

approach that classified information services as telecommunications, without the ability to craft an appropriate regulatory framework, that approach could subject information service providers to market access restrictions or above-cost accounting rates. Such a result would inhibit growth of these procompetitive services, to the detriment of consumers in the United States and abroad.

2. Protocol Processing

49. Senators Stevens and Burns urge that transmission services incorporating protocol processing should be treated as telecommunications services, and not information services. They note that, in enacting the 1996 Act, the conference committee declined to adopt the Senate version of the information services definition, derived from the Commission's definition of enhanced services, which explicitly referred to services that "employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscribers transmitted information."¹⁰³ Rather, the conference committee adopted the House version, which made no explicit reference to protocol processing. As a result, the fact that a service involves protocol processing, those parties urge, should not lead to its classification as an information service.¹⁰⁴

50. The Commission reached a different result in the *Non-Accounting Safeguards Order*, in which it concluded that the category of information services was essentially identical to the pre-existing category of enhanced services. The Commission found that those protocol processing services that had qualified as "enhanced" should be treated as "information services," in part because they satisfy the statutory requirement of offering "a capability for . . . transforming [and] processing . . . information via telecommunications."¹⁰⁵ It noted, however, that certain protocol processing services that result in no net protocol conversion to the end user are classified as basic services; those services are deemed telecommunications services.¹⁰⁶

¹⁰³ See Joint Explanatory Statement of the Committee of Conference, S. Rep. No. 104-230 (1996), at 114-16 ("Joint Explanatory Statement").

¹⁰⁴ See Senators Stevens and Burns comments at 4, 6.

¹⁰⁵ 47 U.S.C. § 153(20); *Non-Accounting Safeguards Order*, 11 FCC Rcd at 21955-58, paras. 104-07.

¹⁰⁶ In those services, while protocol conversion may take place internal to the call, there is no net conversion between or among end users. The services fall into three categories: (1) protocol processing in connection with communications between an end-user and the network itself (e.g., for initiation, routing, and termination of calls) rather than between or among users; (2) protocol processing in connection with the introduction of a new basic network technology (which requires protocol conversion to maintain compatibility with existing CPE); and (3) protocol processing in connection with internetworking (conversions taking place solely within the carrier's network to facilitate provision of a basic network service, that result in no net conversion to the end-user). See *Non-Accounting Safeguards Order*, 11 FCC Rcd at 21958, para. 107; *Independent Data Communications Manufacturers Association, Inc. Petition for Declaratory Ruling that AT&T's Interspan Frame Relay Service Is a Basic Service*, Memorandum Opinion and Order, 10 FCC Rcd 13717, 13719 (1995) (*Frame Relay Order*); *Computer III Phase II Order*, 2 FCC Rcd at 3081-82, paras. 64-71. An example of the third type of protocol conversion occurs when a carrier converts from X.25 to X.75 formatted data at the originating end within the network, transports the data in X.75 format, and then converts the data back to X.25 format at the terminating end.

51. Senators Stevens and Burns raise a substantial point. The conference committee's decision not to adopt language explicitly classifying services employing protocol processing as information services supports the inference that the conferees did not intend that classification. We note, however, that the House language, adopted by the conference committee, was derived from the MFJ, and that services employing protocol processing were treated as information services under the MFJ.¹⁰⁷ Furthermore, as noted above, services offering net protocol conversion appear to fall within the statutory language, because they offer a capability for "transforming [and] processing" information. In light of these considerations, we recognize that the issue of the regulatory treatment of protocol processing is a difficult one.

52. We find, however, little to no discussion of this issue in the record. Accordingly, we do not believe that we have an adequate basis for resolving this matter in this Report. Moreover, we believe that we need not resolve the issue in order to address the important issues raised by the Appropriations Act. The regulatory classification of protocol processing is significant to the provision of universal service only to the extent that it affects the appropriate classification of Internet access service and IP telephony. We find, however, for the reasons explained below, that Internet access services are appropriately classed as information services without regard to our treatment of protocol processing.¹⁰⁸ Similarly, our discussion of the regulatory status of phone-to-phone IP telephony is not affected by our resolution of the protocol processing issue.¹⁰⁹ The protocol processing that takes place incident to phone-to-phone IP telephony does not affect the service's classification, under the Commission's current approach, because it results in no net protocol conversion to the end user.¹¹⁰ Finally, when a facilities owner provides leased lines to an Internet access or backbone provider, it does not provide protocol processing.

3. "Telephone Exchange Service" and "Local Exchange Carrier" Definitions

53. The 1996 Act redefined "telephone exchange service" to include not only "service within a telephone exchange, or within a connected system of telephone exchanges within the same exchange area operated to furnish to subscribers interconnecting service of the character ordinarily furnished by a single exchange," but also "comparable service provided through a system of switches, transmission equipment, or other facilities (or combination thereof) by which a subscriber can originate and terminate a telecommunications

¹⁰⁷ See *United States v. Western Electric Co.*, 673 F. Supp. 525 (D.D.C. 1987) (amending the MFJ to allow RBOCs to provide such services notwithstanding their classification as information services), 714 F. Supp. 1 (D.D.C. 1988) (same), *rev'd in part*, 900 F.2d 283 (D.C. Cir. 1990).

¹⁰⁸ See *infra* Section IV.D.2.

¹⁰⁹ See *infra* Section IV.D.3.

¹¹⁰ See *supra* note 102.

service."¹¹¹ It defined "local exchange carrier" to include "any person that is engaged in the provision of telephone exchange service or exchange access." The definition excludes persons "engaged in the provision of a commercial mobile service . . . except to the extent the Commission finds that such service should be included in the definition of such term."¹¹²

54. Our review indicates that the legislative history does not provide guidance on the meaning of these provisions. It appears from the legislative text that Congress' redefinition of "telephone exchange service" was intended to include in that term not only the provision of traditional local exchange service (via facilities ownership or resale), but also the provision of alternative local loops for telecommunications services, separate from the public switched telephone network, in a manner "comparable" to the provision of local loops by a traditional local telephone exchange carrier. The record contains very little discussion of these definitions. We do not believe, however, that the 1996 Act's modification of the "telephone exchange service" definition, or its addition of the "local exchange carrier" definition, undercuts the analysis we present in this Report.

IV. APPLICATION OF DEFINITIONS

A. Overview

55. We have been directed by Congress to describe in detail the application of the definitions considered in the previous section to "mixed or hybrid services."¹¹³ Congress has also directed that we explain "the impact of such application on universal service definitions and support, and the consistency of the Commission's application."¹¹⁴ Under the statute, all "telecommunications carriers" that provide interstate telecommunications services must contribute to federal universal service mechanisms, and any company that otherwise provides interstate telecommunications may be required to contribute. Companies that use other providers' telecommunications networks to provide the communications path underlying their own information services do not contribute directly, but they support universal service indirectly through the telecommunications services they purchase. We conclude that entities providing pure transmission capacity to Internet access or backbone providers provide interstate "telecommunications." Internet service providers themselves generally do not provide telecommunications. In those cases where an Internet service provider owns transmission facilities, and engages in data transport over those facilities in order to provide an information service, we do not currently require it to contribute to universal service mechanisms. We believe it may be appropriate to reconsider that result, as it would appear in such a case that the Internet service provider is furnishing raw transmission capacity to itself. Finally, we consider the regulatory status of various forms of "phone-to-phone IP telephony" service mentioned generally in the record. The record currently before us suggests that

¹¹¹ 47 U.S.C. § 3(47).

¹¹² *Id.* § 3(26).

¹¹³ Appropriations Act, § 623(b)(2).

¹¹⁴ *Id.*

certain of these services lack the characteristics that would render them "information services" within the meaning of the statute, and instead bear the characteristics of "telecommunications services." We do not believe, however, that it is appropriate to make any definitive pronouncements in the absence of a more complete record focused on individual service offerings. Our analysis, we believe, reflects a consistent approach that will safeguard the current and future provision of universal service to all Americans, and will achieve the Congressionally-specified goals of a "pro-competitive, deregulatory communications policy."

B. Mixed or Hybrid Services

56. We note that the phrase "mixed or hybrid services," as used in the Appropriations Act, does not appear in the text of the 1996 Act. We understand this term to refer to services in which a provider offers a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing or making available information via telecommunications, *and* as an inseparable part of that service transmits information supplied or requested by the user.

