

The Internet and “Telecommunications Services,” Universal Service Mechanisms, Access Charges and Other Flotsam of the Regulatory System

Jonathan Weinberg*

The communications world is changing, and packet-switched networks are taking over. Traditionally, telephone networks have relied on a “circuit-switched” architecture — that is, when one user makes a call to another, a circuit within the network is opened and dedicated to that call for as long as the call lasts.¹ In the 1960s, though, scientists began developing “packet switching” techniques for communicating information. In packet switching, the information (a telephone conversation, video clip, computer program, newspaper article, or something else) is sliced up into small packets, each carrying its own copy of the destination address. The packets travel individually to their destination, not necessarily over the same route, and are reassembled in proper sequence when they arrive. Packet switching is the way the Internet works.²

The traditional communications world relies on distinct infrastructures for each communications service. Voice travels over a nationwide wired, intelligent, circuit-switched network, with a single 64 Kbps voice channel set aside for each call. Video moves over a separate system of terrestrial broadcast stations, supplemented by coaxial-cable or hybrid

* Associate Professor of Law, Wayne State University. During the 1997-98 academic year, I served as legal-scholar-in-residence at the Federal Communications Commission, and was among the drafters of the FCC’s April 1998 *Report to Congress on Universal Service*, which I discuss in text. As should be apparent from this paper, though, the views I express here are not necessarily those of the Commission or its staff. For the ideas contained in this paper, I owe a deep and continuing debt to current and former FCC staffers, including Dale Hatfield, Elliot Maxwell, Mike Nelson, Stagg Newman, Robert Pepper, Stan Trost and Kevin Werbach. I owe particular thanks to Jessica Litman, Neil Netanel and Stagg Newman for their comments on an earlier draft, and to David Clark, Shane Greenstein and Danny Weitzner for their insights. None of them can be held responsible for what I say here, but anything that is useful in this paper probably comes from one of them; the outright errors and unsupported leaps of logic are all mine.

¹ This is oversimplified; time division multiplexing techniques allow multiple calls to share a given circuit. See HARRY NEWTON, *NEWTON’S TELECOM DICTIONARY* 728-29 (14th ed. 1998). Even using multiplexing techniques, though, it remains the case that each call has a fixed share of network resources allocated to it for the duration of the call.

² See *id.* at 527.

fiber/coax networks carrying video programming from a cable headend to all homes in a given area. Data is piggybacked onto the voice network via an awkward kluge, under which the information is converted from digital to analog form and back again.

Digitization and packet switching, though, have the potential to change that traditional design. One can convert the information transmitted via any communications service — whether it be voice, video, text, or data — into digital form. Packet switching, with or without the use of IP (Internet Protocol), enables the transmission of that digitized information across different networks without regard to the underlying network technology.³ This means that the digitized information corresponding to any service can be transmitted over any physical infrastructure — copper wires, fiber, hybrid fiber-coax, microwave, direct broadcast satellites or carrier pigeon.⁴ Proprietors of copper (or hybrid fiber/coax, or wireless) infrastructure can offer services not previously associated with those physical facilities, and new services can be delivered, via the Internet, over any physical facilities supporting high-speed data transmission.⁵

Both local exchange carriers and cable operators are now entering the market to provide high-speed data services. Consumers with Internet access can engage in real-time voice transmission via IP. Cable operators are exploring the provision of voice telephony, via IP, over cable facilities.⁶ New services, including video, can be offered over various facilities; all that is necessary is bandwidth. And increasingly, firms are designing nationwide, packet-switched,

³ See RFC 791 (Internet Protocol), <<http://ds.internic.net/rfc/rfc791.txt>>.

⁴ See RFC 1149 (Carrier Pigeon Internet Protocol), <<http://ds.internic.net/rfc/rfc1149.txt>>. Carrier pigeons are appropriate only for applications tolerating extremely high latency.

⁵ Thus, a telephone company recently announced plans to offer 80 channels of cable programming over copper pair, using RADSL. See *Small Telco Eyes Cable Over DSL*, MULTICHANNEL NEWS, Aug. 29, 1998. US WEST is seeking cable franchises for video services it plans to offer over a fiber / copper network using VDSL. See *U S West Wins Phoenix Franchise*, MULTICHANNEL NEWS, Sept. 3, 1998. And various players are offering video over the Internet. See Richard Tedesco, *Who'll control the video streams?*, BROADCASTING, Mar. 8, 1999, at 20.

⁶ See, e.g., John Markoff, *In AT&T-TCI Deal, Cost and Logistical Problems*, NEW YORK TIMES, July 2, 1998, at D1.

backbone networks to carry that traffic.⁷ These networks are not designed to support a particular service; they carry whatever information is necessary for the service the consumer wants.

These developments, however, give rise to a regulatory dilemma. American communications law has developed along service-specific lines. It has developed complex and distinct regulatory structures covering telephony (wired and wireless), broadcasting, cable television and satellites. It has so far left IP transmission largely unregulated. As those technologies become no longer separate, we need to figure out what to do with the old regulatory structures.

In this paper, I will focus on one aspect of that problem: To what extent should (or can) we impose legacy telephone regulation on IP networks? As a broad-brush matter, it seems plain that it would be a Very Bad Idea either (1) to impose such regulation; or (2) not to impose it. Imposing legacy regulation on IP networks seems like a bad idea because that regulation was not designed for those networks. It was developed to fit a circuit-switched world, served mostly by monopoly telephone service providers, and it is characterized by extensive cross-subsidies and a general disregard of innovation and competitive markets. Not imposing regulation, though, seems untenable as well: IP and conventional networks are merging. To maintain extensive regulation of the circuit-switched world and minimal regulation of the IP world will simply invite arbitrage, and will undercut the legitimate policy goals of the old system.

This problem is made more difficult by the snarl of cross-subsidies that comprise much of modern telephone regulation. Telephone pricing today is characterized by a variety of subsidies: some federal, some state; some explicit, some implicit.⁸ On the federal level, the government

⁷ These networks may rely on native IP, like Qwest's, or on Asynchronous Transfer Mode (a high-speed packet-like transmission technology), like Sprint's planned ION network. See Jacob Ward, *Sprint's Brave New Network*, THE INDUSTRY STANDARD, June 5, 1998, <<http://thestandard.net/articles/display/0,1449,544,00.html>>.

⁸ "Implicit subsidy," in this context, means that "a single company is expected to obtain revenues from sources at levels above 'cost' (i.e., above competitive price levels), and to price other services allegedly below cost." Federal-State Joint Board on Universal Service, Report and Order, 12 FCC Rcd 8776, 8784 n. 15 (1997) (*Universal Service Order*), appeal pending sub nom., Texas Office of Public Utility Counsel v. FCC, No. 97-60421 (5th Cir.).

administers explicit subsidies through “universal service” contributions and disbursements. It implements implicit subsidies through the interstate access charge system,⁹ and through geographic averaging of interstate long distance rates.¹⁰ States, typically, administer implicit subsidies via geographic averaging of local telephone rates, business-to-residential subsidies, and the pricing of vertical features, intrastate access, and intrastate toll. The most important of these is geographic rate averaging: high-density urban areas, where costs are lower, underwrite the provision of service to low-density, high-cost rural areas.¹¹

The Federal Communications Commission, thus, must face these questions: To what extent should the Internet, and IP networks generally, be brought into the web of subsidies that characterize much of modern telephone regulation? What are the consequences if they are not?

In this paper, I will focus my attention on explicit federal universal-service subsidies and, to a lesser extent, on the interstate access charge system. After providing some background (in Part I), I will suggest in Part II that the distinction between “telecommunications” and “information service,” embedded in current law, cannot coherently be applied to IP-based services. Rather than attempting to single out “telecommunications” providers for universal service contribution obligations, it may make sense to impose those obligations on the owners of the physical transmission facilities used for the services. In Part III, I will suggest that in the long run, providers of interstate IP-based services should pay any congestion costs they impose on the local exchange. Such a step may be appropriate, however, in the presence of meaningful competition in the local market, and only on a showing that the failure to require such payments is distorting ISPs’ market incentives.

I. BACKGROUND

⁹ See 47 C.F.R. Part 69.

¹⁰ See 47 U.S.C. § 254(g).

¹¹ See *Universal Service Order*, 12 FCC Rcd at 8784.

This background section begins by briefly describing the architecture of the Internet. It then turns to the charter of U.S. telephone regulation, found in Title II of the 1934 Communications Act. It describes how the FCC, implementing that statute, has approached the intersection of federal and state authority, and the intersection of computing and communications technology. Finally, it discusses the ways in which the 1996 Telecommunications Act has altered those accommodations.

A. *Internet Architecture*

The Internet is an interconnected network of networks, communicating using packet-switching technology. A key part of that technology is the Internet Protocol (IP), which provides the intelligence to transmit packets successfully even if source and destination are on different physical networks. IP converts multiple physical networks, which may run on completely different hardware, into a single logical network. Any computer on any of the underlying networks can thus communicate with any other.¹²

On a more prosaic level, the Internet is a set of computers, packet routers, and the physical communications paths (such as copper wire, or fiberoptic cable, or terrestrial wireless, or satellite transmission, or coaxial cable) connecting them. A packet router is a data communications device whose job it is to tell packets where to go; each time a packet hits a router, the router examines that packet's address information and determines where to send it next.¹³ Typically, each router is connected to at least two others.¹⁴ For the most part, the Internet's physical transmission paths are copper or fiber lines leased from telephone companies

¹² See RFC 1180 (TCP/IP Tutorial), <<http://www.rfc-editor.org/rfc/rfc1180.txt>>, at paras. 2.5-2.7, 5-5.12.

¹³ See Jack Rickard, *Internet Architecture*, in BOARDWATCH MAGAZINE DIRECTORY OF INTERNET SERVICE PROVIDERS 11 (Winter 1998).

¹⁴ See *id.*

(or fiberoptic cable from other providers).¹⁵ All telephone lines are not the same, though. At one extreme is an ordinary analog voice line, which can be used for data by means of a modem transmitting information at (say) a rate of 28.8 kilobytes per second (Kbps). As one seeks increasing speed, one might lease data lines from the telephone company rated at T-1 (1.544 megabytes per second, or Mbps) or T-3 (45 Mbps), or an OC-3 fiberoptic line (155 Mbps) or an OC-12 (622 Mbps). Each of these comes with a progressively higher price tag.¹⁶

When I am at home in Ann Arbor, and send an e-mail message to a YALE JOURNAL ON REGULATION editor who has an account on the Yale University system, the packets constituting that message move something like this: Each packet begins at my home computer, and travels over my home telephone line to a server belonging to Msen, my Internet service provider. Msen is in the business of supplying Internet access to residences and businesses. It has modem banks in two dozen Michigan cities, and provisions its network using telephone lines leased from companies in the state.

Msen has made the business choice to provide service only in Michigan, though; its network doesn't extend beyond the state. In order for my packets to leave Michigan, therefore, Msen must pass them to a backbone provider.¹⁷ A backbone provider is a firm that owns high-speed routers physically located in a number of cities across the United States, and has leased (or constructed) high-speed data lines to connect those routers.¹⁸ It thus controls a high-speed interstate data pathway. To get my packets to Yale University, Msen will most likely pass them via a Detroit interconnection point to a national backbone provider known as UUNET. (UUNET is currently a unit of MCI Worldcom.)¹⁹ UUNET may route the packets to New York and hand

¹⁵ See *id.* at 11-12.

