Internet Telephony—The Regulatory Issues

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Due to the practical nature of the subject matter, and the unavailability of sources, the editors have relied on the expertise and experience of the authors for the accuracy of this article.

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Introduction

Internet telephony and other forms of voice telephone services that use the Internet Protocol (IP), and other voice services provided over packet-switched data networks are proliferating. While many new IP telephony services will never make it out of the laboratory and into the market, others have already deployed national and international networks. Telecom analysts, investment bankers and regulators have studied and reported on the potential for IP telephony services and their implications.

This paper reviews the development of IP telephony and the key related telecommunications regulatory issues. Section One provides a technical overview of various forms of IP telephony services and describes recent developments in the market for such services. Section Two provides an overview of the existing regulatory approaches and industry arrangements which will be most affected by IP telephony, and which, in turn, will most affect the development of IP telephony services. The focus of Section Two is the major telephone subsidy schemes that are integral to current domestic and international telecommunications regulation. These include domestic interservice subsidies, subsidies to support universal service and the subsidies built into the accounting rates which form the basis for international telephone revenue settlements. Other regulatory issues affecting IP telephony include licensing and entry requirements for new service providers and traffic routing restrictions.

Section Three provides a detailed review of recent regulatory developments related to IP telephony in the European Union, Canada, the United States, Japan and a number of other countries.

I

The Development of IP Telephony

A. IP Telephony—A Technical Overview

1. Background

Conventional voice telephony relies on a circuit-switched network (the public switched telephone network or "PSTN") in which each conversation uses a fixed amount of bandwidth
for the duration of the call.\textsuperscript{1} The conversation is routed through a number of switches, each of which dedicates the standard volume of bandwidth.\textsuperscript{2} When a signal is given that the call is terminated, the switches release the allocated bandwidth such that it may be used in a subsequent call.\textsuperscript{3}

With conventional telephony, the available bandwidth is dedicated to a call even if no information is being transmitted.\textsuperscript{4} Therefore, the silences on either end of the call are transmitted to the other end, and the bandwidth cannot be used for other calls.\textsuperscript{5}

In contrast, the Internet uses packet-switched networks.\textsuperscript{6} In such networks, information is sequentially broken down into individual packets of digital bits which are transmitted to their destination through various network routers or switches.\textsuperscript{7} Depending on the quantity of packets from other sources that are occupying the bandwidth between routers, each packet may take a different route to its destination.\textsuperscript{8}

In a packet-switched network, each packet of information must share the available bandwidth with a myriad of other packets, each with its own content and destination.\textsuperscript{9} The only requirement is that all packets be enclosed by a standard encoded "envelope", including the ultimate destination for that packet.\textsuperscript{10} This format is called Transmission Control Protocol/Internet Protocol (commonly abbreviated to "TCP/IP" or even simply "IP").\textsuperscript{11} The TCP/IP format ensures that regardless of the contents of the packet within the "envelope", the packet can be successfully transmitted to its ultimate destination by the routers that form the Internet network of networks.\textsuperscript{12}

\textsuperscript{1} See William Stallings & Richard Van Slyke, Business Data Communications 189 (3rd ed. 1998).
\textsuperscript{2} See id.
\textsuperscript{3} See id.
\textsuperscript{4} See id.
\textsuperscript{5} See id.
\textsuperscript{6} See id. at 190.
\textsuperscript{7} See id.
\textsuperscript{8} See id.
\textsuperscript{9} See id. at 189.
\textsuperscript{10} See id. at 192.
\textsuperscript{11} See id. at 351.
\textsuperscript{12} See id.
The packets sent from an originating source through the Internet to a specific destination may arrive by a variety of routes and in any chronological order. The computer on the receiving end must request a retransmission of any missing packets from the sending computer, reorganize the packets into the proper order, remove the TCP/IP "envelope" around each packet and finally process the received information as appropriate for the particular application for which the packets are required.

Because of the differences between packet-switched networks and "PSTN", a voice conversation over the Internet would be quite different from a voice conversation using conventional circuit-switched telephony. First, the speaker's sounds are "packetized," or broken into sequences of packets which have IP "envelopes" applied to indicate their destination. The packets are then sent through the Internet. At the other end, the packets are reassembled, the IP "envelopes" stripped, the packets processed, and the speaker's voice regenerated. During silences in an IP voice conversation, unlike circuit-switched telephony, no packets are sent and the available bandwidth is used by other IP applications.

IP telephony poses various technical difficulties, two of which are particularly challenging. First, the packetizing, transmission, and de-packetizing must take place quickly and with sufficient voice quality that natural interaction is possible between the speakers. A second difficulty involves the location at which the packetizing and de-packetizing takes place. One option is for this processing to be performed on the premises of the speaker and/or listener, at his or her computer. Another option is to perform the processing at the premises of an IP voice provider, which is an entity that facilitates the connection between the speaker (who connects with it through the PSTN) and the Internet, and provides all the packetizing and transmission services. From the speaker's

13. See id. at 354-56.
14. See id.
15. See Fred Hapgood, Iphone, 3 WIRED 10 (Oct. 1995) (Internet reprint at <http://www.wired.com/wired/archive/3.10/iphone.html>). The delay in transmission of regular circuit-switched calls is approximately 30 ms. The delay in current voice over frame relay calls is around 80 to 100 ms, and the delay in current voice over IP calls can be as high as 400 ms. Silences in conversation are said to be almost as meaningful as the words spoken, and so speakers are very sensitive to even small delays in the transmission of their speech.
perspective, using an IP voice provider is analogous to conventional telephony because the speaker uses an ordinary telephone to conduct the conversation. Alternatively, a hybrid option exists in which the packetizing occurs at the premises of one speaker, while an IP voice provider serves the same function for the other party.

It is not necessary that the Internet be used to transmit packetized voice communications. Any packet data network can be used in the same fashion, including Frame Relay, X.25 and X.400 networks, but the technical issues remain regardless of the type of network used. IP telephony is only a subset of the possible “voice over data” services that could evolve. One of the differences between various voice over data protocols is that different types of “envelopes” are used for packets. In addition, while the IP protocol is generally used over the public Internet, other data protocols are usually employed on private data networks. Apart from this, the technology and technological issues are essentially similar.

2. Methods of Provision of Voice over Data Services

a. Computer to Computer

People seeking to use the most basic and earliest form of IP voice service must install packetizing and routing software on their computers. Both parties to the IP voice telephone call must use the same software. Additionally each party will require a computer sufficiently powerful to packetize the sounds made through an attached microphone, a full duplex sound card to allow for simultaneous two-way communications, speakers to recreate the sound and a high-speed modem.

The Internet service providers (“ISP’s”) through which each party connects to the Internet generally cannot determine whether the packets being sent by their subscribers contain data or portions of compressed voice conversations. As with any other Internet application, such as e-mail, FTP, Telnet, Usenet, or World Wide Web connectivity, the role of

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16. File Transfer Protocol is a method of retrieving files from remote computers attached to the Internet.

17. A method of connecting and logging into remote computers attached to the Internet as if physically present at a terminal connected to that computer.
the ISP is simply to route the subscriber's packets to the
destination marked on their TCP/IP "envelopes."

Further, each party must be connected to the Internet and
usually pre-arranges with the other that the IP voice
telephone call will occur. The voice quality of the calls are poor
(some liken it to ham radio), and owing to delays in
packetizing, transmission and de-packetizing, it is difficult to
maintain a flow to the conversation.

These impediments to setting up "computer-to-computer"
IP voice telephone calls have detracted significantly from their
consumer allure.

b. Virtual Private Networks

Many companies and other organizations that operate
packet-switched private data networks are technically able to
utilize them for voice telephony.\footnote{Virtual private networks for voice communication are commonly
implemented as an overlay network on the PSTN, and do not raise the same
regulatory issues as IP telephony. The discussion here focuses on VPNs used for
packet data communications. These networks can use any packet data protocol,
such as Frame Relay, X.25, X.400 or IP.} Indeed, the technical
hurdles are less daunting due to the closed nature of the
network, which results in greater reliability of packet
transmission than on the public Internet. This means that
delay in packet reception and processing can be minimized so
that perceived silences are closer to live conversation.

c. Voice Terminating on PSTN

The major developing market for voice over data involves
phone-to-phone communications utilizing the Internet (or
another packet data network) as the transmission medium. In
this manner, the regular PSTN connects each party to an IP
voice provider, who in turn processes the call and gains the
revenues therefrom. This "phone-to-phone" technology is seen
by many as the future of consumer IP telephony.

For example, a customer service representative in Saint
John, New Brunswick could call a client in London, England
by routing the call through the company's private data

\footnote{A message storage and retrieval system synchronized across hundreds of
servers on the Internet, sorted by topic. At present there are over 15,000 topics
(or "news groups"), organized by hierarchy, active on the Internet. Each "news
server" can choose to carry any or all of the synchronized news groups, and may
also carry limited-access private news groups.}
network to a node in England. The call would then be switched to the PSTN for termination at a lower rate than if the customer service representative were to call the client directly. The company could engage in its own form of "switched hubbing." Routing calls through centers attached to the VPN that offer the most favorable rates for off-net termination of calls over the PSTN.

New entrants may also provide a "carriers' carrier" service by developing their own international networks to receive, transmit and deliver the international traffic of other telecommunications carriers using voice over data technology. \(^2\) Parties to a conversation routed through such a "carriers' carrier" are unaware that their conversation is being sent as voice over data because the long distance carrier of the calling party transparently transfers the call to the voice over data carrier, which terminates the call over the called party's PSTN access lines.

d. Gateway Services

Another emerging market in IP telephony is "gateway" services provided by companies that act as intermediaries between the Internet and the PSTN. Such IP voice providers attempt to support various standards, including H.323, the audio compression standard endorsed by the ITU. They also attempt to terminate IP calls over the PSTN using whichever standard the calling party may be using, even if the calling party is performing a "computer-to-phone" IP telephone call.

