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Washington, D.C. 20554**

In the Matter of)	
)	
Restoring Internet Freedom)	WC Docket No. 17-108

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TABLE OF CONTENTS

Contents

I. BIAS INCLUDES DISTINCT INFORMATION SERVICES AS WELL AS A TELECOMMUNICATIONS SERVICE.	3
1. BIAS includes telecommunications.	3
2. BIAS transmits information of the user's choosing between or among points specified by the user.	3
3. BIAS transmits this information without change in the form or content of the information as sent and received.	11
II. BIAS IS NOT A SINGLE, INTEGRATED INFORMATION SERVICE.	14
4. An information service needs to incorporate information/data processing activities/functions of its own.	14
5. The information/data processing functions included by ISPs in the product offered to subscribers do not turn BIAS into a single, integrated information service.	20
6. The inclusion of applications with the product does not turn BIAS into a single, integrated information service.	23
7. The data processing activities performed as part of IP data transport do not turn BIAS into a single, integrated information service.	28
8. The offering of DNS by ISPs does not turn BIAS into a single, integrated information service.	31
9. The offering of caching by ISPs does not turn BIAS into a single, integrated information service.	38
III. BIAS INCLUDES A DISTINCT TELECOMMUNICATIONS SERVICE.	42

I. BIAS INCLUDES DISTINCT INFORMATION SERVICES AS WELL AS A TELECOMMUNICATIONS SERVICE.

1. BIAS includes telecommunications.

Broadband Internet access service allows subscribers to send and receive IP data packets to and from any computer attached to the Internet. This transmission services constitutes “telecommunications.” The Communications Act defines “telecommunications” as “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.”

2. BIAS transmits information of the user’s choosing between or among points specified by the user.

Broadband Internet access service transmits IP data packets between the subscriber’s devices and other computers attached to the Internet. The IP data packet is handed to the ISP by the Internet Protocol software running on the subscriber’s computer for delivery to another computer attached to the Internet, and is thus “information of the user’s choosing.” The IP data packet handed to the ISP specifies the IP address of the receiving computer. The ISP then cooperates with other networks that are part of the Internet to deliver the IP data packet to its intended destination. Thus, the ISP transmits IP data packets “between or among points of the user’s choosing.”

To explain this in more detail, subscribers use broadband Internet access service to connect one or more devices (e.g., laptops, personal computers, smart phones) to the Internet. When a

subscriber of broadband Internet access accesses or uses Internet content, applications, or services (short: “applications”) available online using its broadband Internet access service, application software installed on the subscriber’s computer communicates with software that’s part of that application and that is installed on another computer attached to the Internet. The subscriber’s software and the software installed on the other computer communicate by exchanging messages with each other. For example, the subscriber’s web browser might exchange messages with a web server operated by the Wall Street Journal using the Hypertext Transfer Protocol (HTTP).

The Internet was designed according to the layering principle. This principle guarantees that designers of application-layer protocols (e.g., the designers of HTTP) do not have to worry about how to get their messages from one instance of the protocol (e.g., the subscriber’s web browser) to another (e.g., the web server of the Wall Street Journal). To do so, they use the services of lower layer protocols. As is required by the layering principle, lower layers are designed to be independent from higher layers. They are not allowed to use a higher-layer protocol, and they are not allowed to make any assumptions about the content or the meaning of the message passed to it by a higher layer protocol. In line with the layering principle, the protocols involved in the Internet are designed so that a protocol at a specific layer at a receiver receives exactly the same object sent by its protocol peer at the source. Thus, protocol designers working on the HTTP protocol can assume that when a browser sends an HTTP message to a web server, the lower-layer protocol used by HTTP to send the message to the web server delivers exactly the message that the browser sent.

An application-layer program at the sender (in our example, the browser) therefore hands its message to a transport-layer protocol (software that is usually part of the device’s operating

system) for delivery to its peer. That transport layer protocol on the sending computer, in turn, communicates with a transport-layer protocol at the receiving computer (i.e. the computer hosting the application) to provide its service. The transport layer protocol, in turn, uses the services of the Internet Protocol, which is part of the Internet layer, to send its message to the transport protocol on the receiving computer. To do so, the transport layer protocol on the sending computer hands over the transport layer message it would like the Internet layer to deliver to the Internet Protocol software running on the computer, along with the IP address of the receiving computer.

