Policy Report
March 2005

Internet Telephone Service

A New Era of Competition in Telecommunications

By Robert D. Atkinson

Innovation is the driving force in today's information economy. But innovation is in danger of being stifled in the central nervous system of the information economy itself—our telecommunications infrastructure—because of the regulatory tangle that governs our 130-year-old public switched telephone network (PSTN).

A new technology called Voice over Internet Protocol (VoIP), or Internet telephony, promises an evolutionary leap beyond the standard telephone service we have been accustomed to, as well as a host of benefits for consumers. The new technology transmits voice signals the same way email is sent, using the Internet's data-transfer protocols to break conversations into digital packets that can be sent on lower-cost, more efficient "packet-switched" networks. That innovation makes many other innovations possible, from eliminating the distinction between local and long distance calls, to easily maintaining several telephone numbers in a single account, to sorting and storing voice messages on your computer. Internet telephony requires consumers to have broadband Internet connections, which would be an added bonus for the information economy as a whole. Since Internet telephone service may hold great appeal for consumers, it could become a "killer application" that spurs more rapid adoption of broadband Internet service in U.S. households, which will in turn help spur efficiency gains throughout the economy.[1]

Perhaps the most important bonus, however, is the fact that Internet telephony opens telephone service up to competition as never before. Just as consumers can choose from scores of email service providers, they can also choose from a growing field of Internet telephone service providers. Yet, because Internet telephony performs the same basic function for consumers as traditional telephone service (though, with advanced new features), it is being tangled up in a complicated telecom regulatory system—which was originally designed for the era of local phone monopolies, when a single company controlled the wire tethered to your house.

State public utility commissions have been taking steps to impose price controls, rules for market entry and exit, and taxes on Internet telephony on the theory that the old telecom regulations should naturally apply to a new generation of telephone services. This makes no sense, both for the obvious reason that there are not likely to be monopolies in the Internet telephony business, and because it needlessly creates a balkanized patchwork of state regulations when cohesive federal oversight of the new industry would be far more appropriate.

Internet telephony requires a new regulatory framework—a streamlined set of federal

Robert D. Atkinson is vice president of PPI and director of its Technology & New Economy Project.

"One person with a belief is a social power equal to ninety-nine who have only interests."
—John Stuart Mill

The Progressive Policy Institute

The Progressive Policy Institute is a catalyst for political change and renewal. Its mission is to modernize progressive politics and governance for the 21st century. Moving beyond the left-right debates of the last century, PPI is a prolific source of the Third Way thinking that is reshaping politics both in the United States and around the world.

The PPI invents new ways to advance enduring progressive principles: equal opportunity, mutual responsibility, civic enterprise, public sector reform, national strength, and collective security. Its "progressive market strategy" embraces economic innovation, fiscal discipline, and open markets, while also equipping working families with new tools for success. Its signature policy blueprints include national service, community policing, and a social compact that requires and rewards work; new public schools based on accountability, choice, and customization; a networked government that uses information technology to break down bureaucratic barriers; pollution trading markets and other steps toward a clean energy economy; a citizen-centered approach to universal health care; and a progressive internationalism that commits America's strength to the defense of liberal democracy.

Rejecting tired dogmas, PPI brings a spirit of radical pragmatism and experimentation to the challenge of restoring our collective problem-solving capacities—and thereby reviving public confidence in what progressive governance can accomplish.

The Progressive Policy Institute is a project of the Third Way Foundation.
www.ppionline.org

PPI
PROGRESSIVE POLICY INSTITUTE

guidelines geared to the more competitive telephony marketplace enabled by VoIP. Government should not regulate prices or set market entry rules for Internet telephony as it did in the era of local telephone monopolies. But it will still need to guarantee consumer protections and ensure the necessary access for law enforcement to monitor telephone conversations in criminal and homeland security investigations. In the near term, government will also need to manage the transition to an all-VoIP broadband world by addressing legacy issues such as universal service and access charges.

The Federal Communications Commission (FCC) recently took an important first step toward establishing the right regulatory model when it asserted preemptive federal control of VoIP services, ruling that the Minnesota Public Utilities commission could not impose state regulations applicable to traditional telephone service providers on Vonage, a VoIP services company.[2] But now, Congress and the FCC must take further steps to reform our outmoded telecommunications regulatory system for a new era of technological competition. Specifically, they should:

- ❒ Develop a new system for classifying advanced telecommunications services so they can be appropriately regulated according to the functions they offer consumers;

- ❒ Preempt state powers to exercise traditional utility-like regulations over VoIP, as the FCC did in its recent Vonage decision;

- ❒ Ensure regulatory parity among Internet telephony providers that use the North American numbering plan (the system that assigns and manages telephone numbers) and that act as substitutes for traditional telephones;

- ❒ Monitor carefully any violations of neutrality on the Internet so that service providers do not discriminate against particular types of content, applications, or services;

- ❒ Exempt Internet telephony services from regulations dealing with market entry, price, rate of return, reporting obligations, service quality, and terms of service;

- ❒ Reform universal service significantly, which includes eliminating the legislative requirement that rates in high-cost areas be comparable to rates in other areas and taking other steps to lower the costs of universal service payments;

- ❒ Require Internet telephony services to pay into the Universal Service fund (USF), but require that those contributions support the expansion of broadband telecommunications networks, not maintain the PSTN;

- ❒ Reform the dysfunctional access charge system, whereby phone companies pay other phone companies to access their local networks;

- ❒ Include VoIP and broadband services in the Internet Tax Moratorium, including a moratorium from federal telecommunications excise taxes;

- ❒ Provide the industry with a reasonable period of time to develop an adequate Internet-based emergency response system (known as an "E9-1-1 system") before requiring compliance;

- ❒ Require Internet telephony service providers to inform customers when their services have significant limitations compared to traditional telephone services (such as power and E9-1-1 limitations); and

- ❒ Require that Internet telephony services be accessible to law enforcement, but do not subject VoIP applications to requirements of the Communications Assistance for Law Enforcement Act of 1994 (CALEA), which governs law enforcement's access to the circuit-switched telephone system.

