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Primum Non Nocere or Primum Processi?
A Property Rights Approach**

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Abstract

High-speed or “broadband” Internet access currently is provided, at the local level, chiefly by cable television and telephone companies, often in competition with each other. Wireless and satellite providers have a small but growing share of this business. An influential coalition of economic interests and academics have proposed that local broadband Internet access providers be prohibited from restricting access to their systems by upstream suppliers of Internet services. A recent term for this proposal is “net neutrality.”

We examine the potential costs and benefits of such a policy from an economic welfare perspective. Using a property rights approach, we ask whether transactions costs in the market for access rights are likely to be significant, and if so, whether owners of physical local broadband platforms are likely to be more or less efficient holders of access rights than Internet content providers. We conclude that transactions costs are likely to be lower if access rights are assigned initially to platform owners rather than content providers. In addition, platform hardware owners are likely to be more efficient holders of these rights because they can internalize demand-side interactions among content products. Further, failure to permit platform owners to control access threatens to result in inadequate incentives to invest in, to maintain, and to upgrade local broadband platforms.

Inefficiently denying platform owners the ability to own access rights implies a need for price regulation; otherwise, there will be incentives to use pricing to circumvent the constraint on rights ownership. Price regulation is itself known to induce welfare losses through adaptive behavior of the constrained firm. The impact on welfare might produce a worse result than the initial problem, assuming one existed.

Much of the academic interest in net neutrality arises from the belief that the open architecture of the Internet under current standards has been responsible for its remarkable success, and a wish to preserve this openness. We point out that the openness of the Internet was an unintended consequence of its military origins, and that other, less open, architectures might have been even more successful. A policy of denying platform owners the ability to own access rights could freeze the architecture of the Internet, preventing it from adapting to future technological and economic developments.

Finally, we examine the net neutrality issue from the perspective of the “essential facility doctrine,” a tool of the common law of antitrust. The doctrine establishes conditions under which federal courts will mandate access by competitors to the monopoly platform of a vertically-integrated firm. Because local broadband Internet access is not today a bottleneck monopoly (there are several competitors and the market is at an early stage of development), the essential facilities doctrine would not permit reassignment of access rights from platform owners to competitors. We conclude that “net neutrality” is a welfare-reducing policy proposal.

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I. Introduction¹

Great constitutional principles seem to be at stake in the clash over access to broadband facilities, or “net neutrality” to use the current rather ambiguous term for proposed federal regulation of the Internet. These proposals bring the First Amendment to war with the Fifth. According to Professor Larry Lessig, for example, sound public policy consists of a preemptive regulatory intervention designed to preserve the Internet’s original libertarian values in the pursuit of competition and innovation. On the other side, owners of Internet hardware, threatened with expropriation, defend vigorously their right to exclude others from free riding on their investments and make their own arguments about the pursuit of competition and innovation.

A conflict of more modest principles arises from what might be characterized as the war of default policies. *Primum non nocere* (first, do no harm), is a medical precept often, but inaccurately, attributed to the Greek physician Hippocrates. It gathers modern support from the observation that patients with some disorders (e.g., acute back pain) recover at about the same rate with or without treatment, while those treated are sometimes injured by the treatment. The opposite principle, *primum processu* (act first)² evokes the picture of the Dutch boy with his finger plugging the small hole in the dike that protects Holland from the sea. These two default policies do not fit neatly into a standard liberal/conservative dichotomy. The first counsels nonintervention to permit change to

¹ Acronyms used in the text:
CLEC—Competitive local exchange carrier;
DSL—Digital subscriber line;
FCC—Federal Communications Commission (Commission);
ILEC—Incumbent local exchange carrier (telephone company);
ISP—Internet service provider;
LBB—Local broadband distribution system, whether wired or wireless;
MMDS/LMDS—Multipoint (or local) 2.4-2.7 gigahertz (“local” is above 20 gigahertz) wireless distribution system, also know as multi-channel (“local”) multi-point distribution system or as “wireless cable”—terrestrial medium-range (up to 35 mile) broadband services.
WIFI—Terrestrial short-range (30 meter) wireless broadband Internet service (“wireless fidelity”) using IEEE standard 802.11.

² This phrase is adopted from the title of a paper by Bar, et al. (1999), responding to former FCC Chairman William Kennard’s pledge to take a “high-tech Hippocratic Oath” to “do no harm.”

occur through decentralized market mechanisms. The second counsels centralized preemptive regulation to preserve the benefits of existing decentralized market structures.

Our own perspective³ is at odds with what we will call the Lessig School of thought on access to broadband facilities.⁴ Specifically, in this policy debate we think that access regulations will likely have greater costs (through their adverse impact on property rights and economic incentives) than benefits (through their preservation of the Internet libertarian culture and incentives). Nevertheless, we have every sympathy with the Lessig School. One of us (Owen) once advocated, in analogous circumstances, common carrier status for cable television systems as a means to avoid government regulation of video content. As it turned out, that proposal would have been bad policy for two reasons, both applicable to the current discussion.

First, rather than being harmful to consumers, vertical integration into programming was a key ingredient in the economic success of cable television in the 1980s. Independent programmers did not come forward in sufficient numbers to support cable infrastructure demand in urban areas; it was necessary for cable operators to invest in cable networks. Second, Owen's proposal coincided with the peak—i.e., the beginning of the end—of a consensus favoring federal regulation of television content. The threat to First Amendment values turned out to be less than it appeared. In short, the benefits of the proposal would have been small or zero and the costs for consumers would have been large. Nevertheless, given the ratchet character of regulatory intervention, it would have

³ We have previously written papers on behalf of the National Cable Telecommunications Association examining investment incentives from forced access to high-speed cable Internet providers. Owen (2002), Owen and Rosston (1998). However, the current “net neutrality” proposal would apply to both cable and telephone (DSL) services, and presumably also to wireless, satellite, power line, WIFI, M/L/MDS and other broadband distribution methods. (The various technologies are described on the FCC's web site <http://www.fcc.gov/cgb/consumerfacts/highspeedinternet.html>.) This paper looks not only at the investment incentives, but also to the overall character of the marketplace for Internet services and content. Effects on investment incentives remain relevant because present systems need continued upgrades as technology changes.

⁴ Lessig (2001b). More recent summaries linked to the concept of net neutrality appear in Lessig (2001a and 2002).

been very difficult to repeal a mistaken common carrier policy. We think the Lessig School proposals regarding restrictions on vertical integration for high-speed access providers pose similar risks for related reasons.

The Lessig camp seeks to promote or at least to preserve the values that made the Internet what it is today.⁵ What are they? We think a fair reading of the filings, articles and white papers of this school is as follows:

Maximize individual freedom of speech and opportunities for innovation:

Anyone should be free to offer content on the Internet.

No one, aside from the originator of the content, should be in a position to impede any user's access to any content, either directly or indirectly, through technical standards, access or pricing decisions.

From these principles, it follows that:

Local broadband access facilities should be common carriers—i.e., should be required to transmit all content on nondiscriminatory terms.

