

# The Network Neutrality Battles That Will Follow Reclassification

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## 1 Introduction

In March 2015, the U.S. Federal Communications Commission (FCC) adopted a new set of network neutrality rules for the Internet. [FC15] In the process, the FCC declared for the first time that broadband Internet access service is a telecommunications service, which means that the FCC has authority to regulate broadband Internet access services under Title II of the Communications Act. Many advocates for network neutrality celebrate this reclassification, thinking it will inevitably lead to the network neutrality protections they seek. Many opponents of network neutrality mourn reclassification, thinking it will inevitably lead to the network neutrality intrusions they fear. Both sides are wrong to do so. Even if the 2015 Report and Order that reclassifies Internet access withstands the inevitable efforts to overturn it, many of the most important aspects of network neutrality policy have yet to be determined. Reclassification is not destiny, and network neutrality policy is far from settled.

Confusion on this point comes, in part, from the way the debate has been portrayed in the year leading up to this decision. The press has often said that the FCC is deciding whether to “regulate broadband like a utility” [PR15, SI15, WA15]. This is misleading in multiple ways. To begin with, the FCC never even considered regulating the Internet in a way that is all that similar to electric utilities, water utilities, or even telephone companies. What the FCC actually considered is whether to derive authority from the same portion of the Communications Act when regulating Internet as when regulating telephone companies. We must not confuse the source of authority used to justify a public policy with the policy itself. If it wished, the FCC could claim authority under Title II while choosing not to adopt any network neutrality regulations at all, as the FCC has broad discretion in the actual policy [MS00]. In the end, it is policy that will affect the future of the Internet. Policies should be chosen because they serve the public interest, whereas the authority used to adopt those policies should be chosen because that authority is firmly rooted in law.

This paper will describe the important next steps in the network neutrality policy debate that will follow the March 2015 Report and Order. The first step is likely to occur in the courts after a legal challenge to reclassification. Thus, Section 2 will address the legality of reclassification. I have previously argued [CP14] that a decision by the FCC to classify commercial Internet access as a telecommunications service would be consistent with the Communications

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Act as amended by the Telecommunications Act of 1996, and the FCC adopted the core of my argument in the 2015 Report and Order [FCC15]. The next step will occur at the FCC. As shown in Section 3, the FCC left some of the most important policy issues unresolved in its 2015 Report and Order, and we cannot know the real meaning of the network neutrality rules until those issues are decided. Section 3 will also propose some policy options for the FCC to consider. Regardless of what happens in the courts and at the FCC, network neutrality policy will be debated in Congress, and there is a possibility that legislation will emerge. Section 4 presents several forms that legislation might take—particularly if the legislation is motivated by a desire to reverse the FCC’s 2015 Report and Order, and some of the complex issues that must be considered. The paper is concluded in Section 5.

## 2 The Courts: Internet Access is a Telecom Service

The first challenge to the FCC’s 2015 ruling will be a legal one. Will the courts find that the FCC was acting within its authority when it reclassified Internet access as a telecommunications service instead of an information service? This section will explain why, once the FCC chose to revisit the issue of classification, the FCC was allowed if not required by existing law to classify commercial Internet access as a telecommunications service. (Portions of this section appeared in a comment to the FCC by Cherry and Peha. See [CP14] for a more complete discussion of the issue. The FCC cited this comment heavily in its Report and Order [FCC15] when justifying its decision on this matter.)

Although many regulatory details are delegated to the FCC as an expert agency, the FCC is still required to follow the laws passed by Congress and signed by the President, and Congress did not pass a law that allows the FCC discretion to define telecommunications service or information service as it sees fit. Thus, the issue before the FCC, and now to be reviewed by the courts, is whether broadband Internet access service as provided in 2015 meets the definition of telecommunications service mandated by the Communications Act of 1934, as amended by the Telecommunications Act of 1996.

There is no explicit discussion within the 1996 Act about how these two definitions may or may not apply to the Internet, simply because lawmakers were not paying close attention to the Internet in 1996. The Internet is only mentioned in the 1996 Telecommunications Act in two sections: one on the e-rate program that would help fund Internet access for K-12 schools and libraries, and one on Communications Decency that would attempt to limit indecent content on the Internet. Nevertheless, the definitions of telecommunications and information services are reasonably clear.

This section shows that if one applies these statutory definitions, commercial Internet access services as they are offered today are “telecommunications services,” and not “information services.” (Note that what matters is how these services are offered today, and not how services were offered in 1996 or at the time of other legal or regulatory decisions.) The core offering of an Internet access service today is what I call “IP Packet Transfer,” which is telecommunications, and the commercial offering of IP Packet Transfer is a telecommunications service. Indeed, modern Internet access services fit the definition of telecommunications service established by Congress at least as well as commercial telephone services based on traditional circuit-switched technology—if not better.

## 2.1 IP Packet Transfer *is* Telecommunications

We cannot begin to decide what regulations do and do not apply to Internet service providers (ISPs) until we define what they do. The fundamental service of the Internet is the transfer of one or more Internet Protocol (IP) packets from sender to intended recipient, or “IP Packet Transfer,” which is defined below. In that process, a packet may pass through multiple networks, each of which is providing an IP Packet Transfer service of its own.

*A network provides IP Packet Transfer when it transfers IP packets from an ingress point that is receiving IP packets from the sender, to an egress point that can send IP packets to the intended recipient.*

This section will show that IP Packet Transfer fits the statutory definition of “telecommunications” [TA96], which is quoted below:

“The term ‘telecommunications’ means the transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received.”

It is clear that IP Packet Transfer means transmission of information that is of the packet sender’s choosing, because the sender chooses what information to put in each packet. Moreover, it is the nature of IP Packet Transfer that the “form and content of the information” is precisely the same when an IP packet is sent by the sender as when that same packet is received by the recipient. These are both consistent with the above definition.

The one remaining definitional issue, whether IP Packet Transfer occurs “between or among points specified by the user,” is more complicated. The sender places the IP address of the packet’s intended recipient in each IP packet. In some cases, the sender knows the recipient’s IP address already, and in some cases the sender must first look up the desired IP address. Either way, communications is clearly to a point specified by the user sending the packet. Similarly, in a telephone network, the sender may not know the physical location of the points it specifies, but an IP address (or a telephone number) completely specifies the endpoint. For that portion of traffic for which the packet’s sender and intended recipient are both customers of the same Internet access provider, that is the entire story.

