BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

Big River Telephone Company, LLC,	)	
	)	
Complainant,	)	
	)	Case No. TC-2012-0284
v.	)	
	)	
Southwestern Bell Telephone Company d/b/a AT&T Missouri,	)	
	)	
	)	
Respondent.	)	

AT&T'S SUPPLEMENTAL POST-HEARING BRIEF

Pursuant to the Commission's February 8, 2013 Order Directing Filing of Supplemental Briefs ("Order"), Southwestern Bell Telephone Company d/b/a AT&T Missouri ("AT&T") hereby respectfully submits its supplemental post-hearing brief. In its Order, the Commission directed the parties to address whether the traffic which Big River Telephone Company, LLC ("Big River") delivered to AT&T is enhanced/information services traffic because it "undergoes a net protocol conversion, as defined by the FCC, between the calling and called parties." Order, at 1.

It is not disputed that the traffic at issue is Voice over Internet Protocol ("VoIP") traffic.[1] That is, the traffic is voice telephone traffic that originated in Internet protocol ("IP") format at the premises of Big River's customers, and terminated on the public switched telephone network ("PSTN") in time-division multiplexing format at the premises of AT&T's customers. The Federal Communications Commission ("FCC") has not decided, however, whether this IP-to-PSTN

[1] EFIS No. 66, Joint Stipulation No. 25 ("Since January 1, 2010, the traffic that Big River delivered to AT&T Missouri over the interconnection trunks established pursuant to the parties' ICA was Voice over Internet Protocol ('VoIP') traffic.").

protocol conversion is sufficient to make VoIP service an enhanced/information service, rather than a telecommunications service.[2]

AT&T has in other proceedings taken the position that VoIP service should be classified as an enhanced/information service, as it involves an end-to-end, IP-to-PSTN protocol conversion of the voice traffic. Such a classification would be consistent with the FCC's prior explanation that a "protocol conversion" occurs when "an end-user [can] send information into a network in one protocol and have it exit the network in a different protocol."[3] Other parties have taken the opposite position; for example, "NARUC has spent the last decade urging the FCC" to find that "VoIP services are, in fact, 'telecommunications services.'"[4] The Commission need not reach this issue here, however, for two reasons.

First, Big River did not assert, either in its complaint or direct testimony, that its traffic is enhanced services traffic on the basis of any IP-to-PSTN protocol conversion. Rather, it asserted that *other* features of its service (like the conversion of signaling information, call management options and fax capabilities) make its services "enhanced." For example, Big River asserted that various "transformations" make its traffic enhanced services traffic, but it was also careful to emphasize that "[n]one of these changes are part of Voice Over IP," that they "are not synonymous with or part of Voice Over IP," and that they "could be performed with or without Voice Over IP."[5] Similarly, in informal dispute resolution, Big River attempted to walk away from its prior

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[2] *See, e.g., In the Matter of Section 68.4(A) of the Commission's Rules Governing Hearing Aid-Compatible Telephones*, 22 FCC Rcd. 17709, 2007 WL 2903866, n.213 (FCC Oct. 5, 2007) ("the Commission has not classified VoIP as a telecommunications service or an information service"). Copies of the portions of the FCC decisions referenced in this brief are contained in the accompanying Attachment.

[3] First Report and Order and Further Notice of Proposed Rulemaking, *Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, as amended*, 11 FCC Rcd 21905, 21956, ¶ 104 (1996) ("*Non-Accounting Safeguards Order*"), *modified on recon.*, 12 FCC Rcd 2297 (1997), *remanded*, *Bell Atlantic Tel. Cos. v. FCC*, No. 97-1067, 1997 WL 307161 (D.C. Cir. Mar. 31, 1997) (per curiam). On the other hand, as AT&T explained in its initial post-hearing brief (at 13), the conversion of *signaling* information, as opposed to the voice information (*i.e.*, speech) transmitted by the end user, is not the kind of net protocol conversion that makes a service "enhanced." *See Communication Protocols*, 95 FCC2d 584, 1983 WL 182962, ¶¶ 14-15 (FCC 1983).