¹⁶ See *id.* at 12; HARRY NEWTON, *NEWTON'S TELECOM DIRECTORY* 508, 695, 696 (14th ed. 1998).

¹⁷ See *Application of Worldcom, Inc. and MCI Communications for Transfer of Control*, 13 FCC Rcd 18025, 18104-07 (1998) (hereafter, *Worldcom-MCI Order*).

¹⁸ *Id.* at 18106-07.

¹⁹ See *BOARDWATCH MAGAZINE DIRECTORY OF INTERNET SERVICE PROVIDERS* 259 (Winter 1998)

them off to CERFnet, a national backbone provider purchased last year by AT&T.²⁰ CERFnet would then convey the packets to the Yale University network in New Haven; that network would reassemble the packets into my e-mail message and deliver them to the recipient.

Who pays for all this? Internet service providers, and Internet backbone providers, interconnect by means of “transit” or “peering” arrangements.²¹ Msen pays UUNET for transit. That is, it pays UUNET to accept traffic coming from Msen’s network, and to deliver that traffic either to a destination on UUNET’s own network or to a third network for ultimate delivery.²² UUNET and CERFnet, by contrast, have a peering arrangement — that is, each has agreed to deliver traffic to the other, so that the customers of one network can exchange traffic with the customers of the other, and neither network pays the other for that service.²³ As a general matter, the major national backbones peer with one another. Networks that enter into peering arrangements are usually (although not always) more or less the same size, so that roughly equivalent numbers of packets flow in each direction.²⁴

My monthly subscription payment to Msen covers my share of its costs for interconnection to UUNET and other backbone providers. It also covers my share of Msen’s costs to transport packets within its own network: that is, capital expenditures for routers,

²⁰ See *id.* at 221.

²¹ See Worldcom-MCI Order at 18105-06; OECD Working Party on Telecommunication and Information Services Policies, *Internet Traffic Exchange: Developments and Policy* 14-15 (1998), available at <<http://www.oecd.org/dsti/sti/it/cm/prod/TRAFFIC.htm>>.

²² See *Worldcom-MCI Order* at 18106.

²³ See *id.* at 18105-06; Kenneth Cukier, “Peering and Fearing: ISP Interconnection and Regulatory Issues,” available at <<http://ksg222.harvard.edu/iip/iicompol/Papers/Cukier.html>>.

²⁴ See Cukier, *supra* note ; OECD Working Party on Telecommunication and Information Services Policies, *supra* note , at 14-17. See generally Padmanabhan Srinagesh, *Internet Cost Structures and Interconnection Agreements* (March 1995), available at <<http://www.press.umich.edu/jep/works/SrinCostSt.html>>.

servers, modems and associated equipment, and monthly payments for leased lines to connect those pieces of equipment.²⁵

B. *Telephone Regulation*

All of these relationships developed within the context of a much older, completely unrelated telephone regulatory system. I will briefly describe that mass of telephone regulation in order to discuss the regulatory construct applicable to IP-based services. Federal regulation of telecommunications began with the Mann-Elkins Act of 1910, which subjected telephone and telegraph service to the jurisdiction of the Interstate Commerce Commission (whose main job was railroad regulation).²⁶ Twenty-four years later, Title II of the Communications Act²⁷ moved the job of telecommunications regulation to the new FCC. For both the substantive standards applicable to telephone and telegraph service providers and the procedural mechanisms used to enforce those standards, though, Title II looked to then-existing railroad law.²⁸

Title II, as enacted in 1934, regulated the conduct of communications "common carriers," defined to include any person (other than a broadcaster) "engaged as a common carrier for hire in interstate or foreign communication by wire or radio."²⁹ Its keystones were requirements that

²⁵ Finally, it covers costs relating to operations, customer acquisition, and customer service. See Lee W. McKnight & Brett Leida, *Internet telephony: Costs, pricing and policy*, 22 TELECOMM. POL'Y 555, 557-59; Srinagesh, *supra* note 24.

²⁶ Earlier statutes -- the Pacific Railroad Act of 1862 and the Post Roads Act of 1866 -- had provided for some governmental authority over telegraph lines built with government subsidies or along public lands. See Kenneth A. Cox & William J. Byrnes, *The Common Carrier Provisions -- A Product of Evolutionary Development*, in A LEGISLATIVE HISTORY OF THE COMMUNICATIONS ACT OF 1934, at 25, 27 (Max Paglin ed. 1989).

²⁷ 47 U.S.C. §§ 201-76.

²⁸ See Glen O. Robinson, *The Federal Communications Act: An Essay on Origins and Regulatory Purpose*, in A LEGISLATIVE HISTORY OF THE COMMUNICATIONS ACT OF 1934, at 3, 5-6 (Max Paglin ed. 1989); Cox & Byrnes, *supra* note 26, at 30.

²⁹ 47 U.S.C. § 153(10).

carriers' rates be embodied in published tariffs³⁰ and be just, reasonable, and nondiscriminatory.³¹ Carriers were required to interconnect with other carriers,³² and to obtain agency permission before building or acquiring new lines.³³ The agency had the power to prescribe just and reasonable charges,³⁴ to suspend and investigate tariffs,³⁵ and to award damages.³⁶ The FCC administered these provisions with the goals (among others) of safeguarding against anticompetitive behavior, minimizing the potential for improper cross-subsidization and protecting the quality and efficiency of telephone service.³⁷ Over time, Congress added new requirements relating to such disparate issues as carriers' disclosure of private customer information;³⁸ obscene or harassing telephone calls;³⁹ the use of telecommunications services by the hearing-impaired;⁴⁰ pay-per-call services;⁴¹ and facilitation of police eavesdropping.⁴²

1. *The Federal-State Divide.* The Communications Act, though, did not arrogate exclusive control to the FCC. Rather, it divided authority between the national government and

³⁰ *Id.* § 203.

³¹ *Id.* §§ 201(b), 202(a).

³² *Id.* § 201(a).

³³ *Id.* § 214.

³⁴ *Id.* § 205.

³⁵ *Id.* § 204.

³⁶ *Id.* §§ 206-09.

³⁷ *See Amendment of Section 64.702*, 72 FCC 2d 358, 389-90 (1979).

³⁸ 47 U.S.C. § 222.

³⁹ *Id.* § 223.

⁴⁰ *Id.* § 225.

⁴¹ *Id.* § 228.

⁴² *Id.* § 229.

the states: It assigned the FCC authority over interstate communication, but left to the states regulation of *intrastate* communications.⁴³ Even before the passage of the 1934 Act, it became clear that this dividing line between federal and state jurisdictions was problematic.⁴⁴ A long-distance call, after all, passes over the network of the local telephone company serving the caller, *and* that of the long-distance company, *and* that of the local telephony company serving the called party. What does such a call do to the Act's jurisdictional boundaries? In a 1930 case called *Smith v. Illinois Bell Telephone Co.*, the Supreme Court provided an answer: To the extent that local plant is used for interstate calling, the Court stated, it is beyond the reach of the state regulator. Its costs relate to "property used in the interstate service," and must be included in the interstate rate base, under federal control.⁴⁵ The cost of local telephone company plant must thus be allocated between the intrastate and interstate jurisdictions.⁴⁶

In the wake of *Smith v. Illinois Bell*, AT&T increased its per-minute long-distance rates to reflect that portion of local plant costs assigned to the interstate jurisdiction, and returned the corresponding revenues to the local companies (who, for the most part, were its subsidiaries, so the reimbursement was just a division of revenues within the AT&T corporate family).⁴⁷ After the

⁴³ See *id.* § 152(b).

⁴⁴ For more recent struggles with that dividing line, see, e.g., *AT&T Corp. v. Iowa Utilities Bd.*, 119 S. Ct. 721 (1999) (rejecting the argument that FCC rules implementing the local-competition provisions of the 1996 Telecommunications Act relate to local -- rather than interstate -- communications and are thus beyond federal authority); Inter-Carrier Compensation for ISP-Bound Traffic, CC Docket Nos. 96-98 & 99-68 (rel. Feb. 26, 1999).

⁴⁵ 282 U.S. 133, 148-49 (1930); see *Nat'l Ass'n of Regulatory Utility Comm'rs v. FCC*, 737 F.2d 1095 (D.C. Cir. 1984) (discussing *Smith*), *cert. denied*, 496 U.S. 127 (1985). In *Smith*, the Supreme Court reviewed a district court decision adjudicating the legality of Illinois Bell's Chicago payphone rates. The Court explained that the lower tribunal had erred in including all of Illinois Bell's Chicago property in its rate base. "The separation of the intrastate and interstate property, revenue and expenses of the Company," it explained, "is essential to the appropriate recognition of the competent governmental authority in each field of regulation." 282 U.S. at 148.

⁴⁶ *Smith*, 282 U.S. at 148-51.

⁴⁷ See *Nat'l Ass'n of Regulatory Utility Comm'rs v. FCC*, 737 F.2d at 1104 n.3. Where the local carrier was not affiliated with AT&T, AT&T remitted to it the amounts necessary to recover its allocated interstate costs, including a return on investment. See Access Charge Reform, 12 FCC Rcd 15982, 15990-91 (1997).

beginning of long-distance competition,⁴⁸ the new long-distance carriers came to make similar payments.⁴⁹ Under FCC rules promulgated in 1983, AT&T and its competitors each made competitively neutral “access payments” to the (now independent) local carriers for the right to originate and terminate traffic on their networks.⁵⁰

As the FCC recognized, though, this impact of *Smith v. Illinois Bell* was economically questionable. Local plant costs are for the most part non-traffic sensitive. That is, the cost of installing, and maintaining, a wire from an Ameritech central office to my house is the same whether I use that line five minutes each day or eighteen hours. Yet under the access-charge system, those costs were recovered through a per-minute (traffic-sensitive) charge on long-distance usage. Heavy long-distance users ended up paying more than the costs they imposed on the network; light users paid less. This created arbitrage incentives, and raised the possibility that heavy users might turn to solutions in which they bypassed the local telephone networks entirely in initiating long-distance traffic, avoiding access charges and shifting those costs onto an ever-shrinking rate base.

Accordingly, the Commission began moving away from the old structure. It ordered in 1983 that a portion of the local plant costs in the interstate jurisdiction should be recovered through flat, monthly per-line charges assessed on all local telephone subscribers. This, the agency reasoned, would be more nearly economically efficient: non-traffic sensitive costs would be recovered through non-traffic sensitive fees, so that prices would be based on the true cost characteristics of telephone company plant. At the same time, the FCC established a Universal

⁴⁸ Before the mid-1970s, one could place ordinary long-distance telephone calls only through AT&T. MCI filed tariffs for its own service in 1974; the D.C. Circuit twice reversed FCC rulings that would have shut that competition down. *See MCI Telecommunications Corp. v. FCC*, 580 F.2d 590 (D. C. Cir.), *cert. denied*, 439 U.S. 980 (1978); *MCI Telecommunications Corp. v. FCC*, 561 F.2d 365 (D. C. Cir. 1977), *cert. denied*, 434 U.S. 1040 (1978).

⁴⁹ These were referred to as ENFIA (Exchange Network Facilities for Interstate Access) payments. *See ENFIA Agreement*, 43 Fed. Reg. 59,131 (1978); *Access Charge Reform*, 12 FCC Rcd 15982, 15991 (1997).