One company has announced plans to take the technology one step further by creating a gateway that monitors the quality of voice transmission of each call over the IP network, and seamlessly switches calls to the PSTN if their voice quality drops below a pre-determined limit. \(^2\)

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20. Such a service is currently provided by AlphaNet Telecom Inc. of Toronto, which provides international carrier services for the transmission of voice, facsimile and data traffic over high speed global data networks. AlphaNet currently has points of presence in 12 countries.

B. IP Telephony—Market Developments

1. Scope of Market

Estimates of the size of the potential IP telephony market vary considerably. The Gartner Group estimates that IP telephony services will be a $3 billion market by 2003. This represents a minuscule 0.2% of the estimated $1.4 trillion network services market at that date. Forrester Research Inc. estimates the market will be $2 billion by 2004, and Ovum estimates a $14 billion market for IP telephony technology will have developed by that time. Analysis Ltd. puts the worth of the IP telephony market as high as $7 billion by 2003 and estimates that the Internet will carry over 25% of international call minutes by that date.

Many of the major international telecom carriers, including AT&T, MCI, Sprint, Telecom Italia and Deutsche Telekom are exploring domestic and international IP voice markets. Some are already conducting trials. Most traditional PSTN hardware manufacturers are also exploring or developing products for the market, including Nortel, Lucent, Ericsson and Vienna Systems (a subsidiary of Newbridge Networks).

Many software developers are also present in the market. Among them are those that developed the “PC-to-PC” market, including VocalTec, Netscape, Microsoft, Novell, Clarent and StarVox.

Coalitions have also been formed with the intention of establishing multinational gateways by working with local IP

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23. See id.
27. See Phil Jones, *Deutsche Telekom Moves To Outflank Internet Telephony Threat With Own United States Pilot*, COMMUNICATIONS INTERNATIONAL REPORTS (April 9, 1998) <http://www.totaltele.com>. For example, Deutsche Telekom recently announced an IP voice trial in its domestic German market, which is running at the same time as its trial in the U.S. market. See id.
voice providers in jurisdictions that offer these services. Such coalitions include ITXC Corporation and Delta Three, Inc., among others.

2. Applications

Numerous companies have designed innovative IP voice applications. In addition to the approach taken by StarVox with its gateway service, 28 other vendors have also sought to address quality issues. As well as designing gateways for use by corporations to allow IP voice over their virtual private networks, 29 Clarent Corp. has announced a gateway that reduces IP voice latency about 50 per cent to 150 ms. 30

For example, MCI has introduced a “Call-Me” service which allows users to click a button within a web site and be connected to that company’s customer service call center, through the Internet. 31 Other service providers are developing similar features.

Numerous vendors are working on new standards that will permit these applications and others such as those that facilitate teleconferencing and telework. 32 Their success, however, hinges on the approach to IP voice telephony issues taken by regulators around the world.

28. See supra note 21 and accompanying text.


31. See Paulak supra note 22.

II
IP Telephony & the Current Regulatory Model—
Square Pegs in Round Holes

A. The Current Regulatory Model

The traditional regulatory models and industry arrangements that developed over the first century of telephony have come under increasing pressure over the last decade.

The development of IP telephony has, to date, only been a small factor in increasing that pressure. The movement towards deregulation and trade liberalization which began in North America 30 years ago, and then swept through much of Europe and some other markets in the South Pacific, Asia, Africa and Latin America, is now becoming part of official national and multilateral policy. Supplemented by market forces, recent initiatives, such as the World Trade Organization’s 1997 Agreement on Basic Telecommunications and a campaign by the United States Federal Communications Commission (“FCC”) to decrease international accounting rates, are increasing the pressure to change existing regulatory models.

Spurred on by “Internet Fever,” providers of various forms of IP telephony have assembled the financial and technical tools to challenge voice telephony markets head-on. As they do so, they will increasingly run up against (or in many cases, run around) existing telecommunications industry arrangements and regulatory models that are already under threat from the forces of deregulation and trade liberalization.

This Section of the paper provides an overview of the existing regulatory and industry models that will be most threatened by IP telephony, including various telephone subsidy schemes, licensing and entry requirements and traffic routing restrictions.

1. Telephone Subsidy Schemes

In an ideal competitive and efficient telecommunications marketplace, the prices of various telecommunications services would be closely related to the costs of providing each service. That ideal is approached in few, if any, countries today.
While the greatest price/cost discrepancies exist in certain developing countries that use international telephone revenues as a source of financing for various domestic telephone and non-telephone purposes, these countries are not alone. As representatives of developing countries frequently point out, the industrialized nations that are currently in the forefront of the telecommunications deregulation movement have made extensive use of subsidy and “hidden taxation” schemes to finance the nearly ubiquitous basic telephone networks they enjoy today.

Most industrialized nations, including the United States, Canada and the European Union countries, still have substantial inter-service cross-subsidies built into their current telecommunications pricing schemes. These cross-subsidies provide opportunities for arbitrage by new telecommunications service providers. For example, IP telephony providers can avoid payment of “subsidy taxes” levied on traditional voice telephony providers, thus providing them with a cost advantage that can be translated into lower prices.

Some of the subsidy schemes are domestic, others international. Some, such as the traditional North American cross-subsidy from long distance to local service, have been around for decades. These may not disappear entirely, but rather may be replaced by or supplemented with other, more explicit and targeted subsidies, such as those intended to finance “universal service.”

Among the international subsidy schemes, the most significant one by far is built into the current International Settlements arrangements based on accounting rates. An overview of each of these subsidy models is provided below. A more detailed examination of the existing subsidy models in different countries is provided in Section Three of the paper.

a. Domestic Inter-service Subsidies

In North America, revenues from long distance telephone calls have long been used to subsidize the costs of the local telephone access networks.\(^{33}\) Today, after lengthy regulatory

\(^{33}\) This cross-subsidy seems to have resulted from an industry and regulatory policy that is predicated upon the belief that the cost savings
proceedings in the United States and Canada, these subsidies are more explicit and significantly smaller than they were two decades ago. However, they still exist.

In the United States, the collection mechanisms for these subsidies are interstate and state access charges established by the FCC and United States state regulators. Providers of long distance telephone services in the United States (Interexchange carriers, or “IXCs”) pay access charges to the local telephone companies (Local Exchange Carriers, or “LECs”) which originate and terminate the long distance calls. In 1997, FCC-administered access charges were reduced to an average level of $0.012 per minute at each end (originating and terminating) for a total of $0.024 per average minute of long distance calling in the United States.\(^3\)\(^4\)

In Canada, long distance telephone service providers pay a “Carrier Access Tariff” and “contribution charges” to the telephone companies that originate or terminate their long distance calls. The contribution charge represents an explicit subsidy intended to cover the shortfall between the costs and prices for local telephone services. The contribution charge currently ranges from $0.005 to $0.027 Canadian per minute per end.

The tariff structures of a number of other countries incorporate subsidies between various classes of service. In some cases, such as the United Kingdom, these have been studied extensively, but in most countries they have not. As a result, the degree of cross-subsidization between many types of domestic telecommunications services remains uncertain in most countries.

resulting from the introduction of more efficient long distance telephone services during the 1950s and 60s, such as microwave telecommunications systems and direct distance dialing, should be used to subsidize the costs of local telephone access, rather than accruing directly to the users of long distance services.\(^3\)\(^4\)

34. First Report and Order, FCC 97-158, (May 16, 1997). LECs recover the shortfall in their local access through a variety of charges, part of which is included the Interstate Access Charge System. In addition, Subscriber Line Charge (“SLC”) is paid directly to LECs by their local residential and business line customers. The interstate access charges include a flat-rated per line charge (the Presubscribed Interexchange Carrier Charge, or "PICC") paid by IXCs to LECs. Finally, to the extent that those access charges do not recover the local access costs of the LEC, a second interstate access charge (the Carrier Common Line Charge or CCLC) must also be paid by IXCs to LECs. The CCLC is charged on a per minute basis.
Until recently, most forms of IP telephony have avoided the payment of long-distance-to-local telephone subsidies in North America, Europe and around the world. However, various forms of IP telephony are starting to be drawn into the subsidy-paying group of telecommunications services, particularly in Canada and the United States. Individual country developments are summarized in Part three of this paper.

b. “Universal Service” Obligations

In recent years there has been a movement away from the broad untargeted subsidization of local and domestic telephone services by long distance and international services and toward more specific targeted forms of “universal service” subsidy mechanisms. In some cases, universal service subsidies are mandated by domestic telecommunications legislation.

In the United States, for example, section 254 of the 1996 Telecommunications Act requires all telecommunications carriers that provide interstate telecommunications services to contribute to mechanisms established to preserve and advance universal service. The FCC may expand the net of subsidy-paying services to cover other providers of interstate telecommunications if it considers that “the public interest so requires.”

In Canada, section 7(b) of the 1993 Telecommunications Act affirms that one of the objectives of Canadian telecommunications is to render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada.” With this policy in mind, the Canadian Radio—Television Telecommunication Commission (“CRTC”) has recently initiated a public review of the methods of financing local telephone access in high cost serving areas.35

Other governments and the International Telecommunications Commission (“ITU”) have developed detailed policies regarding the promotion of universal service objectives.

35. In re Service to High Cost Serving Areas, CRTC 97-42 (Dec. 18, 1997).
Section Three of this paper reviews the approaches used in various countries to determine which classes of service providers are "taxed" with paying for the achievement and maintenance of universal service objectives. It is in this context that the regulatory classification of IP telephony services becomes critical. For example, in the European Union, universal service charges are paid by providers of "voice telephony service." Thus, the question of where IP telephony service is a voice telephony service determines whether this form of telephone subsidy is paid by IP telephony providers. Similarly, as detailed in Section Three, there is an ongoing debate in the United States as to whether IP telephony falls into the classes of services that must contribute to the "universal service fund."

c. International Settlements

The last major form of telephone subsidy that will be discussed in this paper is particularly relevant to international providers of IP telephony services. Public Telecommunications Operators ("PTOs") that provide international services have traditionally settled revenues for international calls based on "accounting rates" negotiated between such PTOs for each country pair. Revenues from calls between a particular country pair are generally split between two or more operators providing service between those countries based on the difference in traffic originating and terminating in each country.

