functions to reference functions to special caching needs. In short, ISPs are engines for innovation in markets we do not yet imagine.

49. These ISPs thus could be important middle level competitors in the Internet economy. They could provide an ongoing competitive threat to actors at their borders. In the terms defined by Timothy Bresnahan, ISPs could become "vertical competitors" in an industry marked by highly concentrated markets at each horizontal level.[9] Thus AOL, a traditional online content and ISP, is now a potential threat to Microsoft in the operating system platform market. This threat could not have been predicted three years ago. But by maintaining the fluidity of borders, the net preserves the potential for new forms of competition.

50. This layer of potential competition is especially important given how little we know about how the broadband market will develop. The Internet market generally has been characterized by massive shifts in the competitive center. Hardware companies (IBM) have been displaced by operating system companies (Microsoft); operating system companies have been threatened by browser corporations (Netscape) and by open-platform "meta"-operating systems (Sun's Java). As Bresnahan notes, we have no good way to know which layer in this chain of services will become the most crucial. Thus, multiplying the layers of competition provides a constant check on the dominance of any particular actor. Again, Bresnahan: "Far and away the most important is that competition came ... from another horizontal layer."[10] Thus as he

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[9] See Timothy F. Bresnahan, *New Modes of Competition: Implications for the Future Structure of the Computer Industry*, June, 1998, http://www.pff.org/pff/microsoft/bresnahan.html.

[10] *Id.* at 6.

recommends, "one (modest) policy goal would be to make the threat of [vertical competition] more effective."[11]

51. The architecture proposed by AT&T/MediaOne for their broadband cable service threatens this vertical competition. By bundling ISP service with access, and by not permitting users to select another ISP, the architecture removes ISP competition within the residential broadband cable market. By removing this competition, the architecture removes an important threat to any strategic behavior that AT&T might engage in once a merger is complete. The architecture thus represents a significant change from the existing End-to-End design for a crucial segment of the residential Internet market. Further, there is in principle no limit to what AT&T could bundle into its control of the network. As ISPs expand beyond the functions they have traditionally performed, AT&T may be in a position to foreclose all competition in an increasing range of services provided over broadband lines.

52. AT&T and MediaOne would achieve this change by bundling technologically. The consequence of this bundling will be that there will be no effective competition among ISPs serving residential broadband cable. The range of services available to broadband cable users will be determined by one of two ISPs — @Home and RoadRunner, both of whom would be allied with the same company. These ISPs will control the kind of use that customers might make of their broadband access. They will determine whether, for example, full length streaming video is permitted (it is presently not); they will determine whether customers might resell broadband services (as they presently may not); it will determine whether broadband customers

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[11] *Id.* at 18.

might become providers of web content (as they presently may not).[12] These ISPs will have the power to discriminate in the choice of Internet services they allow, and customers who want broadband access will have to accept their choice. Giving this power to discriminate to the owner of the actual network wires is fundamentally inconsistent with End-to-End design.

53. This technological bundling at the network level puts pressure on the principle of End-to-End. These cable-owned-ISPs would thereby influence the development and use of cable broadband technology. They would be exercising that influence not at the "ends" of the network, but at the center. They are therefore shifting control over innovation, as Dr. Jerome Saltzer has written, from a variety of users and programmers to a single network owner. This design defeats the principle that the network remain neutral, and empower the users. It is the first step to a return to the architecture of the old AT&T monopoly.

B. The Costs of Violating Architectural Principles

54. The costs of violating this fundamental principle of the Internet's design are hard to reckon. We simply do not know enough to know how sensitive the innovation of the Internet is to changes in this competitive architecture. Obviously, in part the significance turns on how the broadband market develops. But given trends as we can identify them now, the risks of significant consequences from this design are great. We detail some of these risks below.

55. The first is the cost of losing ISP competition. As we have argued, one should not think of ISPs as providing a fixed and immutable set of services. Right now ISPs typically provide customer support, as well as an IP address that channels the customer's data. Competition among ISPs focuses on access speed, as well as some competition for content.

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[12] These limitations are imposed by At Home Corporation. See @Home Acceptable Use Policy.

AOL, for example, is both an access provider and content provider. Mindspring, on the other hand, simply provides access.

