

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of
IP-Enabled Services
WC Docket No. 04-36

NOTICE OF PROPOSED RULEMAKING

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## **I. INTRODUCTION**

1. In this Notice of Proposed Rulemaking (Notice), we examine issues relating to services and applications making use of Internet Protocol (IP), including but not limited to voice over IP (VoIP) services (collectively, "IP-enabled services").<sup>1</sup> We seek comment on the impact that IP-enabled services, many of which are accessed over the Internet, have had and will continue to have on the United States' communications landscape. As a truly global network providing instantaneous connectivity to individuals and services, the Internet has transcended historical jurisdictional boundaries to become one of the greatest drivers of consumer choice and benefit, technical innovation, and economic development in the United States in the last ten years. We acknowledge that it has done so in an environment that is free of many of the regulatory obligations applied to traditional telecommunications services and networks. Carriers have begun to realize efficiencies associated with utilization of IP in both the backbone and the "last mile" of their networks. Customers are beginning to substitute IP-enabled services for traditional telecommunications services and networks, and we seek comment on the rate and extent of that substitution. Increasingly, these customers will speak with each other using VoIP-based services instead of circuit-switched telephony and view content over streaming Internet media instead of broadcast or cable platforms. By doing so, they will change, fundamentally, their use of these applications and services – consumers will become increasingly empowered to customize the services they use, and will choose these services from an unprecedented range of service providers and platforms.

<sup>1</sup> Specifically, the scope of this proceeding – and the term "IP-enabled services," as it is used here – includes services and applications relying on the Internet Protocol family. IP-enabled "services" could include the digital communications capabilities of increasingly higher speeds, which use a number of transmission network technologies, and which generally have in common the use of the Internet Protocol. Some of these may be highly managed to support specific communications functions. IP-enabled "applications" could include capabilities based in higher-level software that can be invoked by the customer or on the customer's behalf to provide functions that make use of communications services. Because both of these uses of IP are contributing to important transformations in the communications environment, this Notice seeks commentary on both, and uses the term "IP-enabled services" to refer to "applications" as well as "services." Recognizing the broad scope entailed by this definition, we invite comment below on how we might more rigorously distinguish those specific classes of IP-enabled services, if any, on which we should focus our attention. We emphasize, however, that this Notice does *not* address standard-setting issues for the Internet Protocol language itself, which are more appropriately addressed in other fora, or other items outside this Commission's jurisdiction, such as Internet governance.

2. This Commission must necessarily examine what its role should be in this new environment of increased consumer choice and power, and ask whether it can best meet its role of safeguarding the public interest by continuing its established policy of minimal regulation of the Internet and the services provided over it.<sup>2</sup> To that end, we invite comment on IP-enabled services available today and those expected to become available in the future. We seek comment on how we might distinguish among such services, and on whether any regulatory treatment would be appropriate for any class of services.

3. In other proceedings, we have recognized the paramount importance of encouraging deployment of broadband<sup>3</sup> infrastructure to the American people.<sup>4</sup> As broadband facilities have proliferated, communications services and networks have increasingly taken advantage of the efficiencies associated with translating data into IP packets running over the same network infrastructures.<sup>5</sup> As discussed below, enterprises are already relying heavily on IP-based applications to facilitate both internal and external communications.<sup>6</sup> Moreover, providers

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<sup>2</sup> We note that IP-enabled services, as we define this term, are typically provided over broadband facilities, but could ride on narrowband facilities. It appears that as IP-enabled services become more sophisticated and high-speed facilities proliferate, these services will predominantly be provided on broadband platforms, including wireline, cable, wireless, and satellite facilities, and perhaps new platforms not widely used at present. See, e.g., *Inquiry Regarding Carrier Current Systems, Including Broadband over Power Line Systems*, ET Docket No. 03-104, Notice of Inquiry, 18 FCC Rcd 8498 (2003) (seeking comment on technical issues relating to provision of broadband over power line facilities).

<sup>3</sup> We use the term "broadband" to signify "advanced telecommunications capability and advanced services," which we have defined, for the purposes of our section 706 Reports, as those services having the capability to support both upstream and downstream speeds in excess of 200 Kbps in the last mile. *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Third Report, 17 FCC Rcd 2844, 2850-51, para. 9 (2002) (internal quotations omitted) (*Third Section 706 Report*); accord *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Second Report, 15 FCC Rcd 20913, 20919-20, para. 10 (2000) (*Second Section 706 Report*). The Commission also has "denominate[d] as 'high-speed' those services with over 200 kbps capability in at least one direction." *Second Section 706 Report*, 15 FCC Rcd at 20920, para. 11; accord *Third Section 706 Report*, 17 FCC Rcd at 2850-51, para. 9.

<sup>4</sup> See, e.g., *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Universal Service Obligations of Broadband Providers*, CC Docket Nos. 02-33, 95-20, 98-10, Notice of Proposed Rulemaking, 17 FCC Rcd 3019, 3020-21, para. 1 (2002) (*Wireline Broadband NPRM*).

<sup>5</sup> See *infra* Part II A.

<sup>6</sup> See *infra* Part II.A. For example, more and more businesses are moving to VoIP solutions in lieu of PBXs and other traditional facilities to manage their communications. See, e.g., Nortel Networks & Verizon Communications, *Verizon Selects Nortel Networks to Accelerate Building of Nation's Largest Converged, Packet-Switched Wireline Network Using Voice-Over-IP Technology*, Press Release at 3 (Jan. 7, 2004) (stating that Verizon and Nortel intend to market VoIP upgrades to Verizon's existing PBX customers and to migrate them away from existing legacy PBXs to Verizon's converged IP network).

offering VoIP services<sup>7</sup> are beginning to challenge traditional telecommunications carriers in residential markets – and even today use IP to transport residential interexchange calls, often unbeknownst to end users.<sup>8</sup> The increasing deployment of broadband facilities therefore has prompted the development of services and applications that provide broader functionality and greater consumer choice at prices competitive to those of analogous services provided over the public switched telephone network (PSTN). Many observers predict that, before long, providers will be able to integrate voice and real-time video to provide new capabilities and service offerings.<sup>9</sup> The development of such services is likely to prompt increased deployment of wireline, cable, wireless, and other broadband facilities<sup>10</sup> capable of bringing IP-enabled services to the public, which in turn, we expect, will prompt further development and deployment of such services. This process may challenge the central role that legacy technologies have played in American communications for over 100 years.<sup>11</sup>

4 But VoIP services are not necessarily mere substitutes for traditional telephony services, because the new networks based on the Internet Protocol are, both technically and administratively, different from the PSTN. Whereas the PSTN is designed to meet the analog communications requirements of two-way voice conversations, IP networks are designed to meet the short-burst digital data communications requirements of computing networks. Whereas the PSTN's design is logically and physically hierarchical, utilizing highly centralized signaling intelligence to connect parties to a communication, IP network design is "flat," distributing network intelligence and permitting highly dynamic and flexible routing that takes into account network delays, changes in loads, and changes in topology.<sup>12</sup> And whereas enhanced functionalities delivered via the PSTN typically must be created internally by the network

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<sup>7</sup> While we adopt no formal definition of "VoIP," we use the term generally to include any IP-enabled services offering real-time, multidirectional voice functionality, including, but not limited to, services that mimic traditional telephony.

<sup>8</sup> See *infra* Part II.A.

<sup>9</sup> See *infra* Part II.A.

<sup>10</sup> See, e.g., *supra* note 2.

<sup>11</sup> According to industry data compiled by the Commission, interstate access minutes have declined significantly in recent years; industry watchers expect VoIP to hasten the decline. See *Universal Service Monitoring Report*, CC Docket No. 98-202, Table 8.2 (Dec. 22, 2003) (interstate switched access minutes declined to 486.0 billion minutes in 2002 from 538.3 billion interstate minutes in 2001, and interstate switched minutes declined to 113.8 billion in the first quarter 2003 from 124.8 billion in the first quarter of 2002), see also Peter Grant & Almar Latour, *Circuit Breaker Battered Telecoms Face New Challenge: Internet Calling – The "Pac-Man" of Protocols*, Wall St. J., Oct. 9, 2003, at A1 (stating that VoIP poses a "credible threat" to established telecommunications carriers) (Grant & Latour); Dan Richman, *Internet Phone Calls Entice Consumers, Industry*, Seattle Post Intelligencer (last modified Dec. 12, 2003) <<http://msnbc.msn.com/id/3690595/>> (given the low cost of VoIP, business of land-line carriers is threatened).

<sup>12</sup> Applications requiring segmented data to arrive in sequence and without error generally rely on a higher-level end-to-end protocol such as the Transmission Control Protocol (TCP).

operator and are often tied to a physical termination point, IP-enabled services can be created by users or third parties, providing innumerable opportunities for innovative offerings competing with one another over multiple platforms and accessible wherever the user might have access to the IP network.<sup>13</sup> The rise of IP thus challenges the key assumptions on which communications networks, and regulation of those networks, are predicated: Packets routed across a global network with multiple access points defy jurisdictional boundaries. Networks capable of facilitating any sort of application that programmers can devise have empowered consumers to choose services they desire rather than merely accepting a provider's one-size-fits-all offering. In this Notice, we seek comment on whether the proliferation of services and applications utilizing a common protocol may permit competitive developments in the marketplace to play the key role once played by regulation.

5. For all these reasons, the changes wrought by the rise of IP-enabled communications promise to be revolutionary. These developments are expected to reduce the cost of communication and to spur innovation and individualization, giving rise to a communications environment in which offerings are designed not to fit within the limitations of a legacy network but rather to provide each end user a highly customized, low-cost suite of services delivered in the manner of his or her choosing. IP-enabled services generally – and VoIP in particular – will encourage consumers to demand more broadband connections, which will foster the development of more IP-enabled services. IP-enabled services, moreover, have increased economic productivity and growth, and bolstered network redundancy and resiliency. Our aim in this proceeding is to facilitate this transition, relying wherever possible on competition and applying discrete regulatory requirements only where such requirements are necessary to fulfill important policy objectives. We expressly recognize the possibility that we ultimately will need to differentiate among various IP-enabled services. For example, much of the telecommunications regulation implemented by the Commission had its roots in seeking to control monopoly ownership of the PSTN. To the extent the market for IP-enabled services is not characterized by such monopoly conditions, we seek comment on whether there is a compelling rationale for applying traditional economic regulation to providers of IP-enabled services. As discussed below,<sup>14</sup> other aspects of the existing regulatory framework – including those provisions designed to ensure disability access, consumer protection, emergency 911 service, law enforcement access for authorized wiretapping purposes, consumer privacy, and others – should continue to have relevance as communications migrate to IP-enabled services. Because we do not prejudge these issues, however, this Notice asks broad questions covering a wide range of services and applications, and a wide assortment of regulatory requirements and benefits, to ensure the development of a full and complete record upon which we can arrive at sound legal and policy conclusions regarding whether and how to differentiate between IP-

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<sup>13</sup> Indeed, while a century of PSTN development has given rise to relatively few opportunities for user customization, a mere decade of widespread commercial use has produced a dizzying array of IP-enabled services, ranging from presence management to multimedia conferencing to unified messaging, as discussed in greater detail below.