The PTO that originates traffic to another country is entitled to a credit of half the accounting rate for that country pair, plus the excess between the full accounting rate and the higher "collection rate" it charges to its customers. Some of this excess must of course be shared with local telephone companies in its domestic market. The other half of the accounting rate must be paid to the PTO in the other country that terminates the call.

Accounting rates may have been cost-based at one time, but over the years, they have escalated to a level where, for many country pairs, they are well in excess of associated costs. Generally speaking, countries with more monopolistic telephone systems have maintained high accounting rates, while those with more competitive systems have not. This
discrepancy is the result of competitive pressures and partly the result of government regulatory policies.

In theory, PTOs in both countries should benefit equally from the traditional revenue-settlement method, since payments to both are based on the same accounting rate. However, for a number of economic, social and market-based reasons relatively low-tariff countries such as the United States, United Kingdom and Canada originate far more traffic to the rest of the world than they receive. Since revenues are settled on the basis of the net imbalance of traffic, the country that originates more traffic sends a check to the receiver of the traffic, and checks never come the other way. As a result, carriers from net call-exporting countries pay large sums of money to net call-importing countries, such as those in many parts of Europe, Asia and most of the developing world.

International call revenues provide a major source of external revenues for the PTOs (including government-run telephone administrations) around the world. In addition to international settlements based on the accounting rate model, such PTOs often receive significant earnings from high domestic collection rates for international calls. In many developing countries, the business sector produces a large proportion of outgoing calls. In a number of cases, individual hotels frequented by travelling business people rank among the top ten sources of telephone revenues in the country.36

Thus, international calling provides a major source of subsidy for PTOs in the majority of the countries of the world. Depending on the country, this subsidy is used for a variety of telephone and non-telephone related purposes. In countries with private sector PTOs, a part of this subsidy may directly benefit the PTO's shareholders, but other parts are typically directed to cover local telephone network costs. Such cross-subsidies are often implicitly required by regulatory policy or government franchise agreements, such as those which specify network roll-out obligations of the PTO. Other portions of the subsidy will typically be used to cover non-telephone related government expenditures. In the case of private sector PTOs, such subsidies will typically be transferred to governments through dividends, royalty payments and taxes.

36. For example in Indonesia.
d. Accounting Rate Reform

The international settlement regime based on accounting rates has long been under attack by economists, policymakers in developed countries, and international trade organizations.

Indeed, a multilateral consensus has emerged that the traditional accounting rate system must be reformed. The ITU, the Organization for Economic Cooperation and Development ("OECD"), the FCC and other regulatory bodies are pursuing various initiatives to reform or replace the existing accounting rate systems. These regulatory initiatives are aimed at reducing the current competitive and pricing distortions embedded in the accounting rate system. In the wake of the World Trade Organization ("WTO") agreement, a system of traffic compensation that is not "cost-oriented" is not only unsustainable, it also violates the regulatory principles set out in the WTO Reference Paper.

The FCC has been in the forefront of the move to decrease accounting rates. In August 1997, the FCC adopted a number of "benchmark" accounting rates for different countries, which it considered more closely related to the actual costs of providing international service between those countries and the United States. The benchmark rates range from $0.15-$0.23 per minute, and are far below those currently in place, particularly for most of the developing countries which are sometimes in excess of $1.00 per minute. If implemented, these rates would significantly reduce international calling revenues of these countries. While the FCC obviously has no direct regulatory jurisdiction outside of the United States, it has threatened to deny access to the American market to PTOs from other countries that do not reduce their accounting rates to the benchmark levels.

While the future of the existing accounting rate system is being debated in regulatory circles, an increasing proportion of international traffic is bypassing this traditional system of compensation. Facilitated by the global trend towards the liberalization of telecommunications markets, new technological means for bypassing the accounting rate system are developing rapidly.
A recent ITU report identifies a number of technological and service innovations that are undermining the accounting rate system. These innovations or "new modes of operation" include international simple resale, refile and hubbing arrangements and Internet telephony. The impact of these new arrangements on the accounting rate system are far-reaching. For example, the ITU report notes that "new modes of operation," including IP telephony, offer major opportunities for diverting traffic from the settlement process.

Recent technological developments, together with the beginnings of gateway arrangements allowing telephone calls to flow between the Internet and the PSTN, opens up a realistic possibility that the carriage of international telephone calls via the Internet ("Internet telephony") will soon move from its original more or less prototype or hobbyist status to become a major "mode of operation" for carrying commercial traffic. It seems so far that this may happen entirely outside the conventional regulatory framework; it is certainly happening outside the traditional settlement systems.

This same message was emphasized by Dr. Pekka Tarjaenne, Secretary-General of the ITU, nearly two years ago "For developing countries, the bigger threat lies in the bypass of the accounting rate system by alternative networks such as voice over data networks (such as Internet or frame relay), international simple resale, private networks, or satellite bypass."

The pressures that IP telephony and other alternative network services are placing on the accounting rate system are recognized by many industry observers as accelerating the move toward open telecommunications markets and "cost-oriented" settlement rates. As the FCC recently remarked:

In the international realm, the Commission has stated that IP telephony serves the public interest by placing significant downward pressure on international settlement rates and consumer prices. In some instances, moreover, IP telephony providers have introduced an alternative calling option in

38. See id.
39. Id. at 83.
foreign markets that otherwise would face little or no competition. We continue to believe that alternative calling mechanisms are an important pro-competitive force in the international services market.

Given the potential role of IP telephony in securing lower international settlement rates, the FCC has been very careful not to undermine this valuable "weapon against excessive international settlement rates." In particular, the FCC stated in its Universal Service Report that "it may not be appropriate to apply the international accounting rate regime to IP telephony."42

2. Other Regulatory Mechanisms Affecting IP Telephony

While the main economic and regulatory issues facing the IP telephony industry at this point in time relate to their inclusion in the subsidy-paying group of telecommunications service providers, a number of additional regulatory mechanisms may affect IP telephony services.

a. Market Entry Requirements

To date, most Internet services have been classified by regulators as non-basic or non-voice services. As such, Internet service providers have generally not been subject to the more restrictive or onerous licensing or market entry requirements that frequently apply to conventional voice telephony service providers. However, as the market for IP telephony develops and Internet voice services begin to compete directly with traditional voice services, regulators may see fit to impose licensing, registration, or other entry requirements on IP telephony providers.

The nature and scope of any entry requirement will determine its potential impact on IP telephony providers. For example, in many countries, providers of voice services must file for and obtain a carrier license or concession from the relevant regulatory or government body in order to enter the market. Such a process may be time-consuming and may

43. Id.
expose IP telephony providers to a variety of license conditions and regulatory requirements (e.g., interconnection, equal access, proportionate return, etc.). In some countries, hefty franchise fees and royalty payments are levied upon conventional public telephone services providers.

Therefore, in many countries, the requirement to obtain a voice telephony license and to meet related license conditions will create a significant barrier to entry for IP telephony providers. Such entry requirements are likely to stifle the development of IP telephony services.

On the other hand, to the extent that IP telephony providers are simply required to register or file a notification with the regulator or Ministry of Communications, the application of a market entry test or requirement may not be of any real consequence to the IP telephony industry. Such a light-handed regulatory registration regime is under consideration in some countries.

b. Routing Rules

If IP telephony providers are treated, for regulatory purposes, as carriers of basic voice services, they may be required to comply with routing rules and restrictions in place of traditional voice services. Depending upon the jurisdiction, these rules may prohibit such activities as refile, call-back, switched hubbing, and other forms of bypass of the accounting rate system.

Given the intermeshed network structure of the Internet and the virtual impossibility of monitoring individual packets of data information, it seems highly unlikely that regulators or governments will be capable of effectively applying and enforcing traditional routing rules on all IP telephony services.

III
A Survey of Regulatory Developments in IP Telephony

A. European Union

In the wake of the full liberalization of most of the European Community telecommunications market on January 1, 1998, the European Commission (Directorate-
General for Competition—DGIV) announced in early 1997 its intention to clarify its treatment of Internet telephony. The Commission issued a draft notice on the status of voice on the Internet as a supplement to Directive 90/388/EEC on competition in the markets for telecommunications services. Directive 90/388/EEC defined in detail the services which Member States may continue to reserve to their telecommunications organizations. 44

The Commission's draft notice on the status of voice on the Internet concludes that telephony via the Internet is not subject to the regulation applying to voice telephony until certain conditions have been met. In particular, the draft notice stated that "voice on the Internet cannot be considered as "voice telephony" in the sense of [Directive 90/388/EEC] and therefore falls within the liberalized area." The draft notice indicated, however, that this preliminary view would be kept under review in light of technological and market developments. The Commission noted that it intended to adopt the draft position as a supplement to Directive 90/388/EEC after having heard any comments from interested parties.

1. The January 10, 1998 Status Notice

Following a broad public consultation held between May and July 1997, the Commission published its regulatory position on Internet telephony and voice communications over the Internet (the "Status Notice") on January 10, 1998.

The Status Notice generally adopted the positions and recommendations set out in the earlier draft notice. As noted in the press release to the Status Notice:

Currently, Internet telephony does not meet all [the] criteria [for voice services], and therefore will not be considered as voice telephony for the time being. This assessment was broadly endorsed during the public consultation. This will keep markets open for innovation regarding the Internet which could lead to multimedia telephony being offered over it. It also means that no contribution can be required from Internet access providers for the funding of universal service obligations.