We use the term “content” in this paper as an icon for services such as searching and transacting as well as information and entertainment. Many adherents of the Lessig school would extend the principle to apply to hardware and other technical innovations through the use of open, non-proprietary standards. The access camp focuses on local broadband (LBB) facilities such as DSL and cable modem services, which it sees as potential bottlenecks, threatening the objectives above. For these advocates, the first step of “net neutrality” is to exclude no one from access to the local and long distance portions

⁵ “The myriad benefits of the Internet Age flow from one fundamental feature – the ability of consumers and businesses to communicate with one another and lawfully to create, share and access information, all without obstruction from network service providers.” Coalition of Broadband Users and Innovators (2002). Although we do not pursue it here, we think this claim is not self-evident.

of the Internet. But, according to Lessig, the neutrality principles should extend to any aspect of the Internet that threatens basic values of what Lessig calls “the commons” by marrying control of transmission with control of content. This implies not merely that rights of access be transferred from suppliers to users, but that the technology and architecture of the Internet be preserved in its current form, as that form affects access.

On the other side of the debate, analysts point out that net neutrality may not be welfare enhancing, may indeed create incentive effects that reduce consumer welfare, and may simply be unnecessary due to the presence of competition or the absence of any incentive to exclude.⁶

This paper will examine the logic and evidence behind the cases made by each side and finally explain the reasoning that leads us to reject the Lessig school proposals. We use a property rights approach because Lessig himself characterizes the issue in property rights terms and, ultimately, this is a debate about how much control private companies can exercise over the use of the facilities and protocols they develop.

Lessig promotes an Internet commons in which certain private property rights are forbidden to hardware owners. While not usually analyzed in these terms, price regulation and antitrust enforcement also restrict private property rights to further the public interest. In addition, in examining property rights, we look at the incentives for innovation and the incentive and ability to act anticompetitively by excluding more efficient suppliers from providing services to consumers using proprietary resources.

Property Rights

Property consists of bundles of rights established by law and protected by the state. The definition does not appeal to any underlying principles of justice. When we buy or create property we understand what rights are attached to the physical (or intellectual)

⁶ See, for example, Speta (2000), Woroch (2002) and Wu (forthcoming 2003).

manifestation of the property. This understanding informs our decision (incentive) to purchase, preserve or create property.

In the United States under current constitutional law the state is obliged to provide compensation when it takes one or more of these rights for its own or public use, provided that the taking is physical or, if regulatory, destroys the entire economic value of the bundle of rights.⁷ Also, the state is obliged to observe defined forms of due process (but not to compensate) when it takes one or more of these rights for regulatory purposes (e.g., to control “nuisances” or externalities such as noise pollution, or to ensure that prices or profits are not excessive). Finally, the state is obliged to defend property rights against private trespass or appropriation. The founding generation, children of the Enlightenment, viewed property rights as based in natural law and as one dimension of a Lockean social contract. Today it is more usual to take a utilitarian perspective. For most economists this means that private property rights should be defined (and defended) so as to optimize some agreed aggregation of individually-perceived well-being, a.k.a. economic welfare.

The link between property rights and economic welfare, for present purposes, consists of incentive effects. First, the process of preserving, enhancing or creating property can make both the investor and other members of society better off. Those who are better off include, for example, persons employed in the process, and those who value the property or its use more highly than the resources used up in its preservation or creation. Economic actors are induced to invest in the preservation, enhancement or creation of property by the prospect of gain.⁸ The details of this process and of the rights matter, and are subject to public policy analysis to determine their welfare effects.

⁷ Spulber and Yoo (2003) provide an extensive summary of the takings law and literature and address specifically the problem of local broadband access. Recent cases on regulatory takings include *Lucas v. South Carolina Coastal Council* (1992), and *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency* (2002).

⁸ This approach is quite general. It can be used, for example, to approach the issue of human capital formation as a function of civil liberties, an important topic in economic development.

A property rights perspective is useful because there is a large body of economic analysis regarding the efficiency and incentive effects of different property rights regimes.⁹ Probably the most famous manifestation of this literature is the Coase Theorem, which stands for two principles: (1) that in the absence of transactions costs, alienable property rights will end up being put to their most efficient use, so that it does not matter to whom they are initially assigned, and (2) that in the presence of transactions costs it may be quite important to assign property rights initially to, or near to, their most efficient users. It is of course the second principle that is most relevant to public policy analysis in the real world, where transactions often are very costly.

Others counter that in some cases, especially where transactions costs are significant, where there is an incentive to exclude users to increase price, or an inability to meter usage, property rights solutions can lead to inefficient exclusion or withholding of capacity from the market. Lessig (2001) also makes this argument in advocating a radio spectrum commons. However, a spectrum “commons” does not obviate the need for a central authority to determine the protocols and priorities that will govern how the commons is used. Similar government or regulatory involvement in the commons would be required under “net neutrality” proposals. In other words, a commons approach transfers from rights owners to regulators, rather than users, the responsibility for setting standards. It does not automatically preserve the values that the Lessig School seeks to protect. Also, to the extent that the assignment of access rights to platform providers is not efficient, it is necessary to consider other policy instruments (e.g., contract or tort solutions) before resorting to centralized regulation, for reasons we explore below.

Both we and Lessig use property rights as an analytical tool, not as an ideological ensign. Economists want property rights to be put into the hands of their most efficient users, not necessarily to preserve them in the hands of existing owners. To do this,

⁹ See, for example, Posner (2002), chapter 3. Posner claims that economic efficiency requires property rights to be universal, alienable, and exclusive. A more general framework sees property rights as one of several alternative legal mechanisms (others include contract and tort law) by which imperfect markets can be perfected.

property rights should initially be designed efficiently so that the transactions to unbundle or re-bundle those rights are not unnecessarily restricted by transactions costs. Lessig's analysis leads him to the view that assigning property rights over Internet access to platform owners would create "fences" within what should be a "commons," inefficiently depriving users and producers of resources whose use would cost society nothing.

The "net neutrality" debate is at heart a debate about the proper scope of property rights for resources used to produce IP communications services. Specifically, should owners of existing or future Internet hardware platforms be permitted to own the right to decide how to use the physical property in which they have invested, or should that right be assigned instead to users or to content providers? A utilitarian Coasian approach to this problem takes it as given that one important public policy objective is to improve economic well-being, and Lessig appears implicitly to accept this goal, among others. Those who, unlike Lessig, believe that access to the Internet is among the natural rights of humankind may find this paper useful mainly as a measure of what the costs and economic benefits of exercising that right might be.

II. Analysis

Overview of analysis

A useful way to approach the economic analysis of a regulation or competition issue like “net neutrality” starts with an explanation of certain “bad outcomes” that might result from existing economic and technical conditions. The next step is to examine the economic incentives and opportunities of the economic actors to behave in ways that would lead to the bad outcome. The final step is to assess alternative policies (such as “net neutrality”) designed to avoid the bad outcome in terms of their likely effectiveness in eliminating the untoward incentives or opportunities, and their other benefits and costs.

The “net neutrality” policy invites a focus on the provision of local residential broadband service. Proposals for net neutrality have generally centered on local providers of such services. Moreover, if the analysis shows that bad outcomes are unlikely for local residential access, then such outcomes are even less likely for business high-speed access or long haul Internet backbone provision, where there are more competitors. (Indeed, to the extent that residential users reach the Internet using commercial or institutional access modes (from work or school), this same competition would forestall the “bad outcomes” feared by those who assume that residential access itself will be highly concentrated.¹⁰ Whether any uniquely residential services will exist and remain immune from this source of competition cannot be predicted.)

After examining the local residential broadband market, our analysis turns to look at rights of access and the demand for access regulation. With this background, we then assess the costs and benefits of prophylactic regulation and of waiting for some bad outcome before imposing remedial regulations.