The Internet is a network of networks, however, and this is not always the case. Consider the case where an IP packet travels through several networks before reaching its destination. Collectively, these networks are sending the packet to the point specified by the sender. Individually, each network is sending the packet to an egress point that the network has determined is en route to the point specified by the user. This is essentially the same as long-distance calls in the traditional telephone network, where information travels through a local exchange carrier, then through a long-distance carrier, then finally through another local exchange carrier. Each of these telephone carriers is still said to provide telecommunications. Thus, the same must be said of each ISP that provides IP Packet Transfer.

Note that the analysis above assumed only that a network used IP from ingress to egress. As a result, this analysis is applicable to a wide range of networks, including those designed for cable TV, wireline telephony, or cellular telephony. The Internet is based on a layered design.

Underneath the IP layer, there may be a variety of physical infrastructure types, including fiber-optic cable, twisted pair copper, and wireless, as well as a variety of link-layer protocols, including the Data Over Cable Service Interface Specification (DOCSIS)<sup>2</sup> protocol used by many cable TV companies, the Point-to-Point Protocol over Ethernet (PPPoE)<sup>3</sup> protocol used by many telephone companies, and the Long Term Evolution (LTE)<sup>4</sup> protocol used by many cellular companies. On top of the IP layer, there can be a variety of transport protocols, including Transmission Control Protocol (TCP), User Datagram Protocol (UDP), and home-grown proprietary protocols, as well as a variety of applications, including voice over IP (VOIP), web browsing, and video streaming. None of this influences the analysis. In today's Internet, the IP protocol is used to transfer information from an ingress point to an egress point, and IP Packet Transfer meets the legal definition of telecommunications regardless of the layers above or below. This includes when IP Packet Transfer is used for web browsing over a wired network and when it is used for video streaming over a wireless network. Advocates will undoubtedly argue over whether the public interest is best served by network neutrality policies that treat Internet access over wired networks differently from Internet access over wireless networks, but it is clear that both are "telecommunications" under current law.

## 2.2 A Commercial Internet Access Service *Is* a Telecommunications Service

When Internet access is provided on a commercial basis, this fits the statutory definition of "telecommunications service" [TA96], which is quoted below.

"The term 'telecommunications service' means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used."

By definition, a commercial Internet access service is offered "for a fee directly to the public, or to such classes of users as to be effectively available directly to the public." Internet access services vary somewhat from one Internet access provider to another, but the core offering is IP Packet Transfer, which is telecommunications, as shown in Section 2.1. It is IP Packet Transfer that subscribers are seeking when they sign up for an ISP. Other functions of an Internet Access Provider are separable from the core offering, done only in support of the core offering, or both.

A prominent example is electronic mail ("e-mail"). E-mail is an information service. In the wake of the 1996 Telecommunications Act, when the FCC and Supreme Court were making decisions about what constituted a telecommunications service, e-mail may have seemed like a crucial component of any Internet access service. E-mail was the original "killer app." Today, we all know better. Most Americans get their e-mail from separate application service providers such as Google, Microsoft, and Yahoo, or from their employers or schools. While most Internet access providers do provide e-mail as well, it is clear that if they choose not to, the Internet Access Providers' customers will simply go elsewhere for this service. E-mail is not an essential

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<sup>2</sup> Data Over Cable Service Interface Specification (DOCSIS) is a protocol that is commonly used to provide broadband Internet access over cable TV networks. In these networks, IP typically runs on top of DOCSIS.

<sup>3</sup> Point-to-Point Protocol over Ethernet (PPPoE) is a protocol that is commonly used to provide Digital Subscriber Loop (DSL) broadband Internet access service over infrastructure that was initially developed for telephone service. In these networks, IP typically runs on top of PPPoE.

<sup>4</sup> Long Term Evolution (LTE) is a 4<sup>th</sup> generation wireless technology that is commonly used to provide broadband Internet access service over cellular networks. In these networks, IP typically runs on top of LTE.

part of a commercial Internet access service. It is easily separable, and whether an Internet access provider chooses to offer an e-mail service should not be considered when determining whether the Internet access service is a telecommunications or information service.

A similar, but subtler, example is support for use of the Domain Name System (DNS). DNS is the global directory service that allows users to map human-readable names such as “www.fcc.gov” into IP addresses. These IP addresses can then be placed in the header of an IP packet, so that the IP Packet Transfer system can send the packet to its intended recipient. It is common for Internet access providers to place resolvers with caches in their network to facilitate this function for subscribers. Some people have made the mistake of viewing this as a core function of an Internet access provider, and an information service, when it is actually neither. The DNS look-ups provided by these resolvers make the Internet more useful, just as a phone book makes the telephone network more useful, but IP Packet Transfer works just as well without DNS look-ups. Internet users can usually get the IP addresses they need through means other than DNS look-ups, such as search engines, just as telephone users can often get the telephone numbers they need through means other than a phone book.

There are three reasons why an Internet access service does not become an information service simply because it includes access to DNS resolvers. First, it is separable. At the time of these FCC and Supreme Court decisions, it was probably difficult to imagine that an ISP could exist and not play a role in helping its subscribers make DNS queries. Now, we all know better. DNS support can easily be separated from IP Packet Transfer, and, today, some Internet users turn to Application Service Providers (such as Google) for this service, rather than to their Internet access provider. Thus, DNS should be viewed as an extraneous capability, like e-mail, not required for the core service.

Second, even when offered by the Internet Access Provider, this DNS capability is clearly only there in support of the core function of IP Packet Transfer, which is telecommunications. According to the Telecommunications Act of 1996, even a function that might otherwise be an information service will not be considered as such if it is merely used “for the management, control, or operation of a telecommunications system or the management of a telecommunications service,” which is the case here.

Third, for the purposes of categorization, there is little difference between DNS support offered by an Internet access Provider and the 411 directory service offered by many telephone service providers. Both allow a user to discover how to reach another party. Both are extraneous but useful conveniences offered to supplement a telecommunications service. No one argued that telephone companies were not providing a telecommunications service because they offered 411. Thus, DNS support should not be considered when determining whether commercial Internet access providers offer a telecommunications service or an information service.

