

Apps, Internet-Based Services, and the 21st Century Global Telecommunications Network

Any report on the 21st century telecommunications network is guaranteed to be out of date before the ink is dry, or, in today's terms, before the writer can click "send." An ever-escalating rate of change is evident in every aspect of the market from the daily introduction of innovative new "apps" and "smart" mobile devices, to continuous deployment of more efficient and faster wireless and broadband networks, all driven by insatiable consumer demand to communicate and access information from any place at any time. The difficult challenge for legislators is to ensure that laws and regulations keep pace with this competitive, dynamic communications ecosystem. This means not just updating or repealing antiquated statutes still laced with references to "telegraphs" and "pay phones," but also ensuring an overall policy and governance framework that unleashes the full potential of economic and consumer benefits from existing and yet-unknown technologies and services. It also means fostering a network where all competing service providers can interconnect and all consumers have access to service options that meet their needs and enable calling 911 in an emergency.

This hearing is intended to assist legislators in meeting this challenge by providing an overview of today's telecommunications network and new Internet-based services, a report on recent statistics on consumer use of various services and applications, and a review of federal and state law governing today's communications ecosystem.

From POTS to Apps

For much of the last century, telecommunications consisted of Plain Old Telephone Service (POTS) – local and long distance voice service over landline facilities with circuit-based switching offered by a monopoly provider. Consumers received video separately through over-the-air broadcasting. By the 1980s, a nationwide wireless network was emerging, and cable companies were bringing a second wire to homes for video. With a dial-up connection to the Public Switched Telephone Network (PSTN), consumers could transmit data by fax and access the Internet and use email with a personal computer.

Today, a single broadband connection serves as a platform for integrated voice, video and data services and Internet access. Universal access to broadband was made a national priority with the National Broadband Plan in 2010, reinforcing California's initiatives to promote broadband deployment and adoption. New generations of wireless networks are expanding capacity for

transmitting mobile data traffic and providing mobile high-speed Internet access. “Smart” phones, tablets and other mobile devices are used for voice calls, texting, and email, plus taking and sending photos and videos, online banking and shopping, and accessing games, music, movies, and an explosion of apps that touch nearly every aspect of daily life. Indeed, the new “app economy” is a nationwide leader in job creation, with about a quarter of new jobs in California.¹

Network Transitions to Internet Protocol

Underlying a lot of these changes is the transition of the network from circuit switched technology, where a communication is transmitted over one sustained circuit, to Internet Protocol (IP) technology, which is the foundation for the Internet. IP technology changes the contents of a communication into digital packets of information, which are then routed over different pathways on private IP networks or the Internet. These separate packets of information run through various computers, routers, and switches, and are then reconstituted at the destination.

Voice over Internet Protocol (VoIP) is an IP-enabled service for voice calling that requires a broadband connection and a piece of equipment at the caller’s premises to convert analog voice signal into packets. “Interconnected” VoIP enables calling to and from the PSTN. VoIP service may be offered by the same provider of the broadband connection, such as a cable company (i.e. Comcast’s Digital Voice) or a local exchange carrier (i.e. AT&T’s U-verse or Verizon’s FiOS). “Over-the-top” VoIP is offered separately and operates with any broadband connection, in many cases free of charge (i.e., Skype).

While similar in many ways to traditional landline telephone service, VoIP is different in that the IP technology and broadband connection provide an integrated suite of capabilities and features that go beyond the ability to place and receive calls. Users can send and receive information and access their calls and information in a variety of ways from multiple devices – phone, Internet, video, mobile handset, iPod, or smart phone. VoIP service allows, for example, to play back voicemails through a computer or receive them in an email, with the actual message attached as a sound file, have caller identification information appear on a television screen, cause incoming calls to ring at multiple locations simultaneously, or combine voice calling with a live video connection.

Consumers Demand Mobility and High-Speed Internet Access

Technological innovation has dramatically changed consumers’ experience with the telecommunications network. The following are some key data points on major trends in the ecosystem, with increased mobility and mobile broadband dominant themes:

Mobility – Nearly 33 million Californians, or about 89 percent of the statewide population, subscribe to wireless service. About 25 percent of U.S. households are wireless only with no landline telephone service, while 75 percent have both wireline and wireless. About 70 percent of all calls to 911 are from a mobile device.

¹¹ “Where The Jobs Are: The App Economy” (February 2, 2012), available at <http://www.technet.org/wp-content/uploads/2012/02/TechNet-App-Economy-Jobs-Study.pdf>

Landline to VoIP – Nationwide, the number of subscribers to interconnected VoIP service increased 46 percent from 2008 to 2010, while the number of subscribers to traditional wired telephone services decreased by 17 percent during that two-year period. As of December 2010, 31 percent of the 87 million residential telephone subscriptions in the United States were provided by interconnected VoIP providers. As the two largest carriers (AT&T and Verizon) continue to migrate customers from landline to broadband connections, these numbers will increase dramatically. These two carriers had a combined 29 percent increase in the number of VoIP customers in the six months from June to December 2011.