<sup>14</sup> See *infra* Part V.B, Part VI A

enabled services and traditional voice legacy services, and how to differentiate among IP-enabled services themselves. As discussed above, fencing off IP platforms from economic regulation traditionally applied to legacy telecommunications services would not put them beyond the reach of regulations designed to promote public safety and consumer protection (such as E911) or other important public policy concerns. Instead, this proceeding is designed to seek public comment on future decisions that would start from the premise that IP-enabled services are minimally regulated.

6. The remainder of this Notice is organized as follows. In Part II, we describe the evolution of the IP-enabled services falling within the ambit of this proceeding,<sup>15</sup> and set forth the legal framework against which we consider the appropriate regulatory treatment, if any, for these services.<sup>16</sup> In Part III, we seek comment on whether it would be appropriate to establish categories of IP-enabled services, based on important distinguishing characteristics, and ask commenters to propose specific grounds on which such categorization, if appropriate, should be pursued.<sup>17</sup> Part IV examines the jurisdictional issues associated with VoIP and other IP-enabled services and seeks comment on whether to extend the application of the Commission's ruling that a certain type of VoIP offering is an unregulated information service subject to federal jurisdiction.<sup>18</sup> Part V seeks comment on the appropriate legal and regulatory framework for categories of IP-enabled services identified by commenters.<sup>19</sup> Specifically, we seek comment on the appropriate legal classification of each type of IP-enabled service,<sup>20</sup> and then on the necessity of applying specific regulatory requirements or benefits to those specific categories.<sup>21</sup> Part VI of this Notice addresses the applicability of several other regulatory requirements and the implications that our decisions here might have for rural carriers as well as for international and numbering issues.<sup>22</sup>

## II. BACKGROUND

7. Our consideration of the critical legal and regulatory questions posed in this Notice is necessarily informed by the specific technological evolution of the services at issue and

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<sup>15</sup> See *infra* Part II.A.

<sup>16</sup> See *infra* Part II B.

<sup>17</sup> See *infra* Part III

<sup>18</sup> See *infra* Part IV; *Petition for Declaratory Ruling that pulver.com's Free World Dialup is Neither Telecommunications Nor a Telecommunications Service*, WC Docket No. 03-45, Memorandum Opinion and Order, FCC 04-27 (rel. Feb. 19, 2004) (*Pulver Declaratory Ruling*)

<sup>19</sup> See *infra* Part V.

<sup>20</sup> See *infra* Part V.A.

<sup>21</sup> See *infra* Part V B.

<sup>22</sup> See *infra* Part VI

the specific legal framework under which we exercise our jurisdiction over interstate and international communications. In this section, we first briefly describe the history of IP-enabled services – a history characterized by explosive growth and, recently, the advent of offerings that promise to transform the communications environment – and then discuss the legal context in which we consider the questions posed by those offerings.

#### A. Technological and Market Evolution of IP-Enabled Services

8. The rise of the Internet has fundamentally changed the ways in which we communicate by increasing the speed of communication, the range of communicating devices, and the platforms over which they can send and receive. This growth has been possible because the Internet employs an open network architecture using a common protocol – the Internet Protocol, or IP – to transmit data across the network in a manner fundamentally different than the way in which signals transit a circuit-switched service.<sup>23</sup> Whereas circuit-switched networks generally reserve dedicated resources along a path through the network, IP networks route traffic without requiring the establishment of an end-to-end path. A telephone call placed over a circuit-switched network typically requires resources to be reserved along the path between both parties for the entire duration of the call, even if the amount of information being transferred does not require the full bandwidth of the facilities.<sup>24</sup> In contrast, in Internet Protocol networking, data is segmented into packets which are individually addressed and then transmitted over a series of physical networks which may be comprised of copper, fiber, coaxial cable, or wireless facilities.<sup>25</sup> When packets are transmitted via IP between two points, the network does not establish a

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<sup>23</sup> In essence, the Internet is a global, packet-switched network of networks that are interconnected through the use of the common network protocol – IP. The Supreme Court has described the Internet as “an international network of interconnected computers.” *Reno v. ACLU*, 521 U.S. 844, 849-50 (1997). No single entity controls the Internet, for it is a “worldwide mesh or matrix of hundreds of thousands of networks, owned and operated by hundreds of thousands of people.” John S. Quarterman & Peter H. Salus, *How the Internet Works* (visited Dec. 17, 2003) <<http://www.mids.org/works.html>>.

<sup>24</sup> See Presentation by Christopher Rice, SBC Senior Vice-President, to FCC Staff, *VoIP Telephony Discussion at 4* (Nov. 19, 2003) (*SBC Nov. 19 Presentation*) (“Trunk circuit held up between Phone A and Phone B for length of call”). This presentation, and all other cited presentations to Commission staff, have been filed in this docket (WC Docket No. 04-36) for public inspection.

<sup>25</sup> See *Living Internet Routing* (visited Dec. 17, 2003) <[http://livinginternet.com/i/iw\\_route.htm](http://livinginternet.com/i/iw_route.htm)> (IP is used to transfer packets between networks), *Living Internet How Packets Work* (visited Dec. 17, 2003) <[http://livinginternet.com/i/iw\\_packet\\_packet.htm](http://livinginternet.com/i/iw_packet_packet.htm)> (*How Packets Work*) (explaining how IP creates data packets and addresses them). The routers, which are computers connected to the IP network, examine the address on each IP packet, and, using a routing configuration table, decide to which other router in the network the IP packet should be sent. Each router in the network constantly communicates with the other routers, permitting each router to know whether the other router is active and the amount of traffic the other router is carrying. See Curt Franklin, *How Routers Work* (visited Dec. 17, 2003) <<http://computer.howstuffworks.com/router6.htm>> (*How Routers Work*). This information permits the routers to decide which route to use to send an IP packet toward its ultimate destination. See *Living Internet How Switching Works* (visited Dec. 17, 2003) <[http://livinginternet.com/i/iw\\_packet\\_switch.htm](http://livinginternet.com/i/iw_packet_switch.htm)>. When the packet reaches this final destination it is unwrapped and the data inside is used for an application.

permanent or exclusive path between the points.<sup>26</sup> Instead, routers read packet addresses individually, and decide – sometimes on a packet-by-packet basis – which route to use for each packet.<sup>27</sup> Thus, the routes that packets will take to the same destination may vary, depending on the best routing information available to the routers.<sup>28</sup> Indeed, packets traveling in the opposite direction on the return communications between the same sending and receiving pair may follow an entirely different path. Moreover, these packets may carry any type of information for applications offering widely disparate functions, including those facilitating voice communications.<sup>29</sup>

9. The growth of the Internet has been accompanied by an explosion in consumer access to a growing universe of websites, all relying on IP. Many websites have evolved into content-rich information portals configured to serve the broad commercial, educational, political and entertainment interests of Internet users. In its initial stages, the Internet was primarily utilized for e-mail, file transfer, and – more recently – access to the world wide web. Increasingly, the Internet is being utilized for more sophisticated uses, such as peer-to-peer file sharing,<sup>30</sup> instant messaging, streaming media, online gaming, and virtual private networks (VPNs).<sup>31</sup> In turn, as applications proliferate and demand for Internet access services grows, service providers continue to augment network capacity to offer faster Internet access services.<sup>32</sup>

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<sup>26</sup> See *Living Internet Packet Switching History* (visited on Dec 17, 2003) <[http://livinginternet.com/i/iw\\_packet\\_inv.htm](http://livinginternet.com/i/iw_packet_inv.htm)> (IP communications do not require an “always-on, continuous connection”)

<sup>27</sup> See *How Routers Work*

<sup>28</sup> See *id*; *Living Internet Interior Gateway Protocols* (visited Dec. 17, 2003) <[http://livinginternet.com/i/iw\\_route\\_igp.htm](http://livinginternet.com/i/iw_route_igp.htm)> (describing the algorithms that routers use in deciding where to forward a packet)

<sup>29</sup> See *How Packets Work*.

<sup>30</sup> In the “peer-to-peer” (P2P) model, each party to a communication has the same capabilities and either party can initiate a communication session. Applications residing on the user’s PC (or other hardware) permit the user to connect directly to another user’s hardware without the assistance of an Internet Service Provider. Now that some in industry believe that most of the voice quality issues have been addressed, P2P voice service offerings are on the rise. See Victor Schneec, *Free Voice? Skype’s Peer-To-Peer Is To Be Watched!*, Probe Financial Services (Oct 27, 2003), Skype Limited, *What is Skype?* (visited Jan. 14, 2004) <<http://www.skype.com/skype.html>>.

<sup>31</sup> See *infra* Part II.A 2

<sup>32</sup> Dial-up, or narrowband, Internet access utilizes the same PSTN infrastructure that telephone subscribers use to place traditional circuit-switched voice calls. As mentioned above, *see supra* note 3, the Commission has defined “high-speed” to describe transmission capacity capable of achieving over 200 kbps in at least one direction, and “advanced services” as having over 200 kbps capability in both directions. The Commission has more generally defined “high-speed” Internet as a service that “enables consumers to communicate over the Internet at speeds that are many times faster than the speeds offered through dial-up telephone connections” and that enables subscribers to “send and view content with little or no transmission delay, utilize sophisticated ‘real-time’ applications, and take advantage of other high-bandwidth services.” See *Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations by Time Warner Inc and America Online, Inc, Transferors, to AOL Time Warner* (continued. .)

These broadband services have been deployed across multiple platforms, including those of local exchange carriers (LECs), cable operators, direct broadcast satellite (DBS), video programming providers and, increasingly, wireless (including WiFi) providers and electric companies using power lines.<sup>33</sup> In the following sections, we briefly describe a cross-section of the numerous offerings – including not only various sorts of IP telephony, but also new and unique forms of IP-based communication – made possible by these developments.

