
VOICES PAST: THE PRESENT AND FUTURE OF VOIP REGULATION

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I. INTRODUCTION

A unique confluence of economic and technological developments—particularly the growth of broadband services, the decline in laser and computer chip costs, and the development of sophisticated applications software—has led to a dramatic growth in the availability and usage of various forms of Voice over Internet Protocol (“VoIP”) services. These economic and technological developments are decimating the revenue stream from traditional voice services upon which carriers and governments around the world have relied for most of the last century. The carriers and many governments are scrambling to deal with these forces of change.

Since 2003 there has been a dramatic global increase in legislation and regulation focused on VoIP services. This Article examines the nature and causes of that increase and considers how VoIP regulation is likely to evolve in the future given the economic, technological, and political factors at work.

Part II of this Article summarizes the history of regulation of voice services in the United States and other countries. Part III examines the various types of VoIP services that have developed over the last decade, and Part IV discusses the factors driving the process of developing national regulatory schemes for VoIP services. Regulatory developments in various countries occurring from 2003 to early 2006 are reviewed in Part V. The final two Parts discuss the types of direct and indirect regulation that will affect the future development of VoIP services.

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II. HISTORICAL REGULATION OF VOICE SERVICES

VoIP is, by definition, a voice communications service. Voice services were originally available to businesses and the general public through the public switched telephone network (“PSTN”). Later, private networks of business users offered voice services. Government entities have heavily regulated voice services over the PSTN in the United States and around the world for more than a century.¹ In the United States, the original rationale for regulation of voice services was based on principles of common carriage borrowed from case law.² Moreover, many accepted the argument that voice service, commonly known as “telephone service,” was a natural monopoly and should be regulated under principles of antitrust law.³ The U.S. government’s preferred regulatory approach became more formal and expansive after the creation of the Federal Communications Commission (“FCC” or “Commission”) in 1934. Yet, the underlying rationale remained a necessity to constrain the otherwise dominant market power of the incumbent local exchange carriers (“ILECs”)—especially that of the Bell Operating Companies (“BOCs”).⁴

The initial rationale for government regulation of the PSTN differed in much of the rest of the world. In most countries, the national government constructed and operated the PSTN, either because private entity did not construct a nationwide telephone system or because of the perceived importance to society of the ability to communicate with others connected to the PSTN.⁵ Usually the ministry that managed the postal and telegraph services also regulated the telephone system. Consequently, these entities were commonly referred to as “PTTs.”⁶

In the 1980s and 1990s, the convergence of several factors led many governments to begin privatizing their PTT operations.⁷ The most important factors included technological changes, government financial difficulties, and the

¹ See PETER HUBER ET AL., *FEDERAL TELECOMMUNICATIONS LAW* 11–20 (2d ed. 1999).

² *Id.* at 13–16.

³ *Id.* at 16–18; see also STUART BENJAMIN ET AL., *TELECOMMUNICATIONS LAW AND POLICY* 614–23 (2001).

⁴ HUBER ET AL., *supra* note 1, at 21–27. The Bell operating system was the dominant carrier system across the country. Consequently, the superior interconnection capability prevented other carriers from taking advantage of the BOCs’ networks during the early part of the twentieth century. *Id.* at 22–27.

⁵ See Robert M. Frieden, *International Telecommunications and the Federal Communications Commission*, 21 *COLUM. J. TRANSNAT’L L.*, 423, 431–32 (1983).

⁶ See *Int’l Telecomm. L. (BNA) Int/5* (Dennis Campbell ed. 2001). For discussions of the development of PTTs in various countries, see generally *Global Telecomm. L. & Pol’y* (Sweet & Maxwell) pts. 2–3 (Colin D. Long ed. 2004).

⁷ See generally ELI NOAM, *TELECOMMUNICATIONS IN EUROPE* (1992); Taunya L. McLarty, *Liberalized Telecommunications Trade in the WTO: Implications for Universal Service Policy*, 51 *FED. COMM. L.J.* 1 (1998).

lessons learned from the breakup of AT&T Corp. ("AT&T") in the United States.⁸ Additionally, the widespread adoption of the World Trade Organization ("WTO") Agreement on Basic Telecommunications ("ABT") in 1997 accelerated this trend.⁹

With the onset of privatized PSTNs came the need for new regulatory schemes. Governments were forced to create regulations and regulatory agencies to control the behavior of new private monopolists. In most cases—particularly in the countries that agreed to adopt the ABT—the basis for regulation was, at least in theory, U.S.-style antitrust law.¹⁰ In fact, the Regulatory Framework Reference Paper annexed to the ABT constitutes the first instance that such a varied group of countries agreed to adopt principles of antitrust or competition policy to govern a specific sector of their economy.¹¹

Until recently, few countries had laws or regulations that addressed VoIP services or even acknowledged their existence. In the United States, to the extent regulators considered VoIP at all, it was generally assumed to be an unregulated application running over telecommunications services.¹² Most countries that privatized their PTTs followed a similar approach.¹³ However, dozens of countries started at the other extreme: their laws granted a voice service monopoly to a single, usually government-owned entity—meaning that VoIP service provided by any other entity was presumptively illegal.¹⁴ A few countries, usually those with an underdeveloped telecommunications infrastructure and

⁸ For a discussion of the background of the AT&T divestiture, see HUBER ET AL., *supra* note 1, at 27–52.

⁹ Fourth Protocol to the General Agreement on Trade in Services, WTO Doc. S/L/20 (Apr. 30, 1996), 36 I.L.M. 366 (1997) [hereinafter ABT Reference Paper], available at http://www.wto.org/english/docs_e/legal_e/4prote_sl20_e.pdf; see also World Trade Organization, Regulatory Framework Reference Paper (1996), http://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm.

¹⁰ ABT Reference Paper, *supra* note 9.

¹¹ See BOUTHEINA GUERMAZI, CTR. FOR THE STUDY OF REGULATED INDUS., EXPLORING THE REFERENCE PAPER ON REGULATORY PRINCIPLES, <http://www.law.mcgill.ca/institutes/csri/paper-guermazi-reference.php3> (last visited Jan. 28, 2006).

¹² See *In re Federal-State Joint Board on Universal Service, Report to Congress*, 13 F.C.C.R. 11,501, ¶¶ 33–36 (Apr. 10, 1998) [hereinafter Universal Service Report].

¹³ See EUROPEAN COMM'N, INFO. SOC. DIRECTORATE-GEN., COMMISSION STAFF WORKING DOCUMENT ON THE TREATMENT OF VOICE OVER INTERNET PROTOCOL (VOIP) UNDER THE EU REGULATORY FRAMEWORK §§ 1–3 (2004) [hereinafter EU VOIP WORKING PAPER], http://europa.eu.int/information_society/policy/ecom/d/doc/info_centre/commiss_serv_doc/406_14_voip_consult_paper_v2_1.pdf.

¹⁴ The U.S. Department of Commerce maintains a global VoIP report summarizing the state of technology in countries such as Armenia and Costa Rica. OFFICE OF TECH. AND ELEC. COMMERCE, U.S. DEP'T OF COMMERCE, WORLDWIDE VOIP REGULATORY AND MARKET INFORMATION 32 (2006) [hereinafter DOC VOIP REPORT], [http://web.ita.doc.gov/ITI/itiHome.nsf/5713559d82a954b085256cc40075a766/cb2a434afea6790485256d020053fef0/\\$FILE/voip%20worldwide.doc](http://web.ita.doc.gov/ITI/itiHome.nsf/5713559d82a954b085256cc40075a766/cb2a434afea6790485256d020053fef0/$FILE/voip%20worldwide.doc).

an incumbent, usually government-owned, monopoly provider of international toll service, went so far as to make international VoIP calls that terminated in their country illegal.¹⁵

III. CLASSIFYING THE TYPES OF VOIP SERVICES

Any discussion of regulation as it pertains to VoIP services must begin by establishing useful definitions. VoIP can be classified in many different ways. Initially, the FCC and the European Union (“EU”) differentiated classifications of VoIP based upon the customer premises equipment (“CPE”) at the end points of the transmission.¹⁶ One type is computer-to-computer VoIP, where the transmission starts and ends on a computer. Another type of service is computer-to-phone VoIP, where one party uses a phone to receive the transmission. There is also phone-to-phone VoIP—also known as Internet Protocol (“IP”) in the middle—where both parties use phones.¹⁷ Ultimately, this categorization did not provide a useful framework to allow comprehensive regulatory analysis.

Instead, regulators, service providers, and investment analysts in many countries are beginning to think about VoIP regulation using categories based more on the intended functionality of the VoIP service, rather than the type of endpoint. There are currently five categories that regulators may use to frame a regulatory regime. The first is “incumbent VoIP,” broadly defined as the use of IP to transport voice services on all or part of an incumbent network.¹⁸ Today, VoIP technology is sprinkled throughout the incumbent wireline and wireless networks in nearly every country. For instance, almost all long distance carriers’ networks use IP transmission in the backbone. Most wireless carriers use it for backhaul from cell towers to their switches. Therefore, IP in the middle is widespread, if not ubiquitous in established networks. Incumbents are increasingly adopting IP technologies into their existing networks in order to lower costs or improve product offerings.¹⁹ Some incumbent carriers are even transitioning to all-IP networks. Perhaps the best known examples are British Tele-

¹⁵ *Id.* at 14–15; *see also* David Gardner, *Costa Rica May Criminalize VoIP*, TECHWEB, Feb. 28, 2005, <http://www.techweb.com/wire/networking/60403862>.

¹⁶ *See, e.g.*, Universal Service Report, *supra* note 12, ¶ 24.

¹⁷ *See* INT’L TELECOMM. UNION, ITU INTERNET REPORTS: IP TELEPHONY 1–9 (2000) [hereinafter ITU IP TELEPHONY REPORT] (on file with author).

¹⁸ *See generally* Petition for Declaratory Ruling that AT&T’s Phone-to-Phone IP Telephony Services are Exempt from Access Charges, *Order*, 19 F.C.C.R. 7457 (2004) [hereinafter AT&T Declaratory Ruling].

¹⁹ *See, e.g.*, BT Global Services, http://www.btglobalservices.com/business/global/en/products/global_telecom_markets/index.html (last visited Mar. 25, 2006) (explaining BT’s “21CN next generation” IP network).

com²⁰ and the Australian carrier Telstra.²¹

The second broad category of VoIP is “enterprise VoIP,” which entails VoIP being provided over the local or wide area network (“LAN” or “WAN”) of a large business enterprise.²² The migration to VoIP within large business enterprises has progressed significantly in the United States, the EU, and a number of other countries with well-developed telecommunications infrastructures.²³

The third category of VoIP is the “PSTN replacement” or “interconnection service.”²⁴ The initial growth of VoIP outside the enterprise market occurred in the international calling market during the late 1990s, when Internet Service Providers (“ISPs”) and Internet carriers used VoIP to undercut the high prices of international toll calls.²⁵ These bypass carriers succeeded in capturing a large slice of the market formed by the most price-sensitive customers, such as expatriates and students.²⁶ As the quality of services improved, smaller businesses adopted international VoIP services.²⁷ In many developing countries, VoIP providers won considerable market share from incumbents. This trend became another factor leading to regulatory reforms aimed at liberalizing the market and rebalancing tariffs.²⁸ Since 2003, domestic or local VoIP services, marketed as cheaper versions of regular PSTN voice service, have significantly risen in popularity in many countries.²⁹ These services are designed and priced to allow customers to call anyone with a phone number on the domestic PSTN. The types of competitors offering these services vary from country to country. The best known examples of VoIP PSTN replacement services in the United States are provided by Vonage Holdings Corp. (“Vonage”) and SunRocket, Inc.³⁰ SkypeOut and SkypeIn also fall within this category.³¹ Most of the large

²⁰ *Id.*

²¹ See Ray Le Maistre & Nicole Willing, *Telstra Unveils Switch to IP*, LIGHT READING, Nov. 15, 2005, http://www.lightreading.com/document.asp?doc_id=84233.

²² See ROBERT FRANCES GROUP, ENTERPRISE VOIP—ARE WE THERE YET? (2001), <http://www.rfgonline.com/subsforum/archive/daily/073001/073101nt.html>.

²³ See Ed Sutherland, *Enterprise VoIP Adoption? Gradual but Rapid, Say Experts*, WI-FI PLANET, Mar. 28, 2005, <http://www.wi-fiplanet.com/voip/article.php/3493136>.

²⁴ The FCC has defined interconnected VoIP services to include those VoIP services that: “(1) the service enables real-time, two-way voice communications; (2) the service requires a broadband connection from the user’s location; (3) the service requires IP-compatible CPE; and (4) the service offering permits users generally to receive calls that originate on the PSTN and to terminate calls to the PSTN.” See E911 Requirements for IP-Enabled Service Providers, *First Report and Order and Notice of Proposed Rulemaking*, 20 F.C.C.R. 10,245, ¶¶ 24, 36–53 (June 3, 2005), *petition for review filed*, *Nuvio Corp. v. FCC*, No. 05-1248 (D.C. Cir. filed July 11, 2005).

