Like all complex adaptive systems, the internet is changing and adapting, causing itself to find its own stable organizational patterns that will themselves change in time.

The internet—by which I mean the layers above the transport, or access, layer[60]—is the "transcendent" medium described by Judge Dalzell in the CDA litigation,[61] characterized by low barriers to entry and parity among speakers. It is not like anything we have seen before; it is not like broadcast or a newspaper or a telephone network

The telcos/cablecos firmly want to put the internet back into a definitional box they can deal with, either as a circuit-switched telephone network or (more recently) as a proprietary cable network.[62] Their

recognizes." We now live in an era in which possessors of things they believe to be their "property" fervently believe that law protects their possibility of future profits. One example: the continuing kerfuffle over Google Book Search, in which publishers are horrified that someone else may someday make money from the books the publishers sold in the past. They fervently believe that they should get a cut of all possible future revenue streams that others create based on these books, and that courts and judges should act immediately to enjoin any activities that might not fit with this model. The ongoing fight over tiered internet access analyzed in this Article is very similar—the broadband providers are horrified that someone else may someday make money from applications using these networks. The network builders fervently believe that they should get a cut of the revenue streams that others will create using these high-speed networks, and that the legislature should act immediately to bless their vision of the future. We don't (usually) protect existing business models with statutes or caselaw. Susan P. Crawford, *The Possibility of Future Profits*, Jan. 28, 2006 blog post; Susan P. Crawford, *The Biology of the Broadcast Flag* (discussing content industry efforts to use FCC rules to shield their existing business model from competition).

60. See Richard S. Whitt, Codifying the Network Layers Model: MCI's Proposal for New Federal Legislation Reforming U.S. Communications Law, (March 2004), available at http://global.mci.com/about/publicpolicy/presentations/layersmodelfederallegislation.pdf; Kevin Werbach, A Layered Model for Internet Policy, 1 J. Telecomm. & High Tech. L. 37, 45 (2002).

61. ACLU v. Reno, 929 F. Supp. 824, 877 (E.D. Pa. 1996) (Dalzell, J.): "Four related characteristics of Internet communication have a transcendent importance to our shared holding that the CDA is unconstitutional on its face.... First, the Internet presents very low barriers to entry. Second, these barriers to entry are identical for both speakers and listeners. Third, as a result of these low barriers, astoundingly diverse content is available on the Internet. Fourth, the Internet provides significant access to all who wish to speak in the medium, and even creates a relative parity among speakers."

62. Verizon's CEO, Ivan Seidenberg, recently made a statement that revealed that he

deliberate conflation of "network" and "access" is an attempt to address the central tension of all networks that is particularly, exponentially true for the internet: the value of a network is not solely dependent on the characteristics of the valve through which access to the network is obtained. In effect, the telco/cablecos are attempting to recontextualize information, to attach it again to particular pipes, when the internet has taught us that the medium and the message are separate. Their "ownership" claim is fatally weak on many levels.

B. Responses to the Romantic Builder

Just as Boyle found that intellectual property advocates were using the figure of the "romantic author" to move their expansionist arguments forward, the telephone companies are beginning to use the figure of the "romantic builder" (who needs incentives to continue to build this resource) and are attempting to shape communications law to carry out their vision. But the "romantic builder" is an even weaker figure than Boyle found the "romantic author" to be, because he does no real analytical work for his backers.

In the broadband access debate, the rhetoric of the builder is designed to support a claim to own everything online, or at least everything that moves at a high speed. In the case of intellectual property, the rhetorical romantic author at least helped to underscore the notion that there was a distinction between idea and expression, and that only the expression (the romantic material of authorship) was controlled by the "owner." (This distinction quickly falls apart when any close case is considered, but it did help the owners/authors to sound more principled.) Unlike the romantic author figure, the romantic builder does not assist in any line-drawing between owned and unowned. He owns everything. And unlike the romantic author, the builder is not "creating" anything new. He is simply building, and his romantic appeal is thus far less than that of the author in the freezing garret, writing in hopes of being discovered.

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believes the internet is in fact a circuit-switched network. *See* Roger Cheng, *Verizon CEO: Fiber Network Needed To Unlock Opportunities*, Wall St. Journal, Feb. 9, 2006 ("Currently, if Google wants to increase the speed by which it connects with its customers, it buys more facilities. But that solution won't work as more people with broadband connections "camp" on its site and clog up traffic, Seidenberg said. Verizon will ultimately have to upgrade the backbone network, which it believes gives the company the right to charge those using that network.") The idea of people "camping" on a site makes absolutely no sense in a packet-switched network.