¹⁰ Media Metrix (2002) reports that more than half of high-speed online access for 18-50 year olds is through work or university.

Background—Residential Broadband Services

There are many varieties of “net neutrality,” a fact that may cause some problem in determining appropriate policy. For clarity we will focus on the idea that any provider of Internet connectivity (hardware, connections, etc., referred to as “platforms” here) has to make content (broadly defined) from any independent provider accessible to all users and, in particular, as easily accessible (both technically and economically) as content from integrated or affiliated providers. Further, in connection with the provision of such services, any provider of Internet connectivity has to use the current commonly accepted protocols for Internet services—in other words, must not adopt proprietary standards that exclude or raise the costs of unaffiliated content providers. Some “net neutrality” proponents differentiate between an open access requirement that would operate at the transmission or facilities layer and a different set of rules that would operate at the “logical” layer. We interpret the logical layer version as a non-discrimination requirement in the standards dimension. The analysis below is applicable to either vision of net neutrality.

Internet content and services are supplied by many thousands of commercial “sites” or providers, motivated by some combination of promotion goals (“click here to find out about our organization”), consumer payment (“click here to purchase”) or advertising revenue (banner and popup ads). In addition, numerous government and noncommercial sites offer free online information and services. The physical Internet is an concatenation of independently-owned networks, routers and servers that abide by certain voluntary interconnection standards. These networks pay each other to transmit or to route data among various nodes.

Because there are so many suppliers of online information and service, and because users often have difficulty evaluating the quality and reliability of providers, there is an industry of intermediaries offering bundles of Internet services, including email, directories and search tools. There are various terms for this editing, bundling, or

endorsement service, including “portal,” “aggregator,” and “Internet service provider” (ISP).¹¹ Examples of large editorial/aggregation services include America Online (AOL), MSN and Yahoo! Many ISPs operate local modem banks through which their retail customers obtain low-speed access to the Internet. The larger services offer proprietary content, email, and premium services. Some ISPs (e.g., AOL) also provide user software. All ISPs offer access to the wider Internet.

The vast majority (over 73 percent according to eMarketer (2003)) of consumers who connect their home computers to the Internet still do so over ordinary telephone lines using analog modems. Virtually all residential analog Internet connections are provided on facilities owned by local telephone companies (“incumbent local exchange carriers” or ILECs). However, digital “broadband” or “high speed” Internet connections are now a widely available alternative to analog modem connections. More than 83 percent of U.S. households live in zip codes where high speed Internet access service is available from one or more local providers and almost half live in zip codes with two or more providers.¹² Although digital connections are more expensive than analog connections, often costing two to four times as much, the higher speeds and other useful features of digital connections are sufficiently attractive that some home computer users (around 18 percent of all households, or just over 27 percent of those with Internet connections) have switched to digital Internet connections.

¹¹ The terminology is confusing because there are no standard definitions. At one time an ISP was always in the business of providing physical access to the Internet via local modem banks that users reached by dialing a telephone number from their computer modem. Some but not all such ISPs were integrated into editorial or aggregation services. Today, the term ISP is often used to describe a supplier that does not offer local physical connections.

¹² FCC (2003a) for statistics as of December 2002.

Table 1

High Speed Internet Connections Serving U.S. End Users, December 31, 2002

Provider	Number (millions)	Percentage
Telephone companies (ILECs)	7.1	35.9
Cable companies	11.4	57.2
Satellite, wireless and other (incl. CLEC)	<u>1.4</u>	<u>6.9</u>
Total	19.9	100.0

Note: Approximately 87 percent of High Speed lines serve residences and small businesses. Source and definitions: FCC (2003a).

Broadband Internet connections from residences to Internet backbones are provided chiefly by ILECs and local cable operators. Cable offerings are often referred to as “cable modem” services. Telephone company offerings are often called “digital subscriber line” (DSL) services. High speed digital connections are also offered by other wireline providers, terrestrial wireless and satellite operators, but these alternatives do not yet have significant market shares.

The federal government has granted various concessions to promote broadband deployment, including favorable regulatory and tax treatment, and subsidies for certain customers, such as schools. We take as given for present purposes that it is a policy goal of the federal government to expand the consumption of broadband services. This supplements the usual economic policy goal of maximizing output for the benefit of consumers.

As broadband service is now very widely available to American consumers, the

focus of policy concern has shifted to the rate at which consumers are adopting the new services. While the rate of growth of new subscribers for these services has been very high, overall penetration remains at an early stage. (Table 1)

Both cable operators and telephone companies provide broadband Internet access services on the same facilities used to provide other services—chiefly video entertainment and voice messaging, respectively. Cable operator video delivery was formerly subject to rate regulation, and basic video service still is, but today the cable industry faces competitive discipline from satellite providers of video entertainment services and other sources.

There is not yet complete overlap in the areas where cable and DSL offer service, chiefly because DSL service currently is available to fewer households than have access to cable modem service.¹³ This difference in coverage, which may diminish over time, helps to explain a large part of the current difference in the relative “market” shares of cable modem and DSL services. In the long run, of course, shares will depend on relative costs, the outcome of efforts to differentiate the products, and entry by competing technologies.

Background—Rights of Access and Use

Owners of physical transmission and transportation facilities (railroads, pipelines, gas and electricity suppliers, telephone companies, and other “utilities”) have long been subject to state and federal regulation that limits their control of access to the facilities they “own.” Indeed, rights of access to public utility property is but one point on a continuum. For example, owners of private property not commonly “imbued with a public interest” (such as the ordinary landlord, *New State Ice Co. v. Liebman*, (1932)) may nevertheless face loss of control over access to or use of their property in certain

¹³ DSL service quality (transmission speed) deteriorates as the distance between the user and the central office increases. In contrast, cable modem service quality decreases as the number of users sharing a local node increases.

exigencies. Even human capital and human life is subject to uncompensated taking by the state in some circumstances, such as the military draft. Efforts by the courts to protect private property rights from uncompensated regulatory takings ended at a time when private property lost much of its political legitimacy, during the Great Depression.

The earliest regulatory takings of private property in the public utility tradition were for the purpose of regulating prices, rather than access. *Munn v. Illinois* (1876), involved grain elevators, not usually considered to be utilities. But access and pricing go hand in hand. One cannot meaningfully transfer the right of access from a utility to users without also regulating the price of access, just as one cannot place a meaningful constraint on excessive prices without also transferring the right of access. The linkage arises for a couple of reasons. First, neither the services offered by utilities nor the costs of serving different users are uniform. This fact creates opportunities for discrimination, an escape route for the constrained utility. A utility that wishes to minimize access opportunities for a particular group can often define service to that user class, directly or indirectly, as a different service from that offered to others, and charge a higher price for it. Second, it is simply impossible to require access without mandating a price to be charged since the access supplier can deny access by setting a high enough price.

More generally, it is useful to think about a right of access in terms of its relative value to different users. Any party that stands to gain substantially from controlling access to a facility will seek to own that right. If it can be purchased by outbidding others who value the right less highly, it will be. If the law forbids its purchase, the party will act to achieve indirectly what it cannot do directly. Attempts to stop this behavior require greater regulatory effort. The greater the regulatory effort, the more likely it is that behavior will be distorted with potential social costs. But—and this is a very important but—there is no basis to *assume* that a facility owner will be the party that places the highest value on control of access.

