NOTE

AN APPROACH TO THE INTERNATIONAL REGULATORY ISSUES OF IP TELEPHONY

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I. INTRODUCTION

This note explores changes in Internet Protocol ("IP") telephony, analyzes current regulatory schemes in light of the technology, and suggests a possible international approach to regulation for the future. Part I beings with background information on plain old telephone service ("POTS") and IP telephony. It focuses especially on their technical aspects and provides some projections of IP telephony growth. Part II describes how nations regulate POTS on the international level and summarizes the current regulatory schemes (or lack thereof) in place for IP telephony. These regulations include charges for universal service funds and the international settlement accounting rate system. Universal service charges are used to subsidize providing telephone service to all people living in a country. The international settlement accounting rate system determines which nation's telephone companies pay how much money when an international call is made. Part III discusses and analyzes issues relating to the potential international regulation of IP telephony. Finally, Part IV concludes that while governments and industry currently believe increased competition and decreased regulation should be the overall goal of any regulatory structure, some regulation will likely be necessary if IP telephony grows as expected. This note offers an approach that the nations of the world could follow in establishing and implementing an international regulatory scheme, balancing the need for regulations with a focus on competition in the market.

II. IP TELEPHONY AND HOW IT DIFFERS FROM "POTS" (PLAIN OLD TELEPHONE SERVICE)

A. Internet Protocol Telephony and the Packet-Switched Network

IP telephony is a term that refers to a variety of services that involve the transmission of voice data over the Internet.[1] For purposes of this paper, "IP telephony" will encompass all services that transmit voice over a network using the Internet Protocol ("IP"). Such services are also commonly known as

[1] *See, e.g.*, Jesse Berst, *Story: Sorting Out Internet Telephony* (May 20, 1998), *at* http://www.zdnet.com/anchordesk/story/story_2113.html.

voice over IP ("VoIP")[2] or Voice on the Net ("VON").[3] Though both VoIP and VON encompass IP telephony, these terms often include other voice applications,[4] so the term IP telephony will be used throughout this Note.

In order to fully understand IP telephony, one must first have some knowledge of the data network known as the Internet. A complete and reputable definition of the Internet is an "international network of interconnected computers,"[5] or more simply a "network of networks."[6] Internet Service Providers ("ISP's") offer users a connection to the Internet using the local POTS system.[7] Most users connect to the Internet by having their computer place a phone call to their ISP, which completes a connection to the Internet. A user can then access available information by using any number of software applications.

A pertinent characteristic of the Internet and the source of current concern over IP telephony and regulation is that it is a packet-switched network.[8] Such a network transmits information in the form of a packet.[9] Each packet contains part of the user's information and data necessary for transmission.[10] The particulars of a packet's form depend on the type of transmission protocol a user's computer and the network use.[11] The transmission protocol used on the Internet is the Internet Protocol.[12] Based on the current version of IP,[13] a computer breaks user information down into various IP packets, each of a

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[2] *See, e.g., About pulver.com, at* http://pulver.com/about/index (last visited Feb. 14, 2002).

[3] *See id.*

[4] *See, e.g.*, Jesse Berst, *Story: Sorting Out Internet Telephony, at* http://www.zdnet.com/anchordesk/story/story_2113.html (May 20, 1998).

[5] ACLU v. Reno, 521 U.S. 844, 849 (1997).

[6] Christopher Libertelli, *Internet Telephony Architecture and Federal Access Charge Reform*, 2 B.U. J. SCI. & TECH. L. 13 para. 7 (1996); *see also* Telecommunications Act of 1996, 47 U.S.C. § 230(f)(1) (stating Congress's definition of the Internet).

[7] *See* Libertelli, *supra* note 6, para. 10. Alternative means of accessing the Internet, including DSL and cable modems, are currently available. *See Verizon: Verizon Online DSL, at* http://www.bell-atl.com/infospeed (last visited Feb. 14, 2002) (offering a high-speed Internet connection via DSL to users); *Road Runner: Technology, at* http://rrcorp.central.rr.com/hso/explore_tech.asp (last visited Feb. 14, 2002) (offering a high-speed Internet connection via cable modem to users).

[8] *See* LARRY L. PETERSON & BRUCE S. DAVIE, COMPUTER NETWORKS: A SYSTEMS APPROACH 12 (1996).

[9] *See id.* (describing a packet as a discrete block of data that relates to part of a file).

[10] *See id.* at 220-21 (describing the format of a standard IP packet, including such as the source address and the destination address).

[11] *See id.*

[12] *See id.* at 38.

[13] The Internet Protocol currently in use is version four ("IPv4"), which has various limitations. *See id.* at 217-37. To overcome these limitations, a new version of the protocol, version six ("IPv6"), is currently being developed and tested. *See id.* at 252-62.

particular size.[14] Each IP packet also contains data telling a computer where the contents of the packet fit into the overall structure of the information and where the packet is going. The destination is given in the form of an IP address, a sequence of numbers that identifies the location of a specific computer on the Internet.[15] IP addresses can be fixed or randomly assigned by an ISP, but each computer connected to the Internet has a unique one.[16] Most users never see the IP address; instead, they see a domain name, such as "www.bu.edu/law/" which is an alphanumeric representation of the IP address.[17] The IP packets then travel over the Internet, often using very different paths, to the designated computer.[18] This computer reassembles the IP packets in the proper order and the information is available for use.[19] Any packets that do not arrive must be retransmitted from the source.[20]

Packets travel over various different pathways by design.[21] IP packets travel through the Internet using computers called routers.[22] A router in some ways acts like an old-time telephone switchboard operator; it receives the packet, determines the IP address of the destination from the packet, and sends it there over an available path.[23] Unlike the operators of old, however, a router has many available paths to choose from, and chooses the most efficient path based on a variety of factors.[24] These factors constantly change,[25] which means the most efficient path also constantly changes.[26] This allows the Internet to make very efficient use of its resources.[27]

The Internet Protocol can be used to transmit all types of information, such as text, graphics, and voice, once it has digitized the information, enabling a computer to process the data into IP packets.[28] Literally any computer can

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[14] *See id.* at 221 (stating the maximum size of an IP packet to be 65,535 bytes).

[15] *See id.* at 229-31 ("By convention, IP addresses are written as four *decimal* integers separated by dots") (emphasis in original). 149.106.154.12 is an example of an IP address.

[16] *See id.*

[17] *See id.* at 230-31, 267-74 (describing the domain name system ("DNS") used on the Internet, and how domain names and IP addresses are related).

[18] *See id.* at 217-37 (describing the processes of fragmentation and reassembly, and data forwarding, by "taking a packet from an input and sending it out on the appropriate output").

[19] *See id.*

[20] *See id.* at 219-20 (calling IP's service model "*best effort* because while IP makes every effort to deliver [packets], it makes no guarantees") (emphasis in original).

[21] *See id.* at 10-12.

[22] *See id.* at 505 (defining a router as "[individual computers that make up a network] connected to two or more networks that forward packets from one network to another").

[23] *See id.* at 152-77, 231-33.

[24] *See id.* at 162-77 (describing the routing process).

[25] *See id.*

[26] *See id.*

[27] *See id.* at 10-12.

[28] *See id.*

read and decode IP packets with the proper software, allowing information to be sent to any computer connected to the Internet.[29]

B. Plain Old Telephone Service and the Circuit-Switched Network

POTS is the standard telephone system that occupies 99.1 million of U.S. households (as of July, 2000).[30] The system operates over the public switched telephone network ("PSTN") which has been in place for over a century. Two basic networks form the PSTN, local exchange networks and inter-exchange networks.[31] Local exchange companies ("LECs") provide the local exchange networks.[32] These are companies that offer local and regional telephone services, such as Verizon.[33] Competitive local exchange companies ("CLECs") or competitive access providers ("CAPs") may also provide such networks.[34] Long distance companies, also known as inter-exchange companies ("IXCs"), such as AT&T, MCI Worldcom, and Sprint, provide the inter-exchange networks.[35] The networks of the IXCs connect the various geographically separated local exchange networks together to form the PSTN.[36] Each nation's PSTN is then further connected, either by wire, undersea cable, or other means, to the other nations of the world.[37]

POTS uses the PSTN to transmit phone conversations.[38] The PSTN is what engineers refer to as a circuit-switched network.[39] When a person places a phone call using POTS, a part of the PSTN, a "circuit," is temporarily dedicated to only that phone call.[40] All information, including silence and pauses in speech, is transmitted over the network.[41] The use of a temporary dedicated circuit for each call also means that there is a limit to the total number of users who can place calls at the same time.[42] Though this limit is very high, the number of circuits available is not infinite.[43]

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[29] *See id.*

[30] *See FCC Releases Study on Telephone Trends* (last modified Dec. 21, 2000), *at* http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend200.pdf (detailing, on page two, the number of U.S. households with phone service).

[31] *See* Libertelli, *supra* note 6, para. 5.

[32] *See id.*

[33] *See Verizon - Products and Services - Home and family* (last modified Mar. 5, 2001), *at* http://www.verizon.com/prodserv/hf_ba_ma.html.

[34] *See* Libertelli, *supra* note 6, para. 5.