What is VoIP?

The structure of the wireline telephone network has not fundamentally changed since Alexander Graham Bell invented the telephone 130 years ago. Calls travel along dedicated phone lines and are switched in various places to maintain an electronic circuit leading from the phone where the call is made to the phone with the number being called—hence the phrase "circuit-switched network." While digital technologies have increased the functionality of the phone system, any intelligence in the system is largely engineered into the circuit switches of the telephone company's central office.

Contrast that to the broadband Internet world. Consumers use a computer to type an email that is then separated into digital packets (groups of ones and zeros) that are transported via a broadband "pipe" onto high-speed backbone networks. The packets are then reassembled at the destination account, which can be configured for access from any Internet-connected computer anywhere in the world. Packet-switched networks carry many data packets at once, allowing them to accommodate significantly more traffic more efficiently than circuit-switched networks. This means that VoIP services cost less than traditional circuit-switched telephony, both for facilities-based competitors (companies that own physical

networks) and non-facilities-based competitors. Moreover, the output is in digital packets, so intelligent software in the consumer's computer or in the consumer's Internet service provider (ISP) can allow the management of calls in a host of creative ways.

As broadband networks have become more ubiquitous, and computers and software more powerful, companies have begun to provide a wide range of Internet voice applications. Some instant message systems allow voice messages. Online gaming applications allow gamers in different locations to talk to one another as they play. New, free peer-to-peer software systems, such as Skype, allow users to engage in voice communication with each other as long as they both have the Skype software on their computer.[3] Pulver's Free World Dialup service is similar. And other applications, such as Apple Computer's iSight, let users with small video cameras mounted above their computer screens make full-motion video conference calls. While these applications allow voice to be transmitted via the Internet, they differ from Internet telephony in that VoIP is a substitute for traditional telephone service, as it employs telephone numbers that allow users to call or be called by any phone number in the world.[4] Internet telephony works by either using an Internet-enabled telephone or a packetizer device connected to a regular phone. Both convert voice signals into digital bits that are sent through a broadband modem through a packet-switched network to another phone.[5]

When the first VoIP applications for PCs emerged in late 1996, the quality was poor. As computer processing and network speeds have increased, however quality has improved significantly—to the point where in many cases it can successfully compete with voice-grade circuit-switched service. As a result, start-up companies, such as Vonage and Net2phone, have jumped into the market. Within the last year, AT&T, Verizon, and other telecommunications companies have rolled out their own consumer VoIP offerings. A typical package lets users make unlimited local and long-distance calls within the United States for $25 to $30 per month.

VoIP is not only cheaper than traditional telephony, it also offers consumers a variety of innovative features—including, Web access to real-time information on their usage and phone call records; the ability to keep the same phone number when a consumer moves; multiple phone numbers on a single account; auto-dial phone book and voice dialing; automatic or customized voice forwarding; email alerts for new voicemail messages; access to voicemail messages from the Web and the ability to forward voicemails as email attachments; "locate me" services that forward calls to a group of phone numbers, either sequentially or all at once; easy conference calling; and do-not-disturb capabilities based on particular time slots or even particular people. (For example, parents could access an online program to turn off the phone in their teenager's room every night at 10:00 p.m., or they could prevent the family phone from ringing after midnight except if the call is from their aging parents.) Notwithstanding these advantages, currently some VoIP services have several drawbacks. Since VoIP runs through broadband lines, early-generation Internet telephony services may not work in power outages, may not provide location-specific 9-1-1 access, and may have slightly lower voice quality—issues that VoIP service providers are working to overcome.

The lower cost and increased functionality of VoIP technology has spurred its growth, particularly among more expensive overseas traffic.[6] In some Asian countries where there are higher rates of broadband penetration, VoIP is growing rapidly. For example, Yahoo! Japan, which has more than 2 million customers, is packaging VoIP along with its traditional content portal and broadband service. In Europe, VoIP is used to some degree by almost one-fifth of all companies.[7] Domestically, a growing share of companies have moved to VoIP. In-Stat/MDR, a

market research firm, predicts that the proportion of U.S. businesses using VoIP will rise from the current level of 2 percent to more than 19 percent by 2007.[8] McKinsey Consulting estimates that at current trends in the adoption of both broadband and VoIP, 10 percent to 20 percent of residential users in Japan, the United Kingdom, and the United States may switch from traditional telephony to VoIP by 2010.[9]

Policy Issues

To realize the great potential of VoIP, it will be critical for policymakers and regulators to create the right regulatory and tax framework. Given that telecommunications remains one of the most regulated and taxed sectors of the economy, there are a host of public policy issues surrounding VoIP.

Regulatory Classification

Perhaps the most basic issue is determining how VoIP should be classified for regulatory purposes. Some argue that VoIP should be classified like email, which is in the lightly regulated Title I Information Services group (services that ride on top of a telecom service). Others argue that Internet telephony is functionally similar to standard telephony, so it should be classified the same way—in the more heavily regulated Title II group of telecommunications services (the basic transmission facilities used for traditional phone service).[10] Still others argue that it is time for a new classification system.