56. In the future, however, ISPs are potential vertical competitors to access providers who could provide competitive packages of content, or differently optimized caching servers, or different mixes of customer support, or advanced Internet services. This ISP competition would provide a constant pressure on access providers to optimize access.

57. The benefits from this competition in the history of the Internet so far should not be underestimated. The ISP market is extraordinarily competitive. This competition has driven providers to expand capacity and lower prices. It has also driven providers to give highly effective customer support. This extraordinary build-out of capacity has not been incented through the promise of monopoly protection. The competitive market has provided a sufficient incentive, and the market has responded.

58. The second cost is the risk that legacy business models will improperly affect the architecture of the net. Broadband is a potential competitor to traditional cable video services. Traditional cable providers might well view this competition as a long term threat to their business model, and they may not want to change to face that competitive threat. By gaining control over the network architecture, however, cable providers are in a position to affect the development of the architecture so as to minimize the threat of broadband to their own video market. For example, a broadband cable provider that has control over the ISPs its customers use might be expected to restrict customers' access to streaming video from competitive content sources, in order to preserve its market of traditional cable video.

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http://www.home.com/support/aup/ (Visited November 8, 1999); At Home Corporation. @Home Frequently Asked Questions. http://www.home.com/support/netscape/faq/faq.html (Visited November 8, 1999).

59. The third cost of such control by a strategic actor is the threat to innovation. Innovators are less likely to invest in a market where a powerful actor has the power to behave strategically against it. Innovation in streaming technologies, for example, is less likely when a strategic actor can affect the selection of streaming technologies, against new, and competitive systems.

60. One example of this cost to innovation is the uncertainty that is created for future applications of broadband technology. One specific set of such applications are those that count on the Internet being "always on." Applications are being developed, for example, that would allow the net to monitor home security, or the health of an at-risk resident. These applications would depend upon constant Internet access.

61. Whether, as a software designer, it makes sense to develop such applications depends in part upon the likelihood that they could be deployed in broadband cable contexts. Under the End-to-End design of the Internet, this would not be a question. The network would carry everything; the choice about use would be made by the user. But under the design proposed by the merged company, AT&T affiliates would have the power to decide whether these particular services would be "permitted" on the cable broadband network. Cable has already exercised this power to discriminate against some services. They have given no guarantee of non-discrimination in the future. Thus if cable decided that such services would not be permitted, the return to an innovator would be reduced by the proportion of the residential broadband market controlled by cable.

62. Our point is not that cable would necessarily discriminate against such technologies. Rather, our point is that the possibility of such discrimination increases the risk an

innovator faces when deciding whether to design for the net. The increasing risk is a cost to innovation, and this cost should be expected to reduce innovation.

63. Perhaps some of these costs could be remedied by competition from other broadband providers. If cable companies restrict the nature of ISP service for broadband cable, then to the extent there is competition from DSL, DSL might have a competitive advantage over cable.

64. But not all of the costs to the Internet market from this change in architectural design could be remedied by competition from other broadband providers. In particular, the cost to innovation would not be remedied by competition among providers. That cost is borne by the market as a whole, not by particular consumers in the market. Consumers individually don't feel any cost from this threat to innovation. They therefore have no additional incentive to move from one kind of provider (cable) to another (DSL). Thus, if the increase in strategic power dampens the willingness to invest in broadband technologies, there is no mechanism by which that effect will be felt, and remedied, by broadband consumers directly.

65. More importantly, given the approach that the FCC has adopted for this case in particular, there is no reason to expect that the cost will be avoided in other cases. As each new broadband technology enters the Internet market, the FCC's position in this case would imply that that new technology too could violate this principle of End-to-End design. Only xDSL would be required (because of existing statutory obligations) to maintain the principle of End-to-End design with respect to ISP choice.[13] And even if xDSL does provide a competitive market for some ISPs who want to serve broadband access (on which more below), it simply makes no

sense as a matter of economic policy to foreclose the largest possible market for ISP competition, particularly when doing so serves no good end.

C. The Importance of Acting Now

66. As we describe more fully below, there are those within the FCC who have expressed the view that there is no reason for the FCC to address the open access question in the context of this merger. The merger itself will not change the bundling policy of the existing AT&T Cable Services network. Thus any problem with open access, some would claim, is not exacerbated by the merger.