Internet access providers also typically assign IP addresses to their customers, either on a static or dynamic basis. This process is important because it makes it unlikely that two end points will ever adopt the same address, a situation that would cause problems for both the network and the end users. Thus, it is another mechanism “for the management, control, or operation of a telecommunications system or .. service” in support of the IP Packet Delivery telecommunications service, and therefore not an information service. Moreover, the assignment of IP addresses is similar to the assignment of telephone numbers in the telephone network. Most telephone users get a new telephone number by requesting it from their telephone provider, and there is no debate over whether telephone networks offer

telecommunications services. In some cases, users ask their new telephone provider to determine whether the user can regain rights to a phone number the user had once before with a previous provider, but this still requires coordination with the new phone company. Static IP addresses could be assigned in a similar manner, with Internet access providers assigning addresses when service begins. Users who want their IP addresses assigned on a dynamic basis typically learn about the assignment from a server operated by the Internet access provider using a protocol called Dynamic Host Configuration Protocol (DHCP). There is some difference in speed and convenience between this and obtaining an address over the telephone from an employee of the telephone company, but the use of a server is not consequential with respect to categorization. Indeed, other systems that offer telecommunications services also operate servers that provide important information dynamically in a similar manner. For example, a cell phone can request information from nearby towers about geographic location, or whether a phone call through those towers would incur roaming charges.

### 2.3 A Commercial Internet Access Service *Is Not* an Information Service

Finally, Internet access does not fit the statutory definition of “information service” [TA96], which is quoted below.

“The term ‘information service’ means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.”

In IP Packet Transfer, packets are moved from sender to recipient without any change in format or content. This can be done without offering any of the things that the Telecommunication Act of 1996 says must be included in an information service. Merely transferring a packet to its intended recipient does not, by itself, involve generating, acquiring, transforming, processing, retrieving, utilizing, or making available information. Of course, it is possible to make use of IP Packet Transfer to acquire information or to make information available, just as it is possible to make use of telephone calls to acquire information or make information available. For example, services have emerged whereby telephone users can call a given information provider to hear prerecorded messages with anything from sports scores to daily prayers. This does not change the fact that a commercial Internet access service and a commercial telephone service are both telecommunications services, according to the Telecommunications Act of 1996. IP Packet Transfer involves storage only in the sense that each packet can be queued at any router until it is the packet’s turn to be transmitted by that router. However, this ephemeral storage of a packet, while in transit, is not a storage service. Indeed, users would much prefer that their packets spend as little time as possible in buffers waiting to be transmitted. It cannot reasonably be said that Internet access providers are providing the service of storing packets any more than the Department of Motor Vehicles (DMV) is providing the service of storing humans merely because there are sometimes many humans at the DMV waiting to be served.

There are some functions that are common if not required in a commercial Internet Access Provider that do involve “generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information” [TA96]. In addition to those already described in Section 2.2, commercial Internet access providers may want information systems for account management and billing, for configuration management, for the monitoring of failures and other state information, and to keep track of which addresses are reachable through each of the interconnected neighboring networks. All of these fall within the exception of “use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service” as explicitly defined in the 1996 Telecommunications Act [TA96]. They are also not very different from functions in the telephone system, and the existence of these functions did not make telephony an information service.

Many Internet Access Providers also provide true information services, as defined in the Telecommunications Act of 1996, merely to supplement their telecommunications service, but not as an integral part of that telecommunications service. Examples include e-mail and news sites, both of which are easily separable from Internet access. These companies may also lease customer premises equipment (CPE), or sell t-shirts. None of this matters when determining whether commercial Internet access services are telecommunications or information services.

### 3 The FCC: Large Issues Remain Unresolved

Even assuming that the 2015 Report and Order withstands a legal challenge, the FCC left some core network neutrality issues largely unresolved, so further action will be required before anyone can know the true impact of these rules. For example, future decisions on what the FCC is now calling “non-BIAS data services” (where BIAS is broadband Internet access service) [FC15] could drastically change the practical effect of the FCC’s 2015 rules. Indeed, it could affect whether these rules have much effect at all. Section 3.1 describes several unresolved issues and why they are so important. Section 3.2 proposes some effective options that the FCC could consider when making decisions on these issues.

#### 3.1 Uncertainty and the Specialized Services Loophole

Probably the most important unresolved issue involves what this author has previously called the “specialized services loophole” [PE14, PE15]. This involves what the new order calls “non-BIAS data services” [FC15], and what the FCC previously called “specialized services” or “managed services” [FC10, FC14]. This loophole could make some Open Internet rules irrelevant. Moreover, as this section will show, unresolved questions about the meaning of “unreasonably interfere with or unreasonably disadvantage” [FCC15] are also important.

The FCC has “tentatively concluded that it should not apply its conduct-based rules to services offered by broadband providers that share capacity with BIAS over providers’ last-mile facilities” but are not BIAS themselves, although the FCC will “closely monitor their development and use” of these services [FC15]. To demonstrate the impact of this potentially massive loophole, consider an issue that casual readers of the FCC’s 2015 rules might think has been resolved irrefutably—the legality of paid prioritization. The rules have the appearance of certainty: “today we adopt carefully-tailored rules that would prevent specific practices we know are harmful to Internet openness—blocking, throttling, and paid prioritization” [FC15]. “Paid

priority occurs when a broadband provider accepts payment (monetary or otherwise) to manage its network in a way that benefits particular content, applications, services, or devices” [FC15]. For example, perhaps Hulu pays a broadband provider to prioritize the transfer of video streams to affiliated smart televisions, or Apple pays a broadband provider to prioritize the transfer of music streams to the latest model of iPhone, or Amazon pays a provider to prioritize the transfer of e-books to its e-readers. If a broadband provider is foolish enough to label these as services it offers on top of broadband Internet access, then the provider will clearly run afoul of the FCC’s new rule against paid prioritization. However, if the broadband provider simply chooses to label this as a “non-BIAS data service” that just happens to get priority access to capacity that would otherwise be used for Internet access, then the broadband provider appears to be exempt of conduct-based Open Internet rules, including the supposedly “bright-line” rule against paid prioritization. Indeed, the FCC specifically included this example of prioritizing the transfer of e-books to affiliated e-readers in its examples of non-BIAS data services [FC15]. Thus, when prioritizing the transfer of e-books in return for payment from the e-book publisher, at a technical level, there need be no difference between doing so as a non-BIAS data service, which is explicitly allowed, and doing so as paid prioritization, which is explicitly prohibited.

Moreover, if one cares about promoting competition and innovation, the fact that paid prioritization may occur under a different name is not the biggest problem. These rules allow overtly anticompetitive acts. Perhaps through these allegedly non-BIAS services, the broadband provider will provide superior quality of service when transferring video, audio, and e-books to affiliated content providers at a price of 1 cent per GB, and to unaffiliated content providers at a price of 1 million dollars per GB, thereby gaining monopoly or oligopoly control over any upstream service that requires superior quality of service. In the absence of rules against such practices within non-BIAS data services, broadband providers could easily have the ability and incentive to adopt such practices.

