Could private control of access and standards lead to a balkanization of the Internet?

Assigning Broadband Rights

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Some Internet service providers (ISPs) and portals like Yahoo! and Earthlink are concerned that cable television and telephone companies that now provide residential high-speed Internet access may branch out into the provision of content or enter into exclusive deals for content. Their fear is that this might result in current ISPs and content providers being cut off from access to existing and new customers.

Meanwhile, some legal scholars have expressed concern that the provision or control of content by local broadband providers will create incentives for them to adopt proprietary technical standards that would, even if inadvertently, exclude certain kinds of content and information sources. They worry that this would undermine the very incentive and opportunity for innovation that led to the creation and growth of the Internet.

Those concerns have led to various policy proposals. For example, cable television companies providing broadband Internet access might be required either to stay out of the content business or to accept transmission requests from all ISPs without discrimination. My Stanford colleague Larry Lessig's "net neutrality" proposal, although not well-defined, would seek to preserve what he sees as an existing "commons" in which Internet technology and standards are neutral among service providers, users, and content.

Solutions to complex policy debates like these must incorporate ideas from economics, law, and technology. One way to integrate and focus those approaches is by using the idea of property rights. In the present case, we can think of the right to control access to a local broadband system or the right to determine the technical standards that describe which transmissions will or will not be processed for local distribution, as property rights. Such rights can then be assigned to someone, or to some group, or to no one. We then ask which of those assignments produces the greatest net economic benefit for society, and how that assignment might be accomplished.

The policy issue of assigning rights of access to local broadband facilities is no mere academic exercise, partly because of the inconsistencies, noted above, in how technologies and providers are treated. Furthermore, various commercial interests with a stake in the debate have invested in advocacy by lobbyists and economists. The issue also remains alive because of academic support for a collective approach in which no facilities investor would control access.

PROPERTY RIGHTS AS COMMODITIES

Economics students learn about the Coase Theorem. What they remember, usually, is Nobel laureate Ronald Coase's argument that property rights will end up in the hands of the most efficient owners or users if such rights are clearly defined and can be traded freely and cheaply.

The Coase Theorem is an elegant extension of the concept of competitive markets and the power of the "invisible hand." Indeed, the idea is not limited to property rights, but extends to any legal entitlement. The key insight is that legal entitlements are, for some purposes, best understood as economic goods to be bought and sold in the market. Just as competitive markets can allocate other scarce resources efficiently, they can do so with rights.

The Coase Theorem has two policy implications. The point that people tend to remember is that laissez faire policies generally advance consumer welfare. The other implication, less often remembered, is that when transactions are not cheap and

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easy, it is important to assign property rights as nearly as possible to their most efficient users. Otherwise, unless the hard-to-transfer rights happen to land naturally in the hands of efficient users, opportunities for welfare gains will be lost. The recognition and initial assignment of property and other legal rights are, of course, roles for the state.

Determining who are the most efficient holders of a given property right is not easy, which is why it is a relief to let the market work out the answer whenever possible. But when transaction costs are high, the task cannot responsibly be avoided. A thorough analysis of the costs and benefits of various assignments is required, and both static (resource allocation) and dynamic (investment and innovation) issues must be addressed.

ACCESS The present example of this problem arises in the case of access to facilities used for broadband transmission of digital information, including Internet access, to and from consumers. Control of such access could be assigned to those who invested in the hardware (e.g., telephone companies or cable operators) or reassigned to others such as users or organizations of providers, or to no one at all as in a "commons."

The issue is not hypothetical. The facilities used by cable operators to provide digital video services already are subject to laws that reassign certain access rights from cable operators to broadcasters and others. This property rights reassignment was upheld by the Supreme Court in the 1994 *Turner* case that found TV broadcasters have the statutory right to send their signals over local cable systems without charge. Similar rights reassignments affect digital video services provided by telephone companies. Although the distinction between video and other digital services is artificial, access rights policies for "non-video" services such as Internet access are still being resolved. The Federal Communications Commission, for example, has, at least until recently, declined to permit telephone companies to control access to digital facilities that provide an Internet access service called "DSL." Instead, the FCC has granted users

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a common carrier right of access to DSL. In contrast, the same FCC has so far declined to grant ISPs a right of access to cable systems. The Federal Trade Commission did create, with FCC approval, such a right with respect to Time Warner cable systems when Time Warner was acquired by America Online. Lobbying on those issues is ongoing in Washington.