[4] Comments of the National Association of Regulatory Utility Commissioners, WC Docket No. 12-353, p.3 (FCC filed Jan. 28, 2013), *available at* https://prodnet.www.neca.org/wawatch/wwpdf/12913naruc.pdf.

[5] EFIS No. 103, Big River Exh. 1 (Howe Direct) at 6.

statements that its traffic was VoIP,[6] and it reiterated in direct testimony that it "clearly indicated that our dispute was in regards to enhanced traffic and not VOIP traffic."[7]

Second, and in any event, whether VoIP traffic is an enhanced/information service is a moot question because, as AT&T and Staff have demonstrated, Big River's traffic is interconnected VoIP traffic. The ultimate issue before the Commission is whether Big River's traffic is subject to access charges under the parties' interconnection agreement ("ICA"). There is no dispute that the ICA expressly makes interconnected VoIP traffic subject to access charges,[8] and this outcome is not changed whether or not an IP-to-PSTN protocol conversion is sufficient to make VoIP service an enhanced/information service.

Respectfully submitted,

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[6] EFIS No. 106, Big River Exh. 4 (Jennings Direct), Sch. 3.
[7] EFIS No. 106, Big River Exh. 4 (Jennings Direct) at 6.
[8] EFIS No. 79, AT&T Exh. 13 at 3.

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing document were served to all parties by e-mail on February 20, 2013.

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22 F.C.C.R. 17709, 22 FCC Rcd. 17709, 42 Communications Reg. (P&F) 1051, 2007 WL 2903866

Federal Communications Commission (F.C.C.)
Report on the Status of Implementation of the Commission's Hearing Aid Compatibility Requirements

IN THE MATTER OF SECTION 68.4(A) OF THE COMMISSION'S
RULES GOVERNING HEARING AID-COMPATIBLE TELEPHONES

WT 01-309
WT 06-203 (TERMINATED)
DA 07-4151
Adopted: October 5, 2007
Released: October 5, 2007

**1 *17709 By the Chief, Wireless Telecommunications Bureau

*17710 I. INTRODUCTION

1. In this Report, the Wireless Telecommunications Bureau ("Bureau"), in consultation with the Office of Engineering and Technology ("OET") and other Bureaus and Offices of the Commission, reviews the status of implementation of the Commission's hearing aid compatibility requirements. This Report fulfills the Commission's directive for staff to examine, shortly after three years after the effective date of the hearing aid compatibility rules, the following three topics: (1) the impact of the Commission's rules in achieving greater compatibility between hearing aids and digital wireless phones; (2) the development of new technologies that could provide greater or more efficient accessibility of wireless telecommunications to hearing aid users; and (3) the impact of hearing aid compatibility requirements on cochlear implant and middle ear implant users and their ability to use digital wireless phones. [1] Accordingly, this Report reviews the current state of wireless telephone compatibility with hearing aids and offers the Commission specific recommendations designed to further facilitate implementation of hearing aid compatibility requirements.

2. Based upon careful consideration of the record before it, the Bureau: (1) assesses the impact of the Commission's hearing aid compatibility requirements in achieving compatibility between digital wireless phones and hearing aids; (2) evaluates whether to recommend changes to the hearing aid compatibility rules, including potential revised or additional compatible handset deployment benchmarks, consistent with a joint proposal that was submitted by representatives from the wireless industry and consumer advocacy groups for the deaf and hard of hearing; (3) considers potential measures to improve the availability of information to consumers; (4) examines the development of new technologies that could provide greater or more efficient accessibility of wireless telecommunications to hearing aid users; (5) considers whether changes to the hearing aid compatibility rules may be necessary to address changes in technology and regulation; (6) explores the impact of hearing aid compatibility requirements on cochlear implant and middle ear implant users, and their ability to use digital wireless phones; and (7) discusses developments relating to the labeling of hearing aids with their immunity rating.

