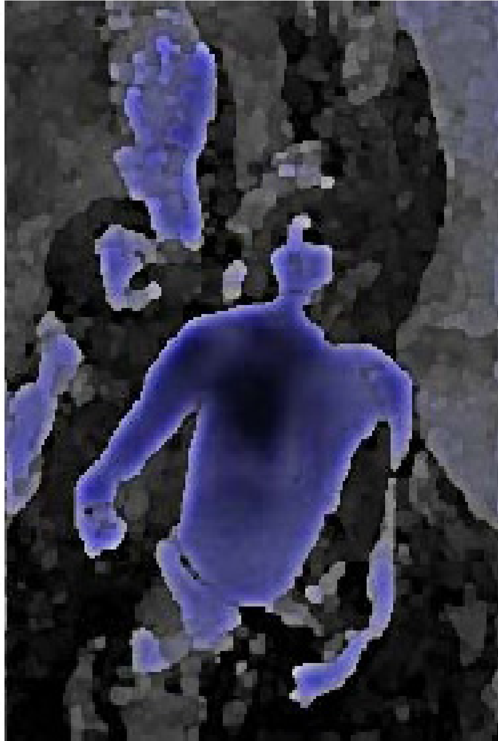

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Symposium

Broadband Reclassification and Net Neutrality

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The *Comcast* Decision and the Case for Reclassification and Re-Regulation of Broadband Internet Access as a Title II Telecommunications Service

Lee L. Selwyn
lselwyn@econtech.com

Helen E. Golding
hgolding@econtech.com

Economics and Technology, Inc.

In 2005, concurrent with its adoption of the order classifying broadband Internet access services provided by local incumbent telephone exchange carriers ("ILECs") as "information services" falling outside of its Title II[1] jurisdiction,[2] the Federal Communication Commission (FCC) adopted a set of four "net neutrality"[3] policy "principles" that were intended Ato safeguard and promote the open Internet."[4] Later that year, AT&T and Verizon made "voluntary commitments" to abide by those same "net neutrality" principles as conditions for FCC approval of the SBC/AT&T and Verizon/MCI mergers.[5] However, in each instance, the

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1 Title II refers to the section of the *Communications Act of 1934*, as amended, that applies to wireline (as distinguished from wireless) local and long distance telecommunications common carriers.

2 *In re Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, 20 FCC Rcd 14853 (2005) (hereinafter "*BWIA Order*").

3 The term "net neutrality" refers to a set of principles requiring that entities that furnish customers with access to the public Internet do so on a nondiscriminatory basis both with respect to price and service quality, that they remain agnostic with respect to the sources and type of content their customers seek to access.

4 *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities, Policy Statement,* 20 FCC Rcd 14986 (2005) (*"Internet Policy Statement"*).

5 *In re SBC Communications Inc. and AT&T Corp. Applications for Approval of Transfer of Control*, 20 FCC Rcd 18290 (2005). Appendix G, "Conditions"; *In re Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control*, 20 FCC Rcd 18433 (2005), Appendix F, "Conditions". In 2006 the FCC accepted a far more detailed and narrowly focused implementation of these principles as a condition for its approval of the AT&T/BellSouth

net neutrality conditions were only temporary, and the last of them expired at the end of June 2009, 30 months after the AT&T-BellSouth merger closing.

In 2009, the FCC initiated a *Net Neutrality Notice of Proposed Rulemaking* (NPRM)[6] with the objective of formalizing and expanding the scope of the *Internet Policy Statement*. The NPRM included two additional net neutrality principles focused upon nondiscrimination and transparency, and proposed that both the existing and additional principles be adopted as formal rules.[7] Because Internet access had previously been designated as an information service, the FCC relied upon its ancillary jurisdiction under section 4(i) of the *Communications Act of 1934*, as amended, as authority.[8] It had also relied upon this same claim of ancillary jurisdiction in a 2009 ruling requiring Comcast to discontinue certain "network management" practices, including, in particular, so-called "deep packet inspection," whose effect was to block its customers from using the Comcast service for "peer-to-peer"[9] file sharing.[10] Comcast appealed, and when in

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merger. *In the Matter of AT&T Inc. and BellSouth Corporation, Application for Transfer of Control*, 22 FCC Rcd 5662 (2007), Appendix F (Conditions).

6 *In re Preserving the Open Internet; Broadband Industry Practices*, 24 FCC Rcd 13064, 13066 (2009) ("*Net Neutrality Rulemaking*").

7 *Id.*

8 Section 4(I) authorizes the Commission to "perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions." 47 U.S.C. § 154(i).

9 Peer-to-peer ("P2P") is an arrangement under which Internet users communicate directly with each other rather than via an intermediary host. P2P file sharing can be accomplished by means of any of several file sharing protocols, enabling users to exchange content such as music, movies, video, or other large files, with one another. One such protocol is BitTorrent, which allows users to download large files quickly by downloading small fragments of a file from each of many different users that had previously downloaded some or all of the file. The entire process is managed, and the overall content reassembled from the individual file fragments, using client software. BitTorrent offers its own client although many other clients are available. Using this file sharing technology, a given amount of content can typically be downloaded far faster using the available bandwidth of many P2P network members than would be possible for a similar amount of content if obtained from a single server. The *quid pro quo* for the ability to obtain downloads though this process is that the user usually then makes his local copy of the entire file available for fragment downloads by other users of BitTorrent – i.e., he must permit other members to access his PC and to utilize his broadband connection – even when the user is not physically present, so that they will be able to download file fragments from him. It is this aspect of P2P file sharing that Comcast was attempting to address and to constrain.

April 2010 a federal appellate court reversed and vacated the FCC's action,[11] the legal foundation for the FCC's net neutrality enforcement suddenly collapsed. In its ruling, the court held that the FCC must be able to establish a direct nexus between the claimed ancillary jurisdiction and an activity over which actual jurisdiction exists, and that, with broadband Internet access having been classified as an information service, the required nexus did not exist.

In response, the FCC has now proposed to *reclassify* the transmission component of broadband Internet access as telecommunications subject to regulation under Title II. The proposed approach was first introduced informally by FCC Chairman Julius Genachowski and General Counsel Austin Schlick, in two memos that outlined a framework described as the "Third Way."[12] As envisioned therein, the Commission could restore Title II jurisdiction but leave intact much of its earlier deregulation of broadband Internet access by forbearing from the enforcement of substantial portions of Title II. A more developed version of this proposal is found in the Commission's *Notice of Inquiry on the Framework for Broadband Internet Service*,[13] which reexamines and questions the "information service" classification of broadband Internet access and the validity of earlier findings as to the purported inseparability of the transmission and information services components and whether the nature of Internet access services has changed since the "information services" designation was conferred.[14] The Commission then considers how it should approach re-regulation and forbearance, including which sections of

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[10] *In re Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* 23 FCC Rcd 13028 (2008)*, vacated and remanded*, *Comcast Corp. v. FCC*, 600 F.3d 642 (D.C. Cir. 2010).

[11] *Comcast v. FCC*, 600 F.3d 642 (2010).

[12] "The Third Way: A Narrowly Tailored Broadband Framework," Chairman Julius Genachowski, FCC, May 6, 2010 (http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-297944A1.pdf). The legal analysis supporting the Chairman's proposal was laid out in an accompanying statement by the FCC's General Counsel, "Third-Way Legal Framework for Addressing the Comcast Dilemma," Austin Schlick, General Counsel, May 6, 2010 (http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-297945A1.pdf).

[13] *In the Matter of Framework for Broadband Internet Service*, GN Docket No. 10-127, *Notice of Inquiry*, released June 17, 2010.

[14] *Id.*, at paras. 53-57.