## 1. Internet Voice

10. Although several providers carry voice calls over their backbone IP networks, until recently, use of the Internet for the purpose of transmitting voice communications has been limited.<sup>34</sup> Early ventures in peer-to-peer IP telephony were largely unsuccessful in part due to the nature of early IP networks, which offered limited reliability and voice quality. Today, however, as a result of improvements in technology, IP networks are increasingly being used to carry voice communications. For example, private IP networks are used to provide an array of communications services to enterprise customers.<sup>35</sup> Residential users can access VoIP services

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*Inc., Transferee*, CS Docket No 00-30, Memorandum Opinion and Order, 16 FCC Rcd 6547, 6572, para 63 (2001) (*FCC AOL Time Warner Merger Order*), see also *id.* at 6572, 6574-77, paras. 64, 69-73. Researchers at Telcordia predict that, in one decade, residential subscribers may possibly have Internet access speeds as high as one gigabit-per-second, and commercial systems may feasibly achieve approximately 20 terabits-per-second on a single optical fiber. See Presentation by Matthew S. Goodman, Ph.D., Chief Scientist and Telcordia Fellow, and Robert J. Runser, Ph.D., Senior Research Scientist, Telcordia Technologies, to FCC Staff, *Broadband Networking What is Broadband?* 5 (Nov. 5, 2003). Providers are also increasing the speeds at which users can access the Internet over narrowband facilities. See, e.g., *ISPs Use Retail Chains To Drive Subscription Growth In 2004*, Electronic Information Report (Jan 12, 2004) (describing “EarthLink Accelerator,” which “enables dial-up subscribers to access the Web at speed up to five times faster than standard 56K connections”).

<sup>33</sup> CMRS providers are also offering broadband access. See, e.g., Verizon Wireless, *Verizon Wireless Announces Roll Out of National 3G Network*, Press Release (Jan 8, 2004) (Verizon Jan. 8, 2004 Press Release) (describing service providing speeds of 300 to 500 kbps); Monet Mobile Networks, *monet broadband*, at 3 (visited Jan. 14, 2004) <<http://www.monetmobile.com/Assets/Audiovoxuser.pdf>> (describing wireless broadband service introduced in the fall of 2002, offering average speeds of 700 kbps).

<sup>34</sup> The increase in the number of voice calls transmitted over at least a portion of an IP network over the past few years has been dramatic. In 2002, international VoIP traffic increased by 80% to 18.7 billion minutes, and comprised approximately 10.8% of all international call traffic. See *Telegeography 2004*, Primetrica, Inc. 12, 26 (Dec 2004) (*Telegeography 2004*) (these numbers include all cross-border calls carried on an IP network and terminated on a PSTN; PC-to-PC communications and PVN traffic were excluded from Telegeography’s survey). Another source estimates that, in 2002, the total world retail (residential and enterprise) IP voice traffic volume was approximately 47.5 billion minutes, while approximately 8 trillion minutes were carried using the PSTN. See *VoIP Services Assessment Communications Service Strategies & Opportunities*, Stratecast Partners 19 (Feb. 2003) (*Stratecast Report*).

<sup>35</sup> Enterprises may utilize intra-office or interoffice private IP networks that handle voice calls and data transmission. Some of these IP networks are Virtual Private Networks (VPNs) that traverse the open Internet. See presentation by Christopher Rice, SBC Senior Vice-President, to FCC Staff, *VoIP Telephony Discussion* (Nov 19, 2003) (*SBC Nov 19 Presentation*).

using phones, laptops, and personal digital assistants. Even many gaming systems now feature VoIP functionality<sup>36</sup> Also, wireless communications standards have evolved to include IP as a key component.<sup>37</sup> Many manufacturers are concentrating most, if not all, new development and marketing on IP-capable alternatives while merely providing maintenance support for legacy circuit-switched equipment currently in place.<sup>38</sup> Similarly, a recent flood of press announcements reflects that a number of service providers, from residential telephony companies to cable

<sup>36</sup> See *infra* para 19

<sup>37</sup> For example, Code Division Multiple Access 2000 (cdma2000), one of the main third generation (3G) systems, uses enhanced Mobile IP in its core network architecture. See A. Jamalipour & P. Lorenz, "Merging IP and Wireless Networks," *IEEE Wireless Communications*, October 2003, Vol 10 No. 5, at 6. The high-speed version of this standard, cdma2000 1xEV-DV (evolution – data, voice) supports an all IP-integrated voice, data, and video communications capability. See Y. Yoon et al., "Tutorial on CDMA 2000 1xEV-DV," *IEEE Wireless Communications and Networking Conference 2003 Ericsson Wireless Communications, USA*, March 17, 2003, at 9. Currently in the U.S., both Sprint PCS and Verizon Wireless support the 2.5G CDMA standard referred to as cdma2000 1X, which supports both circuit-switched voice and packet-switched data using Mobile IP. A 3G CDMA data-optimized standard is the cdma2000 1xEV-DO (evolution – data optimized) standard. See *CDMA2000 1xEV-DO is fast enough to be 3G* (visited Feb. 7, 2004) <<http://www.3g.co.uk/PR/April2002/3273.htm>>. To allow roaming users access to integrated data, voice, and multimedia services, standards bodies, such as the Internet Engineering Task Force (IETF) and Third-Generation Partnership Project (3GPP), are working on the specifications of an all IP wireless network. See N. Banerjee et al., The University of Texas at Arlington, "Mobility Support in Wireless Internet," *IEEE Wireless Communications*, October 2003, Vol. 10 No. 5, at 54. Another European 3G wireless network approved standard is the Universal Mobile Telecommunications System (UMTS). See UMTS Forum, *Network Evolution Radio Access & Core Network Evolution GSM* (visited Feb. 7, 2004) <[http://www.umts-forum.org/servlet/dycon/zumts/umts/Live/en/umts/3G\\_Network\\_gsm](http://www.umts-forum.org/servlet/dycon/zumts/umts/Live/en/umts/3G_Network_gsm)>. UMTS' core network is comprised of an IP Multimedia Subsystem (IMS), which supports VoIP in addition to other multimedia services. UMTS also supports circuit-switched voice communications that are interconnected with the legacy PSTN. UMTS is an evolution of 2.5G GSM networks, including both the circuit-switched voice system and general packet radio service, GSM/GPRS, supporting IP services. See A. Jamalipour, "Tutorial on Wireless Mobile Internet – Architectures, Protocols and Services," *IEEE Wireless Communications and Networking Conference 2003, Ericsson Wireless Communications, USA*, March 16, 2003, at 50, 67; see also A. Jamalipour & P. Lorenz, "Merging IP and Wireless Networks," *IEEE Wireless Communications*, October 2003, Vol. 10 No. 5, at 6

<sup>38</sup> See Nortel Networks, *Voice over IP* (visited Feb. 12, 2004) <<http://www.nortelnetworks.com/corporate/technology/voip/index.html>> ("Service providers and enterprises agree that the network of the future must offer combined voice and data communications over a single integrated platform built on packet technology"); Cisco Systems, *Cisco IP Communications Solutions* (visited Feb. 12, 2004) ("Cisco IP telephony solutions provide a flexible foundation for powerful new applications that extend the limits of traditional telephony.") <[http://www.cisco.com/en/US/netsol/ns340/ns394/ns165/ns268/net\\_value\\_proposition09186a00800d756c.html](http://www.cisco.com/en/US/netsol/ns340/ns394/ns165/ns268/net_value_proposition09186a00800d756c.html)> Nortel is deploying VoIP-capable equipment that wireline carriers can use with their existing circuit-switched networks. See *Netphones Start Ringing Up Customers*, BusinessWeek online (Dec 29, 2003) <[http://www.businessweek.com/magazine/content/03\\_52/b3864039.htm](http://www.businessweek.com/magazine/content/03_52/b3864039.htm)> (estimating that spending on VoIP telephony equipment increased by 10% in 2003 from 2002). By some estimates, worldwide spending by businesses on IP telephony systems in 2003 was nearly double that of the previous year. See Grant and Latour (citing a research firm that estimates that spending on IP telephony systems would exceed \$1 billion in 2003, constituting approximately "20% of world-wide business spending on phone systems")

providers, have begun to use or will soon use IP to provide voice services to residential customers.<sup>39</sup>

11. These recent developments, however, must be understood within the context of the development of the technology in recent years, and the myriad services in which it is now used. IP telephony has been offered in various forms since at least 1995.<sup>40</sup> Early experience with the technology, however, appears to have deterred investors and consumers from adopting it because, analysts argue, its reliability and voice quality were below standards that most consumers would tolerate.<sup>41</sup> According to many industry watchers, technology has now overcome prior quality and reliability concerns.<sup>42</sup> These improvements, the creation of new IP

<sup>39</sup> See, e.g., Ben Charny, *Cox Communications Dives into VoIP*, CNET News.com (Dec. 15, 2003) <<http://news.com.com/2100-7352-5124440.html>> (describing Cox's offering of VoIP service to cable customers in Roanoke, Virginia); Ben Charny, *Qwest Taps into Net Telephony*, CNET News.com (Dec. 10, 2003) <<http://news.com.com/2100-7352-5119020.html>> (describing Qwest VoIP service offered to customers using its broadband facilities), Ben Charny & Jim Hu, *Time Warner Cable Reaches VoIP Deals*, CNET News.com (Dec. 8, 2003) <<http://news.com.com/2100-7352-5116936.html>> (describing VoIP services to be offered using Time Warner's cable facilities); Ben Charny, *Verizon Details Internet Phone Plans*, CNET News.com (Nov. 18, 2003) <<http://news.com.com/2100-7352-5108908.html>> (describing Verizon's plans to offer VoIP services to customers using its broadband facilities)

<sup>40</sup> See Grant and Zuckerman, *Redialing the Internet Frenzy?* Wall St. J., Nov. 13, 2003, at C1 (Grant and Zuckerman)

<sup>41</sup> See *id.* at C1 (noting that many customers, especially enterprise customers, found the sound quality associated with early IP telephony to be unacceptable), see also Presentation by Michael Kende, Principal Consultant, Analysys Consulting, to FCC Staff, *Voice over IP Business Models 3* (Jan. 29, 2004).