It is important to distinguish between two different kinds of VoIP services: those that use telephone numbers assigned through the North American Numbering Plan, and those that do not. The latter services, such as instant voice or video messaging, gaming, and peer-to-peer systems, are much more like email than phones. They use Internet protocols and connect people using similar computer equipment, not telephones. Thus these types are not substitutes for standard telephones. The robust competition in applications like email allow them to be classified in the Title I designation. The Progressive Policy Institute (PPI) believes that VoIP services that do not rely on the North American Numbering Plan should be designated Title I and therefore not subject to Title II regulations—including law enforcement access, universal service payments, price regulation, FCC approval for acquiring or building new lines, unbundling of lines, and network access fees. This was the thinking behind the FCC's early 2004 ruling that, since Pulver's software-based VoIP service does not rely on telephone numbers, it should be a Title I information service.[11]

Determining the appropriate regulatory designation for VoIP services that are full-fledged substitutes for wireline circuit-switched phones is not straightforward. These Internet telephony services are not exactly like regular phone service, but neither do they fully resemble email. Even so, a number of state public utility commissions have classified or tried to classify VoIP providers as telecommunications providers, in part because their laws provide them with very little flexibility. For example, if a company offers voice services in California, it automatically triggers a multitude of requirements, because state laws do not differentiate between VoIP and traditional telephone service. At the federal level, there are proposals for how VoIP should be classified, which include designating Internet telephony as either Title I, fully regulated Title II, lightly regulated Title II (with the FCC using discretion to selectively apply much of the usual regulation), and development of a completely new title.

In determining the appropriate regulatory framework for Internet telephony, it is important not to shoehorn new applications into old categories. The best way to approach VoIP is from a pragmatic perspective, carefully examining which regulatory requirements make sense and which do not. Assigning Internet

telephony to Title I does not give the FCC the authority to deal with issues such as universal service, while assigning it to Title II risks imposing unneeded legacy regulations.[12] One approach has been offered by Reps. Rick Boucher (D-Va.) and Cliff Sterns (R-Fla.) in their Advanced Internet Communications Services Act of 2004 (H.R. 4757), which would create a new title for communications services like VoIP and assign it some regulatory responsibilities while limiting others.[13] While this legislation may be too broad, possibly leading to FCC regulatory authority in applications like instant messaging and gaming, it is on the right track in creating a unique category for Internet telephony.

Regulatory Parity

Another overarching issue is the question of whether different kinds of voice services should be regulated the same way. Regulatory parity is an important principle (although one that is almost always invoked in the service of a particular economic interest), but it should not automatically trump other principles, such as promotion of innovation.

"Congress and the FCC should continue to signal that net neutrality is a critical public policy concern that will prompt strict action if violated."

Some argue that particular kinds of VoIP providers—such as new, small, or rural providers—should be regulated more lightly than larger incumbent ones. However, given the importance of allowing the market to determine the best VoIP offerings, all Internet telephony providers—including facilities-based and non-facilities-based firms—should be subject to the same minimal regulatory requirements.

The issue of regulatory parity between providers of VoIP and circuit-switched services is not as clear-cut as the issue of regulatory parity based on size or location of companies. Proponents of regulatory parity argue that regulating VoIP more lightly could artificially put PSTN at a competitive disadvantage. Yet, there may be compelling reasons to favor new technologies, as they often have significant positive spillover effects that benefit society. In this case, robust adoption of VoIP could be a killer application that drives adoption of broadband Internet services, which in turn would lead to productivity gains and broader economic growth. Moreover, it is not as if regulatory parity is the norm today. In fact, telecommunications regulation is more frequently characterized by regulatory disparities.[14] For example, residential circuit-switched telephone systems benefit from a host of universal service subsidies, while the wireless and broadband/VoIP networks generally do not. As a result, there are compelling reasons not to subject VoIP services to the same tax and regulatory requirements faced by the circuit-switched network.

Net Neutrality

The promise of a competitive telephony marketplace is contingent on competitors being able to offer VoIP services to customers using broadband connections provided by other carriers. In theory, this should not be a problem, since broadband networks are open—consumers can run any legal Web application and hook up any device to the Web (such as a video game console or Internet phone). If these broadband networks stay open, the marketplace should enable a significant number of VoIP providers, creating competition and plenty of choices for consumers. Some have argued, however, that broadband service providers have an incentive to structure their networks to either exclude or disadvantage some applications, or to ensure that their own applications are given preference. But there is no evidence that facilities-based broadband providers are structuring their networks to put

competitors' applications at a disadvantage.[15] In fact, a coalition that includes some facilities-based broadband providers has signed onto a set of principles to keep their networks open and to allow consumers to run any legal application, access any content, run any device, and be informed of any limitations.[16] Some conservatives argue that broadband providers should be able to do virtually anything they want with their networks since they own them. However, PPI strongly disagrees; we believe that network providers should keep their networks open and neutral as a matter of public interest.

Congress and the FCC should continue to stress net neutrality as a critical public policy concern that will prompt strict action if violated.

Net neutrality refers to the principle of broadband providers not discriminating against packets that travel over their networks.[17] Some broadband providers, however, have indicated that, in order to ensure a higher quality of service for their proprietary VoIP offerings, they may contract with Internet backbone providers to give higher priority to their customers' VoIP packets—essentially creating a virtual private network. Their email traffic, as well as competitors' VoIP offerings, would continue to travel on the public Internet at whatever speeds are available. While companies should not be precluded from paying more to ensure a higher quality of service for their own VoIP services, it will be important for regulators to monitor the effects this practice will have on competition. The effects may, in fact be minimal or non-existent with VoIP that requires modest amounts of bandwidth. If Internet-based video telephony becomes widespread, the ability to provide a dedicated private network for certain streams of data has the potential to be an unfair competitive advantage.