Portable and Smart Devices – About 490 million “smart “phones were sold worldwide in 2011, exceeding the number of personal computers sold over the same period. But distinctions between those devices are blurring. Microsoft and Apple recently unveiled new designs of desktop and laptop computers that incorporate elements from smartphones, and Google unveiled a new browser that lets users synchronize Web searches between their mobile devices and computers.

Apps – Apps, which did not exist before the iPhone was introduced in 2007, now number nearly a million. These software programs run on smart phones and other mobile platforms and are incorporated into social networks such as Facebook and Web sites accessible through a fixed or mobile broadband connection. Apps are available to deliver customized news or weather, schedule plane flights, locate destinations, and numerous other practical, business, and entertainment functions.

Federal and State Regulation of Telecommunications in the Age of the Internet

New Computer Technologies Spawn Regulatory Exemption

Establishing bright-line definitions that determine whether a new communications service is subject to regulation has long been a challenge for federal and state policymakers. The Communications Act of 1934 established a dual regulatory regime for communications services, granting the Federal Communications Commission (FCC) authority over all interstate and international communication, and reserving for each state authority over services that are provided between points within that state’s borders. The law provides that only a “telecommunications service”² is subject to utility-type common carrier regulation, which includes regulation of market entry, rates, and terms and conditions of service, among other requirements. Traditional landline voice service has always been recognized as a “telecommunications service.”

This regulatory structure was relatively stable in the days of voice-only telephone service over a landline network. But the paradigm began to shift in the late 1960s when innovators began adding computer devices to the network, first with mainframe computers and remote terminals for data processing services and then interconnected computer networks and personal computers for data transfer and electronic messaging. The FCC decided that these new “enhanced services” enabled by computers should not be regulated as “telecommunications services.” The FCC concluded that

² “Telecommunications service” is defined as the offering to the public of the “transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form of content of the information as sent and received.” 47 U.S.C 153 (46).

“efficient utilization and full exploitation of the interstate telecommunications network would be best achieved if these services are free from public utility-type regulation.”³ As personal computers became widely available and the Internet emerged, the FCC continued this non-regulatory policy for “enhanced services,” concluding that they should be allowed to compete and flourish in the “free give-and-take of the market place without the need for and possible burden of rules, regulations, and licensing requirements.”⁴

Congress reinforced this policy in the Telecommunications Act of 1996, which authorized competition in the local exchange market. First, Congress retained the exemption from regulation for “information services,” the new name for “enhanced services.”⁵ Second, it enacted an explicit policy directive to promote a free and open global Internet. The Telecom Act defined the Internet in terms of computer facilities, transmission media, equipment and software comprising the interconnected worldwide network of computer networks and interoperable packet switched data networks. Congress stated that it is “the policy of the United States to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation.”⁶

Internet Protocol Technology Brings Targeted Regulatory Approach

As advances in IP technology led to new services that enable voice calls over the Internet, the FCC in 2004 was faced with the question of whether to regulate VoIP. In a decision known as the *Vonage Preemption Order*, the FCC preempted the Minnesota Public Utilities Commission from applying its traditional telephone company regulations to a VoIP service that allowed calling through a broadband connection. The FCC concluded that preemption was warranted because it was impossible or impractical to separate out the purely intrastate component of the service and because state regulation would directly conflict with the pro-competitive policy disfavoring utility-type regulations that hinder development of innovative new services. The FCC cited the Congressional directive to promote a free and competitive Internet and emphasized the goal of avoiding patchwork regulation so that these new IP-enabled services would not have to “satisfy the requirements of more than 50 jurisdictions with more than 50 different sets of regulatory obligations.”⁷

In the *Vonage Preemption Order*, the FCC declined from deciding whether VoIP is a “telecommunications service” or an “information service” but stated that it was “making clear that this Commission, not the state commissions, has the responsibility and obligation to decide whether certain regulations apply” to IP-enabled services. In a series of decisions since 2004 relating to IP-enabled services, the FCC has repeatedly declined to classify VoIP service. Instead of opting for the full panoply of regulations applicable to “telecommunications services,” the FCC has identified specific public safety and consumer protections that apply. These include requiring VoIP to:

³ First Computer Inquiry Final Decision, 28 FCC 2d 267 (1971).

⁴ Second Computer Inquiry Final Decision, 77 FCC 2d 384, at 425-33 (1980).

⁵ The Act defined “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.” 47 U.S.C 153 (20).

⁶ 47 U.S.C. 230(b)(2).

⁷ *Vonage Preemption Order*, 19 FCC Rcd 22404 (2004).