<sup>42</sup> Cable operators and wireline carriers have developed and deployed technology that overcomes prior voice quality issues. CableLabs, the cable industry's research and development group, has developed so-called PacketCable specifications that are designed to provide quality of service (QoS) to a variety of IP-enabled services. PacketCable is built on top of the DOCSIS 1.1 cable modem infrastructure that uses IP technology to enable a wide range of multimedia services, such as IP telephony, multimedia conferencing, interactive gaming, and general multimedia applications. Among these services, VoIP is the first service delivered over the PacketCable architecture. Because PacketCable mandates the use of a managed IP network, in that services are not delivered over the Internet, PacketCable compliant systems are able to guarantee priority delivery of voice IP packets over other data packets on the DOCSIS access network. CableLabs has already certified products that meet the PacketCable specifications, such as DOCSIS 1.1 modems that incorporate multimedia terminal adaptors (MTA) that permit a customer to connect a telephone directly to a cable modem. See David McIntosh & Maria Stachelek, *VoIP Services: PacketCable Delivers a Comprehensive System* (visited Jan. 7, 2004) <[http://www.packetcable.com/downloads/NCTA02\\_VOIP\\_Services.pdf](http://www.packetcable.com/downloads/NCTA02_VOIP_Services.pdf)>

Wireline carriers and their partners, such as Telcordia, have also developed solutions for voice quality issues. Some wireline carriers intend to use protocols such as multiprotocol label switching (MPLS), which is an application that runs on an IP network's routers, provides switching capability, and gives priority QoS to certain IP packets. When an IP packet enters the IP network, the MPLS places labels on that packet which determine whether it will receive priority treatment over other packets that transit the network. When an MPLS-labeled priority packet arrives at a router, once that router determines that the MPLS has granted that IP packet priority, it will send the packet through the router before non-priority packets, and it will send the packet on a route through the IP network that has the least congestion. The carrier solution also uses SIP for signaling purposes. See *SBC Nov. 19 Presentation* at 16-17.

services that traditional telephony providers may offer alongside voice service,<sup>43</sup> and increasing penetration of broadband into the residential market<sup>44</sup> have become important market drivers promoting deployment of IP telephony technologies. In addition, market entry by IP service providers such as Vonage appears to have spurred deployment of IP-enabled voice services by established telephony providers.<sup>45</sup>

**a. IP Telephony Offerings by Owners of Transmission Facilities**

12. As noted above, an IP network transmits IP packets, which may contain data that, when unpacked, forms voice communication. Cable operators, wireline carriers, and wireless providers have announced that they have begun to deploy, or intend to deploy, IP networks to transmit IP telephony services to their subscribers. Cable operators have begun to offer video, broadband Internet, and IP telephony over their hybrid fiber-coaxial cable plant. Time Warner Cable predicts that it will offer IP telephony to all of its subscribers by the end of 2004.<sup>46</sup> To achieve this goal, Time Warner recently entered into an agreement with MCI and Sprint to use those companies' networks to provide IP telephony to its cable subscribers and to interconnect their calls with the PSTN.<sup>47</sup>

13. AT&T states that it will provide VoIP service in 100 markets by the first quarter of 2004 and expects to enroll over one million customers in the next two years.<sup>48</sup> Other wireline carriers have announced plans to launch IP telephony services in 2004.<sup>49</sup> SBC currently offers IP telephony to small and medium size enterprises (SMEs) in 13 states, and BellSouth plans to

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<sup>43</sup> See Douglas Sicker, *Delocalization in Telecommunications Networks*, The Progress & Freedom Foundation at 19 (Jan 2004) <<http://pff.org/publications/communications/pop11.2delocalization.pdf>> ("In the long run, VoIP's true advantages (e.g., integrated networks and flexible service platforms) will be what drives its success.")

<sup>44</sup> See Grant & Latour (noting that the "spread of broadband connections" makes "VoIP much easier to use").

<sup>45</sup> See *id.* (noting that some top telecommunications carriers are testing their own IP telephony offerings in response to the "newfound success" of VoIP companies).

<sup>46</sup> See Presentation by John Billock, Vice Chairman & Chief Operating Officer, Time Warner Cable, to FCC VoIP Forum, at 5 (Dec 1, 2003) <<http://www.fcc.gov/voip>> (*Time Warner VoIP Forum Presentation*). Time Warner recently introduced IP telephony to a small community in Maine, where it has an agreement with a competitive LEC to facilitate outgoing and incoming calls to and from the PSTN. See *id.*

<sup>47</sup> See MCI, *MCI and Time Warner Cable Partner to Deliver Next Generation, IP-Enabled Communications*, Press Release (Dec 8, 2003), Ben Charny and Jim Hu, *Time Warner Cable Reaches VoIP Deals*, CNET News.com (visited Jan 14, 2004) <<http://news.com.com/2100-7352-5116936.html>>.

<sup>48</sup> See Shawn Young, *AT&T to Launch Internet-Based Telephone Service*, Wall St. J. B6 (Dec 11, 2003). AT&T's CEO David Dorman states, "Unlike many of our competitors, who are constrained by geographic reach or broadband access technologies, our voice over IP will be available in cities across America to customers with different kinds of broadband access." Margaret Kane & Scott Ard, *AT&T to Offer Internet Calling*, CNET News.com (Dec. 11, 2003) <<http://news.com.com/2100-7352-5119779.html>>.

<sup>49</sup> See Jo Maitland, *RBOC VOIP Coming in 2004*, Boardwatch (Nov. 11, 2003).

rollout service to SMEs in 9 states throughout 2004. Qwest announced that it would offer IP telephony to residential subscribers and SMEs in Minnesota in December 2003. Finally, Verizon intends to offer IP telephony to its DSL subscribers nationwide in the second quarter of 2004, and to businesses in the fourth quarter of 2004.<sup>50</sup>

14. Wireless service providers have also begun providing IP telephony services. Second generation (2G) mobile communications systems solely using circuit-switched networks to provide voice service are now being supplemented by 2.5G and 3G systems providing enhanced multimedia services built on packet switching and IP routing.<sup>51</sup> For example, Verizon Wireless and Sprint PCS have recently launched push-to-talk service,<sup>52</sup> using VoIP technology, and additional carriers are expected to launch push-to-talk service this year.<sup>53</sup> Voice services will also be provided by service providers using WiFi technology.<sup>54</sup>

#### b. IP Telephony Offerings By Other Providers

15. Providers not owning extensive facilities – or any facilities at all – have also begun to offer IP telephony services to residential end users. For example, pulver.com (Pulver) operates Free World Dialup (FWD), an Internet application that facilitates FWD members engaging in free peer-to-peer communications, exchanging voice, video, or text. FWD subscribers use a Session Initiation Protocol (SIP) phone or personal computer<sup>55</sup> to make “calls” to other FWD members that do not utilize the PSTN. Pulver states that the members’ end-user devices establish the actual connection and manage the call, and that the calls are carried by the members’ preexisting broadband connection rather than over Pulver-owned facilities.<sup>56</sup> Vonage offers an IP telephony service that permits a subscriber with a broadband connection to place telephone calls to, and to receive calls from, other Vonage broadband subscribers and end users

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<sup>50</sup> See *id*

<sup>51</sup> For example, Verizon Wireless recently announced plans to rollout its 3G broadband network nationwide. See Verizon Wireless, *Verizon Wireless Announces Roll Out of National 3G Network*, Press Release (Jan. 8, 2004)

<sup>52</sup> “Push-to-talk” services allow CMRS subscribers to use their mobile phones to send instant voice communications to an individual or group of users.

<sup>53</sup> See Verizon Wireless, *Verizon Wireless Launches National Push to Talk Service*, Press Release (Aug. 14, 2003), Sprint, *Sprint Launches Nationwide Two-Way Walkie-Talkie Style Service to Customers with a Quick Way to Communicate One-on-One or in Groups*, Press Release (Nov. 17, 2003).

<sup>54</sup> See Sue Marek, *Wi-Fi Winds Its Way Into Phones*, *WirelessWeek* (visited Jan 15, 2004) <<http://www.wirelessweek.com/article/CA326389?text=wi%2Dfi+winds+its+way+into+phones&stt=001>>

<sup>55</sup> See Petition for Declaratory Ruling that pulver.com’s Free World Dialup is Neither Telecommunications Nor a Telecommunications Service, WC Docket No. 03-45 at 3-4 (filed Feb. 5, 2003) (*Pulver Petition*).

<sup>56</sup> See *id* at 2-3

relying on traditional PSTN facilities alike.<sup>57</sup> Vonage does not provide its customers with Internet access or a personal computer. Rather, Vonage supplies software and a multimedia terminal adapter (MTA) that permits its customers to use analog phones to place calls via their broadband Internet connections.<sup>58</sup> Vonage provides each of its customers with traditional telephone numbers so that Vonage customers may be called by PSTN telephone subscribers.<sup>59</sup> When a Vonage customer communicates with a subscriber of ordinary telephone service, Vonage converts its customer's IP packets into the digital TDM (time division multiplexed) format for transfer through a media gateway to the PSTN, and vice versa.<sup>60</sup> If a Vonage customer communicates with another Vonage customer, this transmission does not utilize the PSTN and Vonage servers use SIP to direct the call to the other customer's personal computer or MTA.<sup>61</sup>

## 2. Other New and Future IP-Enabled Services

16. As discussed above, software developers expect to introduce IP-enabled data applications that take advantage of broadband speeds. In addition, as telephone service is migrated to an IP network, telephony providers plan to provide new IP-enabled data features that will enhance the telephony experience. Software developers are also upgrading traditional IP-enabled data services, such as instant messaging, e-mail, web surfing, gaming, and virtual private networks, to provide new features and capabilities that capitalize on the availability of higher speeds. As these services – which may integrate voice, video, and data capabilities while maintaining high quality of service – are introduced, it may become increasingly difficult, if not impossible, to distinguish “voice” service from “data” service, and users may increasingly rely on integrated services using broadband facilities delivered using IP rather than the traditional PSTN. Analysts predict the increasing integration of IP-enabled services with devices other than telephones and computers.

17. These new services will likely come in many varieties. For example, analysts predict that high-speed broadband connections will fuel the use of video-conferencing, on-demand conferencing, and collaboration on documents while conferencing.<sup>62</sup> These video calls

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<sup>57</sup> See Vonage Petition for Declaratory Ruling, WC Docket No. 03-211, at iii, 9 (filed Sept. 22, 2003) (*Vonage Petition*). Vonage customers cannot access the Vonage service with dial-up connections. See *id.* at 4.