This loophole may undermine the FCC’s rule against blocking as well. A provider of a BIAS is not allowed to “block lawful content, applications, services, or non-harmful devices” [FC15]. By definition, however, BIAS rules only apply if the service “provides the capability to transmit data to and receive data from all or substantially all Internet endpoints” [FC15], which will not be the case if traffic to or from a significant number of Internet endpoints is blocked. Thus, the mere act of blocking may make the FCC’s “bright-line” rule against blocking irrelevant. It appears that blocking is permissible, regardless of the criteria used for blocking, as long as the number of endpoints blocked is “substantial.”

The root cause of this loophole is that the FCC has created a legal distinction where no technical distinction exists, as the examples above demonstrate. There is no practical difference between the case where a provider offers both a BIAS and a separate non-BIAS data service over the same shared capacity, and the case where a provider uses 100% of the capacity to offer a BIAS and some specialized non-BIAS services happen to run on top. Thus, regulations that limit how capacity is allocated within a BIAS, but not how capacity is allocated between BIAS and non-BIAS data services, or how capacity is allocated among non-BIAS data services, will inevitably be easy to circumvent. One way that the FCC could address this problem is by returning to the pre-2015 view that not all non-BIAS services should be considered specialized services, and by providing appropriate guidance as to what should and should not be included.

While the FCC Report and Order [FCC15] does not expressly prohibit the practices described above, some uncertainty remains. Even though the FCC “tentatively” concluded that



conduct-based rules did not apply to non-BIAS data services, it also left the door open for limits by stating that “non-BIAS data services may still be subject to enforcement action” [FC15]. This could occur if “these types of service offerings are undermining investment, innovation, competition, and end-user benefits” [FC15]. This is a vague standard. It remains to be seen how the FCC will determine whether a service undermines investment, innovation, competition or end-user benefits; when this will be enough to overcome the FCC’s tentative decision not to apply rules; and what rules and enforcement actions are applicable when the FCC does make such a determination. These questions are certain to arise in the coming years, and, until they are resolved, it is difficult to know how big the specialized service loophole might be.

There are at least two reasonable ways to limit the loophole. One is to establish a much narrower definition of the class of services to which Open Internet rules may not fully apply. The FCC unfortunately made this harder in the 2015 ruling by changing the name of this class from “specialized services” to “non-BIAS data services,” because the latter implies that any data service that does not meet the previously-established definition of BIAS must meet the definition of a non-BIAS data service. To allow the definition of this less-regulated class to be based on sound policy rather than legacy definitions from other contexts, I will use the phrase “specialized service” instead of “non-BIAS data service.” The reasonable alternative to defining specialized services narrowly is to impose rules on specialized services that prohibit some forms of blocking and discrimination, although these rules could differ from those that apply to standard BIAS. Section 3.2 will explore both of these approaches. It is important to note from the above that anyone who wants to devise an effective policy cannot address the issues of what a specialized service is and what rules should apply to such a service in isolation. These two issues are intertwined.

It is similarly difficult to separate rules regarding specialized services from rules regarding another aspect of the FCC Report and Order that will remain a subject for FCC consideration. According to the 2015 rules, broadband providers “shall not unreasonably interfere with or unreasonably disadvantage” either end users or edge providers in their communications [FCC15]. Applications may emerge that would benefit from better Quality of Service (QoS) than is widely available on the Internet today. Allocating resources to improve the QoS of some traffic streams often has the effect of decreasing QoS of other streams. That sounds like disadvantaging—but is it *unreasonable* disadvantaging? Whether a broadband provider can provide that superior QoS depends on precisely what it means to unreasonably interfere or disadvantage other streams, and the FCC plans to decide this in the coming years on a case-by-case basis. In particular, can a provider offer better QoS within a BIAS, charge more for it, and let end users decide whether to use it? If the provider charges an edge provider, then this is clearly prohibited as paid prioritization, but the 2015 Report and Order does not indicate clearly whether this would be allowed if the provider charges the end user. The Report and Order does say that a practice that “is consistent with promoting consumer choice is less likely to unreasonably interfere with or cause an unreasonable disadvantage” [FC15], and each consumer can choose whether to use the superior but more expensive service. However, saying that this practice is merely “less likely” to violate Open Internet rules is certainly not definitive.

If the FCC decides to allow some forms of discrimination that are deemed to be reasonable within a BIAS, then these applications can operate under general Open Internet rules, and the FCC can greatly limit what constitutes a non-BIAS data service or specialized service without accidentally prohibiting these applications. In this case, there may be little

reason to regulate non-BIAS data services. On the other hand, if the FCC greatly limits the discrimination allowed under BIAS rules with the belief that applications like telemedicine will simply shift to non-BIAS data services, then they need a broad definition for non-BIAS data service. In that case, there should be more rules regulating non-BIAS data services. Thus, these issues are also intertwined.

## 3.2 Policy Options

This section describes objectives and constraints that the FCC should consider when it resolves the open issues described in Section 3.1, and presents two viable options that would balance these objectives, as proposed in [PE15]. Section 3.2.1 explains the advantages of Open Internet rules that allow reasonable discrimination to support applications that require better QoS, and why rules that prohibit unreasonable discrimination are valuable. This balance could be achieved in rules for BIAS, rules for specialized services, or both. Section 3.2.2 describes a policy where many applications requiring better QoS choose specialized services, so the definition of specialized service is broad and there are more rules regulating specialized services. Section 3.2.3 describes a policy where applications requiring better QoS can get the reasonable discrimination they need in basic Internet access, so the definition of specialized service can be much narrower, and the rules governing specialized services can be more relaxed. The options are summarized and compared in Section 3.2.4.

### 3.2.1 Reasonable Discrimination Can Help Consumers. Unreasonable Discrimination Can Harm Consumers.

As discussed in more depth elsewhere [PE06], consumers can greatly benefit from some uses of discrimination and can be harmed by other uses of discrimination. Ideally, we should seek Open Internet rules that encourage the beneficial and prohibit the harmful, although tradeoffs are inevitable.