Nonetheless, the presence of the romantic builder is unquestionably felt on Capitol Hill, as pending legislation makes clear. His presence provides a sharp contrast to the 1994 vision of the Clinton-Gore administration, which promoted access to information as a top priority, suggesting that "governments should foster market and regulatory climates conducive to the broadest possible access to and distribution of information."[63]

The problem of seizing on property analogies when dealing with bits—the "romantic builder" approach—is a common one these days. Courts and legislators are apt to take doctrinal shortcuts when the analogies they are presented with seem persuasive. Courts and legislators are persuaded by mental pictures of digital gates that have been erected around bits, and are quite capable of seeing these stockades as the equivalent of a white picket fence protecting the family home.[64]

These borrowings are destructive, because they fail to take into account the differences between bits and atoms. Bits amplify and combine in interesting and complex ways. You cannot run an algorithm against a hill. You cannot filter information from a jewel, and use it to create another, higher level of meta-jewel, while leaving the original jewel intact. Bits, unlike matter and energy, are not conserved; the creation of one bit does not entail the destruction of another. Second, complex interrelationships among bits lead to the creation of metainformation (information about information) that has value of its own. Humans seek metainformational depth more than anything else. We constantly filter and package and clump, looking for patterns, looking for quality information to guide ourselves, noticing asymmetries that cause us to learn. Our own consciousness is built on metainformational depth, with most of the filtering and processing proceeding without our awareness. We use metainformational depth to create original information, to understand

63. The Global Information Infrastructure: Agenda for Cooperation, available at http://www.eff.org/Infrastructure/Govt_docs/gii_co-op_iitf.agenda. A nascent GII [Global Information Infrastructure] already exists. What we seek is a superior GII, one that has higher capacity, is fully interactive, faster, and more versatile. One that is less expensive to use than existing systems, and more accessible to all the people of the world. But our goal is not merely technological advancement – more bandwidth, faster switching, more powerful processing capability, and greater compression and storage capacity. We view technology not as an end in itself but as the means through which the GII can realize its potential to improve the well-being of all people on this planet." Al Gore, World Telecommunication Development Conference, Buenos Aires, Argentina, March 1994.

64. E.g., *Universal Studios, et al. v. Corley*, 273 F.3d 429 (2d Cir. 2001) (analogizing CSS to locks used by homeowners, and suggesting that fair use can be relegated to "horse and buggy" techniques such as pointing a camera at a monitor as it displays a DVD).

context, to develop our critical faculties, and to continually produce synthesized, integrated information of a higher quality. Bits are not conserved; atoms are; bits amplify and combine in interesting, complex ways, both purposeful and accidental; atoms do not. (At the edges, of course, atoms melt into bits; but most of us live in worlds where the difference between atoms and bits is clear.)

C. So Who Does Own the Internet?

The cable/telcos have many arguments on their side. They can claim that market efficiencies will only be obtained if they are permitted to reap the benefits of their networks. They can claim that family values will be better protected (in addition to law enforcement and Hollywood values) if the network is controlled. Most importantly, however, they can simply claim the precedence of their property rights: "I should control the network because it is mine."

Although the value of the internet stems from everyone's contributions, the internet is owned by no one. Yochai Benkler has written eloquently about how the networked information economy is enhancing the autonomy of individuals at the same time that it is allowing them to do more in loosely-organized groups than might be possible using traditional markets or firms.[65] David Bollier has argued that "there has never been a commons as big, robust and socially creative as the Internet,"[66] and Lawrence Lessig has written frequently about the importance of unowned and uncontrolled yet valuable commons resources online.[67] Even though the wires and servers that make up the internet's infrastructure are privately owned, the whole of the internet cannot be understood in traditional property terms.

65. YOCHAI BENKLER, THE WEALTH OF NETWORKS (2005); Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access*, 52 Federal Communications Law Journal 561-579 (2000).

66. David Bollier, *Reclaiming the Commons*, Boston Review (Summer 2002). DAVID BOLLIER, PUBLIC ASSETS, PRIVATE PROFITS: RECLAIMING THE AMERICAN COMMONS IN AN AGE OF MARKET ENCLOSURE (2001).

67. Lawrence Lessig, *The Future of Ideas: The Fate of the Commons in a Connected World* 19-21 (2001). *See*, e.g., *Internet Commons Congress 2004*, held in Silver Spring, Maryland in March 2004 (described as "An international open assembly of the public, gathered to address a broad range of issues that threaten the Internet Commons and basic rights to own fully-functional computers, to use information rendered to the Commons for the public benefit, and to develop vibrant new means for working with information."). *See generally* Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge Univ. Press, 1990).