TRAGIC COMMONS One of the principles of efficient allocation of scarce resources through markets is that every scarce resource must be owned by someone. If this principle is violated, a "tragedy of the commons" results, in which the resource is ill-managed and over-used. Ocean fisheries are often used as an example. No one owns the fish until they are caught. Therefore, no one has an incentive to ensure there is a sustainable catch. A true commons is a Hobbesian nightmare.

Very often, however, resources in a commons are not really owned by no one, as the term implies, but by some collective or corporate body. The common grazing land in English villages, for example, would have been defended against use by non-residents; its use by residents was not anarchic. Any "tragedies" in such cases have to do not with property rights but with organizational, political, or management failures.

Lessig and other advocates of a "commons" as a solution to broadband Internet and other policy issues probably have in mind not anarchy but collective control. Indeed, the interconnection of electronic networks requires that someone set standards, and from the beginning that has been the case with the Internet. In this sense, the Internet today is not a commons but a collective, managed by committees, "open" to all who comply with its standards, and closed to all who do not. An irony of Lessig's position is that the Internet protocols, like any standards however "open," do exclude. They exclude users and services that might exist but do not, because the present standards prevent their existence.

DOES IT MATTER?

The balance of this article is devoted to analysis of the costs and benefits of alternative rights assignments in the cases of, first, access to broadband facilities, and second, the right to define and use technical standards that establish interconnection and transmission possibilities. However, in the spirit of Coase, we must first ask whether it matters what the government does. If any rights assigned or reassigned by the government could subsequently be traded without difficulty, the market will take care of the efficiency analysis.

Unfortunately, it is clear immediately that a market reassignment cannot be relied upon in the case of rights of broadband access or standard-setting. True, if access rights were granted initially to facilities investors, they could easily sell the rights to, say, content providers if the potential revenues from such sales exceeded the profit from vertical integration. But the reverse is not true. An initial assignment of access rights to "content providers" or any other open group generally means that it would be impossible for facilities investors to purchase such rights in the market, for two reasons: First, there is no way to identify all the owners of the rights, because new ones can declare themselves at will. Second, there is an incentive for false claimants to come forward. Every letter-to-the-editor writer and every college film student, for example, is a content provider.

> If content providers are not the most efficient holders of access rights, then government should not assign them those rights and rely on Coase to sort things out.

Unless content providers are indeed the most efficient holders of access rights, it would be an error — potentially grave and costly — for the government to assign access rights to them and rely on the Coase Theorem to sort things out. This point is important because the political stakes in the policy debate may be driven chiefly by the greed of the interest groups for economic rents rather than their concern for efficiency. Policymakers ought not to have the impression that they can safely ignore efficiency. At least in this case, the overall size of the pie available to be divided by the politicians among the interest groups will be affected by their assignment decisions.

REASONS FOR REASSIGNMENT OF RIGHTS

The "natural" or default initial assignment of rights to control the use of a commercial facility is with the person who invested in its creation. Otherwise, the facility is unlikely to be constructed. Any other (involuntary) assignment requires state intervention, which obviously is both costly and susceptible to error. Nevertheless, as described above, there may be reason to disturb the "natural" assignment if market transfers to more efficient holders are difficult and expensive. (Note that we ignore the political or legal legitimacy of disturbing the initial pattern of rights in what might be called a state of nature. These are compensation-for-takings or distribution-of-wealth issues rather than efficiency concerns.)

One obvious reason for reassignment is market power. A monopolist may increase prices and profits by restricting access to its facility. Public utility and railroad regulators classically responded to such problems by transferring the right of access to users and placing a ceiling on the price charged for service. If regulators do their work well, this may increase consumer welfare while retaining a sufficient incentive for the monopolist to maintain and expand its investment.

Regulatory interventions of this kind carry serious risks.

One risk is that the policy intervention simply is mistaken. Another is that, even if the policy is not mistaken, the potential cost of being subject to such mistakes will unduly stifle new investment by anyone with dreams of vast commercial success. Such dreams may be common among risk-taking entrepreneurs. Still another risk is distorted incentives. Regulated monopolists, of course, seek to escape their regulatory constraints. One escape strategy is to integrate vertically into an unregulated, related business that then receives preferential treatment from the monopoly facility. That was the problem that led to the dissolution of the old Bell System in 1983 — a major property rights reassignment.