57. It follows from the statutory analysis set out in Part III.C of this Report that hybrid services are information services, and are not telecommunications services.¹¹⁵ Because information services are offered "via telecommunications," they necessarily require a transmission component in order for users to access information. Accordingly, if we interpreted the statute as breaking down the distinction between information services and telecommunications services, so that some information services were classed as telecommunications services, it would be difficult to devise a sustainable rationale under which all, or essentially all, information services did not fall into the telecommunications service category. As noted in the previous section, we find strong support in the text and legislative history of the 1996 Act for the view that Congress intended "telecommunications service" and "information service" to refer to separate categories of services.

58. The Commission has considered the question of hybrid services since *Computer I*, when it first sought to distinguish "communications" from "data processing."¹¹⁶ *Computer II* provided a framework for classifying such services, under which the offering of enhanced functionality led to a service being treated as "enhanced" rather than "basic."¹¹⁷ An offering that constitutes a single service from the end user's standpoint is not subject to carrier regulation simply by virtue of the fact that it involves telecommunications components.¹¹⁸ As

¹¹⁵ See *supra* Section IV.C.

¹¹⁶ *Regulatory & Policy Problems Presented by the Interdependence of Computer and Communications Services & Facilities (Computer I)*, 7 FCC 2d 11, 13 (1966) (*Notice of Proposed Rulemaking*); 28 FCC 291 (1970) (*Tentative Decision*); 28 FCC 2d 267 (1971) (*Final Decision*), *aff'd in part sub nom. GTE Service Corp. v. FCC*, 474 F.2d 724 (2d Cir. 1973), *decision on remand*, 40 FCC 2d 293 (1973).

¹¹⁷ See *supra* Section II.B.

¹¹⁸ See *Computer II Final Decision*, 77 FCC2d at 420-28, paras. 97-114.

we have explained above, we find that Congress intended to leave this general approach intact when it adopted the 1996 Act.

59. This functional approach is consistent with Congress's direction that the classification of a provider should not depend on the type of facilities used.¹¹⁹ A telecommunications service is a telecommunications service regardless of whether it is provided using wireline, wireless, cable, satellite, or some other infrastructure. Its classification depends rather on the nature of the service being offered to customers. Stated another way, if the user can receive nothing more than pure transmission, the service is a telecommunications service. If the user can receive enhanced functionality, such as manipulation of information and interaction with stored data, the service is an information service. A functional analysis would be required even were we to adopt an overlapping definition of "telecommunications service" and "information service." If we decided that any offering that "included telecommunications" was a telecommunications service, we would need some test to determine whether the transmission component was "included" as part of the service. Based on our analysis of the statutory definitions, we conclude that an approach in which "telecommunications" and "information service" are mutually exclusive categories is most faithful to both the 1996 Act and the policy goals of competition, deregulation, and universal service.

60. We recognize that the question may not always be straightforward whether, on the one hand, an entity is providing a single information service with communications and computing components, or, on the other hand, is providing two distinct services, one of which is a telecommunications service. It is plain, for example, that an incumbent local exchange carrier cannot escape Title II regulation of its residential local exchange service simply by packaging that service with voice mail.¹²⁰ Since *Computer II*, we have made it clear that offerings by non-facilities-based providers combining communications and computing components should always be deemed enhanced.¹²¹ But the matter is more complicated when it comes to offerings by facilities-based providers. We noted recently in the *Universal Service Fourth Order on Reconsideration*, considering a related question, that "[t]he issue is whether, functionally, the consumer is receiving two separate and distinct services."¹²²

C. Background on Internet Services

¹¹⁹ See 47 U.S.C. § 3(46) (defining "telecommunications service" to include "the offering of telecommunications for a fee directly to the public . . . regardless of the facilities used").

¹²⁰ See *Frame Relay Order*, 10 FCC Rcd at 13722-23, paras. 40-46.

¹²¹ See, e.g., *Computer II Phase II Recon. Order*, 3 FCC Rcd at 1153 n. 23; *Decreased Regulation of Certain Basic Telecommunications Services*, 2 FCC Rcd 645, 648, para. 21 (1987) (Notice of Proposed Rulemaking).

¹²² *Fourth Order on Reconsideration*, at para. 282.

61. Congress explicitly directed us to consider Internet access in connection with our implementation of section 254 of the Act.¹²³ More generally, Internet-based offerings represent perhaps the most significant category of "mixed or hybrid services" discussed in the record. Therefore, we believe it appropriate to address in some detail the application of the statutory definitions considered in the previous section to the Internet. We begin with a brief description of the Internet as a backdrop for the analysis in this section.

62. The Internet is a loose interconnection of networks belonging to many owners. It is comprised of tens of thousands of networks that communicate using the Internet protocol (IP).¹²⁴ For purposes of this report, we find it useful to distinguish five types of entities: (1) end users; (2) access providers; (3) application providers; (4) content providers; and (5) backbone providers.

63. *End users* obtain access to and send information either through dial-up connections over the public switched telephone network, or through dedicated data circuits over wireline, wireless, cable, or satellite networks. *Access providers*, more commonly known as Internet service providers, combine computer processing, information storage, protocol conversion, and routing with transmission to enable users to access Internet content and services.¹²⁵ Major Internet access providers include America Online, AT&T WorldNet, Netcom, Earthlink, and the Microsoft Network. *Application providers* offer users a discrete end-to-end service rather than open-ended Internet connectivity. Examples include IP telephony service providers such as IDT and Delta 3, and free electronic mail vendor Juno. *Content providers* make information available on "servers" connected to the Internet, where it can be accessed by end users. Major content providers include Yahoo, Netscape, ESPN Sportszone, and Time-Warner's Pathfinder service. Finally, *backbone providers*, such as Worldcom, Sprint, AGIS, and PSINet, route traffic between Internet access providers, and interconnect with other backbone providers. Many companies fall into more than one of these categories. For example, America Online offers Internet access as well as content (which can be purchased separately for a lower fee), and until recently owned backbone provider ANS. In addition, many of the networks connected to the Internet are "intranets," or private data

¹²³ Appropriations Act, § 623(b)(2).

¹²⁴ IP defines the structure of data, or "packets," transmitted over the Internet.

¹²⁵ We will use the terms "Internet access providers" and "Internet service providers" interchangeably in this Report.

Access services, as we describe them here, are similar to the "conduit services" we defined in the *Universal Service Order*. We used "conduit services," which is not a statutorily-defined term, to describe those services eligible for reimbursement as forms of "access to advanced information services" for schools, libraries, and rural health care providers. As examples of such services, we cross-referenced language from section 274 of the Act concerning electronic publishing. See *Universal Service Order*, 12 FCC Rcd at 9012-13, paras. 443-44. We stated, however, that "our use of section 274 should not imply anything about the classification of services in other contexts." *Id.*, 12 FCC Rcd at 9013 n.159, para. 444. Despite this admonition, our use of language referring to services that are *not* electronic publishing under section 274 may have caused some confusion. We emphasize that our intent was only to give examples of eligible services, not to somehow shift the legal classification of Internet access.

networks, that offer better performance or security to a limited set of users, but can still communicate with the Internet using IP.

64. The Internet is a distributed packet-switched network, which means that information is split up into small chunks or "packets" that are individually routed through the most efficient path to their destination. Even two packets from the same message may travel over different physical paths through the network. Packet switching also enables users to invoke multiple Internet services simultaneously, and to access information with no knowledge of the physical location of the server where that information resides.

65. Internet usage has grown steadily and rapidly, especially since the development of the World Wide Web in 1989. According to one survey, there are currently more than 4,000 Internet service providers and 40 national Internet backbones operating in the United States.¹²⁶ According to data presented at our *en banc* hearing on February 19, 1998, Internet service provider market revenues are projected to grow from under four billion dollars in 1996 to eighteen billion dollars in the year 2000.¹²⁷

D. Discussion

1. Provision of Transmission Capacity to Internet Access and Backbone Providers

66. Internet service providers typically utilize a wide range of telecommunications inputs. Commenters have focused much attention on the fact that Internet service providers purchase analog and digital lines from local exchange carriers to connect to their dial-in subscribers, and pay rates incorporating those carriers' universal service obligations.¹²⁸ What has received less attention is that Internet service providers utilize other, extensive telecommunications inputs. While a large Internet service provider engages in extensive data transport, it may own no transmission facilities. To provide transport within its own network, it leases lines (T1s, T3s and OC-3s)¹²⁹ from telecommunications carriers.¹³⁰ To ensure transport beyond the edges of its network, it makes arrangements to interconnect with one or

¹²⁶ Boardwatch Magazine, *Winter 1998 Directory of Internet Service Providers* at 4, 25.