[35] *See id.*

[36] *See id.*

[37] *See* Hank Intven et al., *Internet Telephony - The Regulatory Issues*, 21 HASTINGS COMM. & ENT. L. J. 1, 5 (1998).

[38] *See id.*

[39] *See id.*

[40] *See id.*

[41] *See id.*

[42] *See* The New Encyclopedia Britannica, *Telephone and Telephone System* (15th ed. 1998), *available at* http://www.britannica.com/bcom/eb/article/1/0,5716,119001+1+110260,

To transmit a call over the PSTN to another user's phone, a phone transforms its user's voice signal to an electrical signal that can be carried over the PSTN.[44] If the second user is in the geographic area serviced by the first user's LEC, the call only travels over that local exchange network.[45] If the users are in areas serviced by different LECs, the signal will travel over the first user's local exchange network to an inter-exchange network.[46] From there, it may travel over one or many IXCs to the LEC of the second user, and eventually to the second user's telephone.[47] If the second is located in a different country, the call must travel over the PSTN of that country.[48]

The actual owners of the various networks cannot control the contents of their respective networks.[49] Thus, the PSTN is known as a "common carrier"[50] and is subject to government regulation.[51]

C. The (Ongoing) Growth and Development of IP Telephony

Currently, IP telephony transmits voice like the POTS system. The only difference is that an IP telephony transmission takes place over the Internet. IP telephony is often broken up into various categories, such as computer-to-computer, phone-to-phone, and computer-to-phone. The primary advantage of IP telephony is cost. An example using the plan of one domestic IP telephony provider will suffice to explain.[52] With a maximum of ninety-nine cents per domestic call[53] over ten minutes (ten cents per minute up to the tenth minute),

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00.html (providing descriptions of the development of the modern PSTN) (last visited Mar. 26, 2001).

[43] *See* The New Encyclopedia Britannica, *Telephone and Telephone System* (15th ed. 1998), *available at* http://www.britannica.com/bcom/eb/article/1/0,5716,119001+1+110260, 00.html (providing descriptions of the development of the modern PSTN) (last visited Mar. 26, 2001).

[44] *See* Libertelli, *supra* note 6, paras. 5-6.

[45] *See id.*

[46] *See id.*

[47] *See id.*

[48] *See id.*

[49] *See* The New Encyclopedia Britannica, *Telephone and Telephone System* (15th ed. 1998), *available at* http://www.britannica.com/bcom/eb/article/1/0,5716,119001+1+ 110260,00.html (providing descriptions of the development of the modern PSTN) (last visited Mar. 26, 2001).

[50] *See, e.g.*, Communications Act of 1934, 47 U.S.C. § 153(10) (2000) (defining a common carrier in the U.S.).

[51] *See, e.g.*, Title II of the Communications Act of 1934, 47 U.S.C. § 201 et seq. (addressing U.S. regulation of common carriers).

[52] *See, e.g.*, USA Datanet, *Products & Pricing*, *at* http://www.usadatanet.com/phone.html (describing a calling plan that allows users to place telephone calls to any location in the northeast section of the U.S. for a maximum charge of ninety-nine cents for calls ten minutes and longer. It does not matter how long the user remains on the line after the first ten minutes. There is no monthly surcharge.) (last modified April 10, 2002).

[53] This depends on what region the user calls in the U.S. *See id.*

this company's rates compared to a standard POTS long distance company's rates show the great cost advantage of IP telephony. Suppose the POTS long distance company charges five cents per minute, in addition to a monthly surcharge. An hour-long phone conversation at this rate costs the average POTS user three dollars, not including the surcharge. The same call using the described phone-to-phone IP telephony company's rate[54] costs only ninety-nine cents, a savings of two dollars and one cent. If the POTS user makes ten such hour-long calls in a month, using IP telephony instead of a POTS long distance company, they save twenty dollars and ten cents, plus the monthly surcharge paid to the POTS long distance company. In this example, IP telephony reduces the POTS user's monthly long distance phone bill by *sixty-seven* percent. Over the course of a year, the user saves over *two hundred and forty dollars*. The longer the conversation, and the more conversations a user has, the more money IP telephony potentially saves the user.

These savings become more apparent when you compare prices for international phone calls. A standard long distance provider charges varying rates for international calls, depending on the part of the world a user calls. One company's plan could charge a user $4.00 per month, with rates ranging from seven cents per minute to $4.92 per minute, depending on the country the user calls.[55] Thus, the most inexpensive hour-long call possible using POTS still costs $4.42, not including the monthly surcharge or taxes. One provider of PC-to-phone IP telephony[56] offers international rates varying from $0.039 cents per minute to $0.47 cents per minute, with no monthly fees.[57] Here the most inexpensive hour-long call possible costs only $2.34, for a minimum savings of $2.08 compared to POTS. If the user makes five hour-long international calls in a month, IP telephony could save the user $10.40 on their international calling bill, plus the $4.00 monthly surcharge, for a minimum monthly savings of $14.40, which does not include taxes. Over the course of a year, this amounts to a total potential savings of *one hundred seventy two dollars*. Similar to domestic long distance calls, the more calls a user makes, the more money they potentially save by using IP telephony.IP telephony has some problematic technical issues, including time of transmission and voice quality.[58] The transmission delay for a POTS call placed on the PSTN is approximately 30 milliseconds, or three-tenths of a second, which is barely perceptible to most people.[59] This gives a user the impression of an instantaneous transmission of what is said by the other user. For calls placed

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[54] *See infra* text accompanying notes 76-81.

[55] *See* MCI, *MCI Anytime Worldwide*, *at* http://www.mci.com/international/english/usb/Product.jsp?ProductID=worldwide_advantage (describing MCI WorldCom's Anytime Worldwide plan) (last visited Aug. 23, 2002).

[56] *See infra* text accompanying notes 82-85.

[57] *See* Net2Phone, *CommCenter*, *at* http://web.net2phone.com/products/commcenter (last visited Aug. 23, 2002).

[58] *See* Intven et al., *supra* note 37, at 6.

[59] *See id.*

between countries, especially calls overseas, this delay increases, often resulting in what a user would perceive to be an unnaturally long pause in the conversation.[60] Such pauses can be common when using IP telephony because the transmission delays may be as long as one to four seconds,[61] which may seem like an eternity to a user. These long delays are often due to packets being "lost" during the course of transmission.[62] Such a packet must be resent, resulting in the delay.[63] One obvious solution to decreasing the delay is to disregard the missing packets, but this would likely result in a poor quality voice signal. Though even POTS was not designed to provide lifelike sound, IP telephony providers must maintain a basic level of voice signal quality for users to conduct a conversation. Improvements in technology, however, should reduce and eventually eliminate these technical concerns with IP telephony.

1. The Beginning: Computer-to-Computer

The first, and most basic, type of IP telephony is computer-to-computer. It involves two users each with a computer, microphone, sound card, speakers, and the same type of IP telephony software.[64] Each user must be simultaneously connected to the Internet. Users speak to each other back and forth via the microphones and speakers. The sound card digitizes the voice signal from the speaker's microphone and transmits it as IP packets over the Internet via the software and the computer.[65] At the other end, the second user's sound card receives the IP packets, reassembles them and transforms them back to voice, and the speakers of the receiving user then play back that voice signal.[66]

Computer-to-computer IP telephony did not catch on commercially, and likely will not. [67] The voice quality is usually poor, not just because of

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[60] *See* The New Encyclopedia Britannica, *Telephone and Telephone System* (15th ed. 1998), *available at* http://www.britannica.com/bcom/eb/article/1/0,5716,119001+1+110260,00.html (providing descriptions of the development of the modern PSTN) (last visited Mar. 26, 2001).

[61] *See* Intven et al., *supra* note 37, at 6.

[62] *See id. See also supra* notes 8-20 and accompanying text.

[63] *See* PETERSON & DAVIE, *supra* note 8, at 217-37.

[64] *See, e.g.*, Visitalk, *What Is Visitalk?*, *at* http://www.visitalk.com/commsite/marketing/whatisvisitalk.asp (offering a particular type of computer-to-computer IP telephony software) (last visited June 9, 2002); America Online, *AOL Instant Messenger*, *at* http://www.aol.com/aim/home.html (offering a popular instant messaging program allowing users to communicate by computer-to-computer IP telephony) (last modified Feb. 12, 2001). *See also* Libertelli, *supra* note 6, para. 13.

[65] *See* Libertelli, *supra* note 6, para. 13.