The internet, the whole set of communications, interactions, servers, wires, and backbones, is mutually created, governed, organized, and shared by almost a billion people worldwide. The human connection made possible by the internet—and not just the monetary rewards the internet makes possible—makes access to it imperative. To connect with others, to find groups and affiliations, we are publishing 70,000 new blogs daily, and updating 700,000 existing blogs.[68] It is governed (imperfectly, to be sure) by shared norms and expectations that further catalyze its continued development. It is us.

In sum, the telco/cableco claim is that they own "the network," because they built it. The response to this claim is that "the internet," as it is understood by the public, is owned by no one. Indeed, the internet arguably owns itself. Its value is being captured daily by the "owners" of the internet—everyone. Over the last ten years, a wholly decentralized and global investment of time, money, and gifts created the internet, without any need for specific incentives provided by government (after the initial U.S. development projects had run their course).

The new social theory I am about to suggest places the internet in the grand tradition of commons resources, with a twist: the internet is not only self-owned, but it also has a liberty of its own that is highly beneficial to mankind and requires protection. The role of government should be to prohibit any form of ownership (or other action) that unreasonably interferes with the openness of and access to and responsible use of this commons by the collective group.

D. The Theory

If the Bells and the cablecos breach their promise not to block or unreasonably degrade the "internet," we will need to act. (Indeed, many scholars and commentators are suggesting that we need to act preventively to avoid any possibility of a blocked network.) But what is the set of principles under which this action will be taken?

If we accept that the network is a self-owned and self-caused resource, we can frame the relevant questions rather differently than they have been

68. Technorati data.

framed in the past. We can start from the premise that there is a strong public interest (evidenced by Bush Administration as well as Clinton Administration comments) in having high-speed, unfettered internet access be available as widely as possible. We can accept that there is a general public interest in protecting property and compensating property owners. But we can regard access to the self-owned/self-caused commons of the internet as a more important public interest than protecting the private property of the telecom companies.

Why is access to this commons (active, not just passive access, and access at the highest speed that is commercially available) more important than the property interests of the owners of (metaphorically speaking) beachfront property? Such access likely will directly benefit more people than will benefit from perfect protection of the telco/cablecos' property, but mere numbers may not be persuasive. The better answers are found in the identity of the internet itself, and in the unpredictable dynamics of social change.

Because the internet reflects who uses and adds to it, it is ultimately self-reflective. It is what we think. Our bodies may be in terrestrial chairs in identifiable zip codes, but our minds are increasingly online—in our blogs, pictures, wikipedia contributions, group creations, and high-speed interactions yet to come. The internet has a kind of wisdom that our participation makes possible. It reacts to its world (our effects on it) and changes in response. It is us.

Because the internet is us, its ability to continue to be self-reflective is dependent on the participation of the people who go online. And having degraded access to it is like having diminished access to our own memories and thoughts. Thus, even without recognizing any liberty interest or liveliness in the internet itself, if some subset of the people (say, the people in America) who go online begin to feel that they have lost the participation in these thoughts that they used to have, or that they would like to have better access to these collective thoughts, then they will rise up. They may need encouragement or reminders, but they should and will rise up. If the internet begins to disappear because it loses the bandwidth competition to television (IP television, or proprietary video of the telco/cablecos), those who remember the internet will need to switch off their virtual television sets and reclaim their collective minds.

If such access is somehow degraded or blocked, the telco/cablecos'

interest will need to yield to that of the nation.[69] The key question becomes, then, how the law should intervene to require the sale of this access on particular terms to the public.

III. WHAT IF WE TOOK IT?

This new social theory of the network is not primarily about individual empowerment. Rather, it is about the importance of the close relationship between "us" (as a collective) and the network. If the cable/telco group blocks or degrades access to our network, we will need to rise up. As a collective, we can boycott the proffered cable/telco services or attempt to build our own networks.[70] But if these collective actions are impossible or ineffective, we will need the help of government to overcome ownership claims that unduly interfere with the openness of and access to this resource. Regard for the public welfare, the "highest law" of the land, may instruct that the property claims of the network providers be sacrificed for the public good.[71]

A. Public Trust Background

The public trust doctrine, when asserted in connection with beachfront access, holds that that ownership over land reached by tidal waters is vested in the state in trust for the people.[72] (The physical boundaries to which the public trust doctrine applies vary from state to state.) The idea is that the public has a right to use the water for navigation, fishing, and other

69. This section is an attempt to answer a recent question posed by Lawrence Lessig to Bret Frischmann. Because choosing open access, or network neutrality, will impose costs on the polity or the market, Lessig suggested that we needed a "clearer sense of the parameters for deciding when open access is a solution." Lawrence Lessig, Re-Marking the Progress in Frischmann, 89 Minn. L. Rev. 1031, 1039 (2005). My response is that the costs and benefits here are unknown and unknowable. We need to recognize that the internet as a complex mirror of society itself is, like the ocean, a resource that is essential to human flourishing. We need to privilege access over property rights as a matter of public policy, not because the costs of not doing so can be shown as empirically higher than the benefits we will necessarily reap. My view is that we should leave the internet-as-ocean alone, because there will always be private areas online that are, like whales to fish, unequal. But we should ensure that high-speed access—transport—to the internet is available and unfettered, if and when we find that such access is being interfered with by the telco-cablecos.