¹²⁷ February 19, 1998 *en banc* transcript at 15 (testimony of Mr. Hyland).

¹²⁸ See, e.g., USIPA comments at 4.

¹²⁹ A T1 is a digital transmission link with a capacity of 1.544 million bits per second. A T3 has a capacity of 44.736 million bits per second. An OC-3 is a fiberoptic link with capacity of 155.52 million bits per second.

¹³⁰ America Online reports that it expects to spend roughly \$1.2 billion for telecommunications services in fiscal 1999. The prices it pays for those services incorporate universal service contributions. See AOL comments at 17 & n.65; AOL reply comments at Attachment 7-8 (Jeffrey K. Mackie-Mason, "Layering for Equity and Efficiency: A Principled Approach to Universal Service Policy"); see also, e.g., Coalition comments at 13-15; ITI and ITAA comments at 8; Worldcom comments at 8-9 & n.15.

more Internet backbone providers.¹³¹ We explain below, in Part IV.D.2, that Internet service providers themselves provide information services, not telecommunications (and hence do not contribute to universal service mechanisms). But to the extent that any of their underlying inputs constitutes interstate telecommunications, we have authority under the 1996 Act to require that the providers of those inputs contribute to federal universal service mechanisms.

67. With regard to the lines leased by Internet service providers to provide their own internal networks, the analysis is straightforward. We explain below that the Internet service providers leasing the lines do not provide telecommunications to their subscribers, and thus do not directly contribute to universal service mechanisms. The provision of leased lines to Internet service providers, however, constitutes the provision of interstate telecommunications.¹³² Telecommunications carriers offering leased lines to Internet service providers must include the revenues derived from those lines in their universal service contribution base.¹³³ The record reveals that at least some leased-line providers are complying with that requirement, and the prices paid by Internet service providers for their leased lines reflect that universal service obligation.¹³⁴

68. Internet access, like all information services, is provided "via telecommunications." To the extent that the telecommunications inputs underlying Internet services are subject to the universal service contribution mechanism, that provides an answer to the concern, expressed by some commenters, that "[a]s more and more traffic is 'switched' to the Internet . . . there will no longer be enough money to support the infrastructure needed to make universal access to voice or Internet communications possible."¹³⁵ To the extent that IP-based services grow, Internet service providers will have greater needs for transport to accommodate that level of usage. Those needs will lead to increased universal service contributions by providers of the leased lines that make up internal Internet service provider

¹³¹ One study indicates that transport costs, including incoming phone lines, leased lines and interconnection at a network access point, currently amount to roughly 25% of an Internet service provider's total costs. Lee W. McKnight & Brett A. Leida, "Internet Telephony: Costs, Pricing and Policy" (1997), at 14.

¹³² See *Universal Service Order*, 12 FCC Rcd at 9175, para. 780; 47 U.S.C. § 54.703.

¹³³ We base universal service contributions on "end-user telecommunications revenues." 47 C.F.R. § 54.703; *Universal Service Order*, 12 FCC Rcd at 9205-9212, paras. 842-57. Telecommunications revenues are treated as end-user revenues and are included in the funding base, unless the associated telecommunications offerings are provided to an entity that incorporates them into services that should generate their own universal service contributions. See *Instructions for Completing the Worksheet for Filing Contributions to the Universal Service Support Mechanism*, FCC Form 457, at 12. Because an Internet service provider is not such an entity, entities providing interstate telecommunications to Internet service providers must include the associated revenues in their universal service funding base.

¹³⁴ See, e.g., Worldcom comments at 8 n. 15 ("when UUNET purchases network capacity, a basic telecommunications service, from Worldcom Technologies, Inc., Worldcom reports those revenues to the USAC as revenues earned from an end user").

¹³⁵ Senators Stevens and Burns comments at 9; see also, e.g., Airtouch comments at 30-31.

networks.¹³⁶ More generally, the Internet backbone is currently growing at an exponential rate, as Internet-based services gain popularity and new Internet-based services are developed, leading to increased overall universal service support.¹³⁷

69. In those cases where an Internet service provider owns transmission facilities, and engages in data transport over those facilities in order to provide an information service, we do not currently require it to contribute to universal service mechanisms. We believe it is appropriate to reexamine that result. One could argue that in such a case the Internet service provider is furnishing raw transmission capacity to itself.¹³⁸ To the extent this means the Internet service provider is providing telecommunications as a non-common carrier, it would not generally be subject to Title II, but it "may be required to contribute to the preservation and advancement of universal service if the public interest so requires."¹³⁹ As a theoretical matter, it may be advisable to exercise our discretion under the statute to require such providers that use their own transmission facilities to contribute to universal service. This approach would treat provision of transmission facilities to Internet service providers similarly, for purposes of universal service, without regard to how the facilities are provided. We recognize, however, that there are significant operational difficulties associated with determining the amount of such an Internet service provider's revenues to be assessed for universal service purposes and with enforcing such requirements. There also are issues

¹³⁶ McKnight & Leida indicate that movement from zero to moderate use of IP telephony will nearly triple Internet service provider costs associated with purchasing transport. McKnight & Leida, *supra* note 126, at 14 (for the modeled Internet service provider, projecting such costs at \$7.37 million in the "baseline scenario" and \$21.56 million in the "IP telephony scenario").

¹³⁷ See Jeff Sweat, "Internet Demand Is Moving Faster Than Technology, Panel Says," *Information Week* (March 16, 1998), available at <<http://www.techweb.com/wire/story/0398iwld/TWB19980316S0017>>; Kate Gerwig & Salvatore Salamone, "ISPs Mortgage the Farm for Bandwidth," *Internet Week* (Sept. 1, 1997), available at <<http://www.techweb.com/se/directlink.cgi?INW19970901S0068>>.

¹³⁸ This is not inconsistent with our conclusion, above, that the 1996 Act built on the Commission's deregulatory actions in *Computer II*, so that "telecommunications" and "information service" are mutually exclusive categories. See *supra* Section II.C.1; see also Section II.B (describing *Computer II*). *Computer II* dealt with the relationship between an information service provider and its subscribers. Under *Computer II*, and under our understanding of the 1996 Act, we do not treat an information service provider as providing a telecommunications service to its subscribers. The service it provides to its subscribers is not subject to Title II, and is categorized as an information service. The information service provider, indeed, is itself a user of telecommunications; that is, telecommunications is an input in the provision of an information service. Our analysis here rests on the reasoning that under this framework, in every case, some entity must provide telecommunications to the information service provider. When the information service provider owns the underlying facilities, it appears that it should itself be treated as providing the underlying telecommunications. That conclusion, however, speaks only to the relationship between the facilities owner and the information service provider (in some cases, the same entity); it does not affect the relationship between the information service provider and its subscribers.

¹³⁹ 47 U.S.C. § 254(e).

relating to the extent to which Internet service providers would uneconomically self-provide telecommunications because of a universal service assessment.¹⁴⁰

70. The Commission in the *Universal Service Order* expressly characterized entities that "provide telecommunications solely to meet their internal needs" as telecommunications providers subject to our permissive contribution authority. It found that those entities "should not be required to contribute to the support mechanisms at this time, because telecommunications do not comprise the core of their business."¹⁴¹ Further, "it would be administratively burdensome to assess a special non-revenues-based contribution on these providers."¹⁴² We intend to consider, in an upcoming proceeding, the status of entities that provide transmission to meet their internal needs. To the extent that we conclude that such entities provide telecommunications, we would consider, among other things, whether there are efficient, effective ways to require information service providers that provide telecommunications to meet their own internal needs to contribute to universal service support so that our regulations do not create an artificial incentive for information service providers to integrate vertically. We also would consider whether, and to what extent, our reasoning applies to entities other than information service providers that provide interstate telecommunications to meet their own internal needs.

71. With respect to the facilities that make up the Internet backbone, the record does not reveal the extent to which firms providing telecommunications facilities as part of the Internet backbone are currently contributing to federal universal service mechanisms. Yet it seems clear that, in one manner or another, firms are offering telecommunications inputs in this context that underlie the ultimate provision of Internet services to the consumer. We believe we would need to consider these offerings in order to ensure that the goals of section 254 are fully realized.