[66] *See id.*

[67] *See* Dr. Tim Kelley, *IP Telephony: Economic Implications and Impacts on PTOs* (June 2000), *at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/kelly.pdf (defining, on page 3, the market for computer-to-computer IP telephony as less than 50 million users) (last visited June 9, 2002).

software or IP limitations, but also because of the differences between the PSTN and the Internet.[68] Additionally, the system is awkward, in that you must be seated at a computer and the person you are calling must be connected to the Internet at the time you make the call.[69] The chief advantage to the system is that it allows users to make long distance phone calls, even international phone calls, at no cost.[70] The software is usually free to download, and many people already own a computer with the necessary peripherals; the only associated cost (other than a computer system, if the user does not already own one) is access to the Internet.[71] For some, this costs nothing, and for those who must pay, they incur minimal costs compared to the cost of a long distance or international phone call.[72] Despite this cost advantage, the awkwardness of the system and its limitations resulted in most people not using this type of IP telephony in place of POTS.[73] Currently, the most common use is to supplement the available text-based instant messenger services, either for chatting or for use on a company's private intranet.[74] The ITU estimates that the potential market for computer-to-computer IP telephony is less than fifty million users.[75]

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[68] *See* International Telecommunication Union, *IP Telephony Workshop: Background Issues Paper*, *at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/iptel.pdf (discussing, on pages 9-11, service quality issues with respect to IP telephony) (last visited June 9, 2002).

[69] *See supra* text accompanying notes 64-66.

[70] *See* Libertelli, *supra* note 6, para. 14.

[71] *See id.* paras. 13-14.

[72] *See, e.g.*, Netzero, *Welcome to NetZero*, *at* http://www.netzero.net (last modified June 6, 2002). Compared to international calling rates, which may cost as much as a $1 per minute, even $9.95 per month for Internet access, and thus the use of computer-to-computer IP telephony, is a minimal price. At this rate, if you were on the Internet for an hour every day for a month (1800 minutes in a thirty-day month), you pay a little over one cent per minute of use. Every minute past an hour further decreases your cost. Even compared with current U.S. domestic long distances rates, which can be as low as five cents per minute, this is a bargain; there are no monthly fees and no taxes. International calling rates differ depending on what country a user calls. Among the least expensive calls overseas from the U.S., according to one calling plan, are to the United Kingdom at ten cents per minute. *See MCI Anytime Worldwide*, *at* http://www.mci.com/international/english/usb/Product.jsp?ProductID=worldwide_advantage (last visited Aug. 23, 2002). This rate does not include the fees and surcharges for making an international phone call using POTS, resulting in a higher actual price per minute. Compared to one cent per minute, or less, as described above for Internet access, using computer-to-computer IP telephony saves a user a significant amount of money when making international calls.

[73] *See* Dr. Tim Kelley, *IP Telephony: Economic Implications and Impacts on PTOs* 9 (June 2000), *at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/kelly.pdf (last visited June 9, 2002).

[74] *See id.*

[75] *See id.*

2. Expansions Beyond the Computer-to-Computer System

As it became apparent that computer-to-computer IP telephony was not in great demand, two different types of IP telephony developed, phone-to-phone and computer-to-phone IP telephony. Phone-to-phone IP telephony involves the use of a standard telephone and the PSTN, through which a user calls an IP gateway.[76] A gateway is "[a] device that converts data into the IP protocol. It often refers to a voice-to-IP device that converts an analog voice stream, or a digitized version of the voice, into IP packets."[77] The user provides the gateway with the number he/she desires to call.[78] This gateway takes the user's voice signal, digitizes it, and transmits it over the Internet to a similar gateway in the local area of the desired number.[79] After the other user's phone rings, this user establishes a connection by picking up the phone. The gateway operator charges a specified amount per long distance call made using the system.[80] Currently, phone-to-phone seems to be the prevalent form of IP telephony. It can be much cheaper than standard POTS service and has superior voice quality compared to computer-to-computer IP telephony.[81]

Finally, computer-to-phone IP telephony is a hybrid. Here, a user connects to the Internet and uses a computer to place a phone call. This requires software and the same peripherals (speaker, microphone and sound card) needed for computer-to-computer IP telephony.[82] The voice signal is sent over the Internet to a gateway, which then routes the call to the appropriate telephone on the PSTN.[83] As with the other types of IP telephony, the primary advantage is the inexpensive cost of making a long distance or international phone call.[84] Additionally, the voice quality is usually better than computer-to-computer IP telephony, though one user remains limited in that they must be at a computer to use the system.[85]

3. Numerical Estimates of IP Telephony Use Continually Increase While Costs of That Use Remain Lower Than POTS

Former FCC Chairman William E. Kennard regarded IP telephony as the future of telephony, often making the point at industry meetings, including the September 2000 Atlanta VON Conference:

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[76] *See* Intven et al., *supra* note 37, at 9.

[77] *TechEncyclopedia*, *at* http://www.techweb.com/encyclopedia/defineterm?term=ip+gateway (last visited June 6, 2002).

[78] *See* Intven et al., *supra* note 37, at 9.

[79] *See id.*

[80] *See supra* note 52 (describing one company's pricing scheme).

[81] *See id*; *see also* International Telecommunication Union, *IP Telephony Workshop: Background Issues Paper*, *at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/iptel.pdf (last visited June 9, 2002).

[82] *See supra* text accompanying notes 64-75.

[83] *See* Intven et al., *supra* note 37, at 9.

[84] *See supra* text accompanying notes 52-57.

[85] *See supra* text accompanying notes 64-66.

> You may have one percent of the voice traffic now, but estimates are that in five years you will have 15% of the traffic. IDC [International Data Corp.] estimates that in just three years, 300 million people worldwide will be using voice over the net . . . I am convinced that once Americans discover the cost and functionality of IP telephony, they will leave the circuit-switched world forever. And it will happen very fast.[86]

Other commentators echo the estimated jump in worldwide voice traffic share from 1% to 15% of IP telephony, and some place the estimate even higher than 300 million people.[87] In terms of cost, many analysts believe the market for IP telephony will be somewhere between $2 billion and $16.5 billion by 2004.[88] By that time, IP telephony might account for 25% to 40% of all international calls.[89] The possibilities for growth seem endless.

The best case for continued rapid growth of IP telephony is its inexpensive price compared to POTS.[90] As stated above, computer-to-computer IP telephony is essentially free.[91] In seven countries surveyed, the cost of making a long distance call using phone-to-phone IP telephony was lower in each instance than the cost of making a long distance call using POTS.[92] The monthly charge for using IP telephony was also substantially lower than the monthly charge for POTS,[93] with some services charging no monthly fee and having remarkably inexpensive rates. For example, calls to a certain region that exceed ten minutes cost a maximum of ninety-nine cents, regardless of how long over ten minutes the user is on the phone.[94] With such large potential consumer savings, it is reasonable to expect the growth described above.

However, it is important to consider the effect of a price increase on IP telephony due to government regulation, requiring providers of IP telephony to pay fees similar to those paid by POTS providers. Less people would likely use the service, resulting in smaller markets and stunted growth of the

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[86] William E. Kennard, Internet Telephony: America Is Waiting - Opening Remarks to the Atlanta VON Conference (Sept. 12, 2000) (transcript available at 2000 FCC LEXIS 4787).

[87] *See* Intven et al., *supra* note 37, at 10; Tuan N. Samahon, Comment, *The First Amendment Case Against FCC IP Telephony Regulation*, 51 FED. COMM. L.J. 493, 497 (1999).

[88] *See* Intven et al., *supra* note 37, at 10.

[89] *See id.*; Tim Kelly, *IP Telephony: Economic implications and impacts on PTOs, at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/kelly.pdf (last visited June 9, 2002) (stating that Tarifica estimates the market at 40%).

[90] *See supra* text accompanying notes 52-57.

[91] The only associated cost is the computer system used, including the sound card, speakers, and microphone. *See supra* text accompanying note 72.

[92] *See* Lee W. McKnight, *How to Regulate a Platypus: Internet Telephony Regulation, at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/mcknight.pdf (last visited June 9, 2002).

[93] *See id.*

[94] *See supra* note 52.

technology, thus further increasing the price and decreasing use. None of these results, however, is consistent with the current drive toward decreased regulation and increased competition, fostering the growth of new technologies, and making telecommunications affordable for everyone. Yet should IP telephony become a substitute for POTS, the desire to replace lost revenue in terms of less government-collected fees from decreased POTS usage is sure to lead to calls for more regulation. This raises two interesting questions, should IP telephony be regulated on an international level, and if so, what kinds of regulations should apply.

III. REGULATIONS AND REGULATORY SCHEMES

A. A Brief Description of International Regulatory Issues and International Regulatory Development of POTS

In the United States and many other nations, POTS and the PSTN are common carriers and thus subject to government regulation.[95] The most important regulation, the universal service charge, involves a subsidy charge imposed on PSTN users.[96] ISP's and their customers are not subject to this charge because of a commonly drawn distinction in the regulatory framework.[97]

1. Financing an International Goal: "Universal Service" Subsidy Charges

"Universal service" is a term that essentially means every person in a particular area should have some kind of access to basic telephone service.[98] This definition varies from nation to nation, with some nations defining it to mean that each dwelling has a telephone.[99] Others define it to mean that each person is within a particular distance from the nearest telephone.[100] To finance universal service, most nations charge PSTN users a fee, which is paid into a universal service fund.[101] The nation's telecommunications companies (or

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[95] *See supra* notes 50-51.

[96] *See* 47 U.S.C. § 254(c) (2000) (defining universal service).

[97] *See infra* text accompanying notes 110-33.

[98] *See* 47 U.S.C. § 254(c) (defining universal service); *see also* In re Federal-State Joint Board on Universal Service, 13 F.C.C. Rcd 11501, 11504-11506, paras. 6, 9 (April 10, 1998).