Economic Regulations

When wireline phone service was limited to one provider (usually a Regional Bell Operating Company), economic regulations were needed. Without them, monopoly providers could raise prices and engage in anti-competitive behavior. Given net neutrality, however, there is every reason to believe that a vibrant and competitive market will emerge for Internet telephony services.

In a competitive marketplace, the traditional justification for regulations dealing with market entry, price, rate of return, reporting obligations, service quality, and terms of service makes little sense. Competition and the desire to gain more consumers will keep prices low and service quality high. **But, even in a competitive marketplace, consumers will still need protection from deception, fraud, and other unfair practices**.

Regulators will, however, have to carefully monitor the VoIP marketplace during the transition from traditional telephone service. At some point in the future, most consumers will have likely switched to VoIP, but some will stick with what they have. In order to cut the costs of maintaining both a broadband network and a public-switched network, incumbent local exchange carriers (ILECS) may require customers to switch to VoIP phones, then run VoIP traffic completely through packet-switched networks, without charging customers for broadband. These customers would experience very little change in service even though they are using a VoIP phone. If they do not have a computer, however, customers will not be able to buy VoIP service online, giving them fewer choices. If VoIP prices are unregulated, it is possible that ILECs could raise prices for phone service to this class of customers. If this happens, regulators may want to step in and end this practice.

Universal Service

Perhaps the most contentious and high-stakes policy issue related to Internet telephony

is that of universal service. Universal service consists of the traditional system of cross-subsidies that collectively makes up the nation's commitment to provide access to telephone service for all Americans. The funding system supports three main types of users: 1) telecommunications providers in locations that are costly to serve (such as lightly populated rural areas); 2) schools, libraries, and rural health centers; and 3) low-income persons. Universal service has been funded by a mixture of implicit subsidies (for example, long-distance access charges that are higher than their actual cost to providers) and explicit subsidies (universal service charges on local phone bills). Currently, at the federal level, approximately $6.5 billion per year is paid directly into a USF, and an unknown amount of support is buried in access charges. States provide another $1.9 billion annually in direct funds for universal telephone service.

"Unless policymakers undertake fundamental universal service reform, any effort to apply universal service obligations to VoIP will burden this new service with extremely high costs."

Most economists agree that implicit subsidies lead to considerable market distortions. Even without the emergence of VoIP, the current universal system is not sustainable since a large share of universal service is supported by long-distance telephone access charges paid to local carriers, particularly in high-cost rural areas. As long-distance wireline calls are displaced by a combination of email, instant messaging, cellular phones, and increasingly VoIP, the volume of circuit-switched long-distance calls and the universal service taxes it generates will decline even more. As a result, unless policymakers undertake fundamental universal service reform, any effort to apply universal service obligations to VoIP services will burden this new service with extremely high costs.

Payments from the Universal Service Fund to Telecom Providers

The increased pressure on the USF is due to the significant rise of universal service expenditures during the last decade—and these expenditures are expected to continue to grow. This is not surprising, given that there is little accountability in the system and few incentives for high-cost carriers to take meaningful steps to lower rates. (For example, these companies could merge or provide lower-cost services, such as wireless, to customers in high-cost areas.) Meaningful universal service reform should therefore focus on reducing federal costs, and policymakers should take the following three steps.

1. *Allow prices in high-cost areas to be higher than prices in lower-cost areas.*

The 1996 Telecommunications Act affirmed the principle that telecom prices in high-cost rural areas should be roughly equivalent to prices in lower-cost urban areas.[18] Yet, in no other sector of our economy do we expect urban and rural prices to be equivalent. For example, housing (clearly a critical commodity) is 70 percent more expensive in the suburbs of large metropolitan areas than in rural areas, and yet we do not have a national universal housing access program that increases rural residents' property taxes to lower suburban residents' property taxes. Some will argue that high urban rates benefit urban residents because they can call rural telephone users. But the marginal benefits of being able to call a few more people do not necessarily make up for the costs involved. Besides, if this were true, the FCC could impose a tax directly on calls to rural numbers. We should recognize that modest increases in rural telephone bills phased in over a number of years

is acceptable public policy. That would go a long way in reducing the pressure on the USF.

Reducing universal service payments, particularly through significant reduction of access charges, would result in higher rural rates if offsetting revenues were not created. But rates in many high-cost rural areas could increase considerably, while remaining quite affordable for most consumers. For those low-income households where price increases are a burden, federal low-income support programs (such as Lifeline and Link-up) could be expanded so that no one will lose phone service due to these reforms.

2. *Congress and the FCC should take steps to reduce unnecessary universal service payments.*

There are several steps the federal government could take to limit universal service payments without leading to higher prices for primary telephone service. First, they could make clear that second lines do not qualify for support. Universal service is designed to provide basic affordable telecom services to rural residents, and second lines go beyond basic service.[19]

Second, the FCC could limit payments to multiple providers in the same geographic area, designating as eligible only a single carrier of last resort, required to serve everyone. Such designations could be made through a reverse auction with the lowest bidder gaining the right to receive the subsidies. In the quest for ubiquitous competition, the federal-state board overseeing the USF has made competitive communications carriers eligible for universal service subsidies, even though incumbent providers are also serving these same high-cost customers. As a result, payments to these competitive providers have increased from around $250 million to $500 million in the last year, in part because competitors are increasingly classified as qualified providers.