<sup>58</sup> See *id.* at 5. Some of Vonage's customers use “native IP phones,” which produce digital signals and can only be used with an Internet connection and are incompatible with the PSTN. *Id.*

<sup>59</sup> See *id.* at 8 (“The telephone number associated with the Vonage customer is not tied to the customer's physical location. Rather, the telephone number is mapped to the digital signal processor contained in the customer's computer, enabling Vonage to identify and serve that customer over any Internet connection.”)

<sup>60</sup> See *id.* at 6-7.

<sup>61</sup> See *id.* at iii, 6-7.

<sup>62</sup> *Sprint Nov. 17 Presentation*

and conferences may be accompanied by the transmission of data.<sup>63</sup> Some applications that are currently used by enterprise customers, or that may in the future be used by such customers, include distance training, Internet classrooms, IP customer support centers, voice-enabled transactions and content services, subscription video, and telemedicine.<sup>64</sup>

18 With regard to telephone calls, IP-enabled data services might include virtual telephone numbers, directory dialing, automated voicemail attendants, call pre-screening, and call forwarding of pre-screened calls to other IP enabled devices, such as a computer or wireless phone.<sup>65</sup> Industry analysts also contemplate a unified messaging or a unified mailbox that collects a user's e-mail, voicemail, and faxes, which may be accessed through the web, a telephone or any other IP-enabled device.<sup>66</sup> These services permit users to decide which media they would like to use to respond to a given message.<sup>67</sup> For example, software might read a user's e-mail messages or faxes to him or her over the telephone, allowing the user to respond via e-mail, voicemail, facsimile, or voice telephony.<sup>68</sup>

19. Software developers are embedding traditional IP-enabled data services with voice features. For example, both America Online's and Microsoft Windows XP's instant messaging (IM) clients include a voice feature, as do many chat applications.<sup>69</sup> "Click to talk" services offered by Web- or E-mail-based applications permit customers to click on a web button in order to speak with a service operator or to enter into an instant messaging session with the service operator.<sup>70</sup> Map and navigation services and online gaming services also contain voice

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<sup>63</sup> See Presentation by Ming Lai, Telcordia Technologies, to FCC Staff, *Voice Over IP Overview Services, Architectures, Ordering, and Billing* at 6 (May 19, 2003) (*Telcordia May 19 Presentation*).

<sup>64</sup> See *id.* at 6.

<sup>65</sup> See AT&T, *Services over Internet Protocol: Voice is Just the Beginning* at 3 (Dec. 2003) <<http://www.fcc.gov/voip>> (*AT&T FCC VoIP Forum Submission*) (discussing desktop multimedia tools to provide these IP-enabled data services for voice communications), *Telcordia May19 Presentation* at 6; Grant & Latour ("[U]sers will be able to redirect calls to other numbers, take messages only during certain hours, [and] give messages only to certain callers")

<sup>66</sup> See *AT&T FCC VoIP Forum Submission* at 3 (universal messaging); *Telcordia May 19 Presentation* at 6; Michael Rogers, *Will Telephone Calls Be Free?*, Newsweek (last modified Dec. 16, 2003) <<http://msnbc.msn.com/id/3730179>> (discussing an integrated "communications package that also includes voicemail, email, fax, instant messaging and video-conferencing").

<sup>67</sup> See *Sprint Nov 17 Presentation*, Rogers ("[C]lever Web interfaces will let you convert your voicemail messages to email, or your emails to voice").

<sup>68</sup> *Sprint Nov 17 Presentation*; Rogers (discussing "myriad of ways" that a user may respond to a voicemail message or email)

<sup>69</sup> *Telcordia May 19 Presentation* at 6, Rogers (Web portals may offer telephone service as part of email and instant message packages).

<sup>70</sup> *Telcordia May 19 Presentation* at 6.

components.<sup>71</sup> Many PC and console games, such as Microsoft's Xbox, permit their owners to play against other players via peer-to-peer Internet connections.<sup>72</sup> Many of these games permit the gamers to speak with each other via the Internet as they play.<sup>73</sup>

20. Applications providers are preparing to provide IP-enabled services over devices other than phones and computers.<sup>74</sup> Microsoft is currently testing its Internet Protocol television (IPTV) product, which it hopes will offer television subscribers more advanced services, such as HDTV, VOD, interactive television, instant channel changing, multiple pictures-in-picture, and a richer multimedia program guide, via their broadband connections.<sup>75</sup> In addition, Microsoft has already enabled VoIP capability in Windows CE devices by incorporating SIP into that operating system.<sup>76</sup> Personal digital assistants (PDAs) are currently capable of transmitting voice and other data using IP technology; additional IP applications are expected to be developed for PDAs and other mobile devices in the future.<sup>77</sup> Moreover, IP-enabled services are now or may soon be accessed through, or facilitate use of, cameras, home appliances, digital video recorders, medical devices, and other equipment.

21. Mobile services have also benefited from technological advances. Second-generation (2G) cellular and PCS systems, mainly using voice circuit-switched networks and low data rates, are now being supplemented or replaced by "2.5G" networks<sup>78</sup> supporting both circuit-switched and packet-switched services. Both Sprint and Verizon Wireless operate cdma2000 1x networks. Verizon Wireless, for example, currently operates a data-only overlay network based

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<sup>71</sup> *Telcordia May 19 Presentation* at 6

<sup>72</sup> See XBOX, *Xbox Live* (visited Dec 18, 2003) <<http://www.xbox.com/en-us/live/games/default.htm>> (*Xbox Live*); GameSpy Industries, *gamespy arcade* (visited Dec 18, 2003) <<http://www.gamespyarcade.com>> (*Gamespy*) (a web site for PC gamers to meet and play against each other online)

<sup>73</sup> See *Xbox Live, Gamespy, Presentation by Kevin Werbach, Supernova Group LLC, to FCC VoIP Forum, at 5* (Dec 1, 2003) <<http://www.fcc.gov/voip>> (*Werbach VoIP Forum Presentation*) (asking whether game chat devices "count as phones")

<sup>74</sup> See *Werbach VoIP Forum Presentation* at 4-5 (discussing the convergence of IP-enabled services and devices, including personal digital assistants (PDAs)); *AT&T FCC VoIP Forum Submission* at 4 (protocol conversion is occurring in many consumer devices, including cell phones that are also PDAs, SIP telephones that are also Java computing devices, and WiFi handsets that are SIP endpoints)

<sup>75</sup> See Alan Breznick, *Microsoft Pitches IPTV Initiative to MSOs and Telcos Software Giant Aims to Make Commercial Product Available by End of 2004*, *Cable Datacom News* (Nov 1, 2003) <<http://www.cabledatcomnews.com/nov03/nov03-6.html>>

<sup>76</sup> See Microsoft, *Device Platforms* (visited Feb. 12, 2004) <<http://msdn.microsoft.com/embedded/devplat/default.aspx>> (describing Windows CE)

<sup>77</sup> See *Werbach VoIP Forum Presentation* at 4-5 (PDAs, wireless phones and push-to-talk devices that use an IP network for voice transmission), *AT&T FCC VoIP Forum Submission* at 3 (push-to-talk cellular services)

<sup>78</sup> See *supra* para. 14.

on the 1x EV-DO (evolution – data optimized) standard in Washington DC and San Diego, allowing up to 300 kbps to 500 kbps data rates.<sup>79</sup> Cingular and AT&T Wireless operate GSM/GPRS networks which allow voice circuit switched as well multi-media services.

22. Thus, as use of IP expands, the technology's transformative effect on the communications landscape will likely become only more prominent, giving rise to a "virtuous circle" in which competition begets innovation, which in turn begets more competition. End users are likely to enjoy greater and greater flexibility in designing or selecting communications packages that suit their individual needs, and can be expected to access those packages over networks of their choosing, on devices of their choosing. Many parties contend that, in all probability, cross-platform competition will sharpen as distinctions between "voice," "video," and "data" services blur. This competition will likely force more innovation and lower prices, resulting in more individual choice and hence even greater competition.

## **B. Legal Background**

23. Our consideration of issues surrounding IP-enabled services and applications takes place within a legal framework comprised of statutory provisions and judicial precedent, prior Commission orders, ongoing Commission proceedings, and state actions relating to IP-enabled services. An understanding of this legal context is important to ensuring full consideration of the issues raised in this Notice.

### **1. Statutory Definitions and Commission Precedent**

24. The Communications Act and prior Commission orders set forth several definitions relevant to our consideration of VoIP and other IP-enabled services. First, the Act defines the terms "common carrier" and "carrier" to include "any person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio." The Act specifically excludes persons "engaged in radio broadcasting" from this definition.<sup>80</sup> Various regulatory obligations and entitlements set forth in the Act – including a prohibition on unjust or unreasonable discrimination among similarly situated customers and the requirement that all charges, practices, classifications, and regulations applied to common carrier service be "just and reasonable"<sup>81</sup> – attach only to entities meeting this definition.

25. Second, the Commission has long distinguished between "basic" and "enhanced" service offerings. In the *Computer Inquiry* line of decisions,<sup>82</sup> the Commission specified that a

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<sup>79</sup> See Verizon Jan 8, 2004 Press Release

<sup>80</sup> 47 U.S.C. § 153(10)

<sup>81</sup> See 47 U.S.C §§ 201-02

<sup>82</sup> See *Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities*, Docket No. 16979, Notice of Inquiry, 7 FCC 2d 11 (1966) (*Computer I NOI*); *Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities*, (continued. .)