72. Our thinking relating to the Internet backbone points up some of the limitations of our current approaches to implementing the universal service provisions of the 1996 Act. The technology and market conditions relating to the Internet backbone are unusually fluid and fast-moving, and we are reluctant to impose any regulatory mandate that relies on the persistence of a particular market model or market structure in this area. It may be that the most successful approach in this context, maintaining universal service revenues while avoiding the imposition of inefficient or innovation-discouraging obligations, would look to the actual facilities owners, requiring them to contribute to universal service mechanisms on

¹⁴⁰ We express no view in this Report on the applicability of this analysis to cable operators providing Internet access service. The Act distinguishes between Title II and Title VI facilities, and we have not yet established the regulatory classification of Internet services provided over cable television facilities. In the *Pole Attachments Telecommunications Rate Order*, we expressly declined to rule on that issue, finding that cable operators providing traditional cable services and Internet access services over the same facilities were entitled to the 47 U.S.C. § 224(d)(3) pole attachment rate without regard to the regulatory classification of their Internet-based services. See *Pole Attachment Telecommunications Rate Order*, at paras. 32-34.

¹⁴¹ *Universal Service Order*, 2 FCC Rcd at 9185, para. 799.

¹⁴² *Id.* See also April 8, 1998 letter from Representative White to Chairman Kennard, *et al.*

the revenues they receive. It is facilities owners that, in a real sense, provide the crucial telecommunications inputs underlying Internet service. If universal service contribution obligations, in the context of the Internet backbone, were based on facilities ownership rather than end-user revenues, then firms purchasing capacity from the facilities owners would still contribute indirectly, through prices that recover the facilities owners' contributions. This matter deserves further consideration.

2. Internet Access Services

73. We find that Internet access services are appropriately classed as information, rather than telecommunications, services. Internet access providers do not offer a pure transmission path; they combine computer processing, information provision, and other computer-mediated offerings with data transport. Senators Stevens and Burns suggest that services provided by Internet access providers should be deemed to fall on the telecommunications side of the line. When an Internet service provider transmits an email message, they maintain, it transmits "information of the user's choosing, without change in the form or content of the information as sent or received." Changes such as the addition of message headers, they argue, are inconsequential: "If the information chosen by the user has the same form (e.g., typewritten English) and content (e.g., directions to Washington, D.C.) as sent and received, then a 'telecommunication' has occurred."¹⁴³ Senator McCain, by contrast, urges that electronic mail, voice mail and Internet access are information services, because they furnish the capabilities to store, retrieve, or generate information.¹⁴⁴

74. In determining whether Internet access providers should be classed as providing information services rather than telecommunications services, the text of the 1996 Act requires us to determine whether Internet access providers merely offer transmission "between or among points selected by the user, of information of the user's choosing, without change in the form or content of the information as sent and received,"¹⁴⁵ or whether they go beyond the provision of a transparent transmission path to offer end users the "capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information."¹⁴⁶ For the reasons that follow, we conclude that the latter more accurately describes Internet access service.

75. We note that the functions and services associated with Internet access were classed as "information services" under the MFJ. Under that decree, the provision of gateways (involving address translation, protocol conversion, billing management, and the provision of introductory information content) to information services fell squarely within the

¹⁴³ Senators Stevens and Burns comments at 4; *see also, e.g.*, LTD comments at 1-2; RTC comments at 13-14.

¹⁴⁴ Senator McCain letter at 3.

¹⁴⁵ 47 U.S.C. § 153(43).

¹⁴⁶ *Id.* § 153(20).

"information services" definition.¹⁴⁷ Electronic mail, like other store-and-forward services, including voice mail, was similarly classed as an information service.¹⁴⁸ Moreover, the Commission has consistently classed such services as "enhanced services" under *Computer II*.¹⁴⁹ In this Report, we address the classification of Internet access service *de novo*, looking to the text of the 1996 Act. Various commenters have approached this question by inquiring whether specific applications, such as e-mail, available to users with Internet access, constitute "telecommunications."¹⁵⁰ As we explain below, we believe that Internet access providers do not offer subscribers separate services -- electronic mail, Web browsing, and others -- that should be deemed to have separate legal status. It is useful to examine specific Internet applications, however, in order to understand the nature of the functionality that an Internet access provider offers.

76. Internet access providers typically provide their subscribers with the ability to run a variety of applications, including World Wide Web browsers, FTP clients,¹⁵¹ Usenet newsreaders,¹⁵² electronic mail clients, Telnet applications,¹⁵³ and others. When subscribers store files on Internet service provider computers to establish "home pages" on the World Wide Web, they are, without question, utilizing the provider's "capability for . . . storing . . . or making available information" to others. The service cannot accurately be characterized from this perspective as "transmission, between or among points specified by the user"; the proprietor of a Web page does not specify the points to which its files will be transmitted, because it does not know who will seek to download its files. Nor is it "without change in the form or content," since the appearance of the files on a recipient's screen depends in part on the software that the recipient chooses to employ. When subscribers utilize their Internet

¹⁴⁷ See *United States v. Western Electric Co.*, 673 F. Supp. 525 (D.D.C. 1987) (amending the MFJ to allow RBOCs to provide such services notwithstanding their classification as information services), 714 F. Supp. 1 (D.D.C. 1988) (same), *rev'd in part*, 900 F.2d 283 (D.C. Cir. 1990).

¹⁴⁸ See *United States v. Western Electric Co.*, 714 F. Supp. 1, 11, 19 n. 73 (D.D.C. 1988), *rev'd in part*, 900 F.2d 283 (D.C. Cir. 1990); see also *id.* at 18-24 (amending the MFJ to allow the RBOCs to provide "voice storage and retrieval services, including voice messaging and electronic mail services," notwithstanding their classification as information services). The Telecommunications Resellers Association has filed a petition seeking a declaratory ruling that voice mail is a telecommunications service and thus is subject to resale under 47 U.S.C. § 251. That petition is pending.

¹⁴⁹ See, e.g., *Computer II Final Decision*, 77 FCC 2d at 420-21, paras. 97-98.

¹⁵⁰ See, e.g., Compuserve comments at 5 (e-mail); Senators Stevens and Burns comments at 4 (same); Letter from Donna N. Lampert, Mintz, Levin, to Magalie Roman Salas, FCC, dated Feb. 27, 1998 (summarizing AOL's views).

¹⁵¹ FTP, or File Transfer Protocol, is a tool for accessing file archives linked to the Internet.

¹⁵² The Usenet is a gigantic computer bulletin board system that is operated mostly (although not entirely) over the Internet. There are more than 15,000 different Usenet "newsgroups," each devoted to a single topic such as Peruvian culture, molecular physics and the television show "The X-Files."

¹⁵³ Telnet applications allow users to use other computers connected to the Internet as if they were using terminals physically connected to those machines.

service provider's facilities to retrieve files from the World Wide Web, they are similarly interacting with stored data, typically maintained on the facilities of either their own Internet service provider (via a Web page "cache") or on those of another. Subscribers can retrieve files from the World Wide Web, and browse their contents, because their service provider offers the "capability for . . . acquiring, . . . retrieving [and] utilizing . . . information."¹⁵⁴ Most of the data transport on the Internet relates to the World Wide Web and file transfer.¹⁵⁵

77. The same is true when Internet service providers offer their subscribers access to Usenet newsgroup articles.¹⁵⁶ An Internet service provider receives and stores these articles (in 1996, about 1.2 gigabytes of new material each day)¹⁵⁷ on its own computer facilities. Each Internet service provider must choose whether to carry a full newsgroup feed, or only a smaller subset of available newsgroups. Each Internet service provider must decide how long it will store articles in each newsgroup, and at what point it will delete them as outdated. A user can then select among the available articles, choosing those that the user will view or read; having read an article, the user may store or forward it; and the user can post articles of his or her own, which will in turn be stored on the facilities of his own Internet service provider and those of every other Internet service provider choosing to carry that portion of the newsgroup feed. In providing this service, the Internet service provider offers "a capability for generating, acquiring, storing, . . . retrieving . . . and making available information through telecommunications."¹⁵⁸ Its function seems indistinguishable from that of the database proprietor offering subscribers access to information it maintains on-site; such a proprietor offers the paradigmatic example of an information service.

78. As noted above, Senators Stevens and Burns state that electronic mail constitutes a telecommunications service.¹⁵⁹ They note that the provision of a transmission path for the delivery of faxes constitutes telecommunications, and characterize electronic mail as "nothing more or less than a paperless fax."¹⁶⁰ We have carefully considered this argument, but further analysis leads us to a different result. Like the World Wide Web and

¹⁵⁴ Several commenters stress these points. *See, e.g.*, CIX comments at 7-9, Compuserve comments at 6-7; *see also* Worldcom comments at 5.