Third, the FCC could cap the fund at current levels and move away from a guaranteed rate of return for rural carriers, which would give them an incentive to cut costs, merge with other carriers, and raise retail rates. There is no reason why the fund should support extremely small rural carriers with much higher operating costs than if they merged with other carriers.

Fourth, given that VoIP is cheaper than circuit-switched telephony, the FCC could require that schools and libraries qualifying for the E-rate telecommunications subsidy use VoIP services.

Finally, Congress and the FCC could structure the universal service program so states assume more of the burden. If a state wants to lower costs for its rural residents, it is only fair that its urban customers bear some of that burden. States could either spend general fund monies or institute a subscriber line charge higher than the national rate.

3. *Any universal service payments made by VoIP services should support the build-out of broadband telecommunications, not the PSTN.*

As discussed below, there are several reasons why VoIP services should be required to pay into the USF. However, using these revenues to support the 20th century circuit-switched network will only delay that transition to a robust, packet-switched broadband network for the 21st century. As former FCC Commissioner Reed Hundt stated, the current debate about VoIP and subsidies is as if "government responded to Henry Ford's new invention of the automobile by discouraging the construction of roads and, instead, taxing cars in order to subsidize canals and railroads."[20] However, given that the costs of VoIP services, not including broadband, do not differ by geography (while the costs of broadband services do), and given that VoIP services are likely to be extremely affordable (especially for fixed-calling service packages), there appears to be little reason to subsidize VoIP services, even for low-income households.[21] To the extent that

affordability is an issue, regulators could extend programs such as Lifeline and Link-up to VoIP users.

While VoIP is likely to be very affordable, the cost of the underlying broadband service can be more expensive and may vary by location. Yet, universal broadband service has important economic benefits for the nation—including fostering rural development, among other things. As a result, VoIP universal service revenues should be used to support the deployment of broadband telecommunications, particularly higher-speed broadband, to high-cost areas. Regulators could decide how to allocate these funds on the basis of a reverse auction. Broadband providers would bid on serving customers in high-cost areas with the lowest price-per-customer bids qualifying to receive universal service subsidies.

Contributions to the Universal Service Fund

As consumers choose a variety of telecom services beyond regular circuit-switched telephony, there is considerable debate about whether VoIP should be subject to universal service obligations.

We believe that, for the foreseeable future, VoIP service providers using the North American Numbering Plan to assign phone numbers should contribute to the USF—at least until most households subscribers to VoIP.

The issue of timing and managing the transition to a fully packet-switched network is one that should be taken into consideration. Once most Americans have switched to VoIP, these services will be considered simply additional Internet applications, like email. At that point, VoIP service providers should not be required to contribute to universal service. At that time, though, it may be appropriate for broadband firms to pay into the USF, provided that the revenues are used to support the deployment of high-speed networks and not PSTN. While some argue that broadband services should pay into the fund today,[22] given that approximately 20 percent of the population has broadband, subjecting it to universal service obligations would increase the cost of broadband and reduce its growth rate.

While VoIP services that use the North American Numbering Plan should pay into the USF, it is less clear how they should contribute. The contribution could be based either on phone numbers (a fixed charge per phone number) or as a tax on the monthly bill. Each has its advantages and disadvantages. While a per-number approach is easy to administer, it could reduce the functionality inherent in VoIP—for instance, the ability to maintain multiple numbers on the same account. One solution would be to assess a lower USF on second numbers. A per-number approach might also allow some companies to avoid their fair share of taxes if they use one number with multiple extensions. The FCC could account for this by imposing some share of the standardized USF fee on each extension. The advantage of the monthly bill tax is that it is more progressive—higher-income households consume more telecom services—and it does not discriminate against households with multiple phone numbers. But a major disadvantage is that it could be difficult to administer, as determining the cost of VoIP services that come bundled with other features could be quite complex.

Access Charge Reform

A key aspect of the universal service debate concerns charges paid by long-distance carriers (including wireless carriers) to access local PSTNs. Regulators have kept local telephone rates low by authorizing a higher-than-cost access fee that long-distance carriers must pay to connect calls to local networks, including significantly higher costs to connect to many rural networks.[23] As wireline long-distance calls

decline and as universal service costs increase, the system is coming under increasing cost pressure. In addition, because access charges differ according to type of company, size of company, and geography of the call—and often bear little or no relation to the underlying cost born by the carrier being compensated—this system of implicit charges not only distorts markets, but makes it difficult to track exactly how much is spent on universal service. This is why the 1996 Telecom Act gave the FCC the ability to fund universal service directly and explicitly through a federal USF. While the FCC has taken some steps in this direction, it has not implemented comprehensive reform, in part because of opposition from particular players in the industry, especially politically powerful rural carriers.[24]

There is agreement among most players that federal and state access charges should be reduced and made uniform, and, to the extent justified, that the revenue losses should be made up by adding universal service charges to customers' monthly telephone bills. The devil, though, is in the details.[25]

We believe that the FCC should expeditiously lower interstate and intrastate access charges and require that all calls (wireless, VoIP, and long distance) be charged the same lower rate. To make up some of the revenue loss, the FCC should increase the per-line subscriber line charge. To limit the effect on low-income households, this increased charge should be waived for these households.