Title II it has the legal authority to forbear from enforcing, as well as which sections are necessary to achieve its various objectives.[15]

In this article, we address some of the key issues that relate to Internet access classification and regulation. At the retail level, broadband Internet access is offered as a bundle of both telecommunications transport *and* various applications and content available over the public Internet. We conclude that the FCC has a strong basis for classifying the telecommunications elements of broadband Internet access as telecommunications, and for requiring that these be made available on a common carrier basis, subject to Title II. However, we disagree with the FCC's tentative conclusion that creating the conditions for a competitive and "neutral" Internet can best be accomplished with only a skeletal regulatory framework for broadband Internet access. Title II common carrier regulation should be used to create a structural solution for preventing market dominance by facilities-based Internet access providers. By breaking up the Internet access bottlenecks controlled today by ILECs and the cable industry, the FCC will create the conditions that make it difficult, if not impossible, for Internet access providers to violate its net neutrality principles, and will thus not need to engage in the highly regulatory, hands-on supervision of provider network management practices that its purportedly less regulatory approach would require.

In the accompanying article, Glenn Manishin argues generally that "Net Neutrality rules and broadband 'third way' reclassification are unnecessary and unlawful," suggesting that the Internet differs so fundamentally from traditional telecommunications as to render the regulatory model that has traditionally been applied to common carrier telecommunications somehow inapposite in the IP context. He further suggests that the FCC lacks the legal authority to reclassify such services as telecommunications subject to Title II as a means for overcoming the *Comcast* court's rejection of the FCC's reliance upon its "ancillary authority" as a means for imposing net neutrality requirements upon Internet service providers. While we shall leave others to debate the merits of Manishin's legal analysis, we do take issue with the factual predicates upon which that analysis is based.

I. Classification of Internet access as a telecommunications service

The FCC's first occasion to opine specifically about the classification of Internet access arose somewhat tangentially, in the context of the Federal-State Joint Board on Universal Service Report to Congress (the so-called *Stevens Report*).[16] The primary question before the FCC in that context was whether to classify Internet Service Providers ("ISPs") as providers of

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[15] The FCC tentatively concludes that it can accomplish these objectives as to broadband Internet access services by forbearing from all Title II provisions other than those contained in Sections 201 and 202, 208 and 254, and possibly 222 and 255. *Id.* at para. 68.

[16] *In the Matter of Federal-State Joint Board on Universal Service, Report to Congress* ("Stevens Report"), 13 FCC Rcd 11501 (1998).

telecommunications services, subject to assessment under the federal Universal Service Fund.[17] In that *Report*, the FCC expressed the view that ISPs were furnishing *information*, and not telecommunications, services.[18] The Commission went on to conclude that under the *1996 Act* "telecommunications services" and "information services" were mutually exclusive categories, so that a particular service must be one or the other.[19]

However, the major ISPs extant at the time of the *Stevens Report*[20] were distinctly different from today's principal providers of broadband Internet access (incumbent LECs and cable providers) in two major respects. First, according to the FCC,

> In essential aspect, Internet access providers look like other enhanced -- or information -- service providers. Internet access providers, typically, own no telecommunications facilities. Rather, in order to provide those components of Internet access services that involve information transport, they lease lines, and otherwise acquire telecommunications, from telecommunications providers -- interexchange carriers, incumbent local exchange carriers, competitive local exchange carriers, and others.[21]

Second, in addition to redirecting end users to the public Internet, these ISPs typically continued the traditional "information services provider" role of offering end users enhanced

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17 *Id.,* at note 1. With respect to USF funding, the Commission noted that when ISPs purchased telecommunications as a input to their services, they were already contributing (albeit indirectly) to universal service support. *Id.* at para. 55.

18 As Kevin Werbach has observed, "The issue before the Commission in these early decisions was whether an information service provider could be found to engage in telecommunications; the issue was not whether telecommunications service providers could be classified as offering information services. Although the possibility existed that incumbent operators could switch to Internet-protocol-based transmission, the FCC did not consider this possibility a serious threat to the regulatory structure. K. Werbach, "Off the Hook," 95 Cornell L. Rev. 535, 543 (2010).

19 The FCC further noted that this distinction was consistent with the framework established in *Computer Inquiry II* and subsequently incorporated into the terms of the court-supervised consent decree that ended the decades-old antitrust proceeding against AT&T. *Stevens Report* at 11520.

20 *Id.* at 11531 ("Major Internet access providers include America Online, AT&T WorldNet, Netcom, Earthlink, and the Microsoft Network.")

21 *Id.* at 11540.

functionalities on their host computers.[22] As such, as the Commission specifically acknowledged, their classification as information services providers was largely consistent with the FCC's decades-old *Second Computer Inquiry* ("*CI2*") framework, which was reflected in the *1996 Telecommunications Act*'s distinction between "telecommunications" and "information" services.[23] While the Commission acknowledged that Internet access services could also be offered as information services by providers that used their own telecommunications facilities, it continued to require that such companies offer, on a common carrier basis, the underlying telecommunications necessary for competitors to provide Internet access.[24]

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[22] The description at paragraph 76 (*id.* at 11537), stating that "Internet access providers typically provide their subscribers with the ability to run a variety of applications, including World Wide Web browsers, FTP clients, Usenet newsreaders, electronic mail clients, Telnet applications, and others" has much more in common with earlier ISPs than with the Internet access services currently offered by ILEC and cable companies over their last-mile transmission facilities. The service being offered today by (telco and cableco) broadband Internet access providers consists principally of sending packets from the end user's PC to the public Internet (and back); this is not an information service, it's a telecommunications service. The service of providing online applications, databases, etc. from one's own servers to end users is an information service, not a telecommunications service. Sometimes providers of Internet access telecommunications services will include access to a limited collection of information services as part of the service package, but such bundling does not alter the fundamental nature of Internet access as telecommunications. The bundled "information services" are often perceived by users as a "freebie" or a throw-away, and are often ignored by users in favor of substitute services available from other information service providers, such as Google, Yahoo, MSN, Facebook, YouTube, etc. which also can be accessed for free. What customers are really trying to buy is access to the Internet, not access to Verizon's *FiOS* homepage portal. Thus, for example, Verizon *FiOS* high-speed Internet access is a telecommunications service, while Google Search, or Yahoo! Finance are information services.

[23] *Id.* at 11540.

[24] *Id.* at 11546 ("As long as the underlying market for provision of transmission facilities is competitive or is subject to sufficient pro-competitive safeguards, we see no need to regulate the enhanced functionalities that can be built on top of those facilities. [...] *Limiting carrier regulation to those companies that provide the underlying transport ensures that regulation is minimized and is targeted to markets where full competition has not emerged.* As an empirical matter, the level of competition, innovation, investment, and growth in the enhanced services industry over the past two decades provides a strong endorsement for such an approach.") (emphasis added). Similarly, with respect to the collection of USF, the FCC stated both Athat the provision of transmission capacity to Internet access providers and Internet backbone providers is appropriately viewed as Atelecommunications service" or "telecommunications" rather than

In its 2002 *Cable Modem Order*, the FCC made its first concrete application of this earlier classification analysis. Relying directly upon the *Stevens Report*, it ruled that cable companies' "Internet access service is appropriately classified as an information service, because the provider offers a single, integrated service, Internet access, to the subscriber."[25] In *Brand X v. FCC*, the Supreme Court affirmed the FCC's decision, largely in deference to agency expertise.[26] In his dissent, Justice Scalia objected to the circuitous reasoning by which the FCC had concluded that the telecommunications (or "basic" transmission) component of cable modem service was not being "offered" as a telecommunications service.[27] Not long after the release of the *Brand X* decision, the Commission extended the "information service" classification to ILEC-provided broadband Internet access, thus removing these services from Title II regulation.[28] Although the *Comcast* decision provided the impetus for reexamining this classification decision, it is not unreasonable that the Commission, for the reasons articulated by Justice Scalia, would harbor lingering doubts about its original analysis.[29]

"information service," and that the provision of such transmission should also generate contribution to universal service support mechanisms. *Id.* at 11508.

[25] *In re Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities*; *Internet Over Cable Declaratory Ruling*, 17 FCC Rcd 4798, 4821 (2002) (hereinafter, "*Cable Modem Declaratory Ruling*"), aff'd sub nom *FCC v. Brand X Internet Services*, 545 U.S. 967, 5 S. Ct. 2688 (2005) ("*Brand X*").

[26] *Brand X* , 545 U.S. 967, 989-990.

[27] *Id.* at 1009.