This is where broadband Internet access service comes in. Unless they offer applications of their own, ISPs are not involved in the communication between transport-layer protocols or application-layer protocols on the sending and receiving computer. By contrast, Internet Protocol implementations run on the sending and receiving computers that are the original source and ultimate destination of data (e.g., on the subscriber's computer and on the computer hosting the website of the Wall Street Journal) as well as on computers called routers in the core of the network. To implement the service provided by the Internet Protocol, these instances of the Internet Protocol cooperate with each other to deliver IP data packets across the Internet to the end host identified by the destination IP address on the data packet.

To sum up, whenever software installed on one of the subscriber's devices wants to communicate with software on another computer attached to the Internet, it uses the subscriber's broadband Internet access service to exchange messages with its counterpart on that computer. To do so, an Internet Protocol implementation on the subscriber's device (usually part of the device's operating system) takes the message the subscriber's software wants delivered and puts it into an IP data packet. This IP data packet includes both the message that the subscriber wants

to transmit to the receiving computer and some control information. In particular, the IP data packet handed over to the ISP specifies the IP address of the receiving computer.

The NPRM and ISPs argue that broadband Internet access service does not transport information “between or among points of the user’s choosing” because subscribers do not know how their IP data packets are routed across the Internet,³ because they do not know where the computer that they are sending the IP data packet to is geographically located,⁴ and because subscribers use a service called Domain Name System to find the IP address of the computer they want to communicate with.

All of these arguments are incorrect.

First, the definition of telecommunications requires users to choose the “points” it wants its data transmitted to; it does make any reference to how the data gets there. That is not surprising.

Users of telephony services – the quintessential telecommunications service – do not know how their calls are routed over the telephone network. Thus, knowledge of how the information is routed is not and has never been required. Changing the interpretation of “points” so that it requires knowledge about routing would remove telephony services from the telecommunications service category – an absurd result.

Second, it is irrelevant that subscribers do not know where the computer they are sending an IP data packet to is physically located. When placing a call, users specify the destination of the call (“the point of the user’s choosing”) by specifying the phone number they want to call, but the user does not necessarily know where the phone associated with that phone number is located.

³ See, e.g., Federal Communications Commission (2017), par. 29, Comcast Corporation (2017), p. 21, National Cable & Telecommunications Association (2002), p. 19.

⁴ See, e.g., Federal Communications Commission (2017), para 29; Comcast Corporation (2017), p. 21, National Cable & Telecommunications Association (2002), p. 19.

This is particularly true for mobile phone numbers, but also for other types of calls. For example, if two people exchange phone numbers at a party without any additional information and one of them calls the other, the caller most likely does not necessarily know where the phone is located. Thus, the term “points” has always been interpreted as being identified by a numerical address – for telephony, numbers complying with the North American Numbering Plan. IP addresses comply with the numbering scheme used to identify devices attached to the Internet and are no different in kind. Requiring knowledge about the physical location of the device associated with the numerical address specified by the user would be a departure from the FCC’s longstanding interpretation and would remove telephony service from the definition of telecommunications service as well.

Third, the NPRM and ISP commenters argue that broadband internet access service does not transmit information between points of the user’s choosing because users generally do not know the IP address of the computer they want to communicate with.⁵ Instead, users often use so-called host names (e.g. www.wsj.com) to specify destinations on the World Wide Web.

However, the Internet Protocol software does not understand host names, it only understands IP addresses. Thus, before an application can send an IP data packet on behalf of the user using the broadband Internet access service, it needs to find the IP address of the computer it wants broadband Internet access service to deliver the packet to. To do that, the application uses the help of an Internet directory service, the Domain Name System, to look up the IP address for the destination computer.

⁵ See, e.g., Verizon (2017), p. 41.