67. This view misunderstands the potential for strategic action. If there are five broadband cable networks, each acting independently, then the threat to innovation is less than if these five broadband cable networks could act in unison. If they were independent, then the decision of some networks to block certain kinds of Internet services would not necessarily influence any other networks. Thus the threat to innovation would not be as great. Once the cable monopolies can act together, however, and decision to discriminate would affect a larger section of the market. The risk to innovation would therefore be much greater. Further, AT&T is implementing its bundling policy now, and a firm stance in favor of open access by the FCC could have a beneficial effect on AT&T's policy, not only regarding MediaOne, but in other markets as well.

68. The "wait and see" approach also discounts the cost of regulating ex post. In its present state, the ISPs that AT&T would rely upon are independent business units. If the merger were completed, they could easily be folded into the resulting entity. Once integrated, the

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[13] Further, if bundling of broadband service is permitted for every network except those based on classic telephone wires, eventually xDSL providers will have a strong moral case that they should not be subject to a restriction that

regulatory costs of identifying non-discriminatory rates would be much higher than they would be under the existing structure. Rather than the complexity that DSL regulation involves, imposing a rule of open access now would be relatively less costly. The same is even more true of independent ISPs. If the vibrant market for ISPs in narrowband access is weakened or destroyed because they cannot provide broadband service, those ISPs and their innovative contributions will disappear. If they do, we won't magically get competition back by deciding later to open the broadband market to competition.

D. A Comparison to *United States v. Microsoft*[14]

69. To see the significance of the threat in the context of broadband, it is useful to compare the nature of the bundle at issue in this merger with the threat that the government has alleged in *United States v. Microsoft* that Microsoft poses. Obviously the two cases are different in many ways. Microsoft's operating system is far more dominant than is cable broadband service. But the point of the comparison is not to equate the competitive threat of the two services. It is to see the structural equivalence between the threats.

70. The government's primary claim against Microsoft is a charge of monopoly maintenance. The argument is that Microsoft bundled its browser with its operating system, so as to foreclose effective competition in the browser market, and thereby protect its monopoly returns in the operating system market. The threat that the government claims Microsoft was avoiding was the development of a robust application platform, built around Java technologies. As the browser was the platform within which such applications could develop, it was important, the government argues, to keep control of the browser market.

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does not burden any of their competitors.

71. The issues in *United States v. Microsoft* are extremely complex. No fair consideration of the real issues in the case could conclude that either side has an easy argument. But what is clear is that the behavior alleged against Microsoft is far less controlling than the tie alleged here.

72. In this matter too, the claim of those supporting open access is that AT&T/MediaOne would be in a position to maintain monopoly power, at least over the video market. Like the Microsoft case, this maintenance would be affected by keeping control over the source of potential competition. In the Microsoft case, that was the browser; in this case, that is ISP competition.

73. But importantly, the level of control exercised by AT&T in this case is far greater than the control Microsoft is alleged to assert. The government has never argued that Microsoft totally disabled the ability of competing browsers to be installed on client machines; the most the government alleged was that Microsoft made it difficult, or uneconomical, to load a competing browser. Once properly installed, a competitor browser on the Windows platform works just as well as Microsoft's. Or more precisely, the government has not alleged that the platform disables competitor browsers.

74. In the case of cable broadband, however, the architecture does disable the relevant competition. One simply cannot choose a competitor ISP as the primary ISP in the cable broadband architecture, and thus one cannot choose a competitor to provide the primary ISP services.

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[14] We note that Lessig served as special master in a prior proceeding between the United States and Microsoft, and Lemley has served as a consultant to the Antitrust Division of the United States Department of Justice on the current case. It is not our attention to offer here any opinion on the merits of either case.

75. AT&T argues that this competition is not disabled by the cable broadband architecture, since a customer can always "click-through" to a non-cable ISP. But the ability to click through provides just a fraction of the services that a competitor ISP might potentially provide. It would be as if competitor browsers on the Windows platform performed just 30% of the functions that they performed on other platforms. Further, click-though may be economically irrational even if it is technically feasible, just as Microsoft's original "per processor" license made it nominally possible but extremely unlikely for an OEM to load two operating systems onto a computer. Thus the question in this matter is not whether a user will take the time to "download" another ISP connection; there's no such download possible. The architecture ties the user to AT&T/MediaOne's ISP; users cannot cut that knot.