Lots of facility owners seem to have no wish to control access, and no regulation of access is required. Lessig mentions electric utilities as an example of the “principle” of net neutrality, pointing out that electricity suppliers (along with water companies) do not

discriminate among brands of electrical appliances (or faucets). True enough, but it is the preferences of electricity vendors that produces this result, not regulation. In fact, David and Bunn (1987) show that early competition among the different types of electricity distribution (AC vs. DC) led to competition to allow and promote different types of electrical appliances. It would be unnecessary and potentially harmful¹⁴ to establish a regulatory scheme guaranteeing a right of access for appliance brands to consumer electrical outlets. In this case, *primum processu* would be a bad policy.

Indeed, a desire on the part of facility owners to control access or to integrate vertically is hardly universal. Where the desire to control access does not exist, no good can come, but harm may come, from its prohibition. Where it does exist, it may be motivated by benign incentives, by malign (e.g., anticompetitive) incentives, or by a combination of incentives. In these cases, maximization of consumer welfare requires investigation of the economic consequences of prohibitions on integration and property rights reassignments.

Although not an original goal of uncompensated takings, economic efficiency (the maximization of economic welfare) has gradually gained supremacy as the accepted policy objective of utility regulation. This is the subject of a truly vast literature, both at a theoretical level and in specific industries. Even so, it is a subset of an even larger literature on the economics of regulation generally, including, for example, health, safety and environmental regulation. Adaptive behavior is a common theme in this literature. Economic agents respond to incentives. A constraint placed on an economic actor is never simply accepted. The actor, whether a firm or a person, seeks to adjust in ways that ease the burden of the constraint. Adaptations can take many and unexpected forms, from using inappropriate technologies of production to subversion of the political process.

¹⁴ Appliance manufacturers must design their products to meet certain standards in order to avail themselves of access. The establishment of those standards and changes in them raise important and difficult analytical and policy issues. There are conditions under which it would be valid to argue that vertical integration by electric utilities into the appliance business would provide a better guarantee that prevailing electrical standards maximize welfare.

The outcome of adaptive behavior may very well be a reduction in economic welfare compared not simply to the ideal, but to the imperfect, unregulated *status quo ante*. Further interventions to remedy the consequences of adaptive behavior, while certainly possible in principle, often are extremely difficult to implement because of inadequate information.

The important insight that arises from this literature on economic behavior under regulatory constraint, for present purposes, is that however serious a market imperfection may be, it cannot be assumed that a regulatory solution will produce a superior outcome. It may produce an outcome worse than the initial imperfection. Careful study may reveal which solution is better for consumers, and such study should occupy policy makers considering regulatory solutions. Further complicating the choice of solutions is the fact that regulatory intervention is accompanied by procedural rules and political realities that have a strong preference for the status quo. Imperfect markets often, though not always, are self-correcting. Thus, compared to imperfect market solutions, regulatory solutions are difficult to change, a point developed further below.

Access to broadband cable service is not regulated today, and the FCC at present opposes such regulation. Telephone ILECs are subject both to rate regulation and to unbundling requirements that reflect the industry's long regulatory and antitrust history as owners of monopoly "essential facilities," and the federal government's objective of promoting facilities-based entry in local telephone markets.

ILEC DSL services are provided at higher frequencies on the same local copper wires simultaneously used to provide ordinary monopoly voice telephone service. For this reason, ILEC DSL services were subject to the same access requirements as other local telephone services until recently, but these requirements are to be phased out by 2006. Under the new FCC rules, ILECs will still be required to provide unbundled loop access at regulated rates. ILECs will also be able to offer their own broadband content without any special safeguards, provided they provide access to the underlying facilities to other parties (FCC 2003b).

The demand for access regulation

The policy debate about access to local broadband services seems puzzling, at first glance, because LBB service today is not an entrenched monopoly. In many areas cable companies and telephone companies compete directly for customers, and other technologies, including wireless and satellite, may soon become important additional avenues of competitive supply. So why the fuss and why the hurry? The answer is *primum processu*, and the reason is largely based in interest group politics.

Nobel Laureate George Stigler (1971) suggested many years ago that government regulation was a service for which there was a demand as well as a supply, and that not all the demand originates with consumers. As suggested by the word “subversion” above, regulatory solutions in the United States do not spring full grown from the brows of policy mandarins in Washington. They are the outcomes of a political process in which interest groups play a very prominent role. Understanding the economic and other objectives of interest groups makes it easier to predict the outcome of the process. In this subsection we discuss the demand for access regulation by commercial and noncommercial interests.

The *commercial* demand for access regulation arises from a fear on the part of some upstream suppliers of Internet content and services (as well as some consumer electronics manufacturers) that LBBs will themselves integrate vertically into various content, aggregation, or equipment businesses, and that this will be harmful to independent suppliers. This fear is articulated in terms of the possible anticompetitive effects of vertical integration, arising from a presumed desire on the part of LBBs to leverage local market power into upstream or downstream monopolization. The old Bell System illustrates the danger, although incentives created by regulation itself played an important role in AT&T’s desire to exclude competing suppliers or long distance services and telephone equipment. Noll and Owen (1994). Others point to the fear that some companies have of competing or potentially competing with Microsoft.

An illustration of what commercial interests may fear is available today in the

commercial relationship between Yahoo! (www.yahoo.com) and SBC Communication Inc. (www.sbc.com). SBC owns ILECs serving 12 states, including California, Illinois, Michigan, Texas, and Wisconsin. It offers DSL service in large and growing portions of its service areas. Subscribers to SBC DSL receive not simply an Internet connection but a bundled subscription to Yahoo!, a rival of AOL, MSN and other ISPs. The bundled Yahoo! service does not prevent SBC subscribers from using any other Internet services, including Yahoo!'s most direct competitors. But unless the Yahoo! software is removed from a subscriber's computer, Yahoo! remains the default portal through which all other Internet services pass. Whether or not this simple fact is sufficient to violate the principle of net neutrality, clearly SBC could do a variety of things to make it more difficult for users to turn to rival sources of aggregated content and premium service. Ironically, Yahoo! has been among the leaders of the net neutrality movement, fearing, presumably, that its rivals will associate themselves with LBBs in a similar manner.

The same commercial fear might also arise, however, from a belief on the part of independent suppliers that LBB vertical integration would result in a product of superior attractiveness or lower cost to users, so that current suppliers would lose market share to more efficient integrated rivals. Thus, commercial advocacy of regulated access to LBB facilities is consistent both with a genuine fear of monopolization and with a desire to exclude or raise the costs of more efficient competitors.

Only a few years ago, for example, open access was heavily promoted by America Online, which feared vertical integration into the aggregation business by cable operators offering LBB (cable modem) service in conjunction with @Home and Road Runner ISP services. At that time some argued that cable operators would monopolize LBB service. More recently, DSL market shares have increased, other technologies have begun to look more promising, @Home has failed despite vertical integration, and AOL withdrew as a supporter of forced access once it acquired its own extensive collection of cable systems.

Today's commercial net neutrality advocates include some software and content suppliers (for example, Amazon and Yahoo!) and consumer electronics manufacturers. The current motivation of this group may be the belief that LBB service, though not

today a monopoly, eventually will be monopolized by whichever delivery technology turns out to be most efficient, or that the two major providers will each find it in its interest to exclude upstream service providers. To fend off that risk *primum processu* is urgent now, for these interests, before any damage is done, and before whatever dominant technology or technologies emerges has the political muscle to resist. Alternatively, these firms may simply fear increased competition from vertically integrated LBBs.