II. BACKGROUND

A. Hearing Aid Compatibility Requirements

3. In the *Hearing Aid Compatibility Order* adopted in 2003, the Commission took a number of actions to further the ability of persons with hearing disabilities to access digital wireless telecommunications. [2] Among other measures, the Commission required manufacturers and digital wireless service providers collectively to take steps to increase the number of hearing aid-compatible handset models available, and established phased-in deployment benchmark dates for the offering of hearing

209 In the Matter of Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Networks and Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite (GMPCS) Memorandum of Understanding and Arrangements et al., CC Docket No. 94-102 and IB Docket No. 99-67, *Report and Order and Second Further Notice of Proposed Rulemaking*, 18 FCC Rcd 25340, 25347-25360 ¶¶ 20-48, 25385 ¶¶ 111-112 (2003) (adopting, in part, 911 service call center requirements and seeking further comment on how to implement E911 requirements for the MSS).

210 Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L Band, and the 1.6/2.4 GHz Band, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd 1962 (2003) (permitting flexibility in the delivery of communications by MSS providers that operate in three sets of radio frequency bands: the 2 GHz MSS band (the 1990-2025 MHz uplink and the 2165-2200 MHz downlink), the L-band (general designation for frequencies from 1 to 2 GHz) and the Big LEO bands (referring to the 1.6/2.4 GHz bands).

211 In the Matter of Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks, WT Docket No. 07-53, *Declaratory Ruling*, 22 FCC Rcd 5901, 5907-08 ¶ 15 (2007) ("Wireless Broadband Internet Access Service Declaratory Ruling").

212 Wi-Fi (Wireless Fidelity) is a wireless technology based on the IEEE 802.11 standards.

213 *See* <http://www.fcc.gov/voip/> (visited August 9, 2007). To date, the Commission has not classified VoIP as a telecommunications service or an information service, and the discussion in this section is not intended to address the classification of VoIP services. *See* In the Matter of IP-Enabled Services, WC Docket No. 04-36, *Notice of Proposed Rulemaking*, 19 FCC Rcd 4863, 4893-94 ¶ 43-44 (2004).

214 Vonage, <http://www.vonage.com/device.php?type=F1000&refer_ id=WEBPR07060100001W1> (visited August 9, 2007, Skype, <http:// us.accessories.skype.com/DRHM/servlet/ControllerServlet?Action=DisplayCategoryProductListPage&SiteID=skype&Locale=en_ US&Env=BASE&parentCategoryID=4141800&categoryID=7032700> (visited August 9, 2007).

215 *See, e.g.*, Sprint Nextel, *Unlimited WiFi HotSpot Plan* <http:// nextelonline.nextel.com> (visited August 9, 2007).

216 A new line of service is required for both new and existing customers, the phones must be activated with a monthly plan, and a two-year service agreement is required. *See* T-Mobile USA, *T-Mobile Dash*™ <http://www.t-mobile.com> (visited August 9, 2007); T-Mobile USA, *T-Mobile Wing*™ <http:// www.t-mobile.com> (visited August 9, 2007); T-Mobile USA, *Services* <http:// www.t-mobile.com> (visited August. 9, 2007).

217 T-Mobile USA, *T-Mobile Dash*™ <http://www.t-mobile.com> (visited August 9, 2007); T-Mobile USA, *T-Mobile Wing*™ <http://www.t-mobile.com> (visited August 9, 2007).

218 *Sprint Customers Will Get More Done With The New Mogul™ By HTC*, Press Release, Sprint Nextel, June 18, 2007. Customers must enter into a two-year service agreement, with eligible monthly plans starting at $39.99. *See* Sprint Nextel, *Mogul™ by HTC* <http://nextelonline.nextel.com> (visited August 9, 2007); Sprint Nextel, *Sprint Power Pack Plans* <http://nextelonline.nextel.com> (visited August 9, 2007). *See also Sprint Nextel Announces 4G Broadband Wireless Initiative with Intel, Motorola and Samsung*, available at <http:// www2.sprint.com/mr/news_dtl.do?id=12960> (visited September 21, 2007).

219 *See* <http://www.apple.com/iphone/questionsandanswers.htm> (visited August 10, 2007).

220 *Id.*

221 *See* Matt Hamblen, *RIM Announces Dual-Mode BlackBerry 8820*, CIO, July 19, 2007; *see also* Melissa J. Perenson, *Money-Saving, Dual-Mode Mobile Phones do Voice Over Wi-Fi*, CIO, July 26, 2007.