IV. The Arguments in Favor of Broadband Bundling

A. A Policy of "Regulatory Restraint"

76. It is our view that AT&T's desired design of the architecture of the emerging broadband cable market could be a significant threat to innovation in this market. We suggest a presumption that no significant portion of the broadband market be permitted to violate the "End-to-End" design, unless there is clear evidence that such a change is benign.

77. So far the FCC has taken a different view. In its initial consideration of this matter, and in the most recent reports from the Cable Services Bureau, the FCC has taken the position that it would best facilitate competition in this market by simply doing nothing. In our view, this profoundly underplays the importance of the FCC's activism in assuring competition in the past, and will jeopardize the innovative prospects for broadband Internet service in the future.

78. The Cable Services Bureau most recent report to Chairman William Kennard has recommend a policy of "regulatory restraint."[15] It grounds its recommendations on a number of "responses and preliminary findings," and on a straightforward cost benefit analysis of the risks, and benefits, from "regulatory restraint." The "responses and preliminary findings" are as follows:

(1)	The broadband industry is nascent;
(2)	Cable modem deployment spurs alternative broadband technologies;
(3)	Regulation or the threat of regulation ultimately slows deployment of broadband
(4)	Market forces will compel cable companies to negotiate access agreements with unaffiliated ISPs, preventing cable companies from keeping systems closed and proprietary
(5)	If market forces fail and cable becomes the dominant means of Internet access, regulation might then be necessary to promote competition
(6)	There was no consensus on how to implement "open access" from a regulatory perspective
(7)	There was no consensus on how to implement "open access" from a technical perspective
(8)	Rapid nationwide broadband deployment depends on a national policy

79. In our view, conclusions (1) and (2) are correct. Conclusions (6), (7) and (8) may be correct, but are irrelevant to this proceeding. Conclusions (3), (4), and (5), the heart of the policy recommendation, are both wrong and internally inconsistent.

80. *Findings (1) and (2)*: It is clearly correct that broadband services are just beginning. The vast majority of Internet users are narrowband users. The content and services

[15] See Broadband Today, Staff Report To William E. Kennard, Chairman Federal Communications Commission On Industry Monitoring Sessions Convened By Cable Services Bureau (October 1999).

that fit best with broadband are just being developed. These services are in part services that require large bandwidth to function effectively. (Streaming video or audio is an example). More significantly, they are also services that assume that the user is "always on" the Internet. This latter fact will, in our view, lead to the most significant change in how the Internet will be used. There are a host of applications that are just beginning to be envisioned that will depend upon the Internet constantly monitoring and responding to situations "at home." Many of these services are difficult or impossible to implement through modem-based telephone access.

81. It also appears correct, though we have not studied the matter independently, that cable broadband service has spurred other broadband providers, in particular DSL. We do believe the report overstates the significance of existing DSL competition. The current market share of cable in the residential broadband market is over 80%.[16] This lead is significant, and is unlikely to change quickly.[17]

82. *Findings 6 and 7*: The Bureau maintains that there is neither agreement on how to implement "open access" nor agreement on what "open access" is. But this part of the report reads like a poor imitation of a Socratic dialogue. Obviously, if one gathers a collection of bright lawyers and technologists, each advancing different interests, one can create a cacophony of views about what "open access" is, just as a good law professor can create a cacophony of views about what "justice" is, or even what the "FCC" is. But a law professor can not deny that there is an "FCC" merely because no "agreement" in definition is found. And the Bureau should not

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[16] See *Cable Takes the Early Lead*, **The Industry Standard** (October 11, 1999) at 119. For an earlier and higher estimate, see Randy Barrett, "*Cable, phone lines in battle for supremacy*, **Inter@ctive Week** 69 (January 25, 1999)

[17] See, e.g., Forrester Report, From Dial-Up to Broadband, April 1999, at 10.

deny the fundamental principle of "open access" that has animated telephone deregulation merely because lawyers can disagree about how it should be implemented.