There is no real basis to assume that LBB service will ultimately turn out to be monopolized. Whether this happens turns on the cost structures of various delivery technologies, of course, but also on the importance of product differentiation and the difference in costs in different areas. One plausible future structure for LBB service is competing facilities with differing characteristics. The differing characteristics might be transmission-specific qualities (speed or portability, for example), but might also involve integration with differing content and service packages. In that case, some form of exclusion could enhance the competitiveness of the marketplace. The exclusion might entail denial of certain content to rival LBB competitors, or it might involve exclusion from a given LBB content aggregation of some independent content.¹⁵ Territorial and product line exclusivity can be an important efficiency-enhancing feature of markets for the distribution of intellectual property. Mandating a right of access in these competitive circumstances would have the effect of constraining the market away from its most efficient structure, reducing consumer welfare by preventing suppliers from offering packages that consumers prefer.

Put into property rights terms, assigning access rights to content suppliers rather than LBB operators would exclude the possibility of a range of potentially efficient outcomes; assigning access rights to operators would not. For example, a high-speed access provider might have the incentive to develop video instant messaging if it could guarantee speed and could reap the rewards from its investment in this complementary service. It is

¹⁵ Rubinfeld and Singer (2001) use the terms “content discrimination” and “conduit discrimination” to describe these methods of exclusion.

possible that mandating access to this technology for all high-speed access providers would make the investment in this complementary technology less attractive. If so, the service would never be offered. Coase's second principle in this case requires the assignment of access rights to facilities owners.

Similarly, if all bits are to be treated equally, it will not be possible to offer broadband content that requires priority in delivery, or guaranteed arrival times. For example, high quality real-time video conferencing requires that packets of bits not be delayed in their arrival. But, if the local provider is required to treat all bits equally, the bits that are going to the high school student downloading a pirated copy of the new *Matrix* movie will have the same priority. Given capacity constraints in the network, this could cause the video conference quality to be suboptimal, even though delay in delivering the movie to the student's hard drive would be completely inconsequential because such one-way transmissions are easily buffered.

The Lessig school counter-argument is that non-affiliated providers would spring forth to provide all sorts of innovative content and services if they had assurance that their upfront investment would not be expropriated by the access provider. However, the access provider should want to enhance the demand for its own transmission and content services. It cannot extract rents from services that do not exist. It does have an incentive to exclude or raise the costs of those providers that offer content that is a substitute for its own, but only if the content is offered at the same or higher cost or if the content produces negative external effects on the overall demand for Internet content.¹⁶ In this context, an LBB can certainly act opportunistically to raise a rival's costs, but it cannot persist in such behavior without reducing the supply of content that it requires. The longer the life of the access provision and the more often the game with non-affiliated providers is repeated, the less incentive the access provider has to expropriate any individual provider's investments.

¹⁶ See Farrell and Weiser (2002) for a discussion of incentives for a monopolist to exclude downstream content.

Commercial advocates of net neutrality therefore appear to want assurance that their own profit streams will not be put at either of two risks: the risk of anticompetitive discrimination by a hypothetical future LBB monopolist; and the risk of losing market share to a competitive group of LBB suppliers. The second risk is one that is inherent in the competitive process that benefits consumers. *Primum processi* serves to protect against both threats. However, *primum processi* puts consumers at risk if the LBB market turns out to be (potentially) competitive. This could preclude an efficient, competitive outcome in advance of knowing whether a monopoly outcome is likely, much less whether imperfect regulation will improve consumer welfare relative to imperfect competition.

The *noncommercial* (academic and self-styled consumer advocate) demand for access regulation arises in part from admiration for the astonishing speed with which the Internet has changed many important aspects of life and work, and the attribution of these benefits to the original openness, transparency, volunteerism, and libertarian spirit of the Internet technical community. The Internet's early "openness," of course, was an unintended side effect of the military objectives (preservation of communication during nuclear attack) of the Internet's original Department of Defense sponsors.

Some noncommercial net neutrality advocates have adopted the term "end-to-end" to describe the architecture of the Internet because it allows any intelligent device to be attached and to communicate using the agreed-upon protocols. This architecture is chiefly responsible, they argue, for the many different ideas and services that have blossomed on the Internet because no one can block any content or service that uses the agreed-upon protocols. (Unfortunately this includes spam.) But this openness inevitably has a price: there have doubtless been useful services (such as effective spam filters!) that have been slowed or even blocked because of the requirement that the network not have embedded intelligence. While "end-to-end" architecture has benefits, those benefits standing alone do not prove that the architecture was or will continue to be optimal. The benefits must be put onto the scales with the costs, most of which may involve the loss of services that never came into existence, as the relative prices and functionality of processors, storage,

and communication links have evolved. It is noteworthy that the degree to which “intelligence” is centralized rather than located at user terminals has changed repeatedly during the half-century history of computing.¹⁷

The very fact that the Internet and all the new services associated with it was an unintended and unpredicted side effect of military planning for thermonuclear war serves as a vivid illustration of the power of unintended effects. The last generation of academic writers on regulation of industry, from airlines to telephones, documented the unintended and unpredicted consequences of regulations designed to protect consumers, but which had the opposite effect (Noll and Owen (1983)). Virtually everyone, including the experts, was surprised to find, for example, that “hubbing” was an efficient way to run an airline, a practice that was impossible before deregulation of the airline industry in 1976. Similarly, it is impossible to predict the type and importance of unintended effects of regulation seeking to impose net neutrality.

For example, the end-to-end “spirit” of the Internet was responsible, in the early 1990s, for a failed effort to prevent privatization and commercialization of the Internet. Internet users, at that time chiefly academics, believed that permitting commercial use of the Internet would be socially harmful. Had this effort succeeded, none of the commercial services associated with the Internet today, including Yahoo!, eBay and Amazon, would have come into existence. This consequence of privatization (or of failing to privatize) was not predictable.

Put into property rights terms, the early post-military Internet is remembered as an idyllic commons, in which no one asserted property rights and all nevertheless cooperated unselfishly to advance the technology and its uses. But such a utopia, if it ever existed, could not last. As demonstrated by the failed hippie communes of the 1960s and the failed experiment of Vladimir Lenin, we ignore supply side incentives at our peril.

¹⁷ For a discussion of the tradeoffs among communication, processing and storage, see Owen (1999) pp. 151-171.

The perceived success of the pre-privatization period, along with the apparent continued success of certain open source software, is taken as evidence that commercial property rights—i.e., the right to exclude—are not compatible with sustained technological progress in this field. From this perspective, the possibility of LBB monopolization is a sufficient basis for regulation, but by no means a necessary condition. In fact, any market structure that involves an element of exclusivity would be offensive.

But even if an idyllic commons protected by end-to-end architecture had been among the reasons for the growth of the Internet, it does not provide a sufficient basis for preserving by force of law the historical Internet architecture. Indeed, it seems ironic that the interest group most nostalgic for the heady freedom that Defense Department planners inadvertently provided to the computer scientists of the 1980s is intent on preventing the benefits that might arise from similar architectural freedom for future innovators.

Public Goods and Network Effects

Professor Lessig's own analysis is much more pointed than our characterization of his "school." Lessig sees the Internet as an instance in which private property rights would limit the potential benefits of the technology by ruling out gains that cost nothing to produce. Lessig's description of the phenomenon he seeks to promote by protecting the Internet commons from enclosure is not given in economic terms. However, it appears to correspond to two concepts that economists call, respectively, "public goods" and "network externalities." These are distinct concepts, although both have implications for the assignment of property rights.