“basic” service is a service offering transmission capacity for the delivery of information without net change in form or content.<sup>83</sup> Providers of “basic” services were subjected to common carrier regulation under Title II of the Act.<sup>84</sup> By contrast, an “enhanced” service contains a basic service component but also “employ[s] 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.”<sup>85</sup> The Commission concluded that enhanced services were subject to the Commission’s jurisdiction.<sup>86</sup> It further found, however, that the enhanced service market was highly competitive with low barriers to entry; therefore, the Commission declined to treat providers of enhanced services as “common carriers” subject to regulation under Title II of the Act.<sup>87</sup> In separate orders, the Commission also determined that exempted enhanced service providers (ESPs) should not be subjected to originating access charges for ESP-bound traffic.<sup>88</sup>

26 In 1996, the Telecommunications Act codified, with minor modifications, the Commission’s distinction between regulated “basic” and largely unregulated “enhanced” services. The 1996 Act defined “telecommunications” to mean “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.”<sup>89</sup> The Act then defined “telecommunications service” to mean “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 facilities used”<sup>90</sup> The Commission has concluded, and courts have agreed, that the

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Docket No. 16979, Final Decision and Order, 28 FCC 2d 267 (1971) (*Computer I Final Decision*); *Amendment of Section 64 702 of the Commission’s Rules and Regulations (Second Computer Inquiry)*, Docket No. 20828, Tentative Decision and Further Notice of Inquiry and Rulemaking, 72 FCC 2d 358 (1979) (*Computer II Tentative Decision*); *Amendment of Section 64 702 of the Commission’s Rules and Regulations (Second Computer Inquiry)*, Docket No. 20828, Final Decision, 77 FCC 2d 384 (1980) (*Computer II Final Decision*), *Amendment of Section 64 702 of the Commission’s Rules and Regulations (Third Computer Inquiry)*, CC Docket No. 85-229, Report and Order, 104 FCC 2d 958 (1986) (*Computer III*) (subsequent cites omitted) (collectively the *Computer Inquiries*).

<sup>83</sup> *Computer II Final Decision*, 77 FCC 2d at 419-22, paras 93-99

<sup>84</sup> *Id* at 428, para 114.

<sup>85</sup> 47 C.F.R. § 64.702, *see also Computer II Final Decision*, 77 FCC 2d at 420-21, para 97.

<sup>86</sup> *Computer II Final Decision*, 77 FCC 2d at 432, para 125

<sup>87</sup> *Id* at 432-35, paras. 126-132.

<sup>88</sup> *MTS and WATS Market Structure*, CC Docket No. 78-72 Phase I, Memorandum Opinion and Order, 97 FCC 2d 682, 715, para. 83 (1983) (*MTS/WATS Market Structure Order*), *Amendments of Part 69 of the Commission’s Rules Relating to Enhanced Service Providers*, CC Docket No. 87-215, Order, 3 FCC Rcd 2631, 2633, para 17 (1988) (*ESP Exemption Order*)

<sup>89</sup> 47 U.S.C. § 153(43).

<sup>90</sup> 47 U.S.C. § 153(46)

“telecommunications service” definition was “intended to clarify that telecommunications services are common carrier services.”<sup>91</sup> Various entitlements and obligations set forth in the Act – including, for example, the entitlement to access an incumbent’s unbundled network elements for local service<sup>92</sup> and the obligation to render a network accessible to people with disabilities<sup>93</sup> – attach only to entities providing “telecommunications service.”

27. By contrast, the 1996 Act defined “information service” to mean “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 network or the management of a telecommunications service.”<sup>94</sup> The Act did not establish any particular entitlements or requirements with regard to providers of information services, but the Commission has exercised its ancillary authority under Title I of the Act to apply requirements to information services.<sup>95</sup>

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<sup>91</sup> *Cable & Wireless, PLC*, Order, 12 FCC Rcd 8516, 8521, para. 13 (1997), see also *Virgin Islands Tel Corp. v FCC*, 198 F.3d 921, 926-27 (D.C. Cir. 1999).

<sup>92</sup> See 47 U.S.C. § 251(c)(3).

<sup>93</sup> See 47 U.S.C. § 255(c).

<sup>94</sup> 47 U.S.C. § 153(20). We note that the “information service” category includes all services that the Commission previously considered to be “enhanced services.” See *Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, as Amended*, CC Docket No. 96-149, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 21905, 21956-57, para. 102 (1996) (subsequent history omitted). Specifically, enhanced services are defined in section 64.702(a) of the Commission’s rules as “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,” and include, among other things, such services as voicemail, electronic mail, facsimile store-and-forward, interactive voice response, protocol processing, gateway, and audiotext information services. 47 C.F.R. § 64.702(a).

<sup>95</sup> See, e.g., *Implementation of Section 255 and 251(a)(2) of the Communications Act of 1934, as Enacted by the Telecommunications Act of 1996*, WT Docket No. 96-198, Report and Order and Further Notice of Inquiry, 16 FCC Rcd 6417, 6455-62, paras. 93-108 (1999) (*Disability Access Order*) (invoking ancillary authority to impose section 255-like obligations on providers of voicemail and interactive menu services); see also *Computer II Final Decision; Amendment of Section 64.702 of the Commission’s Rules and Regulations (Second Computer Inquiry)*, Memorandum Opinion and Order, 84 FCC 2d 50 (1980) (*Computer II Reconsideration Decision*); *Amendment of Section 64.702 of the Commission’s Rules and Regulations (Second Computer Inquiry)*, Memorandum Opinion and Order on Further Reconsideration, 88 FCC 2d 512 (1981) (*Computer II Further Reconsideration Decision*) (asserting ancillary jurisdiction over enhanced services, including voicemail and interactive menus, as well as over CPE).

## 2. Commission Consideration of VoIP

28. While the Commission has not addressed IP-enabled services in a comprehensive and definitive manner, the Commission has discussed issues relating to VoIP. Moreover, there are several petitions relating to this issue currently pending before the Commission. These items are briefly described below

### a. Stevens Report

29. In a 1998 Report to Congress known as the "Stevens Report,"<sup>96</sup> the Commission considered the proper classification of IP telephony services under the 1996 Act.<sup>97</sup> In that Report, the Commission declined to render any conclusions regarding the proper legal and regulatory framework for addressing these services, stating that "definitive pronouncements" would be inappropriate "in the absence of a more complete record focused on individual service offerings."<sup>98</sup> The Commission did, however, observe that in the case of "computer-to-computer" IP telephony, where "individuals use software and hardware at their premises to place calls between two computers connected to the Internet," the Internet service provider did not appear to be "providing" telecommunications, and the service therefore appeared not to constitute "telecommunications service" under the Act's definition of that term.<sup>99</sup> In contrast, a "phone-to-phone" IP telephony service relying on "dial-up or dedicated circuits ... to originate or terminate Internet-based calls" appeared to "bear the characteristics of telecommunications services,"<sup>100</sup> so long as the particular service met four criteria:

- (1) it holds itself out as providing voice telephony or facsimile transmission service;
- (2) it does not require the customer to use CPE different from that CPE necessary to place an ordinary touch-tone call (or facsimile transmission) over the public switched telephone network;
- (3) it allows the customer to call telephone numbers assigned in accordance with the North American Numbering Plan, and associated international agreements; and
- (4) it transmits customer information without net change in form or content.<sup>101</sup>

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<sup>96</sup> *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report to Congress, 13 FCC Rcd 11501 (1998) (*Stevens Report*)

<sup>97</sup> *See id.* at 11541-45, paras. 83-93

<sup>98</sup> *See id.* at 11541, para. 83.

<sup>99</sup> *Id.* at 11543, para. 87.

<sup>100</sup> *Id.* at 11544, para. 89

<sup>101</sup> *Id.* at 11543-44, para. 88

30. With respect to protocol conversion and phone-to-phone services, the Commission noted that its *Non-Accounting Safeguards Order* determined that “certain protocol processing services that result in no net protocol conversion to the end user are classified as basic services; those services are deemed telecommunications services.”<sup>102</sup> The Commission further stated that “[t]he protocol processing that takes place incident to phone-to-phone IP telephony does not affect the service’s classification, under the Commission’s current approach, because it results in no net protocol conversion to the end user.”<sup>103</sup> Moreover, the Commission observed that “[t]he Act and the Commission’s rules impose various requirements on providers of telecommunications, including contributing to universal service mechanisms, paying interstate access charges, and filing interstate tariffs.”<sup>104</sup> The Commission also predicted that future proceedings would require it to consider “the regulatory status of various specific forms of IP telephony, including the regulatory requirements to which phone-to-phone providers may be subject if we were to conclude that they are ‘telecommunications carriers.’” Specifically, the Commission noted that to the extent it concluded that phone-to-phone IP telephony services constituted “telecommunications service[s]” and obtain the same circuit-switched access as obtained by other interexchange carriers, the Commission “may find it reasonable that [providers of such services] pay similar access charges.”<sup>105</sup> However, the Commission has also stated in its *Intercarrier Compensation NPRM* that IP telephony “threatens to erode access revenues for LECs because it is exempt from the access charges that traditional long-distance carriers must pay.”<sup>106</sup>

#### b. Disability Access NOI

31. In 1999, the Commission issued an order implementing the disability accessibility provisions found in sections 251(a)(2) and 255 of the Act.<sup>107</sup> The Commission attached to that Order a Notice of Inquiry raising specific questions regarding the application of these sections and the Commission’s implementing regulations in the context of “IP telephony” and “computer-based equipment that replicates telecommunications functionality.”<sup>108</sup> That Notice sought comment on the extent to which Internet telephony was impairing access to communications services among people with disabilities, the efforts that manufacturers were taking to render new

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<sup>102</sup> *Id.* at 11526, para. 50 (citing *Non-Accounting Safeguards Order*, 11 FCC Rcd at 21958, para. 107).

<sup>103</sup> *Id.* at 11527, para. 52.

<sup>104</sup> *Id.* at 11544, para. 91.

<sup>105</sup> *Id.* at 11544-45, para. 91, see also *Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92, Notice of Proposed Rulemaking, 16 FCC Rcd 9610 (2001) (*Intercarrier Compensation NPRM*).

<sup>106</sup> *Intercarrier Compensation NPRM*, 16 FCC Rcd at 9657 para. 133.

<sup>107</sup> See generally *Disability Access Order*, 16 FCC Rcd 6417; *infra* paras. 58-60.