83. This is especially true for the FCC, because the FCC mandates that DSL offer broadband under what is described as an "open access" model. How it is possible that there is no concept of "open access" in the context of cable, but a concept of open access in the context of DSL, frankly baffles us.[18] Certainly if the providers of DSL refused customers the choice of ISPs, and then cited the Bureau's findings as a defense to its actions, no court would recognize the lack of a definition as any excuse.

84. In our view, "open access" is simply a short hand for a set of competitive objectives. The objectives sought in the DSL context are perfectly adequate to apply in this context, at least as a starting point. For the relevant question that the agency should address is how to assure that customers have an easy choice among relevant competitors, so as to preserve competition in the broadband market. The DSL requirements assure that.

85. The Commission can impose open access conditions on the AT&T/MediaOne merger without replicating the complex regulatory scheme necessary to implement sections 251 and 252 of the 1996 Telecommunications Act. Interconnection to a cable modem network, even by multiple ISPs, involves nothing more than a standard Internet connection between an ISP and a router. It does not require collocation of equipment, nor would open access conditions require AT&T/MediaOne to honor requests for interconnection at special locations within its network.

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[18] Indeed, AT&T has argued vigorously in favor of imposing open access requirements on local telephone providers. See Reply Comments of AT&T Corp. (CC Docket No. 98-147), filed October 16, 1998, at 37: "the most important action the Commission can take to speed deployment of advanced telecommunications services is to vigorously implement and enforce the market-opening obligations that Section 251 imposes on incumbent LECs." Why deployment is encouraged by open access in one context, but closed access in another, is unclear to us.

So long as unaffiliated ISPs are allowed to interconnect at the same place — and at the same price — as unaffiliated ISPs, the End-to-End principle will not be compromised.

86. The Bureau report seems to suggest that it is enough if access is open in one broadband context, and not in all. But in our view, a principle is respected if respected generally, not occasionally. And the benefits of a principle come from the expectation that it will be respected. Further, it makes no sense economically to argue that competition in a small subset of the broadband market is an adequate substitute for competition in the entire broadband market. This is particularly true if (as the Bureau report itself suggests) the characteristics of the media differ.

87. *Finding (3), (4) and (5)*: The core of the Bureau's arguments, however, rest on findings 3 through 5. These findings, we submit, are internally inconsistent. On the one hand, the Bureau seems to assume that broadband cable will voluntarily adopt some form of open access. Finding (4) states that "market forces will compel cable companies to negotiate access agreements with unaffiliated ISPs." Thus the future, in the Bureau's view, will be much like DSL is (because of regulatory requirements) today. The naïve assumption that AT&T will voluntarily open the market to competition flies in the face of AT&T's established policy, compounded by the consolidation that is occurring in the broadband market. The Bureau does not explain exactly what "market forces" will compel AT&T to open this market. How exactly will customers of a certified natural monopoly exercise the power to "vote with their wallets?" The only plausible disciplining effect the market might have on AT&T's closed access policy is to slow the rate of subscription to cable modem service, because the bundled service AT&T provides is less attractive than an open alternative. But there is no reason to believe that AT&T, lacking effective competitors in the broadband business in any given city, will recognize or respond to this market

threat. Further, if the Bureau's hope is that AT&T will be forced into open access because consumers will delay their switch to broadband in boycott of its closed access policy, it is a supreme piece of irony to suggest that it is the threat of *regulation* that will delay the deployment of broadband technology.

88. If, however, the future is not a future of open access, and if cable becomes dominant, then finding (5) suggests that "regulation might then be necessary."[19] Thus the Bureau threatens regulation if access is not open, after stating, in finding (3) that "the threat of regulation ultimately slows deployment of broadband." These three findings cannot go together. The Bureau cannot consistently maintain it is not threatening regulation and then threaten regulation. The Bureau creates more uncertainty than it removes, by conditioning this threat of regulation of extremely vague notions of how extensive cable broadband must be, and how much open access cable must provide.

89. Indeed, if the Bureau does in fact decide to regulate this industry because access does not magically become open, we will end up with *more* rather than less regulation, because the bureau will have to regulate not just access to the wires, but a whole host of industries that could have been competitive but that ended up being bundled to the network itself. We will find ourselves, in short, in a new era of regulation reminiscent of the old days of the Bell System.