²⁵ See ITU IP TELEPHONY REPORT, *supra* note 17, at 21–31.

²⁶ *Id.* at 21–22.

²⁷ *Id.*

²⁸ *Id.* at 22–31.

²⁹ See discussion *infra* Part V.

³⁰ See *What’s Vonage?*, <http://www.vonage.com> (last visited Jan. 26, 2006); see also

U.S. cable companies now offer VoIP services in their territories. In fact, the two largest U.S. VoIP providers are Cablevision Systems Corp. and Time Warner Cable Inc.³²

The fourth type of VoIP service is “peer-to-peer (“P2P”) voice telephony” such as Pulver.com’s Free World Dial-Up (“FWD”) and the original, non-PSTN-interconnected, version of Skype.³³ These P2P applications can only be used to connect to other users who have downloaded the software.³⁴ They are computer software programs that can be designed to utilize a central server—essentially like Napster, but for voice communication instead of music—or they can be pure P2P with no central server operation.³⁵ They are not designed to substitute directly for, or to interconnect with the PSTN. Generally, there is no charge to users of these types of services. Most of these are computer-to-computer applications.³⁶

The fifth category of VoIP services is what industry analyst and former FCC Chief of Staff Blair Levin has dubbed “P2P Community” (“P2PC”).³⁷ These are services in which voice communications are merely a subset in a suite of Internet services.³⁸ This category is not marketed as a direct competitor to the PSTN, “rather, the model involves pre-existing communities that use communications to facilitate or expand their existing activities.”³⁹ The most well-known example of this category is eBay Inc.’s (“eBay”) purchase and incorporation of Skype Limited’s voice functionality into its platform.⁴⁰ Other examples include Yahoo!, Inc. (“Yahoo!”), Google, Inc.’s Google Talk program, MSN.com, Amazon.com, and America Online, Inc.’s (“AOL’s”) instant messaging (“IM”) program.⁴¹ Many characterize these companies as being in different businesses, but as Levin has stated, “[T]hey are really all in the informa-

What is SunRocket?, <http://www.sunrocket.com> (last visited Jan. 26, 2006).

³¹ See About SkypeOut, <http://www.skype.com/products/skypeout> (last visited Jan. 26, 2006); About SkypeIn, <http://www.skype.com/products/skypein> (last visited Jan. 26, 2006).

³² See Alan Breznick & Michael Harris, *North American MSOs Top 1 Million Mark for VoIP Subs*, CABLE DIGITAL NEWS, Sept. 1, 2005, <http://www.cabledatcomnews.com/sep05/sep05-2.html>.

³³ See *In re* Petition for Declaratory Ruling that Pulver.com’s Free World Dialup is Neither Telecommunications Nor a Telecommunications Service, *Memorandum Opinion and Order*, 19 F.C.C.R. 3307, ¶ 5 (Feb. 19, 2004) [hereinafter Pulver Order].

³⁴ *Id.*

³⁵ *Id.* ¶¶ 5–7.

³⁶ See discussion *supra* Part III.

³⁷ Blair Levin, *Cable-Bell Showdown for Broadband Supremacy May Someday Be Eclipsed by PSTN-P2PC Fight*, WASH. TELECOM & MEDIA INSIDER, Sept. 16, 2005, at 3–4; S. Ward, *Emerging Voices*, BARRONS, Sept. 26, 2005, at 56.

³⁸ Levin, *supra* note 37.

³⁹ *Id.*

⁴⁰ *Id.* at 3.

⁴¹ *Id.*

tion-management business.⁴² In each of the companies' business models, the information and connectivity is free. These companies realize profits because they manage certain kinds of information—for example search engines, multimedia, retail sales, or auctions—better than anyone else. Voice is only one way that these innovators can communicate with their users and enable their users to communicate with each other. Other methods of communication used by such communities include both synchronous applications such as instant messaging and chat rooms, and asynchronous applications such as e-mail and message boards.⁴³

In the past, most countries' regulatory schemes considered all voice traffic to be similar and treated it as such.⁴⁴ The most important exception to this rule was voice traffic on private or corporate networks, which were freed from most regulation in the United States beginning in the 1970s and in the rest of the developed world from the 1980s forward.⁴⁵ This state of unitary or monolithic treatment of voice traffic is changing as voice becomes largely a packetized service. As this occurs, each of the five categories of VoIP will be regulated differently. The remainder of this Article examines the drivers for VoIP regulation generally and predicts national regulatory frameworks that are likely to emerge for each type of VoIP service.

IV. THE DRIVERS OF VOIP REGULATION

The remarkable growth of VoIP, together with the parallel expansion of broadband and wireless service, is causing permanent structural change in the voice service market. This change is leading to a dramatic decline in revenue from landline voice services in countries around the world, including the United States. That revenue loss will begin to accelerate in 2006 and continue through the decade. In September 2005, News Corp. Chairman Rupert Murdoch argued that voice service will be nearly free in a few years.⁴⁶ A few weeks later, eBay's chief executive, Meg Whitman, publicly agreed. She claimed that users can expect to make phone calls for free in three to six years.⁴⁷ According to the views of Mr. Murdoch and Ms. Whitman, voice communications will be

⁴² *Id.*

⁴³ *Id.*

⁴⁴ See discussion *infra* Part V.

⁴⁵ See discussion *supra* Parts III.

⁴⁶ Alan Breznick, *Moves by VoIP Players Could Dampen Cable's Voice Ambitions: eBay's Purchase of Skype Sparks Concerns About IP Telephony Price Wars*, CABLE DIGITAL NEWS, Oct. 1, 2005, <http://www.cabledatcomnews.com/oct05/oct05-5.html>. Murdoch cited the rapid growth of Skype and the likely development of rival free Internet phone services from such major players as Yahoo! and Google. *Id.*

⁴⁷ Doug Mahoney, *eBay Signs onto Free Phone Calls*, VON MAG., Oct. 20, 2005, http://www.vonmag.com/webexclusives/2005/10/20_eBayFreecalls.asp.

part of a package of IP services upon which carriers will make money through advertising or transaction fees.⁴⁸ These claims should not be taken lightly. The trend is unmistakable: consumers will pay little or nothing for a large portion of their voice services by 2010.

A key driver in the regulation of VoIP services is the perceived need to address the economic effects on the existing voice business. Landline voice revenues in the United States were almost \$229 billion in 2000; in 2004 they were only about \$196 billion.⁴⁹ This \$33 billion decline in annual landline voice revenues in the past five years dwarfs the total revenues of many U.S. industries. Hollywood movie studios, for example, gross less than \$10 billion a year from U.S. movie theaters, while U.S. radio networks earned only about \$20 billion in annual revenues in 2004.⁵⁰ Thus, the decline in annual voice revenues is already larger than the combined 2004 revenues for the movie and radio industries' main sources of income. Similar declines are forecast for other countries.⁵¹ The worst is yet to come: those revenues are inevitably going to shrink further and faster over the rest of this decade.⁵² Even analysts who disagree with the Murdoch–Whitman “voice will be free” position estimate that United States and European landline voice revenues may decline by as much as 1/3 or more in the next five years.⁵³

The U.S. experience is not unique, and it is unclear whether the United States leads other countries in the rate of revenue decline. Nevertheless, it is clear that the trend is being repeated throughout the world.⁵⁴ A revenue decline of this magnitude in one industry has rarely occurred in United States or global economic history.

The challenge for incumbents is to manage this revenue decline while transitioning to a new broadband world. How can they slow the decline of their existing voice revenue stream while they begin generating new broadband revenue streams? One tried and true—and, in most countries, very cost effective—way is to lobby legislators and regulatory agencies to impose regulatory obli-

⁴⁸ *Id.*

⁴⁹ Gary Kim, *Telecom Drought Over*, VOIP BUS. WKLY., Feb. 2, 2006, http://www.voipweekly.com/features.php?feature_id=40.

⁵⁰ See Yearly Box Office, <http://www.boxofficemojo.com/yearly/?view2=domestic&view=releasedate&p=.htm> (last visited Jan. 28, 2006); Press Release, Radio Adver. Bureau, Radio Tops \$20 Billion in 2004 Revenue Marking Its Biggest Year Ever (Feb. 1, 2005), http://rab.com/public/pr/revenue_detail.cfm?id=49.

⁵¹ Press Release, Analysys, Western European Fixed Voice Revenues Could Fall by EUR29 Billion by 2009 (Mar. 3, 2005), http://www.analysys.com/default_acl.asp?Mode=article&iLeftArticle=1863&m=&n=

⁵² *Id.*

⁵³ *Id.*

⁵⁴ *Id.*; see also ITU IP TELEPHONY REPORT, *supra* note 17, at 21–32.

gations on new VoIP competitors.⁵⁵

Due to the strong governmental interest in slowing the revenue cannibalization process, voice service in most countries is one of the largest and most heavily taxed industries, and substantial government revenues are derived from fees and taxes on existing voice services.⁵⁶ For example, it is estimated that in the United States, telecommunications companies and their customers pay “an average effective tax rate that is 250% higher than the tax rate for all other industries with the exception of electric utilities.”⁵⁷ In some states, the taxes amount to more than 25% of the customer’s bill.⁵⁸ Governments throughout the world have come to rely on the income derived from taxes on voice services to fund other projects. These include, for example, the Universal Service Fund (“USF”) in the United States and communications and other infrastructure buildout in less developed countries.⁵⁹

This convergence of interests explains why there is currently so much activity in VoIP regulation, both in the United States and elsewhere. Incumbents are fighting back and in many cases governments are helping them.

V. VOIP REGULATION: 2003–2005

In 2003, VoIP was either accidentally illegal or essentially unregulated in most countries in the world. For the United States, this situation changed quickly. Until the fall of 2003, the FCC had generally avoided rendering decisions related to the regulation of VoIP. In the 1998 Universal Service Report to Congress, the FCC declined to categorize VoIP services as either a telecommunications or an information service, indicating that it wanted to avoid making decisions that might cause problems for the nascent VoIP industry.⁶⁰ But business and technological developments, combined with a private party’s ability under the U.S. law to file petitions in a matter requiring a decision on the part of the FCC, have forced its hand to some extent. The FCC refused to

⁵⁵ Lobbying expenditures are required to be reported in few countries, so no estimate of total expenditures can be made. However, information on incumbents’ United States lobbying expenditures gives an idea of their magnitude. See generally JOHN DUNBAR, CTR. FOR PUB. INTEGRITY, FORMER BELLS DIAL UP BIG NUMBERS IN STATEHOUSES (2005), <http://www.publicintegrity.org/telecom/report.aspx?aid=744>; DANIEL LATHROP, CTR. FOR PUB. INTEGRITY, BELLS VS. AT&T TELEPHONE LOBBYING SURPASSES HALF-BILLION (2004), <http://www.publicintegrity.org/telecom/report.aspx?aid=408>.

⁵⁶ See ITU IP TELEPHONY REPORT, *supra* note 17, at 39–41.

⁵⁷ Susan P. Kennedy, Comm’r, Cal. Pub. Utils. Comm’n, Presentation at the Internet Telephony Conference & EXPO: VoIP: A Consumer’s Dream; A Regulator’s Nightmare (Oct. 24, 2005), <http://blog.pff.org/archives/Internet%20Telephony%20Conference%5B1%5D.doc>.

⁵⁸ *Id.*

⁵⁹ See, e.g., ITU IP TELEPHONY REPORT, *supra* note 17, at 39–41, 61–64.

⁶⁰ Universal Service Report, *supra* note 12, ¶ 39.

adopt a broad policy approach, but had to address those VoIP issues presented for consideration in various petitions. Thus, the FCC created a patchwork based on decisions in a number of cases involving VoIP, including the Pulver.com,⁶¹ the AT&T calling card,⁶² and the Vonage cases.⁶³

The Pulver.com petition addressed FWD, a peer-to-peer voice network similar to Skype.⁶⁴ FWD allows a user to have a voice connection over the Internet to any other user who is running the software anywhere in the world. After Pulver.com filed a petition for a declaratory ruling in 2003, the FCC held that FWD was not a telecommunications service.⁶⁵ Instead, it is considered to be an information service and providers do not pay access charges or any telecommunications fees or taxes.⁶⁶

In a 2004 decision, the FCC ruled that AT&T's IP-in-the-middle telephone long distance services were telecommunications services, not information services, because the conversion to IP was transparent to the customer placing the call.⁶⁷ The FCC stated that its decision applied to all services that "(1) use ordinary customer premises equipment (i.e., telephones) with no enhanced functionality, (2) originate and terminate on the PSTN, and (3) undergo no net protocol conversion and provide no enhanced functionality to end users due to the provider's use of IP technology."⁶⁸ This ruling ultimately subjected these calls to federal fees, taxes, and access charges.⁶⁹

Later, the FCC addressed another type of VoIP, IP-to-PSTN, in its Vonage decision.⁷⁰ The decision addressed the regulatory treatment of Vonage's DigitalVoice, one of the most widely-known examples of IP-to-PSTN VoIP service. Some have argued that the decision also applied to other VoIP services offered by cable companies and non-facilities-based VoIP providers such as SunRocket that operate similarly.⁷¹ The FCC concluded that "DigitalVoice and

⁶¹ See Pulver Order, *supra* note 33.