¹⁵⁵ As of April 1995 (the last period in which the National Science Foundation collected the relevant information), about half of all Internet data traffic, measured in bytes of traffic, related to the World Wide Web. That proportion was rising sharply, having doubled in just the previous year. The second largest category of traffic related to FTP file transfer. Electronic mail and Usenet news, combined, amounted to less than 15% of Internet data traffic, and that proportion was falling. *See* Merit, Inc. data files at <<http://www.merit.edu/nsfnet/statistics/history.ports>>.

¹⁵⁶ *See supra* note 138.

¹⁵⁷ *See* Chris Lewis, "How to Become a Usenet Site" (rev. 4/13/97), *available at* <<ftp://rtfm.mit.edu/pub/usenet/news.answers/usenet/site-setup>>.

¹⁵⁸ 47 U.S.C. § 153(20).

¹⁵⁹ Senators Stevens and Burns comments at 4, 7.

¹⁶⁰ *Id.* at 7.

Usenet services described above, electronic mail utilizes data storage as a key feature of the service offering.¹⁶¹ The fact that an electronic mail message is stored on an Internet service provider's computers in digital form offers the subscriber extensive capabilities for manipulation of the underlying data. The process begins when a sender uses a software interface to generate an electronic mail message (potentially including files in text, graphics, video or audio formats). The sender's Internet service provider does not send that message directly to the recipient. Rather, it conveys it to a "mail server" computer owned by the recipient's Internet service provider, which stores the message until the recipient chooses to access it. The recipient may then use the Internet service provider's facilities to continue to store all or part of the original message, to rewrite it, to forward all or part of it to third parties, or otherwise to process its contents -- for example, by retrieving World Wide Web pages that were hyperlinked in the message. The service thus provides more than a simple transmission path; it offers users the "capability for . . . acquiring, storing, transforming, processing, retrieving, utilizing, or making available information through telecommunications."¹⁶²

79. More generally, though, it would be incorrect to conclude that Internet access providers offer subscribers separate services -- electronic mail, Web browsing, and others -- that should be deemed to have separate legal status, so that, for example, we might deem electronic mail to be a "telecommunications service," and Web hosting to be an "information service." The service that Internet access providers offer to members of the public is Internet access.¹⁶³ That service gives users a variety of advanced capabilities. Users can exploit those capabilities through applications they install on their own computers. The Internet service provider often will not know which applications a user has installed or is using. Subscribers are able to run those applications, nonetheless, precisely because of the enhanced functionality that Internet access service gives them.¹⁶⁴

80. The provision of Internet access service involves data transport elements: an Internet access provider must enable the movement of information between customers' own computers and the distant computers with which those customers seek to interact. But the provision of Internet access service crucially involves information-processing elements as well; it offers end users information-service capabilities inextricably intertwined with data

¹⁶¹ Particular users may not exploit this feature of the service offering; indeed, two users with direct Internet connections can communicate via electronic mail in close to real-time. Nonetheless, it is central to the service offering that electronic mail is store-and-forward, and hence asynchronous; one can send a message to another person, via electronic mail, without any need for the other person to be available to receive it at that time.

¹⁶² See, e.g., CIX comments at 9, CompuServe comments at 5-6, NCTA comments at 5-7, AOL ex parte.

¹⁶³ In this respect, we distinguish Internet access providers from application providers such as Juno; electronic mail is the only functionality Juno offers.

¹⁶⁴ We note that large corporate users with internal computer networks and direct connections to their Internet access providers receive somewhat different functionality than do residential dial-up subscribers.

transport.¹⁶⁵ As such, we conclude that it is appropriately classed as an "information service."¹⁶⁶

81. An Internet access provider, in that respect, is not a novel entity incompatible with the classic distinction between basic and enhanced services, or the newer distinction between telecommunications and information services. In essential aspect, Internet access providers look like other enhanced -- or information -- service providers. Internet access providers, typically, own no telecommunications facilities. Rather, in order to provide those components of Internet access services that involve information transport, they lease lines, and otherwise acquire telecommunications, from telecommunications providers -- interexchange carriers, incumbent local exchange carriers, competitive local exchange carriers, and others.¹⁶⁷ In offering service to end users, however, they do more than resell those data transport services. They conjoin the data transport with data processing, information provision, and other computer-mediated offerings, thereby creating an information service. Since 1980, we have classed such entities as enhanced service providers. We conclude that, under the 1996 Act, they are appropriately classed as information service providers.

82. Our findings in this regard are reinforced by the negative policy consequences of a conclusion that Internet access services should be classed as "telecommunications." We have already described some of our concerns about the classification of information service providers generally as telecommunications carriers.¹⁶⁸ Turning specifically to the matter of Internet access, we note that classifying Internet access services as telecommunications services could have significant consequences for the global development of the Internet.¹⁶⁹ We recognize the unique qualities of the Internet, and do not presume that legacy regulatory frameworks are appropriately applied to it.¹⁷⁰

¹⁶⁵ As GTE put it, "[t]he very core of the Internet and its associated services is the ability to 'retrieve' and 'utilize' information." GTE comments at 18.

¹⁶⁶ *But see* Bell Atlantic reply comments at 7-9 (Internet access providers should make universal service fund contributions to the extent of the telecommunications component of their services).

¹⁶⁷ *See supra* Section IV.D.1.

¹⁶⁸ *See supra* Section II.C.1.

¹⁶⁹ On a related point, we note that the European Commission has determined that extant IP telephony services should not be regulated as "voice telephony." *Status of Voice Communications on Internet Under Community Law and, in Particular, Under Directive 90/388/EEC*, Official Journal of the European Community OJ No C 6 (January 10, 1998) at 4.

¹⁷⁰ The United States emphasized in the WTO Negotiations on Basic Telecommunications that countries should not impose new regulatory burdens on Internet and online service providers that could stifle the development of new technologies and services. *See* The White House, *A Framework for Global Electronic Commerce* 24 (July 1, 1997). As a general matter, the participants in those negotiations characterized as "basic" those services that involve end-to-end transmission of user-supplied information, such as voice telephony, packet-switched and circuit-switched data transmission, telex, telegraph, fax, and leased lines. Services such as the provision of online databases, electronic mail, and voice mail, by contrast, were characterized as "value-added." As part of the WTO Basic Telecom Agreement, however, WTO Members enter their own schedule of

3. IP Telephony

83. Having concluded that Internet access providers do not offer "telecommunications service" when they furnish Internet access to their customers, we next consider whether certain other Internet-based services might fall within the statutory definition of "telecommunications." We recognize that new Internet-based services are emerging, and that our application of statutory terms must take into account such technological developments. We therefore examine in this section Internet-based services, known as IP telephony, that most closely resemble traditional basic transmission offerings.¹⁷¹ The Commission to date has not formally considered the legal status of IP telephony.¹⁷² The record currently before us suggests that certain "phone-to-phone IP telephony" services lack the characteristics that would render them "information services" within the meaning of the statute, and instead bear the characteristics of "telecommunications services." We do not believe, however, that it is appropriate to make any definitive pronouncements in the absence of a more complete record focused on individual service offerings.

84. "IP telephony" services enable real-time voice transmission using Internet protocols.¹⁷³ The services can be provided in two basic ways: through software and hardware at customer premises, or through "gateways" that enable applications originating and/or terminating on the PSTN.¹⁷⁴ Gateways are computers that transform the circuit-switched voice signal into IP packets, and vice versa, and perform associated signalling, control, and address translation functions. The voice communications can be transmitted along with other data on the "public" Internet, or can be routed through intranets or other private data networks for improved performance. Several companies now offer commercial IP telephony products. For example, VocalTec sells software that end users can install on their personal computers to

commitments with regard to the extent of their liberalization efforts.

¹⁷¹ Several of the commenters discuss IP telephony as a service that, for legal and policy reasons, should be treated as a "telecommunications service" under the Act. See AT&T comments at 12-13; Alaska comments at 8-9; AirTouch comments at 30-31; Senators Stevens and Burns comments at 8; RTC comments at 13.

¹⁷² A petition for rulemaking by Americas Carriers Telecommunication Association (ACTA) asking that IP telephony software and hardware providers be classified as common carriers is still pending. See *Common Carrier Bureau Clarifies and Extends Request for Comment on ACTA Petition Relating to "Internet Phone" Software and Hardware -- RM 8775*, Report No. CC 96-10 (March 25, 1996). Although the analysis in this Report addresses many of the issues raised in the ACTA petition, we will be considering the petition in a separate order.

¹⁷³ While these services are often referred to as "Internet telephony," the same technology is used both over the public Internet and over separate private IP networks. This class of services includes both voice and facsimile transmission using IP.