A pure public good is one that costs nothing to provide to any user after the first, and is non-rivalrous in consumption. Intellectual property usually fits this definition quite closely. Other common examples are TV broadcasts and national defense. Most goods have an element of public-ness in this sense, which also can be thought of in terms of the distinction between fixed and variable cost. The Internet, or some aspects of it, has the

character of a public good. It is a bit difficult to pin down exactly where the Internet's public-ness arises, but Lessig appears to argue that it lies in the Internet's design standards and philosophy (end-to-endedness, or lack of central direction). For present purposes we will take this at face value, but it is perhaps worth further scrutiny.

Network externalities occur when the value of a good or service to a particular user increases as the number of other users increases. The fax machine is a common example. A fax machine is a lot more useful if there are lots of people with fax machines rather than few. Fax machines were available for purchase for decades before they suddenly became popular and common in the 1980s. Demand accelerated as the number of owners grew.

Lessig uses network externalities and public goods, without naming them, to argue that no one should be allowed to restrict access to the Internet (i.e., that rights of access should not be assigned at all, or equivalently, assigned to all actual and potential users). In the case of public goods, it is inefficient to exclude any particular user, because it costs nothing to supply service (or at least certain aspects of service) to any particular user. If property rights are assigned to facility owners, they will seek to exclude those who do not pay, reducing social welfare. In the case of network externalities, the exclusion of any particular user reduces the value of the Internet to all other users. Hence, it is inefficient to exclude any particular user by charging a price above marginal cost that has such an effect. Lessig is perfectly correct on these points. Unfortunately, however, his analysis focuses solely on the demand side of the Internet world, neglecting the supply side.

The difficulty is that if we assign property rights in access to users rather than suppliers, resulting in an efficient price of access (zero), there will be no long run supply of Internet services. A zero price yields zero revenues—a lesson many dotcoms learned too late. While the benefits of the Internet can be made available to any *particular* user at zero cost, they cannot be made available to *all* users at zero cost. This phenomenon is well known in economics—while marginal cost pricing is efficient, a firm has to have the expectation that it will be able to cover all of its cost including a reasonable profit in order to provide service. Ramsey (1927) developed the first model to show that price

discrimination would achieve optimal departures from marginal cost pricing so that the firm could cover total costs and therefore have an incentive to produce. In the case of public goods, Lessig is clearly right that the marginal cost is zero, but it is also clear that zero is not always the best practical price. Lessig would probably agree that price of access would have to be above zero. But then how far above zero should the price be and how should the level be determined? These questions are unanswered by any of the net neutrality or open access proponents, perhaps because the only answer is regulation.

If providing Internet service is costly and there are no revenues, or revenues are less than costs, obviously there will be no Internet. Having no Internet is worse than having an inefficiently small or exclusive Internet. The problem is not so stark as this, however. If suppliers can discriminate among users, they can charge high prices to those with high use values and low prices to others, in principle ending up with plenty of supply and no or little inefficient exclusion. Similar results can be obtained, in some cases, by bundling public goods with private goods. For example, intellectual property is imbedded in private-good media such as CDs, books, and periodicals. Also, in the case of network externalities, each user does not have equal value to other users as a potential communicant, and welfare losses can be reduced by pricing accordingly.

The commons approach similarly ignores supply-side problems that arise because the demand for transmission is dependent on the supply of content, and vice versa, and because one kind of content may increase or decrease the demand for other content, or for transmission. These effects can often be taken into account by pricing, but sometimes require internalization by a single supplier. Net neutrality would ban both of these solutions.

We see Lessig's demand for a ban on property rights (of access) in an Internet commons as an over-reaction to a common problem in the supply of goods and services. The potential loss of "costless gains" that might arise from assigning property rights to facility owners is very likely to be more than offset by gains from increased supply of Internet services. There are reasons for suppliers themselves to minimize exclusion of low-value users, where this is feasible.

Regulatory Model for Broadband Access

Although LBB service is not today a classic monopoly, and even though there is no evidence that it will become one, and despite the fact that not all monopolists seek to block access or to discriminate, it is worth considering the most likely form that regulation would take if a policy of net neutrality were adopted. Only in this way can the potential benefits and costs of such regulation be assessed.

In the case of rights of access to LBB platforms that do not yet exist, there is a policy tradeoff between the incentive to produce LBB transmission services and the incentive to engage in the creation of content and other upstream services. Both inputs are required to produce delivered Internet services for consumers. The right should be assigned, in the presence of significant transaction costs, and holding other things equal, to whichever set of holders has the greatest demand for the right.¹⁸ There are several problems, however, in assigning the access right to upstream content suppliers.

The first problem is that there are no significant transaction costs involved in LBBs selling access to content suppliers, whereas the reverse is not true. An LBB operator cannot purchase access rights from a set of sellers whose identities are unknown. Most would not come forward or even exist until a general offer of purchase were made. Many sellers would be fraudulent. Second, as noted above, some upstream suppliers may produce negative externalities on demand for overall delivered content, which they have no incentive to take into account. Well-known examples include spam, pornography, and other material whose very presence reduces consumer demand for connections. LBBs have a greater incentive than individual independent content suppliers to internalize this externality. The reverse problem exists for content producers that may generate positive

¹⁸ If rights are assigned in bulk they should be allocated to their most efficient users, and those users will in the absence of externalities, etc., also be the highest bidders. If rights are assigned incrementally in small units, Ramsey pricing and other second-best rules may be required.

externalities in demand.

In the case of reassigning access rights to existing facilities *ex post*, from LBBs to content providers, there is an additional consideration, which is the adverse effect on investment incentives of an uncompensated taking. Subtracting without compensation one of the property rights that an investor created (or would create) through a risky investment of funds with an opportunity cost clearly will reduce, perhaps to zero, the amount it is rational to invest. The result, inevitably, is a reduction in the supply of new or upgraded LBB facilities.

While a right of access newly reassigned to content providers might take any number of forms as discussed above, the analysis below assumes that the Commission would apply essentially the same access regulations that are currently (prior to phase-out) imposed on the digital subscriber line (DSL) services of local telephone companies. We refer to this as the “DSL regulatory model.” The current regulations require telephone companies (ILECs) to offer “unbundled elements” of their local networks, including bandwidth capacity on local telephone wires (“loops”), to resellers at wholesale prices reflecting “forward looking incremental cost.” We assume that analog regulations would be fashioned for other LBBs in the event the Commission opted to force access to all broadband systems, whether at the physical or logical level of the network.

The assumption that forced access to LBB services, if it occurred, would resemble current DSL regulation is not arbitrary. As with DSL, a mere access requirement for cable systems is likely to be meaningless in the absence of unbundling and maximum wholesale price regulation. This will become obvious once the Commission comes face to face with the need to adjudicate access complaints. If ISP access to LBB platforms is desirable from a consumer welfare perspective and yet would not otherwise be available, we argue below that it must be because LBB systems have very substantial market power in the relevant market, that alternatives are not available, that LBB operators refuse to grant access, and that access would force LBB operators to lower retail prices. In those circumstances any regulation less intrusive than current DSL-type regulation would be unlikely, even if the Commission began with a simple access requirement, because

increasingly intrusive and detailed regulation would flow inevitably from the need to resolve access disputes, just as it did in telephony in the implementation of the 1996 Telecommunications Act.