[99] *See Discussion Paper on Definition of Universal Service and Universal Access in Telecommunications in South Africa*, 400 GOV'T GAZETTE NO. 19397, § 4 (Oct. 22, 1998), *available at* http://www.polity.org.za/govdocs/discuss/usa.html.

[100] *See The Green Paper on Telecommunications Policy* (July 1995) (outlining South Africa's definition of universal service under Question 1.1) (published by the Ministry of Posts, Telecommunications and Broadcasting, South Africa), *available at* http://www.polity.org.za/govdocs/green_papers/telecomms.html (last visited June 9, 2002).

[101] *See* International Telecommunication Union, *IP Telephony Workshop: Background Issues Paper*, *at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/iptel.pdf (discussing, on pages 9-11, service quality issues with respect to IP telephony) (last visited June 9, 2002).

company) each receive a portion of the money from this fund.[102] In theory, the nations use this money to extend basic telephone service, however defined, to areas that lack it.[103]

In the 1990s, many nations adopted new definitions of universal service. Their goal was to expand the universal service fund and provide more than basic telephone service by changing who would incur universal service charges.[104] For example, in the United States, section 254 of the Telecommunications Act of 1996 made universal service an explicit statutory goal and broadened the types of services that should be available to all.[105] Additionally, Canada, the European Union, many other nations, and the International Telecommunications Commission ("ITU") adopted various explicit policies regarding universal service with a similar eye towards expansion.[106] The key language in these statutes or policies is the way a nation determines what types of service providers are subject to the subsidy charges.[107] Depending on the statutory language used, some IP telephony service providers may be subject to these charges.[108] This represents a marked switch from government regulations over the last thirty years.[109]

2. Common Carrier Regulation and the "Basic" Service Versus "Enhanced" Service Distinction

In the 1970s and 1980s, the United States' FCC distinguished "basic" service from "enhanced" service in its *Computer I*[110] and *Computer II*[111] decisions. *Computer I* created a confusing number of distinctions designed to help the growth of early data processing services that functioned over the PSTN.[112] The main idea behind the *Computer I* decision was to avoid regulation of the new data processing service, allowing growth, especially in areas that were just

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[102] *See id.* para. 85.

[103] *See id.* para. 86.

[104] *See* Intven et al., *supra* note 37, at 21-53 (describing the regulatory policies of those nations).

[105] *See* 47 U.S.C. § 254(c) (2000); *see also* John C. Roberts, *The Sources of Statutory Meaning: An Archaeological Case Study of the 1996 Telecommunications Act*, 53 SMU L. REV. 143, 151 (2000).

[106] *See* Intven et al., *supra* note 37, at 21-53 (describing the regulatory policies of those nations).

[107] *See* Roberts, *supra* note 105, at 151; Intven et al., *supra* note 37, at 21-53.

[108] *See infra* text accompanying notes 167-92.

[109] *See infra* text accompanying notes 110-33.

[110] *See* In re Regulatory And Policy Problems Presented by the Interdependence of Computer And Communication Services And Facilities, 28 F.C.C.2d 267 (1971) ("*Computer I*").

[111] *See* In re Amendment of Section 64.702 of the Commission's Rules and Regulations (Second Computer Inquiry), 77 F.C.C.2d 384 (1980) ("*Computer II*").

[112] *See Computer I*, 28 F.C.C.2d at 268-70; Roberts, *supra* note 105, at 151-52.

coming into focus.[113] The FCC justified its decision by pointing to a high level of competition in the new industry.[114] Federal courts upheld the FCC's choices.[115] Rapid changes to the industry, however, forced the FCC to revisit these issues in the mid-1970s.

When the FCC released its *Computer II* decision in 1980, it eliminated the old scheme of *Computer I*[116] and replaced it with a simpler scheme, accomplishing the same general purpose of fostering growth of new technology through a lack of regulation.[117] This new scheme redefined the previously confusing distinction from *Computer I* as being between "basic" services and "enhanced" services.[118] "Basic" services were defined as "the core of the public switched telephone network traditionally subject to regulation, the 'common carrier offering of transmission capacity for the movement of information.'"[119] On the other hand, an "enhanced" service "was 'any offering over the telecommunications network which is more than a basic transmission service.'"[120]

The key to determining whether a service was "enhanced" was whether it acted on the "content, code, protocol, or other aspects of the customer's information, or . . . [whether it was] just the ability to interact with it."[121] Thus, POTS was a "basic" service and subject to regulation, while the service provided by an ISP was an "enhanced" service and free from regulation. The FCC justified the distinction based on its ability to regulate "common carriers"[122] under Title II of the Communications Act of 1934.[123] It did not interpret the meaning of "common carrier" to include the new category of "enhanced" services.[124] Once again, the courts upheld the FCC's interpretation of the law.[125]

With the passage of the Telecommunications Act of 1996,[126] new terms came to define the sides of the distinction. In the Act, Congress drew the line

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[113] *See* Roberts, *supra* note 105, at 151-53.

[114] *See id.*

[115] *See* GTE Serv. Corp. v. F.C.C., 474 F.2d 724, 736 (2d Cir. 1973).

[116] *See Computer II*, 77 F.C.C.2d at 385-87.

[117] *Id.* at 394; Roberts, *supra* note 105, at 153-54.

[118] *See* Roberts, *supra* note 105, at 154.

[119] Roberts, *supra* note 105, at 154 (quoting the FCC's decision in *Computer II*).

[120] *Id*. at 154 (quoting the FCC's decision in *Computer II*).

[121] *Id*. at 154.

[122] *See* Title II of the Communications Act of 1934, 47 U.S.C. § 201 et seq. (2000); *see also* Roberts, *supra* note 105, at 154.

[123] *See* Title II of the Communications Act of 1934, 47 U.S.C. § 201 et seq. (2000).

[124] *See Computer II*, 77 F.C.C.2d at 395-400; Roberts, *supra* note 105, at 154.

[125] *See* Computer and Comm. Indus. Ass'n v. FCC, 693 F.2d 198, 220 (D.C. Cir. 1982).

[126] *See* 47 U.S.C. § 151 et seq. (2000). The WTO's Basic Telecommunications Agreement adopted the basics of the Act. *See WTO | The Services Agreement*, *available at* http://www.wto.org/english/tratop_e/servte_e/tel05_e.htm (last modified June 2, 2001).

between "telecommunications service" and "information service."[127] Section 3 of the Act contains definition for both terms.[128] According to the Act,

> 'information service' means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.[129]

"The term 'telecommunications service' means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used."[130]

The FCC interpreted these distinctions to follow the "basic" versus "enhanced" distinction.[131] In other words, POTS was a "telecommunications service" subject to regulation, while ISP's were "information services" subject to no regulations.[132] Most important for the purposes of this Note, however, was that the FCC did indicate that phone-to-phone IP telephony more closely resembled a "telecommunications service" and thus was possibly subject to regulation, including universal service charges.[133]

3. International Settlement Rates and Accounting Rates Develop From International PSTN Connection

One of the chief features of international regulation of POTS and the PSTN is the system of international settlement rates based on accounting rates. Accounting rates are the "price a U.S. facility-based carrier negotiates with a foreign carrier for handling one minute of international phone service."[134] The settlement rate is usually half of the accounting rate, one half going to each of the two carriers.[135] Payment of these rates are based on the fact that a nation's

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[127] *See* 47 U.S.C. §§ 153(20), (46).

[128] *See id.* §§ 153(20), (46).

[129] *Id.* § 153(20).

[130] *Id.* § 153(46). Note that the term "telecommunications," as used in this definition, is also defined by the act. *See id.* § 153(43).

[131] *See* Roberts, *supra* note 105, at 154-55.

[132] *See* In re Federal-State Joint Board on Universal Service, 13 F.C.C.R. 11501, 11503-04 (1997).

[133] *See id. See also* Intven et al., *supra* note 37, at 45-47 (pointing out that the FCC has not yet declared where each of the various types of IP telephony fall in the regulatory framework).

[134] John J. Alissi, Comment, *Revolutionizing The Telephone Industry: The World Trade Organization Agreement On Basic Telecommunications And The Federal Communications Commission Order*, 13 CONN. J. INT'L L. 485, 495-96 (1999) (quoting In re International Settlement Rates: Notice of Proposed Rulemaking, Federal Communications Commission, IB Docket No. 96-261, at #6 (December 19, 1996), available in 1997 WL 738850).

[135] *See id.* at 496.

international calling service carrier can collect the so-called termination costs associated with terminating a call on that nation's PSTN.[136] Each carrier tallies the net minutes of service that it originated for a certain period of time.[137] If these are equal, the carriers pay each other nothing.[138] However, when one carrier originates more calls then the other, that carrier must make a settlement payment to the other, determined by multiplying the rate times the number of excess minutes of service.[139]

A simple example should suffice to explain the process. When a person in the U.S. calls a friend in France, the phone call must travel over part of France's PSTN to reach its destination. The call ends at a phone in France, having reached this phone via a French local exchange network, and is said to have terminated on the French PSTN. Since the person in the U.S. used part of the French PSTN to make the call, the French carrier is entitled to payment for use of their part of the PSTN. This is the termination cost. Of course each international calling service provider must pay part of the money it receives to the IXCs and LECs that allow it to use their networks. If the negotiated accounting rate between the U.S. carrier and the French carrier is $1, and each carrier originates 10,000 minutes of calls, both would owe the other $5,000, so nothing is paid. However, if the U.S. carrier originates 30,000 minutes of calls, while the French carrier originates only 10,000 minutes, the French carrier would receive a $10,000 settlement payment.