In the interim, there is still the question of whether VoIP calls should be subject to the current dysfunctional access charge regime. In order to understand this, it is important to note that there are several ways a VoIP call can be made. First, calls can originate and terminate on VoIP phones, without being routed over the local circuit-switched telephone network. Such calls should be treated like an email and not incur access fees. Second, calls can originate and terminate on the circuit-switched network, but run over the IP backbone, without adding additional information and functionality. Such calls, according to a recent FCC ruling, are considered telecommunications services and subject to access charges. Finally, calls can originate on a VoIP phone, travel through an IP backbone, and be delivered by a local telephone company over the PSTN. The FCC is currently reviewing whether this kind of call should trigger access charges.

One challenge in treating different types of calls differently is that there is currently no way to distinguish calls that come from a VoIP provider versus those from a PSTN provider. While it is technically possible for VoIP providers to label their calls, it is not clear whether the effort is worth the expense.

The national interest demands accelerating the transition to a fully packet-switched network that is better suited to our 21st century needs than the old public-switched network. But, with so many incumbent service providers and upstart players on the field, there is no clear agreement on that principle. Some argue that making the new VoIP service participate in a broken funding system makes little sense, and that exempting VoIP providers would not only increase pressures for access charge reform, but also spur adoption of VoIP that keeps prices low. Others counter that exempting VoIP services would be unfair, because it would "artificially decrease demand" on the PSTN.[26] Still other proponents argue that forcing VoIP providers to pay gives them an incentive to encourage more customers to switch to VoIP so they can avoid access charges altogether.

PPI believes the ideal solution would be for the FCC to take quick action to dramatically reduce access charges. Failing this, if VoIP providers can develop a system to indicate the call as IP-originated, the FCC could require that VoIP callers pay access charges, at a significantly lower rate more closely aligned to true costs.

Taxation

Telecommunications is one of the most heavily taxed consumer items; only alcohol and tobacco have higher taxes. As we move into a world where most consumers will use VoIP to make telephone calls, there is a fierce debate about whether states and the federal government should apply the tax regime of the circuit-switched world to VoIP. In 1998, Congress passed the Internet Tax Moratorium, which covers Internet access charges.[27] But as Congress debated the reauthorization of the act in 2004, there was considerable disagreement about extending the moratorium to VoIP and broadband.

Opponents of applying the moratorium to online services argue that it is unfair to tax certain types of telecommunications services, like the telephone line. That argument is somewhat of a red herring, since these distinctions are made all the time—for example, states exempt most services from sales taxes. Similarly, the choice of what to tax should be based on sound public policy reasons, not just the fairness argument.

Opponents also argue that the Internet and broadband are merely consumer services, no more important than such services as cable television, telephone service, or energy, all of which are taxed. However, this represents a fundamental misreading of the Internet. Internet users do engage in "consumption" activities when they read websites or play games. But, what many have not appreciated is that the Internet turns users into what futurist Alvin Toffler termed "prosumers"—consumers who are part of the production system. For example, when consumers buy an airline ticket or pay a bill online, they substitute for a travel agents or bank clerks. When they buy music online, they substitute for CD manufacturers. These self-service prosumers, who use Internet access and broadband services as equipment to be productive, are a key part of the productivity boom in the digital economy.

Tax policy favors investment by businesses because governments want to stimulate capital investment. At the very least, tax policy should not penalize productive investments made by prosumers.[28] To the extent that VoIP is a killer application that will drive the deployment and adoption of high-speed broadband, it is an application that policy should support, not discourage. As a result, VoIP and broadband should be included in the Internet tax moratorium, including a freeze on the federal telecommunications excise tax on VoIP services. The moratorium should be temporary, however, because at some point—when most telephony is on the Internet and most Americans have broadband—it may make sense to tax broadband services and use a portion of the revenues to fund a universal service program to help low-income Americans afford broadband.

Other Social Obligations

Telecommunications is a regulated industry, and thus is required to meet a number of social obligations, including offering 9-1-1 emergency services, providing access for the hearing disabled, and giving law enforcement proper and authorized access to telephone traffic.

9-1-1 Emergency Service

Currently, 9-1-1 services automatically identify the originating addresses of phone calls. However, with VoIP, consumers can move their telephone and phone number to any location, as long as they have a broadband connection and the hardware to make VoIP calls. As a result, when VoIP users call 9-1-1, responders may not automatically get the correct location information.

The telecommunications industry is working on this challenge.[29] The FCC should provide the industry with a reasonable period of time to

develop an adequate 9-1-1 system before requiring compliance. Until then, providers should be required to inform consumers if their VoIP services do not offer 9-1-1 service comparable to their traditional service.

Power

Since VoIP services rely on power to the phone, modem, computer, and even the neighborhood network (in the case of cable), a loss of power will temporarily disable the service. Many consumers may not be fully aware of this limitation, just as many do not recognize that the local phone remains powered, in many cases, if there is a power outage. The FCC should require VoIP providers to inform customers of this limitation. The industry is working on long-term solutions to these power issues, such as providing battery-powered backups. Many residential VoIP services also provide "follow me" or forwarding services that enable consumers to remotely forward their calls to a wireless phone or other device, which can be beneficial in times of a power outage or phone line disconnection.

Law Enforcement Access to Networks

In the 1990s, as telecom networks were converted from analog to digital, the law enforcement community worried that they would have difficulty legally accessing telecommunications traffic. As a result, Congress passed the Communications Assistance for Law Enforcement Act (CALEA) requiring Title II telecommunications providers—not Title I providers—to structure their networks for law enforcement access. As we move into a VoIP world, law enforcement is once again concerned that they have access to traffic necessary in criminal investigations or national security situations. Recently, the FBI proposed that VoIP providers be required to comply with CALEA.