Essential facilities policy

In assessing market power, its consequences and remedies, it is useful to consider the experience of competition policy enforcement, which has long confronted nearly identical issues in a variety of industrial contexts. The essential facilities doctrine, which arises in the common law of antitrust, is relevant because it deals with the circumstances in which forced access is a useful remedy for a situation where the vertically-integrated owner of a bottleneck facility uses its monopoly of that facility to exclude equally or more efficient competitors from an upstream or downstream market in which the monopolist also participates. (The seminal case was *U.S. v. Terminal Railroad* (1912). The classic example is the practice of local telephone companies, when they were owned by AT&T, of excluding AT&T's long distance competitors from access to local connections.) The interesting question, then, becomes whether the underlying problem for which the net neutrality remedy is proposed meets the standards that courts and commentators have set, at a general level, as justifying such a remedy on the basis of costs and benefits to consumers.

Forced access is regarded as an extraordinary remedy in monopoly cases because it requires on-going supervision of technical production decisions and regulation of prices, because it risks raising production costs and hence retail prices, and because it may have adverse spillover effects on the investment decisions of parties and nonparties alike. As Justice Breyer observes,

“Even the simplest kind of compelled sharing, say, requiring a railroad to share bridges, tunnels, or track, means that someone must oversee the terms and conditions of that sharing. Moreover, a sharing requirement may diminish the original owner's incentive to keep up or to improve the property by depriving the owner of the fruits of value-creating investment, research, or labor.” (Justice

Breyer, dissenting in *AT&T Corp. v. Iowa Utilities Bd.* (1999)).

A market power problem justifying such a drastic remedy as forced access must be truly a bottleneck—an entrenched, long term, otherwise intractable monopoly, and accompanied by ample evidence of adverse effects on consumer welfare. Further, the situation must be one in which access can have a positive effect on consumer welfare, such as facilitating a transition to facilities-based competition or facilitating competition in products or services of which the monopolized component is a relatively small part. The standard for market power in essential facilities cases accordingly is the highest one that exists in competition policy.

Do LBB operators have “bottleneck” market power in providing local broadband service? If so, is there evidence that the market power is used to exclude more efficient competitors or to raise consumer prices in either upstream or downstream markets? These questions must be answered affirmatively if forced access is to make economic sense in a competition policy context.

First, LBB operators today by definition do not possess a “bottleneck” monopoly over anything. No one has identified the products, services or markets from which foreclosure could take place, or identified either a systematic refusal of access or an economic incentive to refuse access.

Given current competition in providing broadband Internet access services, the question of forced access does not even get to first base in an analysis of potential costs and benefits under essential facilities doctrine because there is no essential facility. Specifically, Internet content providers, aggregators, and ISPs have alternative ways to reach consumers, and consumers have alternatives to DSL or cable modems. These alternatives will likely increase. LBB operators could not and do not inefficiently exclude competitors in upstream or downstream markets.

In fact, if one believes that there is a chance for additional competition to come in the form of widespread wireless or satellite facilities, it may be crucial to permit vertical

integration in order not to reduce the investment incentives of these entrants. Otherwise, cable, DSL, and business access may remain the only competitors in the LBB marketplace. A regulatory model that detracts from the potential returns for new entrants diminishes the incentives to provide the hoped for competition, and may become a self-fulfilling prophecy of eventual monopoly.

If there is no economic policy case for forced access requirements today, might such regulations be a prudent precaution against future problems? Any new industry as it matures may begin to display increased concentration, heightened entry barriers and a slowing of technological change. Schumpeter (1942) saw this process of competition to become the surviving supplier in a mature market as the central dynamic engine of economic growth. In that case, incumbent firms may gain market power or even monopolies. But such an outcome is by no means inevitable, and prophylactic application of access regulation would penalize—and therefore discourage—efforts to achieve early success in young and dynamic industries. The recent dotcom crash provides a florid example of Schumpeter’s process of creative destruction at work, and the surviving content providers—the Amazons and the eBays—are stronger companies as a result.

So far as we are aware, no LBB operator has ventured into the non-local-transmission aspects of ISP service except as a means to jump start subscriber demand for their transmission services. (We assume that is the correct characterization of the SBC/Yahoo relationship.) The fact is that the earliest efforts to offer content and aggregation services that took advantage of broadband speeds were organized, not by independent ISPs, but by firms owned by cable operators. These efforts took place in the face of the failure of independent suppliers of such services to come forward, and certainly have not resulted in any market power or dominance, as witnessed by the bankruptcy of @Home, once the leading cable-owned ISP. In other words, cable operators’ so-far-not-very-successful efforts to offer upstream services tailored to the special features of broadband are better understood as attempts to remedy the failure of independent ISPs and content providers to provide such service than as an attempt to monopolize or foreclose any market.

The benefit (if any) of regulation of LBB service is the potential consumer welfare gains from reducing the distortions caused by monopoly power. Our conclusion from the preceding analysis is that there is no case for DSL-type regulation (i.e., essential facility regulation) of local broadband services. The adoption of such regulation would not be in the public interest because there is no conceptual or empirical evidence of any monopoly power or any distortion. None of the necessary conditions for essential facility treatment of LBB is currently met, implying that the weight of experience from more than a century of weighing costs and benefits of forced access militates strongly against such intervention.

Whether the necessary conditions for essential facility regulation will exist in the future is an entirely speculative question. Some have argued that imposition of restrictions now is important because there is a *chance* that restrictions will be required in the future. Their argument continues that it would be better to put on restrictions now because it will be more difficult if not impossible to implement regulations in the future (citing, for example, the difficulty of designing meaningful remedies in the Microsoft case) against an entrenched monopolist. Such fears would need to come up with a high probability of the need for restrictions in the future, a low cost of restrictions now, and a high probability that absent current restrictions, future restrictions would be difficult to enact. In short, the monopolist would need to be identified and a remedy imposed in advance. None of those arguments appear to have been made, much less supported.

As a result, there is no case for the imposition of regulation because of current anticompetitive activity or essential facilities; and there is also no case for current imposition because of a high likelihood of future competitive problems.

Summary and Conclusion

We have considered and rejected the notion that special features of the historical architecture of the Internet must be preserved by law in order to prevent an unraveling of the benefits of the Internet. We have also considered and rejected the more conventional case for local broadband access being classified as an essential facility in the antitrust

tradition, and local broadband access clearly, for the same reasons, is not a natural monopoly justifying the application of public utility principles. Where does this leave us in terms of the choice between *primum non nocere* and *primum processi*? Should we Act Now to forestall the threat of exclusion, or should we be careful, First, to Do No Harm?

Lemley and Lessig (2000) and Bar et al (2000) set out the arguments that lead them to conclude that waiting will be problematic for the future of the Internet. Essentially, they argue that thirty years of FCC regulation has kept the network owners (the ILECs that supply local analog, or low-speed, Internet access) out of the Internet. The Internet has flourished during this time, they argue, precisely because innovative firms have had unfettered access to the network and users without the ILECs being able to influence network design. But dial-up analog connections to the Internet are identical to—indeed, are—voice connections; telephone companies have always controlled the technical standards, such as bandwidth, pertaining to these connections. Thus, indirectly, the necessity to rely on analog connections has until the recent advent of high-speed services very much affected the architecture of the Internet. Further, no FCC regulation has prevented the ILECs from offering Internet services, or Internet-like services, other than a requirement that such services be offered through a separate subsidiary. Present FCC regulations, to be phased out, provide for non-discriminatory access to telephone company high-speed platforms, but do not prevent the telephone companies from determining the technological characteristics of the services offered.