Initially, accounting rates tended to be much higher than the actual cost of service.[140] Over time, however, countries with more highly concentrated markets began to drop the rates to make them closer to cost, hoping to increase competition.[141] Those countries that maintain monopolies on telephone service, or a structure close to a monopoly, have kept their accounting rates very high in relation to costs.[142] Thus, the world's most developed nations, who pay out high settlement charges, wish to change the system and decrease their costs.[143] At the same time, those nations receiving the payments want the system to remain unchanged.[144] Most of these nations have state-run monopolies on telephone service and, as a result, the government receives all of the money from the payments. Governments use the money primarily to pay the costs of providing services within their nations, though sometimes the money is used for other purposes.[145] Those nations who pay out large international settlement charges often cite IP telephony as an excellent

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[136] *See* In re International Settlement Rates, 12 F.C.C.R. 19806, 19808-09 (1997).

[137] *See* Alissi, *supra* note 134, at 496.

[138] *See id.*

[139] *See id.* at 497.

[140] *See id.* at 497-98.

[141] *See id.*; Intven et al., *supra* note 37, at 18-20.

[142] *See* Intven et al., *supra* note 37, at 17.

[143] *See id.*; *see generally* In re International Settlement Rates, 12 F.C.C.R. 19806 (1997).

[144] *See* Intven et al., *supra* note 37, at 17.

[145] *See id.* at 13, 17.

downward pressure on what they consider to be overly high accounting rates.[146] Those nations on the receiving end of large settlement charges tend to be wary of IP telephony for just this reason.[147]

Another concern of nations with carriers paying out large settlement charges is the practicing of "whipsawing."[148] This allows a person in Zimbabwe, for example, to make an international phone call to South Africa, but make it seem like the call originated in the U.S.[149] This increases the settlement payments U.S. carriers make to South African carriers. At the same time, the payment Zimbabwe carriers must make is less than it otherwise would have been.[150] This creates a deficit of minutes between Zimbabwe carriers and South African carriers, making Zimbabwe carriers the recipients of a large settlement payment from South African carriers.

B. Summary of the Lack of Current International Regulations

Currently, there are no international regulations regarding IP telephony. However, the WTO's Basic Telecommunications Agreement may serve as the basis for future international regulations.[151] Additionally, many nations have adopted domestic policies regarding IP telephony. Examining these policies offers insight into how different nations would view international regulations.

1. Summary of Relevant Provisions of the WTO's Basic Telecommunications Agreement

All members of the WTO have adopted its Basic Telecommunications Agreement ("the Agreement").[152] Though it covers a wide variety of telecommunications services,[153] for purposes of this Note, those provisions dealing with POTS and IP telephony are most essential. It is also important to note that each member nation has a different schedule for implementing domestic laws and regulations in accordance with the Agreement.[154] While the Agreement contains no express provisions regarding IP telephony, it is seen as similar to the U.S. Telecommunications Act of 1996,[155] under which the FCC has indicated that, for domestic purposes, phone-to-phone IP telephony may be subject to regulation.[156] However, the FCC has not yet imposed any

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[146] *See id.* at 19-20.

[147] *See id.* at 19.

[148] *See* In re International Settlement Rates, 12 F.C.C.R. 19806, 19864 (1997).

[149] *See id.*

[150] *See id.*

[151] *See WTO | The Services Agreement*, *supra* note 126.

[152] *See id.*

[153] *See* Alissi, *supra* note 134, at 491.

[154] *See id.* at 492.

[155] *See* Alissi, *supra* note 134, at 485.

[156] *See* In re Federal-State Joint Board on Universal Service, 13 F.C.C.R. 11501, 11503-11504 ; Intven et al., *supra* note 37, at 45-47.

regulations.[157]

The primary focus of the Agreement is to increase competition on an international scale through deregulation and open markets.[158] In other words, nations who sign the agreement will eventually open their markets to foreign companies, allowing them to come in and provide services.[159] The largest impact of this opening will be on nations where a telephone is considered a luxury, or where phone access is very limited.[160] Parties to the Agreement hope increased competition and open markets will bring in companies with the capital to set up modern telephone services and systems in developing nations, especially in those areas that are extremely poor and rural.[161] However, competition may create problems for such nations. The Agreement allows for the reduction of international settlement and accounting rates, both directly and through the use of alternative services such as IP telephony.[162] This may have a negative impact on developing countries, possibly creating a rise in their local phone service rates as compensation for lost revenue from the international calling sector.[163]

Another important aspect of the Agreement concerns its Reference Paper, which is designed to regulate the telecommunications industry on an international level.[164] It contains six pro-competitive regulatory elements: (1) competitive safeguards, (2) carrier interconnection, (3) universal service, (4) public availability of licensing criteria, (5) the establishment of an independent regulator, and (6) the allocation and use of scarce resources such as the

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[157] It is worth noting that there have been attempts by the U.S. Congress to regulate IP telephony. One bill, H.R. 1291, passed the House of Representatives in May 2000. Thanks to industry lobbying, this bill never made it to the Senate. *See* Jeff Pulver, *Help Stop HR 1542 – pulver.com* (May 8, 2001), at http://www.pulver.com/hr1542. Representatives have tried to resurrect the provisions of H.R. 1291 in other bills, however. *See id.* The industry continues to lobby against such acts, to keep IP telephony and VoIP in general from falling under the regulatory scheme of the Telecommunications Act of 1996. *See id.* Not all proposed bills have been in favor of regulation. For example, the title of another bill, H.R. 4769, says it all: the Internet Telephony Access Charge Prohibition Act of 2000. This bill would prevent "the FCC from imposing time-based access charges" on IP telephony as well as universal service charges "for telephone communications that travel over the Internet." Laura Guevin, *Points of Presence* (Jan. 26, 2001), at http://www.tmcnet.com/tmcnet/columns/laura012601.htm.However, H.R. 4769 remains in the House committee stage of proceedings. *See id.*

[158] *See* In re International Settlement Rates, 12 F.C.C.R. 19806, 19811 (1997); Alissi, *supra* note 134, at 485.

[159] *See* Alissi, *supra* note 134, at 485 n.2. However, there are certain limits on how open each nation will be to foreign investment and companies. *See id.* at 491-93.

[160] *See id.* at 508.

[161] *See id.*

[162] *See* In re International Settlement Rates, 12 F.C.C.R. at 19811-12.

[163] *See* Alissi, *supra* note 134, at 508.

[164] *See id.* at 493.

spectrum.[165] Out of the need for flexibility, the Reference Paper only contains guidelines rather than specific detail. As one commentator notes, "[T]his should not detract from its significance as providing important regulatory guidelines as well as providing a process to ensure that nations comply with their liberalization promises."[166] This Paper shows that it is possible to have a general, flexible, and functional international regulatory framework in the telecommunications field.

2. Summary of Various Domestic Regulations and Policies Regarding IP Telephony

A survey of various nations and how they react to IP telephony reveals many differences in treatment. When viewing the policies and regulations of these nations, it is important to remember "that it is voice telephony *service*, delivered by means of Internet or IP telephony, which is most frequently the subject of policy, not IP *technology* itself."[167]

At least twenty-seven nations as of April 2002 have either banned the use of IP telephony in its entirety or have no policy on the matter.[168] These include nations as diverse as Cuba, Egypt, Israel, South Africa, Kenya, Mexico, Argentina, and Panama.[169] The reasoning behind this choice varies depending on the nation. For example, developing nations that continue to have monopolies in telephone and telecommunications service permit no competition, including IP telephony.[170] Some do not see IP telephony as actual voice telephony, and thus have no policy on the matter.[171] Nations with specific bans, especially developing nations and those nations with essentially a government monopoly in the telecommunications industry, worry about the loss of vital funds foreseeably coming from competition with the government monopoly.[172]

However, in such countries, the door to IP telephony is not permanently closed. Nations that have only recently made IP telephony services legal, such as Russia and India, will experience the benefits the technology can bring, and will cause other nations to take notice.[173] As nations learn that initially

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[165] *See id.*

[166] *Id.* at 494.

[167] IP Telephony Workshop: Background Issues Paper, May 29, 2000, at 21, *available at* http://www.itu.int/osg/spu/ni/iptel/workshop/iptel.pdf (last visited May 31, 2002).

[168] *See* Laura Guevin, *Points of Presence* (Jan. 31, 2000) *available at* http://www.tmcnet.com/tmcnet/columns/laura013100.htm; *How to Regulate a Platypus: Internet Telephony Regulation* at slide 13 *available at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/mcknight.pdf (last visited Mar. 26, 2001); IP Telephony Workshop: Background Issues Paper, *supra* note 167, at 22-23.