⁵⁰ *MTS & WATS Market Structure*, 93 F.C.C.2d 241, *on reconsid.*, 97 F.C.C.2d 682 (1983), *further reconsid.*, 97 F.C.C.2d 834, *aff'd in relevant part*, 737 F.2d 1095 (D.C. Cir. 1984), *cert. denied*, 496 U.S. 127 (1985).

Service Fund, to be supported by the long distance carriers, to subsidize rates in high cost areas.⁵¹ The agency contemplated that over time, it would increase the monthly per-line charges paid by local telephone subscribers until those charges covered *all* local plant costs in the interstate jurisdiction, with the exception of the costs reimbursed by the Universal Service Fund.⁵² This goal proved unrealistic, as the Commission faced complaints that allowing the flat charges to rise might cause low-income customers to disconnect their telephone service.⁵³ Instead, local costs assigned to the interstate jurisdiction ended up being recovered partly through subscriber line charges and partly through interstate carriers' access payments.⁵⁴

2. *Computer II*. In the meantime, the FCC was forced to revamp the regulatory structure in an entirely different respect, to confront “the growing . . . interdependence of communication and data processing technologies.”⁵⁵ In the early days of telecommunications, customers buying telephone or telegraph service got an integrated communications offerings managed from top to bottom by the service provider. That changed: “in providing a communications service, carriers [increasingly] no longer control the use to which the transmission medium is put.”⁵⁶ Instead,

⁵¹ See *id.* at 1109; Federal-State Joint Board on Universal Service, 12 FCC Rcd 8776, 8890-92 (1997), *appeal pending*, Texas Office of Public Utility Counsel v. FCC, No. 97-60421 (5th Cir.). In addition, in 1985, the Commission established the Lifeline and Link Up programs, designed to make telephone service affordable for low-income consumers. Subscribers eligible for Lifeline need not pay the federal subscriber line charge and certain intrastate end-user charges; until 1996, the federal portion of Lifeline was funded through a charge assessed on interexchange carriers. Linkup pays a portion of eligible subscribers' installation charges, and was funded, before 1996, by an expense adjustment allocating its costs to the interstate jurisdiction. See *Federal-State Joint Board on Universal Service*, 12 FCC Rcd at 8952-60.

⁵² See *Rural Telephone Coalition v. FCC*, 838 F.2d 1307, 1311-12 (D.C. Cir. 1988); *NARUC v. FCC*, 737 F.2d at 1129-30.

⁵³ See Access Charge reform, 12 FCC Rcd 15982, 15992-93 (1997).

⁵⁴ See *id.*

⁵⁵ Regulatory & Policy Problems Presented by the Interdependence of Computer and Communications Services & Facilities, Notice of Proposed Rulemaking, 7 F.C.C. 2d 11, 13 (1966).

⁵⁶ *Amendment of Section 64.702 of the Commission's Rules and Regulations (Computer II)*, 77 F.C.C. 2d 384, 419, *recon.*, 84 F.C.C. 2d 50 (1980), *further recon.*, 88 F.C.C. 2d 512 (1981), *aff'd sub nom. Computer and Communications Industry Ass'n v. FCC*, 693 F.2d 198 (D.C. Cir. 1982), *cert. denied*, 461 U.S. 938 (1983).

carriers came to offer transparent communications channels that subscribers could use as they chose, for the transmission of voice, data, fax or other information.⁵⁷ Users were able to combine the communications paths provided by telephone companies with computing power, and thus create new services -- such as voice mail or database access -- that they could sell to others. The FCC recognized, in a landmark 1980 proceeding known as *Computer II*, that it would be undesirable to subject these new services to the tariffing and other requirements that were the concomitants of traditional telephone regulation. Imposing those regulatory burdens would discourage innovation and distort the new marketplace, as vendors sought to structure their services so as to avoid coming under the regulatory umbrella. And because the markets for the new services were competitive, regulations primarily intended to restrain market power were unnecessary.⁵⁸

Accordingly, the Commission announced that it would distinguish between “basic” and “enhanced” services.⁵⁹ It limited “basic” transmission services to the offering of “pure transmission capability over a communications path that is virtually transparent in terms of its interaction with customer supplied information.”⁶⁰ By contrast, “any offering over the telecommunications network which is more than a basic transmission service” was an enhanced service.⁶¹ Enhanced services included services “offered over common carrier transmission facilities” that “employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information; provide the subscriber additional, different, or restructured information; or involve subscriber interaction with stored

⁵⁷ *See id.*

⁵⁸ *See id.* at 434.

⁵⁹ *Id.* at 417-30.

⁶⁰ *Id.* at 419-20.

⁶¹ *Id.* at 420.

information.”⁶² Thus, for example, any service featuring “voice or data storage and retrieval applications, such as a ‘mail box’ service,” was enhanced.⁶³

Enhanced service providers, the Commission continued, should not be subject to regulation under Title II of the Communications Act.⁶⁴ Notwithstanding that any enhanced service by definition had a communications component, the Commission found that no regulatory scheme could “rationally distinguish and classify enhanced services as either communications or data processing,”⁶⁵ and that any attempt to impose regulation on enhanced services would lead to arbitrage, inconsistency, and/or inappropriate regulation.⁶⁶ (There was one major caveat: Ma Bell and her descendants, when they sought to offer enhanced services, were subject to a set of rules designed to ensure that they did not leverage their monopoly power.)⁶⁷ That approach was wildly successful in spurring innovation and competition in the enhanced-services marketplace: Government was able to maintain its control of the underlying transport, sold primarily by regulated monopolies, while eschewing any control over the newfangled, competitive “enhancements.”

When the FCC revamped access payments in 1983, it initially took the position that both basic and enhanced service providers should pay access charges. Both were “users of access service,” in that they “obtained local exchange service or facilities which are used . . . for the

⁶² 47 C.F.R. § 64.702(a).

⁶³ *Computer II*, 77 FCC 2d at 420-21.

⁶⁴ The agency reasoned that enhanced services involve “communications and data processing technologies . . . intertwined so thoroughly as to produce a form different from any explicitly recognized in the Communications Act of 1934,” and that enhanced service providers were not “common carriers” within the meaning of the Act. *Id.* at 430-32.

⁶⁵ *Id.* at 428.

⁶⁶ *See id.* at 423-28.

⁶⁷ *See id.* at 461-75; *see also* Amendment of Section 64.702, 2 FCC Rcd 3072 (1987) (*Computer III*), *vacated*, *California v. FCC*, 905 F.2d 1217 (9th Cir. 1990), *on remand*, *Bell Operating Company Safeguards and Tier I Local Exchange Company Safeguards*, 6 FCC Rcd 7571 (1991), *vacated in part*, *California v. FCC*, 39 F.3d 919 (9th Cir. 1994), *cert. denied*, 115 S. Ct. 1427 (1995).

purpose of completing interstate calls."⁶⁸ On reconsideration, though, the agency abandoned that view. Enhanced service providers, it stated, would experience severe rate shocks if they were to pay the same access charges as long-distance carriers.⁶⁹ Accordingly, it exempted enhanced service providers from any access-charge obligations. Rather, those charges fell solely on firms offering basic, interexchange services on a common-carrier basis.⁷⁰

3. *The 1996 Telecommunications Act.* Three years ago, Congress passed the Telecommunications Act of 1996. This enactment, which significantly rewrote United States telecommunications law, did not refer to basic and enhanced services at all; instead, it characterized communications services as “telecommunications” or “information service.”⁷¹ Congress defined “telecommunications,” though, in a manner strongly reminiscent of the basic services category, as “the transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received.”⁷² It defined “information services” in a manner reminiscent of enhanced services, to include “the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing and making available information via telecommunications . . .”⁷³

⁶⁸ *MTS and WATS Market Structure*, 97 F.C.C. 2d 682, 711 (1983), *on further reconsid.*, 97 F.C.C.2d 834, *aff’d in relevant part sub nom. NARUC v. FCC*, 737 F.2d 1095 (1984) *cert. denied*, 469 U.S. 127 (1985).

⁶⁹ *See id.* at 715.

⁷⁰ *See NARUC v. FCC*, 737 F.2d 1095, 1130-36 (1984), *cert. denied*, 469 U.S. 127 (1985).

⁷¹ *See* 47 U.S.C. § 153(20), (43). These categories originated in the 1982 Modification of Final Judgment (MFJ) ending the antitrust suit between the United States government and AT&T. *See* *United States v. American Tel. & Tel. Co.*, 552 F. Supp. 131, 226-32 (D.D.C. 1982), *aff’d sub nom. Maryland v. United States*, 460 U.S. 1001 (1983); Federal-State Joint Board on Universal Service, 13 FCC Rcd 11501, 11514, 11521-22 (1998) (*Report to Congress on Universal Service*). The legislative history does not reveal why the drafters preferred this terminology.

⁷² 47 U.S.C. § 153(43).

⁷³ *Id.* § 153(20).

The FCC concluded that Congress in the 1996 Act intended “telecommunications” and “information service” to parallel basic and enhanced services.⁷⁴

At the heart of the 1996 Act are provisions intended to enable, for the first time, competition in the provision of *local* telecommunications service. Local telecommunications competition is problematic because the incumbents already own the key facilities — most importantly, the lines running from telephone company central offices into every home and business. Accordingly, section 251 of the 1996 Act requires incumbent local exchange carriers to make those lines, and other facilities, available to competitors at cost, and to allow competitors to place their own equipment in the incumbent’s central offices.

Robust competition, though, calls for reform of the subsidy system. Under the pre-1996 status quo, local service was subsidized both explicitly, through the universal service fund, and implicitly, through subsidies built into long-distance carriers’ access payments. The 1996 Act directed the FCC to move towards a system under which implicit subsidies would be eliminated: All federal subsidy support would be distributed through “specific, predictable and sufficient” explicit mechanisms.⁷⁵ The FCC, accordingly, announced that it would seek to reduce access charges so that they covered *only* the traffic-sensitive costs of interconnection with the local network (and thus were cost-justified).⁷⁶ All other local plant costs in the interstate jurisdiction, it continued, should be covered either through flat, per-line charges or through explicit, portable subsidies provided by a larger, revamped Universal Service Fund. This fund, by the terms of the 1996 Act, would be supported by equitable and nondiscriminatory “contributions” (as the statute put it) from interstate telecommunications carriers.⁷⁷

⁷⁴ *Report to Congress on Universal Service*, 13 FCC Rcd at 11511.

⁷⁵ *See* 47 U.S.C. § 254(b)(4), (e); Joint Explanatory Statement of the Committee on Conference (H.R. Rep. No. 458, 104th Cong., 2d Sess.) 131.

⁷⁶ *See* Access Charge Reform, 12 FCC Rcd 15982, 15998-16001 (1997).

⁷⁷ *See* 47 U.S.C. § 254(d). The statute requires all common-carrier providers of “telecommunications services,” as defined in 47 U.S.C. § 153(46), to contribute, and authorizes the FCC to require contributions from other interstate telecommunications providers.