90. The way to reduce uncertainty, and promote broadband adoption, would be for the FCC to simply state a clear policy — that cable must be architected to facilitate open access to cable customers. How quickly, and how precisely, are questions the agency can defer for now. Just as the FTC has required online merchants to deal with privacy, or face regulation, so too

could the FCC require access providers with significant market power to provide open access, or face regulation if they don't. The policy — open access — should be clear, even if cable companies control how it is implemented in the first instance.

91. The need for this policy is pressing. The Bureau's evidence that cable will negotiate open access contracts is both slight, and beside the point. The Bureau points to negotiations with America Online, which it suggests is evidence that cable will provide independent access generally. But the principle of open access, and the value preserved by End-to-End architecture, is not that the largest and most powerful have the right to access. The principle of open access, and the design of End-to-End, is that *anyone* with a better mousetrap gets access to the market.

B. Technological Limitations to Open Access

92. The Bureau repeats technological arguments about why open access is not feasible in the context of broadband cable. These arguments are misleading at best.

93. *First,* the Bureau repeats cables claim that there is something technologically impossible about giving ISPs access to the cable lines. Cable, it is claimed, is a "shared medium," while DSL is dedicated.

94. This is a fundamentally misleading argument. The Internet itself is a shared medium. Its performance, as the report notes, "var[ies] depending on the number of actual subscribers using the Internet connection at the same time."[20] The only difference between DSL and cable is the place where one enters the shared pool. It is true that cable is architected to share

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[19] See Broadband Today, Staff Report To William E. Kennard, Chairman Federal Communications Commission On Industry Monitoring Sessions Convened By Cable Services Bureau 35 (October 1999).

bandwidth among local users, whereas DSL does not. But whether that difference results in a difference in performance is simply a function of how many users the cable company decides to connect, and not upon whether the users it connects have different ISPs. Give a certain profile of usage, cable broadband can guarantee an effective equivalent of unshared access simply by not overselling the access they attach at any single node. More to the point, the cable companies can control usage whether or not they also own the ISPs, merely by limiting the number and size of network subscriptions. So the shared medium argument does not justify bundling of ISP service with access to the network.

95. *Second*, the Bureau argues that security on a cable node is less effective than on a DSL connection, since data from other computers passes by all computers on a network node (as is the case, for example, with an Ethernet network). This argument too is misleading. There is a difference in the security approaches necessary to implement broadband cable securely, since users on a particular node are all exposed to the same network traffic. But cable companies are already developing technologies to eliminate that security risk. There is no reason to believe that a properly implemented cable system would be any less secure than a comparable DSL system. And again, there is no reason to believe that cable control over ISPs is necessary to achieve this goal.

96. *Third,* the Bureau makes much of AT&T's expectations that it would be permitted to run a closed network. The report sites the colorful mixed metaphor of one analyst, that an open access requirement "puts a shotgun slug through two inches of Excel spreadsheets that

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[20] *Id.* at 19.

[cable companies] use to generate their rate-of-return calculations."[21] The argument is apparently a point about economic justice or fairness — that it would be unjust or unfair to change the rules just now.

97. If AT&T had these expectations, they were unreasonable. In an age that has reaped extraordinary benefits from the regulations that deregulated the telephone monopoly, and that is beginning to reap the benefits from similar regulations deregulating other local monopolies — for example, electricity — no reasonable business could believe it likely that it could sustain an old-world regulatory structure that protected monopoly. And if AT&T did build its models on that assumption, doubtless Excel is quite capable of recalculating the returns on a different set of assumptions. That, after all, is what an electronic spreadsheet is for.

C. Incentives to Build Broadband Connections

98. The Bureau repeats the threat of cable companies, that they won't invest as quickly if they are forced to open access. In effect, the argument is that we must grant cable companies not just a monopoly over the wires, but a right to expand that monopoly into competitive markets, in order to give them an incentive to implement broadband access. This argument is simply wrong as a matter of economics. It is possible to grant whatever incentives are needed by setting the appropriate price for control of the wires themselves. Allowing the cable companies to gain that incentive by monopolizing a competitive market offers no guarantee of giving the appropriate incentive, and (as discussed above) poses significant risks to competition and innovation.