[169] *See* IP Telephony Workshop: Background Issues Paper, *supra* note 167, at 22-23.

[170] *See id.* at 24.

[171] *See id.*

[172] *See id.* at 32 (discussing Nepal in particular).

[173] *See* Laura Guevin, *Points of Presence* (Jan. 31, 2000), *available at*

introducing IP telephony will not decrease revenue in a harmful way, and that increased competition resulting from an open market helps and does not harm an economy, it is likely that the legal restrictions against IP telephony will disappear. Similarly, as nations without a policy on IP telephony realize the great benefits it can bring, they are likely to implement policy that will foster its growth.

Others nations have enacted partial bans on the service[174] or regulations for some services that they classify as "IP telephony."[175] Poland, for example, sees IP telephony as illegally competing with the government's exclusive international service provider licensee, but allows a mobile operator to route international phone calls over the Internet. [176] The Czech Republic allows certain classes of operators to offer IP telephony services, but only the exclusive government licensee offers phone-to-phone IP telephony through the PSTN.[177]

The majority of developed and industrialized nations tend to avoid regulating IP telephony and instead allow the market and competition to work at keeping costs and prices down.[178] With just a few exceptions,[179] these nations generally do not fear potential losses to their universal service funds from a lack of regulation of IP telephony. These nations also hope to realize the potentially large decreases in the amount of their international settlement charges payments to other nations. The United States is a prime example,[180] and most of its domestic policies and laws concerning IP telephony have been detailed in previous sections of this Note. The policies of the European Union are somewhat stronger than those of the United States. Canada and Japan have actually implemented limited regulations, however, their regulations primarily focus on increasing competition.[181]

Canada makes a distinction between Internet data applications, which are free from regulation, and Internet applications that provide alternatives to public switched voice service, which are regulated.[182] In other words, Canada subjects phone-to-phone IP telephony to some regulation, so IP telephony providers in Canada make payments to Canada's universal service fund.[183] Canada was the only nation to adopt IP telephony to its regulatory framework

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http://www.tmcnet.com/tmcnet/columns/laura013100.htm (last visited Feb. 14, 2002).

[174] *See id.*; *see also* IP Telephony Workshop: Background Issues Paper, *supra* note 167, at 25.

[175] *See* IP Telephony Workshop: Background Issues Paper, *supra* note 167, at 25.

[176] This bar is effective at least until the exclusive monopoly ends in 2003. *See id.* at 5.

[177] *See id.* at 21.

[178] *See supra* text accompanying notes 95-150.

[179] Senator Ted Stevens is representative of the fear of potential U.S. losses. *See* Roberts, *supra* note 105, at 160-63.

[180] *See* IP Telephony Workshop: Background Issues Paper, *supra* note 167, at 24.

[181] *See id.* at 23, 28.

[182] *See* Intven et al., *supra* note 37, at 27-38.

[183] *See* IP Telephony Workshop: Background Issues Paper, *supra* note 167, at 28.

before the technology became a widely-used service.[184] Japan has also enacted some regulations regarding IP telephony, including obtaining prior approval from the Ministry of Posts and Telecommunications before providing service and submitting periodic reports on their income and volume of traffic.[185] Most importantly, these regulations were enacted with the purpose of "'securing fair and effective competition' relating to international Internet telephony service."[186]

The European Union takes a cautious approach towards IP telephony, seemingly with an eye on regulation in the future.[187] In a Status Notice[188] the EU details a number of criteria for IP telephony's three forms that would subject it to regulation in the future.[189] The most important criterion seems to be quality of service.[190] Currently no form of IP telephony meets all the criteria.[191] However, the Notice indicated that with continued development of the technology, this may change and the EU would act appropriately if it did.[192] Many believe the regulation of IP telephony would require the EU to change its current regulatory framework to better encompass the service.[193]

IV. ISSUES RELATING TO POTENTIAL INTERNATIONAL REGULATION OF IP TELEPHONY

Though many in industry fear any international regulation of IP telephony or VoIP,[194] if it does replace current POTS use as many in the industry believe it will, some form of international regulation will probably be necessary to ensure that people throughout the world have some type of telephone service. Without access to such service, the advantage of an inexpensive alternative to POTS, will disappear, hurting the technology's continuing growth and development. Equally important are those people; better services, increased competition, and more business will all result from a greater number of people with access to the service. The way to attract those people is to provide quality service that benefits them if they use it - hence, the importance of keeping costs down. The primary fears on both sides of the regulation question can be

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[184] *See* Intven et al., *supra* note 37, at 27-38.

[185] *See id.* at 48-50.

[186] *Id.* at 49.

[187] *See id.* at 21-27.

[188] *See id.*

[189] *See id.*

[190] *See id.*

[191] *See id.* It follows that no form of IP telephony must pay universal service charges.

[192] *See id.*

[193] *See id.* at 25.

[194] *See, e.g.*, *Is The ITU Promoting National and International Regulation of VoIP and the Internet?*, The Pulver Report, *at* http://pulver.com/reports/25sep00.html (Sept. 25, 2000) (stating that the decision by the ITU to hold a conference on March 7-9, 2001 specifically on IP telephony "must be considered to be a serious threat to accelerate efforts to regulate the VoIP industry").

linked to costs.

There are three critical questions that relate to any potential international regulation. First, should current regulatory distinctions apply or should new distinctions be determined? Second, should the regulations that lead to subsidies under POTS be applied to IP telephony, and can this be done without decreasing competition? And third, what roles will international organizations play in the process? These issues, and a proposed approach, are discussed in the sections that follow.

A. Current Regulatory Distinctions Should Not Continue to Apply and Eventually International Regulation of IP Telephony Will Be Necessary

As mentioned before, the primary problem with regulation of IP telephony is that there is no universal definition of the term 'IP telephony' suitable for a regulatory framework.[195] Its varied technical meanings produce different results under various nations' regulatory schemes, especially with regard to how distinctions are drawn between POTS and IP telephony.[196] This is often a product of those nations trying to fit the technology within existing regulatory frameworks.[197] A new approach could be to start with the definition of the new technology and build or adapt the framework around it. This avoids the all-too-common problem of being forced to alter the regulatory scheme because it does not function adequately with changed technology. Until adjustments occur, the manner in which new technology fits into such a framework is confusing and unclear, an undesirable state for any kind of law. This kind of forced change may lead to problems, such as inadvertently stifling a new technology before it can develop, or constantly changing the present framework because technology has gone in a direction unanticipated by the drafters of the framework. Following the new approach, once a basic definition is determined, nations can adapt the distinctions in their laws and regulations according to the definition, or decide to change the framework entirely.

Some commentators argue that regulations should be technology-neutral,[198] thereby eliminating the need for a definition of "IP telephony." This neutrality means that regulations should not try to draw distinctions between services based on the types of technology used to provide those services.[199] This is based on the idea of "convergence" that seems to permeate society today.[200]

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[195] *See supra* text accompanying notes 1-3.

[196] *See supra* Part III.

[197] *See id.*

[198] *See* Lee W. McKnight, *How to Regulate a Platypus: Internet Telephony Regulation, at* http://www.itu.int/osg/sec/spu/ni/iptel/workshop/mcknight.pdf (last visited Feb. 11, 2002).

[199] *See id.*

[200] *See* Roberts, *supra* note 105, at 156-57; Barbara Espin, *Internet Over Cable: Defining the Future in Terms of the Past*, 7 COMMLAW CONSPECTUS 37, 43 (1999) (discussing convergence with regard to telephone services and cable services). *See also NEC CNG* (describing a new type of IP telephone with advanced features, including Web browsing) *at*

One meaning of convergence recognizes that many technologies are now transmitting data and information in a digital format, as opposed to the conventional analog format, and that data networks can be utilized to transmit the information.[201] For example, under the current U.S. regulatory distinction between "telecommunications service" and "information service,"[202] POTS is a telecommunications service, while computer-to-computer IP telephony is an information service.[203] But what happens when a company manufactures a device that looks like a standard telephone but contains hardware that internally converts voice to IP packets for transmission over a data network.[204] Or, what happens when you have one device that combines the current functions of a television, telephone, and computer with Internet access. At that point it is unclear which category these devices would occupy, and thus what regulations, if any, they would be subject to.[205] These concerns illustrate a situation where a broad, yet comprehensive definition is most useful. Instead of trying "to fit the square peg that is IP telephony into the round hole that is traditional regulation,"[206] an appropriately shaped "hole" for a regulatory scheme can be designed to properly fit the "peg" that is IP telephony.

The above situation is also an example of where building a regulatory framework around the definition of a new technology would not work. The combination television-telephone-computer device described above does not exist, at least not yet.[207] Problems inevitably arise when a regulatory

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http://www.cng.nec.com/cng/NewsEvents/NewPressPage.asp?release=2002022001%2Exm (last visited Feb. 26, 2002); *See also IP Appliances and Peripherals* (describing another type of IP telephone with Web browsing features, among others) *at* http://www.mitel.com/news_events/pdf/background_peripherals.pdf (last modified May 15, 2002); Peter Forman & Robert W. Saint John, *Creating Convergence*, SCI. AM., Nov. 2000 (relating the history of convergence, dating back to the television in 1939, and speculating on the future) *at* http://www.sciam.com/2000/1100issue/1100stjohn.html (last visited Feb. 11, 2002); *Ceiva* (advertising a picture frame capable of connecting to the Internet to download digital photos) *at* http://www.ceiva.com/public/all_about_ceiva.jsp (last visited June 23, 2002).