222 *See* Perenson, *Money-Saving, Dual-Mode Mobile Phones do Voice Over Wi-Fi*, CIO, July 26, 2007.

223 47 C.F.R. § 20.19(a).

224 *Id. See also 700 MHz Service Report and Order*, 22 FCC Rcd 8119-20 ¶¶ 148-150.

225 Worldwide Interoperability for Microwave Access (WiMAX) is a broadband wireless access technology based on the IEEE 802.16 standards that is intended to improve the compatibility and interoperability of broadband wireless access equipment. *See* Newton's Telecom Dictionary, 23rd Edition, at 1013.

226 47 U.S.C. § 610(b)(2). "Public mobile service" is defined to include certain services covered under Part 22 of our rules. 47 U.S.C. § 610(b)(4)(B); 47 C.F.R. § 68.3.

227 Moreover, even if voice operation over the WLAN is not an inherent part of the equipment or service, users may be able to add applications that would permit such use.

228 ATIS Reply Comments at 6 and HLAA Reply Comments at 5. *See also* HAP Comments at 3. We note that there does not appear to be any current requirement that the iPhone be compatible under Section 20.19 of the Commission's rules, as Apple would appear to come under the *de minimis* exception and AT&T meets its compatible handset model deployment benchmarks using other models. *See* 47 C.F.R. § 20.19(e).

229 HLAA Reply Comments at 5.

11 F.C.C.R. 21905, 13 F.C.C.R. 11230, 11 FCC Rcd. 21905, 13 FCC Rcd. 11230, 5 Communications Reg. (P&F) 696, 1996 WL 734160

NOTE: An Erratum is attached to the end of this document.

Federal Communications Commission (F.C.C.)
First Report and Order and Further Notice of Proposed Rulemaking

IN THE MATTER OF IMPLEMENTATION OF THE NON-ACCOUNTING SAFEGUARDS OF SECTIONS 271 AND 272 OF THE COMMUNICATIONS ACT OF 1934, AS AMENDED.

CC Docket No. 96-149
FCC 96-489
Adopted: December 23, 1996
Released: December 24, 1996
Comment Date: February 19, 1997
Reply Comment Date: March 21, 1997

****1 *21905** By the Commission:

*21907 I. INTRODUCTION

1. In February 1996, the Telecommunications Act of 1996 became law.[1] The intent of the 1996 Act is "to provide for a pro-competitive, de-regulatory national policy framework designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans by opening all telecommunications markets to competition."[2]

***21908** 2. In this proceeding, we adopt non-accounting safeguards, pursuant to section 272 of the Communications Act, to govern entry by the Bell Operating Companies (BOCs) into certain new markets.[3] This proceeding is one of a series of interrelated rulemakings that collectively will implement the telephony provisions of the 1996 Act. Other proceedings under the 1996 Act have focused on opening markets to entry by new competitors,[4] establishing rules to preserve and advance universal service,[5] establishing rules for competition in those markets that are opened to competitive entry,[6] and on lifting legal and regulatory barriers to competition.[7]

3. Upon enactment, the 1996 Act permitted the BOCs immediately to provide interLATA[8] services[9] that originate outside of their in-region states.[10] The 1996 Act conditions ***21909** the BOCs' entry into in-region interLATA services on their compliance with certain provisions of section 271. Under section 271, we must determine, among other things, whether the BOC has complied with the safeguards imposed by section 272 and the rules adopted herein.[11] Section 272 addresses the BOCs' provision of interLATA telecommunications services originating in states in which they provide local exchange and exchange access services, interLATA information services,[12] and BOC manufacturing activities.[13]

***21910** 4. On July 18, 1996, we initiated this proceeding by releasing a Notice of Proposed Rulemaking (Notice)[14] that sought comment on the non-accounting separate affiliate and nondiscrimination safeguards of the 1996 Act. These provisions govern the BOCs' entry into certain new markets. We initiated a separate proceeding to address the accounting safeguards required to

**31 104. We further conclude that, subject to the exceptions discussed below, protocol processing services constitute information services under the 1996 Act. We reject Bell Atlantic's argument that "information services" only refers to services that transform or process the content of information transmitted by an end-user, because we agree with Sprint that the statutory definition makes no reference to the term "content," but requires only that an information service transform or process "information."[236] We also agree with ITI and ITAA that an end-to-end protocol conversion service that enables an end-user to send information into a network in one protocol and have it exit the network in a different protocol clearly "transforms" user information.[237] We further find that other types of protocol processing services that interpret and react to protocol information associated with the transmission of end-user content clearly "process" such information. Therefore, we conclude that both protocol conversion and protocol processing services are information services under the 1996 Act.