[28] The FCC subsequently applied this classification to broadband Internet access offered over other transmission platforms, including electric power lines and wireless systems. *United Power Line Council's Petition for Declaratory Ruling Regarding the Classification of Broadband Over Power Line Internet Access Service as an Information Service*, 21 FCC Rcd 13281 (2006); *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, 22 FCC Rcd 5901 (2007).

[29] The FCC's determinations with respect to classification and mandated wholesale access to Internet access facilities stands in stark contrast to the regulatory framework adopted by the federal regulator in Canada, the Canadian Radio-television and Telecommunications Commission (CRTC) The CRTC requires ILECs to make their high-speed access services available to competitors at speeds that match all of the speed options the ILECs offer their retail Internet service customers, a policy known as "speed matching." In Canada, the speed matching requirement also applies to the high-speed Internet access facilities of "cable carriers." In December 2009, the Canadian Government directed the CRTC to review its speed matching requirements in light of current market conditions and the objective of ensuring regulatory symmetry in the treatment of ILECs and cable carriers. *Order in Council P.C. 2009-2007*, 10 December 2009. After examining current evidence, the CRTC affirmed

While incumbent LECs and cable providers have decried the FCC's proposed reclassification of Internet access as being a legally impermissible departure from Commission precedent, the line of decisions upon which they rely comes from a very narrow time frame in the Commission's long history of separating basic transmission from enhanced/information services, dating back to the 1980 *Computer Inquiry II* decision ("CI2").[30] As defined in *CI2*,

> basic service is limited to the common carrier offering of transmission capacity for the movement of information, whereas enhanced service combines basic service with computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information, or provide the subscriber additional, different, or restructured information, or involve subscriber interaction with stored information.

Although *CI2* articulated a relatively "bright line" between basic and enhanced services, a service could be classified as "basic" telecommunications notwithstanding its use of some nominal computer processing functionalities that were deemed "ancillary" to the basic service.[31]

The dichotomy between "telecommunications" and "information services" contained in the 1996 *Telecommunications Act* is a direct reflection of the rules adopted by the FCC in its1980 *CI2* order. Until 2002 – that is, for the first 22 of the 30 years that *CI2* rules have been in place – the FCC succeeded in applying this framework to the continuously evolving telecommunications network. As Justice Scalia recognized, it took some fancy footwork for the FCC to sidestep the longstanding *CI2*/*Telecommunications Act* dichotomy between basic telecommunications and enhanced/information services when it found that there was no distinct telecommunications service component being offered in connection with cable company and ILEC broadband Internet access services.[32]

Incumbent providers have also argued that because "nothing has changed" since the FCC modified its legal stance with regard to broadband Internet access, a subsequent

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and broadened the requirements for competitor access to ILEC and cable company high-speed access facilities for the purposes of supporting retail competition for Internet access services. *In re Wholesale high-speed access services proceeding*, Telecom Regulatory Policy CRTC 2010-632, Ottawa, 30 August, 2010.

[30] *Computer Inquiry II*, *Amendment of Section 64.702 of the Commission's Rules and Regulations, Final Decision,* 77 FCC 2d 384 (1980) ("*CI2*"), recon. 84 FCC 2d 50 (1980), further recon., 88 FCC 2d 512 (1981), aff'd sub nom. *Computer and Communications Industry Ass'n v. FCC,* 693 F.2d 198 (D.C. Cir. 1982), *cert. denied*, 461 U.S. 938 (1983).

[31] *CI2,* 77 FCC 2d at 421. See also n. 35 and n. 40, *infra*.

[32] *Brand X* at 1010-11.

modification of those policies would be impermissible as a legal matter.[33] As noted above, Manishin advances a similar theory, arguing, *inter alia*, that "the precedents the FCC set in the infancy of the Internet are still the law."[34] Regardless of whether this correctly states the underlying legal rule (a matter we leave for others to debate), there is ample basis for taking a fresh look at the facts underlying the FCC's classification decision.

In the earliest (pre-Internet) days of so-called "online" information services – such as Compuserve, Prodigy, and America Online, and even specialized online services such as Lexis/Nexis and the airline industry's SABRE system – the information accessed was physically furnished by means of what were then referred to as '"enhanced service provider"' ("ESP") host computers.[35] Using a dial-up telephone connection, the subscriber sent data (typically via

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[33] See, e.g., April 28, 2010 *ex parte* letter from Seth P. Waxman, Counsel for the United States Telecom Association (USTA), to Julius Genachowski, Chairman, FCC, GN Docket No. 09-191 *et al.*

[34] Glenn B. Manishin, "Why Net Neutrality Rules and Broadband "Third Way" Reclassification Are Unnecessary and Unlawful," also appearing in this issue of *Icarus*, Fall 2010 ("Manishin"), at 42. There he suggests that "[s]o long as we have the present *Communications Act* codification of *Computer II*, ... the responsibility for revising or updating the regulatory treatment of broadband is one for Congress, not the Commission." But there is nothing in *Computer II* that in any way designates *broadband* as an "information service" *per se*. Indeed, as we discuss below, both *Computer II* as well as the *1996 Act* distinguish between basic transmission and those enhanced services that utilize basic transmission, requiring "facilities-based common carriers to provide the basic transmission services underlying their enhanced services on a nondiscriminatory basis pursuant to tariffs governed by Title II of the Act," such that they "offered the underlying basic service at the same prices, terms, and conditions, to all enhanced service providers, including their own enhanced services operations." *Computer Inquiry II*, at 474-75. The *1996 Act* made no change in this core requirement. 47 U.S.C. § 251(g). Indeed, the core principle of *Computer II* – that enhanced services did not require Title II common carrier regulation – was directly premised upon the expectation that the underlying basic services would be available to competing providers of such enhanced services. There is no technical basis for singling out broadband or IP telecommunications to *not* receive this same *Computer II/TA96* treatment.

[35] The term "enhanced service provider" has its origins in *Computer Inquiry II* , supra, and was used to generically describe pre-Internet online service providers, such as Telenet, Tymnet, and GE Information Services in the 1980s, and subsequently providers such as Compuserve and Prodigy. In the *1996 Act*, the term "information services" was substituted for such "enhanced services." See, In Re Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, as amended, 11 FCC Rcd 21905, 21956 (1996). While the use of the acronym "ISP" today is generally used to denote *Internet* Service Providers, in the period immediately following the *1996 Act*, "ISP" was understood

keystrokes) to the service provider, and the service provider acted upon that data and sent information back to the subscriber. Eventually, some of these service providers were able to expand the applications and content offered to users by adding information products developed by third parties, some of which did not reside on the service provider's own platform; however, the selection and management of these third party applications or content sources continued to be within the control of the ISP.

The public Internet has changed all of this. When the FCC first opined that Internet access services were "information services" in its 1998 *Stevens Report,* the most prominent providers of Internet connections were not telecommunications common carriers. They were in many cases the companies that had previously offered non-Internet enhanced services. Now known as Internet Service Providers (ISPs), these firms initially had offered Internet access in connection with content and applications (often the same information services that they had been providing in the pre-Internet era) that resided on their proprietary host computers. The connections between the ISP's end user customers and the ISP's Internet access platform were accomplished by means of dial-up and dedicated telecommunications services that the customer and the ISP purchased separately from regulated telecommunications common carriers. Today, rather than maintain and provide applications and content on their own computing platforms, Internet service providers (and especially providers that offer Internet access over their own local distribution facilities) act primarily, if not exclusively, as conduits, forwarding and transmitting their subscribers' data to one or more Internet gateways or "peering points" from where the data stream would be routed to the designated website or other locations anywhere in the worldwide Internet "cloud." If the ISP also offer its own proprietary "information services," these are typically accessed and provided over the Internet as well.[36]

The nature of Internet services has also changed from the customer's perspective. Rather than interacting by default with the ISP's e-mail or web-browsing capabilities, the customer must affirmatively choose whether to utilize his own ISP's information services or the equivalent (and often preferred) services that are available from independent providers. For example, a growing number of customers are electing increasingly to utilize ISP-independent sources of e-mail services (such as Google's "Gmail" service), which has the advantage of allowing them to change ISPs without also having to change their e-mail addresses. And, while most ISPs offer their subscribers content-rich home pages as "portals" to news, sports, weather, financial data, sometimes maintained by the ISP but often by other sources, Internet users have

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as referring to "Information Service Providers" generally. See *In re Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Transport Rate Structure and Pricing End User Common Line Charges,* 12 FCC Rcd 159 82, 16003 (1997); see also, *In re In the Matter of Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Transport Rate Structure and Pricing Usage of the Public Switched Network by Information Service and Internet Access Providers,* 11 FCC Rcd 21354, 21491-92 (1996).