70. Mesh networks.

71. Joseph William Singer, *The Legal Rights Debate in Analytical Jurisprudence from Bentham to Hohfeld*, 1982 Wis. L. Rev. 975, 1028, citing E. Weeks, *The Doctrine of Damnum Absque Injuria considered in Relation to the Law of Torts* 17-18 (1879).

72. Jennifer Sullivan, *Laying Out an "Unwelcome Mat" to Public Beach Access*, 18 J. Land Use & Envtl. L. 331, 334 (2003).

recreational activities.[73] This right also includes the right to access the beach itself, because without such access use rights are meaningless.[74] This ancient principle stems from the Institutes of Justinian and was restated by English scholars of the 13th Century: "By natural law these are common to all: running water, air, the sea, and the shores of the sea, as though accessories of the sea. No one therefore is forbidden access to the seashore, provided he keeps away from houses and buildings [built there]."[75]

The earliest expressions of the public trust doctrine in America concerned access to oyster beds that were being privatized by well-off oyster planters. The Supreme Court of New Jersey found that "The sovereign power itself . . . cannot, consistently with the principles of the law of nature and the constitution of a well-ordered society, make a direct and absolute grant of the waters of the state, divesting all the citizens of their common right. It would be a grievance which never could be long borne by a free people."[76] More than twenty years later, the Supreme Court affirmed the doctrine in Martin v. Waddell,[77] and in 1892 held that the doctrine precluded the Illinois legislature from granting ownership in the then-entire waterfront of Chicago to the Illinois Central Railroad.[78]

Although the public trust doctrine fell into disuse in the first half of the 20th century, the 1970 publication of Joseph Sax's seminal article, "The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention,"[79] renewed interest in the idea of the public trust. Earth Day also began in that same year, sparking widespread concern over the protection of the environment. Then, in 1983, the Mono Lake decision by the California Supreme Court resoundingly supported the notion of a public trust. In that case, the court extended the state's public trust ownership and dominion to include preventing the diversion of water from *non-navigable*

73. Id. In 1821 the New Jersey Supreme Court ruled that the doctrine ensured the public's right to use the tidelands "for the purposes of passing and repassing, navigation, fishing, fowling, sustenance and all other uses of the water and its products." Arnold v Mundy. 6 N.J.L. 1, 12 (1821).

74. Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 365 (N.J. 1984) ("the public must be given both [reasonable] access to and use of privately-owned dry sand areas as reasonably necessary.")

75. Id. at n. 62.

76. Arnold v. Mundy, 6 N. J. Law, 1 (1821).

77. 16 Pet. 367, 410 (1842).

78. Illinois Central Railroad v. Illinois,

79. cite

streams. The decision claimed that common interests in certain resources (like water) can take precedence over private uses, because those resources simply cannot be privately owned.[80] Since then, the public trust doctrine has gone in and out of fashion, used to support efforts to clean up the Hudson River (despite longstanding private polluting rights)[81] as well as to support lifting a ban on jet skis.[82]

In California, for example, individuals cannot own beachfront land below the mean high tide land—the area between mean high tide and mean low tide. The state owns the land below the mean high tide line under its "public trust,"[83] and the California Constitution provides that "No private entity owning land fronting on navigable waters may exclude the public right of way to such water."[84] New Jersey has famously increased beach access by the public.[85]

B. Public Trust and Internet Access

Participation in the internet (the true internet) is arguably one of those interests that are "so intrinsically important to every citizen that their free availability tends to make the society as one of citizens rather than of serfs."[86] The internet is very like the sea. Like the sea, it is unowned by anyone, and access to it is extremely important to our success as humans. The argument to network owners that degrade or block access may be that they are building wharves that interfere with our navigation of the internet. Wharves are not per se illegal, but wharves that interfere with navigation unduly may be.[87] Moreover, the state may not divest itself of the authority to protect public access to the sea,[88] or, arguably, the internet.