For example, a browser who would like to access the website of the Wall Street Journal needs to identify the IP address associated with www.wsj.com. To solve this problem, the Internet offers a directory service called the Domain Name System (DNS). The application (here, the browser) calls on program installed on the user's device called "DNS client", asking for the IP address associated with the host name (here: www.wsj.com) of the computer the application wants to send data to.⁶ The DNS client uses the broadband Internet access service to send a query to a Domain Name Server. Once the DNS client receives a reply with the IP address for the host name from the Domain Name Server, it passes the IP address back to the application. The application (here, the browser) now has all of the information it needs to start communicating with the application on the other computer (here, the web server of the Wall Street Journal) and passes two pieces of information to the Internet Protocol software on the user's device: the message it wants to send to that application (here: an HTTP message) and the IP address of the computer on which that application is located.⁷ The Internet Protocol software then uses this information to construct an IP data packet and sends it to the ISP for delivery to the desired destination. Thus, when a user's computer sends an IP data packet to the broadband Internet access service for transmission, that IP data packet includes the IP address of the desired destination that was specified by the user's application that is sending the data. Thus, the user's device asks the broadband Internet access to transmit the IP data packet to a "point of the user's choosing."

⁶ For a more detailed description of this process, see Kurose & Ross (2016), p. 127-128. The description in the text closely follows the language in that section.

⁷ For simplicity, this description omits the services of the transport layer. Application-layer services use transport layer services to exchange message with each other. The transport layer protocols, in turn, use the services of the Internet layer, including the services of the Internet Protocol, to send their messages across the Internet.

However, the definition of telecommunications does not constrain how the user identifies the numerical identifier of the device it wants the provider to transmit information to and from. In the context of telephony service, it doesn't matter whether a user receives a phone number orally from a friend, takes it from a signature block in an email, or looks it up in an electronic directory service. All that matters is that a user specifies the phone number it wants to reach when it places the call, and that makes this phone number "a point of the user's choosing."

Similarly, it does not matter how a user identifies the IP address of the device it wants to exchange data with. An application might use the help of a directory service to identify the IP address of the host it wants to communicate with, but it's still the application (on behalf of the user) which specifies the IP address of the host it wants its message to be delivered to, and the user's Internet Protocol software puts that IP address on the IP data packet before it is sent into the network. Thus, independent of how the application got the IP address, any IP data packet that the user's device sends into the network specifies the IP address of the desired destination that has been chosen by the user's application, making the destination a "point of the user's choosing."

Some commenters put weight on the fact that a specific host name might be linked to a number of IP addresses.⁸ For example, when a website is hosted on a content delivery network, the content delivery network has copies of the website on various servers around the country. However, this does not change anything regarding the classification of the transmission. First, the user does not care where the website is physically located, and the location of the website does not matter. Second, if a website is hosted on a content delivery network, the Domain Name

⁸ See, e.g., AT&T Inc. (2014), p. 70 ; Verizon Verizon (2017), p. 41.

System still replies to the user's DNS client with a specific IP address. The subscriber's application then specifies that IP address as the intended destination for its messages. Thus, when the resulting IP data packet to the computer hosting the web page is sent into the network for delivery, it clearly specifies the intended destination of the packet. Some commenters suggest that because the DNS is involved in the selection of the IP address that is ultimately sent to the subscriber's DNS client and subscribers often use DNS servers operated by their ISPs, this means that the ISP ultimately selects the destination of the data, not the subscriber. This argument is based on a misunderstanding of the operation of the Domain Name System. The Domain Name System is a large, distributed database. The ISP's domain name server does not determine which of several possible IP addresses to provide back to the subscriber's DNS client. Instead, this choice is made by the Content Delivery Network based on its agreement with the provider of the website. In essence, it's as if the electronic directory service for the telephone network would call the person the user wants to call and ask which number it would like to be called at.⁹ Thus, even though it is the Domain Name Server that the user contacted (which may or may not be operated by the user's ISP) that delivers the destination IP address to the user's DNS client, it is only the messenger.