44. The 1990 Directive allowed member states to reserve the supply of voice telephony services, and the related competitive provision of infrastructure for such services until 1998. The majority of EC member states were required to fully liberalize their telecommunications markets on January 1, 1998.
The Commission's review of the status of voice communications over the Internet was conducted with reference to the definition of "voice telephony" in Article 1 of Directive 90/388/EEC. Pursuant to this Article, "voice telephony" means:

The commercial provision for the public of the direct transport and switching of speech in real-time between public switched network termination points, enabling any user to use equipment connected to such a network termination point in order to communicate with another termination point.

In the context of this definition of voice telephony, the Status Notice addressed two key regulatory questions:

(a) Whether Internet telephony services, in the run up to the full liberalization of voice telephony services and telecommunications infrastructure in 1998, were already in the liberalized area, after the assessment under the Voice Telephony definition in Directive 90/388/EEC; and

(b) To what extent should those elements of the regulatory framework for 1998 that are applicable to the provision of voice telephony services be applied to voice communications services provided over the Internet.

The Status Notice considered these key regulatory questions with regards to three distinct categories of voice communications making use of the Internet: (i) computer-to-computer voice services; (ii) computer-to-telephone voice services; and (iii) phone-to-phone voice services.

Each of these categories of Internet telephony was then analyzed in light of the voice telephony definition in Directive 90/388/EEC. The Status Notice indicated that voice communications via the Internet could only be considered as voice telephony if each of the following criteria were met:

1. Such Communications are the Subject of a Commercial Offer

The Status Notice stated that "commercial" means that the transport of voice is provided as a separate commercial activity with the intention of making a profit.

The Status Notice concluded that,

given that in most cases, the facility for voice communications is only one part of an integrated Internet service offered to the customer, where the voice service is ancillary to other elements of the Internet service. Internet voice will as a general rule not match this first element of the Community voice definition.

The Status Notice stipulated, however, that where phone-to-phone Internet telephony is marketed in the European Union as an alternative form of voice telephony service, it would be considered as a commercial offering and would therefore satisfy this first criterion for voice telephony.

(2) For the Public

The Status Notice concluded that computer-to-phone and phone-to-phone voice communications transmitted via the Internet would meet this criterion, since such services would be available to all members of the public.

(3) To and From Public Switched Termination Points

For Internet telephony to be classified and treated for regulatory purposes as a voice telephony service, it would not only have to be offered commercially and to the public, but it also would have to connect two termination points on the PSTN at the same time.

The Status Notice concluded that, “if access to the Internet is obtained via leased circuits, the service could never be considered as voice telephony, even if the call terminates on the public switched network. This would be true whether connecting a telephone or computer.” However, where regular PSTN connections (i.e., local loops) are used in lieu of leased circuits to connect two termination points, Internet voice applications would satisfy this criterion.

(4) Involves Direct Transport and Switching of Speech in Real-Time

The Status Notice concluded that, at this time, the quality of Internet telephony cannot be considered the same as conventional telephony. In particular, the Status Notice observed that transmission of voice over the Internet is subject to unpredictable congestion risk, making it difficult to guarantee the same level of reliability and speech quality as produced by the PSTN.

The Status Notice indicated, however, that “where organisations offering phone-to-phone Internet voice are
guaranteeing quality of speech by bandwidth reservation and claim themselves that the quality of the service is the same as circuit-switched PSTN voice, this element of the voice telephony definition will obviously already be met."

Applying the above-noted criteria, the Commission concluded that Internet telephony services cannot for the time being be considered "voice telephony," and therefore should not be subject to traditional voice telephony regulation.

The Commission noted, however, that its ruling may need to be re-assessed in light of future developments:

The current position of voice communications on Internet under Community law may change in light of further technical and market developments. The comments received by the Commission show that at least to a limited extent key elements of the conditions for such an evolution in the Community approach are close to being met, namely:

- at least one group of Internet service providers are starting to provide a service whereby an Internet user can connect to a local Internet service, log on with his PC or other terminal equipment, input the destination telephone number, have the call routed over the Internet to any telephone number (including to users without a modem) at the far end against payment;

and

- the use of the Internet (and the lower consequent tariffs) are a decisive driver for Internet subscription to a service (whether or not the subscriber is also taking an Internet connection to a PC as part of the service allowing use of his or her telephone).

In recognition of these impending technological and market developments, the Commission explicitly noted that it will review the Status Notice periodically and at least before January 1, 2000.

2. Regulatory Implications of the Status Notice

In ruling that Internet telephony cannot at this time be considered a "voice telephony service," the Status Notice exempted Internet telephony services from the regulatory framework established for voice communications services. The main implications of this ruling are described below.

a. Licensing

As non-voice telephony services, Internet voice services fall within the liberalized area for telecommunications
services. Accordingly, even in the five countries (i.e., Greece, Spain, Luxembourg, Portugal, and Ireland) which have yet to fully liberalize their telecommunications market, Internet telephony services may be offered on a commercial, competitive basis.

Moreover, pursuant to Directive 90/388/EEC, the provision of telecommunications services other than voice telephony, may be subject to a general authorization or a declaration procedure. As long as Internet voice is considered not to be a voice telephony service, a requirement for an individual license may, therefore, not be imposed on providers of such services.

b. Universal Service

To the extent that Internet voice is not considered “voice telephony service,” no universal service charges or contributions may be required from Internet telephony providers.

c. Interconnection

Because they are not “voice telephony service” providers, ISPs are exempt from the terms and conditions of the EU’s Interconnection Directive. For example, ISPs need not provide interconnection to their networks at any technically feasible point or at cost-based rates. At the same time ISPs may not access cost-based interconnection rates that are offered exclusively to voice telephony providers. However, given that interconnection is one of the most significant costs for ISPs, it may be preferable for Internet voice providers to operate under the voice telephony regulations in order to benefit from more advantageous interconnection and access conditions.

3. The Future Regulation of IP Telephony in the EU

Although Internet voice services have presently been found not to meet the criteria for traditional voice telephony services, there is a clear expectation that with the growing sophistication of Internet voice technologies, certain Internet telephony providers will soon qualify as providers of voice telephony.

As contemplated in the Status Notice, the key element that will determine the regulatory classification of Internet
voice services is quality of service. The press release accompanying the Status Notice made clear that Internet telephony providers will "be subject to the regulatory regime applicable to voice telephony in the future, as soon as they will offer a quality of service equivalent to traditional voice telephony." (Emphasis added).

While the Status Notice refers to certain elements that comprise quality of service (i.e., reliability, speech quality, real-time service), it is not clear how the Commission will assess, on a going-forward basis, whether Internet voice services offer a quality of service equivalent to traditional voice telephony. For example, the Commission has not set out proposed criteria, standards or specifications that will be used to assess the quality of Internet voice vis-à-vis voice telephony services. Also, the Commission has not established a specific threshold test that will be applied to Internet voice services in order to determine their future regulatory classification.

Given the difficulty in assessing and comparing the quality of service of various Internet telephony service offerings, it is likely that the Commission will rely on qualitative, and not quantitative, measures to determine the future regulatory classification of Internet voice services.

Notwithstanding the nature or breadth of any future assessment of the status of voice over the Internet, the growth of Internet voice services is bound to place pressure on the Commission and national regulators to review and restructure the regulatory framework for voice telephony. As noted recently by Richard Crawley, a member of the European Commission (Directorate General XIII) "[A]ny regulatory framework which attempts to retain inefficient distorted pricing structures (for example via access charges or inappropriate cross-subsidy schemes) is likely to be exposed by Internet developments in this area."46

B. Canada

Like many other countries, Canada is currently considering the regulatory and public policy implications of IP telephony. Although IP telephony has yet to be marketed or

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46. RICHARD CRAWLEY, THE IMPACT OF INTERNET ON COMMUNICATIONS REGULATORY MODELS IN EUROPE (Nov. 1997).
offered in Canada to any significant extent, Canadian policy makers and regulators have initiated discussion and debate about the appropriate regulatory treatment of IP telephony and other voice over data network services.

To date, the question of whether, and if so, how to regulate IP telephony and other similar services has been considered within the context of Canada’s existing regulatory framework for traditional carriers and services. The focus of the debate is whether IP telephony services should be subject to the same regulations that are applied to traditional voice services and service providers. Significantly, there has been far less debate about the various pressures that IP telephony is placing and will continue to place on traditional regulatory structures. In many respects, therefore, the focus of the existing debate is on whether it is appropriate or feasible to fit the square peg that is IP telephony into the round hole that is traditional regulation.

1. IP Telephony Regulatory Issues

As mentioned above, the issues raised by IP telephony are currently being considered by the Canadian telecommunications regulator, the Canadian Radio-Television and Telecommunications Commission (“CRTC”), within the context of the traditional regulatory framework for voice services and service providers. The two main IP telephony-related regulatory issues that are being addressed at this time are:

(a) Should Internet service providers and, in particular, those ISPs that provide IP telephony services be required to formally register with the CRTC?

(b) Should ISPs and, in particular, those ISPs that provide IP telephony be required to pay contribution charges (i.e., subsidy payments to local telephone access providers) where they provide public switched interexchange voice or data services?

Another regulatory issue under consideration in Canada relates to whether ISPs that provide IP telephony services should be subject to the routing rules for basic voice traffic that are imposed by the CRTC on traditional voice carriers. These routing, or “bypass” rules preclude Canadian telecommunications service providers from routing Canada-
Canada traffic via the United States, and routing internationally destined traffic via the United States.\textsuperscript{47}

2. CRTC Determinations Regarding Internet Voice Services

The CRTC has issued several recent decisions that bear on the future regulation of Internet voice services. Although many of these decisions establish important regulatory principles for IP telephony services, the Commission has approached the issue of IP telephony on an ad hoc basis. In contrast to the recent initiatives of the FCC and the European Commission, the CRTC has not undertaken a comprehensive regulatory review of the impact and implications of IP telephony.

a. Telecom Order CRTC 97-590, May 1, 1997

In Telecom Order CRTC 97-590, the CRTC concluded its examination of the issues relating to a broadening of the base of interexchange contribution paying services. Among other rulings in Telecom Order 97-590, the Commission established:

a requirement that wireless service providers pay contribution on the same basis as the interexchange services of wireline carriers;

a requirement that certain data traffic pay contribution charges; and

a requirement that traffic carried on direct access lines (DALs) be subject to a contribution regime that would discourage contribution avoidance through DAL usage.