Some applications benefit from superior QoS, which is best provided through some form of discrimination. For example, someday a telemedicine application may allow patients to recover from surgery in their own homes with constant monitoring from medical professionals at a hospital. An ISP could use discrimination to ensure that QoS is adequate for medical monitoring. Thus, some applications that benefit from superior QoS actually involve life and death, although many do not. For example, those recovering patients and their healthy neighbors may want to listen to music streamed by Internet radio stations, but with guarantees that transient congestion will not ruin the sound. To avoid denying Internet users the benefits of these applications, FCC rules should not prohibit the kind of discrimination that makes such applications possible, nor should FCC rules prevent an ISP from charging for these services because the services may not emerge unless someone pays for them. These examples should be considered *reasonable discrimination*. In the best cases, Internet access providers would simply be allocating limited resources to improve the QoS of those applications that benefit most from those resources and charging for the resources allocated.

Arrangements like these become problematic when an ISP with market power seeks to extract oligopoly rents through fine-tuned discrimination [PE06]. Perhaps the telemedicine application requires the exact same QoS from the network as a new multiplayer game, but if the network is allowed to set prices based on the application users choose rather than based on the

QoS that the network offers, the ISP will charge very differently for telemedicine and gaming. In each case, with limited competition, the ISP will charge the maximum that the market will bear for that particular application, and consumers could see higher prices and less availability for content and applications as a result. Alternatively, someone may wish to use the same underlying service that supports the streaming of music to support the streaming of political speeches against mergers in the telecom industry. Would an ISP agree to carry the music, but not carry the speeches? These are examples of discrimination based on application and content, and discrimination by those criteria should be considered *unreasonable discrimination*. If an ISP with market power has unrestricted ability to discriminate based on content and application, then it has the ability and the incentive to give content providers affiliated with the ISP an advantage over competitors. Moreover, it would have incentive to bring separate oligopoly rents onto each distinct application or content market, even when that application or content market is highly competitive [PE06]. In accordance with the Open Internet principles, it should be considered *unreasonable* to block or discriminate with respect to QoS or price solely based on content, application, user, or type of attached device when none of these factors affect the scarce resources that the network must allocate. It should be considered *reasonable* to discriminate between Class A service and Class B service with respect to QoS and price if both services are available to all, but *unreasonable* if some users can access one service and other similarly-situated users cannot.

### 3.2.2 Option 1: Broad Definition of Specialized Service, and Meaningful Regulation of Specialized Services

First, consider the case where many applications that require superior QoS would have to operate over specialized services, because the rule against “unreasonably interfering with or unreasonably disadvantaging” [FCC15] does not allow this form of discrimination within a BIAS, or this rule does not allow Internet access providers to be paid for offering superior QoS. In this case, we can expect different specialized services to emerge, each with a QoS that is appropriate for a different application type, which may be consistent with the FCC’s current view that all non-BIAS data services are specialized services. In this case, however, there should be rules governing these specialized services to prevent unreasonable discrimination, and rules of this kind do not currently exist.

Section 3.2.1 argued that Open Internet rules should allow ISPs to offer services of different QoS, which requires some form of discrimination, but it argued that some uses of discrimination should not be allowed. For example, Open Internet rules should not allow Internet access providers to offer a given specialized service to some users, perhaps those affiliated with the ISP, and not to others who are similarly situated. It should be deemed unreasonable to favor some users over others in this way. In addition, Internet access providers should be able to take into account technically relevant factors that affect cost, such as data rate or guaranteed latency, when setting prices for specialized services. Open Internet rules should not allow these providers to employ *unreasonable discrimination* and base prices on content or application. Further, providers should not be allowed to employ *unreasonable blocking* and limit access to a specialized service based on content or application and block non-conforming traffic.

All of the unreasonable discrimination described above would be prohibited while still allowing Internet access providers to offer superior QoS through discrimination through either

of the two following policies. In a more traditional approach, ISPs could be required to post the types of specialized services they offer, including the form of discrimination or a technical description of the QoS that is expected as a result of that discrimination, and the associated prices. The Internet access provider must make the same options available to similarly-situated users, and those users would be free to choose the specialized service that meets their needs. Alternatively, in what I have called a “Most Favored Nation” approach [PE14], ISPs could negotiate individually to create new arrangements for specialized services, but the details of those arrangements would subsequently become public, and other similarly-situated users would be given the right to demand an arrangement with the ISP that has the same technical and financial terms and conditions. Again, those arrangements should be based on the form of discrimination or a technical description of the QoS that is expected as a result—not on content or application. The latter approach gives Internet access providers greater flexibility, while still offering protection against unreasonable discrimination and the extraction of oligopoly rents.

### 3.2.3 Option 2: Narrow Definition of Specialized Service, and Little Regulation of Specialized Services

The FCC has tentatively concluded that specialized (or non-BIAS) services require no rules. Indeed, there may be little need for rules on discrimination and blocking if there are adequate limits to the definition of specialized services, and if the rules regarding “unreasonably interfering with or unreasonably disadvantaging” allow reasonable discrimination within a BIAS so that applications requiring better quality of service can be supported.

In the absence of clear limits on the definition of specialized services, current technology would make it easy for Internet access providers to engage in unreasonable discrimination among their offerings, while maintaining the illusion that their specialized services are somehow distinct from their BIAS. For example, as previously suggested, traffic from a supposed specialized service “may be sent over a separate virtual local area network (VLAN), or a separate service flow in a cable system operating under the DOCSIS standard” [PE06]. While the VLAN or service flow for a specialized service may appear to be separate from general Internet traffic, traffic from both services travel through the same bottleneck links, and the VLAN or service flow identifier is used to give the supposed specialized service priority over other traffic during periods of congestion. In reality, this is simply a priority Internet service. If priority Internet services receive blanket exemption from Open Internet rules regarding discrimination and blocking because they were given a specialized service label, this would create a large loophole.

If we consider the case where few rules, if any, are imposed on specialized services, then we must ask whether there are cases where FCC rules should allow ISPs to engage in the most blatantly anticompetitive forms of discrimination or blocking, and then limit the definition of specialized services to just those cases. For this situation to arise, a company must offer two communications services. One is a BIAS and subject to Open Internet rules. The other is not Internet access, and imposing Open Internet rules on this service would be inappropriate.

For a service to be exempt from Open Internet discrimination and blocking rules without undue risk of the kind of oligopoly rents discussed in Section 3.2.1, that service should not be Internet access. Also, it should not be just another way to communicate with things that users

would otherwise access over the Internet, as that would make it a trivial substitute for Internet.<sup>5</sup> Finally, it should not operate over limited resources that would otherwise be used for Internet, as that would make it a simple Internet service with preferred access to shared resources.