[36] An exception to this model may be AOL, which has traditionally maintained several proprietary data centers through which its subscribers gain access to various information/content on AOL's own platform or are sent on to any Internet site.

access to and frequently prefer to make use of popular non-ISP portals, such as yahoo.com and google.com, or any number of specialized or special interest portals (such as those maintained by local newspapers, TV networks, and other organizations). By the same token, anyone can access the ISP's portal (such as comcast.net and verizon.net) without having to also be a customer of that ISP. Most Internet users, most of the time, are visiting websites that are neither supported nor maintained by their own ISP. Today few, if any, users actually select one ISP over another (e.g., Verizon over Comcast) based upon the selected providers' proprietary portal or other proprietary "information services." In essence, such "content" as the Internet access incumbents may offer to their access subscribers amounts to little more than a "throw-away." Thus, whereas the crux of what customers had in the past sought to obtain from a traditional information service provider was information (content or applications), today's Internet access customer is really purchasing telecommunications access into the Internet "cloud."[37]

Another thread in the FCC's original classification analysis involves its misunderstanding of Domain Name Services (DNS). DNS translates web addresses (e.g., www.anything.com) into IP addresses (e.g., 123.234.345.456) for routing over the Internet.[38] The analysis that the FCC used to arrive at the conclusion that DNS is an information service function is completely inconsistent with its treatment of other telecommunications routing functions. DNS provides a routing function that is in every material sense analogous to numerous database-supported routing arrangements that operate within the traditional public switched telephone network (PSTN) and that have never been viewed as transforming a "basic" service into something else.[39] Examples include 800 Database Service, which performs translations of dialed toll-free numbers into physical PSTN or special access addresses; Local Number Portability (LNP), which redirects dialed calls to the appropriate terminating carrier and central office switch, and

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[37] In the words of Justice Scalia, "It happens that cable-modem service is popular precisely because of the high-speed access it provides, and that, once connected with the Internet, cable-modem subscribers often use Internet applications and functions from providers other than the cable company." *Brand X, supra*, at 1005.

[38] A master DNS database is maintained by the Internet Corporation for Assigned Names and Numbers ("ICANN") and is replicated at multiple locations throughout the global Internet. Individual access providers typically maintain their own DNS, updating it continuously as new or changed domain name registrations are propagated across the Internet by ICANN and certified domain name registrars.

[39] *See*, *In re Communications Protocols under Section 64.702 of the Commission's Rules and Regulations*, 95 FCC 2d 584, 596 (1983) ("*Communications Protocols*") ("Clarification is warranted that protocol processing involved in the initiation, routing and termination of calls (or subelements of calls, e.g., packets) is inherent in switched transmission and is not within the definition of enhanced service, and we have done so herein. See, para. 15, supra. Such protocol processing or conversion may be associated either with basic or enhanced service without affecting the classification of such service under Section 64.702(a) of our rules.")

customized toll-free routing arrangements that provide dynamic routing based upon the identity or geographic location of the caller and/or traffic conditions at particular call centers. If any of these database and translation functions involve a process that is "more than" basic telecommunications, they are far more fairly characterized as "ancillary" to the telecommunications than as "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."[40] In any event, the FCC has consistently treated all of these other database and translation functions, which are completely analogous to the functions performed by DNS, as part of Title II telecommunications services – and indeed the provision of number portability is expressly required of all local telecommunications carriers by the 1996 Act.[41]

Nor is it consistent with FCC precedent that Internet access be classified as an information service as a result of the various "translations" or "conversions" required for Internet Protocol ("IP") transmissions to coexist with transmissions via the circuit-switched PSTN. While the Commission expected that its basic/enhanced distinction was sufficiently robust as to survive even "[a]s the market applications of computer technology increase," it also recognized that "[t]ransmission networks have benefitted from some of the productive breakthroughs which this relatively new field has made possible."[42] As such, the Commission determined that its basic/enhanced distinction "allows the provider of these basic services to integrate technological advances conducive to the more efficient transmission of information through the network without the threat of a sudden, fundamental change in the regulatory treatment of that service or firm."[43] In a 1983 ruling, the FCC expressly recognized that such evolutionary transition to new transport technology could even involve some sort of format, code or protocol conversion – e.g., between the legacy and the new technology – and that in such cases the mere presence of a purely mechanical, passive format, code or protocol conversion would not in and of itself transform a "basic" into an "enhanced" service.[44]

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[40] *See*, 47 C.F.R. § 64.702(a) (definition of enhanced service); see also, 47 U.S.C. 153 (41).

[41] 47 U.S.C. § 251(b).

[42] *Computer Inquiry II*, at 422.

[43] *Id.*, at 423.

[44] *See*, *Communications Protocols*, 95 FCC 2d 584, 588 (1983) ("we conclude that the provisions of Section 64.702(a) should be applied in a flexible manner so as to ensure that the transitional introduction of new technology in basic services is not inhibited" (*id.*); "[a] literal application of the definition of enhanced service could have the effect of limiting the ability of carriers to introduce new technology in existing basic services during a transitional period when a new protocol is employed on some lines, but not others, and calls are desired to be made between both types of lines." (*id.* at 596).

Over time, there have been numerous examples of service arrangements involving such "passive" conversions that do not alter their "basic" character. Among these are (1) analog-to-digital conversion, as from an electromechanical or analog electronic space-division central office switch to a time-division multiplexed digital switch, or from an analog voice wireline handset to a digital voice wireless handset, and (2) analog-to-digital wireless conversions as well as conversions among different wireless digital protocols, e.g., TDMA, CDMA, GSM. As discussed above, the same type of passive conversion occurs when computer processing is used to retrieve routing information from a data base, as with 800 Database Service and Local Number Portability databases. The use of Internet Protocol to effect the transmission of voice and data is entirely analogous, and should properly fall into this same category.

In today's Internet access service, the presence of routing functions such as DNS and the offering of information that the end user neither pays for not values are not sufficient to transform what is fundamentally nothing more than pure telecommunications into a *bona fide* information service. The framework adopted by the FCC in *CI2* and carried forward into the 1996 *Telecommunications Act* was expressly intended to prevent common carriers from contaminating telecommunications services with incidental computer processing functions as a device for preventing competitors from making efficient use of the underlying telecommunications capability. By correctly classifying Internet access as a telecommunications service, the FCC will restore the conditions necessary for the reinvigoration of a competitive information services market.

Assuming that the FCC decides to reclassify Internet access as telecommunications – as it should – several key (and related) questions still remain: (1) What type of regulatory structure will ensure that the Commission's six net neutrality principles can be implemented and enforced; (2) which sections of Title II can the FCC forbear from enforcing, consistent with its statutory mandate (including the specific directives of Section 10); and (3) can net neutrality be achieved in a manner that also facilitates other pro-competitive public interest goals? The approach that the FCC appears to favor restores jurisdiction primarily for the purpose of permitting the FCC to respond, after the fact, to specific instances of unjust rates or undue discrimination with respect to Internet access and perhaps also to ensure that IP services participate equitably in the support of universal service. While the FCC intends for this approach to minimize regulation, the requirement for specific ongoing enforcement may well turn out to be anything but a "hands-off" approach.

Beyond the requirement for continual monitoring and enforcement, the FCC's approach also does nothing to overcome the ILEC and cable duopoly for broadband Internet access. As the United States Department of Justice recently advised the FCC in comments regarding the National Broadband Plan:

> We do not find it especially helpful to define some abstract notion of whether or not broadband markets are "competitive." Such a dichotomy makes little sense in the presence of large economies of scale, which preclude having many small suppliers and thus often lead to oligopolistic market structures. ...