As the FCC has implemented the 1996 Act, the Universal Service Fund has several components. The largest component is the “high cost” fund. This mechanism subsidizes telephone companies in rural and other high-cost areas where the costs of the local loop — that “last mile” of the telephone network running to the individual home or business — are so high that many users would drop off the network rather than shoulder the full costs themselves.⁷⁸ In the second quarter of 1999, interstate telecommunications carriers will pay about 2.4% of their interstate and international end-user revenues for that purpose.⁷⁹ The Universal Service Fund also supports the Lifeline and Link Up programs, targeted towards low-income consumers,⁸⁰ and a program designed to connect schools, libraries, and rural health care providers to the Internet.⁸¹

⁷⁸ The purposes of high-cost support are contested. When the FCC first created an explicit universal service fund in 1983, it characterized its universal-service policymaking as seeking to avoid situations in which the price of local telephone service “cause[s] a significant number of local exchange service subscribers to cancel that service.” *See* MTS & WATS Market Structure, Third Report & Order, 93 F.C.C.2d 241, 266 (1983), *aff’d in relevant part sub nom.* NARUC v. FCC, 737 F.2d 1095 (D.C. Cir. 1984), *cert. denied*, 496 U.S. 127 (1985). This suggests that subsidies in high-cost areas should be high enough to prevent rural users from dropping off the network, but need not be so high as to equalize rates in urban and rural areas.

The Telecommunications Act of 1996, though, asserts a broader goal, legislating the principle that universal service support should give rural consumers telecommunications services at rates comparable to those charged in urban areas. 47 U.S.C. § 254(b)(3). Policymakers in Europe also appear to treat geographical equality of rates as an independent universal-service goal. *See, e.g.*, Barbara Bardski and John Taylor, “Understanding Universal Service: A European Perspective” (1998), at 5 (in the early stages of network diffusion, it is a central universal-service objective that telecommunications services be available at uniform prices throughout the country).

It’s not clear, though, why it should be desirable for government to equalize rural and urban telecommunications costs, to the extent that unequal costs are consistent with high telephone penetration in high-cost areas. A wide variety of goods and services, after all, have different costs in different parts of the country. Achieving this goal requires a higher level of subsidies than would be necessary if government sought to enable high penetration without more.

⁷⁹ More precisely, they will pay .0305 of those revenues to fund the high-cost program together with the Lifeline and Linkup programs. Proposed Fourth Quarter 1998 Universal Service Contribution Factors Announced, CC Docket No. 96-45 (rel. Aug. 18, 1998), <http://www.fcc.gov/Bureaus/Common_Carrier/Public_Notices/1998/da981649.html>. About 78% of that money will go to the high-cost program, and about 22% to the low-income programs. *Id.*

⁸⁰ *See supra* note 51.

⁸¹ For the second quarter of 1999, the Universal Service Administrative Company has estimated \$433,300,000 demand (excluding administrative overhead) for the high cost program, amounting to 49% of all Universal Service Fund expenses. The schools and libraries fund is projected to make up 36%, and the Lifeline and Linkup programs 14%. *See* Proposed Second Quarter 1999 Universal Service Contribution Factors, CC Docket No. 96-45 (rel. Mar. 4, 1999), <http://www.fcc.gov/Daily_Releases/Daily_Business/1999/db990305/da990455.wp>.

The FCC's reorganization of the Universal Service Fund following the 1996 Act greatly increased the scope of explicit federal telephone subsidies. But it did not increase total support. In imposing a charge paid by long-distance carriers to a centrally managed fund and disbursed to local exchange carriers, rather than setting the ratemaking boundary between federal and state jurisdictions so that long-distance carriers paid local carriers inflated fees, it simply made explicit what had previously been implicit. For the most part, the same entities (interstate telecommunications carriers) still paid the monies in question, and the same entities (local exchange carriers) still received them. Because the 1996 Act was able to carry over existing subsidy patterns in this manner, Congress gave no serious thought to funding universal service from some other source — say, out of general tax revenues.

Universal service support mechanisms, under the 1996 Act, may support *only* “telecommunications [that is, basic] services.”⁸² The Act directs the Commission periodically to reevaluate the definition of supported telecommunications services in light of “advances in telecommunications and information technologies and services,” relying on “the extent to which such telecommunications services are essential to education, public health, or public safety; have . . . been subscribed to by a substantial majority of residential customers; [and] are being deployed in public telecommunications networks by telecommunications carriers.”⁸³ The services supported by the Universal Service Fund today, as defined by the FCC, are no more than single-party voice grade access to the public switched telephone network, with touch-tone signaling and access to emergency services, operator services and directory assistance.⁸⁴

II. THE INTERNET AND UNIVERSAL SERVICE MECHANISMS

⁸² 47 U.S.C. § 254(c)(1); see also Federal-State Joint Board on Universal Service, 12 FCC Rcd 8776, 8822 (1997), *appeal pending*, Texas Office of Public Utility Counsel v. FCC, No. 97-60421 (5th Cir.). The FCC has interpreted section 254(c)(3), though, to allow support of other services in connection with the Schools and Libraries program. See Federal-State Joint Board on Universal Service, 12 FCC Rcd at 9009-11.

⁸³ 47 U.S.C. § 254(c)(1).

⁸⁴ See Federal-State Joint Board on Universal Service, 12 FCC Rcd at 8809. *But see supra* note 82.

This section begins by describing the FCC's April 1998 *Report to Congress on Universal Service*,⁸⁵ which sought to characterize IP-based service offerings as “telecommunications” or “information service” in order to assess their regulatory obligations. It urges that that distinction cannot coherently be applied to IP-based services, and tries to explain why. It then suggests, and evaluates, an alternative approach.

A. *The Report to Congress on Universal Service*

After the passage of the 1996 Act, the FCC consistently characterized IP-based services as information services rather than telecommunications.⁸⁶ This meant that the providers of such services were required neither to pay a percentage of their end-user revenues as a contribution to the Universal Service Fund, nor to comply with any other Title II obligations.⁸⁷ The agency was forced to reexamine that judgment, though, in 1998. Opponents, including Senators Stevens and Burns, were urging that all IP-based services should be deemed to involve “telecommunications.”⁸⁸ Those Senators expressed concern that as telephone traffic shifted from conventional to IP networks, a failure to impose universal service charges on IP-based services would endanger universal service.⁸⁹ They crafted an appropriations rider directing the agency to

⁸⁵ Federal-State Joint Board on Universal Service (Report to Congress), 13 FCC Rcd 11501 (1998).

⁸⁶ See Federal-State Joint Board on Universal Service, 12 FCC Rcd 8776, 9010-12, 9179-81 (1997), *appeal pending sub nom.* Texas Office of Public Utility Counsel v. FCC, No. 97-60421 (5th Cir.); see also Amendment of the Commission's Rules and Policies Governing Pole Attachments, 13 FCC Rcd 6777, 6795 (1998).

⁸⁷ See *Report to Congress on Universal Service*, 13 FCC Rcd at 11515-16.

⁸⁸ The gist of their argument was that a service should be deemed *both* telecommunications and information service if it involved both transmission and manipulation of information. Such a “hybrid” service, Senators Stevens and Burns argued, should be subject to all Title II obligations, including those relating to universal service. See Letter from Senators Conrad Burns and Ted Stevens to William E. Kennard, Chairman, Federal Communications Commission (Jan. 26, 1998), at 1-7; *Report to Congress on Universal Service*, 13 FCC Rcd at 11517-19.

⁸⁹ See Letter from Senators Conrad Burns and Ted Stevens to William E. Kennard, Chairman, Federal Communications Commission (Jan. 26, 1998), at 7-12. It is useful to remember that the main function of the

undertake a detailed review of its definitions of the terms “information service,” “telecommunications,” and “telecommunications service” (among others) in the Telecommunications Act of 1996; the application of those definitions to “mixed or hybrid services” (referring in part to Internet access services and IP telephony); and “the impact of such application on universal service definitions and support.”⁹⁰

The FCC duly wrote a report responsive to the appropriations rider.⁹¹ It reaffirmed its conclusion that Internet access services were information services (and that the providers of such services therefore were under no obligation to make direct payments to the universal service fund).⁹² By contrast, the Commission classed the provision of pure transmission capacity to Internet access and backbone providers as telecommunications.⁹³

The agency ran into some difficulty, though, when it sought to characterize IP telephony services -- that is, services enabling real-time voice transmission using Internet protocols. The FCC first addressed “computer-to-computer” IP telephony, in which individuals use software and hardware at their premises to place calls between two computers connected to the public Internet. In that context, the FCC stated, it need not decide whether there was “telecommunications” taking place; Title II requirements (including universal service payment obligations) would not apply in any event.⁹⁴ Title II obligations, the agency explained, apply only to the “provi[sion]” or “offering” of telecommunications.⁹⁵ When a user, with an ordinary Internet connection through

universal service fund today is to make possible the provision of low-cost telephone service in rural and other high-cost areas — a function to which one would expect Senators Stevens and Burns, who hail from Alaska and Montana respectively, to be sensitive. See *supra* note 78 & accompanying text.

⁹⁰ Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998, Pub. L. No. 105-119, 111 Stat. 2440, 2521-2522, § 623.

⁹¹ *Report to Congress on Universal Service*, *supra* note 85.

⁹² *Id.* at 11536-40.

⁹³ *Id.* at 11532-36.

⁹⁴ *Id.* at 11543.

⁹⁵ *Id.*; see 47 U.S.C. § 153(46), 254(d).

her ISP, uses Internet telephony software to enable real-time voice communication between her computer and that of a fellow enthusiast, the Internet service provider may not even know that the subscriber's packets are carrying voice communications. The ISP is not, in any meaningful sense, "provid[ing]" the voice telephony to that subscriber, and cannot be made subject to Title II on that basis.⁹⁶

The agency was unable to be so definite, though, with respect to "phone-to-phone" IP telephony services. Those are services in which a customer places a call, using an ordinary telephone and the public switched telephone network, to a gateway device that packetizes the voice signal and transmits it via IP to a second gateway, which reverses the processing and sends the signal back over the public switched network to be received by an ordinary telephone at the terminating end.⁹⁷ The Commission was unable to reach a conclusion as to the proper classification of such services, stating only that "[t]he record currently before us suggests that certain forms of 'phone-to-phone' IP telephony lack the characteristics that would render them 'information services' within the meaning of the statute, and instead bear the characteristics of 'telecommunications services.'"⁹⁸ It deferred any "definitive pronouncements" on phone-to-phone IP telephony to an unspecified later proceeding.

The *Report to Congress on Universal Service* stressed the FCC's position that the growth of IP-based services would buttress universal service, not undercut it. Notwithstanding that Internet access providers are not required to make universal service payments, they are major *users* of telecommunications, and thus make "substantial indirect contributions to universal service" in the prices they pay to purchase telecommunications.⁹⁹ The agency did express concern

⁹⁶ *Report to Congress on Universal Service*, 13 FCC Rcd at 11543. If the user is reaching her ISP over a dial-up telephone connection, then the telephone company is providing her with telecommunications, but that service is wholly distinct from the IP telephony functionality. *Id.* at 11523 n. 187.

⁹⁷ *Id.* at 11541-42 & n.177, 11544.

⁹⁸ *Id.* at 11508.

⁹⁹ *Id.* at 11503-04.

that exemption of IP telephony providers from universal service contribution requirements might create an incentive to shift traffic to IP networks, increasing the burden on the remaining contribution base and undermining universal service; it found no evidence, however, of “an immediate threat to the sufficiency of universal service support” at this time.¹⁰⁰

B. *The Breakdown of the Telecommunications / Information Service Distinction.*

It shouldn't be surprising that the FCC had trouble with the characterization and regulatory obligations of IP telephony providers. On the one hand, the agency was surely correct that Title II obligations should not leap into existence simply because a consumer transmits voice, rather than, say, graphics, over an IP connection. It would be highly problematic to treat packets differently just because they carried voice rather than some other sort of information. More importantly, as the Commission noted, in the simplest “computer-to-computer” case, the customer is buying only Internet access, rather than an IP telephony service as such. In other IP telephony services, by contrast, the customer will receive enhanced functionality that goes beyond the plain-vanilla transmission that constitutes “telecommunications.”