There are services with the properties above for which the application of Open Internet rules would be inappropriate. This can occur when Open Internet rules apply to separate networks as if they were one network. Consider a company that offers two IP-based services. One gives a user access to the entire Internet, and the other gives a user access to a closed and highly secure network with endpoints that trust each other. For example, a company might use the closed network to connect its various offices and the residences of some trusted employees. The network for Internet access and the closed network are separate, in that traffic from one cannot reach the other, cannot carry malware to the other, and cannot even cause congestion to the other, which is precisely what makes the closed network valuable to its users. To further enhance the security and productivity of the closed network, traffic from some applications is blocked. Open Internet rules should not be imposed on the closed network, as this might allow traffic from unknown sources and unknown applications into the network, thereby reducing the network's value to users. Note that this is a true private network, and not a mere *virtual* private network (VPN) where private traffic and regular Internet traffic are intermixed within shared capacity. The VPN label should not automatically exempt a service from Open Internet rules.

Another example occurs when a company offers both an Internet and a telephone service that are entirely separate. Consider the case where the telephone network is upgraded from circuits to VOIP, while remaining separate from the network that provides Internet access. This alone should not make the telephone service subject to Open Internet rules, which would prohibit blocking non-VOIP packets. Otherwise, companies might be discouraged from improving technology. Both of the services above do not meet the definition of Internet access service and are not a trivial substitute for Internet because customers use them to access endpoints that are not on the open Internet. In the first case, those endpoints are other trusted computers within the company's private network. In the second case, the endpoint accessed is a VOIP-Public Switched Telephone Network (PSTN) gateway that is operated by the carrier and is accessible only through the carrier's closed network. In addition, central to the examples above, the service that is exempt from Open Internet rules is truly separate from Internet access. Implicitly, some of the debate about specialized services is over what it means for two services to be separate. I propose here a simple litmus test that should be used to determine if services are separate, along with a condition to exclude services that are trivial substitutes for Internet.

*A communications service can be considered a specialized service under Open Internet rules if (i) the primary use of the service is not to access content, services, or systems that are accessible through an Internet access service, and (ii) the service does not share capacity with Internet access.*

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<sup>5</sup> As [PE06] warns, discrimination can be accomplished if "one can simply provide separate channels for different classes of traffic. For example, favored traffic may be sent over a lightly used wavelength in a fiber optic cable, while other traffic goes over a heavily used wavelength."

*Two services are said to “share capacity” if it is ever possible for utilization of one service to affect the performance of the other service.*

The precise definition of sharing capacity is important. For example, when a telephone network offers a traditional DSL service, circuit-switched telephone and Internet services do operate over the same copper wire, but they do not share capacity. Internet and telephone traffic travel within separate frequency bands in the last-mile connection, arrive at separate switches at the central office, and are forwarded into separate nationwide networks (i.e., the PSTN and the Internet). If there is a high volume of Internet traffic on the last-mile link, in the IP router closest to the user, or in any link or router anywhere on the global Internet, this will not affect telephone service in any way. Similarly, a high volume of telephone traffic will not reduce the performance of the Internet service. This would not change if the telephone service was converted to VOIP, but the capacity allocated to telephone service is fixed, as is the capacity allocated to Internet service. In contrast, if VOIP packets are sent over the same last-mile link as Internet traffic and VOIP packets are simply given transmission priority over Internet traffic based on VLAN label, then telephone utilization would somewhat degrade the quality of Internet service. Contrary to what some ISPs will claim, this latter case is an example of shared capacity, and the proposed definition above makes this clear.

The impact of a specialized services rule on telephone and cable TV services deserves particular attention, in part because these two services have played a particularly important role in the business case for Internet access (e.g., as part of “Triple Play” service), and in part because these two services have their own regulations. Some IP-based telephone and cable TV services would qualify as specialized services under the proposed rule above, but some would not. For example, with AT&T’s U-verse service, a customer who begins watching a pay-per-view video may notice a sudden decrease in Internet performance because capacity is shared. AT&T adopted this architecture years ago, and if the FCC were to decide now that this technical approach makes the IP-based service used for video distribution subject to Open Internet rules, it would be disruptive. Consequently, I propose the following rule to specifically address IP-based telephone and cable TV services.

*A communications service can be considered a specialized service under Open Internet rules if the service is only used to provide a service that is subject to telephone regulations or to cable TV regulations.*

If specialized services are limited to the extent proposed in this section, then it is important for the FCC rules against “unfair disadvantaging” to allow reasonable discrimination within Internet access services (BIAS) as this will allow applications that benefit from superior quality of service to develop.

### 3.2.4 Summary

It is important that the FCC adopt appropriate rules for specialized services. Failure to do so could provide a loophole that would allow even the most harmful forms of discrimination or “paid priority” to gain widespread use, or it could have the effect of denying Internet users access to valuable applications that require good quality of service. The following table summarizes the policy approaches in Sections 3.2.2 and 3.2.3 that are intended to avoid both problems.

	<i>Discrimination rules for BIAS</i>	<i>Definition of Specialized Services</i>	<i>Rules for Specialized Services</i>
Option 1	May or may not allow reasonable discrimination and the ability to charge for it.	Definition is broad to support all traffic streams that could benefit from superior QoS.	Unreasonable discrimination and blocking are prohibited.
Option 2	Allow reasonable discrimination and the ability to charge for better QoS. Prohibit unreasonable discrimination.	Definition is narrow, including only services that meet one of these conditions 1. The primary use of the service is not to access content, services, or systems that are accessible through an Internet access service, and (ii) the service does not share capacity with Internet access. <i>Or</i> 2. The service is only used to provide a service that is subject to telephone regulations or to cable TV regulations.	Few rules, if any (other than transparency).

## 4 Congress: Good and Bad Approaches for New Legislation

New legislation could change everything. This section explores ways that Congress could respond if it is displeased with the FCC's 2015 order, and some of the challenges that must be addressed if new legislation is to lead to effective policy. Section 4.1, discusses legislation that is narrowly focused on reversing reclassification while leaving the rest of the 1996 Telecommunications Act largely unchanged. Section 4.2 discusses the idea of creating a new category of regulation beyond telecommunications and information services that would be appropriate for Internet access. Section 4.3 discusses the idea of more fundamental reform that would replace the 1996 Telecommunications Act.