Finally, some commenters suggest that ISPs do not transmit data between or among points of the user's choosing because a website consists of many different objects that, unbeknownst to the user, might be located on many different servers.¹⁰ Again, this argument is based on a misunderstanding of how HTTP works.¹¹ When a browser requests a website, the web server contacted by the browser sends back messages that include all of the objects that are part of the

⁹ For a more technical description, see Kurose & Ross (2016), p. 150-153.

¹⁰ See, e.g., AT&T Services (2017), p. 70.

¹¹ For a detailed description, see Kurose & Ross (2016), pp. 98-103; pp. 500-505.

website with their URLs. The user's browser then requests all of these objects. For each object, it identifies the IP address where the object is located using the Domain Name System, and then uses the Internet Protocol on the user's computer to exchange messages with its counterpart on that computer to deliver that message. Any IP packet that is sent on behalf of the user's browser by the user's Internet Protocol, includes the IP address of the receiving computer as specified by the browser. Thus, every IP data packet sent as part of that process is sent to a point of the user's choosing, even if the parts of a website might in fact be located on different computers.

Finally, the fact that some elements included in the website might be less desirable to the user (AT&T's comments mention the ad content)¹² does not change the fact that the user's browser requests the ad content included in the website as part of the overall process. Ultimately, this is no different from telephony. Even though users are not always happy with what the person they called says on a phone call, the phone company still transmits information between points of the user's choosing.

3. BIAS transmits this information without change in the form or content of the information as sent and received.

Finally, the ISP commenters make various arguments suggesting that various forms of protocol processing happening as part of the transmission of IP data packets result in a "form or content of the message as sent and received."¹³ For example, Comcast mentions blocking of data packets

¹² AT&T Services (2017), pp. 70-71.

¹³ See, e.g., Comcast Corporation (2017), p. 22

as part of firewalls, protocol processing to “interweave IPv4 with IPv6 packets”, and that “the nature of Internet transmissions necessarily entails a ‘change in the content’ of the information.”

First, in line with the layering principle, the Internet layer does not change the message given to it by the higher layer protocols on the sending computer (i.e. the payload of the IP data packet). In general, the Internet protocol does not change the header of the data packet (which includes information that instances of the IP protocol need to communicate and cooperate with each other) as the data packet travels across the network.

More generally, these arguments ignore the FCC’s longstanding, nuanced approach towards protocol processing. While certain forms of protocol processing, particular certain forms of protocol conversions, were classified as enhanced services under the framework developed by the Computer Inquiries, the FCC deliberately excluded protocol processing as part of the basic transmission services that transmitted data end-to-end with no net protocol conversion from the enhanced services definition. Thus, data transport over packet-switched networks using the X.25 protocol, the Frame Relay protocol, or the Internet Protocol were classified as basic services.¹⁴ Broadband Internet access service receives IP data packets from the user’s computer and delivers IP data packets to its destination. Thus, there is no net protocol conversion, so protocol processing as part of the transmission of the IP data packets does not constitute a change in the form or content of information.

As part of these orders, the FCC also explicitly rejected the arguments that changes made to a packet header that occur during network transmission happening as part of the general operation

¹⁴ See, e.g., Federal Communications Commission (1980), paras 94-96; FCC 1982 Basic Packet Switching Order Federal Communications Commission (1982); Federal Communications Commission (1983); Federal Communications Commission (1995a); Federal Communications Commission (2008a).

of the transmission service, are part of the basic transmission service and, “without more, fail to alter the customer’s data in manner that results in the delivery of “different” data to the termination point.”¹⁵

Moreover, the FCC adopted certain exceptions to its general rule that net protocol conversions constitute enhanced services. One of them applied to cases in which the network infrastructure was transitioning from one technology to the other, and the net protocol conversion was necessary to allow the old and the new technology to continue to talk with each other, which is exactly what protocol conversion between IPv4 and IPv6 is meant to achieve.