On the other hand, it is also problematic if the provider of a service that looks and feels to the user just like conventional telephony is subject to regulation far different from that imposed on conventional telephony providers. In particular, it would be odd and unhelpful if huge regulatory distinctions should turn on the question whether a vendor transports an intermediate leg of its telephone calls via IP or via some other packet-oriented technology. Conventional telecommunications carriers are increasingly using Asynchronous Transfer Mode (ATM), a different packet-oriented communications technology, in their networks, and it's completely accepted that the use of ATM to transmit a telephone call does not render the carrier an information service provider.

¹⁰⁰ *Id.* at 11548-49.

To accommodate both of these concerns, one must devise a way of distinguishing those forms of IP telephony that should be subject to regulation from those that should not; but that turns out to be troublesome. The FCC in the *Report to Congress on Universal Service* suggested the possibility of subjecting to Title II regulation IP telephony services in which the provider

- 1) * * * holds itself out as providing voice telephony or facsimile transmission service; 2) * * * does not require the customer to use CPE [customer premises equipment] different from that CPE necessary to place an ordinary touch-tone call (or facsimile transmission) over the public switched telephone network; 3) * * * allows the customer to call telephone numbers assigned in accordance with the North American Numbering Plan, and associated international agreements; and 4) * * * transmits customer information without net change in form or content.¹⁰¹

The effect of these requirements would be to regulate an IP telephony service as telecommunications if the customer's signal travels in unpacketized form over the public switched network to a gateway (as in conventional phone-to-phone service), but not if it is packetized in the customer premises equipment (as in computer-to-computer service).

It's doubtful that that would work very well. Consider a telephone handset that packetizes the customer's voice signal and sends the packets via IP to an Internet telephony service provider, but that nonetheless looks and acts, from the user's perspective, like a conventional telephone. If a service should rely on such equipment, it's not obvious what policy goals would be served by treating that service differently from phone-to-phone IP telephony as defined.¹⁰² Indeed, consider business telephone users served by switchboard or Centrex systems. Should the policymaker apply one regulatory paradigm if calls from the business's telephones are directed to an IP gateway on the public switched network, but another if the switchboard serving the business itself serves as such a gateway? Why?¹⁰³

¹⁰¹ *Id.* at 11543-44.

¹⁰² *See id.* at 11623-24 (dissenting statement of Commissioner Furchgott-Roth).

¹⁰³ Or imagine technology that sets up an IP telephony call from a person's computer to a corporate call center when that person clicks on a button on the corporation's Web page; whether the call is characterized as computer-to-phone or computer-to-computer will depend on the fortuitous consideration of whether the IP gateway serving the call is on- or off-site.

The difficulty, further, extends beyond the particular definition suggested in the *Report to Congress on Universal Service*. What if the phone-to-phone IP telephony provider adds just a dab of functionality -- say, it not only enables two people to talk, but automatically records the conversation and makes it available via streaming audio on a Web site? Or -- so as to enable anybody to be a talk show host — it allows the originator to conduct a conference call with three or four people, while allowing any member of the public to dial in and listen?¹⁰⁴ Looking to the 1996 Act definitions, it seems plain that the recording, storage and rebroadcast of the conversation in the first example involves enhanced functionality and constitutes an “information service”; the more difficult question is whether we have one service or two. That is, does the example involve a single information service, or a plain-vanilla telephony service (telecommunications) *combined* with a separate transcription service (information service)? Similarly, the service in the second example doesn’t appear to qualify as “telecommunications” -- which the 1996 Act defines as “the transmission, between points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received” -- because the transmission doesn’t seem to be “among points specified by the user.”¹⁰⁵ Yet should we therefore characterize the overall service as an “information service,” or can one again find a regulated telecommunications service by dividing the offering into two?

The anomaly here is that it is easy to build functionality into IP-based services, yet under the “telecommunications” / “information service” dichotomy, an IP-based service will be deemed “telecommunications,” and thus subject to regulation and universal service obligations, only if it offers sufficiently crumbed functionality. If the same service gets a software upgrade, and offers a little more functionality, it becomes an information service and escapes regulation -- unless the

¹⁰⁴ These examples are Mike Nelson’s.

¹⁰⁵ 47 U.S.C. § 153(43).

new functionality is deemed a separate service, but we don't have any rules for deciding when that should be so.¹⁰⁶ It is hard to see why any of this makes sense.

IP telephony, further, presents another puzzle: Under the FCC's current definitions, phone-to-computer and computer-to-phone IP telephony both appear to be information services. In each case, the gateway is providing protocol conversion and processing (translating from unprocessed voice to a series of IP packets, or vice versa); under established rules, that enhanced functionality pulls the service out of the realm of simple telecommunications.¹⁰⁷ Yet put those two services together, and what do you have? Any protocol conversion taking place at one point in the call is undone at another; established law suggests that the concatenated services *are* mere "telecommunications."¹⁰⁸ It is hard to know what to do with that, since the firms providing the two services may not, in a distributed environment, even be aware of one another.¹⁰⁹ Bottom line: the telecommunications / information service boundary doesn't seem to divide up the world of IP-based services in any especially useful way.

Nor are these problems limited to IP telephony. Consider a rather more important finding of the *Report to Congress on Universal Service*: that Internet access is an information service.

¹⁰⁶ The genius of *Computer II* was the recognition that it is difficult to disentangle communications and computing functionality, and that therefore, at least where the provider does not own transmission facilities, "offerings . . . combining communications and computing components" should be treated as unitary services and exempted from regulation. See *Report to Congress on Universal Service*, 13 FCC Rcd at 11530. This approach had salutary effects. Yet it has its limits: "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." *Id.*

¹⁰⁷ See Implementation of the Non-Accounting Safeguards of Sections 271 and 272, Report and Order, 11 FCC Rcd 21905, 21955-58 (1996) (*Non-Accounting Safeguards Order*) (in general, services involving protocol processing fall within 47 U.S.C. § 153(20)'s definition of "information service," because they offer "a capability for . . . transforming [and] processing . . . information via telecommunications"), *on recon.*, 12 FCC Rcd 2297, *aff'd sub nom.* Bell Atlantic Tel. Cos. v. FCC, 131 F.3d 1044 (D.C. Cir. 1977).

¹⁰⁸ See Deployment of Wireline Services Offering Advanced Telecommunications Capacity, CC Docket No. 98-147 (Aug. 7, 1998), at ¶ 35 n. 57 (*Section 706 Order and NPRM*); *Report to Congress on Universal Service*, at 11526 & n. 106; *Non-Accounting Safeguards Order*, 11 FCC Rcd at 21958; see also Amendment of Section 64.702, Report and Order, Phase II, 2 FCC Rcd 3072, 3081-82 (1987), *on recon.*, 3 FCC Rcd 1150 (1988), 4 FCC Rcd 5927 (1989), *vacated sub nom.* California v. FCC, 905 F.2d 1217 (9th Cir. 1990).

¹⁰⁹ I am indebted to Stagg Newman for his emphasis of this point.

That conclusion seems vulnerable, outside of the dial-up context. One of the defining characteristics of IP is that an IP network itself displays no intelligence; it only passes information transparently from one edge to another. In a phrase, the network provides only “commodity connectivity.”¹¹⁰ All of the intelligence and enhanced functionality -- the storage and manipulation of user information -- takes place at the edges of the networks (that is, either before or after the information is transmitted from origin to destination).¹¹¹ Simple IP transmission, thus, seems like a classic example of “transmission, between or among points specified by the user, of information of the user’s choice, without change in the form or content”: that is, telecommunications. Indeed, the Commission has said essentially that about other packet-based services.¹¹²

The *Report to Congress on Universal Service* bottoms its finding that Internet access is an information service largely on the fact that Internet service providers run mail servers, host Web pages, offer Usenet news feeds, operate caches, and engage in other computer-mediated activities that go beyond simple transmission of packets.¹¹³ But not all customers require these services. Where the customer is a corporate intranet, it will maintain its own mail and Web servers. The Internet access provider likely will provide nothing except pure transmission and routing of packets within its internal network and connection to the larger Internet. In such a case, it seems hard to avoid the conclusion that the ISP is offering telecommunications: it is providing transport and nothing else.

This suggests some really silly accounting problems. Imagine that an ISP leases a fat digital transmission link to a network access point. The carrier leasing that line to the ISP is liable for universal service payments to the extent the ISP uses that connection to serve dial-up

¹¹⁰ David S. Isenberg, *Dawn of the Stupid Network*, <<http://www.isen.com/papers/Dawnstupid.html>>. “[A]ll that matters is that the bits sent by your machine are received by my machine, and vice versa.” *Id.*

¹¹¹ *See id.*

¹¹² *See* Independent Data Communications Mfrs. Ass’n, 10 FCC Rcd 13717 (1995), and cases cited in *Section 706 Order and NPRM*, at ¶ 35 n. 56 and accompanying text.

¹¹³ *Report to Congress on Universal Service*, 13 FCC Rcd at 11537-39.

customers, because the ISP is providing those customers with an information service, and thus is itself a telecommunications “end user” for universal service purposes.¹¹⁴ At the same time, if the analysis in the preceding paragraph is correct, the carrier need *not* pay into the universal service fund to the extent the ISP uses the same connection to serve corporate customers, for the ISP is providing telecommunications to those customers and thus is not an “end user.” If nothing else, that’s administratively unworkable.

The notion that pure Internet connectivity is “telecommunications” within the meaning of the 1996 Act, though, is troubling on a more fundamental level. It expands the scope of services subject to universal service fund exactions without any policy-oriented understanding of why that should be necessary or desirable. Put another way, it extends old rules to the Net without adequate consideration of whether that’s a good thing.¹¹⁵

D. *Why the Telecommunications / Information Service Distinction Doesn’t Work*

To understand why the “telecommunications” / “information service” distinction doesn’t work in the IP context, it’s useful to look back to *Computer II*. The *Computer II* categories, like their 1996 Act cognates, focused on service offerings. That is, the things being categorized were services, rather than (say) equipment, or capabilities.¹¹⁶ That’s a natural way to divide up the world from a conventional telephony perspective; folks from the world of computer-to-computer communications, though, tend to use a different set of categories.

The computing world, in thinking about the communications process, tends to rely on the Open Systems Interconnection model, which organizes that process into “layers.”¹¹⁷ The *physical*

¹¹⁴ Universal service contributions are calculated as a percentage of end user revenues. *See* 47 CFR §§ 54.706, .709.

¹¹⁵ There are surely good arguments that we should not increase the cost of Internet service in order to subsidize telephone service. *See, e.g.,* Michael Riordan, “Conundrums for Telecommunications Policy,” Remarks to the National Economists Club, Washington, D.C., May 28, 1998, at 14-15.

¹¹⁶ *See Computer II*, 77 F.C.C.2d at 419-20; 47 U.S.C. § 153(20), (43), (46).