<sup>108</sup> *Disability Access Order*, 16 FCC Rcd at 6483-84, para. 175; see generally *id.* at 6483-6486, paras. 173-85.

technologies accessible, and the degree to which these technologies should be subjected to the same disability access requirements as traditional telephony facilities.<sup>109</sup>

### c. Pending Petitions

32. Several parties have filed petitions asking the Commission to rule on the proper legal classification and regulatory treatment of various IP-enabled services. The services at issue in these petitions differ markedly, ranging from (1) a “phone-to-phone” service using IP to transport interexchange traffic to (2) an Internet application that facilitates peer-to-peer communications or to (3) services permitting IP telephony subscribers to communicate with subscribers of traditional circuit-switched telephone service to (4) a broad range of “IP platform services.”<sup>110</sup> Today, in a separate order, we resolve one of these petitions, finding that Pulver’s Free World Dialup is an unregulated information service – that does not use the PSTN – subject to federal jurisdiction.<sup>111</sup> We hereby incorporate the records of the pending AT&T, Vonage and Level 3 petitions and note that the record developed here could influence disposition of those proceedings.<sup>112</sup> We note, however, that by seeking comment on whether access charges should apply to the various categories of service identified by the commenters, we are not addressing

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<sup>109</sup> See *id.* at 6484-86, paras 179-85

<sup>110</sup> See Petition for Declaratory Ruling that AT&T’s Phone-to-Phone IP Telephony Services are Exempt from Access Charges, WC Docket No 02-361 (filed Oct 18, 2002), *Pulver Petition*, *Vonage Petition*, Level 3 Petition for Forbearance Under 47 U.S.C. § 160(c) from Enforcement of 47 U.S.C. § 251(g), Rule 51.701(b)(1), and Rule 69.5(b), WC Docket No 03-266 (filed Dec 23, 2003), Petition of SBC Communications Inc. for Declaratory Ruling (filed Feb. 5, 2004) (defining “IP platform services” to include networks relying on IP, the capabilities and functionalities of those networks, and services and applications utilizing those networks to facilitate communications). SBC has also filed a petition seeking forbearance from application of Title II regulations in the context of “IP platform services.” See Petition of SBC Communications Inc. for Forbearance, WC Docket No. 04-29 (filed Feb. 5, 2004). The Commission has solicited public comment on that petition. See *Pleading Cycle Established for Comments on Petition of SBC Communications Inc. for Forbearance Under Section 10 of the Communications Act from Application of Title II Common Carrier Regulation to “IP Platform Services,”* WC Docket No 04-29, Public Notice, DA 04-360 (rel. Feb 12, 2004)

<sup>111</sup> See *Pulver Declaratory Ruling*

<sup>112</sup> In so doing, we also expressly preserve the Commission’s flexibility to address one or all of these petitions by issuing a declaratory ruling or rulings before the culmination of the instant proceeding. We also expressly preserve the Commission’s flexibility to address the *Intercarrier Compensation* and *Universal Service* proceedings currently pending before the Commission before the culmination of the instant proceeding. See *Intercarrier Compensation NPRM*, 16 FCC Rcd 9610 (2001), *Federal-State Joint Board on Universal Service, 1998 Biennial Regulatory Review – Streamlined Contributor Reporting Requirements Associated with Administration of Telecommunications Relay Service, North American Numbering Plan, Local Number Portability, and Universal Service Support Mechanisms, Telecommunications Services for Individuals with Hearing and Speech Disabilities, and the Americans with Disabilities Act of 1990, Administration of the North American Numbering Plan and North American Numbering Plan Cost Recovery Contribution Factor and Fund Size, Number Resource Optimization, Telephone Number Portability, Truth-in-Billing and Billing Format*, CC Docket Nos. 96-45, 98-171, 90-571, 92-237, 99-200, 95-116, 98-170, Report and Order and Second Further Notice of Proposed Rulemaking, 17 FCC Rcd 24952, 24984-98, paras. 66-100 (2002) (*Universal Service Further NPRM*).

whether access charges apply or do not apply under existing law.

33. As a policy matter, we believe that any service provider that sends traffic to the PSTN should be subject to similar compensation obligations, irrespective of whether the traffic originates on the PSTN, on an IP network, or on a cable network. We maintain that the cost of the PSTN should be borne equitably among those that use it in similar ways.

#### d. State Regulation

34. We also note that states are beginning to address VoIP issues. Recently, several states have taken actions with regard to VoIP providers that are rapidly changing the regulatory landscape on the state level.<sup>113</sup> Even at this early stage, states have begun to diverge in their approaches to the regulation of VoIP services. For example, some states have required VoIP providers to be certified to provide service in the state,<sup>114</sup> while others have not.<sup>115</sup>

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<sup>113</sup> See, e.g., *State Telecom Activities*, Communications Daily, Jan. 8, 2004, at 7 (reporting that, after notifying VoIP providers that they must comply with state telephone regulations, the California Public Utilities Commission has now decided to open a proceeding to examine regulation of VoIP providers rather than taking immediate enforcement action against VoIP providers that did not comply); *State Telecom Activities*, Communications Daily, Dec. 3, 2003, at 9 (reporting that the Missouri Public Service Commission has called for comments on Time Warner Cable Information Services' application for a state certificate to provide VoIP services); *State Telecom Activities*, Communications Daily, Nov. 24, 2003, at 7 (reporting that the Ohio Public Utilities Commission of Ohio is considering an application by Time Warner Cable Information Services for a state certificate to provide VoIP services); *State Telecom Activities*, Communications Daily, Oct. 15, 2003 (reporting that the New York Public Service Commission has opened a case to consider its jurisdiction over VoIP services in response to an incumbent LEC complaint seeking to impose state telephone regulation on VoIP providers); *State Telecom Activities*, Communications Daily, Oct. 8, 2003 (reporting that the Washington Utilities & Transportation Commission, in response to a remand from a federal district court, began considering whether VoIP providers must register as competitive LECs and what state regulatory requirements should apply to VoIP providers).

<sup>114</sup> For example, in September 2003, the Minnesota Commission found that it had jurisdiction over the VoIP services provided by companies such as Vonage in Minnesota and ordered Vonage to comply with state statutes and rules regarding the offering of telephone service. See *Vonage Holdings Corp v Minnesota Pub Utils Comm'n*, 290 F Supp 2d 993, 996 (D Minn 2003) (citing *In the Matter of the Complaint of the Minnesota Department of Commerce Against Vonage Holding Corp Regarding Lack of Authority to Operate in Minnesota*, Docket No. P-6214/C-03-108 (Minn. Pub Utils Comm'n Sept 11, 2003) (order finding jurisdiction and requiring compliance)). Vonage sought review of this decision in federal court, and has also sought a ruling from the Commission regarding the issues raised by the Minnesota Commission's order. In a decision issued on October 16, 2003, the U.S. District Court for the District of Minnesota concluded that Vonage "uses telecommunications services, rather than provides them." *Id* at 999 (emphasis in original). Further, the court held that "state regulation over VoIP services is not permissible because of the recognizable congressional intent to leave the Internet and information services largely unregulated." *Id* at 1002. In the court's view, "Congress's expression of its intent to not have Title II apply to enhanced services demonstrates its intent to occupy the field of regulation of information services." *Id*. The Minnesota PUC has appealed this ruling. See Gayle Kansagor, *Minnesota PUC Appeals VoIP Ruling*, TR Daily, Feb. 13, 2004, at 7-8.

<sup>115</sup> Florida, for example, recently enacted legislation excluding VoIP services from the class of "services" subject to regulation by the Florida Public Service Commission. This legislation, however, expressly stated that it did not (continued.. )

### III. CATEGORIZING IP-ENABLED SERVICES

35. In this section, we solicit comment regarding how, if at all, we should differentiate among various IP-enabled services to ensure that any regulations applied to such services are limited to those cases in which they are appropriate. As noted above, IP-enabled services are an increasingly available, sophisticated and attractive alternative to consumers. These services have arisen in an environment largely free of government regulation, and the great majority, we expect, should remain unregulated. To the extent – if any – that application of a particular regulatory requirement is needed to further critical national policy goals, that requirement must be tailored as narrowly as possible, to ensure that it does not draw into its reach more services than necessary.<sup>116</sup> In order to guarantee that even those regulations deemed essential are applied only where needed, we seek comment as to whether it would be useful to divide IP-enabled services into discrete categories, and, if so, how we should define these categories. We also ask commenters to address whether there are technical or other characteristics of particular VoIP or other IP-enabled services that suggest that providers use the underlying network in different ways or provide different functionality to end users that warrants differential treatment. Further, we seek comment on how our regulatory framework should evolve over time, as IP-enabled services themselves evolve. In considering these issues, we ask commenters to address three central questions: In which cases is some form of regulation needed to pursue important national objectives? What differentiates those services for which some form of regulation is required from those for which it is not? Finally, in what relevant ways is a particular service like or unlike Pulver's Free World Dialup, which we have today classified as an "information" service, free from regulation under the Commission's current rules?

36. For purposes of stimulating analysis regarding the proper grounds for distinguishing among IP-enabled services, we provide below a list of functional and economic factors that might be used to divide these services into categories calling for distinct treatment, and ask commenters to address the utility of drawing distinctions based on these factors. As communications migrate from networks relying on incumbent providers enjoying monopoly ownership of underlying transmission facilities to an environment relying on numerous competing applications traversing numerous competing platforms, power over the prices and terms of service necessarily shifts from the provider to the end user. This shift raises the question whether our existing regulatory framework merits reevaluation. In establishing distinctions among various IP-enabled services, we seek ways to distinguish those regulations designed to respond to the dominance of centralized, monopoly-owned networks from those designed to protect public safety and other important consumer interests. We thus focus primarily on ways to distinguish services that might be viewed as replacements for traditional voice telephony (and which thus raise social policy concerns relating to emergency services, law

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"affect the rights and obligations of any entity related to the payment of switched network access rates or other intercarrier compensation, if any, related to voice-over-Internet protocol service." Fla. Stat. ch. 364.02(12) (2003).

<sup>116</sup> We believe, for example, that traditional economic regulation designed for the legacy network should not apply outside the context of the PSTN, and therefore will be inapplicable in the case of most IP-enabled services.

enforcement, access by individuals with disabilities, consumer protection, universal service, and so forth) from other services (which do not appear to raise these same regulatory questions to the same extent).

37. We note that this list is not intended to be exhaustive, and we invite commenters to address any other characteristic that they believe should guide our decisions in this proceeding.<sup>117</sup> Further, we do not presuppose that any one ground must be considered to the exclusion of any other ground, and invite commenters to explain why we should categorize services using a combination of factors, which may or may not include any of those listed below. In addressing the relevance of any specific consideration, we urge commenters to focus on the reasons why particular regulations should or should not be applied to particular services, why the benefits of differential treatment will outweigh administrative or other costs associated with the more complicated regulatory environment resulting from categorization, and how the technical or functional aspects of the service warrant particular categorization.