*21957 105. This interpretation is consistent with the Commission's existing practice of treating end-to-end protocol processing services as enhanced services.[238] We find no reason to depart from this practice, particularly in light of Congress's deregulatory intent in enacting the 1996 Act.[239] Treating protocol processing services as telecommunications services might make them subject to Title II regulation. Because the market for protocol processing services is highly competitive, such regulation is unnecessary to promote competition, and would likely result in a significant burden to small independent ISPs that provide protocol processing services. Thus, policy considerations support our conclusion that end-to-end protocol processing services are information services.[240]

106. We note that, under Computer II and Computer III, we have treated three categories of protocol processing services as basic services, rather than enhanced services, because they result in no net protocol conversion to the end-user. These categories include protocol processing: 1) involving communications between an end-user and the network itself (e.g., for initiation, routing, and termination of calls) rather than between or among users; 2) in connection with the introduction of a new basic network technology (which requires protocol conversion to maintain compatibility with existing CPE); and 3) involving internetworking (conversions taking place solely within the carrier's network to facilitate provision of a basic network service, that *21958 result in no net conversion to the end-user).[241] We agree with PacTel that analogous treatment should be extended to these categories of "no net" protocol processing services under the statutory regime.[242] Because "no net" protocol processing services are information service capabilities used "for the management, control, or operation of a telecommunications system or the management of a telecommunications service," they are excepted from the statutory definition of information service.[243] Thus, "no net" protocol conversion services constitute telecommunications services, rather than information services, under the 1996 Act.

**32 107. We further find, as suggested by PacTel, that services that the Commission has classified as "adjunct-to-basic" should be classified as telecommunications services, rather than information services.[244] In the NATA Centrex order, the Commission held that the enhanced services definition did not encompass adjunct-to-basic services.[245] Although the latter services may fall within the literal reading of the enhanced service definition, they facilitate establishment of a basic transmission path over which a telephone call may be completed, without altering the fundamental character of the telephone service. Similarly, we conclude that "adjunct-to-basic" services are also covered by the "telecommunications management exception" to the statutory definition of information services, and therefore are treated as telecommunications services under the 1996 Act.

2. Distinguishing InterLATA Information Services subject to Section 272 from IntraLATA Information Services

a. Background

108. In the Notice, we sought comment on how to distinguish between interLATA information services, which are subject to the section 272 separate affiliate requirements, and *21959 intraLATA information services, which are not.[246] In particular, we asked whether an information service should be considered an interLATA service only when the service actually involves an interLATA telecommunications transmission component, or, alternatively, when it potentially involves interLATA

55 Rad. Reg. 2d (P & F) 104 (F.C.C.), 95 F.C.C.2d 584, 1983 WL 182962

Federal Communications Commission (F.C.C.)

Memorandum Opinion, Order, and Statement of Principle s adopted regarding communications protocols under Section 64.702 of Commission's Rules and Regulations. The proceeding is an outgrowth of Second Computer Inquiry, 77 FCC 2d 384 (1979).