### 4.1 Reversing Reclassification

To some in Congress, the most obvious way to reverse the FCC's 2015 Report and Order is to pass legislation that simply requires the FCC to define Internet access services as an information service. For example, Congress could pass a law that makes its own determination that Internet access is an information service, as might occur with the following language that appeared in a proposed House bill:

“Notwithstanding any other provision of law, the provision of broadband Internet access service or any other mass market retail service providing advanced telecommunications capability (as defined in section 706 of the Telecommunications Act of 1996 (47 U.S.C. 1302)) shall be considered to be an information service.” [HR15].

Alternatively, Congress could pass a law that nullifies the FCC's March 2015 Report and Order, as in a proposed Senate bill:

“Congress disapproves the rule submitted by the Federal Communications Commission relating to regulating broadband Internet access (published at 80 Fed. Reg. 19737 (April 13, 2015)), and such rule shall have no force or effect” [SR15].

This approach is tempting because it does not require reconsideration of the many complex issues surrounding regulation of telephone, Internet, cellular, content, and application services. Such legislation appears to bring a return to the laws of 2014 and nothing more, but that is not actually the case. The problem is that insisting that Internet access is an information service, rather than a telecommunications service, without any change to the definitions of “information” and “telecommunications services” is an attempt to legislate facts rather than to legislate policy. When the FCC concluded in 2015 that broadband Internet access was a better fit for the legal definition of telecommunications service than the legal definition of information service, this was a finding of fact rather than a policy ruling. Moreover, as shown in Section 2, it was an appropriate finding of fact for Internet access services as offered in 2015. Passing a new telecommunications law to overturn this finding of fact is like passing a law that winter in the U.S. is warmer than summer, and the sun rises in the north; laws do not change facts.

This approach is worse than ineffectual because it builds an inherent contradiction between the new law and some unchanged portions of the 1996 Telecommunications Act, which could bring confusion and uncertainty. If broadband Internet access service is an information service, notwithstanding the fact that its core service is the transfer of information “without change in the form or content” that we expect in a telecommunications service [TA96], then precisely what can be called a telecommunications service? We may agree that the telephone systems that existed when the 1996 Telecommunications Act passed offered



telecommunications services, but telephone systems have changed, and there is room for confusion about classification of current telephone systems even without a new law that contradicts the old.

Consider a telephone company that completely abandons traditional, circuit-switched technology in its core in favor of IP (Internet protocol), so its core network cannot be distinguished from that of a provider of broadband Internet access by technology. This company offers its telephone customers content over their smart phones in what appear to be information services bundled with telephony, much like how many broadband Internet access providers offer email service along with IP Packet Transfer. While IP prevails in the core, the company supports diverse technologies in its wired and wireless last-mile connections, so that some customers have phones that exchange IP packets, some have phones that operate over a digital circuit, and some may even have phones that operate over an analog circuit. Thus, the company's basic telephone service arguably provides a change in the form of information transmitted, although not a change in content, which is not consistent with the statutory definition of telecommunications. This is not the telephone system that lawmakers had in mind when they passed the 1996 Telecommunications Act. The argument that this new kind of telephone service is an information service is not perfect, but it is at least as good as the argument that the broadband Internet access offered today is an information service. Now imagine that this telephone service comes bundled with Internet access, and Congress has just passed a law that Internet access is an information service without modifying or clarifying the definition of information service. This must strengthen the argument that this bundle, which includes telephony, is an information service and, therefore, exempt from Title II regulation. Title II regulation could become easy to evade.

If Congress wants to make sure that Internet access service is regulated as an information service without creating this kind of uncertainty, then Congress needs to pass legislation that does more than simply reversing a finding of fact. The following sections will consider more expansive options.

## 4.2 A New Category for Internet Access Services

Through new legislation, Congress could establish three, rather than two, types of services: telecommunications services, information services, and Internet access services. This would involve rewriting one or both of the definitions of telecommunications and information services to remove the contradictions discussed in the preceding section. It might also involve separating Internet access services from "advanced telecommunications" (as defined in section 706 of the Telecommunications Act of 1996), as was done in [HR15]. Further, the law would establish a new regulatory regime for the new Internet access class. This could include whatever network neutrality rules (or lack thereof) that Congress deems to be appropriate, which should make this an attractive option to those lawmakers who would like to see Congress, rather than the FCC, take the lead on network neutrality. This approach, however, demands legislation that is more comprehensive than we have seen to date.

Decades of decisions by lawmakers, regulators, and courts have brought some degree of clarity over the rules surrounding telecommunications services and information services, and further study is required to determine how much of that would apply to a newly-created legal category for Internet access providers. Thus, lawmakers writing legislation of this kind must

consider a wide range of issues that go well beyond network neutrality. For example, if Internet access service is not an “information service,” a “telecommunications service,” or an “advanced telecommunications service” as defined in Section 706, will providers of Internet access service be viewed as providers or curators of information that are entitled to the right of freedom of expression, as cable TV operators and news websites are [CM14]? If they are viewed as information providers or curators, then under what circumstances is an Internet access provider liable for unlawful transfers of information over its network, as can occur with copyrighted material, child pornography, online gambling, or incitements to violence? Do laws that protect Internet access providers from liability allow or mandate technology designed to detect unlawful transfers, or even block them? Such policies should consider the operating cost externalities, the privacy implications, and the inherently imperfect nature of these tools, which cannot always determine the legality of a transfer correctly [PM14]. Can Internet access providers refuse to provide service to some potential customers? Must they pay into universal service funds, and can they receive universal service funds? In what way are they subject to wiretapping from law enforcement? Do Internet access providers have rights to pole attachments?

Determining whether or how each of these issues may change with new legislation is beyond the scope of this article. A failure to address any one of these issues in an appropriate manner, however, could have significant, unintended consequences. Thus, this option would require a much more thorough investigation than is immediately apparent.

### 4.3 Reimagining the Communications Act

The idea from Section 4.2 of keeping a telecommunications services category for telephony and an information services category for content providers, while creating a new category for Internet access providers, is an attractive strategy for those trying to create the law they wish had been written in 1996. At that time, content and application services such as e-mail and online newsgroups were operating on top of the Internet, while, in many ways, the Internet operated on top of the telephone system. Residential users were using telephone dial-up connections to reach an Internet gateway, and Internet backbone networks were operating over long-distance circuits leased from telephone companies. Thus, the issue of classifying Internet access can be viewed as deciding whether to include the Internet in the layer above it or the layer below it even though neither is a perfect fit. Creating a middle category is, therefore, a reasonable solution.