⁶² AT&T Declaratory Ruling, *supra* note 18.

⁶³ See *In re Vonage Holdings Corporation Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Utilities Commission, Memorandum Opinion and Order*, 19 F.C.C.R. 22,404 (Nov. 12, 2004) [hereinafter Vonage Order].

⁶⁴ See Skype Products, <http://www.skype.com/products> (last visited Feb. 5, 2006) (explaining that its software enables users to make "free calls to your friends all over the world.").

⁶⁵ Pulver Order, *supra* note 33, ¶ 26 ("[Declaring] FWD to be neither 'telecommunications' nor a 'telecommunications service' [and finding] FWD to be an unregulated 'information service' subject to the Commission's jurisdiction.").

⁶⁶ *Id.*

⁶⁷ See AT&T Declaratory Ruling, *supra* note 18, ¶¶ 1, 24.

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ Vonage Order, *supra* note 63.

⁷¹ See SunRocket Internet Phone Service, <http://www.sunrocket.com> (last visited Apr. 5, 2006).

its analogues are services that enable subscribers to originate and receive voice communications; they also provide a host of other features and capabilities that allow subscribers to manage their personal communications over the Internet.”⁷² The FCC found that the services “resemble the telephone service provided by the PSTN,” but differed in that the Vonage customer must have a broadband connection to use the service, and must purchase specialized equipment to make and receive calls.⁷³ The services were further differentiated when the FCC concluded that “although customers may in some cases attach conventional telephones to the specialized CPE that transmits and receives these IP packets, a conventional telephone alone will not work with IP-to-PSTN services such as Vonage.”⁷⁴

The FCC’s Vonage order arose out of a petition asking the FCC to preempt Minnesota Public Service Commission’s (“Minnesota Commission”) 2003 decision finding that it—and potentially every other state regulatory agency—had regulatory jurisdiction over Vonage’s service. In its decision, the Minnesota Commission ordered “the company to comply with all state statutes and regulations relating to the offering of telephone service in Minnesota.”⁷⁵ Despite asserting jurisdiction and finding that Vonage’s DigitalVoice service was a “telephone service” under state law, the Minnesota Commission did not determine whether the service was a telecommunications service or an information service under federal law.⁷⁶ Vonage reacted by filing suit against the Minnesota Commission in the U.S. District Court for the District of Minnesota.⁷⁷ In October 2003, the court found in favor of Vonage and “entered a permanent injunction against the Commission’s actions.”⁷⁸ The court determined that Vonage was providing an information service and that federal law preempts the Minnesota Commission’s authority to subject such a service to common carrier regulation. The court held that “VoIP services necessarily are information services, and state regulation over VoIP services is not permissible be-

⁷² Vonage Order, *supra* note 63, ¶¶ 4, 7.

⁷³ *Id.* ¶¶ 4–6. The FCC found that IP-to-PSTN services require customers to use specialized customer premises equipment (CPE).

Customers may choose among several different types of specialized CPE: (1) a Multimedia Terminal Adapter (MTA), which contains a digital signal processing unit that performs digital-to-audio and audio-to-digital conversion and has a standard telephone jack connection that allows use of PSTN telephones; (2) a native Internet Protocol (IP) phone; or (3) a personal computer with a microphone and speakers, and software to perform the conversion (softphone).

⁷⁴ *Id.* ¶ 6.

⁷⁵ *Id.* ¶ 6.

⁷⁶ *Id.* at 22,405 n.8.

⁷⁷ *Id.* ¶ 11.

⁷⁸ *See* Vonage Holding Corp. v. Minn. Pub. Utils. Comm’n, 290 F. Supp. 2d 993 (D. Minn. 2003).

⁷⁸ *Id.* at 1002; *see also* Vonage Order, *supra* note 63, ¶ 11.

cause of the recognizable congressional intent to leave the Internet and information services largely unregulated.”⁷⁹

At the same time that it filed suit in the district court in Minnesota, Vonage filed a petition for a declaratory ruling requesting that the FCC preempt the Minnesota Commission’s order and find that (1) Vonage was a provider of “information services,” and not a “telecommunications carrier” and (2) state regulation of this service would unavoidably conflict “with the national policy of promoting unregulated competition in the Internet and information service market.”⁸⁰ In the alternative, Vonage also asked the FCC to preempt the Minnesota Commission’s order because it was impossible to separate the service, regardless of its regulatory classification, into distinct interstate and intrastate communications.⁸¹ The FCC granted the petition on the second ground, finding “that the characteristics of DigitalVoice preclude any practical identification of, and separation into, interstate and intrastate communications for purposes of effectuating the traditional dual federal-state regulatory scheme, so that permitting Minnesota’s regulations would thwart federal law and policy.”⁸² The FCC declined to reach the issue of the definitional classification of DigitalVoice as either a telecommunications or information service. Nevertheless, it did preempt the Minnesota Commission’s decision and clarified that the FCC, “not the state commissions, has the responsibility and obligation to decide whether certain regulations apply to DigitalVoice and other IP-enabled services having the same capabilities.”⁸³

In light of the Vonage order, the regulatory status of IP-to-PSTN VoIP is unclear. Currently, the FCC has at least four pending industry-initiated VoIP proceedings.⁸⁴ The FCC has also started a broad-ranging proceeding on addressing the regulation of IP services, including VoIP. In this IP-Enabled Services Proceeding, the FCC has asked for comment from parties concerning, among other things, the extent of USF obligations and whether the duty to pay access charges and other forms of intercarrier compensation should apply to

⁷⁹ Vonage Order, *supra* note 63, ¶ 11.

⁸⁰ *Id.* ¶ 14.

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

⁸⁴ See Pleading Cycle Established for Frontier’s Petition for Declaratory Ruling Regarding the Application of Access Charges to IP-Transported Calls, *Public Notice*, DA 05-3165, WC Docket No. 05-276 (Dec. 9, 2005), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-05-3165A1.pdf; Pleading Cycle Established for SBC’s and VarTec’s Petitions for Declaratory Ruling Regarding the Application of Access Charges to IP-Transported Calls, *Public Notice*, 20 F.C.C.R. 15,241 (Sept. 26, 2005); Pleading Cycle Established for Grande Communications Petition for Declaratory Ruling Regarding the Application of Access Charges to IP-Transported Calls, *Public Notice*, 20 F.C.C.R. 16,167 (Oct. 12, 2005).

VoIP and other IP-enabled services.⁸⁵ There is no statutory deadline for the completion of this rulemaking proceeding, and the FCC has not announced any informal timetable for its decision. It is widely acknowledged that the growth of VoIP is also complicating the FCC's ability to reach decisions in other important proceedings, particularly its proceedings on universal service reform and intercarrier compensation reform.

The FCC has approached VoIP regulation from the perspective that non-regulation, or minimal regulation, of the Internet and Internet applications should be a guiding principle. Therefore, the FCC began to apply regulation to VoIP services only incrementally. The EU and numerous countries with well-developed communications infrastructures and some degree of competition in voice service are taking a similar approach.⁸⁶

The EU began examining the issue of VoIP regulation by trying to clarify how its 2003 regulatory framework for electronic communications services applies to VoIP.⁸⁷ In March 2004, the European Commission organized a public workshop to discuss a study on VoIP drafted by a consulting firm.⁸⁸ Later that year, the EU published an Information and Consultation Document on the Treatment of Voice over Internet Protocol under the EU Regulatory Framework.⁸⁹ Numerous EU member countries, including France,⁹⁰ Germany,⁹¹ the Netherlands,⁹² and Spain,⁹³ initiated similar consultations. The United King-

⁸⁵ *In re IP-Enabled Services, Notice of Proposed Rulemaking*, 19 F.C.C.R. 4863, ¶¶ 61–66 (Feb. 12, 2004) [hereinafter IP-Enabled Services NPRM].

⁸⁶ EU VOIP WORKING PAPER, *supra* note 13, §§ 1–3.

⁸⁷ ANALYSYS CONSULTING, FINAL REPORT FOR THE EUROPEAN COMMISSION: IP VOICE AND ASSOCIATED CONVERGENT SERVICES ii–iii (2004) [hereinafter IP VOICE ANALYSYS REPORT], http://europa.eu.int/information_society/policy/ecom/doc/info_centre/studies_ext_consult/ip_voice/401_28_ip_voice_and_associated_convergent_services.pdf.

⁸⁸ *Id.*

⁸⁹ EU VOIP WORKING PAPER, *supra* note 13.

⁹⁰ Press Release, Autorité de Régulation des Télécommunications, L'Art a Lancé une Consultation "Preliminaire" sur la VoIP [ART Launched a "Preliminary" Consultation on VoIP] (June 21, 2004) (Fr.), <http://www.art-telecom.com/communiqués/revue/2004/21juin.htm>.

⁹¹ Press Release, Regulatory Auth. for Telecomms. & Post, RegTP Opens Consultation on Voice over IP (2004) (Den.), http://www.bundesnetzagentur.de/enid/40e6113ba6a6737f13983dace76b7e05,0/Archive/2_4_-_January-June_11z.html#3322.

⁹² ONAFHANKELIJKE POST EN TELECOMMUNICATIE AUTORITEIT, CONSULTATIE VODSL EN UITNODIGING RONDE TAFEL [INVITATION ROUND TABLE CONSULTATION ON VOIP] (2003) (Neth.), http://www.opta.nl/download/Openb_versie_codo_VoDSL.pdf; see also STRATIX CONSULTING, VOICE-OVER-PACKET TECHNOLOGY: OPTIONS FOR OPTA (2003), <http://www.opta.nl/download/VoIP%20rapportage%20Stratix%20nl%20.pdf>.

⁹³ COMISION DEL MERCADO DE LAS TELECOMUNICACIONES, CONCLUSIONES DE LA CONSULTA PÚBLICA SOBRE LA PROVISIÓN DE SERVICIOS DE VOZ MEDIANTE TECNOLOGÍAS IP (VOIP) [CONCLUSIONS OF THE PUBLIC COUNCIL ABOUT VOIP], DT 2004/757 (Feb. 3, 2005)

dom's telecommunications regulatory agency—often referred to as OfCom—recently published a guidance document addressing VoIP services.⁹⁴

In May 2005, the Italian telecommunications regulator, *Autrit  per le Garanzie nell'Comunicazione*, redefined its guidelines for VoIP operators. Under the new guidelines, IP calls are considered the equivalent of standard fixed line calls, and VoIP operators face the same obligations as traditional providers.⁹⁵ The new guidelines also require number portability and identification, and require the availability of wiretapping of IP communications facilities for law enforcement purposes.

Canada is also re-examining its regulation of VoIP services. In April 2004, the Canadian Radio-Television and Telecommunications Commission ("CRTC") issued a public notice opening a proceeding to address the regulatory framework for VoIP services.⁹⁶ In May 2005, the CRTC announced that it would regulate VoIP service "only when it is provided and used as a local telephone service."⁹⁷ The CRTC decided that VoIP services offered by non-incumbent competitors such as Skype, Vonage, and cable providers would remain unregulated, and that ILECs are not permitted to price their VoIP services below cost.⁹⁸ The CRTC stated that its decision represents "limited regulation for VoIP" and that it would foster competition in Canada's fixed telephony market.⁹⁹ Not surprisingly, Canada's ILECs strongly disagree, arguing that the CRTC's decision to regulate ILEC retail rates for Internet telephony will stifle IP innovation, price competition, and, by extension, consumer choice.¹⁰⁰ Like the FCC, the CRTC has ventured into the emergency services arena: in October 2005, it required all providers of local VoIP to notify current and prospec-

(Spain), http://www.cmt.es/cmt/centro_info/c_publica/pdf/cp_VoIP.pdf.

⁹⁴ OfCom, *New Voice Services—A Consultation and Interim Guidance* (Sept. 6, 2004) (U.K.), http://www.ofcom.org.uk/consult/condocs/new_voice/new_voice/#content.

⁹⁵ See *AUTRIT  PER LE GARANZIE NELL'COMUNICAZIONE, CONSULTAZIONE PUBBLICA CONCERNENTE PROPOSTE DI INTERVENTI REGOLAMENTARI IN MERITO ALLA FORNITURA DI SERVIZI VOIP*, [PUBLIC CONSULTATION CONCERNING THE PROPOSAL OF PRESCRIBED PARTICIPATIONS WITH RESPECT TO THE SUPPLY OF VOIP SERVICES], *Delibera n. 26/05/CIR* (July 18, 2005) (Italy) [hereinafter *ITALIAN VOIP PUBLIC CONSULTATION*], http://www.agcom.it/provv/c_p_26_05_CIR/d_26_05_CIR.htm.

⁹⁶ *CANADIAN RADIO-TELEVISION & TELECOMM. COMM'N, REGULATORY FRAMEWORK FOR VOICE COMMUNICATION SERVICES USING INTERNET PROTOCOL* (Apr. 7, 2004), <http://www.crtc.gc.ca/archive/ENG/Notices/2004/pt2004-2.htm>.