Opponents of applying CALEA to VoIP argue that, while VoIP providers are complying with all legitimate law enforcement requests, a requirement to comply with CALEA's design mandates would place an unwieldy burden on technological innovation. They also point out the original congressional intention was not to exclude Internet-based services in CALEA. Even in a post-Sept. 11, IP-enabled world, PPI believes that law enforcement should have access to all electronic communications traffic, including Title I. The issue is how to meet these demands without stifling innovation. In August 2004, the FCC announced a proposed rule that would address law enforcement access to VoIP services. Virtually all providers of Internet telephony have already committed to opening their networks to law enforcement. The nature of Internet architecture is not the same as the circuit-switched telecommunications architecture; therefore, VoIP providers may not be able to provide exactly the same functionality to law enforcement as they would under Title II services currently covered by CALEA. There may be other benefits from VoIP though, including making it easier for law enforcement to gain legal access to voice traffic.[30] As a result, while Internet telephony providers should provide law enforcement with a decoded bit stream and/or list of dialed numbers, they should not be required to comply with the terms of CALEA that were designed specifically for the circuit-switched network.

Addressing other VoIP services, such as Pulver and Skype, or even voice instant messaging, is more problematic. For example, given the fact that Skype is not based in the United States, it is unclear whether the federal government would have jurisdiction over them. Given that consumers will soon be able to access hundreds, if not thousands, of voice applications—including instant messaging, gaming, and email—expecting everyone to comply with CALEA requirements would place a significant burden on the technology industry

and hamper innovation. This is one reason why the FCC ruled that Pulver's Free World Dialup is an information service, not subject to telecom rules or CALEA.[31] The best way for law enforcement to track this traffic is at the ISP level, and law enforcement will need additional resources to develop the technological means and skills to monitor Internet traffic more effectively.

Federal-State Roles

As with almost all issues involving e-commerce and the Internet, the appropriate locus of regulation is at the federal level, not the state. With services that are inherently interstate (and even international), where service providers in one state sell a service to customers in all 51 jurisdictions, a patchwork of 51 regulations makes little sense—whether the regulations cover VoIP or other telecom issues such as Spam, privacy, or Spyware. But this is particularly true with respect to VoIP, because interstate calls are likely to be routed through multiple states and consumers can take their phone numbers and service with them as they move from state to state. Even so, several states, including California, Minnesota, and New York, have attempted to assert jurisdiction over VoIP and others are expected to follow.[32] On November 9, 2004, the FCC correctly ruled that Vonage, a leading Internet telephony company, is not subject to state utility regulations, but instead is subject to federal rules, since VoIP services are interstate in nature. The decision applies to all VoIP providers.

Conclusion

If the late 1990s were characterized by irrational (or at least premature) exuberance for the innovative promise of the IT revolution, the last few years have been characterized by the opposite trend: an irrational pessimism about the long-term benefits of IT, and the Internet in particular. As public attitudes settle on a more realistic middle ground and new innovations spur growth, one driver of continued progress will be VoIP. It is critical that our legal, regulatory, and tax systems not hinder that transition.

Endnotes

[1] Atkinson, Robert D., Shane Ham, and Brian Newkirk, "Unleashing the Potential of the High-Speed Internet: Strategies to Boost Broadband Demand," Progressive Policy Institute, September 24, 2002, *http://www.ppionline.org*.

[2] "Memorandum Opinion and Order in the Matter of Vonage Holdings Corporation's Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Utilities Commission," Federal Communications Commission, November 2004, *http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-267A1.doc*.

[3] There were approximately 70,000 registered Skype users in October 2004.

[4] Skype and Free World Dial Up both offer paid-for services that allow users to call users on the PSTN. However, these services do not assign users a phone number that allows them to receive calls from the public switched telephone network (PSTN).

[5] Consumers can also buy Voice over Internet Protocol (VoIP) phones that plug directly into a broadband modem. In addition, consumers can use "soft phones," software that enables computers to receive voice.

[6] More than 50 percent of overseas fax traffic no longer goes over circuit switched connections and more than 10 percent of voice traffic is sent over IP backbones overseas.

[7] Beardsley, Scott, Luis Enriquez, and Jon C. Garcia, "A New Route for Telecom Deregulation," The McKinsey Quarterly, 2004, no. 3, *http://www.mckinseyquarterly.com/article_page.asp?ar=1437&L2=22&L3=78&srid=27&gp=0*.

[8] In-Stat, *http://www.instat.com*.

[9] Beardsley, *op. cit.*

[10] This issue is certainly not new. For example, in 1998 the Federal Communications Commission (FCC) wrote a report on the classification of VoIP at the behest of Sen. Ted Stevens (R-Alaska) who wanted to know whether Internet services should contribute to the universal service fund (USF) designed to help everyone have affordable access to communications services.

[11] "FCC Rules on Pulver's Free World Dialup VOIP Service," *Tech Law Journal*, February 12, 2004, *http://www.techlawjournal.com/topstories/2004/20040212b.asp.*

[12] Some argue that it should be assigned as a Title II telecommunications service and that the FCC can forbear from regulations. This

is true, but it creates a considerable level of regulatory uncertainty as the FCC may decide to regulate after a period of forbearance.

[13] In their case, the Boucher and Stearns legislation would not subject VoIP to traditional price and market entry rules, but would have the responsibility of Internet-based emergency response system (known as an "E9-1-1 system"), disability access, U.S. Fund, and inter-carrier compensation.

[14] For example, providers of cable modem broadband services are not required to open up their networks to competitors, as are incumbent providers of digital subscriber line (DSL) services.

[15] Priority to the telecom carrier's own VoIP packets over a competitor's may not even be a problem given that VoIP packets do not appear to need high levels of broadband capacity. However, as the applications evolve to video telephony, packet prioritization could reduce the quality of competitor services compared to incumbent provider services.