¹⁷⁴ The two basic technical mechanisms described here can be used to create a broad range of IP telephony service offerings. For example, gateways can be deployed on either the originating or the terminating end of the call, or both. Wherever a gateway is not deployed, premises-based equipment must be available as an alternative.

make calls to other users with similar equipment, and also makes software used in gateways.¹⁷⁵ Companies such as IDT and Qwest employ gateways to offer users the ability to call from their computer to ordinary telephones connected to the public switched network, or from one telephone to another.¹⁷⁶ To use the latter category of services, a user first picks up an ordinary telephone handset connected to the public switched network, then dials the phone number of a local gateway. Upon receiving a second dialtone, the user dials the phone number of the party he or she wishes to call. The call is routed from the gateway over an IP network, then terminated through another gateway to the ordinary telephone at the receiving end.¹⁷⁷

85. Commenters that discuss IP telephony are split on the appropriate treatment of these services.¹⁷⁸ Several parties, including Senators Rockefeller, Snowe, Stevens, and Burns, urge that IP telephony providers offer interstate telecommunications services and, consequently, should contribute to universal service support mechanisms.¹⁷⁹ Other parties, including Senator McCain, Representative White and the National Telecommunications and Information Administration, oppose application of Title II regulation.¹⁸⁰ Some commenters argue that IP telephony is a nascent technology that is unlikely to generate significant revenues in the foreseeable future.¹⁸¹ Regardless of the size of the market, we must still decide as a legal matter whether any IP telephony providers meet the statutory definitions of offering "telecommunications" or "telecommunications service" in section 3 of the 1996 Act.

¹⁷⁵ To engage in a "computer-to-computer" call, a user must typically install IP telephony software on a personal computer equipped with a sound card and microphone, connect to the Internet through an ISP, locate another user who is running compatible IP telephony software and is also connected to the Internet at that moment, and then initiate a call to the other user. See Ashley Dunn, "More Phone, Less Computer, Behind New Generation of Internet Phones," *New York Times CyberTimes*, January 7, 1998; Deborah Branscum, "A Cheaper Way to Phone," *Newsweek*, March 16, 1998, at 80 (describing different forms of IP telephony).

¹⁷⁶ Significant commercial phone-to-phone services have recently been announced by IDT, AT&T, Qwest, Delta 3, and ICG. See Nicholas Denton, "Telecoms Set to Take Further Step into Cyberspace," *Financial Times*, March 13, 1998, at 6; Paul Festa, "Net Phone Market Heats Up," *CNet News.com*, March 11, 1998 (<http://www.news.com/News/Item/0,4,19977,00.html>).

¹⁷⁷ More specifically, the customer places a call over the public switched telephone network to a gateway, which returns a second dial tone, and the signalling information necessary to complete the call is conveyed to the gateway using standard in-band (i.e., DMTF) signals on an overdial basis. The customer's voice or fax signal is sent to the gateway in unprocessed form (that is, not compressed and packetized). The service provider compresses and packetizes the signal at the gateway, transmits it via IP to a gateway in a different local exchange, reverses the processing at the terminating gateway, and sends the signal out over the public switched telephone network in analog, or uncompressed digital, unpacketized form.

¹⁷⁸ Compare AT&T comments at 12-13; Alaska comments at 8-9; Airtouch comments at 30-31; Senators Stevens and Burns comments at 8; RTC comments at 13 (arguing that IP telephony services are "telecommunications") with AOL reply comments at 8-9; Comcast reply at 4 (claiming IP telephony services should not be regulated under the Act at this time).

¹⁷⁹ See, e.g., Senators Rockefeller and Snowe letter; Senators Stevens and Burns comments at 8.

¹⁸⁰ See Senator McCain letter; Representative White letter; Assistant Secretary Irving letter.

¹⁸¹ See AOL reply comments at 8; Comcast reply comments at 4; Senator McCain letter at 4.

86. As we have observed above in our general discussion of hybrid services, the classification of a service under the 1996 Act depends on the functional nature of the end-user offering.¹⁸² Applying this test to IP telephony, we consider whether any company offers a service that provides users with pure "telecommunications." We first note that "telecommunications" is defined as a form of "transmission."¹⁸³ Companies that only provide software and hardware installed at customer premises do not fall within this category, because they do not transmit information. These providers are analogous to PBX vendors, in that they offer customer premises equipment (CPE) that enables end users to engage in telecommunications by purchasing local exchange and interexchange service from carriers. These CPE providers do not, however, transport any traffic themselves.¹⁸⁴

87. In the case of "computer-to-computer" IP telephony, individuals use software and hardware at their premises to place calls between two computers connected to the Internet. The IP telephony software is an application that the subscriber runs, using Internet access provided by its Internet service provider. The Internet service providers over whose networks the information passes may not even be aware that particular customers are using IP telephony software, because IP packets carrying voice communications are indistinguishable from other types of packets. As a general matter, Title II requirements apply only to the "provi[sion]" or "offering" of telecommunications.¹⁸⁵ Without regard to whether "telecommunications" is taking place in the transmission of computer-to-computer IP telephony,¹⁸⁶ the Internet service provider does not appear to be "provid[ing]" telecommunications to its subscribers.¹⁸⁷

88. "Phone-to-phone" IP telephony services appear to present a different case. In using the term "phone-to-phone" IP telephony, we tentatively intend to refer to services in which the provider meets the following conditions: (1) it holds itself out as providing voice telephony or facsimile transmission service; (2) it does not require the customer to use CPE

¹⁸² See *supra* Section III.D.1.

¹⁸³ 47 U.S.C. § 153(43).

¹⁸⁴ We note that this argument applies to IP telephony services provided through both dial-up residential connections to the public Internet, and to dedicated lines connected to corporate local area networks. The critical distinction is that packetizing and depacketizing takes place at the customer premises, rather than within the network.

¹⁸⁵ See 47 U.S.C. §§ 153(46), 254(d).

¹⁸⁶ It may be argued that the poor sound quality of such services when offered over the public Internet effectively constitutes a "change in the form or content" of user information. Because of our conclusion that IP telephony software companies do not "provide telecommunications," we need not resolve this question.

¹⁸⁷ As we note in Section IV.D.1, the provider of underlying transmission facilities is "providing telecommunications" to the Internet service provider. Further, if the customer uses a dial-up Internet connection, there is of course a LEC that "provides telecommunications" regardless of what information service that customer employs. This underlying telecommunications service is, however, distinguishable from the IP telephony functionality for the same reason it is distinguishable from the Internet access services offered by Internet service providers.

different from that CPE necessary to place an ordinary touch-tone call (or facsimile transmission) over the public switched telephone network; (3) it allows the customer to call telephone numbers assigned in accordance with the North American Numbering Plan, and associated international agreements; and (4) it transmits customer information without net change in form or content.

89. Specifically, when an IP telephony service provider deploys a gateway within the network to enable phone-to-phone service, it creates a virtual transmission path between points on the public switched telephone network over a packet-switched IP network. These providers typically purchase dial-up or dedicated circuits from carriers and use those circuits to originate or terminate Internet-based calls. From a functional standpoint, users of these services obtain only voice transmission, rather than information services such as access to stored files.¹⁸⁸ The provider does not offer a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information. Thus, the record currently before us suggests that this type of IP telephony lacks the characteristics that would render them "information services" within the meaning of the statute, and instead bear the characteristics of "telecommunications services."

90. We do not believe, however, that it is appropriate to make any definitive pronouncements in the absence of a more complete record focused on individual service offerings. As stated above, we use in this analysis a tentative definition of "phone-to-phone" IP telephony. Because of the wide range of services that can be provided using packetized voice and innovative CPE, we will need, before making definitive pronouncements, to consider whether our tentative definition of phone-to-phone IP telephony accurately distinguishes between phone-to-phone and other forms of IP telephony, and is not likely to be quickly overcome by changes in technology. We defer a more definitive resolution of these issues pending the development of a more fully-developed record because we recognize the need, when dealing with emerging services and technologies in environments as dynamic as today's Internet and telecommunications markets, to have as complete information and input as possible.

91. In upcoming proceedings with the more focused records, we undoubtedly will be addressing the regulatory status of various specific forms of IP telephony, including the regulatory requirements to which phone-to-phone providers may be subject if we were to conclude that they are "telecommunications carriers." The Act and the Commission's rules impose various requirements on providers of telecommunications, including contributing to universal service mechanisms, paying interstate access charges, and filing interstate tariffs.¹⁸⁹ We note that, to the extent we conclude that certain forms of phone-to-phone IP telephony

¹⁸⁸ Routing and protocol conversion within the network does not change this conclusion, because from the user's standpoint there is no net change in form or content.