80. Audubon Society v. the Los Angeles Department of Water and Power.

81. Hudson-Raritan initiative.

82. Weeden v. San Juan County (Washington), 1998

83. Jessica A. Duncan, Coastal Justice: The Case for Public Access, 11 Hastings W.-N.W. J. Envtl. L. & Pol'y 55, 56 (2004).

84. Article X, Section 4.

85. Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 368-70 (N.J. 1984), cert. denied, 469 U.S. 821 (1984) (requiring open membership in beach club owned by quasi-public association in community where no municipal beach; reasonable access to the beach could be required in some circumstances across privately owned beachfront property).

86. Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 Mich. L. Rev. 471, 484 (1970).

87. State v. Cleveland and Pittsburgh Railway, 94 Ohio St. 61, 113 N.E. 677 (1916) (cited in Sax) (railroad may build wharf on submerged lands).

88. Illinois case. *Fordham note*

If the telco/cablecos companies actually block or impair access to the internet, that will be just like a private owner erecting "no trespassing signs" along a public beach. The government will need to intercede to assure unfettered public access.

If we acknowledge the network providers' property interests, but nonetheless determine that imposition of a public trust is necessary to assure access at appropriately high speeds to our internet, will this intercession constitute a taking?

C. Regulatory Takings

It has "long [been] recognized that land use regulation does not effect a taking if it 'substantially advances legitimate state interests.'"[89] But there must be a close connection between the stated interest and the condition exacted by any property regulation,[90] and the burden of the impact of the regulation and the benefits it creates must be "roughly proportionate" to each other.[91] Any limitations that prohibit all economically beneficial uses of land will arguably work a taking unless they are justified by background principles of nuisance law.[92]

Here, if the telco/cablecos constrain access to the internet in their attempts to compete with it, and some sort of federal-level public trust is

89. Nollan v. California Coastal Comm's, 483 U.S. 825, 828 (1987). As Justice Holmes wrote in Pennsylvania Coal v. Mahon, "while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking." 260 U.S. 393, 415 (1922). I have not discussed whether a requirement of internet access of a particular kind and at particular prices would constitute a per se physical taking under Loretto v. Teleprompter Manhattan CATV Corp, . 458 U.S. 419 (1982). It seems to me unlikely that such a physical showing could be made here, because we will be arguing about rate structures and types of services. *But see* Daniel F. Spulber & Christopher S. Yoo, Access to Networks: Economic and Constitutional Connections, 88 Cornell L. Rev. 885, 947-49, 960- 70 (2003) (arguing that 1996 Act interconnection requirement constitutes a physical taking).

90. Id.

91. Dolan v. City of Tigard.

92. Lucas v. South Carolina. The rule articulated in Lucas is that a regulation that deprives a property of all economically valuable uses will be a taking unless the regulatory limitation on the property use was inherent in common law background principles of nuisance or property. Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1015 (1992). See also Nollan v. California Coastal Comm'n, 483 U.S. 825, 834, (1987), citing Agins v. City of Tiburon, 477 U.S. 255, 260 (1980) (in the case of a facial challenge to a regulation, there will be a taking if a regulation either: (1) fails to substantially advance a legitimate state interest, or (2) denies an owner all economically viable use of his land).

imposed[93] the argument that no taking has occurred is strong. The three *Penn Central* factors[94] all militate against the existence of a taking. The telco/cablecos will still be able to exact economic rents from their "lands," because their private internets will be unaffected.[95] (No government would claim the power to keep one private network owner from using its own facilities to provide subscribers with its own video services.) Indeed, limiting the providers' ability to dampen access to the "public internet" might even be said to "secure an average reciprocity of advantage,"[96] because the network providers will themselves have better access to the public internet, and their employees' (and the nation's) quality of life will be improved by connection to this complex system that is a reflection of our collective mind.

As for the cable/telco "investment-backed expectations," such expectations, "though important, are not talismanic under Penn Central. Evaluation of the degree of interference with investment-backed expectations instead is one factor that points toward the answer to the question whether the application of a particular regulation to particular property 'goes too far.'"[97] Here, the cable/telcos could not have expected prior to the summer of 2005 (when Brand X was decided and the FCC released DSL providers from common carriage obligations) that they would be permitted to "own" their networks and discriminate against competing sources of content. Thus, all "expectations" must have been recently triggered and should be commensurately low.

Finally, there are legitimate federal interests in ensuring this access.

93. *See* Kleppe v. New Mexico, 426 U.S. 529 (1976) (regarding the Wild Free-Roaming Horses and Burros Act) (federal public trust authority may be superior to that of the states in some wildlife management situations)

94. Penn Central Transp. Co. v. New York City, 438 U.S. 104, 124 (1978). Those factors are: (1) the economic impact of the regulation on the claimant; (2) the extent to which the regulation has interfered with distinct investment-backed expectations; and (3) the character of the governmental action.