A second reason for favoring reassignment of initial property rights is spillover effects, or "externalities." The full marginal costs and benefits of facility operation may not fall naturally on the investor. For example, there may be pollution problems. Or, there may be benefits from the facility for which the investor is unable for technical reasons to identify or charge beneficiaries. In those cases, the facility investor may invest either too much or too little. Reassignment of some initial rights to or from those who are affected by the facility may "internalize" the external effects of operation. Efficient investment results from better alignment of private incentives with social outcomes. Where that is not feasible, the rights in question may have to be reallocated to the state at some level, or taxed or subsidized.

A third reason for intervention to reassign initial property rights may be that leaving those rights where they fall can lead to technical decisions that inadvertently discourage innovation and investment by others. While this really is a species of externality, it is an important one in the broadband "commons" debate.

A facility investor makes technical or engineering decisions so as to maximize its profits. It would be difficult for the investor to assess and charge for the benefits created by its choice of a set of standards especially conducive to experimentation and invention or to investment in and use of others' facilities. Hence, the facility investor may have too little incentive to take account of the social benefits or costs. Transfer of the right to set technical standards, such as interconnection protocols, to user groups or industry-wide collectives may help solve such problems. In some cases, those transfers may not take place voluntarily. In practice, when it comes to the Internet, facilities investors act as if they had transferred standard-setting rights to industry associations.

Those three conceptual rationales for reassigning rights away from facilities investors each calls for a policy analysis that is partly technical and partly economic. The information used in the analyses will be imperfect, particularly regarding future events. It seems sensible to insist, in view of the likely margin of error, that the expected net benefits of intervention be quite large. Solutions involving permanent government involvement are often inflexible and difficult to change, even when a policy turns out to be based on erroneous assumptions. In contrast, bad market outcomes can change spontaneously without recourse to due process or political consensus.

BROADBAND ACCESS RIGHTS

Should rights of access to local broadband facilities be reassigned from investors and, if so, to whom: users, ISPs and content providers, a collective, or no one? As noted above, a prominent reason for considering such a policy would be to eliminate a barrier that prevented the voluntary transfer of such rights in response to a differentially higher valuation by someone other than the initial investor. No such barrier appears to exist. Indeed, access to broadband facilities is now routinely offered for sale and broadband facilities investors adhere, not surprisingly, to the prevailing technical standards that permit their transmission services to be useful for transmission.

MONOPOLY Market power in local distribution is a more serious matter. Local telephone companies have long enjoyed a monopoly, and cable television systems have also been viewed by the FCC as monopolists of multi-channel video services. This era, however, is ending. Local wireline telephone service is increasingly competitive as a result of wireless telephony. Internet telephony appears poised to further increase competition by making digital cable facilities fully substitutable for local telephone loops and by undermining the anticompetitive regulatory system of cross-subsidies among telephone services. Direct broadcast satellites now compete with cable systems in providing multi-channel video distribution. Thus, the traditional local monopolies in telephone and video service are disappearing.

In local broadband Internet access, there never was a monopoly. Cable systems compete now with telephone companies, and both face competition to a much lesser but increasing extent from wireless and satellite providers.

Even if competition in local broadband service were not present, this business is too new (about five years old, with less than a quarter of U.S. households signed up, although service is available to about three-quarters) to meet the usual strict standard for reassignment of access rights. For example, in antitrust law the so-called "essential facilities doctrine" imposes an obligation to provide access (to competitors) only as a last resort, in the absence of reasonable alternatives, and after the incumbent monopolist has engaged in a sustained pattern of anticompetitive abuses and exclusions. Neither local cable systems nor telephone companies have met this test in their digital broadband offerings, whatever the case may be in their older services.

There is a tradeoff involved in making an assessment of this sort. On one side there are the potential costs to consumers from a monopolist's incentive and opportunity to exclude or raise the costs of its competitors, or to stifle competitive innovation. On the other side is the harm to consumers from creating a disincentive for a monopolist to invest in expanding or maintaining its own facilities. The investment disincentive arises from restricting the monopolist's ability to receive part or all of the benefits of its investments. This disincentive can extend not only to a firm that has acquired a monopoly already, but also to any firm that might acquire a monopoly if it competes more vigorously. Clearly, at the very least, one should make sure that a firm from whom certain access rights are to be taken really is an entrenched monopolist. If it is not, then there probably are not going to be any consumer benefits from the reassignment of access rights, and thus nothing to weigh against the costs of impaired investment incentives.