The Commission also considered the appropriateness of extending the contribution regime to include Internet services. Indeed, various interested parties, including Stentor, the alliance of the major telephone companies in Canada, submitted that all Internet voice and data services should be subject to contribution charges, unless an ISP can demonstrate that certain traffic is not interexchange traffic.

The Commission concluded that it would not be appropriate to extend the contribution regime to Internet

\textsuperscript{47} Both of these routing restrictions are currently under review by the CRTC and may be eliminated by the end of 1998.
services at that time, but that it may revisit the issue as a result of technological innovation and market developments.\textsuperscript{48}

Although Internet services were exempted from the application of the existing contribution regime, the Commission specifically noted that "where the Internet network is used as the underlying transmission facility by a service provider to provide public switched IX voice or data services, the service provider is to register as a reseller and to pay contribution."\textsuperscript{49}

Thus, pursuant to Telecom Order 97-590 networks that are used to carry Internet data traffic only are exempted from the requirement to pay contribution. However, networks used to provide interexchange services, whether traditional circuit-switched networks or packet-switched networks, are subject to contribution charges.

As a result Telecom Order 97-590 set a significant Canadian regulatory precedent for the proposition that contribution charges and certain other regulatory requirements (e.g. registration) apply to all carriers that provide public switched interexchange voice or data services, and utilize the local PSTN to originate or terminate their services.


In Telecom Order 98-28, the CRTC considered an application from ShadowTel Communications Inc. requesting an exemption from contribution payments for a network providing voice and data communication for services marketed under the trademark TheLinc.

In support of its application for contribution exemption, ShadowTel stated that TheLinc is the first voice over Frame Relay network with public access gateways to the PSTN. ShadowTel further submitted that the unique application of its technology would benefit consumers and that its services "are distinct, and can almost be considered as value-added services."\textsuperscript{50} Accordingly, ShadowTel argued that its services were different from traditional voice services and should be exempted from the requirement to pay contribution.

\begin{itemize}
\item \textsuperscript{48} See Telecom Order, CRTC 97-590, ¶ 79-81 (May 1, 1997).
\item \textsuperscript{49} Id. at ¶ 82.
\item \textsuperscript{50} Telecom Order, CRTC 98-28, para. 6 (1998).
\end{itemize}
Notwithstanding ShadowTel's argument that its service was unique, innovative, and "value-added," the Commission concluded that:

"ShadowTel is providing public switched interexchange voice services, albeit over the Internet and that, consistent with Order 97-590, ShadowTel is clearly required to register as a reseller and pay contribution." 51

The Commission thus reaffirmed its earlier finding that carriers that provide interexchange services (either voice or data) over the Internet or over other packet-switched networks are, for regulatory purposes, treated the same as traditional long distance carriers. Significantly, the CRTC did not attempt to define the terms "public switched interexchange voice services" or "voice communications," as have other regulators. Nor did the CRTC attempt to make a distinction between traditional voice services and voice over the Internet services based on perceived or real quality of service differences. On the contrary, the Commission specifically noted in Telecom Order 98-28 that "issues relating to the quality of service provided by ShadowTel . . . are irrelevant to the disposition of ShadowTel's application." 52


In Telecom Public Notice 97-37, the Commission initiated a public proceeding to examine a number of issues related to the establishment of a streamlined contribution exemption regime for ISPs. In particular, the Commission invited comments on the following issues:

(a) The appropriate evidence to be filed with the incumbent local exchange companies ("ILECs") and with the competitive local exchange carriers ("CLECs") to support exemptions within the lighter regime;

(b) Whether telecommunications service providers who provide Internet access as one of several services should be included in this lighter regime;

(c) The potential risks of moving to a lighter regime, such as the fact that as of January 1, 1998, line-side data

51. Id. at ¶ 17.

52. Id. at ¶ 18.
interconnections will be subject to contribution while Internet services will continue to be exempt;

(d) Any methods currently available to determine whether ISP circuits are, in fact, solely carrying contribution-exempt traffic;

(e) The current availability of technical devices that could be used to monitor circuits for random audits, if required; and

(f) Any other issues which parties may wish to address.

As is evident from this list of issues, the Commission appears intent on developing regulatory solutions to the Internet that are based on existing regulatory structures and concepts (e.g., contribution exemption applications, monitoring reports, etc.). While this approach may be the most expedient today, it is not clear that traditional regulatory approaches are best suited to meet the challenges raised by the emergence of IP telephony, multi-media telephony, and other non-traditional services.

Although the Commission has yet to render a decision in the proceeding initiated by Public Notice 97-37, the submissions filed by various interested parties highlight the current issues surrounding the IP telephony regulatory debate and underscore the various pressures that IP telephony is placing on traditional regulatory structures.

a. The Incumbent Telephone Companies: The Need to Regulate Internet Voice Services

As the dominant providers of PSTN services in Canada, the Stentor companies have a significant interest in ensuring that their market share as well as their investment in circuit-switched networks is not eroded by new technologies or service providers. As explained in a recent report by the telecommunications consulting firm, Analysis Limited, "[t]he growing volume of voice telephony which is switching to the Internet from the public switched telephone network is a specific threat to [incumbent telephone operators], as it directly challenges the core business which maintains their market power."53

In order to protect their core business and also, perhaps, limit the market opportunity for IP telephony services, the Stentor companies have urged the CRTC to regulate phone-to-phone Internet voice services on the same basis as traditional interexchange voice services. In particular, Stentor has proposed that phone-to-phone interexchange calls completed over the Internet should be subject to the CRTC's contribution regime.

"PSTN Voice services clearly fall within the scope of contribution-eligible services. PSTN Voice provides a direct alternative to normal long distance calling between PSTN locations."  

In contrast to the proposed regulation of PSTN Voice services (i.e., phone-to-phone Internet voice services), Stentor has proposed that PC-to-PC and PC-to-phone Internet long distance services be exempted from the CRTC's contribution regime. Stentor argues that such services are not direct substitutes for normal long distance calling and that, from a practical perspective, it is difficult to separate and identify different forms of data traffic carried on the same access line.

Although there may be some basis for making a regulatory distinction between phone-to-phone Internet services and PC-to-phone Internet services, such a distinction raises new


In its comments filed in PN 97-37, Stentor makes a distinction between PC-to-PC voice services and phone-to-phone Internet voice services (i.e., "PSTN Voice"). Stentor defines the two terms as follows:

PC Voice. . . is "real-time" voice communication via the Internet using a personal computer or other terminal equipment which is equipped with a modem, and the hardware and software required to perform voice compression and conversion to a form which can be transmitted to or from an ISP over IALs [Internet Access Lines]. At the IAL, PC Voice communication is effectively indistinguishable from other forms of communication between a modem-equipped PC and an ISP.

PSTN Voice refers to "real-time" voice communication via the Internet to or from a telephone set or other equipment where the conversion for carriage on the Internet is performed at the service provider's (i.e., the ISP's) equipment. Unlike PC Voice, such communication can be accommodated using a normal telephone set, without requiring the user to be equipped with a modem or a computer with special hardware or software at the terminal location.

Id.

55. Id. at ¶ 11.
regulatory concerns. As a start, there is the question of what is a telephone and what is a computer? Technological developments in the terminal equipment market may quickly make such a distinction obsolete. Consider the emergence of such devices as smart phones, digital personal assistants, and "hybrid" computer/handset digital mobile phones. Are such devices to be classified as computers or telephones? Given the economic and market implications of exempting PC Voice services from contribution charges, will a new market for computer-based telephony terminal equipment develop? In this circumstance, will the Commission be called upon to define the terms "computer" and "telephone"? These are just some of the questions that may arise if the Commission makes a regulatory distinction between PC-based Internet voice service and phone-based Internet voice services.

As evident, the digitization of information coupled with the convergence of networks and service capabilities makes it extremely difficult, if not impossible, to establish a regulatory framework based on distinctions relating to the type of equipment used to originate traffic (i.e., PC or telephone), the characteristics of traffic (i.e., voice or data), or the underlying networks used to transport traffic (i.e., circuit-switched or packet-switched). More significantly, any attempt to create a regulatory framework based on these distinctions is bound to distort market outcomes by creating arbitrage opportunities.

Given the practical difficulty of attempting to classify services in a convergent environment and the near impossible task of regulating Internet-based applications, the question of whether and how to regulate IP telephony service offerings may ultimately be a hypothetical one. As Stentor has concluded:

Given the convergence of service capabilities, the practical limitations to identifying exempt and non-exempt services, and the pressures to reduce or eliminate contribution and rationalize pricing policies that will inevitably occur over the next few years, Stentor submits that an exemption regime for ISPs may well have a limited lifetime. It would, in Stentor's submission, be unwise to invest significant resources in developing and maintaining a regulatory process that, in the near term, may not be justifiable, and that may well be eliminated within a few years.  

56. Id. at ¶ 81.
b. Internet Service Providers: A "Hands-Off" Approach to IP Telephony Services

As the leading provider of Internet services in the world, it is not surprising that AOL does not support the regulation of Internet service applications, including IP telephony. In its comments filed with the CRTC in response to Telecom PN 97-37, AOL's Canadian subsidiary, AOL Canada, argues that Internet telephony offerings today are neither substitutable for, nor equivalent to, traditional voice telephony offerings. As such, Internet telephony services should not be classified as "voice" services and should, therefore, be exempted from traditional regulatory requirements and obligations. According to AOL Canada, premature regulation of Internet service applications will stifle the development of these services and will have an adverse effect on consumers and the economy as a whole.