- 1) offer 911 service, including customer location information, and collect 911 fees
- 2) provide law enforcement access to facilities
- 3) make facilities accessible to disabled users
- 4) protect customers' proprietary information
- 5) apply number portability requirements so customers can keep their telephone number when changing providers
- 6) contribute to universal service programs,
- 7) not transmit fraudulent Caller ID information
- 8) provide customers notice of discontinuance of service, and
- 9) report network outages.

Mobility Raises Questions on VoIP Definitions

The FCC has generally limited application of these regulations to “interconnected VoIP,” which it defined as service that (1) enables real-time, two-way voice communications; (2) requires a broadband connection from the user’s location; (3) requires IP-compatible equipment at the customer’s premise; and (4) permits users to receive calls that originate on the PSTN and terminate calls to the PSTN. However, it appears that innovation may be rendering this definition outdated. In July 2011, the FCC cited increased portability and emerging types of VoIP and broadband voice service as rationale for proposed amendments to its four-part VoIP definition. For example, outbound-only interconnected VoIP services are becoming increasingly popular, especially with businesses, because they offer low-cost rates for marketing calls, but the service does not meet the fourth prong of the definition. Moreover, the enhanced mobility of VoIP services, deployment of 4G LTE mobile broadband networks, and emerging portable devices that combine features of phones and laptops are making “mobility” a feature of VoIP that blurs – or may transcend – the distinction between “fixed” and “nomadic” VoIP.

CPUC Activity Related to VoIP

In the wake of the *Vonage Preemption Order* and subsequent IP decisions, any attempt by a state commission to apply utility-type regulation to VoIP has been highly controversial. No state commission regulates VoIP as a telephone utility. The few decisions by state commissions asserting jurisdiction over VoIP have either been suspended, challenged in court, or invalidated by legislation. At least 23 states and the District of Columbia have enacted statutes that generally prohibit utility-type regulation of IP-enabled services including VoIP, although generally applicable business, taxation and consumer protection laws apply.

The California Constitution grants the CPUC authority, subject to control of the Legislature, to regulate utilities including “telephone corporations,” defined as every entity “owning, controlling, operating, or managing any telephone line for compensation within this state.” A “telephone line” includes “all conduits, ducts, poles, wires, cables, instruments, and appliances, and all other real estate, fixtures, and personal property owned, controlled, operated, or managed in connection with or to facilitate communication by telephone, whether such communication is had with or without transmission wires.” Thus, the CPUC has authority to regulate the intrastate component of service that equates to a “telecommunications service” under federal law, subject to any preemption.

Like the FCC, the CPUC has declined from applying utility-type regulation to VoIP and has never decided whether or not a VoIP provider is a “telephone corporation.” In 2004, the CPUC opened a proceeding to evaluate the appropriate regulatory structure for VoIP under state law, but several years later closed the proceeding, concluding that it was premature to assess its regulatory role over VoIP until the FCC classifies VoIP as either a regulated “telecommunications service” or an unregulated “information service.” However, some stakeholders and some CPUC staff have argued in various proceedings that providers of “fixed” VoIP service should be classified as “telephone corporations,” which would trigger application of all state laws and regulations that apply to traditional landline voice service. This argument is based primarily on the assertion that the FCC has preempted state regulation of “nomadic” VoIP service but not “fixed” VoIP.

California Legislation Applicable to VoIP

Meanwhile, rather than wait for resolution of legal battles over whether these new Internet-based services fit into definitions of service from another century, the Legislature has enacted several statutes to impose discreet requirements that apply to VoIP in order to achieve pressing policy objectives consistent with federal law. These include:

AB 2393 (Levine, 2006) – authorized the CPUC to adopt backup power requirements for VoIP.

SB 202 (Simitian, 2006) – applied state privacy protections to calling records of VoIP customers.

SB 1040 (Kehoe, 2008) – required VoIP to pay fees to support the state’s 911 system.

AB 1335 (Fuentes, 2010) – authorized the CPUC to obtain data from VoIP providers related to forbearance petitions filed with the FCC.

SB 3 (Padilla, 2011) and AB 841 (Buchanan, 2011) – authorized the CPUC to require VoIP to pay fees to support state universal service programs.

At least one bill that would impact VoIP is pending this session – SB 1160 (Padilla), which would update current law related to intentional service interruptions so that it applies to any service that enables users to call 911 in an emergency, including wireless and VoIP service.

Questions to Consider

- What policy and governance framework should California follow regarding Internet-based services?
- What framework will best foster competition and consumer access to affordable service options that meet their needs and enable calling 911 in an emergency?
- What framework will best foster continued economic growth and job creation throughout the communications ecosystem and maintain California's leadership in the Internet and app economy?
- Do existing federal and state laws and regulations adequately address critical public safety and consumer issues related to IP-enabled services, such as access to 911, and backup power requirements to maintain service during an electric power outage?