[201] *See* Roberts, *supra* note 105, at 156-57.

[202] *See supra* text accompanying notes 110-33.

[203] *See id.*

[204] *See* In re Federal-State Joint Board on Universal Service, 13 F.C.C.R. 11501, 11637 (1998) (Furchtgott-Roth, dissenting) (asking a similar question with respect to the regulatory scheme of the United States).

[205] *See id.*

[206] Intven et al., *supra* note 37, at 28.

[207] However, technology is moving closer and closer to this point. *See Net2Phone* (describing two products, one that allow users to use a typical phone headset connected to a compute to place IP telephony calls, the other that allows a user to place IP telephony calls through their standard phone without having a computer), *at* http://store.net2phone.com/yapgear.asp (last visited June 23, 2002). Note that the prices of these devices add to the costs of using IP telephony. *See supra* text accompanying notes 52-55.

framework for a new technology is built around a definition that did not contemplate the existence of that technology.[208] How can one determine the underlying policy goals and risk-preventative measures of a regulation without knowing what precisely is being regulated? Unlike the devices mentioned above, IP telephony does exist. While it is sure to undergo many technological changes, there are numerous examples of the technology in use today.[209] There also exist what seem to be common goals and common fears. People know what they want from the technology, but also know the major risks involved in advance. As long as it continues to grow and develop as expected, it is an ideal situation to take the technology, define it, and build an adaptable framework around it. If the provisions providing for the adaptability of the framework are clear, confusion over how a new or changed technology will become part of the framework will be greatly reduced.

Another type of convergence is relevant to IP telephony. Internet access is not limited to a user using the PSTN to call their ISP. Alternative methods of access include DSL and cable modems. Such services can be more attractive to consumers because they are faster and can send more information than an Internet connection over the PSTN.[210] These facilities could potentially allow computer-to-computer IP telephony and computer-to-phone IP telephony that travels over networks other than the PSTN. A similar question to that posed above thus arises: what happens when your phone is connected to your television cable box and transmits your calls over the Internet - is that device subject to the government's ability to regulate cable, or telephony, or something else. If and when that happens, having shoe-horned IP telephony into the traditional POTS regulatory scheme will create further undesirable problems.

Based on the examples relating to convergence provided above, any "new definition" of "IP telephony" must determine what types of services currently in use fit under the term. Because of the current rate of change in technology, any definition must be broad enough so that the "square peg-round hole"

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[208] *See, e.g.,* In re Regulatory And Policy Problems Presented By The Interdependence Of Computer And Communication Services And Facilities, 28 F.C.C.2d 267 (1971) ("*Computer I*") (attempting to determine where computers are in the communications regulatory framework); In re Amendment of Section 64.702 of the Commission's Rules and Regulations (Second Computer Inquiry), 77 F.C.C.2d 384 (1980) ("*Computer II*") (clarifying and amending the confusing scheme set up in Computer I, and replacing it with a more simple scheme). Note that the scheme resulting from Computer II, carried over in the Telecommunications Act of 1996, has led to problems with more recent technologies. *See supra* text accompanying notes 193-198.

[209] *See supra* text accompanying notes 86-94.

[210] *See Verizon: Verizon Online DSL: About Speed*, *at* http://www.bell-atl.com/infospeed/more_info/about_speed.html (last visited Feb. 11, 2002) (comparing the speed and amount of information transmitted using various DSL connections versus a 56k modem connection); *Road Runner: residential High Speed Online See the Blazing Speed* (comparing the download time for a thirty-second video clip using Road Runner versus a 56k modem) *at* http://rrcorp.central.rr.com/hso/explore_speed.asp (last visited Feb. 11, 2002).

problem described above is avoided. Since there is no way to look into the future to see what new technologies await discovery, the definition should include a provision that allows for amendments and additions based on new technologies and developments as these enter widespread use. Additionally, the agreement on the definition should specify that regulatory schemes and distinctions must be flexible enough not to stunt the growth of any nascent technologies by subjecting such technologies to traditional regulations.

The best way to arrive at this new, comprehensive definition is to make use of the ITU, as described in section III.C later in this Note.[211]

B. It Is Possible to Continue POTS Subsidies in the Realm of IP Telephony and Continue the Movement Away From Regulation and Towards Increased Competition

The conflict over whether or not IP telephony should be regulated stems from two powerful forces that are in constant tension. On one side, which will be referred to as the "industry side," there is a call for increased competition, deregulation, and the opening of markets. This side advocates avoiding government regulation of the Internet in any form, as such regulation is perceived to be contrary to the public interest.[212] This includes governments placing a tax on the Internet in general or on particular Internet services or providers (especially IP telephony) in particular.[213] With respect to IP telephony, the industry side desires to make sure a nascent industry and technology,[214] perceived to have great potential,[215] are not stunted or inhibited in growth by government regulations. They believe increased competition and open markets, which seem to have led to great successes in POTS markets around the world, will address any and all regulatory concerns. The industry side wants all people to have access to IP telephony, just not under government regulation.

The other side, which will be referred to as the regulatory side, fears that IP telephony, and telephony services in general, will not reach the entire population unless regulation is in place. This side perceives IP telephony as drawing away from two vital monetary sources, universal service funds and international settlement rates, because it allows users to bypass POTS and these charges. Without the funds these charges supply, the regulatory side argues, it will be very hard and expensive to bring basic telephone service to all people, much less IP telephony service.[216] Another common argument on

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[211] *See supra* Part III.C.1.

[212] *See* Leonard J. Kennedy and Lori A. Zallaps, *If it Ain't Broke ... The FCC and Internet Regulation*, 7 COMMLAW CONSPECTUS 17, 30 (1999).

[213] *See id.*

[214] *See, e.g., Is The ITU Promoting National and International Regulation of VoIP and the Internet?*, The Pulver Report, Sept. 25, 2000 *at* http://pulver.com/reports/25sep00.html (last visited Feb. 11, 2002).

[215] *See supra* text accompanying notes 86-94.

[216] *See* Kennedy & Zallaps, *supra* note 212, at 30 (noting comments by Senator Stevens

this side is that to replace the lost revenue, a tax should be imposed on the data communication industry's sales or profits. Some advocates and nations on this side oppose open markets and increased competition in general, but not all.[217] Like the industry side, the regulatory side does not desire to stunt the growth of IP telephony technology, because they too see its potential. They just wish to make sure that everyone can benefit, and that no one is harmed by the growth of IP telephony.

Neither side is without its problems. For example, even increased competition has not helped to improve services in some developing nations.[218] Even in the most developed countries, like the United States, there are still portions of the population who lack access to a basic phone within their own dwelling.[219] Similarly, those nations that traditionally received high international settlement payments have used some of those payments for expenses not related to expanding or improving service.[220] The best solution seems to be one that allows for continued growth of IP telephony through increased competition, while still providing means for developing nations and rural areas to acquire basic telephone service.

This solution starts with the group that is the primary focus of both sides: the consumers, people who use the services. The goal is to provide basic service to as many consumers as possible while still keeping competition high and costs low. Thus, at the start, every nation should be required to provide at least some type of basic telephony service to its people. This effort will be funded, as it is now, through universal service payments and international settlement payments from POTS. This system functions well and can continue to do so even in the realm of IP telephony. As described below, IP telephony can contribute to each of these in a certain time and certain way.

IP telephony does not currently pose any dangers to universal service funds. The IP telephony industry is small, but growing.[221] It does not yet carry a significant amount of voice traffic, in either developed or developing nations.[222] Thus, for now, with regard to the contributions by IP telephony services to universal service funds, the focus should be on increased competition, and little or no regulation. This allows the service and technology to grow and flourish, keeping costs down, and encouraging consumers to begin using the service. At the same time, because universal service funds are affected only minimally, nations can continue to expand basic telephone service to those areas that lack it. Additionally, nations like Canada, which find that certain types of IP telephony fit within their currently regulatory scheme and subject them to universal service charges, can impose such

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of Alaska and Senator Burns of Montana).

[217] *See supra* note 180.

[218] *See supra* text accompanying notes 167-92.

[219] *See supra* text accompanying note 30.

[220] *See supra* text accompanying note 145.

[221] *See supra* text accompanying notes 86-94.

[222] *See id.*

regulations as they see fit, as long as the regulations do not stunt growth or competition.[223] As nations began to reach the defined minimal level of universal service, they can begin focusing efforts on expanding their basic level of service beyond the minimal level. As IP telephony use expands and begins to become a substitute for POTS, nations can begin to impose regulations and charges on the service as they see fit to counter the loss of universal service fund money that will occur as a result of IP telephony's expansion. Given the strength and growth of the service, it will not be harmed nor stunted should it now cost consumers a little more money. Additionally, this will help spread IP telephony service to all people in such a nation, a desirable public goal. For IP telephony to have reached such a point, competition must be strong; thus fears of decreased competition are lessened. When this occurs will be up to the determination of each nation, as will the specific regulations imposed. The primary focus of such regulations, however, should be to provide for universal service contributions while continuing to support growth and competition in the IP telephony industry.