¹¹⁷ The OSI model was developed by the International Standards Organization, to provide a common design framework for communications networks. While the specific protocols developed as part of the OSI model were not widely adopted (and particular implementations may not follow the model rigorously), the concepts underlying

layer is concerned with the physical infrastructure over which the information travels; immediately above that is the *data link* layer, concerned with the procedures for transmitting data using a particular technology, and the *network* layer, concerned with the transfer of data between computers and routing.¹¹⁸ The *transport* layer defines the rules for information exchange and manages the reliable end-to-end delivery of information.¹¹⁹ The *session, presentation* and *applications* layers focus on user applications; in particular, the applications layer contains the functionality for specific services.¹²⁰

The service offerings contemplated by *Computer II* cut across the layers of the Open Systems Interconnection model. For example, the paradigmatic example of basic service (or “telecommunications”) is plain old telephone service (POTS), designed to enable ordinary voice communication. POTS constitutes a vertically integrated intertwining of components from various layers. It relies on a copper twisted pair infrastructure (the physical layer), organized into a circuit-switched architecture, with 64 Kbps channels set aside for each voice signal (data link, network and transport layers).¹²¹ Applications such as flash hook signaling rely on elements ranging from the bottom (physical) to the top (applications) layers.¹²²

The *Computer II* model in fact contemplated that enhanced services would be constructed in a layered manner, but it relied on an entirely different set of layers: Its fundamental assumption was that *POTS services were the foundation on which enhanced services were built*. One created an enhanced service by taking POTS service (or a similar but higher-bandwidth service provided

the model are dominant in the computing world. The National Research Council followed a similar approach in devising its Open Data Network architecture: that conceptual model incorporates a “bearer service” layer (sitting on top of the “network technology substrate”), a “transport” layer, a “middleware” layer and an “application” layer. See NATIONAL RESEARCH COUNCIL, REALIZING THE INFORMATION FUTURE 47-51 (1994).

¹¹⁸ See HARRY NEWTON, NEWTON’S TELECOM DICTIONARY 519-20 (14th ed. 1998).

¹¹⁹ See *id.*

¹²⁰ See *id.*

¹²¹ See *supra* text following note 2.

¹²² I owe this point to Stagg Newman.

by the telephone company), using that service to transmit data, and adding data processing (and thus enhanced functionality). The underlying POTS transport was subject to regulation; the enhanced service — which was “enhanced” in the most literal sense — was not. That made perfect sense in the world of *Computer II*, back in 1980, and for years to come: It was perfectly natural for government to seek to regulate the underlying transport (which was, after all, offered for the most part by regulated monopolies), while eschewing any control over the “enhancements.” The 1996 Act, as the FCC has interpreted it, carried forward the same model.¹²³

That key assumption doesn’t work, though, in the IP world. IP maintains a sharp separation between the various layers of the Open Systems Interconnection model. Different components of the network are responsible for the physical infrastructure, the transport of the underlying bits (using the Internet protocol), and the applications (or services) that ride on top. One can write applications without having to worry at all about the lower layers; one’s service will work over any physical infrastructure and any transport protocol with IP on it. That means, though, that the foundational assumption of *Computer II* -- that an enhanced service is a basic service “plus”-- no longer works.

In the IP world, there are no vertically integrated service offerings such as POTS that can be seen as the “foundation” of more elaborate offerings. An IP-based service offering that transmits information transparently does not play the same role in the IP world as POTS does in the conventional telephony world, because it does not provide transport for other, more elaborate IP-based service offerings. Rather, the only foundation of any IP-based service offering is the underlying IP transport.

As applied to the IP world, the basic / enhanced distinction does not serve the goal of allowing government to regulate underlying transport while leaving the “enhancements” to the marketplace. Instead, it only creates the anomalous distinction that a service is subject to regulation if it offers little functionality, but free from regulation if it offers somewhat more.¹²⁴ It

¹²³ As the 1996 Act put it, a firm offers information services “via telecommunications.” 47 U.S.C. § 153(20).

¹²⁴ See *supra* text at notes 104-106.

creates the anomalous result that two services, each deemed information services when viewed in isolation, may combine in a distributed environment to form an end-to-end offering magically deemed telecommunications.¹²⁵ If regulators wish to carry forward into the IP world *Computer II*'s goal of attaching regulatory obligations to underlying transport, they need to aim those obligations more precisely.

E. *Universal Service Redux*

In rethinking universal service support in the modern telecommunications world, how should we draw the line between regulated and unregulated services? One approach might be to revise the universal service payment obligation so as to associate it not with *service provision*, but with the *physical facilities* along which the information moves.¹²⁶ *Computer II*, after all, sought to impose regulatory obligations on the underlying transport, and it is the physical layer that is associated with underlying transport in the most fundamental sense. A payment obligation tied to the ownership of qualifying facilities could apply without regard to whether the information moving via those facilities was in digital or analog form, or was packet- or circuit-switched.

Such an approach would have a variety of advantages. We could avoid the problems associated with determining which providers were providing “telecommunications,” making them subject to the assessment, and which were providing “information services,” leaving them exempt.

¹²⁵ See *supra* notes 107-109 and accompanying text.

¹²⁶ The FCC in the *Report to Congress on Universal Service* took this approach when it mused about the possibility of requiring only

the actual facilities owners . . . to contribute to universal service mechanisms on 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 on 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.

Facilities ownership would trigger the obligation without regard to the nature of the traffic moving over those facilities. Such a rule might be able to do what the *Computer II* distinction itself can no longer do: it might effectuate *Computer II's* goal of imposing regulatory obligations on underlying transport, without burdening the service components higher up the protocol stack. It would thus vindicate *Computer II's* still-valid judgment that, in order not to retard innovation, we should not impose regulatory costs on the new, still unfolding functionalities made possible by the marriage of silicon and data transmission.¹²⁷

Such an approach would be esthetically appealing: To the extent that the high-cost fund is designed to support the availability of physical infrastructure universally throughout the nation,¹²⁸ it makes a nice symmetry to impose the associated costs on physical infrastructure. More consequentially, the approach would be technology-neutral. Based on the assumption that a bit is a bit, no matter how transmitted, it would address the concerns of those who fear that a shift of telephone traffic away from circuit-switched voice to packet-switched data will undermine the entire subsidy structure. This seems important: In the ultimate analysis, it is hard to justify a regulatory scheme that assigns different consequences to provision of the same transport using different technologies. Such a scheme leads providers to make technology choices on the basis of regulatory arbitrage, not on the basis of which technology is most efficient, powerful or inexpensive in the particular context.

Under a facilities-based approach, the facilities owners (telephone companies and others) from which Internet service providers and backbone providers lease data lines, as well as any Internet service providers and backbone providers owning their own transmission facilities, would make payments to the Universal Service Fund. One would expect facilities owners to pass on costs to Internet service providers and backbone providers leasing capacity from them; backbone

¹²⁷ A facilities-based approach, however, would not be appropriate in connection with all Title II obligations. Most importantly, one could not sensibly apply a facilities-based approach to the tariffing rules carried over from railroad regulation. Similarly, one could not apply a facilities-based approach to the requirement that carriers safeguard customer privacy.

¹²⁸ See *supra* text accompanying note 78.

providers to pass on costs to Internet service providers paying them for transit; Internet service providers to pass on costs to their subscribers.¹²⁹ All this would likely increase the share of universal service obligations ultimately paid by consumers of Internet-based services. That without more, though, should not be a dispositive objection. Conventional and IP networks are merging, so that it will no longer work simply to seek to insulate IP networks from regulation.¹³⁰ Rather, the goal should be to find ways to recast existing regulation (where it should not simply be jettisoned for circuit-switched and packet-switched networks alike) to be technology-neutral and IP-friendly, to make sense in an increasingly packet-switched world.¹³¹

The approach I have detailed is not, in fact, the best one we could choose. The simplest and best way to fund universal service would be to take the money from general tax revenues. That would eliminate any arbitrage or distortions caused by taxing one class of communications activity and not another. For the reasons set out earlier, though, Congress did not consider that approach;¹³² as a political matter, it is now infeasible. Alternatively, we could reduce the scale of the problem by sharply reducing universal service subsidies, to the minimum necessary to keep rural subscribers on the network.¹³³ That approach too, though, seems politically infeasible. If

¹²⁹ In suggesting this approach, I am assuming that facilities owners would in fact be able to pass on their costs. To the extent that they could not — so that the obligation would weigh heavily on facilities owners but only lightly on lessors — the proposal would have the effect of singling out a particular industry segment without policy justification, and would be rather more problematic.

¹³⁰ To illustrate that convergence: a working group of the European Telecommunications Standards Institute, developing standards for computer-to-phone IP telephony, is considering an approach under which E.164 telephone numbers with a special country code would correspond to Internet addresses. See E-mail from Prof. Marvin Sirbu to the telecomreg mailing list, Sept. 3, 1998 (on file with author).

¹³¹ *But see* Riordan, *supra* n. , at 14-15 (requiring Internet providers to pay universal service fees to sustain high telephone penetration “is exactly backwards”). Indeed, to the extent that high-cost subsidies today are too high (because they are designed to equalize the prices of telecommunications services in rural and urban areas without regard to whether less-subsidized rural prices would be a threat to telephone penetration, *see supra* note 78), requiring IP-based services providers to contribute to those subsidies only makes a bad situation worse. On the other hand, universal service subsidies do not only support voice telephony; a consumer can use the local loop made affordable by universal service support for Internet as well as circuit-switched telephony services.

¹³² See *supra* text following note 81.

¹³³ See *supra* note 78.

we are to fund extensive subsidies through assessments on communications providers, we need a method of doing so that is consistent with the nature of IP offerings. A facilities-based approach would satisfy that criterion; our current approach does not.

The FCC would have to overcome considerable practical difficulties, though, before it could adopt a facilities-based approach. How would the agency determine the amount of the fee paid by facilities owners? The agency currently sets universal service assessments as a percentage of the revenues a firm receives from end users for telecommunications.¹³⁴ If the agency tied the *fact* of the payment obligation to physical facilities ownership, then it could sensibly tie the *amount* of the assessment to revenues only by looking to that limited set of revenues corresponding to physical transmission. Yet typically, a telecommunications (or information service) provider provides its customers with a combination of physical infrastructure, transport, and associated features and services, not just physical facilities. The revenues it receives are for the combination. Where a provider itself owns transmission facilities (rather than purchasing raw transmission from a third party) and provides its customers with an integrated service, it's not clear how one can isolate that portion of its revenues that correspond to raw transmission alone.¹³⁵

Tying universal service obligations to a metric other than revenues could be at least as precarious. One possibility might be to make the fee proportional to the raw bandwidth of a firm's transmission facilities. Increasingly, though, carriers are creating bandwidth through improved multiplexing techniques rather than laying new fiber.¹³⁶ It would be undesirable if a firm's implementation of such techniques led to a massive jump in its universal service obligations;

¹³⁴ See 47 CFR §§ 54.706, .709.

¹³⁵ See Kevin Werbach, *How to Price a Bit*, RELEASE 1.0 (June 1998), at 1 (the "cost to send a bit of data across the Internet . . . is surprisingly complex. Networks involve a mix of fixed and variable investments, and pricing requires assumptions about demand levels, competition and usage patterns.").