95. Indeed, very large reductions in property value caused by government regulations may not be takings where there is still some value left behind. See, e.g., Euclid v. Ambler Realty Co., 272 U.S. 365 (1926) (75% diminution in value caused by zoning law); Hadacheck v. Sebastian, 239 U.S. 394 (1915) (87.5% diminution in value). Simply making less money as a result of a regulation does not establish a taking. MacDonald, Sommer & Frates v. Yolo County, 477 U.S. 340, 353 n.9 (1986). And not being able to make the most profitable use of property does not make for a taking. Concrete Pipe & Products of California, Inc. v. Construction Laborers Pension Trust, 508 U.S. 602, 644-45 (1993).

96. Mahon.

97. Palazzolo v. Rhode Island, 533 U.S. 606, 634 (2001) (O'Connor, concurring) (citing Pennsylvania Coal v. Mahon, 260 U.S. at 415).

The close connection required by Supreme Court jurisprudence between the regulation and the condition will arguably exist, because the regulatory condition will be to allow access to all services at the same, unprioritized speed. And the benefits (human and economic) will be great, and arguably proportionate to the harm. If Donald Trump can be forced to provide pleasant subway stations near his enormous buildings, the telco/cablecos can be forced to ensure that their bits are not prioritized over those of the public internet.[98] The gains to the public will outweigh the losses of individual network owners.

On the other hand, there is a strong argument in favor of exercising eminent domain, and paying compensation, rather than regulating around a taking in this context. Takings per se are not unconstitutional; takings without compensation are.[99] The benefits of such a route are many. It is in fact difficult to say empirically whether the gains of a regulatory taking would exceed the private harms suffered by the network owners. It would be very difficult to write down in words what discriminations were unlawful by a particular network provider, given the providers' propensity to label everything they do "network management." (Network providers will always be able to claim that particular discriminations were simply matters of "network management.") Litigation over whether any rate-setting regulation was a taking would take years and would be enormously expensive, given the almost limitless resources of the telco/cablecos to fight for their franchises. It might be wise to simply declare that the federal government was acting to enforce structural separation of the telcos and cablecos. This step could then be accomplished through an actual compensated taking, forcing the network providers to cease providing prioritized content or do more than provide transport services that were open to interconnection. The expense would be great, but the arguments

98. The related "confiscatory rate" line of cases, begun with R.R. Comm'n Cases, 116 U.S. 307, 331 (1886), may also be relevant here. Spulber and Yoo argue that there is little difference between "confiscatory rate" and "regulatory takings" principles: "It is easy to conceptualize a restriction on the amount that one can charge for access to a piece of property as either a restriction on the property's use or as a 'public program adjusting the benefits and burdens of economic life to promote the common good.'" Spulber & Yoo, supra note ___, at 943-44. The courts will examine whether the ultimate result of requiring internet access at reasonable rates is "unfair." Fed. Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944) ("[T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.") It may be impossible to determine without years of litigation what rates would be fair for internet access.

99. See, e.g., First English Evangelical Lutheran Church v. County of Los Angeles, 482 U.S. 304, 314-15 (1987).

would be over.

There are analogies available in other fields. For example, in 1992 a FERC Order (No. 636, known generally as the Open Access Order) made pipeline unbundling a requirement, mandating that pipelines separate transportation from the services they offer. Order 636 meant that the transport pipelines could no longer engage in gas sales or sell any product as a bundled service. Thus, no advantages in terms of (among other things) the timing of gas transportation could be afforded by a pipeline to its affiliates. This set of actions has had generally beneficial effects on gas customers. It was expensive to achieve: FERC recognized that pipeline companies would incur costs as a result of complying with Order 636, and allowed them to charge customers for them.[100] The initial plan was to allow pipeline companies to charge exit fees and surcharges to recover 100 percent of their "prudently incurred" transition costs; later, FERC issued Order 636-A on August 3, 1992, which required pipeline companies to recover 10 percent of these transition costs through the rates they charged for gas transportation.[101] It is true that having the FCC work on such a "prudently incurred" cost-assessment regime will take a great deal of time and may be very expensive. But the cost will serve a higher public value.

Whatever the costs of such a transition, they will not necessarily include paying the cable/telcos under the Tucker Act[102] for all the lost profits they will not be able to squeeze from their networks in the future under this new regime. In the past, we have held that railroads can be forced to operate unprofitable lines or services (unless they are hopelessly losing money as a whole),[103] and internet access may become an

100. These costs included "realignment costs" for changing gas supply contracts, "stranded costs" for assets used to provide bundled products, costs incurred to purchase new equipment, and other costs. Energy Information Administration, *FERC Order 636: The Restructuring Rule (1992),* available at http://www.eia.doe.gov/oil_gas/natural_gas/analysis_publications/ngmajorleg/ferc636.html.