⁹⁷ *CANADIAN RADIO-TELEVISION & TELECOMM. COMM'N, REGULATORY FRAMEWORK FOR VOICE COMMUNICATION SERVICES USING INTERNET PROTOCOL, TELECOM DECISION, CRTC 2005-28* (May 12, 2005) [hereinafter *CANADIAN VOIP REGULATORY DECISION*], <http://www.crtc.gc.ca/archive/ENG/Decisions/2005/dt2005-28.htm>.

⁹⁸ *Id.* ¶ 153.

⁹⁹ *Id.* ¶ 194.

¹⁰⁰ See, e.g., Tyler Hamilton, *Phone Companies Criticize CRTC's "Hasty Procedure" Dispute over Net-Based Service Bell, Telus Favour Slower Process*, *TORONTO STAR*, Apr. 16, 2004, at 3.

tive customers regarding the availability, characteristics, and limitations of 911 and Enhanced-911 (“E911”) services.¹⁰¹

In November 2005, following a yearlong investigation, the Australian Department of Communication, Information Technology and the Arts (“DCITA”) released a report on the policy and regulatory implications of VoIP services.¹⁰² The report concluded that no immediate need for any significant changes to the regulatory framework existed, but recommended some small adjustments to existing numbering, emergency services, and customer service regulation to accommodate VoIP services.¹⁰³ In addition, a new non-geographic numbering system will be established for VoIP to enable providers to offer non-location-specific services.¹⁰⁴ The government of Australia accepted DCITA’s recommendations and plans to implement them.¹⁰⁵

There has also been significant VoIP regulatory activity in Asia. Japan has perhaps the most well-developed VoIP market in the world. Several years ago, Japan instituted a separate and fairly comprehensive regulatory scheme for VoIP services.¹⁰⁶ This included a discrete numbering block for VoIP services, quality of service requirements, and classification of VoIP as a telecom service.¹⁰⁷ Because this system created a stable regulatory environment for consumers and carriers, VoIP expanded rapidly in Japan.¹⁰⁸ The development of VoIP in Japan was also greatly facilitated by the growth of fixed broadband networks and the substantial decline in the price of their services, since VoIP was in most cases bundled with the broadband service.¹⁰⁹ According to the U.S. Department of Commerce, Japan may have as much as 80% of the world’s VoIP users.¹¹⁰

The South Korean Ministry of Information and Communication (“MIC”) promulgated a Ministerial Decree in 2004 that regulates VoIP as a basic tele-

¹⁰¹ CANADIAN RADIO-TELEVISION & TELECOMM. COMM’N, EMERGENCY SERVICE OBLIGATIONS FOR LOCAL VOIP SERVICE PROVIDERS ¶¶ 93–94 (2005), <http://www.crtc.gc.ca/archive/ENG/Decisions/2005/dt2005-21.htm>.

¹⁰² DEP’T OF COMMC’NS, INFO. TECH. & THE ARTS, EXAMINATION OF POLICY AND REGULATION RELATING TO VOICE OVER INTERNET PROTOCOL (VOIP) SERVICES (2005) (Austl.), http://www.dcita.gov.au/_data/assets/pdf_file/34194/VOIP_Report_November_2005.pdf.

¹⁰³ *Id.* at 33.

¹⁰⁴ *Id.*

¹⁰⁵ See Tony Jones, *UAE and Aussies Set to Establish VoIP Rules*, VOIP BUS. WKLY., Oct. 31, 2005, at 28.

¹⁰⁶ See Kenji Erik Kushida, *Japan’s Telecommunications Regime Shift: Understanding Japan’s Potential Resurgence* 13–19 (Berkeley Roundtable on the International Economy, Working Paper No. 170, 2005), <http://brie.berkeley.edu/~briewww/wp170.pdf>.

¹⁰⁷ *Id.* at 20.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.* at 4–5.

¹¹⁰ DOC VOIP REPORT, *supra* note 14, at 32; see also Global IP Alliance, <http://www.ipall.org/matrix/#'Asia%20Pacific> (last visited Feb. 22, 2006).

communications service.¹¹¹ The corresponding regulations “impose[d] minimum quality of service standards, create[d] a system for providing telephone numbers to VoIP subscribers, and govern interconnection.”¹¹² Yet despite the regulations, VoIP subscribers do not have access to the country’s equivalent to the United States’ emergency 911 system. In addition, the regulations do not require VoIP service providers to develop and provide the technology to permit law enforcement agencies to carry out wiretapping warrants on VoIP subscribers.¹¹³

The Korean regulations provided different rules for facility-based providers—who own their own Internet backbone network, subscriber network, and server equipment—and resellers who do not own their own network infrastructure. Resellers were allowed to begin operating in 2004 if they registered with the MIC and satisfied its quality of service requirements.¹¹⁴ In early 2005, MIC also began to provide “service licenses to facility-based VoIP operators . . . and the first facilities based provider began offering service in late 2005.”¹¹⁵

VoIP services and corresponding regulations are also expanding in other areas of Asia. One example is Hong Kong, where, until recently, there were no specific VoIP regulations.¹¹⁶ In 2004, the “Hong Kong Broadband Network (“HKBN”) and City Telecom began offering VoIP services . . . using [Hong Kong’s incumbent telephony provider] PCCW’s broadband network.”¹¹⁷ PCCW protested HKBN’s action to the Hong Kong regulatory agency, OFTA, which initially did not subject VoIP calls to local access charges. After PCCW appealed the decision, OFTA reversed its decision and found that a cost-based interconnection fee could be levied against VoIP providers.¹¹⁸ In response, PCCW subsequently dropped its appeal.¹¹⁹ Recently, OFTA continued to examine these issues and in January 2006 the agency issued a new and “revised li-

¹¹¹ See Rob Frieden, *Lessons from Broadband Development in Canada, Japan, Korea and the United States*, 29 TELECOMM. POL’Y 595 (2005); see also DOC VOIP REPORT, *supra* note 14, at 50.

¹¹² DOC VOIP REPORT, *supra* note 14, at 50–51; Hankook Ilbo, *Internet Phone Connects to Mobile Handset*, KOREA TIMES, April 3, 2005, <http://times.hankooki.com/lpage/tech/200504/kt2005040317340711810.htm>.

¹¹³ DOC VOIP REPORT, *supra* note 14, at 50–51.

¹¹⁴ *Id.*

¹¹⁵ *Id.*; Press Release, Hanaro Telecom, First Service Provider in Korea to Offer VoIP Services (Sept. 1, 2005), http://www.voipnow.org/2005/09/hanaro_telecom_.html. See generally Press Release, Lucent Technologies, Hanaro Telecom Selects Lucent Technologies VoIP Solution to Offer Advanced Services to Enterprises (Sept. 1, 2005), <http://www.lucent.com/press/0905/050901.coa.html>.

¹¹⁶ DOC VOIP REPORT, *supra* note 14, at 26.

¹¹⁷ *Id.*; see also Stephen Leung, *VoIP Era Dawning*, CHATTER GARDEN, Dec. 3, 2004, <http://www.chattergarden.com/node/164>.

¹¹⁸ DOC VOIP REPORT, *supra* note 14, at 50–51.

¹¹⁹ *Id.*

censing and interconnection scheme for VOIP providers.¹²⁰

China provides another model of the adaptation of VoIP technology and regulations. In 1998, China's Ministry of Information Industry ("MII") took an aggressive approach and "banned unauthorized telephone and fax services over IP in response to concerns that these cheaper IP phone services were undermining China Telecom's monopoly."¹²¹ In spite of the ban on VoIP services, the technology thrived in some areas of China, specifically, southern China. Subsequently, the Fuzhou Intermediate People's Court in Fujian held "that VoIP is just one of many computer information services and not prohibited under the monopoly business law."¹²² The MII recently announced new regulations for VoIP, determining that it would oversee technical and interconnection regulations "of IP Phone Gateway Equipment and the General Requirement for IP Phone/Fax Services."¹²³

The Chinese government remains concerned about the growth in VoIP providers and services, all of which are unlicensed, and "which China Telecom claims are causing dramatic losses in long-distance revenue."¹²⁴ Presumably as a result of this concern, in "September 2005, China Telecom began blocking Skype's VoIP service in Shenzhen, with plans to do so throughout the country."¹²⁵ In early 2006, press reports indicated that the Chinese government is "reportedly considering a plan to make formerly unregulated VoIP calls made over [personal computers] illegal."¹²⁶

In contrast to the regulatory approach taken by the United States and the EU, where VoIP services are increasingly regulated, a large number of countries are approaching VoIP regulation from another direction. As previously noted, in many countries laws provided for a monopoly on voice service by a single, often government-owned, entity, so VoIP service by any other entity was automatically illegal, even though there had never been any legislative or regulatory consideration of VoIP or its merits. For example, the availability of VoIP technologies are limited in Armenia because of the government agency's

¹²⁰ See OFFICE OF THE TELECOMM. AUTH., SERVICE-BASED OPERATOR (SBO) LICENSE (2006) (H.K.), <http://www.ofa.gov.hk/en/tas/ftn/tas20060106.pdf>; see also Leung, *supra* note 117.

¹²¹ DOC VOIP REPORT, *supra* note 14, at 13.

¹²² *Id.*

¹²³ For additional information on Chinese telecommunications laws, see International Telecommunication Union, Country Profiles, http://www.itu.int/ITU-D/treg/profiles/Build_Guide.asp?Country=CHN (last visited Apr. 5, 2006).

¹²⁴ DOC VOIP REPORT, *supra* note 14, at 13.

¹²⁵ *Id.*; see also *Skype Blocked in China: Do Chinese Carriers Have the Right to Block VoIP to Stop Revenue Loss or to Bolster National Security?*, RED HERRING, Sept. 9, 2005, <http://www.redherring.com/Article.aspx?a=13516&hed=Skype+Blocked+in+China>.

¹²⁶ DOC VOIP REPORT, *supra* note 14, at 13.

monopoly over telephony.¹²⁷ Other countries with government monopolies, such as Costa Rica and Haiti, have taken steps to prevent private companies from offering VoIP.¹²⁸ According to a U.S. Department of Commerce survey and press reports, at the end of 2005, VoIP remained illegal in almost fifty countries.¹²⁹ Many of these are in the Middle East, Africa, or the former Commonwealth of Independent States (“CIS”).¹³⁰

In many of these countries, laws or regulations have begun to change incrementally to allow certain types of VoIP. These countries are comparatively deregulating VoIP simply by permitting the service to operate even in limited circumstances. The impetus for legal change has generally been the detrimental effect of economic arbitrage.¹³¹ Substantial gray markets in VoIP services developed, first in international calls, then in local calls.¹³² As these gray markets drained revenues from government-sanctioned incumbents, these governments had to address the situation.

One approach is to have the regulator actively aid the incumbent by blocking the licensing of alternative VoIP providers. Mexican regulators protected the interests of the incumbent provider, TelMex, by declaring the activities of certain VoIP providers illegal, delaying deregulatory activity, and failing to halt certain anticompetitive actions taken by TelMex.¹³³ A slightly less obstructive approach has been taken in Ecuador and Egypt, which require that any VoIP provider enter into a termination or strategic arrangement with the incumbent voice provider.¹³⁴ Other countries have taken more liberal approaches. VoIP services were illegal in India, for example, until April 2002, when VoIP

¹²⁷ *Id.* at 3.

¹²⁸ *Id.* at 14–15; see W. David Gardner, *Costa Rica May Criminalize VoIP*, TECHWEB, Feb. 28, 2005, <http://www.techweb.com/wire/networking/60403862>; *Regulator Imposed Telecom Blackout in Haiti*, FUNREDES, Oct. 5, 1999, <http://www.funredes.org/funredes/domaine/rddh.html>.

¹²⁹ See Gary Kim, *VoIP Illegal in at Least 46 Countries*, VOIP BUS. WKLY., May 16, 2005, at 24.

¹³⁰ *Id.*; see also DOC VOIP REPORT, *supra* note 14. CIS was formed in 1991 as an organization that viewed its counterparts as equal, sovereign entities. The countries form an economic union “grounded on free movement of goods, services, labour force, capital; to elaborate coordinated monetary, tax, price, customs, external economic policy; to bring together methods of regulating economic activity and create favourable conditions for the development of direct production relations.” About Commonwealth Independent States, <http://www.cisstat.com/eng/cis.htm> (last visited Feb. 9, 2006).

¹³¹ See ITU IP TELEPHONY REPORT, *supra* note 17, at 5, 61.

¹³² Most of these countries had per minute pricing on all in-country calls, whether local or long distance. *Id.* at 27–31, 61–62.

¹³³ See DOC VOIP REPORT, *supra* note 14, at 37–38; Ben Chamy, *Mexico Telephone Operator Under VoIP Fire*, CNET NEWS.COM, April 25, 2005, http://news.com.com/Mexico+telephone+operator+under+VoIP+fire/2100-7352_3-5681542.html.