Under these conditions, the two owners of the physical broadband access paths for reaching the Internet have both the opportunity and the incentive to leverage their market power with respect to last-mile Internet access connections to impede competition in both upstream (Internet backbone networks) and downstream (application and content) markets. The market power that ILECs and the cable companies presently have with respect to Internet access differs very little from that which large ILECs possessed with respect to information services and customer premises equipment prior to the implementation of the structural framework of *CI2* or that the Bell operating companies possessed with respect to long distance before the FCC and federal court put into place a structural framework that ensured equal access by competitive IXCs.

Manishin nevertheless summarily dismisses such concerns, "because the business economics of broadband access are in conflict with the assumption by net neutrality proponents that the local wired distribution duopoly gives operators an incentive to discriminate."[45] Yet the concern here – the potential for vertical foreclosure – is certainly neither theoretical nor far-fetched. Prior to the consent decree with the US Department of Justice that broke up the former Bell System in 1984,[46] local Bell telcos afforded highly preferential treatment to their own and their affiliate's long distance service. Customers of competing long distance carriers were forced to dial as many as 35 digits rather than 11 to place a long distance call. Physical interconnection arrangements available to competing carriers were distinctly inferior, and no access at all was provided to important signaling protocols. The denial of access to one of these, answer supervision, undermined rival carriers' ability to accurately time and bill calls to their customers. Meaningful long distance competition did not become a reality until the structural separation of the local and long distance businesses made local telcos indifferent as to their customers' choice of long distance carrier, thereby eliminating any business purpose in the local telcos' maintaining these and other discriminatory practices. When the 1996 *Telecommunications Act* allowed the divested Bell companies to reenter long distance (upon satisfying certain requirements intended to facilitate competition at the local service level), and the FCC went on to permit them to bundle their local and long distance services into a single flat-rate package, stand-alone long distance competition all but disappeared. Similarly, the intense competition that had developed for dial-up Internet access – where the underlying (dial-up) telephone service was purchased by the end user separately from the purchase from an ISP of Internet connectivity – was all but eviscerated once the ILECs and cable companies were able to bundle last-mile broadband transport with ongoing Internet access and in so doing tie last-mile transport with Internet access. And with respect to bundled Internet access services, a 2005 statement by a BellSouth executive as reported in the *Washington Post* makes the ILECs' intentions abundantly clear:

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45 Manishin, at 45.

46 *United States v. American Tel. & Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd sub nom. Maryland v. United States,* 460 U.S. 1001 (1983).

> A senior telecommunications executive said yesterday that Internet service providers should be allowed to strike deals to give certain Web sites or services priority in reaching computer users, a controversial system that would significantly change how the Internet operates.
>
> William L. Smith, chief technology officer for Atlanta-based BellSouth Corp., told reporters and analysts that an Internet service provider such as his firm should be able, for example, to charge Yahoo Inc. for the opportunity to have its search site load faster than that of Google Inc. Or, Smith said, his company should be allowed to charge a rival voice-over-Internet firm so that its service can operate with the same quality as BellSouth's offering. Network operators can identify the digital "packets" of content moving through their wires from sites and services and can block some or put others at the head of the stream.
>
> But Smith was quick to say that Internet service providers should not be able to block or discriminate against Web content or services by degrading their performance. Rather, he said, a pay-for-performance marketplace should be allowed to develop on top of a baseline service level that all content providers would enjoy.[47]

Some, including Manishin,[48] have suggested that the presence in the broadband access market of both the incumbent local telephone company *and* the incumbent cable company operates to minimize the potential for vertical foreclosure by either incumbent in the

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[47] "Executive Wants to Charge for Web Speed; Some Say Small Firms Could Be Shut Out of Market Championed by BellSouth Officer," Jonathan Krim, *Washington Post*, December 1, 2005. This, of course, raises the issue of "paid prioritization, a matter of considerable debate a discussion of which goes well beyond the scope of this article. Manishin addresses this issue briefly, and correctly observes that "wealthy content providers can and do buy preferred access via hosting, caching, edge networking, etc." and that "ISPs vary widely in bandwidth and downstream speed, as do backbone transport and peering providers." Manishin, at 51. But that is not what "paid prioritization" in the net neutrality context means. As the comment by the BellSouth executive suggests, ILECs and cable companies want the ability to charge application and content providers for priority access to the ILEC and cable end user "eyeball" customers, notwithstanding the amount of bandwidth to which each such customer may subscribe. It is this type of "paid prioritization" that creates the slippery slope leading to potential discriminatory and anticompetitive conduct, *particularly if the last-mile broadband provider is itself competing with nonaffiliated content and application providers in downstream markets*.

[48] Manishin, at 45. While claiming that, "[a]s a factual matter, ... the business incentives of broadband ISPs are qualitatively different from those predicted by the bottleneck monopoly theory against vertical integration," he nevertheless advances no "facts" or economic theory in support of this contention.

downstream content and application market, due to the compelling need for each to seek to capture share from the other. Market performance does not, however, bear this out. Apart from superficial price competition focused almost exclusively upon up-front "buy-in" promotions, there has been little if any downward movement with respect to the basic price point for either of these incumbents' most heavily marketed offering, the "triple-play" bundle consisting of video, phone and Internet access.[49]

Indeed, serious price competition between the incumbent telco and the incumbent cableco is extremely unlikely, in view of significant differences in their respective cost structures. The major multi-system cable operators (MSOs) began and largely completed upgrading their video distribution infrastructure to digital, and then created a digital uplink capability in order to provide two-way cable modem Internet access, both more than a decade ago. As a result, MSOs like Comcast, Cox and TimeWarner are now able to overbuild the ILECs' voice telephone service infrastructure using digital Voice over Internet Protocol (VoIP) technology at a far lower incremental investment than that which confronts the local telcos in overbuilding cable's video and Internet access networks.[50] Considering that it is the telco that has the considerably smaller

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[49] Indeed, these promotions may well be aimed more at encouraging customers not currently taking a triple-play package from anyone to migrate to such an offering rather than being offered solely as a competitive reaction to the other duopolist's pricing. Verizon, for example, offers an entry triple-play price set initially at $89.99 for phone, *FiOS* video and *FiOS* Internet, under a package that includes a "free" multi-room Digital Video Recorder (DVR) for the first six months. After six months, the DVR is no longer "free," and so the monthly rate escalates by $19.99 to $109.98. After twelve months, the monthly rate jumps up to $129.99 plus the $19.99 for the DVR, or $149.98 in all. Additional charges apply for premium channels, such as movies and HBO. Similarly, Comcast offers several packages with initial prices ranging from $99.99 to $159.99, escalating in two annual adjustments such that after 24 months the price points fall between $129.99 and $199.99. Comcast includes more premium video channels in its packages, such that a direct apples-to-apples comparison between the two, to the extent a precise comparison is even possible, would bring Verizon's total package prices higher than those identified here.

[50] In an August 27, 2009 *ex parte* submission by Verizon in the FCC's *National Broadband Plan* proceeding, GN Docket No. 09-51, Verizon indicated that it had set a 2010 target capex for *FiOS* construction at $700 per home passed and $650 per home connected. By the end of 2010 *FiOS* will pass 18-million homes. However, FiOS TV connections are running at around 3-million, with FiOS internet at about a half million more. Assuming a 20% "take rate" and based upon the 2010 "target" capex levels, Verizon's investment per home connected is around $4,150 ($700/0.20 + $650), and that does not include any non-capitalized costs of acquisition. But that estimate may be on the low side. By the end of 2010 Verizon will have invested some $23-billion in *FiOS*. "Verizon to End Roll-out of FiOS," *The Wall Street Journal*, March 30, 2010. If we divide the $23-billion by the 3-million actual *FiOS* triple-play customers, that works out to more than $7,000 per connected home.

share of the consumer video/Internet market, any attempt by the telco to reduce its price in an effort to gain share could be easily countered by a comparable or greater price drop by cable, resulting in little or no net telco share gain but at a potentially large revenue loss. In a head-to-head price war, cable would ultimately prevail, a reality that would certainly blunt any incentive on the part of the telco to initiate a serious downward price spiral.