In support of its call for a "hands-off" regulatory approach to IP telephony, AOL Canada asserts that:

The Internet telephony offerings available today lack several key features of traditional voice telephony offerings, including transparency, ubiquity, full reliability and real-time capability. Voice transmissions over the packet-switched networks operated by ISPs represent a niche component of the array of services being offered by ISPs and others and are not made available to the public at large. In many instances, ISPs themselves may be unaware that their subscribers are engaged in voice transmissions, since Internet voice applications often rely upon customer premises software and hardware obtained and installed by end users. Moreover, voice applications are often sub-elements of multi-function environments that combine voice, data, and graphics, such as telemedicine or data conferencing applications, rather than discrete service offerings. In short, the nascent Internet voice services available today are by no means substitutable, from either a technical or consumer perspective, for traditional voice telephony.

AOL Canada identifies other critical technical and regulatory differences between Internet voice services and traditional voice telephony. In particular, AOL Canada argues that, unlike basic voice telephony services, virtually all of the emerging packet-based voice communications services that

57. Id. at ¶ 4.
are provided over the Internet are "enhanced" services that involve protocol processing at both ends of the connection and that act upon the format of the transmission. The distinction between "basic" service offerings and "enhanced" services is significant given that many regulators, including the CRTC and the FCC in the United States, have historically subjected "enhanced" or "value-added" services to lighter-handed regulation as compared to "basic" services.

Notwithstanding the ultimate regulatory treatment or classification of Internet voice services, AOL Canada argues that any attempt to regulate Internet voice offerings is futile given the very nature of the Internet.

Attempts to monitor the transmission of voice-based applications over the Internet (for regulatory purposes, including registration and contribution) are likely to be futile, because ISPs can do little to detect and prevent the transmission of voice traffic on their networks into or out of particular States even if required to do so. Internet voice traffic—like any other information transmitted over the Internet—is broken down into digitized packets that may take widely divergent routes through any number of countries before being reassembled at a point-of-presence on a local exchange circuit-switched network for delivery to the intended recipient. As indicated, ISPs cannot distinguish between packets that contain "voice" data from packets that carry text, graphics, or other forms of information, so they are not in a position to block these packets from reaching their destination or to meter such transmissions in order to facilitate regulation.

As suggested by AOL Canada, the notion that the CRTC or any other regulatory body is capable of imposing and enforcing traditional regulations on digitized voice packets travelling over the Internet borders on the absurd. As the growth in other non-traditional service offerings like call-back, refile, and switched hubbing demonstrates, regulators can no longer rely on traditional regulatory models to achieve their policy objectives. Telephone service cross-subsidy regimes and routing rules will become increasingly difficult to sustain in an age of seamless, borderless, digitized communications.

4. Canada and IP Telephony: Implications for the Future

As detailed above, the CRTC has established two separate regulatory regimes for Internet service applications. Pursuant

58. Id. at ¶ 20.
to Telecom Order 97-590, Internet data applications are exempted from contribution and registration requirements, whereas Internet applications that provide alternatives to public switched interexchange voice service are subject to traditional regulatory requirements.

It is significant to note that, despite the current IP telephony regulatory debate in Canada, there are few, if any, IP telephony offerings currently available or marketed in Canada. In many respects, the CRTC's Internet-related determinations have been made in advance of a market for IP telephony services. In this regard, it is still uncertain whether the Commission's Internet policies and regulations will encourage or stifle the development of IP telephony in Canada.

One outcome that appears clear is that as IP telephony technologies develop, it will be increasingly difficult for the CRTC to maintain the regulatory distinction between Internet data services and IP telephony applications. Although the provision of IP telephony traffic requires access services that are separate from the Internet access lines used to carry Internet data communications, this situation is likely to change in the near future. As Stentor has noted:

> Given the pace of developments associated with Internet uses and services, the deployment of access lines and gateways capable of accepting both forms of traffic and distinguishing between PSTN voice and other service requirements such as data connections, based on signaling information or initial message content, is likely to occur within a very short time.

Once the technology is available to integrate Internet voice and data applications on the same access trunks, it will be virtually impossible to distinguish between Internet data and Internet telephony packets. In this circumstance, the Commission will be faced with two options:

(a) Impose contribution payments and other regulatory requirements on all Internet traffic, including Internet data traffic. This option may not be politically palatable since contribution charges would apply on all Internet email messages, graphical files, and other data applications, thereby increasing the cost of these service applications. Moreover, from an implementation perspective, it is not evident whether it would be feasible to impose per-minute contribution charges on data packets. Indeed, any decision to levy
contribution charges on ISPs may very well necessitate a fundamental change to the contribution collection mechanism. In an environment where packets and not minutes are being transported across networks, usage-based contribution mechanisms may ultimately need to give way to a more practical and efficient method of collecting contribution, such as a revenue tax applicable to all telecommunications service providers; or

(b) Reform the existing regulatory framework so as to eliminate any arbitrage or gaming opportunities that will otherwise be available to IP telephony carriers. This option would require the Commission to eliminate existing cross-subsidies and contribution charges so that IP telephony providers are not presented with the incentive and opportunity to engage in contribution avoidance activities. This option is also politically unpalatable since it would result in significant local rate increases for most Canadians.

It is perhaps too early to speculate about which regulatory option the Commission is likely to pursue. Given the current state of the IP telephony market in Canada, the Commission is not under immediate pressure to reform its existing regulatory framework to meet the challenges of IP telephony. However, as the market for IP telephony develops, the Commission will need to develop a more comprehensive approach to the various regulatory issues.

C. United States

1. General Regulatory Oversight

Regulatory control of telecommunications in the United States is divided between two levels of government. Communications that cross state lines or are international in nature are governed by the Communications Act of 1934, as amended by the Telecommunications Act of 1996. The administration of these Acts is governed by the United States federal regulator, the FCC.

Communications that are carried on wholly within a state are regulated by the public utility commissions of each state.

59. 47 U.S.C. §§1-1010 (1934) (hereinafter the "1934 Act").
subject to a certain amount of interaction with the FCC. Since IP telephony is used almost exclusively for communications over long distances, the most significant regulation of IP telephony occurs at the federal level.

Companies seeking to enter the American IP voice services market should be aware of the various regulatory categories under which their services may be classified and the consequences of such classifications.

2. “Common Carrier" and “Telecommunications Service Provider”

American telecommunications law has long distinguished “common carriers" from other telecommunications service entities. Certification by the FCC as a communications common carrier generally entails various regulatory requirements including mandatory interconnection with certain other carriers and the filing of tariffs.

In the present context, the most significant regulatory burden that is placed upon certain telecommunications service providers is that they are obliged to contribute to a "universal service fund" that subsidizes access to telecommunications services for high-cost and low-income communities and public institutions, such as schools and libraries. In addition, common carriers must also pay Common Carrier Line Charges (“CCLCs”) and Presubscribed Interexchange Carrier Charges (“PICCs”) to the local exchange carriers with which they interconnect to originate and terminate their traffic.61

The 1996 Act introduced a new definition of the type of entity that would be treated as a common carrier, namely, the “telecommunications carrier,” which is defined as follows: “The term ‘telecommunication carrier’ means any provider of telecommunications services. . . . A telecommunications carrier shall be treated as a common carrier under this act only to the extent that it is engaged in providing telecommunications services.”62

61. The maximum PICC for primary residential and single-line business lines in 1998 was $0.53 per month, while the monthly charge for each non-primary residential line was $1.50 and the maximum PICC for each multi-line business line was $2.75.

This raises the definition of "telecommunications service": "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 to the public, regardless of the facilities used."^63

Indeed, the definition of the term "telecommunications" is critical to the understanding of whether IP voice providers are to be treated as telecommunications carriers and hence subject to common carrier regulation and the attendant consequences. The term is defined as follows: "The term 'telecommunications' means the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received."^64

As discussed below, whether IP voice providers fall under this definition was addressed by the FCC in its recent Universal Service Report.

3. Basic and Enhanced Services

a. The Traditional Regulatory Distinction

Prior to the implementation of the 1996 Telecommunications Act, the FCC had determined that electronic communications services, and subsequently Internet services, were not subject to regulation by the FCC under the 1934 Act because they were "enhanced" services different from conventional telephony. Enhanced services were defined as including:

services offered over common carrier transmission facilities used in interstate communications, which employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information; provide the subscriber additional, different, or restructured information; or involve subscriber interaction with stored information.^65

By contrast, basic services provide "pure transmission capability over a communications path that is virtually
transparent in terms of its interaction with customer supplied information."  

The FCC has ruled that enhanced service providers ("ESP") are not subject to common carrier regulation. ESPs exempted from this requirement included ISPs, which provide services beyond the simple carriage of information extending to computer processing of information, such as e-mail storage, authentication and access, and the provision of additional services through their proprietary private databases.

However, the FCC has considered the mere transport of packet data through networks insufficient to qualify a carrier as an ESP. Such transport was characterized as a basic service, and hence subject to the relevant common carrier provisions.

b. ACTA Petition

The 1996 Act maintained the distinction between basic and enhanced services, using the terms "telecommunications services" and "information services" to differentiate the two. The Act defines "information services" as:

- 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.

In light of this definition and the definitions related to "telecommunications carriers," and in particular the exclusion from the exemption of entities that provided capabilities for the "management, control, or operation of a telecommunications system," America's Carriers Telecommunication Association ("ACTA") filed a petition before the FCC on March 4, 1996. The petition requested the FCC to

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68. See supra text accompanying note 63.
interpret the 1996 Act such that companies providing products that facilitated IP voice telephony were certified as common carriers. 71 The FCC requested public comment on the petition and established a deadline for comments of May 8, 1996.

Various comments strongly opposed the ACTA petition both during and following the comment period. 72 The main arguments advanced by some opponents to the ACTA report were that the FCC should forbear from regulating Internet services not only because they fell within the definition of "enhanced" or "information" services, but also because the success of the Internet depended on its development without limitations imposed by regulation.