With regard to international settlement and accounting rates, a slightly different approach is required. As described in section II.A.3, nations that in the past received large settlement payments from international phone calls may find it necessary to raise their local phone rates should those funds significantly decrease or disappear altogether.[224] IP telephony is an alternate way to make an international phone call bypassing the settlement and accounting rate structure.[225] Thus, IP telephony may pose a threat to those nations that rely on this revenue to support their telecommunications infrastructure and continue to expand services. However, imposing the current settlement rate structure on IP telephony would drive up the cost, decreasing use, competition, and the growth of the technology and industry. Thus, it currently seems unwise to impose any such regulations. Similar to universal service, once IP telephony use in a nation reaches a level where it is a substitute for POTS, then regulatory charges can be imposed. However, these will have to differ from the current scheme for technological reasons. Monitoring the number of minutes of international phone calls transmitted over the Internet may not be possible. The following section of this Note discusses how all these matters should be implemented.

C. The Roles International Organizations, Such as the International Telecommunication Union (ITU) and the World Trade Organization (WTO), Will Play in Deciding These Issues

Based on the analysis of this Note, there are two tasks that must be completed in order for anything to be positively done to regulate IP telephony.

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[223] *See* Intven et al., *supra* note 37, at 21-52 (describing the approaches of the European Union, Canada, the United States, Japan, and other nations to domestic regulation of IP telephony).

[224] *See supra* text accompanying notes 140-47.

[225] *See id.*

Each task is best suited to a particular international body currently in existence.

1. The ITU Should Take Care of Determining the Definition of "IP Telephony"

An international body like the ITU, composed of government, industry, and technology experts, with its growing knowledge of and wealth of experience with the various "voice over IP" services, seems ideally suited for developing such a definition. In fact, the ITU may be moving towards such a goal currently.[226] There are several reasons why the ITU is the proper organization for this role. The ITU has previously considered the technology and issues of IP telephony regulation, and continues to do so even now.[227] It has the procedures and organizational structures already in place to gather the leading industry, government, and technological experts together.[228] Having done so many times in the past, though for different purposes,[229] it would be much simpler for the ITU to serve this function than to try to create, organize, and convene such a gathering from scratch. The sole focus of the organization is telecommunications, because it allows the organization to take into account the ways in which the field is changing outside of the scope of just IP telephony. The ITU has knowledge of the current regulatory schemes in its member nations, particularly those bearing directly on IP telephony.[230] Thus, it would not need to do exhaustive and time-consuming work to become familiar with the various types of schemes and the policies that underlie them. This vital information can be kept in context when considering and determining the definition. The definition itself is described in section III.A. above.

2. The WTO Should Take Care of Determining the Levels of Service and Implementing Agreements to Make Sure All Nations Meet These Levels

Once this definition is developed, regulators, lawmakers, and industry and technology experts in the field from around the world can best determine if and how "IP telephony" should be regulated, both domestically and internationally. The best approach to international regulation is to follow a framework similar to that of the WTO's Basic Telecommunications Agreement.[231] The WTO is the best body suited to this task.

The first step is to negotiate, draft and have nations adopt a general

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[226] *See WTPF 2001 on IP Telephony* (regarding the ITU's recent conference on IP telephony) *at* http://www.itu.int/wtpf/index.html (last modified April 22, 2002).

[227] *See id.*

[228] *See id.*

[229] *See ITU Meetings, and Conferences* (listing upcoming and past meetings of the ITU and giving a brief description of their purposes) *at* http://www.itu.int/events/index.asp (last visited June 30, 2002).

[230] *See WTPF 2001, supra* note 223.

[231] *See WTO | The WTO in brief – 3, at* http://www.wto.org/english/thewto_e/whatis_e/inbrief_e/inbr03_e.htm (last modified June 3, 2002).

agreement. This agreement would set up the most basic goals and necessary requirements and guidelines for all nations. It would include the definition of IP telephony as determined by the ITU. It would also include the agreed-upon minimal level of basic service, as discussed in section III.B. above. It would also make clear the primary goals of any regulatory framework, including universal service funding, international settlement rate funding, increased competition, open markets, and access to minimal services for all people.

The next step requires each nation to determine its own schedule and commitments for meeting the goals and requirements of the general agreement. Since each nation is most familiar with its own telecommunications infrastructure, each nation can best determine for itself at what point IP telephony is a "threat" to settlement rates and universal service funds. Each nation can also best determine how a regulatory framework and scheme should function. This determination would be made using the definition developed by the ITU, and based upon the general agreement discussed above. As a suggestion each nation could follow the basics of the scheme suggested in section III.B. above.

Once each nation determined its own schedule and commitments, such would be submitted to the WTO for attachment to the general agreement. The agreement could be amended as necessary based on the schedules and commitments. Additionally, sufficient time should be provided in the general agreement for the negotiations that are sure to take place between member nations as they try to resolve these important questions.

The WTO is the ideal body to handle these duties. It has organized and effected such an agreement before,[232] and has a very large membership that includes most of the world's nations.[233] Additionally, and perhaps most importantly, the WTO has a settlement and dispute board already in place which could handle any problems that arise under the agreement or the schedules and commitments.[234] The suggested framework raises a variety of potential controversies, illustrating the importance of a dispute board. These controversies include issues such as member nations not keeping to their schedule and commitments, member nations violating the procedures of the general agreement, and member nations using the money intended for extending services for other purposes. The WTO settlement and dispute resolution board can address any of these problems in a just and efficient

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[232] *See WTO Trade Topics - Basic Telecommunications - Schedules of Commitments and Lists of Article II Exemptions, at* http://www.wto.org/english/tratop_e/servte_e/gbtoff_e.htm (last modified June 2, 2002) (discussing the results of the negotiations on basic telecommunications).

[233] *See WTO | What is the WTO?, at* http://www.wto.org/english/thewto_e/whatis_e/whatis_e.htm (last modified May 21, 2002) (listing the WTO membership as of Nov. 30, 2000 as 140 countries).

[234] *See WTO | Trading into the Future - Introduction to the WTO - disputes menu, at* http://www.wto.org/english/thewto_e/whatis_e/tif_e/disp0_e.htm (last visited June 30, 2002).

manner. The board "is extensively structured, with defined stages and an emphasis on prompt settlements."[235] Most of the member nations have already used this board at one time or another to deal with various other disputes governed by the WTO. Thus, these nations are familiar with its practices and procedures, and are comfortable with having it resolve disputes, as they know the board is capable of doing so fairly.

V. CONCLUSIONS

Narrow definitions in the black letter text and legislative history of various nations' telecommunications laws have no place in the current quick-paced, ever-changing, technology-based world of international telecommunications. International consensus must be reached with a comprehensive broad definition of what we today call "IP telephony". The decision on this definition must determine what types of services would be included. This will allow nations to make intelligent and informed choices regarding possible regulations, instead of simply trying to shoehorn a new technology into an old scheme that never contemplated that technology's existence in the first place. An international body like the ITU, with its growing knowledge of and experience with the various "voice over IP" services, seems ideally suited for developing such a definition.

Once this definition is developed, telecommunication regulators and lawmakers around the world will best be able to determine if and how "IP telephony" should be regulated, both domestically and internationally. The best approach to international regulation is to follow a framework similar to that of the WTO's Basic Telecommunications Agreement.[236] First, nations must negotiate and sign a general agreement. This agreement must set up the most basic goals and necessary requirements for all nations. Then each individual, sovereign nation will determine its own schedule and commitments for meeting the goals and requirements of the general agreement. However, these goals and schedules would need to be approved by the nations as a whole before the agreement could take effect. Since the WTO has organized and implemented such an agreement before,[237] it is the most ideal body to handle such duties.

Any regulatory scheme, or lack thereof, must initially focus on increased competition and decreased (or no) regulation. This would allow the industry to continue to grow and develop to the point where it may become a substitute or even a replacement for the traditional POTS system known all over the world. However, should it reach that stage, regulation may be necessary to maintain the focus on expanding basic services to all people. At that time, nations may need to move to a scheme where increased competition is not the sole concern.

The great allure of IP telephony for consumers, assuming the quality is at

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[235] *See* Alissi, *supra* note 134, at 490.

[236] *See supra* text accompanying notes 151-66.

[237] *See id.*

least as good as POTS, is its cost.[238] This is also the great allure for businesses, as consumers around the world may flock to a new high-quality service, which is less expensive then their current service. Yet this is also the cause of worry and concern among developing nations and representatives of rural sections of developed nations.[239] The subsidy schemes in place for POTS under current regulations allow the continued expansion of services to the people in such nations and areas. The desire of the industry and nations to not regulate "IP telephony" must be balanced by the equally great desire to expand basic services, and the benefits they bring, to all people, not just those living in the most technologically advanced parts of the world.

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[235] *See supra* text accompanying notes 52-57.

[236] *See supra* text accompanying notes 166-92.