The prospects for serious content competition by facilities-based ISPs are also limited – at least as to such competition as could occur without endangering the independence and viability of stand-alone content and application providers. As discussed earlier, today's large ISPs do not originate any significant amount of content or applications, and such content or applications as they do create have little if any influence upon the end user's selection of his or her Internet access provider. The rich diversity of content and applications available over the Internet results from the competition that exists among providers that are independent of telcos and cable companies and (at least so far) those providers have benefitted from having their content be accessible by any "eyeball" using any ISP, on a nondiscriminatory basis. For content-based competition among ISPs to arise, each ISP would have to present a meaningfully differentiated content repertoire, which would require that the ISP establish an exclusive, or at least some sort of preferential, relationship with one or more content/application providers. What is certainly less clear is why a content provider with sufficient market presence to matter would see any benefit in entering into such a relationship.

A more immediate concern, however, is that with the number of broadband ISPs limited to just two in most geographic areas, the two incumbents would be capable of imposing monopoly rents in the form of access fees or charges for prioritization of Internet traffic upon application and content providers, each one acting as a gatekeeper – or more accurately, a toll booth – between those providers and the ISPs' end user "eyeballs." As former SBC/AT&T CEO Ed Whitacre put it several years ago,

> How do you think they're going to get to customers? Through a broadband pipe. Cable companies have them. We have them. Now what they [the application and content providers] would like to do is use my pipes free, but I ain't going to let them do that because we have spent the capital and we have to have a return on it. So there's going to have to be some mechanism for these people who use these pipes to pay for the portion they're using.[51]

The potential imposition of such charges or transmission restrictions upon content providers is, of course, a central theme in the current net neutrality debate. The FCC has proposed regulations aimed at precluding such tactics. As we discuss in Section III below, an alternative, and far less regulatory, approach is to adopt measures aimed at increasing the number of retail broadband Internet access competitors such that no one of them would possess

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[51] "At SBC, It's All About 'Scale and Scope' – CEO Edward Whitacre talks about the AT&T Wireless acquisition and how he's moving to keep abreast of cable competitors," *Business Week*, November 7, 2005.

market power sufficient to permit the imposition of such fees or other restrictive measures upon downstream application and content providers.

II. A Structural Approach to Reclassification and Forbearance

Under FCC Chairman Genachowski's "Third Way" proposal, the Commission would, and correctly, "[r]ecognize the transmission component of broadband access service – and only this component – as a telecommunications service"[52] and would not, as had the earlier *BWIA* ruling[53] that this proposal seeks to modify, continue to view broadband Internet access as an *integrated* information service not subject to any common carrier regulation. While the Chairman makes clear that reclassification would be confined solely to that portion of broadband Internet access that is unambiguously telecommunications, much of the push-back against any FCC involvement in net neutrality appears to have, perhaps deliberately, missed it, choosing instead to portray the limited reclassification plan as one that amounts to "regulation of the entire Internet." Manishin correctly notes that this perception is an exaggeration.[54] Yet, notwithstanding his fundamentally correct observation that "the data pipes used by Internet transport providers have for years been treated as classic Title II telecom services, purchased from common carriers and bundled by Tier 1 backbone network operators as an 'information service,'" Manishin's own challenge to "Third Way" reclassification also seems to focus upon the *integrated* service rather than just the underlying telecommunications,[55] Reclassification and *unbundling* of the telecommunications portion of Internet access as a Title II service subject to *Computer II* treatment likely overcomes many, if not all, of the legal hurdles that Manishin and others have raised, and creates regulatory parity as between broadband Internet access and dial-up Internet access. Manishin misstates our "conclusion that the FCC should or can decide, *ipsi dixit*, that broadband Internet access is a telecom service under the scheme adopted by Congress"[56] because, as the following discussion demonstrates, our "conclusion" is strictly confined to the *telecommunications component* of Internet access. And regulation of the telecommunications component of broadband Internet access is not, and does not, amount to, regulation of the entire Internet.

A convenient device for separating the telecommunications and information services elements of integrated broadband Internet access is through the use of a construct known as a "layers model" that identifies, at a functional level, the various elements of Internet Access

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52 *Third Way*, *supra*, fn. 13, at 5.

53 *Supra*, fn. 3.

54 Manishin, at fn. 26.

55 *Id.* at 39.

56 *Id.* at 41.

service. One widely accepted layers construct is the International Organization for Standardization's *Open Systems Interconnection* ("OSI") model.[57] In the OSI framework, each layer represents a collection of similar functions that furnish services to the layer above it and that receive services from the layer below it.[58] See Figure 1 below.

[57] *ISO/IEC International Standard 7498-1, Second Edition 1994 (Corrected and Reprinted 1996).* Available online at http://standards.iso.org/ittf/PubliclyAvailableStandards/s020269_ISO_IEC_7498-1_1994(E).zip

[58] Many variations on the OSI model have been suggested as a basis for policy analysis. See, e.g., Whitt, Richard S., "A Horizontal Leap Forward: Formulating a New Communications Public Policy Framework Based on the Network Layers Model," *Fed'l Comm'n L. J.*, 56:3, May 2004, at 589, 621-624. One such variant is the 6-layer construct proposed by Dale Hatfield. *Review of Regulatory Framework for Wholesale Services and Definition of Essential Service*, Canadian Radio-television and Telecommunications Commission Telecom Public Notice CRTC 2006-14, Report of Dale N. Hatfield prepared for Rogers Communications Inc., March 15, 2007, at paras. 3-12. Hatfield's formulation, with several small modifications, offers a particularly useful foundation for our present purposes, because it nicely aligns the various network functions with the issues that confront the FCC with respect to its reclassification of broadband Internet access as a telecommunications service, including the nature and extent of regulation that should accompany any reclassification. A slightly modified version of Hatfield's layers model is illustrated in Figure 1.

Layer	Functional elements
Application and Content Layer	Content: music/video downloads, search engine results, VoIP conversations, product details (shopping, auctions), social network member pages, tweets, e-mail content
	Applications: web browsers, search engines (e.g., Google), VoIP services (e.g., Skype), auction sites (e.g., eBay), e-mail servers, twitter, social networking sites, IPTV servers
Transport Layer	Performs such sub-functions as setting up connections between computers and for error and flow control
Network Layer	Routing of data packets through networks -- the associated software resides in devices (e.g., computers) at the edge of the network and in routers at nodes throughout the network. Transmission protocols applied to the raw bit stream (at the Data Link Layer) – e.g., Internet protocol (IP), TDM
Data Link Layer	The base transmission protocols and bit stream carried over the physical transmission media at the Physical Layer, including the derivation of multiple logical channels and the interconnection and routing of traffic among adjacent network segments, and associated equipment
Physical Layer	The actual medium used by the Data Link layer – e.g., twisted pair copper, coaxial cable, fiber optic cable, or radio spectrum.
Support Structures Layer	Poles, conduit, cell towers, etc.