Opponents to the ACTA petition also pointed out that regulation of Internet telephony was nearly impossible because of the inability of the ISP to detect the computer-to-computer IP voice communications in contrast to any other packetized TCP/IP service. Opponents of the petition also claimed that the FCC did not have any jurisdiction over the manufacturers of the commercial software used during computer-to-computer IP telephony communications.

To date, the FCC has not proceeded further with the ACTA petition. However, issues presented in the petition have been addressed by the FCC in its recently issued Universal Service Report, where the FCC indicated that it intends to proceed with the petition in due course.

4. The April 1998 Universal Service Report

A key question to be resolved in the United States is whether IP voice providers qualify as telecommunications

71. The specific companies listed by ACTA in its petition were VocalTec, Inc., Internet Telephone Company, Third Planet Publishing Inc., Camelot Corporation and Quarterdeck Corporation.

72. A substantive reply was filed jointly by Netscape Communications Corporation, Voxware, Inc. and InSoft Inc. on May 8, 1996. See Netscape Opposition to ACTA Petition on Internet Telephony (May 8, 1996) <http://www.technologylaw.com/techlaw/acta_comm.html>. The reply of the Internet Telephony Consortium, whose members included at that time Commercial Internet Exchange Association (CIX); FreeTel Communications, Inc. and Third Planet Publishing Inc.; Microsoft Corporation; Millin Publishing Group, Inc.; Netscape Communications Corporation and Voxware, Inc.; New Media Coalition for Marketplace Solutions; Quarterdeck Corporation and VocalTec(TM) Ltd; Software Publishers Association; and the VON Coalition, was filed on May 8 and June 10.
carriers or as information service providers. On April 10, 1998, the FCC submitted its Universal Service Report,73 which was mandated by the Senate Appropriations Committee as part of the allocation of the FCC's 1998 budget.74 The Report considers the implementation of certain sections of the 1996 Act related to the Universal Service System and reviews the distinction between telecommunications services and information services. Importantly, the Universal Service Report addresses whether ISPs are required to contribute to the U.S. universal service fund and whether ISPs and IP voice providers are telecommunications carriers and hence subject to at least some of the same requirements as other common carriers.

The balancing act that the Commissioners addressed centered around the need to make meaningful distinctions between telecommunications and information services as defined in the 1996 Act and the importance of the Internet as a significant new medium thriving without government intervention.

a. Arguments

Prior to issuing the report, the Commission heard arguments75 that IP voice telephony is simply another form of technology, like satellite or fiber-optic transmissions. Accordingly, the choice by the user of a new technology should not affect the underlying function or regulation of telecommunications. Once this is recognized, the argument was made, it followed that IP voice telephony fell squarely within the definition of "telecommunications services" and did not qualify as an "information service." A contrary finding would distort the economics of the telecommunications services.


75. The FCC held two en banc hearings into this issue, on February 19, 1998 and March 6, 1998. Transcripts of the hearings can be found at <http://www.fcc.gov>.
marketplace, as new and incumbent carriers would exploit the opportunity presented and divert a significant amount of voice traffic from the PSTN to the Internet.

Contrary to these arguments, the Commission was urged that IP voice telephony is a technology entirely different from conventional telephony and that it represented the future of communications. This nascent form of communication could be stifled, it was argued, if it were subjected to the same regulation as common carriers. The Commission was, therefore, asked to exercise its forbearance power\footnote{76} should it find that IP voice telephony fell within the scope of basic telecommunications services. It was also pointed out that IP voice telephony provides a more technically efficient form of communication than conventional voice networks, and that any artificial distinction would inevitably foster private, unregulated, IP networks that would take advantage of the artificial distinction to qualify as information services.

b. Telecommunications Services and Information Services

The Universal Service Report stopped short of imposing common carrier status on ISPs or IP voice providers. The FCC found that the definitions of telecommunications and information service were mutually exclusive. It held that the intent of the 1996 Act was not to subject ISPs to common carrier regulation merely because they provide their services via telecommunications. In analyzing the American legislators' intent and also the 1996 Act itself, the FCC determined that:

\begin{quote}
[An entity offering a simple, transparent transmission path, without the capability of providing enhanced functionality, offers "telecommunications." By contrast, when an entity offers transmission incorporating the "capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information," it does not offer telecommunications. Rather, it offers an "information service" even though it uses telecommunications to do so. We believe that this reading of the statute is most consistent with the 1996 Act's text, its legislative history, and its pro-competitive, deregulatory goals.\footnote{77}
\end{quote}

\footnote{76. The FCC may forbear (i.e., refrain) from regulating in accordance with Section 10 of the 1996 Act.}

\footnote{77. \textit{Report and Order}, supra note 41, at para. 39.}
Having made this decision, the Commission applied the distinction to various entities involved in the Internet marketplace and determined that the companies that supply transmission capacity for the benefit of ISPs, and ultimately for the benefit of ISPs' subscribers, provide "telecommunications services." Accordingly, these companies are to be treated as common carriers, which implies that, in the absence of regulatory forbearance, such transmission providers will bear obligations to contribute to the Universal Service Fund, pay Common Carrier Line Charges and PICCs, and file tariffs.

ISPs, on the other hand, were held by the Commission to be providing "information services" to their subscribers, and not to be responsible for common carrier obligations. The Commission held that the various applications provided by ISPs, including e-mail, World Wide Web transport services, Usenet, FTP, and Telnet services, amongst an infinite possible range of others, fell within the definition of "information services."

ISPs that use their own transmission facilities to transport data and services to their subscribers may be treated differently. The Commissioners discussed the possibility of subjecting the transmission portion of ISPs' services to universal service contribution requirements under the FCC's discretionary power to promote the public interest.78

c. Status of IP Telephony

IP voice services are treated separately by the Commission in its Universal Service Report. The FCC used a functional test, holding that from the perspective of the end user, "phone-to-phone" IP voice services appear to parallel conventional PSTN telecommunications. Unlike regular Internet communications, which support an unlimited number of TCP/IP applications, the Commission noted that the Internet service provided as part of a "phone-to-phone" service is solely limited to voice communications.

78. The 1996 Act provides that such an entity may be required by the FCC "to contribute to the preservation and advancement of universal service if the public interest so requires." 47 U.S.C. § 254(e).
In an extraordinarily tentative set of conclusions, the FCC noted that:

"To the extent we conclude that certain forms of phone-to-phone IP telephony service are "telecommunications services," and to the extent the providers of those services obtain the same circuit-switched access as obtained by interexchange carriers, and therefore impose the same burdens on the local exchange as do other interexchange carriers, we may find it reasonable that they pay similar access charges."

The Commission stopped short of holding that IP voice providers supply either "telecommunications" or "information" services. The Commission determined that there was insufficient information in the public record to come to a definitive standard treatment of IP voice services. The Universal Service Report stated:

The record currently before us suggests that certain "phone-to-phone IP telephony" services lack the characteristics that would render them "information services" within the meaning of the statute, and instead bear the characteristics of "telecommunications services." We do not believe, however, that it is appropriate to make any definitive pronouncements in the absence of a more complete record focused on individual service offerings.

In its report, the Commission appeared prepared to distinguish between "computer-to-computer" and "phone-to-phone" IP voice offerings, placing emphasis on the location of the packetizing of the transmission. If the packetizing were performed using customer premises equipment (i.e., in a "computer-to-computer" scenario), then no common carrier regulation would follow. However, if the packetizing were performed at the facilities of an ISP or IP voice gateway, then common carrier regulation might be appropriate.

In a dissent to the ruling, Commissioner Furchtgott-Roth noted that the other Commissioners' distinction is "artificial and fragile" and that this would lead to a market distortion in which vendors would sell telephone sets to consumers that packetize the data for transmission through IP networks without corresponding regulation and financial obligations. Commissioner Furchtgott-Roth wrote:

At base, the Commission's analysis hinges on where the conversion to IP packets takes place. Neither can this

79. Report and Order, supra note 41, at para. 91.
80. Id. at para. 83.
construct withstand close scrutiny. A "conversion" already occurs in ordinary phones: sound energy is converted into electrical energy. In most phones, the signal exiting the phone varies analogously to variations in the input sound. In ISDN phones, the signal is further converted from an analog electrical signal into a PCM encoded digital bit stream before being sent to the network. As noted above, it would be a trivial technical matter for a new breed of phones to convert the analog signals to IP packets, instead of a PCM encoded digital bit stream. Such phones could look like and, for the consumer, behave exactly like ordinary ISDN telephones. Under the FCC's definition, however, these new IP packet devices would be "computers." 81

Thus, if it emits a PCM encoded digital bit stream, it's a phone and it's taxed; if it emits a stream of IP digital packets, it's a computer and it's not taxed.

These difficult questions will be tackled by the FCC when it considers the issue of IP telephony as part of a separate proceeding. At that time, the FCC will doubtlessly be under pressure to reconcile its stated deregulatory and pro-competitive goals against its apparent determination that phone-to-phone IP voice telephony providers should be subject to the considerable burden of American regulatory intervention.

d. International Settlement Rates

In its Report, the Commission recognized that its treatment of IP telephony may have a significant effect on international accounting rates. While the Commission has in the past lauded IP telephony as a source of downward pressures on international settlement rates, 82 it recognized that regulating IP telephony entities as common carriers could negate such pressures. To this end, the Universal Service Report contemplated exempting IP telephony from the international accounting rate regime. 83

Commissioner Furchtgott-Roth agreed with this in dissent, noting:

81. See generally supra note 42.


83. See supra note 41, at ¶ 93.
For over a year now, the United States has made it a matter of national policy to encourage other nations to eschew Internet regulation and taxation. To introduce our own form of Internet regulation and fees at this point would be the height of hypocrisy and would set a terrible precedent for other countries to follow.