As to firewalls, firewalls do not change the format or content of the information, they just drop certain packets. Prior order explicitly discussed the use of choke techniques to avoid excessive calls basic service as part of the basic service, or the dropping of packets when a user was sending too much traffic into the network which also did not change the nature of the basic service.¹⁶

After the adoption of the 1996 Act, the FCC explicitly stated that these earlier interpretations and exceptions under the Computer Inquiries Framework carried over to its interpretation of the 1996 Telecommunications Act.¹⁷

Finally, changing this interpretation would not only constitute a radical departure from long-standing precedents, but would also be unreasonable under Chevron Step 2, because it would remove traditional wireline and mobile telephony from the scope of Title II as these networks transition towards using the Internet Protocol to offer traditional telephony services.

¹⁵ See, e.g., Federal Communications Commission (1995a), par. 29-30.

¹⁶ See, e.g., Federal Communications Commission (1995a), par. 31.

¹⁷ See, e.g., Federal Communications Commission (1996), par. 106-107.

In sum, broadband Internet access service includes “telecommunications”, since the service transmits information of the user’s choosing without change in the content and meaning of the information as sent and received by transmitting IP data packets on behalf of the user’s applications to and from computers attached to the Internet.

II. BIAS IS NOT A SINGLE, INTEGRATED INFORMATION SERVICE

4. An information service needs to incorporate information/data processing activities/functions of its own.

According to the NRPM and ISP commenters, Broadband Internet Access Service is an information service because it enables subscribers to access and use Internet applications, content, and services offered by third parties.

The Act defines “information service” as “the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.”¹⁸

The NPRM and ISP commenters argue that Broadband Internet Access Service “offers a *capability* for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information”¹⁹ (emphasis added) simply because it enables its subscribers to access and use third-party services providing these functionalities, regardless of whether Broadband Internet Access Service incorporates any of these data-processing functionalities itself.²⁰

¹⁸ 47 U.S.C. § 153 (24).

¹⁹ Federal Communications Commission (2017), par. 28.

²⁰ Federal Communications Commission (2017), par. 27. Comcast Corporation (2017), p. 12-13: As the NPRM notes, BIAS satisfies each aspect of this definition. It plainly “offer[s]” consumers the “capability” to “acquir[e]”

Under this interpretation, an information service does not need to include any information processing functionalities of its own, as long as it enables subscribers to use third-party services that do so. This would be a fundamental departure from how FCC has understood the term, both under the 1996 Telecommunications Act and under its predecessors. Under the FCC's longstanding interpretation of the relevant terms, the service itself needs to provide at least one of the information processing functionalities listed in the definition to qualify as an information service.

Pre-1996 Frameworks

In its comments, AT&T claims that “the direct antecedents of today’s Internet access services, with the same salient features, were uniformly considered “information services” (or “enhanced services”) rather than “telecommunications services” (or “basic services”).”²¹

However, the precedents cited by AT&T are not relevant to the classification of today’s broadband Internet access services. They do not stand for the proposition that the providers of data transmission services were classified as “information services” or “enhanced services” under the pre-1996 frameworks simply because they transmitted data from information services generated by others or offered access to third-party databases. Instead, the services discussed in the precedents were classified as “information services” or “enhanced services” because they incorporated data-processing or data-storage functions as part of their own service that met the definition of “information service” or “enhanced service.” These functions, however, are absent from today’s broadband Internet access services.

and “retriev[e]” information from websites and other sources of online content [...] Consumers use BIAS to “generate[]” and “mak[e] available” information by creating and uploading new content, such as by emailing pictures and videos to friends and family or uploading them to “social media websites like Facebook.”³³ Finally, users can “transform[]” and “process[]” information because BIAS enables the manipulation of online content, and users may “utiliz[e]” information by interacting with stored data—including not only the user’s own data stored on remote servers, but also data made available by any other person or entity connected to the Internet, ranging from individual bloggers to major edge providers.”

AT&T Services (2017), p. 68-69: [Internet access] “offer[s] consumers the “capability” ” to “acquir[e]” and “retriev[e]” information from websites, to “stor[e]” information in the cloud, to “transform[]” and “process[]” information by translating plain English commands into computer protocols, to “utiliz[e]” information through computer interaction with stored data, and to “generat[e]” and “mak[e] available” information to other users by sharing files. Indeed, the whole point of Internet access is to offer the “capability” to obtain and manipulate the information stored on the millions of interconnected computers that constitute the Internet.