101. Id.

102. The Tucker Act, 28 U.S.C. § 1491, provides for automatic appropriation of money to pay just compensation for takings. Where there is a taking, damages are to be calculated based on the property's fair market value. Olson v. United States, 292 U.S. 246 (1934); City of New York v. Sage, 239 U.S. 57, 61 (1915) ("But what the owner is entitled to is the value of the property taken, and that means what it fairly may be believed that a purchaser in fair market conditions would have given for it in fact . . . ."). What exactly constitutes "fair value" will undoubtedly be litigated, but perhaps the FERC analogy will be persuasive.

103. The Supreme Court has held that a regulated railroad may be required to operate a certain service at a loss or for less than the actual cost. Brooks-Scanlon Co. v. Railroad Comm'n of Louisiana, 251 U.S. 396 (1920) (Louisiana attempted to require a lumber company to operate a rural railroad route as a loss; taking found). If regulating a business causes it to operate at a loss (as a whole), it must be permitted to go out of business, and will paid its salvage value. But if it

unprofitable service that the broadband providers are forced to provide. These providers will not be permitted to abandon services that are vital to the public, merely in order to optimize their profits.

Enforcing separation will bring us back to the regime that made the internet such a powerful force in American life. American insistence on flat-rate dial-up and open-access DSL routes to the internet made the explosive growth of the net possible. In the meantime, the carriers have spent money on fiber broadband networks, and we should recognize their desire to run their own packet-switched private services. These private services are not "the internet," however, and must not be advertised as "the internet." When it comes to "the internet," broadband providers may need to be required not to prioritize any packets, and not to make special arrangements with any subset of internet resources. The fact that the providers have spent money should not stop us from adopting an intelligent—and environmentally sound—public policy protecting access if that access is degraded.

IV. THE FUTURE

As a polity, we now have the opportunity to decide what is important to us. The network providers are moving to erase traditional concerns over the monopolization of access that have shaped communications law since the days of the railroads. The entire communications law infrastructure thus appears to be up for grabs. We have the opportunity to shape a new approach to communications law rather than, as in the intellectual property context, tinkering around the edges of old laws that incumbents fiercely protect. Unlike the intellectual property story, communications law has been occupied for years with providing access to public networks at reasonable prices. What is new now is that the telco incumbents want to change the game (the cable people have essentially always had control over their networks), and other incumbents have strong interests in the kinds of control that deep packet inspection will allow.

A view of networks centered on the ideal of the romantic builder will

remains in business, such an entity may be required to continue service in a particular area even though this service creates a loss. Baltimore & Ohio Railroad Co. v. United States, 345 U.S. 146, 148 (1953) ("[s]o long as a railroad is not caused by such [rate] regulations to lose money on its over-all business, it is hard to think that it could successfully charge that its property was being taken for public use 'without just compensation.") Here, of course, the remaining business lines of the network providers (all of their much-hyped content) may be profitable.

tend to disproportionately favor the contributions of the network provider—their streaming, big-media productions (rather than the file transfers and local storage embraced by end users), and their preference for downloading over uploading. This will mean that the astonishing resources of the collective mind, and its overwhelming efficiency in using many eyes and hands to create value, will eventually, inevitably, diminish rather than grow. The result may be a reduced flow of complex, interesting new structures for the collective mind to encounter and cause to evolve online.

Right now, the public discourse is entirely about the need to incent the heroic builder of the networks—the people rolling out fiber. This is a powerful image, and governments (including our government) are going along. The distributional, environmental, and innovation-related effects of this trend will be profound. The monopolistic aspect of the problem is less apparent, although comments have been made about the need to ensure competition for broadband access. There is of course very little empirical evidence either way on the monopoly/public goods issue.

We have time to consider the question of network control. Monetization of internet access—prioritization of particular packets—is not inevitable. To be successful, such monetization depends on the continued health of an ecology that the packet inspection might itself destroy. At the very least, there is no necessary link between the commodification of particular packets and the increased health, value, and diversity of the internet. It is possible to imagine an alternative future for the internet, a future that embraces the approach taken in Japan: blazing high speeds, no prioritization/discrimination, and the emergence of new applications taking advantage of the open-ocean internet.