¹³⁶ See Erik Kreifeldt, *NFOEC '98: DWDM Hot Topic, But Not Magic Bullet*, (Sept. 17, 1998) <http://news.fiberonline.com/news-analysis/19980917-5443.html> (dense wave division multiplexing).

that might discourage desirable experimentation and capacity expansion. Nor would it always be clear, in the case of innovative technologies, how much bandwidth to associate with a given facility. Indeed, for some technologies (say, unlicensed wireless spread spectrum), the notion of the bandwidth associated with a facility seems essentially meaningless.¹³⁷

It might be possible to impose a fee based on a firm's asset investment in physical facilities, or on other such proxies. Alternatively, these difficulties might push us back to a solution based on actual or imputed revenues: conceivably, a second-best solution might limit the universal service assessment to owners of transmission facilities; require those entities to make payments based on actual revenues in cases in which they provide leased lines or the equivalent; and require them to make payments based on the imputed value of the raw transmission they provide to themselves when they offer other services. Ultimately, this issue appears to be essentially one of tax policy: how to devise an appropriate base for raising universal service funds that won't distort infrastructure development.¹³⁸

In the end, an attempt to vindicate *Computer II* principles in the context of universal service obligations may be misdirected. The universal service obligation, after all, is today

¹³⁷ See generally Operation of Unlicensed NII Devices in the 5 GHz Frequency Range, 12 FCC Rcd 1576 (1997), *recon.*, 13 FCC Rcd 14355 (1998).

¹³⁸ I have not so far, in this paper, addressed the legal constraints on these approaches: Any solution the FCC adopts, absent statutory amendment, would have to be consistent with 47 U.S.C. § 254(d), which mandates that "[e]very telecommunications carrier providing interstate telecommunications services" contribute to universal service mechanisms "on an equitable and nondiscriminatory basis." A facilities-based approach would be vulnerable to the objection that it did not require "every" carrier to contribute. Alternatively, one might argue that under this approach non-facilities-based carriers *would* contribute (albeit indirectly) through the prices they paid for transmission, since those prices would reflect the facilities-based carriers' direct payments. Indeed, if the statute were read to impose an inflexible requirement that all carriers contribute directly, the current approach would not comply, since it is only the provision of telecommunications *to end users* that triggers the payment obligation. A carrier that does not serve end users is not required to contribute today.

The approach described in text might also be vulnerable to the argument that the Commission has no authority to impose payment obligations on facilities-based information service providers. Here, though, the *Report to Congress on Universal Service* provides the answer: Such a firm should be deemed to be providing telecommunications to itself, and thus falls within the FCC's authority to require "[a]ny . . . provider of interstate telecommunications . . . to contribute to the preservation and advancement of universal service if the public interest so requires." 47 U.S.C. § 254(d); see *Report to Congress on Universal Service*, 13 FCC Rcd at 11534-35.

essentially a tax supporting a particular government program.¹³⁹ Under current rules, a firm may receive universal service support for serving customers in high-cost areas, if it provides access to the public switched telephone network sufficient to support analog voice transmission, with touch-tone signaling and access to emergency services, operator services and directory assistance.¹⁴⁰ This reflects the conventional understanding of universal service: voice access to the public switched telephone network is seen as essential to public safety and participation in society and democracy, and every network subscriber benefits when that network is expanded.¹⁴¹

For historical and political reasons, we have chosen to fund this program not out of general tax revenues, but through exactions from a class of communications service providers. In defining that class, it may be that our lodestar should not be *Computer II*, but rather these more general principles: Any definition [1] should be adequately broad; [2] should not discourage development and deployment of new technology; and [3] should not introduce obvious distortions – which is to say, that it should treat substitutable services similarly.

It would not make sense, thus, to limit the universe of universal-service contributors to providers of supported services. Such a rule would tax the provision of conventional analog voice telephony connections while leaving untouched other data pathways that consumers could use to secure similar functionality. Indeed, there's no obvious reason to limit the universe of contributors to actors regulated under Title II. Under the current regulatory structure, only telecommunications carriers need contribute to the universal service fund. Providers of cable service need not make payments to the fund, because cable service is not defined as “telecommunications” — it is governed by Title VI, rather than Title II, of the Communications

¹³⁹ The Fifth Circuit is now considering whether the USF contribution obligation (or any part of it) is inconsistent with the constitutional command (U.S. CONSTITUTION, ART. 1, SEC. 7, CL. 1) that “All bills for raising Revenue shall originate in the House of Representatives.” *Texas Office of Public Utility Counsel v. FCC*, No. 97-60421 (5th Cir.). It would be incongruous, though, if the FCC were found to have overstepped constitutional boundaries merely by following Congress's direction to refashion existing implicit subsidies into explicit ones.

¹⁴⁰ See *supra* text accompanying note 84.

¹⁴¹ See Francois Bar & Annemarie M. Riis, “From Welfare to Innovation: Toward A New Rationale for Universal Service” 14 (1998)

Act.¹⁴² Yet if the FCC is not to impose distortions, statutory pigeonholes should not overcome considerations of functionality and market substitutability. Under a technology-neutral approach, all services functionally similar to those subject to a USF obligation (or the facilities used to provide them) should be in play.

II. THE INTERNET AND ACCESS CHARGES

The Universal Service Fund is not the only -- or even the most important -- federal subsidy mechanism. Telephone pricing today is characterized by a tangle of implicit as well as explicit cross-subsidies,¹⁴³ and the implicit subsidies are larger than the explicit.¹⁴⁴ The most important such subsidy mechanism, on the federal level, is interstate access pricing.¹⁴⁵ In part, as noted above, those charges are designed to compensate the local telephone companies for the costs the call imposes on their networks. Historically, however, they have also included a substantial implicit subsidy component.¹⁴⁶ As a result, access charges today are an opaque blend of forward-looking economic cost, historic costs, and subsidies intended to depress local rates.¹⁴⁷ The FCC is seeking to remove the subsidy element from access charges, and to drive those charges down to a level more nearly approximating forward-looking cost.¹⁴⁸

¹⁴² See generally Barbara Esbin, "Internet Over Cable: Defining the Future in Terms of the Past," OPP Working Paper No. 30 (Aug. 1998).

¹⁴³ See *supra* notes 8-11 and accompanying text.

¹⁴⁴ See Federal-State Joint Board on Universal Service, Report and Order, 12 FCC Rcd 8776, 8784 (1997), *appeal pending sub nom.*, Texas Office of Public Utility Counsel v. FCC, No. 97-60421 (5th Cir.).

¹⁴⁵ See *supra* text preceding note 75.

¹⁴⁶ See *id.*

¹⁴⁷ See Federal-State Joint Board on Universal Service, Report and Order, 12 FCC Rcd 8776, 8785 (1997) (*Universal Service Order*), *appeal pending sub nom.*, Texas Office of Public Utility Counsel v. FCC, No. 97-60421 (5th Cir.).

¹⁴⁸ See Access Charge Reform, First Report and Order, 12 FCC Rcd at 15986-87, 15915-16004; *supra* note 76 and accompanying text.

Where should the Internet, and IP networks generally, fit within the access-charge structure? As in the universal-service context, I'd suggest, access-charge obligations need not turn on the telecommunications / information service distinction in the long run at all. While universal-service payments are pure subsidy, access charges include a cost-recovery element. There is no compelling reason why, in the long run, information service providers should not pay charges tied to the costs they impose on the local exchange. Rather, the goal should be to move access charges towards cost for telecommunications and information service providers alike.

A. *The Status Quo.*

Currently, information service providers do not pay access charges.¹⁴⁹ That exemption should continue for now. As the FCC has explained, it would make little sense to require Internet service providers to pay interstate access charges as currently constituted:

[T]he existing access charge system includes non-cost-based rates and inefficient rate structures. [There is] no reason to extend this regime to an additional class of users The mere fact that providers of information services use incumbent [local exchange carrier] networks to receive calls from their customers does not mean that such providers should be subject to an interstate regulatory system designed for circuit-switched interexchange voice telephony.¹⁵⁰

I suggested in the previous section of this article that attempts simply to insulate IP networks from regulation are doomed to fail. But that is not to say that one should blindly extend old rules to IP networks, no matter how inefficient or ill-advised that regulation is. The FCC is currently seeking to *remove* implicit universal-service subsidies from interstate access charges.¹⁵¹ Against

¹⁴⁹ See *supra* notes 68-70 and accompanying text.

¹⁵⁰ Access Charge Reform (Notice of Proposed Rulemaking), 11 FCC Rcd 21354, 21480 (1996) (footnote omitted). The agency confirmed this tentative conclusion in its *Access Charge Reform Order*. 12 FCC Rcd 15982, 16133 (1997), *aff'd*, *Southwest Bell Tel. Co. v. FCC*, No. 97-2618 (8th Cir. Aug. 19, 1998).

¹⁵¹ Access Charge Reform, 12 FCC Rcd 15982, 15986 (1997), *aff'd*, *Southwest Bell Tel. Co. v. FCC*, No. 97-2618 (8th Cir. Aug. 19, 1998).

that backdrop, it would not be sensible to extend those subsidies to a new class of users, imposing distortions and inefficiencies on IP networks.

B. *Beyond the Status Quo.*

But the current exemption is not the end of the story — access charges, after all, recover costs as well as generating subsidies. In the absence of access charges or some comparable payment, there is no mechanism to cause Internet service providers to pay any congestion costs they impose on the local exchange. Any traffic-sensitive costs they impose, rather than being reflected in their own rates, are assigned to the local jurisdiction and spread among all local ratepayers.¹⁵²

The extent to which Internet service providers impose costs on the local exchange is hotly debated.¹⁵³ The FCC's *Local Competition Order*, though, estimated a cost of .2 to .4 cents (\$.002 to \$.004) per minute as a default proxy for the traffic-sensitive component of local switching.¹⁵⁴ This figure, small as it is, suggests the potential for a mismatch between prices and economic costs where ISPs receive huge numbers of calls over the public switched network, since typically such a call is free to both caller (paying flat residential rates) and ISP (under standard local business rates, paying a flat fee for incoming calls). The matter is not simple — local switching costs appear to be essentially congestion costs,¹⁵⁵ and the interested parties fiercely dispute the degree to which Internet access in fact generates congestion on the local network.¹⁵⁶ The

¹⁵² See Kevin Werbach, *Digital Tornado: The Internet and Telecommunications Policy* 62-63 (1997), <http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp30.pdf>

¹⁵³ See *id.* at 58-61.

¹⁵⁴ See *Implementation of Local Competition*, 11 FCC Rcd 15499, 15905, 16024-26 (1996) (*Local Competition Order*).

¹⁵⁵ See Werbach, *supra* note 152, at 58-63.

¹⁵⁶ Local exchange carriers have asserted that Internet traffic commonly gives rise to congestion at the telephone switch serving the Internet service provider. See *id.* at 58. A local exchange carrier switch cannot simultaneously support connections for all users of the switch. *Id.* Rather, there is one call path through the

associated costs may well be zero except during peak periods.¹⁵⁷ But it seems plausible that Internet access may impose some costs on the local exchange not reflected in the rates ISPs pay.¹⁵⁸

The legitimacy of any mismatch between prices and economic costs in this area is usually debated in federalism terms. ISPs urge that the local lines they buy fall within the intrastate jurisdiction, so that it's up to state regulatory commissions to decide whether there's an impermissible disparity between prices and costs. They continue that, in receiving large numbers of incoming calls while making few outgoing calls, ISPs are no differently suited from a variety of other local businesses (pizza parlors, say), and should not be singled out for different treatment.¹⁵⁹

That argument seems unsatisfactory, though, on a variety of levels. To the extent that the bulk of the inefficiencies and subsidies that characterize conventional telephony are built into the

switch for every four to eight users. Because calls by users to Internet service providers tend to be longer than voice calls, but still — like all calls on the circuit-switched public telephone network -- tie up an end-to-end call path for the duration of the call, local exchange carriers claim that heavy Internet usage will increasingly lead to situations in which all available paths through the switch are in use and additional calls seeking a call path through the switch will be blocked. *See id.* at 58-60.