Figure 1. Functional elements of the protocol stack

At the bottom of the stack is the *Support Structures* layer, consisting of poles, conduit and other structures that house the physical telecom media. In the wireless context, support structures would also include antenna towers and rooftop antenna farms, but would *not* include the radio antennas, transmitters, receivers and repeaters used to create physical communications channels. The next level up is the *Physical Layer*, consisting of the actual media over which the telecom signals are transported, such as twisted pair copper, coaxial cable, fiber optic cable or, in the case of wireless, electromagnetic spectrum and radio transmitters/receivers/repeaters. Moving up the stack, the next level is the *Data Link Layer*, which supports and transmits the base signal subdivided into logical channels of varying bandwidths over the physical transmission medium. The Data Link Layer encompasses the base signaling protocols and associated equipment that enables the transmission of bits over the physical medium in a single circuit. In this adaptation of the OSI model, the Data Link layer also includes the ability to subdivide the full bit stream into multiple logical channels of varying bandwidths and to interconnect and route traffic among adjacent segments of the network.[59] Thus, optronics and optical

59 In the formal OSI construct, the Data Link layer is local to each individual network segment and the interconnection and routing functions exist at higher layers. However, where the

transmission protocols associated with fiber optic cable, DOCSIS[60] equipment and protocols associated with coaxial cable, and radio transmitters/receivers associated with wireless transport, all occur at the Data Link Layer. The distinction between the *Physical Layer* and the *Data Link Layer* is useful here, because it is at the Data Link Layer that the base signal may be split up among multiple users and uses. For example, a strand of fiber optic cable (at the Physical Layer) may carry an ultra broad bandwidth signal (e.g., 1 terabit) that can then be divided up into multiple digital channels each one of which can support any of several bandwidths and protocols.[61]

Above the *Data Link* is the *Network Layer*, any of several different transmission protocols (e.g., time-division multiplexing (TDM) or a packet-based protocol such as IP or other Ethernet-compatible protocol) is layered onto the derived (Data Link Layer) channel to support routing of the transmitted data and data packets through multiple networks. Analogous to interexchange switching in the legacy circuit switched telecom world, in IP networks the associated hardware

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physical network segments are controlled and, in the normal course of business, interconnected by a telecommunications carrier, it would be technically impractical and economically infeasible for downstream entities to assume responsibility for these interconnection and routing functions. Accordingly, for purposes of this regulatory/market analysis, these additional functions should be considered as existing within the Data Link layer.

[60] Data Over Cable Service Interface Specification (DOCSIS) is an international telecommunications standard that permits the addition of high-speed data transfer to an existing Cable TV (CATV) system.

[61] The "network management" activity that was the subject of the FCC's action at issue in *Comcast* relates to services provided at the Data Link Layer, although the specific device utilized by Comcast – deep packet inspection followed by the issuance of content-specific disconnect packets – could involve several Layers up to and including the Application and Content Layer. Manishin observes, correctly, that "'choking' and 'throttling' traffic to eliminate congestion and avoid blockages" are routine network management practices common to both circuit-switched telephony as well as IP networks, and further notes that the potential for such disruption is particularly relevant in the case of cable, where broadband access "is a shared service, with which many users communicate over the same broadband capacity." Manishin, at 51. We do not disagree that a broadband Internet access provider is entitled to – and indeed is *obligated* to – manage its network so as to assure that all users receive the quality of service that is promised and expected. That said, the FCC's focus upon the particular device used by Comcast, coupled with Comcast's failure to disclose such use, certainly falls within the reasonable scope of common carrier regulation. However, any regulation of network management practices (whether falling within "net neutrality" or otherwise) should be strictly confined to reasonable disclosure and to assuring that their purpose and/or effect does not operate to disadvantage competing downstream services or providers.

and software resides in devices (e.g., computers) at the edge of the network and in routers at nodes throughout the network. Next up is the *Transport Layer*, where such sub-functions as setting up connections between computers and for error and flow control are performed. World Wide Web addressing and routing using Domain Name Services (DNS) occur at this layer. These functions are roughly analogous to common channel signaling and call management and control in the circuit switched world. Finally, at the very top of the stack is the *Application and Content Layer*.[62] Applications organize and act on content. Thus, a search engine is an application, the results returned by the search engine are content.[63]

The 6-layer model as outlined here is useful in delineating and separating the *telecommunications* functions from those associated with *information services*, but it is also useful for examining the economic characteristics of the various segments for purposes of figuring out how competition and regulation can be combined to produce a result that is consistent with the pro-

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[62] Some versions of the layers model distinguish between "applications" and "content." For our purposes here these can be combined, since both (when offered over telecommunications facilities) constitute "information services."

[63] An *application* is a tool that helps a user perform one or more tasks. An application imports, processes, produces and exports content. *Content* comes in a broad range of simple forms such as voice conversations, printed words, images, and video but also includes complex forms such as software code, computer files, and databases. The distinction between "application" and "content" may be illustrated in the following examples: Outlook is an e-mail *application* that handles the sending and receiving of e-mails, but the actual text of the e-mail is *content*, written by the user; Skype is a voice over Internet protocol (VoIP) application that processes and transmits/receives digital audio signals, but the facilitated voice conversation between two people is content; Internet Explorer is a Web Browsing application that interprets and displays websites, but the actual website accessed using IE is the content viewed by the user surfing the web. Applications and content can sometimes be difficult to differentiate, especially when the Internet is involved, because many applications are also delivered as content on a website. A common example is the Google website, which is delivered as content to a web browser, but then becomes an application that allows its users to search the web. The website accepts content from the user (the search terms typed into the website), processes the search, produces its own content (advertisements, the time it took to perform the search), and exports the search results (more content) by displaying them on the screen to the user. Another example would be YouTube, which is also a website delivered as content to a web browser, but then allows users to search for and watch videos. Those search capabilities, along with the ability to playback video, are applications. The videos themselves are content. This distinction is important in connection with any structural analysis of the information services sector, but is not important for our purposes here.

competitive goals of the *1996 Act* and with the "public interest."[64] With regard to the functional characterization of the layers as telecommunications versus information services, all but the very top *Application and Content Layer* are *telecommunications* and, contrary to the FCC's previous conclusions, are plainly capable of being segregated from the higher layer information services functions (see Figure 2).

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[64] Each individual layer of the OSI model can also be thought of as constituting a separate relevant product market for antitrust purposes, despite the fact that each layer is indeed dependent upon its adjacent layers for functionality. The 2010 revision of the DoJ/FTC *Horizontal Merger Guidelines* specifies that "[m]arket definition focuses solely on demand substitution factors, i.e., on a customer's ability and willingness to substitute away from one product to another in response to a price increase or a corresponding non-price change such as a reduction in product quality or service." U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines*, August 19, 2010, Section 4.0. Each individual layer of the OSI model represents its own market, because the functionality supported at each layer cannot be used as a substitute for the functionality supported by any other layer, even though the adjacent layers may be closely interrelated. By way of example, chicken and beef are certainly close substitutes and could well be viewed as part of the same product market. One eats the chicken or beef using plates and silverware, but it would not be reasonable to consider plates and silverware as being in the same market as the chicken or beef, since plates and silverware are clearly not substitutes for food. Similarly, while the plate and silverware are typically placed on a table while the food is being consumed, the table is obviously not in the same product market as the plate that rests upon it. The same could be said of the building that houses the table, or the land upon which the building sits, even though all of these elements collectively support the consumption of chicken (or beef). The individual layers in the OSI model are directly analogous to this example – with one critically important difference: None of the individual markets comprising each of the land/building/table/plate/food layers model are so concentrated that incumbents in any one of them would be capable of engaging in vertical foreclosure. This is not the case with the OSI components, where the high market concentration extent in the lowest layers affords the entities that control them the economic ability to limit entry in the higher layers.

Layer	Classification
Application and Content Layer	Information Services
Transport Layer	Telecommunications
Network Layer	
Data Link Layer	
Physical Layer	
Support Structures Layer	

Figure 2. Classification of elements as "telecommunications" or "information services"

As such, any telecommunications carrier (which definition should be read to include cable companies that offer IP telephony and Internet access over their facilities) should be required to offer any service comprised of functions within these layers as a Title II telecommunications services. However, classification is not the final step in this process. Such reclassification does not prevent the Commission from subsequently finding that there is a basis for forbearance from enforcing particular Title II requirements, including the obligation to provide unbundled elements on a nondiscriminatory basis. However, there is nothing to support the type of categorical *presumption* that forbearance should apply – a presumption that lies at the core of the so-called "Third Way" proposal. Instead, the Commission will need to specifically examine and analyze all of the circumstances (including the competitive conditions) that are required to support forbearance under Section 10.

Because Section 10 reflects the non-dominance analysis that the FCC had used in pre-1996 Act forbearance actions,[65] it is useful to examine market conditions within each of the six layers. Viewed in the context of industrial organization, there is progressively less market concentration as one moves up along the stack (see Figure 3).

[65] See, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, WC Docket No. 09-135, *Memorandum Opinion and Order*, Adopted June 15, 2010, Released June 22, 2010, at paras. 5-8.