More scholars should be writing about the intersection of communications law with the social phenomenon that is the internet. The copyright concerns that scholars have been focused on for the last ten and more years are amplified in the internet context, and there are similarities to be explored that copyright scholars may find intriguing. We are moving from the conceit of owning information (the problem of intellectual property, the problem taken on by James Boyle in his 1996 book) to the conceit of owning the public internet itself—or, in other words, the conceit of owning complex, quasi-organic flows of information.

In 1996, Boyle noted that developed nations were insisting on the adoption of strong intellectual property rights by developing nations. The argument made then (and still made now, ten years later), was that

becoming part of the club of countries with maximalist intellectual property standards would assist these nations. Companies would invest in developing nations, so the reasoning went, only if they could be confident that their intellectual property rights would be protected there. The idea was that the developing nation would be brought into the magic circle of riches and respect if it joined the intellectual property regime. Very similar arguments are made in the internet context by the incumbents who are interested in controlling the internet. They claim that the internet will be a dangerous backwater until it is secured and commodified.

Similarly, it is likely that sources of user-created online content, like the sources of indigenous cultural content that were of concern to Boyle, will not be rewarded by the commodifying network providers. These user-created experiences, whose number is growing at an exponential rate, are systematically undervalued by the network owners, even though they now provide much of the value of the network.[104] A telco lobbyist takes two logical steps in undervaluing indigenous cultural content: first, conflate the societal realm of the internet (complete with its private areas) with the access provided to that realm (privately owned), and call them collectively "the network." Then bring in the romantic, heroic builder, rolling fiber across the land. If and when the network providers degrade access to or discriminate against the ability to create user-generated content, they will do this by managing "their" network. They will say, "For network management purposes, we can't allow you to use X port or Y peer-to-peer file-trading application. Both of these activities are using up too much bandwidth. And we will be prioritizing our bits. We're sure you'll understand."

Although "fair use" in the strictly statutory copyright sense is not a concern for communications law (at least, that is what the FCC said in the broadcast flag context), the approach we adopt to networks will have dramatic effects on what, as a practical matter, people will be able to do with their minds and their thoughts. The digitization of all human endeavors gives to the network owner (if such an entity exists) the power to control what new, transformative creations we collectively imagine.

We are at risk of being in thrall to an idea of romantic network

104. *See* Lawrence Lessig, Re-Marking the Progress in Frischmann, 89 Minn. L. Rev. 1031, 1039 (2005) ("[W]e cannot rely on the market alone to determine access to [the internet]. The market will undervalue the social value of such a network.)

ownership that should be questioned as dogma.

CONCLUSION

We live in an age of internet essentiality. (We also are beginning to notice complex networks generally and wonder how we relate to them; this is a fruitful area for further scholarly work.)[105] We have four options when it comes to the internet: we can relax into the property talk being conveyed by the carriers, and believe that the granting of legislative incentives to invest in their networks will lead to overall benefits for mankind; we can worry about inadequate competition for broadband access, and attempt to shore up the small non-telco/cableco players that now exist; we can attempt to draft a network neutrality rule that calls upon carriers to treat "similar" services similarly, and then founder on the rocky shoals of trying to determine which flow of amplifying bits is "similar" to another (imagine the deep packet inspection that will be required to make that assessment possible); or we can recognize that the "internet" is not the same as "access to the internet." We can decide as a collective that the internet's value to people will be better served by choosing to enforce unfettered access to this resource if such access is somehow degraded.

Taking any of the first three routes—worrying only about security from harm, and supporting property rights, or worrying only about freedom and autonomy, and supporting whatever it takes to create competition, or worrying only about how to draft the perfect network neutrality language—will be too simple to address the complexity and importance of the internet to our lives. The internet, like the sea, is nonmechanical, organic, and central to our future. Our relationship to it goes far beyond individual empowerment or the mere facilitation of economic innovation. It is a mirror of us, of our collective minds, and it will only continue to grow in influence and importance as the years go by—particularly if we do not turn it into a proprietary, heavily-secured television delivery mechanism.

It is us. We must protect it, at all costs.

105. See, e.g., ALBERT-LASZLO BARABASI, LINKED, THE NEW SCIENCE OF NETWORKS: HOW EVERYTHING IS CONNECTED TO EVERYTHING ELSE AND WHAT IT MEANS FOR SCIENCE, BUSINESS, AND EVERYDAY LIFE (2002); Thomas Smith, *The Web of Law* (Spring 2005). San Diego Legal Studies Research Paper No. 06-11 http://ssrn.com/abstract=642863; Susan P. Crawford, *Shortness of Vision: Regulatory Ambition in the Digital Age,* 74 Fordham L. Rev. 695 (2005) (symposium) (arguing that where the complexity of a system (government) is insufficient to cope with the complexity of its environment (the internet), the system will be unsuccessful).