Finally, a decision to separate access rights from investment and operation carries with it the necessity to engage in regulation. The (hypothetical) monopolist will still wish to use whatever means are at its disposal to maximize its profits, reducing the user value of access rights. Courts or public utility regulators must seek to limit those efforts or the whole exercise may be pointless. Unfortunately, regulatory intervention can introduce other costly distortions. Effective regulation of monopolists is harder than herding cats. Policymakers should try very hard to seek competitive solutions before resorting to structural remedies, especially those that require continuing regulation.

Overall, local broadband access meets none of the criteria for state intervention to transfer rights away from facilities investors involuntarily. We turn next to the question of standards.

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THE RIGHT TO SET AND USE STANDARDS

Should local broadband facilities investors be able to control the technical standards according to which they will accept and deliver transmissions, or should the right to specify those standards be reassigned to others? This question is much more difficult than the access question just discussed. Economists lack "invisible-hand theorems" when it comes to the decentralized adoption of standards.

Standards are peculiar. They have features that make them like non-rivalrous consumption goods, so that prices should not be used to exclude marginal users. Standards may be subject to network effects, becoming more useful as more users adhere to them. Standards may contribute to inefficient monopolization, and yet they may be under-produced in competitive markets. Based on economic research to date, it appears that competitive, decentralized markets may sometimes adopt inefficient standards, or no standards at all, as may a monopolist or a government agency or an industry committee — although the reasons for the error may differ in each case.

Standards for transmission on the Internet — the descriptions of the various Internet and Web communication protocols with familiar acronyms like FTP, HTTP, SSL, SMTP and so on — were set initially by the United States Department of Defense. The DOD invented DARPAnet, the ancestor of the Internet, to provide convenient electronic communication between government officials and defense contractors. The scientists hired to construct DARPAnet inadvertently created a system that also made a very useful platform for civilian communication. As communication technologies have evolved, so have the protocols. The standards are now defined by committees. This happened first under the aegis of various civilian government agencies and, after the Internet was privatized, by industry associations such as ICANN.

The Internet protocols are not proprietary — they are not secret or patented, and anyone can use them free of charge. Nevertheless, the protocols are not established today by a "commons." They are established by industry committees representing a variety of user and supplier economic interests, but with a common interest in promoting the growth of Internet use.

The distinction between control of the standards and use of the standards is important. Even entities that do not participate in setting a standard nonetheless benefit from its use because those who control the standard voluntarily assign use rights to everyone. Perhaps they do so out of goodwill. But it is no accident that increased use of the Internet benefits the equipment and service suppliers and corporate or agency users whose employees staff the standard-setting committees.

So far, there does not seem to be any obvious flaw in this picture, except for the exclusion of users and uses that do not or cannot utilize the established standards. It is a system that obviously has supported the explosive growth of the Internet and the many innovative services that now rely in part on Internet transmission of data. No one knows what would have happened but for the decisions made by the government early in the game or the collective more recently; the outcome of some other set of decisions could have been either better or worse than the Internet that we actually observe.

PROPIETARY STANDARDS Nevertheless, Professor Lessig and many others have argued that there is a danger in permitting local broadband service companies to provide unregulated high-speed residential Internet services. The danger they see is that those companies will choose not to adhere to the established standards, but will instead adopt new proprietary standards.

In property rights terms, the danger that Lessig sees is that both the right to create and the right to use certain (as yet undefined) future communication protocols will be owned by facilities investors rather than industry committees and users, respectively. To avert that danger, the proposed remedy is to forbid broadband providers to establish their own standards, requiring them instead to adhere to some specified set of outside standards. This would, according to Lessig, protect the standards "commons" that has served so well as a platform for innovation and investment in new digital services.

The policy analysis starts with the Coase Question: Does it matter? If rights to set and use Internet standards are left to lie

where they fall (on facilities investors), can investors easily transfer those rights to others, such as users or industry committees? Answer: Yes, it is the norm today. How about the reverse: If standard-setting and use rights were assigned initially to open industry committees and to users, respectively, could they easily be transferred back to facilities investors? Answer: No, for the same reasons as with access rights — with whom does a facilities investor negotiate in an open collective? Therefore, as with access, it does matter to whom rights are assigned initially.