Layer	Market concentration
Application and Content Layer	Many providers, but risks monopolization by owners of Physical and Data Link Layer facilities if net neutrality not enforced, either by regulation or by facilitating competition at the Network and Transport Layers
Transport Layer	High concentration, but could support many providers if unbundled nondiscriminatory access to lower layers is available
Network Layer	
Data Link Layer	In most areas, maximum of two wireline providers, a few more in a small fraction of business locations – high concentration
Physical Layer	
Support Structures Layer	Typically no more than one provider – high concentration

Figure 3. Market concentration at each layer

There is typically only a single support structure configuration along any given street or right-of-way (*Support Layer*).[66] One support structure configuration can, and typically does, support several physical networks (*Physical Layer*) through required access arrangements – pole attachments, conduit occupancy. However, in a network environment, the number of providers that have the economic ability to participate at the *Physical Layer* is still quite small. In its March 2010 *National Broadband Plan* report, the FCC noted that only 4% of all US households had a choice of three or more terrestrial broadband providers.[67]

Because modern telecommunications networks typically utilize high-capacity transport media – fiber optic or coaxial cables – capable of transmitting hundreds of millions of bits per second, these *Physical Layer* facilities are typically subdivided into numerous logical telecommunications channels of varying bandwidths and transmission protocols, as required to

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[66] This could be a string of utility poles or underground conduit. While usually privately owned, such support structures are generally subject to municipal construction permitting or franchising, and rarely are two or more such systems authorized on any given street or road. Pole lines are often shared (both with respect to ownership and use) by the local telephone and electric distribution utilities, and "pole attachments" are authorized for the local cable television provider(s) and for competing (i.e., non-incumbent) local telecommunications companies. Section 703, amending 47 U.S.C. § 224(e)(1): "The Commission shall ... prescribe regulations ... to govern the charges for pole attachments used by telecommunications carriers to provide telecommunications services, when the parties fail to resolve a dispute over such charges. Such regulations shall ensure that a utility charges just, reasonable, and nondiscriminatory rates for pole attachments."

[67] Federal Communications Commission, "Connecting America: The National Broadband Plan," March 16, 2010 ("NBP"), at 37. 13% have access to only one wireline provider; 78% have access to two providers, and 5% have no access to any wireline broadband service.

satisfy specific user needs. Thus, so long as the owners of facilities in the *Physical Layer* are made to comply with common carrier requirements and unbundle at the *Data Link Layer* (configured in any technically feasible manner that may reasonably be required as a *Network Layer* input by another telecommunications provider), then despite the high concentration at the *Physical Layer*, competitors can potentially build upon the functions in the lower layers to provide retail telecom and information services directly to end user customers or, on a wholesale basis, to competing downstream providers as inputs to their own upper layer functions and services.

Conversely, if such unbundling requirements are not mandated by regulation – the situation that exists today – the potential exists for the few owners of *Physical* and *Data Link Layer* assets to leverage their formidable market power into the adjacent *Network, Transport*, and *Application and Content Layers*. As noted above, each layer furnishes services to the layer above it and utilizes services from the layer below it. With concentration greatest at the lowest layers in the stack, the entity(ies) that control the lowest layer functions possess the ability (absent legal or regulatory constraints) to leverage its(their) market power into the adjacent next-higher layer by denying or otherwise restricting access to that layer by downstream users. Without access to logical telecom channels at the *Data Link Layer*, downstream rivals would be required to lease an entire physical facility (e.g., a strand of fiber optic cable) even where all that is needed is a small fraction of the physical facility's potential bandwidth.

<table>
<tr><td>Application and Content Layer</td><td>Information Services</td></tr>
<tr><td>Transport Layer</td><td rowspan="2">Telecommunications, but subject to forbearance with respect to most common carrier regulation</td></tr>
<tr><td>Network Layer</td></tr>
<tr><td>Data Link Layer</td><td rowspan="3">Telecommunications, subject to Title II common carrier regulation including unbundling and nondiscrimination obligations at Secs. 251/252.</td></tr>
<tr><td>Physical Layer</td></tr>
<tr><td>Support Structures Layer</td></tr>
</table>

Figure 4. Required regulatory status at each Telecommunications Layer

Putting this analysis into the regulatory context (as depicted in Figure 4), while the first five layers meet the criteria for telecommunications services (and thus Title II regulation), if the FCC appropriately enforces Title II obligations with respect to the bottom three layers – *Support Structures,*[68] *Physical, Data Link* – this approach is likely to establish the competitive conditions

[68] Sec. 251(b)(4) requires all (incumbent and non-incumbent) local exchange carriers "to afford access to the poles, ducts, conduits, and rights-of-way of such carrier to competing providers of telecommunications services on rates, terms, and conditions that are consistent with section 224." Sec. 224, amended by Sec. 703 of the *1996 Act*, establishes access requirements, as well as limited conditions for denial of access, applicable to "poles, ducts, conduits, or rights-of-way," sets forth a framework for cost sharing of such support

that will support forbearance from enforcing most Title II requirements with respect to any telecommunications service (or the provider of such service) that consists solely of functions above the *Data Link* layer, and will also help to assure an open and competitive *Application Layer* and its associated Internet content, application software, and various other information functionalities.

A structural approach that facilitates the expansion of retail competition is precisely what has been adopted in Canada, where both ILECs and "cable carriers" are required to offer wholesale high-speed access facilities to retail competitors, at all speed options that the ILEC or cable carrier offers to its own retail Internet customers. The CRTC recently examined – and soundly rejected – arguments by ILECs and cable companies that wholesale access was no longer necessary to ensure retail competition. The CRTC found that retail Internet access would not be competitive without the continuation of a wholesale access requirement, finding that (1) a cable-ILEC duopoly was not sufficient to protect consumers' interests, and that (2) non-wireline platforms, such as wireless and satellite, were not presently substitutes for retail Internet services provisioned over wireline facilities.[69] The CRTC thus found that the only reliable way to ensure retail Internet access competition was through mandated wholesale access to high-speed ILEC and cable facilities.[70]

III. Conclusion

Net neutrality is about a great many things, but fundamentally it is about preserving and protecting competition in all non-last-mile adjacent network, application and content markets. When a "last mile" broadband provider is able to act as a gatekeeper for access to consumer "eyeballs," it has the ability to restrict or deny access to downstream application and content providers, impose fees for such access, and/or force downstream application and content providers to direct their traffic to the "last mile" provider's own backbone network. This could eventually result in the elimination of backbone network providers that do not also have end user customers. Similarly, application and content providers are vulnerable to being put in the untenable position of paying whatever the last-mile provider demands to avoid receiving a degraded connection or losing their access to the last-mile provider's end users altogether.

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structures, and directs the FCC to promulgate regulations addressing these and related issues. Finally, Sec. 271(c)(b)(B)(iii) (one of the elements of the "competitive checklist" that a Bell operating company must satisfy before reentering the in-region long distance market) requires that competing telecommunications carriers be provided with "[n]ondiscriminatory access to the poles, ducts, conduits, and rights-of-way owned or controlled by the Bell operating company at just and reasonable rates in accordance with the requirements of section 224."

[69] Telecom Regulatory Policy CRTC 2010-632, supra n. 32, at para. 53-54.

[70] *Id.* at para. 55.

Neither antitrust enforcement nor the FCC's cumbersome complaint process will create the market conditions that prevent this from happening. Thus, instead of relying upon after-the-fact enforcement to ensure net neutrality, a far more efficient and effective solution is for the FCC take affirmative steps to address the underlying ILEC and cable dominance that makes it possible for those providers to discriminate against upstream backbone and downstream application and content providers. This can best be accomplished through a structural approach that creates the conditions for a competitive broadband access market in place of the current duopoly, by requiring that the bottleneck broadband facilities for Internet access be made available, at just and reasonable rates and on a nondiscriminatory basis, to any requesting carrier. Whether the FCC reaches this result through its *CI2* framework, its authority under Sections 251 and 252 of the 1996 *Telecommunications Act*, or some combination of both, the requirement for unbundling should apply to both ILECs and cable companies that own last-mile facilities that they offer to end users for purposes of Internet access. A competitive Internet access market is the most efficient and least regulatory means of promoting net neutrality and innovation in Internet access services, as well as content and application offerings.

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