—*Communication Protocols*

GEN Docket No. 80-756
FCC 83-510

In the Matter of
Communications Protocols under Section 64.702 of the Commission's Rules and Regulations

Gen. Docket No. 80-756

MEMORANDUM OPINION, ORDER, AND STATEMENT OF PRINCIPLES

(Adopted: November 8, 1983; Released: November 21, 1983)

**1 *584 BY THE COMMISSION: COMMISSIONER RIVERA ABSENT.

A. *Introduction*:

1. This proceeding is an outgrowth of the *Second Computer Inquiry* (hereafter, 'Computer II'), 77 FCC2d 384 (1979) (*Final Decision), aff'd on reconsideration*, 84 FCC2d 50 (1980) ('Reconsideration Decision'), 88 FCC2d 512 (1981), *aff'd sub nom., C.C.I.A. v. FCC*, 693 F.2d 198 (D.C. Cir. 1982), *cert. denied sub nom., Louisiana v. United States*, 103 S.Ct. 2109 (1983). In *Computer II*, we established a dichotomy between basic communications services which are the subject of regulation under Title II of the Communications Act of 1934 as amended, and enhanced services which are not subject to such regulation. Section 64.702(a) of our rules defines 'enhanced services' as:

> service 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.

*585 Such services are not regulated under Title II of the Act.

2. The definition of enhanced services is fundamentally predicated on the concept that a basic service is an offering of transmission capacity between two or more points suitable for a user's transmission needs, and subject only to the technical parameters of fidelity or distortion; in offering a basic transmission service, a carrier essentially offers a pure transmission capability over a communications path that is virtually transparent in terms of its interaction with customer supplied information. *Final Decision*, 77 FCC2d at 420.[1] An enhanced service does more than this. It alters the subscriber's information or electrical signals, or it involves subscriber interaction with stored information. *Id*, 420-21.

services which include protocol conversion capabilities were concerned with competitive ramifications of any approach which would permit AT&T to commingle protocol processing with its basic facilities. These firms argued that it is unnecessary to permit commingling of protocol conversion capabilities with the facilities that support the provision of basic services, that protocol processing capabilities are and will remain available from a variety of sources (other than the provider of the underlying basic services) if the existing constraints are maintained, and that to permit any such commingling would be more detrimental to the overall goals of *Computer II* than any benefits which might thereby be achieved.

**5 12. And finally, the Department of Defense, as executive agent for the National Communications System [9] and for its own interests *590 as a user, argued that it is to the advantage of users for basic services to include all forms of code and protocol conversion, to allow a single service vendor to assume end-to-end responsibility.

C. *Discussion*:

13. As noted, upon review of the comments received in this proceeding and of pertinent comments filed during the course of *Computer II*, we conclude that a change is not warranted in the *Computer II* rules which address protocol processing. In this section we address those limited circumstances where clarification of the *Computer II* rules is desirable, and where flexibility may be desirable.

1. Network Processing

14. In the *Final Decision*, we defined 'protocols' as follows:

> Protocols govern the methods used for packaging the transmitted data in quanta, the rules for controlling the flow of information, and the format of headers and trailers surrounding the transmitted information and of separate control messages.

77 FCC2d at 420, n. 33. The definition of enhanced service includes, *inter alia*, 'processing applications that act on the . . . protocol of the subscriber's transmitted information.' On reconsideration, we clarified that the definition of enhanced service does not reach protocol conversions which are performed internally to a carrier's network, and not manifested at the outputs of the network in end-to-end transmission, 84 FCC2d at 60-61. However, there are forms of processing within such networks which might be thought of as cprocessing' or 'conversions' of protocols within the meaning of the definition of enhanced service, although they are not within the intent of the definition. For example, when the rules or tones corresponding to an MTS dialed number are used to route a call through the network, they are often changed in a variety of ways. The electrical signals (pulses or tones) corresponding to the dialed number might be thought of as part of the 'subscriber's transmitted information.' These signals, which represent the dialed number, are not explicitly transmitted to the dialed party when an MTS call is made. [10] Obviously, we did not intend to classify this form of action on subscribers' transmitted dialing (routing) information as enhanced as we stated that processing in the nature of 'functions necessary to route a message throught the network', 77 FCC2d at 418, may properly be associated with basic service. Similar examples of a potential but unintended reach of the literal rule were provided in connection with AT&T's 'control signals' proposal, (*e.g.*, tone-to- *591 pulse dialing signal conversions, and automatic identified dialing arrangements for PBXs), n. 6 above.