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[21] *Id.* at 34.

99. We also suggest that the cable companies protest too much. We have heard many times the argument that an industry won't ever develop — or will collapse — if it isn't given preferential treatment by the government. Most of those arguments turn out to be illusory. In the late 1970s, Hollywood argued to Congress that the movie business would not exist in ten years unless VCRs were banned. We wisely decided not to ban VCRs, and Hollywood is doing better than ever. More recently, respected legal scholars argued as late as 1995 that no one would ever put any valuable content on the Internet unless Congress passed special copyright protections for Internet works. The amazing variety of useful material on the Internet today, despite Congress' failure to give special perks to copyright owners, belies the argument. It may well be that cable companies will provide broadband Internet access whether or not we give them special incentives to do so. And if we are to grant such incentives, they certainly shouldn't take the form of the power to destroy a vibrant ISP market.

100. Further, the speed of investment in broadband is not the only economic and social value at stake. There is as well the environment for innovation which is affected by the competitive environment of the Internet. If the cost of a faster deployment of broadband is a reduction in that competitive environment, then it is not clear the benefit is worth the cost. Again, the extraordinary returns that AT&T enjoyed before the 1984 consent decree may well have sped its investment in its conception of what a communications network should be; it doesn't follow that there was a net benefit to society from that increased incentive to invest.

D. Regulation as a Backstop

101. As an alternative to its argument that the government should do nothing now, the Bureau argues that if things turn out for the worse — if cable does in fact implement a closed system as they say they intend, and if cable becomes an important aspect of the broadband

market — then the government can pursue open access to cable after the fact, through, one presumes, antitrust litigation.

102. This is an extraordinary argument. Whether one believes the government is justified in its suit against Microsoft or not, one cannot avoid the conclusion that the existing systems for dealing with monopoly problems in the networked economy ex post are extremely inefficient. Among the costs of using antitrust litigation to design markets are precisely the costs of uncertainty that the Bureau discusses in relation to cable. To say there is no reason to use a seatbelt because there is always the care of an emergency room is to miss the extraordinary costs of any ex post remedy. There is little evidence that the government is in a position to intervene to undo excess monopoly power in an efficient and expeditious manner.

103. Moreover, the costs of dislodging an existing monopoly power are always significant, and always higher ex post. This is particularly true in this context, where if we must regulate ex post we will face integrated, bundled broadband providers that will have to be broken up, and ways will have to be found to recreate the competition the FCC will have allowed to languish.

V. Conclusion: The Appropriate Presumptions in the Internet Context

104. The Bureau is right about one important fact: We know very little about how this market functions. Ten years ago, no one would have predicted how the network would matter to the creation of the Internet; as late as 1995, Microsoft itself confessed it had missed the significance of the Internet. We are faced in the Internet with a phenomenon we don't fully understand, but which has produced an extraordinary economic boom.

105. In the face of such uncertainty, the question we should ask is what presumptions should we make about how this market is functioning. In our view, these assumptions should

reflect the design principles of the Internet. The Internet has been the fastest growing network, crucial to our economy, because it has enabled an extraordinarily innovative competition. It has enabled this competition in part because of its design. It has been architected, through the End-to-End design, to enable this competition.

106. This principle of the initial Internet should guide the government in evaluating changes to the Internet's architecture, or acquisitions that threaten to change this effective architecture. The presumption should be against changes that would interfere with this End-to-End design. The aim should be to keep the footprint of monopoly power as small as it can be, so as to minimize the threats to innovation.

107. These principles should guide the FCC in the context of mergers affecting ownership of significant aspects of the Internet. If a merger threatens an architecture which is inconsistent with the Internet's basic design, and if that merger affects a significant portion of a relevant Internet market, then the burden should be on the party making that merger to justify this deviation from the Internet's default design. The presumption should be against deviating from these principles.

108. As with any principle, these presumptions should apply unless there is clear evidence that displacing them in a particular case would be benign. The burden should not be upon those who would defend the existing design. The existing design has done quite enough to defend itself. If there is good reason to allow AT&T to change the cable network into a version of the old telephone network, then it should bear a heavy burden in justifying this return to past. In our view, it has not come close to meeting that burden.