¹³⁴ See DOC VOIP REPORT, *supra* note 14, at 18.

was permitted for end-users and service providers.¹³⁵ Subsequently, in November 2005, the Minister of Communications for India “announced that telephone service companies, access-providers, and others . . . [could] use IP technology in their backbone networks.”¹³⁶ VoIP is considered an application service in India, so ISP customers can use their personal computer or other IP-based CPE to make PC-to-PC calls, both within and outside India.¹³⁷ However, PC-to-phone calls are only allowed if the phone is outside of India.¹³⁸ In addition, India has imposed quality of service (“QoS”) requirements for VoIP calls.¹³⁹

Several other countries have taken steps to permit limited VoIP services, but in many cases the government or an incumbent has erected barriers that limit VoIP providers’ ability to compete. For example, in 2004, the South African Minister of Communications effectively legalized VoIP for the first time in that country. Still, users claim that the incumbent, Telkom, is hampering the growth of competing VoIP services.¹⁴⁰ Similarly, the government of Bangladesh announced that it would legalize VoIP in December 2003, but stated that it would limit the number of companies in order “to maintain high quality service” and to ensure that all calls are directed through the international gateway of the incumbent Bangladesh Telephone and Telegraph Board.¹⁴¹ In practice, the deregulation has yet to occur, as the government has moved slowly, apparently due to pressure from the incumbent telephone providers.¹⁴²

Almost all of the regulatory developments discussed thus far have occurred since the beginning of 2003, a mere blink of the eye in regulatory time. The rest of this decade will no doubt see a further explosion in attempts to regulate VoIP services. The next two parts of this Article examine the likely forms that regulation will take, and how direct and indirect regulation are likely to shape the development of VoIP services.

¹³⁵ *Id.* at 27–28.

¹³⁶ *Id.*

¹³⁷ *Id.* at 27.

¹³⁸ *Id.* at 28.

¹³⁹ *Id.* at 27. The Telecom Regulatory Authority of India’s quality of service regulations are available on its website. See TELECOM REGULATORY AUTHORITY OF INDIA, REGULATION ON QUALITY OF SERVICE OF BASIC AND CELLULAR MOBILE TELEPHONE SERVICES (2005), <http://www.trai.gov.in/regu1jul05.pdf>.

¹⁴⁰ See DOC VOIP REPORT, *supra* note 14, at 48–49; *VoIP Uptake Slow for Corporates While Consumers Chat Away*, CUASA NEWSL. (2005), <http://www.cuasa.org.za/newsletters/2005/aprilmay/voip.htm?O=S&CiRestriction=cuasa>.

¹⁴¹ See DOC VOIP REPORT, *supra* note 14, at 6.

¹⁴² See generally Simon A. Sabir, Joint Sec’y, ISP Assoc. Bangl., PowerPoint Presentation: VoIP Deregulation in Bangladesh, <http://www.sanog.org/resources/sanog4-sumon-voip-dereg.pdf> (last visited Feb. 15, 2006); Dhak Bdnews, *Use of VoIP Not Legalised To Protect a Few IT Cos* [sic], DAILY STAR (Bangl.), Oct. 30, 2005, <http://www.thedailystar.net/2005/10/30/d51030060969.htm>.

VI. DIRECT REGULATION OF VOIP IN THE FUTURE

One safe prediction is that the regulation of VoIP will continue predominantly at the national level into the foreseeable future, even though the globally distributed nature of the Internet limits to some degree the effectiveness of national regulation. Two multilateral organizations, the WTO and the International Telecommunications Union ("ITU"), could, in theory, play a significant role in shaping the national responses, but they are unlikely to do so. The regulation of advanced telecommunications service offerings such as VoIP was discussed in negotiations in the Doha Round of the WTO.¹⁴³ Unfortunately, there will not likely be any decision from that forum for years.¹⁴⁴

The ITU is even more hobbled by institutional inertia than the WTO, primarily because the ITU acts by consensus and reflects the status quo bias of many national regulators and the incumbent carriers.¹⁴⁵ As part of its Next Generation Network ("NGN") 2004 project, ITU-T Study Group 13 is developing Recommendation Y.NGN-CON on the regulatory considerations of the NGN, including VOIP services.¹⁴⁶ There has been limited progress on the document in recent group meetings. ITU-T Study Group 13 is also developing a series of recommendations on quality of service for NGNs.¹⁴⁷ The recently established ITU-T NGN Focus Group is also considering quality of service and network security issues in addition to emergency telecommunications services

¹⁴³ See Press Release, EUROPA, Summary of the EU's Revised Services Offer in the Doha Negotiations (June 2, 2005), <http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEMO/05/190&format=HTML&aged=0&language=en&guiLanguage=en> (summarizing the EU's most recent offer on telecommunication services in the Doha Round). The Doha Round, named after the location of the first trade meeting, is a round of negotiations between members of the WTO to advance a non-discriminatory trade policy that encourages and furthers progress and enlargement among WTO members, most of which are developing nations. Doha WTO Ministerial 2001: Declaration, http://www.wto.org/English/thewto_e/minist_e/min01_e/mindecl_e.htm (last visited Apr. 5, 2006).

¹⁴⁴ See, e.g., J. Robert Vastine, *Services Negotiations in the Doha Round: Promise and Reality*, 5 GLOBAL ECON. J. 4 (2005).

¹⁴⁵ That is why, for example, the ITU originally opposed the telecommunications negotiations in the Uruguay Round that led to the WTO Agreement on Basic Telecommunications. See Peter Cowhey & Mikhail M. Klimenko, *The WTO Agreement and Telecommunications Policy Reform* (unpublished manuscript, University of California, San Diego, Graduate School of International Relations and Pacific Studies), <http://www.sice.oas.org/geograph/services/cowhey.pdf> (last visited Jan. 31, 2006).

¹⁴⁶ In 2001, the ITU held a workshop to address and attempt to classify and define NGNs. Subsequently, the ITU has held numerous workshops to address the issues related to NGNs and the ITU-T launched the "NGN 2004 Project." The purpose of the project is "to organize and to coordinate ITU-T activities on Next Generation Networks." For further information on the NGN 2004 Project, see INT'L TELECOMM. UNION, NEXT GENERATION NETWORKS (NGN) 2004 PROJECT, <http://www.itu.int/ITU-T/studygroups/com13/ngn2004>.

¹⁴⁷ *Id.*

and lawful interception issues.¹⁴⁸ Still, the ITU has a history of moving slowly¹⁴⁹ and it is unlikely to significantly affect VoIP regulation before 2008.¹⁵⁰ Whether anything it does at that time will have much practical effect remains an open question. The one area where earlier ITU action might be possible is the implementation of the electric number mapping system (“ENUM”).

This means that the level of regulation of various types of VoIP services will be determined on the national level until at least 2010. The question remains: what regulatory obligations are likely to be imposed, either directly or indirectly, that will affect the development of VoIP?

Two broad categories of regulations exist that can be imposed directly on VoIP services: economic regulation and social regulation.¹⁵¹ The economic issues involve regulation of rates and the quality of service. The two types of economic regulation were originally designed to protect consumers from the unchecked exercise of market power by incumbents. The two types of economic regulation are not necessary to protect customers of new competitors who lack market power and in fact are more often used by incumbents to raise VoIP providers’ costs and slow their growth. The areas of social regulation include the funding of universal service, disability access, and emergency services, and law enforcement interception of voice calls.¹⁵²

A. Incumbent VoIP

It seems likely that, in most countries, incumbent VoIP will be subject to the same economic and social requirements imposed on the PSTN today. This is what Canada and Japan, for instance, have done.¹⁵³ However, there may be an emerging trend to exempt incumbents’ new broadband networks—and services, such as VoIP, that ride over those networks—from the economic regulation imposed on the PSTN. This is the intended result of the FCC’s Cable Modem¹⁵⁴ and Wireline Broadband¹⁵⁵ decisions. Similarly, the German regulatory

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

¹⁵⁰ *Id.*; see discussion *infra* Part VII.

¹⁵¹ HANK INTVEN ET AL., TELECOMMUNICATIONS REGULATION HANDBOOK 1-1 (2000), available at http://www.infodev.org/files/1080_file_module1.pdf.

¹⁵² *Id.*

¹⁵³ See CANADIAN VOIP REGULATORY DECISION, *supra* note 97, 105–07.

¹⁵⁴ *In re Inquiry Concerning High-Speed Access to the Internet over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking*, 17 F.C.C.R. 4798, ¶ 38 (Mar. 15, 2002), *aff’d sub nom.*, Nat’l Cable & Telecomms. Ass’n v. Brand X Internet Servs., 125 S. Ct. 2688, 2711, 162 L.Ed.2d 820, 850 (2005) (holding that cable modem service is an interstate information service and not a cable service and seeking comment on the proper scope of regulations recognizing the objective of promoting investment and innovation and access to advanced technology by all Americans).

¹⁵⁵ *In re Appropriate Framework for Broadband Access to the Internet over Wireline*

agency, Regulierungsbehörde für Telekommunikation und Post (“RegTP”), announced in November 2005 that it would exempt a broadband network planned by Deutsche Telekom (“DT”) from regulation for two to three years.¹⁵⁶ This action may have set a precedent for treatment of incumbents’ new IP networks in other recently liberalized telecommunications markets in Europe. However, under pressure from the EU, RegTP has since backtracked by announcing that it will indeed subject DT’s proposed new broadband network to a level of regulation similar to that imposed on its existing network.¹⁵⁷ Thus, the extent to which there exists a trend to exempt incumbent IP networks from economic regulation remains unclear.

B. Enterprise VoIP Services

Voice and data networks—WANs and LANs—composed of closed user groups have generally been free of most types of regulation in the United States, the EU, and other countries with developed telecommunications infrastructures.¹⁵⁸ The telecommunications services and facilities purchased by an enterprise to create a WAN or LAN are subject to regulation in almost all countries, however, and the operators of enterprise networks generally pay the same fees and taxes as other end-user customers of public telecommunications services.¹⁵⁹ There is no reason to think that this state of affairs will change as enterprises migrate en masse to IP-enabled networks and VoIP services. In fact, the United States and the EU have already reached this conclusion.

Facilities; Universal Service Obligations of Broadband Providers; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings, *Report and Order and Further Notice of Rulemaking*, 20 F.C.C.R. 14,853, ¶¶ 12–17 (Aug. 5, 2005). The Order established a new regulatory framework for broadband Internet access services offered by wireline facilities-based providers, and in doing so, found that wireline facilities-based Internet access providers are “information services” for the purpose of regulatory obligations. The FCC also adopted four principles in an adjacent policy statement to encourage development of broadband and promote the interconnected nature of the Internet. These principles state that consumers are entitled to view all lawful Internet content, to connect to their preferred legal device, to use all services and applications, and to competition among various providers. *Id.*

¹⁵⁶ Gerrit Wiesmann, *DTelekom Network to Be Free of Regulation*, FIN. TIMES (London), Nov. 13, 2005, at 26.

¹⁵⁷ See Sarah Leitner & Gerrit Wiesmann, *Brussels, Bonn End VDSL Dispute*, FIN. TIMES (London), Dec. 15, 2005, at 6.

¹⁵⁸ See IP VOICE ANALYSIS REPORT, *supra* note 87, at ii–iii.

¹⁵⁹ The enterprise purchase services, like WANs, are not considered public networks in the United States or the EU, therefore, like WANs and LANs, the private enterprise services should not be subject to regulation. See 47 U.S.C. § 397(7) (2000).

C. PSTN Replacement VoIP Services

PSTN replacement VoIP services such as Vonage will probably not be subject to economic regulation in most countries because the services do not have market power. Therefore, the imposition of economic regulation cannot be justified under antitrust or government monopoly rationales. As long as the PSTN exists in its current form, economic regulation also cannot be justified under the guise of the network's importance to society as a whole. Nonetheless, the incumbents will seek imposition of as many requirements as possible in order to raise their rivals' costs and slow their own loss of voice revenues.¹⁶⁰ The voice incumbents in most countries lack the political prowess to persuade regulators to impose economic regulation on VoIP providers when faced with the lack of policy justification for such regulation. There are exceptions to this rule, however. A number of countries have chosen to equate VoIP service to regular voice service and imposed similar regulations on both, and in doing so have sidestepped the justification issue.¹⁶¹ Moreover, as more traffic transitions to non-PSTN networks, the "national importance" rationale may acquire more force in certain countries.

Even where economic regulation cannot be justified, PSTN replacement VoIP services will be subjected to most of the social obligations imposed on the PSTN. In the United States, these obligations will probably include existing fees and taxes, such as the Universal Service Fund ("USF") and E911.¹⁶² The FCC recently decided that facilities-based, PSTN-interconnected VoIP providers will also be subjected to another social obligation, the Communications Assistance for Law Enforcement Act ("CALEA") wiretapping duties.¹⁶³ The Federal Bureau of Investigation and the U.S. Department of Justice are seeking to expand those duties to include non-facilities-based providers.¹⁶⁴ Some states

¹⁶⁰ See generally Thomas Krattenmaker & Steven Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price*, 96 YALE L.J. 209, 223–53 (1986).