¹⁸⁹ Other requirements include, but are not limited to: customer proprietary network information (CPNI) rules; section 214 authorization requirements for international service; interconnection provisions of section 251(a); TRS obligations; CALEA assistance capability requirements; compliance with standards promulgated pursuant to sections 255 (access by persons with disabilities) and 256 (coordination for interconnectivity); and certain fees, reporting, and filing requirements.

service are "telecommunications services," and to the extent the providers of those services obtain the same circuit-switched access as obtained by other interexchange carriers, and therefore impose the same burdens on the local exchange as do other interexchange carriers, we may find it reasonable that they pay similar access charges. On the other hand, we likely will face difficult and contested issues relating to the assessment of access charges on these providers. For example, it may be difficult for the LECs to determine whether particular phone-to-phone IP telephony calls are interstate, and thus subject to the federal access charge scheme, or intrastate. We intend to examine these issues more closely based on the more complete records developed in future proceedings.

92. With regard to universal service contributions, to the extent we conclude that certain forms of phone-to-phone IP telephony are interstate "telecommunications," and to the extent that providers of such services are offering those services directly to the public for a fee, those providers would be "telecommunications carriers." Accordingly, those providers would fall within section 254(d)'s mandatory requirement to contribute to universal service mechanisms. Finally, under section 10 of the Act, we have authority to forbear from imposing any rule or requirement of the Act on telecommunications carriers.¹⁹⁰ We will need to consider carefully whether, pursuant to our authority under section 10 of the Act, to forbear from imposing any of the rules that would apply to phone-to-phone IP telephony providers as "telecommunications carriers."

93. We recognize that our treatment of phone-to-phone IP telephony may have implications for the international telephony market. In the international realm, the Commission has stated that IP telephony serves the public interest by placing significant downward pressure on international settlement rates and consumer prices.¹⁹¹ In some instances, moreover, IP telephony providers have introduced an alternative calling option in foreign markets that otherwise would face little or no competition. We continue to believe that alternative calling mechanisms are an important pro-competitive force in the international services market. We need to consider carefully the international regulatory requirements to which phone-to-phone providers would be subject. For example, it may not be appropriate to apply the international accounting rate regime to IP telephony.

4. Policy Implications

94. Congress directed us to explain in this Report "the impact of the Commission's interpretation . . . on the current and future provision of universal service,"¹⁹² and "the

¹⁹⁰ 47 U.S.C. 160.

¹⁹¹ See *Rules and Policies on Foreign Participation in the U.S. Telecommunications Market and Market Entry and Regulation of Foreign-Affiliated Entities*, Report and Order and Order on Reconsideration, 12 FCC Rcd 23,891 (1997), recon. pending.

¹⁹² Appropriations Act at §623(b)(1). We have also been directed to explain specifically how our application of the statutory definition to "mixed or hybrid services" impacts on "universal service definitions and support." *Id.* at § 623(b)(2).

consistency of the Commission's application" of statutory definitions.¹⁹³ Therefore, we address in this section the policy consequences of the legal analysis described above. We conclude that our reading of the statutory definitions reflects a consistent approach that will safeguard the current and future provision of universal service to all Americans, and will achieve the 1996 Act's goals of a "pro-competitive, deregulatory communications policy." Further, we are committed to monitoring closely developments in the telecommunications industry to ensure that such changes do not undermine our obligation to ensure universal service.

a. Generally

95. The Internet and other enhanced services have been able to grow rapidly in part because the Commission concluded that enhanced service providers were not common carriers within the meaning of the Act.¹⁹⁴ This policy of distinguishing competitive technologies from regulated services not yet subject to full competition remains viable. Communications networks function as overlapping layers, with multiple providers often leveraging a common infrastructure.¹⁹⁵ As long as the underlying market for provision of transmission facilities is competitive or is subject to sufficient pro-competitive safeguards, we see no need to regulate the enhanced functionalities that can be built on top of those facilities. We believe that Congress, by distinguishing "telecommunications service" from "information service," and by stating a policy goal of preventing the Internet from being fettered by state or federal regulation, endorsed this general approach.¹⁹⁶ Limiting carrier regulation to those companies that provide the underlying transport ensures that regulation is minimized and is targeted to markets where full competition has not emerged. As an empirical matter, the level of competition, innovation, investment, and growth in the enhanced services industry over the past two decades provides a strong endorsement for such an approach.

b. Impact on Universal Service

96. Congress has directed us to explain how our interpretation of the 1996 Act promotes "the current and future provision of universal service to consumers in all areas of

¹⁹³ *Id.* at § 623(b)(2).

¹⁹⁴ AOL comments at 7-8; USIPA comments at 3; ITI and ITAA comments at 8; AOL reply comments at Attachment 14-16.

¹⁹⁵ See AOL reply comments at Attachment 2-7.

¹⁹⁶ Several commenters observe that the 1996 Act states that it is the policy of the United States "to promote the continued development of the Internet and other interactive computer services and interactive media . . . [and] to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation." 47 U.S.C. § 230(b)(1)-(2). See CIX comments at 5; ITI and ITAA comments at 8; NCTA comments at 10; CIX reply at 1-2. See also Senator McCain letter at 2 (claiming that imposition of new burdens on Internet services would be directly contrary to the will of Congress).

the Nation, including high cost and rural areas."¹⁹⁷ With regard to the current provision of universal service, we have established programs under section 254 to fund telecommunications services in high-cost areas and for low-income consumers, as well as access to advanced services for schools, libraries, and rural health care providers.¹⁹⁸ We believe that these programs have been designed with a sufficiently broad contribution base to support current universal service needs.¹⁹⁹

97. As we have explained, our interpretation of the terms "telecommunications" and "information service" reflect continuity with pre-existing legal categories. Consequently, we do not believe that these interpretations would create significant shifts in contribution obligations based on the current configuration of the communications industry. Retail revenues of Internet service providers -- approximately five billion dollars in 1997²⁰⁰ -- are relatively small compared to the \$100 billion in long-distance revenue reported in the latest telecommunications relay service fund worksheet report.²⁰¹ The fact that Internet access is not considered a "telecommunications service" therefore does not have a significant impact on the current universal service funding base. More importantly, however, Internet access generates additional telecommunications revenue to support universal service in the form of the thousands of business lines (with their associated tariffed rates, subscriber line charges, and presubscribed interexchange carrier charges) that Internet service providers must purchase in

¹⁹⁷ Appropriations Act, § 623(b)(1).

¹⁹⁸ See *Universal Service Order*, 12 FCC Rcd at 8888-8951, paras. 199-325 (addressing high cost support); *id.* at 8952-8994, paras. 326-409 (addressing low-income support); *id.* at 9002-9092, paras. 424-607 (establishing mechanisms to support access to advanced services for schools and libraries).

¹⁹⁹ Commenters that expressed concern about the sufficiency of the current mechanisms generally did so on the basis of the split between federal and state support. Arguments about the effects of Internet-based services generally focused on potential effects in the future. See, e.g., Senators Stevens and Burns comments at 9 ("Federal and state universal service mechanisms, including access charges, currently collect enough money to support the physical infrastructure today. However, if the current Commission exemptions from universal service contributions and access charges remain unchanged, that will not be the case tomorrow.")

²⁰⁰ Coopers & Lybrand's New Media Group, Internet Service Provider Overview (presented at FCC *en banc* hearing, Feb. 19, 1998) at 18.

²⁰¹ Telecommunications Industry Revenue: TRS Fund Worksheet (FCC Common Carrier Bureau, Industry Analysis Division, November 1997) at Figure 1. See also MCI reply comments at 1-2 (observing that exclusion of Internet revenues has an insignificant effect on universal service funding). We note, however, data presented at our February 19, 1998 *en banc* hearing indicating that Internet service provider market revenues are projected to grow to eighteen billion dollars in the year 2000. See *supra* Section IV.C.