[16] "Broadband Principles for Consumer Connectivity," High Tech Broadband Coalition, September 25, 2003, *http://www.nam.org/s_nam/bin.asp?CID=161&DID=227140&DOC=FILE.PDF*.

[17] Both competitive VoIP providers and broadband providers of VOIP rightly prioritize their packets so they receive priority over other applications such as email or Web downloads. The issue here is whether some VoIP applications receive priority over other VoIP applications.

[18] In reality, because of extensive universal service subsidies, many rural phone users pay less in monthly charges than urban and suburban users, even though it often costs considerably more to provide phone service to rural users. For example, it is not uncommon for rural telephone companies to sell residential phone service for between $6 to $10 a month (a much lower rate than in urban areas). Only 12 percent of rural telephone companies get more than 40 percent of their revenue from local end user rates. "NTCA Concerns with ICF Plan," National Telecommunications Cooperative Association, Webcast for the Press, September 3, 2004, *http://www.ntca.org/content_documents/PRESS%20Sep%203%202004%20NTCA%20Concerns%20with%20ICF%20Plan.pdf.*

[19] Moreover, funding second phone lines has the perverse incentive of making broadband relatively more expensive, since broadband and VoIP are often substitutes for a second line. If second lines are subsidized, consumers will have less incentive to scrap their second line and use the savings to help pay for broadband service, as in the case of DSL, which uses the primary phone line.

[20] Hundt, Reed, "Reforming Telecom Policy for the Big Broadband Era: Why is Government Subsidizing the Old Networks When 'Big Broadband' is Inevitable and Optimal?," speech given to the New America Foundation, December 2003, p. 2, *http://www.newamerica.net/Download_Docs/pdfs/Pub_File_1431_1.pdf*.

[21] Net2phone sells 300 minutes a month of outbound calls (and unlimited inbound calling) for $9.99 a month. VONAGE provides 500 minutes for $14.99 per month.

[22] Providers of DSL are currently subject to paying into the USF because it is classified as a telecommunication service.

[23] For example, an intrastate call to the customer of a rural carrier can generate several cents per minute for the rural carrier, but a wireless or VoIP call from the same location will likely generate only a fraction of the revenue realized from a traditional call. Calls delivered to U.S. regional carriers in rural areas pay as much as $.07 per minute, a remnant of the old system. The result is an average cost of 1.1 to 1.5 cents to connect a call across the United States. This amounts to an enormous transfer of funds to rural carriers.

[24] Interstate access charges have been brought down to $0.55 per second under the "Consumers Are Losing Lots" proposal (known as the CALLS plan), but they are still above cost.

[25] The Intercarrier Compensation Forum (ICF, an ad-hoc group of some, but not all, telecom companies) recently proposed that they would eliminate charges for interstate access, intrastate access and reciprocal compensation by 2009. They propose the creation of a unified access rate for all calls to the PSTN by the end of 2005. The new rate of 0.000175 cents per minute would be significantly less than current access charges. However, political pressure from rural carriers has prompted the ICF proposals to charge a higher rate to calls from non-rural local exchange carriers (LECs) to rural carriers. While the proposal is an attempt to keep rural carriers from losing more money, it is still a system that artificially distorts prices. The ICF proposes to replace the revenues lost from the reduced access charges with a higher universal charge on the local telephone bills, raising the monthly subscriber line charge cap from $6.00 to $8.50 for rural carriers, and $10 for urban carriers.

[26] "Comments of the Federation for Economically Rational Utility Policy," In the Matter of IP-Enabled Services (WC Docket No. 04-36), Federal Communications Commission, May 28, 2004, p. 18, *http://www.ferup.org/summit/materials/FERUP-VOIP-Comments-FCC.pdf*.

[27] *Federal Internet Taxation Freedom Act* of 1998, 105th Congress, 2nd sess., H.R. 4105 IH.

[28] In fact, PPI proposes that we go further and a provide a one-time, $300 dollar tax credit to individuals subscribing to high-speed Internet access with speeds greater than 20 mb per second (most current residential broadband has speeds of around only 1 to 3 mb per second).

[29] The Alliance for Telecommunications Industry Solutions is joining forces with the National Emergency Number Association to form a committee that will develop a plan to give Internet telephone users access to emergency 9-1-1 services. One likely solution is to tie location information to the broadband modem being used, so that emergency service providers would know what modem a caller is using. Many residential VoIP services already feature a traditional E9-1-1 service, which provides a location and call-back number automatically.

[30] For example, with VoIP (and a legal wiretap warrant) law enforcement officials might be able to listen into a conversation while they are at their desktop computer instead of having to go out in the field and tap into the telephone line.

[31] "FCC Rules on Pulver's Free World Dialup VOIP Service," *op. cit.*

[32] The U.S. District Court recently ruled that Minnesota's public utilities commission could not regulate Internet calls as they had proposed.

Find this and other policy reports at **WWW.PPIONLINE.org**, *the official website of the Progressive Policy Institute.*

Now on PPIonline.org:

- ❒ **Our National Security Challenge:** An Open Letter to Democrats

Also from PPI's Technology and New Economy Project:

- ❒ **Radio Frequency Identification:** Little Devices Making Big Waves
  Julie Hutto and Robert D. Atkinson

- ❒ **Technological Innovation Without Big Brother:** Privacy Principles for Government in the Information Age
  Robert D. Atkinson

If you would prefer to receive future reports via email, please contact the PPI Publications Department at **publications@dlcppi.org.**