Their argument is also based in part on the prediction that cable is the technology that is likely to dominate the next generation of Internet access and on the assumption that each local area will be served by a single local cable system. So consumers will have one main choice and the local cable companies will become not only the dominant supplier of high-speed Internet access, but also seek to extend their control of the network and influence network design to maximize their own profits. As we point out above, there is no basis to assume that cable or any other technology platform will monopolize the LBB service, or that if one does, it will be profitable for that monopolist to exclude equally or more efficient upstream or downstream suppliers.

Even competition among LBB services, they contend, will not be sufficient to squelch the danger of vertical foreclosure of access. Bar et al. argue that even under the current FCC rules applicable to DSL, the closed cable system will reduce competition to “host” independent ISPs so that the ILEC will be less hospitable to its third party ISPs. In addition, they argue that a duopoly is not sufficient to provide the openness that allowed the Internet to flourish. For example, competition in wireless telephony surely increased with the introduction of additional PCS licensees to compete with the cellular duopolies. But that does not mean that an unregulated duopoly (or even monopoly) would produce worse results than a vertically regulated firm or set of firms. Nor does it mean that such a policy is the appropriate policy to provide incentives for competing access providers. Of course, a policy of *primum processu* shifts the burden on these points to advocates of deregulation, who must prove a negative: that the absence of regulation would not lead to harm.

The “bad outcome” in the Lessig school scenario is that failing to restrict the ability of LBB operators to deny access will lead to exclusion of efficient suppliers. The claim is that this exclusion is not only harmful to current consumers because they are denied the choice that a competitive market would give them, but more importantly that such control would artificially dictate the path of investment and innovation for the future of the Internet. In other words, the risk is that a closed solution would lead to a path that is optimized for the cable and DSL provider and not necessarily optimized for long-term consumer welfare.

For the reasons already given, we think this story falls far short of justifying the equivalent of “preventative detention” for current and coming LBB access platforms. The story does not account of the costs we have enumerated above, and appears to be based very largely on the assumption that the historical path of the Internet was optimal and that the history of the Internet is also its future. This assumption may be user-friendly, but it is unsupported by evidence.

Access regulation involves an assessment of the risk of two kinds of error. The first, the focus of the Lessig School, is that worthy new services and innovations will be

excluded either by monopolistic greed or by the selection of a centralized architecture. The second, which the Lessig School ignores, is that a vertically integrated monopolist will have incentives to produce more output than a vertically disintegrated industry would, and that (a) centrally controlled network(s) would, in the future, become more efficient than (an) “end-to-end” network(s). The preceding parentheses remind us that of the possibility that competing, differentiated networks will be the most efficient outcome.

Some public policy choices are close calls, because the costs and benefits of the alternative courses are equal. The net neutrality proposal is not one of these hard choices at this point in time. There is no evidence that the outcome proponents of net neutrality wish to avoid (hardware platform owners’ controlling access and choosing content) is likely to happen, or that if it did happen it would be harmful to consumers. Rather than holding back the North Sea, the dike into which net neutrals would insert their fingers is more likely to block the road to competition and innovation.

Bibliography

AT&T Corp. v. Iowa Utilities Bd., 525 US 366 (1999) (Justice Breyer, dissenting).

Bar, François, Stephen Cohen, Peter Cowhey, Brad DeLong, Michael Kleeman, and John Zysman (1999), “Defending the Internet Revolution in the Broadband Era: When Doing Nothing is Doing Harm,” *Berkeley Roundtable on the International Economy, Economy Working Paper 12*, August.

Coalition of Broadband Users and Innovators (2002), *Ex Parte* Communication to the Commissioners of the Federal Communication Commission in CC Docket Nos. 02-33.98-10 & 95-20, CS Docket No. 02-52 & Docket No. 02-52, November 18.

Coase, Ronald H. (1960), The Problem of Social Cost, *Journal of Law and Economics* 3, 1-44

David, Paul A. and J. Bunn (1987), “Gateway Technologies and the Evolutionary Dynamics of Gateway Industries: Lessons from Electricity Supply History” ,” in Mark Perlman and A. Heertje (editors), *Evolving Technology and Market Structure*, Chicago, University of Chicago Press, pp. 121-156. (NIL)

eMarketer (2003)

Farrell, J. and Weiser, P. (2002), “Modularity, Vertical Integration and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age,” *Institute of Business and Economic Research*, Paper CPC 02-035

FCC (2003a), High Speed Services for Internet Access: Status as of December 31, 2002 (Industry Analysis and Technology Division, Wireline Competition Bureau).

FCC (2003b), [forthcoming: Broadband DSL access rule modifications. Press Release dated Feb 20, 2003.]

Lessig, Lawrence (2001b) *The Future of Ideas: the Fate of the Commons in a Connected World*, New York: Random House.

Lessig, Lawrence (2002), “The Government’s Role in Promoting Broadband Deployment,” Testimony before the Senate Commerce Committee, October 1, 2002

Lessig, Lawrence (2001a), “The Internet Under Siege,” *Foreign Policy*, Nov./Dec. 2001

Lucas v. South Carolina Coastal Council, 505 US 1003 (1992)

Media Metrix (2002)

Munn v. Illinois 94 U.S. 113 (1876)

New State Ice Co. v. Liebman, 285 U.S. 262 (1932)

Noll, Roger G. and Bruce M. Owen (1983) *The Political Economy of Deregulation*, American Enterprise Institute.

Noll, Roger G. and Bruce M. Owen (1994), United States v. AT&T: The Economic Issues, in Kwoka and White, eds., *The Antitrust Revolution*, Scott Foresman, 2nd ed.

Owen, Bruce M. (2002), "Forced Access to Broadband Cable," June 17, 2002, in FCC CS Docket No. 02-52 Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities.

Owen, Bruce M. (1999) *The Internet Challenge to Television*. Harvard University Press.

Owen, Bruce M. and Gregory L. Rosston, (1998) "Cable Modems, Access and Investment Incentives," December 1998

Posner, Richard (2002), *Economic Analysis of Law*, 6th ed. Aspen Publishers

Ramsey, Frank P.(1927), "A Contribution to the Theory of Taxation," *Economic Journal*

Rubinfeld, Daniel and Singer, Hal (2001), "Open Access to Broadband Networks: A Case Study of the AOL-Time Warner Merger," *Berkeley Technology Law Journal*, Vol. 16, No. 2, Spring, pp. 631-675

Schumpeter, Joseph (1942) *Capitalism, Socialism and Democracy*, New York: Harper & Row

Speta (2000) "Handicapping the Race for the Last Mile": A Critique of Open Access Rules for Broadband Platforms," *Yale Journal on Regulation*, Vol. 17:39

Spulber, Daniel F., and Christopher S. Yoo (2003), "Access to Networks: Economic and Constitutional Connections," ___ *Cornell Law Review* ___ (May 2003)

Stigler, George (1971) "The Theory of Economic Regulation," *Bell Journal of Economics*, vol. 2, 1971, pp. 3-21.

Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency, 122 S. Ct. 1465 (2002).

United States v. Terminal Railroad Association, 224 U.S. 383 (1912).

Woroch, Glenn (2002), "Open Access Rules and the Broadband Race," 2002 *L. Rev M.S.U.-D.C.L.* 1

Wu, T. (forthcoming 2003), "Network Neutrality and Broadband Discrimination," *Journal of Telecommunications & High Technology*