15. To reiterate the concept established in the *Final Decision*, a basic switched service may properly include those forms of protocol processing which are necessary for a switched service to be offered. Specifically, the network may accept and utilize premises equipment-generated signals which alert the network that the terminal is ready to generate or to receive a call (i.e., off hook-type signals), signals which tell the network the destination of the call (i.e., dialing-type signals), and signals which alert the network that a call has ended (i.e., on hook-type signals). This principle applies to entire calls made on a switched network (e.g., to MTS and WATS calls in telephony and to TWX and telex calls in telegraphy), and to individual messages which are, in essence, individual calls themselves (e.g., to packets in a packet-switched network). It should be emphasized that these network functions which are intrinsic to the provision of switched services do not involve the creation, deletion,

or modification of message information, nor subscriber interaction with stored information. They may properly be associated with basic service without changing its nature, or with an enhanced service without changing the classification of the latter as unregulated under Title II of the Act.

2. Transitional Introduction of Technology

**6 16. A second area warranting discussion concerns the introduction of new technology in basic service. Oftentimes, such technology is introduced piecemeal, and appropriate conversion equipment is used within the network to maintain compatibility. For example, digital transmission technology has for some time been used within the telephone network to support voice transmission, but the network interfaces to subscriber equipment have continued to be analog. Requisite analog-to-digital and digital-to-analog conversion equipment has been used within the network, but the internal digital signals have not been manifested at subscribers' loop interfaces. However, there is currently a trend towards the use of digital loops which will interface with customer premises equipment using a digital protocol interface. A potential problem might arise if a call were placed between a user of equipment which employs such a digital interface and a user using the more traditional analog interface (with appropriate conversion equipment employed within the network): there would be a net protocol conversion within the network for such a call to proceed, i.e., from a digital to an analog protocol between the ends of that call. This could be thought of as invoking the definition of enhanced service, although the service itself would remain a switched message service otherwise unchanged except for the characteristics of the electrical interface. to ensure that this potential result *592 does not create disincentives for introduction of new technology. Accordingly, in circumstances involving no change in an existing service, but merely a change in electrical interface characteristics to facilitate transitional introduction of new technology, we are prepared to act favorably and expeditiously on petitions for waiver of the *Computer II* rules to ensure that new technology to implement an existing service can and will be employed.

3. Other Forms of Protocol Conversion

18. Appropriate treatment of other forms of protocol conversion which carriers might seek to associate with basic service is less clear. In the *Notice*, we proposed to retain our *Computer II* treatment of protocol conversion as an enhanced service, but we raised the possibility that limitations on protocol conversion in the specific case of conversion to another protocol to facilitate interconnection of networks (*e.g.*, a conversion from X.25 to X.75 to facilitate interconnection of packet-switched networks) could result in undue inefficiency.[11] In light of this, we sought comment on whether protocol conversion to support interconnection between (and among) networks might be treated specially. A number of comments argue that any such conversions can be performed outside of carriers' basic service networks by unregulated service vendors offering a conversion service. As noted, conversions such as these are permitted internally in individual carriers' basic networks, but it is unclear whether in a multiple carrier (or combination of carrier and enhanced service vendor) service arrangement conversions such as these may be included in any common carrier basic network which may be involved, with the end result that there is no net protocol change between the ends of the basic common carrier service involved.

**7 19. In a packet-switched network, subscribers' information is collected into individual bursts (or 'packets') of information, to which routing information is attached at the source. The network utilizes the routing information on a packet by packet basis to route *593 the packets to the chosen destination. The allows packets to take different routes through the network. Delays and other operational difficulties may be encountered when two packet-switched networks are interconnected. For the X.25 protocol, packets may have to be resequenced at the point of interconnection, adding to overall transmission delay. One approach to avoiding this is use of a special interworking protocol, X.75, that has been recommended as a standard by the CCITT to facilitate the efficient interconnection of X.25 packet-switched networks. However, if an otherwise basic packet-switched network, receiving subscribers' signals under the standard X.25 subscriber interface protocol, were to use the X.75 protocol for an interworking interface with another network, there would be net protocol conversion of the subscribers' transmitted information (i.e., from the X.25 protocol to the X.75 protocol). This would be an enhanced service under Section 64.702(a). Conversion equipment outside of a carrier's network would appear incapable of avoiding these ineffiencies.