¹⁶¹ Italy is one example of a nation that imposes the same requirements on VoIP providers as they do on traditional voice services. See ITALIAN VOIP PUBLIC CONSULTATION, *supra* note 95. Similarly, Israel has announced new regulations that require VOIP providers to obtain the same license and pay the same access fees as traditional voice service providers. See Mark Hachman, *Israel Puts Brakes on International VoIP Calls*, EXTREME VOIP, Dec. 1, 2005, http://www.extremevoip.com/print_article/Israel+Puts+Brakes+on+International+VOIP+Calls/166528.aspx.

¹⁶² See IP-Enabled Services NPRM, *supra* note 85.

¹⁶³ *In re Communications Assistance for Law Enforcement Act and Broadband Access and Services, First Report and Order and Further Notice of Proposed Rulemaking*, 20 F.C.C.R. 14,989, ¶¶ 1–3, 4, 35 (Aug. 5, 2005) [hereinafter CALEA Broadband Order] (requiring telecommunications carriers that provide wireline facilities-based broadband service to develop and utilize equipment and services that are conducive to the electronic surveillance instruments used by law enforcement).

¹⁶⁴ See *In re Communications Assistance for Law Enforcement Act and Broadband Ac-*

may also seek to impose their own regulatory requirements involving such social obligations. For example, a proposed Pennsylvania bill would require VoIP providers that are interconnected with the PSTN “to charge a \$1 monthly E-911 surcharge per-subscriber phone number.”¹⁶⁵

Other countries are beginning to consider whether and how to impose similar social obligations on PSTN replacement VoIP services.¹⁶⁶ In fact, Canada has asked telecommunications carriers, including VoIP providers, to build wiretapping capability into their networks, allowing surveillance of e-mail and IP phone calls of more than 8000 people at a time.¹⁶⁷ The EU promulgated a directive that covers all voice and data service providers, including VoIP providers, and requires all telephone and Internet traffic to be logged and stored for between six months and two years in order to help combat organized crime and terrorism.¹⁶⁸ Other social obligations will undoubtedly develop in other countries.

D. P2P VoIP

True P2P VoIP providers like Pulver.com and the Skype clones will escape regulatory burdens nearly everywhere.¹⁶⁹ In large part this is because in the great majority of countries there will be no entity or infrastructure over which the national power can be exercised. Regulators’ impulse to regulate will be further tempered by the realization that the true P2P providers have no revenue stream to tax or divert. As a result, P2P providers will not be subject to economic regulation and few, if any, of the PSTN social requirements can or will be imposed on them. They will not have to pay traditional taxes or fees, or provide 911-type services. Other countries’ national security agencies will no doubt wish to impose CALEA-like wiretapping obligations on P2P networks, but there is no obvious way to enforce such a requirement because the software provider can simply operate outside the jurisdiction of any country that attempts to impose such regulation.

cess and Services, *Comments of the U.S. Department of Justice*, ET Docket No. 04-295, at 9–10 (Nov. 14, 2005) (accessible via FCC Electronic Comment Filing System).

¹⁶⁵ *Pa. Eyes E-911 Surcharge For VoIP Bills*, TELECOM A.M., Oct. 20, 2005.

¹⁶⁶ *See, e.g., ITALIAN VOIP PUBLIC CONSULTATION*, *supra* note 95; *see also* discussion *supra* Part V (explaining the Italian VoIP wiretapping example).

¹⁶⁷ *Canada Orders VoIP Providers to Issue 911 Warnings*, TELECOM A.M., Oct. 14, 2005.

¹⁶⁸ Lisa Vaas, *EU Passes Contentious Data-Retention Law*, EWEEK.COM, Dec. 19, 2005, <http://www.eweek.com/article2/0,1895,1903618,00.asp>.

¹⁶⁹ The EU is currently evaluating whether the services fall under current regulations. It released a consultation paper discussing the issue. *See* EU VOIP WORKING PAPER, *supra* note 13, § 3(1).

E. P2P Community Providers

The most difficult VoIP category for regulators to address will be P2PC services. P2PC voice services will be both a battleground and the key catalyst for future regulatory developments. The reason is that P2PC traffic displaces calls that would otherwise have been made on the PSTN—and thus is effectively a PSTN replacement technology—but the service is not necessarily interconnected with the PSTN.¹⁷⁰ P2PC networks are analytically most similar to the closed user group or corporate networks that are essentially exempt from regulation in most jurisdictions.¹⁷¹ The difference is that participation in the latter networks is generally at the election of the enterprise, while P2PC groups are self-selecting or self-organizing networks.

As with PSTN-replacement, like VoIP services such as Vonage, the imposition of economic regulation on P2PC providers cannot be justified under either an antitrust rationale or because of the network's importance to society as a whole.¹⁷² Nonetheless, it is likely that attempts will be made to do so. However, attempts may not succeed because voice incumbents in most countries do not have enough political strength to prevail against the lack of policy justification for such economic regulation.

Therefore, incumbents and regulators considering direct regulation of P2PC providers will probably focus on social issues. As with PSTN replacement services, the incumbents will seek to impose as many requirements as possible, in order to raise their rivals' costs and slow their own loss of voice revenues. While it is not likely that E911 obligations could be imposed on P2PC providers, there are other possibilities for regulation. For example, in the United States, the FCC could choose to broaden its USF funding base by including P2PC providers. Another example is the FCC's recent notice seeking comment on whether non-interconnected VoIP services should be subject to law enforcement wiretaps as in the CALEA obligation recently imposed on facilities-based providers.¹⁷³ Imposing such a requirement will have a large financial impact on P2PC service providers.¹⁷⁴ Such government mandates could also

¹⁷⁰ In fact, the adoption of ENUM technology will reinforce the ability of P2PC providers to siphon off PSTN traffic without ever touching the PSTN. See discussion *infra* Part VII.C.

¹⁷¹ In the EU, for example, such closed user networks are subject only to an authorization requirement. See EU VOIP WORKING PAPER, *supra* note 13, § 3(2).

¹⁷² See discussion *supra* Part VI.C.

¹⁷³ See CALEA Broadband Order, *supra* note 163, ¶¶ 48–49 (inquiring whether other types of “managed” VoIP service, not included in the definition of interconnected VoIP, should be subject to CALEA and whether there should be an exemption from CALEA for small and rural broadband providers or educational and research institutions).

¹⁷⁴ Obviously, a large P2PC provider such as eBay would be better able to absorb such costs than a small PSTN replacement VoIP provider. Therefore, a large provider is less likely to exit the market because of such increased costs.

stifle the creation of new VoIP technologies, since developers may be required to build surveillance capabilities into new communication technologies from the very start.¹⁷⁵

VII. INDIRECT REGULATION AFFECTING VOIP IN THE FUTURE

Direct regulation of P2PC is not the key issue for the development of VoIP services. The options open to incumbents and regulators seeking to impose obligations on P2PC providers are limited because of the separation of the transmission facilities and services. Until recently, the two were technologically tied; only those who owned a voice network, or who were resellers or capacity lessors and purchasers, could offer voice services.¹⁷⁶ Now that applications and facilities have been separated, a voice service provider no longer needs to control a voice network.¹⁷⁷

As a result, the question of what type and level of regulation will be applied to the rest of the communications service marketplace is now crucial. The shape and the speed of the long-term growth of VoIP, particularly P2PC VoIP, will largely be determined by the rules that apply to the physical networks on which it rides.

There are four key issues that will define what P2PC, and other VoIP flavors, look like in the future: network interconnection; network neutrality; control of customer contact through ENUM or other mechanisms; and Internet governance. Two of these issues have been widely debated for years. The other two may come as something of a surprise.

A. Network Interconnection

The first issue regards the scope of network interconnection. Without interconnection and interoperability of the underlying physical networks, competitive VoIP services can be balkanized and non-incumbent VoIP services will grow much more slowly.¹⁷⁸

¹⁷⁵ *In re Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, Ex Parte Filing of Timothy Wu and Lawrence Lessig*, CS Docket No. 02-52, at 12–15 (June 17, 2002) [hereinafter Wu and Lessig Ex Parte Filing] (accessible via FCC Electronic Comment Filing System). See generally Timothy Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141 (2003) (discussing the likely effects on innovation).

¹⁷⁶ See HUBER ET AL., *supra* note 1, at 1072–73.

¹⁷⁷ Levin, *supra* note 37, at 3–4; Ward, *supra* note 37, at 56.

¹⁷⁸ This is, of course, what happened when AT&T declined to interconnect other carriers with each other or with itself, and thereby created a monopoly over much of the U.S. market. See HUBER ET AL., *supra* note 1, at 212–14.

While the economic and strategic importance of interconnection cannot be overstated, a full discussion of the issue is well beyond the scope of this Article. It is now a generally recognized truism that the value of a network increases with the number of users on it.¹⁷⁹ Interoperability and interconnection expand the number of users on interconnected networks through the sharing of network effects.¹⁸⁰

The initial question is whether there is a business imperative for network owners to interconnect and interoperate in a particular country.¹⁸¹ If there are multiple broadband local access networks available, interconnection will almost certainly result from business pressures. Each network owner, recognizing that it cannot capture the entire market, will have an incentive to interoperate in order to increase the value of its network to itself and its subscribers. Where there are only one or two providers of local broadband access, however, experience suggests that the economic pressure to interconnect may not be sufficient.¹⁸² Providers may still believe that they can capture or keep the entire market by refusing to interconnect, thereby sacrificing additional short-term revenue for long-term strategic gain.¹⁸³ The refusal to interconnect was, of course, the fundamental strategic maneuver permitting the Bell System to obtain its near monopoly status in the United States.¹⁸⁴ The Bell System's success was noted and emulated by telecommunications providers in other countries and industries.¹⁸⁵

If there is no business imperative to interconnect, the development of alternative regulatory mechanisms to force interconnection may well be necessary.¹⁸⁶ This will involve the regulator imposing a duty on the part of some or

¹⁷⁹ CARL SHAPIRO & HAL R. VARIAN, *INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORKED ECONOMY* 183–84 (1999) [hereinafter *INFORMATION RULES*].

¹⁸⁰ See generally Joseph Farrell & Garth Saloner, *Standardization, Compatibility, and Innovation*, 16 *RAND. J. ECON.* 70 (1985) (examining standardization of different firm models); Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 *AM. ECON. REV.* 424 (1985) (discussing the development of an oligopoly model to analyze network effects).

¹⁸¹ For a discussion of network industries where mandated interconnection did not prove necessary in the United States, see RICHARD O. LEVINE & RANDOLPH J. MAY, *PROGRESS & FREEDOM FOUND., INTERCONNECTION WITHOUT REGULATION: LESSONS FOR TELECOMMUNICATIONS REFORM FROM FOUR NETWORK INDUSTRIES* (2005), <http://www.pff.org/issues-pubs/communications/books/051018Interconnection.pdf>.

¹⁸² *INFORMATION RULES*, *supra* note 179, 244–55.

¹⁸³ *Id.* at 186–88, 250–51; see also Michael L. Katz & Carl Shapiro, *System Competition and Network Effects*, 8 *J. ECON. PERSP.* 93, 105–07 (1994) (explaining the risks exclusivity presents to network industries); Carl Shapiro, *Exclusivity in Network Industries*, 7 *GEO. MASSON L. REV.* 673, 674–75 (1999).

¹⁸⁴ HUBER ET AL., *supra* note 1, at 11–12; *INFORMATION RULES*, *supra* note 179, 212–14.

¹⁸⁵ See HUBER ET AL., *supra* note 1, at 10–11.

¹⁸⁶ See LEVINE & MAY, *supra* note 181, at 1–22 (discussing regulatory-free interconnection polices adopted by various network industries).

all facilities-based networks to interconnect and exchange communications traffic. The general scope of such a duty is set out in the Regulatory Frameworks Reference Paper annexed to the Agreement on Basic Telecommunications (the Fourth Protocol to the 1994 General Agreement on Trade in Services).¹⁸⁷ The Reference Paper, which has been adopted by most of the important telecommunications providing and consuming countries except China, establishes a fundamental right to interconnection for basic telecommunications services.¹⁸⁸ The right is limited in scope, however: it only applies to interconnection with “major suppliers . . . providing public telecommunications transport networks or services in order to allow the users of one supplier to communicate with users of another supplier. . . .”¹⁸⁹ The term “supplier” is not defined in the Reference Paper, but a “major supplier” is defined as “a supplier which has the ability to materially affect the terms of participation (having regard to price and supply) in the relevant market for basic telecommunications services as a result of: (a) control over essential facilities; or (b) use of its position in the market.”¹⁹⁰

Among those countries that have begun to address the issue, the developing consensus seems to be that only providers of basic telecommunications services have a right to mandated interconnection. In the United States, for example, the FCC has broad power to order interconnection for “common carriers” under 47 U.S.C. § 201(a), but a statutory interconnection right applies only to providers of “telecommunications services.”¹⁹¹ Providers of “information services,” including VoIP providers, have no automatic right under U.S. law to interconnect their networks, and thus to offer services, with the PSTN.¹⁹² The EU has reached a similar, but even more limited, conclusion: its Access Directive applies only to providers of electronic communications services that have “significant market power.”¹⁹³

A related question that will affect development of competitive VoIP services is the determination of the physical, technical, and economic terms of interconnection. These terms are, in most cases, equally as important as the basic right of interconnection. The Reference Paper only offers limited guidance by

¹⁸⁷ ABT Reference Paper, *supra* note 9.