The next step, given this answer, is to ask who the most efficient holder of those rights is. In practice, given the facts, we can ask a narrower question: If the rights are left to lie where they fall, which as we know is with a holder who can easily transfer them to others if that is profitable, is there reason to believe that the incentives provided by private profit-seeking differ from socially optimal incentives? Is there market power, for example, or some externality that suggests the necessity for an involuntary transfer?

Clearly, market power on the scale required to justify property rights transfers is not an issue. As explained above, cable companies do not have a monopoly of local broadband facilities; neither do DSL providers such as telephone companies, and more competitors using wireless transmission methods probably are on the way. On the real-world spectrum from iron-clad monopolists to atomistic competitors, local broadband providers are too competitive to justify regulation. Therefore, it is reasonable to assume that the principal reason why such an investor would wish to establish its own standards, or not to accept all prevailing industry standards, would be a desire to attract more customers by offering a service that was in some way improved — in other words, to compete. After all, proprietary standards drive off at least some users, putting the provider at a competitive disadvantage. Indeed, the advantage to any supplier of adhering to established standards in a network setting usually is overwhelming. One would expect it to be abandoned only if necessary in order to offer some innovation that would provide huge benefits to the remaining users. Why would we want to discourage such innovation?

NETWORK EFFECTS Leaving market power behind us, is there some other economic pathology justifying an involuntary transfer of standard-setting or use rights? Two possibilities are apparent.

First, standard-setting is potentially subject to network effects, as noted above. That is, the value of a standard to a given user depends in part on how many other users have adopted the standard or a compatible one. For example, life might be better for everyone if all humans agreed to speak one common language. Because every culture or country adopts its own language, the world is in some ways less efficient than if there were a central language-setting organization to which language-setting rights had been reassigned. On the other hand, a monolithic language would have costs, such as the potential loss of all the creative works, specialized ideas, and social constructions that might not exist but for the variety of human languages. Whether humankind is better off without a single tongue is an open question.

While ultimately each case is a very complex empirical question, there are good reasons to doubt that it is often correct to reassign standard-setting rights away from competitive facilities investors on account of network effects. The very factors that create those effects also create powerful pressures for decentralized adoption of common standards. It makes little sense, for example, to produce automobiles that do not run on widely available standard fuels unless the automobiles have such overwhelming advantages to consumers in some other dimension as to make them worth the trouble. But we should want to preserve, for the benefit of consumers, providers' option to reach for innovations so advantageous as to justify the inconvenience of a proprietary standard.

The second possible justification for reassigning rights pertains to standards-use rights. Standards are, from a user perspective, non-rivalrous goods; they are not scarce. The cost of producing a standard is not affected by how many people use it. Hence, it is inefficient to exclude any users by, for example, charging a fee for using the standard. The problem is not with those who pay the fee but with those who do not, and who thereby are excluded from using something that costs nothing to supply to an additional user. Of course, suppliers of standards have little incentive to charge for use when users have alternatives, so that competition will drive prices to the correct level — zero, or at least to price schedules in which the marginal price is zero.

In sum, we cannot rule out the possibility, a priori, that involuntary reassignment of use rights with respect to interconnection standards might be justified on economic welfare grounds in some situations. But there certainly is no general argument for reassignment, and there appears to be no case at all when it comes to broadband access to the Internet because those rights are now free to all, and vertical integration has thus far produced no threat to this pattern.

CONCLUSION

Property rights assignments, like the allocation of other scarce resources, can be evaluated with the tools of economic analysis. Fortunately for everyone, letting property rights stick where they fall initially, combined with subsequent free trade in them, will usually promote social welfare. But that is not always the case. Sometimes, to overcome a market failure, state intervention is required to reassign property rights to more efficient holders. When considering such intervention, it is important to remember how common is human error and how difficult it is to correct such error once enshrined in political institutions. Accordingly, the burden of proof required for intervention should be high.

If local broadband Internet services were supplied by an entrenched monopolist, and if that monopolist sought to integrate vertically into Internet content and standards creation or to restrict use of its proprietary standards in order to extend or perfect its market power, there would be a case for reassignment of access (and/or standard-setting) rights to users or others. But those conditions are not yet met, so such intervention is not justified. R