Internet service providers, however, sharply dispute the extent to which switch congestion is a serious problem. *See id.* at 60. A study commissioned by the Internet Access Coalition concludes that incidents of congestion have been localized, are easily corrected, and are primarily attributable to inadequate planning and inefficient engineering by the local exchange carriers. *Id.* The FCC-chartered Network Reliability and Interoperability Council takes the view that Internet-related congestion is primarily a provisioning issue, best handled by close coordination between carriers and Internet service providers. *See id.* at 60-61.

¹⁵⁷ *See generally Local Competition Order*, 11 FCC Rcd at 16028-29 (discussing peak and non-peak pricing plans for reciprocal compensation).

¹⁵⁸ The question whether ISPs impose uncompensated costs on the local exchange is different from the question whether they impose uncompensated costs on local exchange carriers. In the *Access Charge Reform Order*, the Commission found insufficient evidence that local exchange carriers suffered losses by virtue of Internet use. *Access Charge Reform Order*, 12 FCC Rcd 15982, 16133-34 (1997), *aff'd*, *Southwest Bell Tel. Co. v. FCC*, No. 97-2618 (8th Cir. Aug. 19, 1998). It noted that the carriers received revenue not only from ISPs' connections to the local exchange, but also from consumers' purchases of second lines and ISPs' purchases of leased lines to provision their internal networks. Moreover, the popularity of the Internet generated revenue through subscriptions to incumbent local exchange carrier's own Internet access services. *Id.* These considerations, though, suggest that uncompensated costs in one area are balanced by monopoly profits in another. They do not speak to whether the rates paid by ISPs are related to the costs they impose (much less to whether either the profits local exchange carriers earn or the costs they incur are passed on to the ratepaying public).

¹⁵⁹ *See id.* ("commenters point out [that] many of the characteristics of ISP traffic (such as large numbers of incoming calls to Internet service providers) may be shared by other classes of business customers").

intrastate pricing structure, we should be wary of too quick a finding that any IP-based service is properly regulated as part of that structure. Moreover, the federalism argument seems wrong: ISPs provide what is in predominant part an interstate information service.¹⁶⁰ Customers use ISP facilities to exchange traffic with e-mail correspondents, Usenet news participants, Web sites, FTP servers and other persons or devices without regard to jurisdictional boundaries.¹⁶¹ Indeed, the entire point of Internet access is to enable communication with persons and sites ranged across the globe.¹⁶²

Dialup Internet access, to be sure, is an information service under the definitions discussed earlier in this paper, not a telecommunications service like long-distance POTS. It is by no means clear, though, why that should be relevant to a charge designed to recover actual costs imposed on the local exchange. As noted above, when the FCC established the access charge system in 1983, it initially contemplated that both basic and enhanced service providers would pay access charges.¹⁶³ Even in reversing that initial judgment, it had no doubt that enhanced service

¹⁶⁰ The FCC made this clear in *GTE Telephone Operating Cos.*, CC Docket No. 98-79 (rel. Oct. 30, 1998), at ¶¶ 22-26 (*GTE ADSL Tariff Approval*).

¹⁶¹ That traffic is sometimes stored on ISP computers along the way, but that storage (in a web cache, Usenet news feed, or mail queue) is simply an intermediate step in a larger journey. *Inter-Carrier Compensation for ISP-Bound Traffic*, CC Docket Nos. 96-98 & 99-68 (rel. Feb. 26, 1999), at ¶¶ 12-13. “[T]he Commission analyzes the totality of the communication when determining [its] jurisdictional nature” *Id.* at ¶ 13.

¹⁶² The “key to [federal] jurisdiction” is the interstate movement of communications traffic. *BellSouth Corp.*, 7 FCC Rcd 1619, 1621 (1992) (quoting *New York Telephone Co. v. FCC*, 631 F.2d 1059, 1066 (2d Cir. 1980)). In characterizing a service as interstate or intrastate, thus, we look to the nature of the traffic: “the actual uses to which the property is put.” *Smith v. Illinois Bell Tel. Co.*, 282 U.S. 133, 151 (1930); *see also, e.g., California v. FCC*, 567 F.2d 84, 86 (D.C. Cir. 1977) (the regulatory characterization depends on “the nature of the communications that pass through the facilities”); *MTS and WATS Market Structure*, 97 F.C.C.2d 682, 713 n. 58 (1983) (*MTS and WATS Market Structure Reconsideration Order*), *on further reconsid.*, 97 F.C.C.2d 834, *aff’d in relevant part sub nom.* *NARUC v. FCC*, 737 F.2d 1095 (1984), *cert. denied*, 469 U.S. 1227 (1985).

In important respects, Internet access traffic is best characterized as jurisdictionally mixed. Not all ISP services are necessarily interstate; some users may make such limited use of the Internet that they never interact with data bits that have crossed, or will cross, a state line. It is impossible, however, to identify those users, or to separate them out, by examining Internet traffic; packet-switched networks by their nature are less amenable than circuit-switched networks to such partition. The status of the traffic as jurisdictionally mixed gives the FCC some discretion over its jurisdictional and separations treatment. *See Southwestern Bell Tel. Co. v. FCC*, No. 97-2618 (8th Cir. Aug. 19, 1998), at 40-41.

¹⁶³ Both basic and enhanced service providers were “users of access service,” in that they “obtained local exchange service or facilities which are used . . . for the purpose of completing interstate calls.” *MTS and WATS*

providers “employ exchange service for jurisdictionally interstate communications.”¹⁶⁴ Because the Internet traffic passing over the local phone lines connecting end users and ISPs is predominantly jurisdictionally interstate, federal policy should govern how the costs associated with that traffic are allocated.¹⁶⁵

It has been suggested that the fact that ISPs need not pay all of the costs they incur may lead to concrete distortions. Specifically, the most efficient way to move bits from end users to ISPs may well be over digital, packet-switched links that bypass the public switched telephone network entirely (or that use customers’ local loops, but leave the network before hitting a telephone switch). Yet ISPs’ freedom from access charges could motivate them to stay on the circuit-switched network even where that is the less efficient solution. If ISPs were required to pay the economic costs of their connections to the circuit-switched network, the argument runs, then competitive local exchange carriers would have incentives to offer, and ISPs to buy, more efficient packet-switched connections. Incumbent local exchange carriers might well then roll out their own comparable services in response.¹⁶⁶

On the other hand, the scenario just sketched out is vulnerable to a variety of objections. First, it appears that end-user demand for Digital Subscriber Line and other packet-switched services, and competition from ISPs affiliated with incumbent local exchange carriers and cable

Market Structure Reconsideration Order, 97 F.C.C.2d at 711. The FCC’s initial order defined “access service” to include “services and facilities . . . provided for the origination or termination of any interstate or foreign *enhanced service* . . .” MTS and WATS Market Structure, 93 F.C.C.2d 241, 344 (emphasis added), *on reconsider.*, 97 F.C.C.2d 682 (1983), 97 F.C.C.2d 834, *aff’d in relevant part sub nom.* NARUC v. FCC, 737 F.2d 1095 (1984), *cert. denied*, 469 U.S. 1227 (1985); *see supra* note 68 and accompanying text.

¹⁶⁴ *MTS and WATS Market Structure Reconsideration Order*, 97 F.C.C.2d at 715. *See generally* *GTE ADSL Tariff Approval*, at ¶¶ 7, 21.

¹⁶⁵ *But see* Inter-Carrier Compensation for ISP-Bound Traffic, CC Docket Nos. 96-98 & 99-68 (rel. Feb. 26, 1999), at ¶¶ 28-30 (though traffic passing from an end user to an originating local exchange carrier (LEC), to a second local exchange carrier, to an Internet service provider, bound for the Internet, is largely jurisdictionally interstate, and any inter-LEC compensation in connection with that traffic should be governed by a federal rule, the best rule would simply effectuate negotiated agreements between the carriers).

¹⁶⁶ *See* Kevin Werbach, *Digital Tornado: The Internet and Telecommunications Policy* 72 (1997), <http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp30.pdf>.

operators, are driving ISPs to seek packet-switched connections in any event. It's by no means clear that ISPs' low rates for connection to the local exchange are significantly affecting ISP's and consumers' choices in this regard.

Second, the reasoning set out above assumes the existence of local competition. That is, it assumes that some firm is in fact offering packet-switched access in competition with the incumbent local exchange carrier. In the absence of local competition, reforming the rates paid by ISPs accomplishes nothing except that ISPs pay higher prices and incumbent local exchange carriers keep the money, because the monopoly providers have little incentive to develop ways to move the Internet traffic off the circuit-switched network.

Nor would it work simply to postpone the imposition of any new charges on ISPs until after local competition emerges. There's a chicken-and-egg problem: One of the most important factors affecting the willingness of local exchange carriers (competitive or incumbent) to roll out packet-switched connectivity for ISPs is ISPs' willingness to buy that connectivity -- yet current regulation diminishes ISPs' incentive to do so. One answer, thus, might be for the FCC to announce *now* that ISPs will be required to pay a federally-tariffed charge for connectivity to the circuit-switched network, reflecting actual economic costs, upon the emergence of local competition in the relevant market. This would encourage competitive local exchange carriers to roll out packet-switched services directed at ISPs, knowing that the imposition of the federally tariffed charge on circuit-switched connectivity would level the playing field and make those services more attractive. The FCC's actual moves, though, have been in the opposite direction. The agency has stressed that "the FCC has no intention of assessing per-minute charges on Internet traffic or changing the way consumers obtain and pay for access to the Internet."¹⁶⁷

Finally, tying the new charge to the existence of competition might be difficult in other ways. How could the agency determine the actual economic costs imposed by ISP circuit-switched connections on the local network? To the extent that it required local competition as a

¹⁶⁷ See *Fact Sheet: No Consumer Per-Minute Charges to Access ISPs* (February 1999), <http://www.fcc.gov/Bureaus/Common_Carrier/Factsheets/nominute.html>.

prerequisite for any regulatory change, how would it measure competition? The FCC's experience with the 1996 Act's famously problematic directive¹⁶⁸ that the Bell Operating Companies may provide in-region long-distance services only after they open up their local markets to competition, offers no grounds for optimism that this process would be any easier.

CONCLUSION

The distinction between regulated "telecommunications" and unregulated "information services" is at the center of the 1996 Telecommunications Act. That distinction, though, is rooted in the conventional telephone network; it doesn't work in the IP world. We need to develop new ways of reconciling old telephone regulation with new IP networks. For example, regulators should consider associating universal service payment obligations not with the provision of "telecommunications," but with the ownership of transmission facilities. Such a rule might effectuate the underlying goals of the telecommunications / information service distinction, as current law cannot. The exemption of information service providers from access charges should continue for now. In the long term, however, it may make sense for information service providers to pay charges tied to the costs they impose on the local exchange. Ultimately, we will have to reshape the rules governing both old and new technology if we are to find a structure that works.

¹⁶⁸ 47 U.S.C. § 271 provides that a Bell Operating Company may provide in-region long-distance service only when it satisfies a fourteen-point checklist demonstrating that it has opened its local market to competition. So far, the FCC has rejected every such petition filed with it, finding that the checklist was not yet satisfied. The process has been highly complex, and highly contentious.