¹⁸⁸ GUERMAZI, *supra* note 11, at 5–8, 17–20.

¹⁸⁹ ABT Reference Paper, *supra* note 9, § 2.1.

¹⁹⁰ *Id.*

¹⁹¹ 47 U.S.C. §§ 153(43), 251(a) (2000).

¹⁹² *Id.* § 251(a). Because of this statutory limitation, many U.S. VoIP providers are wrestling with the problem of how to ensure their interconnection rights. See generally Edie Herman, *Telecom Act Generally Worked, Policymakers Say*, COMM. DAILY, Feb. 7, 2006, at 5.

¹⁹³ Council Directive 2002/19, 2002 O.J. (L 108) 7 (EC), http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_108/l_10820020424en00070020.pdf (addressing access to and interconnection of electronic communications networks and associated facilities).

providing that “[i]nterconnection with a major supplier will be ensured at any technically feasible point in the network.”¹⁹⁴ How this provision is interpreted by national regulators will have a strong effect on the development of competitive VoIP services. The more difficult and expensive it is for competitors to connect, the more costs will be imposed not only on them, but on the VoIP service providers that use their networks.

B. Network Neutrality

The determination of the technical and economic terms of interconnection—the terms on which traffic that originates on one network can transmit or terminate on another network or networks—is the heart of the net neutrality or open access issue. At the bottom, the network neutrality issue is simply a more vertical and granular application of the disputes that have always been inherent in the second part of the interconnection question: who determines the technical and economic terms of interconnection?¹⁹⁵ Originally, interconnection disputes focused on the physical interconnection of separate voice networks.¹⁹⁶ In that paradigm, once a circuit was established, the treatment of a voice call was the same, whether it crossed networks or originated and terminated on the same network.¹⁹⁷ Discrimination, if it were to occur, would generally be at the network interface level.¹⁹⁸ Technology has changed this equation, opening many possibilities for discrimination and blocking at levels much more granular than an entire network.¹⁹⁹ This means that an interconnection right by itself is no longer sufficient to guarantee the sharing of network effects that offers the greatest benefit for society.

As with interconnection, the first question is whether there is a business imperative for net neutrality. The answer is in flux and seems to depend on the service provider. The proponents of network neutrality argue that it will be the optimal outcome for growth of the Internet and innovation throughout the

¹⁹⁴ ABT Framework Reference Paper, *supra* note 9, § 2.2.

¹⁹⁵ See James B. Speta, *A Common Carrier Approach to Internet Interconnection*, 54 FED. COMM. L.J. 225, 229 (2002) (discussing Internet backbone peering disputes, the open access debate, the IM interoperability debate, and the debate concerning compensation for Internet bound telephone calls as interconnection debates).

¹⁹⁶ HUBER ET AL., *supra* note 1, at 8–18.

¹⁹⁷ *Id.*

¹⁹⁸ See Mark Cooper, *Open Access to the Broadband Internet: Technical and Economic Discrimination in Closed Proprietary Networks*, 71 U. COLO. L. REV. 1011, 1013 (2000).

¹⁹⁹ See, e.g., *In re SBC Communications Inc. and AT&T Corp. Applications for Approval of Transfer of Control, EarthLink Ex Parte Filing*, WC Docket No. 05-65 (Aug. 26, 2005) [hereinafter *Earthlink Ex Parte Filing*] (accessible via FCC Electronic Comment Filing System).

economy, thus providing the greatest benefits for society as a whole.²⁰⁰ A strong contrary argument can be made that imposition of network neutrality mandates will have the opposite effect, impeding innovation and investment in the buildout of broadband networks.²⁰¹ Vertically integrated firms—often incumbents—are tempted to block or degrade the performance of competitors' communications or applications over their networks. This behavior is widespread. For example, in 2005, China Telecom announced that it intended to block Skype VoIP calls because of their effect on voice revenues.²⁰² In September 2005, the company began blocking Skype's VoIP service in Shenzhen, with plans to do so throughout the country.²⁰³ Similarly, Vodafone Inc. ("Vodafone") recently announced a plan to block VoIP calls over its 3G wireless network in Germany.²⁰⁴

The United States is hardly immune to the phenomenon. For example, the subscriber agreement for Verizon Communications Inc. ("Verizon") Wireless' Broadband Access service prohibits customers from using a VoIP application over the network.²⁰⁵ The desire to block VoIP applications is not limited to incumbents. Clearwire, Inc. ("Clearwire"), the new broadband wireless startup backed by Craig McCaw, has announced that it intends to limit certain types of VoIP on its network, supposedly to prevent network engineering problems.²⁰⁶ The wireless carrier SFR has announced a similar plan for its French network.²⁰⁷

Depending on how net neutrality is defined, it can be argued that there are widespread violations of the principle. Vertically integrated incumbents are expanding their tactics from the shotgun approach of blocking, to a more nuanced approach. In the United States particularly, incumbents are looking to increase their broadband revenue streams not by blocking, but by discrimina-

²⁰⁰ See generally Wu, *supra* note 175; Wu and Lessig Ex Parte Filing, *supra* note 175.

²⁰¹ See, e.g., CHRISTOPHER S. YOO, PROGRESS & FREEDOM FOUND., THE ECONOMICS OF NET NEUTRALITY: WHY THE PHYSICAL LAYER OF THE INTERNET SHOULD NOT BE REGULATED (2004), <http://www.pff.org/issues-pubs/pops/pop11.11yoonetneutrality.pdf>.

²⁰² *China Telecom Seeks to Block VoIP*, MSNBC.COM, Sept. 12, 2005, <http://www.msnbc.msn.com/id/9311134>.

²⁰³ This approach is facilitated where the application uses well-known connection parameters (or ports) for its services, as Vonage does. Mure Dickie, *Chinese Telecoms Operator Blocks Skype Web Phone Service*, FIN. TIMES (London), Sept. 10, 2005, at 7.

²⁰⁴ Gary Kim, *Vodafone Blocks VoIP*, VOIP BUS. WKLY., Nov. 7, 2005, http://www.voipweekly.com/news_detail.php?news_id=162.

²⁰⁵ Peter Grant, *Phone, Cable Firms to Rein in Consumers' Internet Use*, WALL ST. J., Oct. 21, 2005, at A1; Dionne Searcey, *Phone Companies Set Off a Battle over Internet Fees*, WALL ST. J., Jan. 6, 2006, at 1.

²⁰⁶ Paul Kapustka, *Clearwire May Block VoIP Competitors*, NETWORKING PIPELINE, Mar. 25, 2005, <http://www.networkingpipeline.com/showArticle.jhtml?articleID=159905772>.

²⁰⁷ Steven Cherry, *The VoIP Backlash*, IEEE SPECTRUM, Oct. 2005, at 61, available at <http://www.spectrum.ieee.org/print/1846>.

tion, charging more for faster download speeds or for certain types of traffic sent by unaffiliated parties.²⁰⁸ This approach is greatly facilitated by new filtering and “deep packet inspection” network-management tools that allow service providers to determine the types of traffic flowing across their networks.²⁰⁹ With these tools, network operators can offer improved speeds—and, conversely, to block or degrade the service—for specific types of traffic.²¹⁰ It is not just Skype, Vonage, and other VoIP providers that are at risk. Most international telephone calling cards also use VoIP technology and could be subject to this type of blocking or discrimination.²¹¹ In addition, incumbents, at least in the United States, have made clear that they view other providers of other applications services that compete with their own products and services, such as Microsoft Corp. (“Microsoft”) and eBay, as targets for similar discrimination.²¹²

There are a variety of principles designed to address and minimize the impact of the network neutrality issue.²¹³ One of the few regulatory agency pronouncements on the issue came in August 2005, when the FCC adopted a policy statement outlining four principles that were designed “to encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet.” The four principles are:

- (1) consumers are entitled to access the lawful Internet content of their choice; (2) consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement; (3) consumers are entitled to connect their choice of legal devices that do not harm the network; and (4) consumers are entitled to competition among network providers, application and service providers, and content providers.²¹⁴

The Commission refrained from adopting these policies as rules, although it stated that it “will incorporate these principles into its ongoing policymaking

²⁰⁸ See *At SBC, It's All About "Scale and Scope"*, BUS. WK., Nov. 7, 2005, http://www.businessweek.com/magazine/content/05_45/b3958092.htm; Jonathan Krim, *Executive Wants to Charge for Web Speed: Some Say Small Firms Could Be Shut Out of Market Championed by BellSouth Officer*, WASH. POST, Dec. 1, 2005, at D5; *QOS Fees Could Change Everything*, LIGHT READING, Jan. 12, 2006, http://www.lightreading.com/document.asp?doc_id=86495.

²⁰⁹ Earthlink Ex Parte Filing, *supra* note 199, ¶ 5.

²¹⁰ *Id.* at 1–2, 4; see also *In re SBC Communications Inc. and AT&T Corp. Application of Transfer of Control, Memorandum Opinion and Order*, 20 F.C.C.R. 18,290 (Nov. 17, 2005) [hereinafter *SBC/AT&T Merger Approval Order*], (discussing the merged companies' ability to selectively discriminate content carried on their networks).

²¹¹ Cherry, *supra* note 207.

²¹² See, e.g., Jeff Smith, *Qwest Watches as Others Weigh Fee for Faster Internet Services*, DENVER ROCKY MOUNTAIN NEWS, Jan. 9, 2006, at 6B.

²¹³ See Wu, *supra* note 175, at 165–71.

²¹⁴ Press Release, Fed. Comm'n's Comm'n, FCC Adopts Policy Statement: New Principles Preserve and Promote the Open and Interconnected Nature of Public Internet (Aug. 5, 2005), <http://www.fcc.gov/meetings/080505/policy.pdf>.

activities.”²¹⁵ In what may be a loophole that swallows the principles, the Commission also warned that “[a]ll of these principles are subject to reasonable network management.”²¹⁶ The FCC’s four policy points appear to mirror the suggestions of a number of commenters in ongoing FCC proceedings. For example, Professors Timothy Wu and Lawrence Lessig have proposed a network neutrality regime that would prohibit last-mile broadband providers from imposing any restrictions on end users’ ability to run applications (including VoIP), attach devices, and access the content of their own choosing.²¹⁷ The High Tech Broadband Coalition (“HTBC”) has advanced a similar proposal that would impose a series of “connectivity principles” on all last-mile broadband providers.²¹⁸ The HTBC proposal would require that all last-mile broadband providers give end users unrestricted access to all content and allow them to run any applications and attach any devices they desire, so long as these efforts do not harm the providers’ network, enable theft of services, or exceed the bandwidth limitations of the particular service plan.²¹⁹

The FCC subsequently imposed net neutrality guidelines as conditions for the approval of mergers proposed by two of the four remaining regional Bell operating companies SBC Communications Inc. (“SBC”) and Verizon, with AT&T and MCI, Inc. (“MCI”), respectively.²²⁰ However, those restrictions are temporary, expiring two years from each merger’s closing date, between December 2007 and January 2008.²²¹

All of these approaches consider the net neutrality problem only from the perspective of the consumer or end user. Therefore, the proposals do not address the potential problems of technical or economic discrimination that impose costs on rivals of the vertically integrated incumbents. Whether this is a crucial flaw or whether consumer-focused principles are adequate to maximize the benefits and minimize the costs is an open question.

²¹⁵ *Id.*

²¹⁶ *Id.*

²¹⁷ Wu and Lessig Ex Parte Filing, *supra* note 175, at 12–16. Restrictions are necessary to comply with a legal duty, prevent physical harm to the network, prevent interference with other users’ connections, ensure quality of service, or prevent security violations. *Id.*

²¹⁸ *In re* Appropriate Regulatory Treatment for Broadband Access to the Internet over Cable Facilities, *Comments of the High Tech Broadband Coalition*, CC Docket No. 02-52, at 6–9 (June 17, 2002) (accessible via FCC Electronic Comment Filing System).

²¹⁹ *In re* Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control, *Memorandum Opinion and Order*, 20 F.C.C.R. 18,433, ¶ 130 (Nov. 17, 2005); *see also* SBC/AT&T Merger Approval Order, *supra* note 210, at app. F.

²²⁰ SBC/AT&T Merger Approval Order, *supra* note 210, at app. F.

²²¹ *See* sources cited *supra* note 219.

C. Control of Customer Contact Through ENUM or Other Mechanisms

The third issue of indirect regulation has received less attention, but it may end up being as important as either of the first two. It is the issue of control of the database or databases that facilitate contact among the members of a network or group of networks. Consumers may contact people or businesses in a variety of ways: by dialing their PSTN phone number, by typing their e-mail address in an e-mail program, or by clicking on their instant messaging name. Each of these identifiers is connected through a database—the PSTN numbering system, the domain name registry, and the IM presence database. These databases are each controlled by a different entity.