However, anyone trying to write the perfect legislation for 1996 is creating a law that is already decades out of date. Thus, another option for Congress is to write a new telecommunications act that will serve the nation well in future decades, rather than in decades already past. Today’s Internet does not operate over a telephone network. It is more accurate to say that telephony is just another application—like e-mail, news websites, or social media—and all of these applications operate on top of a common IP-based broadband transmission facility. Cable television pay-per-view services used by a growing number of consumers can also be viewed as an application on top of this shared platform, rather than the separate system it was in 1996. Applications differ in that some, such as telephony and cable television pay-per-view, are typically offered today by a vertically-integrated entity that also provides broadband transmission services, whereas applications such as twitter and nytimes.com are not. Of course, this may change. Moreover, vertically-integrated applications may compete with non-vertically-

integrated applications, such as when IP-based cable TV pay-per-view services compete with IP-based, over-the-top video services. Another difference among applications is that end users access some using a service that is labeled as Internet access, and end users access other applications using a service that is labeled as a specialized or non-BIAS data service, as discussed in Section 3. Nevertheless, all these applications operate over a common platform that uses IP Packet Transfer to move information from place to place without change in form or content. Because that platform is shared, allocating more resources for the user of one application to improve quality of service may reduce the resources available for the user of another application. Sooner or later, policies will be needed that reflect this new reality.

### **PAST**

E-mail	News	Online Shopping
Internet services		
Telephone Transmission Services		

### **FUTURE**

Telephone Service	E-mail	News	Online Shopping
Broadband Transmission Services			

This new, technical architecture has many implications for those who would write a new telecommunications act. First, it has long been the case that the cost of deploying and operating a wired infrastructure depends more on the miles covered than on the amount of information carried, which creates a high financial barrier to enter the market. In 1996, when the underlying wired infrastructure was the telephone network, lawmakers concluded that they had to subsidize providers of telephone service in sparsely populated areas where cost per household was high, and regulate telephone networks everywhere because competition would be limited. There was little need to regulate Internet access providers that offered dial-up service on top of the telephone network because strong competition was likely at this layer. If a new telecommunications act presumes, however, that the underlying infrastructure provides IP-based broadband services and that telephony is just an application, then it is broadband infrastructure, rather than telephone infrastructure, that requires subsidies in rural areas. Moreover, it is broadband Internet access service that may need some kind of regulation to address limited competition. We have already seen the FCC moving in this direction in both universal service policy [FC10a] and network neutrality policy. Indeed, as discussed in [PE06], the technology shift from Internet over dial-up to facilities-based broadband Internet is part of what made network neutrality an important issue in the first place. These trends can eventually be reflected in legislation as well.

The 1996 Telecommunications Act [TA96] included regulations of telephone and cable TV services that presumed that both were vertically integrated. The next telecommunications act will view them as applications. Thus, unlike its predecessor, the next act is likely to include application-layer obligations that apply to both facilities-based and non-facilities-based providers, to the extent possible. This may include common requirements for telephone services to be compatible with E-911 emergency services and common obligations of video distribution services to copyright holders. (Nevertheless, decentralized versions of telephone or video applications may create challenges because there may be no centralized entity in charge to regulate.)

At the same time, the next telecommunications act must accommodate competition between facilities-based and non-facilities-based providers of the same application, as occurs when cable TV pay-per-view competes with over-the-top services like Netflix, and when traditional telephone companies compete with Vonage or Skype. In part, that means addressing the specialized services issues discussed in Section 3, which are at the core of promoting competition and innovation when quality of service matters. It may also include consideration of differences in fees imposed on facilities-based and non-facilities providers.

## 5 Conclusion

In March 2015, the FCC issued a new set of network neutrality rules, and used Title II of the Communications Act to support that decision after finding that broadband Internet access services are telecommunications services. This marks the end of the latest chapter on network neutrality policy, but we are far from the end of the book. Further debate must now occur in the courts, at the FCC, and in Congress.

Based on an examination of Internet technology and architecture, I find that the services provided today by commercial Internet access providers are consistent with the definition of telecommunications services established in the 1996 Telecommunications Act and are not consistent with the definition of information services established in this Act. It will, therefore, be difficult for courts to overturn the FCC's decision on the grounds that the FCC is wrong on the facts, and that the court understands these technical facts better than the expert agency. This does not guarantee that plaintiffs will be unable to find some other grounds for complaint, such as a procedural issue. However, the core of the FCC's legal case, which was built on the arguments in Section 2 and [CP14], is strong.

Nevertheless, actual network neutrality policy is far from clear. The FCC decided not to provide a clear definition of what it now calls non-BIAS data services (and previously called specialized services), and decided not to clarify what regulations are enforceable with non-BIAS data services. As a result, it may be relatively easy to circumvent supposedly "bright-line" rules, such as the prohibition on blocking and paid prioritization. Thus, the FCC has more work to do on network neutrality, and the next decisions made by the FCC could have an even greater impact on actual network neutrality policy than the decision to classify Internet access as a telecommunications service. There is also, still, significant uncertainty over the precise meaning of "unreasonabl[e] interfere[ing] and unreasonabl[e] disadvantage[ing]" [FCC 15]. Future decisions on this issue will greatly determine what Internet access providers can and cannot do to provide superior quality of service for some traffic.

This paper has proposed two sets of policy options for the unresolved issues above. Both options are intended to balance a desire to promote innovation among applications that may benefit from superior quality of service and a desire to prevent Internet access providers with significant market power from using their control over quality of service to become gatekeepers or to seek rents. One such policy would allow reasonable discrimination within a broadband Internet access service and greatly limit the services that can avoid Open Internet rules as non-BIAS data services or specialized services. The other such policy would allow the definition of non-BIAS data services to be much broader, but would establish some Open Internet rules for non-BIAS data services as well.

Finally, those in Congress who are dissatisfied with the FCC's 2015 Report and Order can always change policy by passing new legislation. The simplest way to do this is to pass a law declaring that Internet access services are information services, while keeping the current definitions of telecommunications and information services intact. Yet, this is also the most problematic form of legislation, as it is likely to bring uncertainty and the risk of unintended consequences. The FCC's decision to classify broadband Internet access service as a telecommunications service using the definitions Congress established in 1996 is a finding of fact. If Congress wants a different outcome, it should change the definitions. A more effective approach would be to establish three, rather than two, distinct definitions for telecommunications service, information service, and Internet access service. This is viable, but it raises complex issues that deserve more thorough consideration than one might first imagine. Moreover, this approach may make sense for those who want a law that works well for the last twenty years, but we may need something very different for the next twenty years. Thus, it would make more sense for interested legislators to begin work on the next telecommunications act. The current act was written for a different era.

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