We use the disparity between long distance market revenues and Internet service provider market revenues to illustrate the relatively small size of the Internet service provision market. We note, however, that the total revenues subject to universal service mechanism substantially exceed the long distance revenues.

order to provide connectivity to their users, and the high-capacity leased lines that they use to route data across their networks.²⁰²

98. It is critical, however, to make sure that our interpretation of the statute, to the extent legally possible, will continue to sustain universal service in the future. Some parties argue that, as new communications services such as Internet access and IP telephony grow, traffic will shift away from conventional telecommunications services, thus draining the support base for universal service.²⁰³ We are mindful that, in order to promote equity and efficiency, we should avoid creating regulatory distinctions based purely on technology. Congress did not limit "telecommunications" to circuit-switched wireline transmission, but instead defined that term on the basis of the essential functionality provided to users.²⁰⁴ Thus, for example, we have previously required paging providers to contribute to universal service funding, because they are providers of "telecommunications service."²⁰⁵ We have also required private carriers to contribute to federal universal service funding, even though they are not common carriers.²⁰⁶ In this Report, we have further addressed providers of pure transmission capacity used for Internet services, and have concluded that these entities provide services that meet the legal definition of "telecommunications." We also have considered the regulatory status of various forms of "phone-to-phone IP telephony" service mentioned generally in the record. The record currently before us suggests that certain of these services lack the characteristics that would render them "information services" within the meaning of the statute, and instead bear the characteristics of "telecommunications services." We do not believe, however, that it is appropriate to make any definitive pronouncements in the absence of a more complete record focused on individual service offerings. As noted, to the extent we

²⁰² AOL comments at 17 n.65 (stating that AOL spent over \$900 million on telecommunications services in its most recent fiscal year). *See also* CIX comments at 10-11; Compuserve comments at 11; Coalition comments at 13; ITI and ITAA comments at 8-9; USIPA comments at 4; Internet Service Providers reply comments at 4-5. *But see* AT&T reply comments at 12; RTC reply comments at 10 (asserting that indirect ISP contributions are insufficient to support universal service in an equitable manner); *but see also* GTE reply comments at 21-22 (arguing that current FCC interpretations favor self-provision of transmission by ISPs). We acknowledge that such indirect contributions are different from direct contributions by telecommunications carriers. The point is that Internet access does generate substantial support for universal service.

²⁰³ *See* AirTouch comments at 28-33; Alaska comments at 8-10; Ameritech comments at 2; AT&T comments at 12-13; GTE comments at 15-17; Senators Stevens and Burns comments at 8-9; RTC comments at 10-13; TDS comments at 3; WUTC comments at 5; AT&T reply comments at 11-12; Bell Atlantic reply comments at 14.

²⁰⁴ *See* 47 U.S.C. § 153(46) ("The term 'telecommunications service' means the offering of telecommunications for a fee directly to the public . . . regardless of the facilities used.") (emphasis added). The Commission has followed the same approach in implementing *Computer II*. *See, e.g., American Telephone and Telegraph Company, For Authority under Section 214 of the Communications Act of 1934, as amended, to Install and Operate Packet Switches at Specified Telephone Company Locations in the United States*, Memorandum Opinion, Order and Authorization, 94 FCC 2d 48 (1983) (BPSS) (classifying pure packet switching as a basic service).

²⁰⁵ *Universal Service Order*, 12 FCC Rcd. at 9179, para. 787.

²⁰⁶ *Universal Service Order*, 12 FCC Rcd. at 9182-9184, paras. 793-96.

conclude that certain forms of phone-to-phone IP telephony are "telecommunications," and to the extent that providers of such services are offering those services directly to the public for a fee, those providers would be "telecommunications carriers." Accordingly, those providers would fall within section 254(d)'s mandatory requirement to contribute to universal service mechanisms. If such providers are exempt from universal service contribution requirements, users and carriers will have an incentive to modify networks to shift traffic to Internet protocol and thereby avoid paying into the universal service fund or, in the near term, the universal service contributions embedded in interstate access charges. If that occurs, it could increase the burden on the more limited set of companies still required to contribute.²⁰⁷ Such a scenario, if allowed to manifest itself, could well undermine universal service. At this time, however, there is no evidence that there is an immediate threat to the sufficiency of universal service support.

99. Several commenters urge us to subject Internet access providers and other information service providers to universal service contribution requirements.²⁰⁸ The potential future threat to universal service funding posed by use of the Internet derives from services that are functionally substitutable for telecommunications services at the same level of the network hierarchy. An end user that shifts its local exchange service from an incumbent local exchange carrier (LEC) to a competitive LEC, or to a wireless carrier, is purchasing a functionally identical service using different providers or technologies. We have designed the universal service regime so that shifting between such services does not eliminate the contribution requirement. Substitutability in a particular case, however, is not sufficient under the statute to require universal service contributions. Instead of making a telephone call or sending a fax, an end user could send an overnight letter. It is unlikely, however, that anyone would argue that the overnight delivery service should contribute to universal service funding. The key difference is that delivery service does not provide "telecommunications" as defined in the Act. Congress limited universal service contribution obligations to providers of "telecommunications," because only those services are truly substitutable in a functional sense.

100. Some parties argue that we should reclassify Internet service providers as telecommunications carriers in order to address congestion of local exchange networks caused by Internet usage.²⁰⁹ We note that the Commission addressed this argument last year in the *Access Reform* proceeding, and decided to continue to treat Internet service providers as end users for purposes of access charges.²¹⁰ As the Commission stated in that Order, although concerns about network congestion deserve serious consideration, imposition of per-minute

²⁰⁷ We recognize that there are other factors that could influence a carrier in deciding to shift its traffic.

²⁰⁸ AirTouch comments at 30; Alaska comments at 9; AT&T comments at 12-13; SBC comments at 2; February 19, 1998 *en banc* transcript at 25 (testimony of Mr. Comstock); AT&T reply comments at 11, 14; Bell Atlantic reply comments at 2, 10-11; February 19, 1998 *en banc* transcript at 88-89 (testimony of Mr. Dix, LCI, Int'l).

²⁰⁹ See, e.g., Bell Atlantic reply comments at 10-12.

²¹⁰ *First Report and Order in the Matter of Access Charge Reform*, 12 FCC Rcd 15982, 16133-16135, paras. 344-48 ("Access Charge Reform Order").

interstate access charges on Internet service providers is not an appropriate solution. Commenters in this proceeding have raised many of the same arguments that we considered in the *Access Reform* proceeding. We make no conclusions here as to whether some alternate rate structure for Internet service providers would be more efficient. That is an issue best addressed either on reconsideration of our *Access Reform* decision, or in connection with the Notice of Inquiry on Internet and Information Services that Use the Public Switched Telephone Network that we issued in the *Access Reform* proceeding.²¹¹ For purposes of this Report, we believe that the central issue is whether our decision that Internet access is not a "telecommunications service" is likely to threaten universal service. In other words, will Internet usage place such a strain on network resources that incumbent LECs will be unable to provide adequate service? As we noted in the *Access Reform Order*, both ILECs and the Network Reliability and Interoperability Council agreed that Internet usage did not pose any threat to overall network reliability.²¹² Incumbent LECs are investing in network upgrades to handle Internet traffic, and our *Notice of Inquiry* docket provides the appropriate forum to consider steps that we could take to ensure that incumbent LECs have incentives to choose the most efficient technology.

101. We realize that, as technology evolves, new means of providing telecommunications service may emerge. Although we conclude that Internet access is not a "telecommunications service," we acknowledge that there may be telecommunications services that can be provisioned through the Internet. We have singled out IP telephony services for discussion in this Report.²¹³ As discussed above, users of certain forms of phone-to-phone IP telephony appear to pay fees for the sole purpose of obtaining transmission of information without change in form or content. Indeed, from the end-user perspective, these types of phone-to-phone IP telephony service providers seem virtually identical to traditional circuit-switched carriers. The record currently before us suggests that these services lack the characteristics that would render them "information services" within the meaning of the statute, and instead bear the characteristics of "telecommunications services."²¹⁴ With respect to the provision of pure transmission capacity to Internet service providers or Internet backbone providers, we have concluded that such provision is telecommunications.

102. As some parties observe, our interpretation of the 1996 Act may mean that information services such as Internet access are not eligible for subsidies outside of the limited scope of schools and libraries under section 254(h).²¹⁵ We believe Congress made a

²¹¹ Usage of the Public Switched Network by Information Service and Internet Access Providers, *Notice of Inquiry*, 11 FCC Rcd 21354 (1996).

²¹² *Access Charge Reform Order*, 12 FCC Rcd at 16134, para. 347. See also Comcast reply comments at 4 (claiming that cable-based ISPs actually reduce demand on the PSTN).

²¹³ See *supra* Section IV.D.3.

²¹⁴ As discussed above, however, we do not believe that it is appropriate to make any definitive pronouncements in the absence of a more complete record focused on individual service offerings.

²¹⁵ Senators Stevens and Burns comments at 9; TDS comments at 10-11. On section 254(h), see *infra* Section VI.B.2.