Almost immediately, IP telephony would be eliminated as a competitor to foreign telecommunications monopolies that hold international settlement rates so high in so many countries. Like international call-back, IP telephony could have drive costs much faster than inter-government negotiations and would have been perhaps the best lever to bring rates down to benchmark levels.84

It appears from the Commission’s report that it may be heading towards inconsistent conclusions with respect to the treatment of IP telephony for domestic and international purposes. For domestic purposes, the Commission appears prepared to treat phone-to-phone IP telephony as conventional voice telephony substitutes, thereby subjecting them to the subsidy regimes inherent in access charges and the universal service fund. On the other hand, the Commission seems to want to exempt phone-to-phone IP telephony from the subsidy regime inherent in current international settlement rates.

There is no doubt that the United States market is far more competitive than that of some developing countries, and that the current accounting rates to those countries incorporate very high subsidy components by United States standards. However, some developing countries may legitimately ask: “If the United States can tax its phone-to-phone IP telephony services to support its domestic universal service objectives, why can’t we do the same with international phone-to-phone IP services?”

These issues will certainly be subject to scrutiny by the world telephony marketplace, including regulators, trade organizations, and international competitors.

D. Japan

In August 1997, Japan’s Ministry of Posts and Telecommunications (“MPT”) responded to the proliferation of call-back services in Japan85 by liberalizing the provision of

84. Supra note 42, at ¶ 93.
85. See Jeremy Scott-Joynt, KDD Set to Suffer as Japan Gives Go-Ahead to
international Internet telephony services. MPT noted that the provision of IP telephony services will spur price reductions and create new demand for international telephone services.

In its August 26, 1997 ruling, Settlement on the Guideline to Liberalize the Provision of International Internet Telephony Services, MPT announced:

From today, international Special Type II carriers who wish to provide international Internet telephony services must first form, or make any necessary changes to, a non-tariff contract with an international Type I carrier. Then, after obtaining the approval of the Minister of Posts and Telecommunications, Special Type II carriers or other international Type II carriers connected with them will be able to provide services.86

Therefore, although Internet telephony services have been liberalized in Japan, the provision of these services requires the prior approval of MPT. Rather than adopting a “hands-off” policy with respect to Internet telephony services, MPT has imposed some traditional regulatory requirements and obligations on Internet telephony providers. For example, MPT has adopted the following measures “for securing fair and effective competition” relating to international Internet telephony service:

Type II carriers that provide international Internet telephony services are required, in accordance with Article 92 of the Telecommunications Business Law, to submit a periodic report on the volume of traffic and income. International Type I carriers that provide international Internet telephony services are also required to submit the same reports. Since

86 See Ministry of Posts and Telecommunications, Settlement on the Guideline to Liberalize the Provision of International Internet Telephony Services (Aug. 26, 1997) <http://www.mpt.go.jp/pressrelease/english/telecomm/news8-26.html>. In Japan, carriers are classified as either Type I or Type II. Type I carriers provide services using their own telecommunications circuit facilities. Type I carriers need the permission of MPT to enter the market. Type II carriers provide service through circuits leased from Type I carriers. Type II carriers include Special Type II carriers (i.e., carriers that provide service to an unspecified number of general subscribers and of a scale that exceeds the criteria established by the applicable cabinet order or that provide international VAN service using an international leased line) and General Type II carriers (i.e., all other Type II carriers). Special Type II carriers must register with MPT and General Type II carriers must file a notification with MPT.
international Internet telephony services are in their infancy in terms of technology and service, further discussion on the necessity for a proportionate share of return traffic will be carried out in the future.\textsuperscript{87}

Notwithstanding the reporting requirement and the prospect of proportionate return regulation, a number of Japanese and foreign companies have indicated their intention to enter the IP telephony market in Japan.\textsuperscript{88}

E. Other Countries

Many countries have yet to confront the regulatory issues raised by IP telephony. In the case of most developing countries, no specific regulations or policies have been adopted with respect to Internet voice services. One obvious reason for this is that Internet development is still in its infancy in many places abroad. Internet access, let alone Internet voice service, is not generally available in many developing countries. Accordingly, regulators and governments in such places have not yet had to turn their attention to the IP telephony threat.

Given the very high international rates in most developing countries the market opportunity for IP telephony is significant. Accordingly, many countries may soon need to consider the regulatory implications of IP telephony.

One indicator of how regulators and governments are likely to treat IP telephony services is their existing regulatory approach to other alternative international services (e.g., call-back, refile, etc.). Countries that have banned call-back services based on concerns that these services will erode international revenue flows, may also prohibit or, at the very minimum, attempt to regulate Internet telephony as well.

The emergence of alternative calling services that bypass the public networks of incumbent telecommunications operators have led many countries to ban these services. Developing countries, in particular, have argued that their plans for network infrastructure improvement are adversely

\textsuperscript{87} Id.

\textsuperscript{88} See Scott-Joynt, supra note 85. United States Global Link and Global Exchange Carrier have both stated they will offer Internet voice services in Japan this year. In addition, Nifty Corporation, a subsidiary of Fujitsu Ltd, has announced an agreement with RSL Communications to provide international telephone services to 2.5 million customers in Japan using voice over the Internet technology. \textit{Id.}
affected by the activities of call-back providers operating outside their jurisdictions. In order to protect the revenue base of state-owned national operators, many governments have prohibited call-back.

Developing countries that currently prohibit call-back include India, Pakistan, China, Thailand, Syria, Jordan, Cyprus, United Arab Emirates, Egypt, Mozambique, Uganda, Tanzania, Peru, Colombia, Ecuador, Cuba, and Panama. In addition, there are a few Eastern European countries (e.g. the Czech Republic and Hungary) that currently prohibit both call-back and Internet voice services.

The link between a country's regulatory approach to call-back and IP telephony can be illustrated by reviewing the case of India, where call-back service has been declared illegal through a notification issued by India's Department of Telecommunications ("DOT"). The DOT has also recently issued a notice to all Internet subscribers in India making it clear that, in addition to call-back services, Internet voice services are also prohibited. The notice was issued by the government-owned international carrier and ISP, Videsh Sanchar Nigam Limited ("VSNL"), which sent the following e-mail to all its Internet users:

Dear Internet Customer,

As you are aware, the usage of Telephony on the Internet is not permitted as per the terms and conditions of your Internet subscription and the Indian rules and regulations.

It has come to our notice that some agents are actively selling Internet Telephony by offering low tariffs. We would like to inform our customers that this type of usage of Internet is illegal and violative of the terms and conditions of the Internet subscription.

You are advised not to use the Internet connection for Telephony or Fax applications. VSNL would be monitoring the use of Internet and those subscribers who are found to be violating the conditions of subscription, would be permanently debarred from using Internet services.

While it can be expected that many developing countries will attempt to prohibit or regulate IP telephony services in

89. A list of all countries which prohibit the practice of call-back is available at <http://www.itu.int/itudoc/itu-t/com3/callback.html>.
order to protect existing revenues from international services, this approach is likely to be unsustainable over the middle to long term.

In addition to the practical limitations of banning or attempting to regulate Internet service applications, the maintenance of artificially inflated international rates is likely to create a burgeoning market for IP telephony and other alternative calling procedures in these countries. Governments and regulators must, therefore, begin the process of transition to a more open and efficient telecommunications market in order to prevent a future "meltdown" of their regulatory structures and national telecommunications operations.

IV
Conclusions

Much of the initial market allure of IP telephony derives from its ability to avoid some of the cost burdens and other restrictions that regulation imposes upon conventional voice telephony. Subsidy charges (i.e., local access charges, universal service charges, and international accounting rates) that are currently levied upon conventional interexchange and international telephone service providers form a large part of these cost burdens.

Initially, many regulators lauded the introduction of a wide range of services via the Internet as innovative and pro-competitive developments. IP telephony services were initially granted a fair amount of leeway by regulators, many of whom were reluctant to impose the traditional burdens of telecommunications regulation on these new services. This "hands off" approach is clear from the rulings of the European Commission and the United States FCC to date.

Over time, some forms of IP telephony, particularly those that originate and terminate on a user's telephone set which is connected to the PSTN, are more closely approximating conventional voice telephony, not only in terms of quality and reliability, but also in their use of local PSTN access facilities. As a result, even those regulators that have maintained an ambiguous approach towards IP telephony are starting to reconsider the application of telephone subsidy charges. The Universal Service Report published by the FCC last week
signals a preparedness to levy local access and universal service fund charges on IP telephony services. In the words attributed to FCC staff, "If it walks like a duck, if it quacks like a duck, it just might be a duck".  

The EU has signaled a similar willingness to reconsider the application of universal service charges and other regulatory burdens on IP telephony services once their quality and reliability develop to a level where they are similar to conventional "real time" voice telephony.

Canada has moved to impose traditional regulatory subsidies on IP telephony faster than the United States or the European Union, through its CRTC ruling that local access contribution charges are payable on Internet access lines used for voice telephony purposes.

Several other countries, mostly in the developing world, have gone further than trying to "level the playing field" between IP and conventional voice telephony. These countries have moved to prohibit IP telephony services outright.

A few other countries, which are in the minority so far, have gone the other way, and have assertively authorized the provision of IP telephony services subject to relatively light-handed forms of regulation. This is the case in Japan.

In summary, in most industrialized countries, providers of IP telephony services are starting to face a somewhat more regulated and costly operating environment than in the early days of their services. The initial advantages accruing from the avoidance of subsidy payments and other regulatory obligations are likely to diminish in those markets, leaving IP telephony services to rely on other factors to compete effectively with conventional voice telephony services. These factors may include cost advantages inherent in packet switched services; service innovations such as multimedia voice applications; Internet "voice-buttons" and other value added features; and the quality, functionality, and ubiquity of the international networks of individual service providers. However, in the longer run, the regulatory burdens and restrictions imposed upon all international and domestic voice

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service providers (including IP telephony providers) will inevitably continue to decrease.

It will never be possible for regulators to identify, restrict, and tax all IP telephony providers any more than they have been able to do so with call-back providers, refilers, switched-hubbing providers, or other operators that bypass current accounting rates. Consequently, IP telephony will enhance the pressures to deregulate and simplify international and domestic regulation of the telecommunications sector.