In the future, all of these may be unified through ENUM. ENUM employs a system for routing that is similar to the domain name system used for Web addresses.²²² It can allocate a single identifier, consisting of both letters and numbers, that can then be used for multiple IP services, such as VoIP, e-mail, and instant messaging. In an ENUM environment, if you enter a PSTN phone number into your cellphone or an e-mail address into your computer, the ENUM software can map that number or e-mail address to the ENUM identifier and deliver information about all the possible ways to contact the owner of that number or e-mail address. The caller can then choose one of those connections and be charged appropriately.

The beauty, and the threat, of ENUM is that it minimizes the importance of a PSTN phone number by making it simply one option to be used in contacting a party. It allows that phone number to be used to route a call, e-mail, or instant message on a network other than the PSTN. When combined with relatively simple least cost routing software, ENUM implementation that is not controlled by incumbents will inevitably hasten the ongoing decline of PSTN revenues, particularly the incumbents' above cost charges for termination of voice calls. As of early 2006, ENUM implementation is in a state of uncertainty. There is neither an international nor national requirement that it be adopted. The ITU, which developed and controls the standard, is in no hurry to create a centralized ENUM directory.²²³ This is not surprising, since the ITU is

²²² ENUM is an IETF standard (RFC3761) finalized in April 2004 that allows an end user to type a telephone number into a web browser and to access a listing of Internet resources ("URI") for that number, such as addresses for IP telephony, e-mail, or Web sites. ENUM works by reversing a phone number's digits, putting a dot between each digit, and adding the string ".e164.arpa" to the end. For example, the telephone number +202-416-3000 becomes 0.0.0.3.6.1.4.2.0.2.e164.arpa. See also Richard Stastny & Hans Wallner, *ENUM—The Bridge Between Telephony and Internet*, EURESCom, http://www.eurescom.de/message/messageSep2004/ENUM_The_bridge_between_telephony_and_Internet.asp (explaining how to arrange an e164 number into a format compatible with ENUM).

²²³ See generally *ENUM Heads for Primetime*, LIGHT READING, Mar. 30, 2005,

focused on protecting incumbents and the existing voice market. At least twenty-four countries have been delegated country codes for ENUM and about a dozen have started public trials.²²⁴ The United States is expected to begin trials in the first half of 2006.²²⁵

There is no consensus on what form of ENUM should be adopted. Several flavors of ENUM are being considered or tested. There is public ENUM which functions as an open database on the Internet. This implementation maps a single telephone number to multiple user services and in most cases bypasses the PSTN entirely.²²⁶ Public ENUM has the best potential to offer converged services, but it also raises the strongest concerns over privacy and faces the greatest resistance from existing voice providers.²²⁷ Another option is private ENUM, which is a database inside a carrier's network that allows it to control how its subscribers' calls are connected.²²⁸ Wireless service providers in the United States already use private ENUM to allow users to send pictures from their cellphones to customers on other mobile networks.²²⁹ There is also a middle ground called carrier ENUM, which allows VoIP providers to look up the destination number on another IP network directly and bypass the PSTN.²³⁰

http://www.lightreading.com/document.asp?site=lightreading&doc_id=70976.

²²⁴ See generally Austrian ENUM Trial Website, <http://www.enum.nic.at> (discussing ENUM and its implementation) (last visited Jan. 29, 2006); ENUM Forum, <http://www.enumf.org> (last visited Feb. 17, 2006); The Web Resource on ENUM Issues in Canada, <http://www.enumorg.ca> (last visited Jan. 29, 2006).

²²⁵ Public ENUM is more commonly known as User ENUM, however the former gives a better description of its functions. See EUROPEAN TELECOMM. STANDARDS INST., TELECOMMUNICATIONS AND INTERNET CONVERGED SERVICES AND PROTOCOLS FOR ADVANCED NETWORKING (TISPAN); ENUM SCENARIOS FOR USER AND INFRASTRUCTURE ENUM 10 (2005) [hereinafter ENUM SCENARIOS FOR USER AND INFRASTRUCTURE ENUM] (describing User ENUM the public e164.arpa space defined in the Internet Engineering Task Force memorandum *supra* note 222); Stastny & Wallner, *supra* note 222; see also CTR. FOR DEMOCRACY & TECH., ENUM: MAPPING TELEPHONE NUMBERS ONTO THE INTERNET 8–9 (2003) [hereinafter ENUM: MAPPING] (describing how both individuals and corporations will use ENUM to bypass the PSTN).

²²⁶ Private ENUM is commonly known as Infrastructure ENUM. See Stastny & Wallner, *supra* note 222; ENUM: MAPPING, *supra* note 225, at 9 (discussing how the practice of telephone company's internal routing of calls is similar to an individual bypassing the PSTN); ENUM SCENARIOS FOR USER AND INFRASTRUCTURE ENUM, *supra* note 225, at 11–12 (discussing different types of Infrastructure ENUM).

²²⁷ See, e.g., Renai LeMay, *Telcos Ignore ENUM Trials*, VOIP BUS. WKLY., Oct. 11, 2005, http://www.zdnet.com.au/news/communications/soa/Telcos_ignore_ENUM_trials/0,2000061791,39216506,00.htm.

²²⁸ See generally Richard Grigonis, *Enum A Great Idea But . . .*, VON MAG., July 2005, <http://www.vonmag.com/issue/2005/jul/features/enum.asp>.

²²⁹ See Gary Kim, *Enterprise ENUM Could Be a Shocker*, VOIP BUS. WKLY., Jan. 29, 2006, http://www.voipweekly.com/features.php?feature_id=94.

²³⁰ See Susana Schwartz, *Standards Watch: Can Carrier ENUM Solve IP Interconnect Problems?*, BILLING WORLD & OSS TODAY, July 2005,

VoIP providers have begun rolling out their own carrier ENUM exchanges without waiting for national or international regulatory action. For example, Stealth Communications (“Stealth”) operates what it calls a “VoIP Peering Fabric” or VPF.²³¹ This is essentially a VoIP peering cooperative. Stealth has a database of millions of phone numbers that can connect to each other through the VPF without ever touching the PSTN. This creates a “private VoIP Internet” where the IP voice traffic can be exchanged. When a local customer places a call, his or her local telephone provider sends a query to the Stealth ENUM database looking for the number the user has dialed. If the number is found, routing instructions are sent to the router nearest the caller, which routes the call through the VPF to the carrier to which the called number is subscribed.²³²

The VPF system cuts out the traditional telephone providers, who made billions of dollars a year collecting termination fees from Competitive Local Exchange Carriers (“CLECs”). Similar user or competitor confederations could erode those revenues even more quickly. Large business or enterprise users of the PSTN can relatively easily implement a similar exchange or could use existing carrier exchanges such as the VPF. It is estimated that by doing so they could keep as much as 60% of their calls off the PSTN.²³³ The U.S. cable industry standards body, Cable Television Laboratories, Inc. (“CableLabs”), recently announced a request for information (“RFI”) for a similar peering technology for cable broadband providers.²³⁴ Again, the goal of CableLabs is to bypass the PSTN entirely whenever possible, in order to avoid paying access charges to the telephone companies.

Similar peering arrangements that do not touch the PSTN are arising in other countries. For example, in 2005, two companies, e164.info and XConnect Global Networks, launched separate ENUM-based international peering networks of VoIP providers.²³⁵ In an arrangement that may be a harbinger of the future, the Japanese incumbent NTT Communications Inc. (“NTT”) and Soft-

<http://www.billingworld.com/archive-print.cfm?ArchiveId=7689>.

²³¹ See Sean M. Kerner, *VoIP Peering a Stealth Business*, ENTERPRISE VOIP PLANET, June 30, 2005, <http://www.voipplanet.com/solutions/article.php/3516826>.

²³² See The Voice Peering Fabric, <http://www.thevpf.com/?action=about> (last visited Jan. 29, 2006).

²³³ See Kim, *supra* note 229.

²³⁴ See CABLE TELEVISION LABS., INC., REQUEST FOR INFORMATION—CABLE LABS VOICE OVER IP (VoIP) PEERING PROJECT (2005), http://www.cablelabs.com/downloads/CableLabs_VoIP_Peering_RFI.pdf.

²³⁵ See E-164 The Carrier Enum Exchange, https://www.e164.info/documents/e164_info-executive-summary.pdf (last visited Mar. 25, 2006); Xconnect, <http://www.xconnect.net> (last visited Jan. 29, 2006); Nicole Willing, *ENUM Heads for Primetime*, LIGHT READING, Mar. 30, 2005, http://www.lightreading.com/document.asp?site=lightreading&doc_id=70976.

bank BB Corp. interconnected their VoIP networks in the fall of 2005 to do away with access charges and offer cheaper rates to their VoIP customers.²³⁶ The firms, Japan's two largest IP phone service providers, currently hold about 70% of the domestic Japanese IP phone market.²³⁷ The effect of the arrangement on NTT's PSTN voice revenues was immediate. Only time will tell whether this example of an incumbent cannibalizing a substantial portion of its PSTN voice revenues in one fell swoop will be repeated elsewhere. It does suggest, however, the seriousness with which NTT takes the VoIP threat.

The corrosive effect of ENUM implementation on landline voice revenues suggests that delaying its implementation will be a profitable strategy for traditional voice providers, incumbents and new competitors alike.²³⁸ Whether governments, whose financial interests are to some degree aligned with those of the traditional voice carriers, will create enough "fear, uncertainty and doubt" about the outcome of the ENUM implementation process to delay its effectiveness will no doubt vary from country to country.²³⁹

D. Internet Governance

The Article asserted earlier that regulation of VoIP will occur at the national level for the foreseeable future. There exists one wild card that could change this analysis. The battle over the scope and governance of the Internet Corporation for Assigned Names and Numbers ("ICANN") could greatly affect the future development of VoIP services. It is no secret that numerous governments have a strong interest in imposing content controls and other capabilities that facilitate discrimination on the Internet.²⁴⁰ If ICANN's governing structure

²³⁶ See *Kyodo Economic News Summary*, JAPAN ECON. NEWSWIRE, Sept. 28, 2005.

²³⁷ INFORMATION RULES, *supra* note 179, 275–76.

²³⁸ ICANN is a private-public partnership that oversees "the operational stability of the Internet; to promoting competition; to achieving broad representation of global Internet communities; and to developing policy appropriate to its mission through bottom-up, consensus-based processes." It also has oversight over the Internet domain name system. ICANN was initially

created through a Memorandum of Understanding (MoU) between the U.S. Department of Commerce and ICANN to transition management of the Domain Name System (DNS) from the U.S. government to the global community. The most recently issued version of the MoU . . . sets out a series of goals for ICANN that, when achieved, will result in a fully independent ICANN organization.

ICANN, Fact Sheet, <http://www.icann.org/general/fact-sheet.html> (last visited Feb. 21, 2006); *see also* World Summit on the Information Society, <http://www.itu.int/wsis> (last visited Jan. 29, 2006).

²³⁹ INFORMATION RULES, *supra* note 179, at 275–76.

²⁴⁰ A full discussion of this issue is well beyond the scope of this Article. For additional information, see Jo Twist, *Essential Test for UN Net Summit*, BBC NEWS, Nov. 19, 2005, <http://news.bbc.co.uk/1/hi/technology/4451950.stm> and World Summit on the Information Society, *supra* note 238.

is changed so that these governments have more influence on ICANN policy and the architecture of the Internet, this could be detrimental not just for VoIP providers, but for many application and content providers. The first skirmish in this battle was fought in December 2005 at the World Summit of the Information Society.²⁴¹ While the structure of Internet governance was not modified, it is clear that the battle to bring the Internet under closer multi-lateral control will continue into the foreseeable future.²⁴²

VIII. CONCLUSION

The ongoing decimation of the revenue stream from traditional voice services and the rise of VoIP technologies creates a unique economic and regulatory situation around the world. Most governments and traditional voice carriers recognize that they cannot affect or deflect the key drivers of the voice revenue decline, most of which are far beyond their control—particularly technological change and decreasing costs.

Many traditional carriers and some government participants have nonetheless been tempted to erect barriers to this revenue erosion where they can, and they see the “unfair” cost arbitrage of VoIP services as an easy target. Providers of VoIP services in many countries lack the financial resources and experience to fight these political and regulatory battles. Even where VoIP providers have the resources and expertise, the regulatory impulse can be hard to overcome. But given the financial stakes, the battles over VoIP regulation are likely to intensify over the next few years. The battles will not only occur between incumbent network operators and much smaller VoIP providers, but between the incumbents and all enterprises that use the networks to deliver a product or service. Providers of voice services, multi-player gaming, video content, adult educational services, or anything else that can be digitized will find their interests more or less aligned. One might say that the regulatory battles, like most wireless technologies used in the future, will be orthogonal. That is, pressure from many different vectors will ultimately determine the shape of network regulation.

These new regulatory battles will also be fought on Internet time, so that regulatory developments that formerly would have taken decades may take only months or a couple of years at most. For students of the regulatory process and users of advanced communications services, 2006 to 2010 will be a fascinating time.

²⁴¹ See World Summit on the Information Society, *supra* note 238.

²⁴² See, e.g., World Summit on the Information Society, Tunis Agenda for the Information Society, <http://www.itu.int/wsis/docs2/tunis/off/6rev1.html> (last visited Apr. 5, 2006).