- *Functional equivalence to traditional telephony:* Some IP-enabled services resemble traditional wireline telephony, while others do to a lesser degree. These functional differences likely shape end users' expectations regarding the service. For example, consumers might consider a telephone replacement IP-enabled service to be very much like traditional telephony, but may have none of the same expectations for a voice function on a gaming platform. Is a service's functional equivalence to traditional telephony an appropriate basis on which to draw distinctions among IP-enabled services, or is such a comparison an unproductive endeavor? If so, what tests might we employ to identify such functional equivalence? In determining whether current regulatory requirements should be applied to IP-enabled services, should the Commission draw distinctions between services that facilitate instantaneous, simultaneous communications and those that do not?
- *Substitutability:* Should any regulation be reserved for those IP-enabled services that are used in lieu of, rather than simply in addition to – traditional telephony?<sup>118</sup> Is a service's substitutability for traditional telephony an appropriate basis on which to draw distinctions among IP-enabled services? If so, what tests might we employ to identify substitutability? Should it matter, for purposes of categorization, whether the service at issue is provided to mass market or enterprise market customers?

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<sup>117</sup> We note, too, that the features listed below overlap. We include overlapping criteria because, at the margins, these similar tests might give rise to different results (for example, a service might interconnect with the PSTN but, due to other features or limitations, not be deemed a "substitute" for traditional telephony).

<sup>118</sup> In strict economic terms, "substitutes" are services exhibiting positive cross-elasticity of demand. That is, two services are "substitutes" in the economic sense if demand for one rises when the price for the other increases, and falls when the price for the other drops. See, e.g., Steven E. Landsburg, *Price Theory and Applications* 108 (3d ed 1995).

- *Interconnection with the PSTN and Use of the North American Numbering Plan:* One key distinction among VoIP services is that dividing those services that offer interconnection with the PSTN and/or utilize traditional NANPA-administered telephone numbers from those – including “closed” networks but also online games and other services not used primarily for voice communication – that do not. For example, Vonage currently offers a VoIP service that allows customers to place voice calls to numbers served by traditional telecommunications carriers using the PSTN, or by other VoIP providers, and assigns its customers traditional telephone numbers.<sup>119</sup> Other services, however, might permit communication only within a single IP network or a set of intersecting IP networks, never interconnecting with the PSTN and/or never utilizing traditional telephone numbers. Should the Commission distinguish between such services on this basis?
- *Peer-to-Peer Communications vs. Network Services:* We solicit comment as to whether the Commission should distinguish between offerings that facilitate disintermediated peer-to-peer IP-enabled services (such as that offered by Pulver)<sup>120</sup> and IP-enabled services relying on a provider’s centralized servers (such as that offered by Vonage). Should a service that functions and is sold to consumers as a dedicated voice network offering some additional enhanced functionality be regulated differently from a service that simply facilitates direct peer-to-peer voice communications between or among end users? What criteria should we employ to distinguish “peer-to-peer” services from other services?
- *Facility Layer vs. Protocol Layer vs. Application Layer:* In recent years, several observers have urged reliance on a “layered” model to address VoIP and other areas of regulatory concern.<sup>121</sup> Under the “layered” approach, regulation would differentiate not among different platforms, but rather among various aspects of a particular offering – distinguishing, for example, among the regulation applied to (1) the underlying transmission facility, (2) the communications protocols used to transmit information over that facility, and (3) the applications used by the end user to issue and receive information. Under a layered model, a provider’s ownership of bottleneck facilities might warrant economic regulation of the facilities “layer” but not of the applications that traverse those facilities. We note that while certain legacy

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<sup>119</sup> Vonage Petition at 6

<sup>120</sup> We describe peer-to-peer services in note 30, above.

<sup>121</sup> See, e.g., Kevin Werbach, *A Layered Model for Internet Policy* (Sept. 1, 2000) <<http://www.edventure.com/conversation/article.cfm?counter=2414930>>; Robert M. Entman, *Transition to an IP Environment*, The Aspen Institute (2001); Michael L. Katz, *Thoughts on the Implications of Technological Change for Telecommunications Policy*, The Aspen Institute (2001), Douglas C. Sicker, *Further Defining a Layered Model for Telecommunications Policy* (Oct. 3, 2002) <<http://ntel.silumich.edu/tprc/papers/2002/95/LayeredTelecomPolicy.pdf>>; MCI/CompTel Joint Reply, WC Docket No. 03-211 at 4 (filed Nov. 24, 2003).

services also involved severable “layers,” some parties state that IP-enabled services riding numerous (primarily broadband) platforms appear to erode the links among the facility, the protocol, and the application more systematically than previous services. In categorizing IP-enabled services, should the Commission rely on a “layers” approach? If so, how should it define the relevant layers? If we adopt a “layers” approach, must we also take into account competition between and among layers and the substitutability of different platforms and services for one another at different layers? On a related note, in some cases, IP-enabled services are offered by companies that also own the underlying transmission facilities, thus raising the question of how to regulate entities that provide multiple layers.<sup>122</sup> Is ownership of such facilities relevant to our decisions here? We note that in other contexts, the Commission has countered the market power exercised by owners of bottleneck facilities by applying differential regulation to carriers that are deemed “dominant” and “non-dominant.”<sup>123</sup> Should the Commission apply a similar distinction here? Moreover, how should the Commission treat cases in which services offered by different providers at different “layers” are combined to create an IP-enabled service, as that term is used here?

- *Other Grounds for Categorization:* We invite comment as to whether the Commission should distinguish among IP-enabled services on grounds not discussed above. Should the Commission differentiate between services offered on a “common carriage” and “private carriage” basis?<sup>124</sup> Between services that do and do not utilize the Internet? Should regulatory treatment depend on whether the service is being

<sup>122</sup> See *supra* note 39

<sup>123</sup> See, e.g., *Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations Therefor*, First Report and Order, 85 FCC 2d 1 (1980) (subsequent history omitted) (adopting the dominant/nondominant framework), *Policy and Rules Concerning the Interstate, Interexchange Marketplace, Implementation of Section 245(g) of the Communications Act of 1934*, CC Docket No. 96-61, Second Report and Order, 11 FCC Rcd 20730 (1996) (subsequent history omitted) (adopting mandatory detariffing for the interstate, domestic, interexchange service of nondominant interexchange carriers); *Implementation of Section 402(b)(2)(A) of the Telecommunications Act of 1996*, CC Docket No. 97-11, Report and Order, 14 FCC Rcd 11364, paras. 29-32 (1999) (adopting differing discontinuance requirements for dominant and non-dominant carriers). The D.C. Circuit recently stated that “market forces are generally sufficient to ensure the lawfulness of rate levels, rate structures, and terms and conditions of service set by carriers who lack market power.” *Orloff v FCC*, 352 F.3d 415, 419, 421 (D.C. Cir. 2003) (quoting *Implementation of Sections 3(n) and 332 of the Communications Act Regulatory Treatment of Mobile Services*, GN Docket 93-252, Second Report and Order, 9 FCC Rcd 1411, 1478 (1994) (*CMRS Second Report and Order*)) (upholding Commission’s determination to forbear from applying tariff requirements to CMRS providers lacking market power)

<sup>124</sup> Under the D.C. Circuit’s so-called *NARUC I* decision (which predated, but survived, the 1996 Act), when considering whether a communications service is offered on a “private” or “common” carriage basis, the Commission first inquires whether there is a legal compulsion to serve the public indifferently, and then – if not – examines “whether there are reasons implicit in the nature of [the provider’s] operations to expect an indifferent holding out to the eligible user public.” See *Nat’l Ass’n of Regulatory Util Comm’rs v FCC*, 525 F.2d 630, 642 (D.C. Cir. 1976), *Virgin Islands Tel Corp v. FCC*, 198 F.3d at 924, 927.

used as a “primary line” or whether, instead, it supplements an existing telephone line? Is there any utility to distinguishing between “phone-to-phone” services, “computer-to-computer” services, and “computer-to-phone” services, or to drawing other distinctions relating to the CPE used to access a service?<sup>125</sup> Should IP-enabled services be differentiated on the basis of the platform on which they are provided (e.g., wireline, wireless, cable, satellite)? Finally, is there some other basis upon which the Commission should draw distinctions among IP-enabled services?

#### IV. JURISDICTIONAL CONSIDERATIONS

38. In this section, we seek comment on the jurisdictional nature of IP-enabled services. We note that in a recent declaratory ruling, the Commission determined that Pulver’s Free World Dialup is an unregulated information service subject to federal jurisdiction. FWD is a peer-to-peer service that facilitates VoIP calls between subscribers by informing them when other subscribers are online or “present.”<sup>126</sup> As noted above, FWD offers its members no transmission services. Subscribers must “bring their own broadband” connection. This high-speed connection can be through cable modem, digital subscriber line, satellite, wireless or any other high-speed facility. In addition, FWD provides subscribers with its own numbers, not North American Numbering Plan numbers.<sup>127</sup>

39. As explained in the *Pulver Declaratory Ruling*, FWD is an unregulated information service subject to federal jurisdiction. In this ruling, we explained that courts have recognized the preeminence of federal authority in the area of information services, particularly in the area the Internet and other interactive computer services.<sup>128</sup> This finding is consistent with Congress’s clear intention, as expressed in the 1996 Act, that such services remain “unfettered” by federal or state regulation<sup>129</sup> and with our own “hands-off” approach to the Internet. We also determined that state-by-state regulation of FWD, an Internet application, is inconsistent with the controlling federal role over interstate commerce required by the Constitution. Moreover, because FWD is a completely portable Internet service and for other reasons, the Commission

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<sup>125</sup> See *Stevens Report*, 13 FCC Rcd at 11543-45, paras 87-90

<sup>126</sup> FWD offers other features to its members. For example, if the subscriber has opted in to FWD’s voicemail service, FWD acts as a voicemail agent by accepting a call if a member is not available. Further, if a member’s equipment generates a private Internet address that interferes with the ability of the user’s CPE to determine Internet addresses, FWD will repair the addressing information and will relay the “signaling and media stream via a protocol conversion solution to facilitate delivery.” See *Pulver Declaratory Ruling* at para. 11.

<sup>127</sup> This feature further emphasizes the fact that FWD member-to-member calls are routed over the Internet, not the PSTN

<sup>128</sup> See *Pulver Declaratory Ruling* at paras 17-18

<sup>129</sup> See, e.g., 47 U.S.C. § 230(b); see also 47 U.S.C. § 157 & nt (stating that, in general, it is policy of the United States to encourage the deployment of new technologies and services to the public, and, in particular, the Commission is required to encourage the deployment of advanced telecommunications capability)