Verizon (2017), p. 35: “Broadband Internet access service qualifies as an information service under the plain terms of the Telecommunications Act. It “offer[s]” consumers the “capability” of “acquiring” and “retrieving” information from websites, “storing” information in the cloud, “transforming and processing” information by manipulating images and documents, and “generating” and “making available” information to others through social media – among a multitude of other uses.”

²¹ AT&T Services (2017), p. 61. See also the heading of the relevant section in AT&T's comments: “The “Gateway” Functionality Performed by Broadband Internet Access Is an “Information Service”/“Enhanced Service” Under the Pre-1996 Act Definitions That Congress Codified in 1996.” AT&T Services (2017), p. 61; AT&T Services (2017), p. 67: “In short, under both the MFJ and the Computer Inquiries regime, the “information service”/“enhanced service” category encompassed services that provided the same functions as, and bore a striking resemblance to, the most pared-down Internet access services available today.”

Computer Inquiries

The framework established by the Computer Inquiries established two categories of service: “basic services,” which were regulated under Title II of the Communications Act, and “enhanced services,” which were regulated under the FCC’s ancillary authority. Under the Computer II framework, “basic service” was the offering of a “pure transmission capability over a communications path that is virtually transparent in terms of its interaction with customer supplied information.”²² “Enhanced services” were defined as “services, offered over common carrier transmission facilities used in interstate communications, which employ computer processing applications that act on the format, content, code protocol, or similar aspects of the subscriber’s transmitted information; provide the subscriber additional, different, or restructured information; or involve subscriber interaction with stored information.”²³

AT&T’s comments suggest that under this framework, “any ‘gateway’ functionality designed to give end users access to third-party databases,” a functionality AT&T describes as comparable to today’s Internet access, was classified as an “enhanced service”:

Any offering was an “enhanced service” if it “involve[d] subscriber interaction with stored information.” 47 C.F.R. § 64.702(a). Thus, any “gateway” functionality designed to give end users access to third-party databases was deemed an “enhanced service,” with a narrow “adjunct-to-basic” exception for computerized functionalities designed merely to facilitate the completion of voice telephone calls. In the Commission’s words, “[a]n offering of access to a data base for the purpose of obtaining telephone numbers may be offered as an adjunct to basic telephone service; *an offering of access to a data base for most other purposes is the offering of an enhanced service.*”²⁴ (emphasis added by AT&T, footnotes omitted)

This description of the FCC’s classification of gateway services under the Computer Inquiries is highly misleading.

First, AT&T’s description seems to imply that under the Computer II Framework, providing access to third-party databases meets the definition of an enhanced service simply because it “involves subscriber information with stored information” offered by a third party. This seems to suggest that a service does not need to include information-processing functionalities of its own to qualify as an enhanced service, as long as it provides access to third-party services providing these functionalities. However, this interpretation directly contradicts the language and structure of the enhanced services definition, and the FCC’s precedents do not support this proposition.

²² FCC Computer II Final Decision Federal Communications Commission (1980), par. 96.

²³ 47 CFR 64.702(a).

²⁴ See AT&T Services (2017), p. 66. The quote by the FCC is followed by a footnote citing Federal Communications Commission (1985a) (“NATA Centrex Order”). US West Communications Petition Federal Communications Commission (1995b), par. 27-31. See generally Computer II Federal Communications Commission (1980), par. 98. Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934 Federal Communications Commission (1996) (“Non-Accounting Safeguards Order”).

Under the Computer II Framework, the FCC has defined “enhanced services” as

[S]ervices, offered over common carrier transmission facilities used in interstate communications, which *employ computer processing applications* that act on the format, content, code protocol, or similar aspects of the subscriber’s transmitted information; *provide the subscriber additional, different, or restructured information*; or *involve subscriber interaction with stored information*. Enhanced services are not regulated under Title II of the Act. (emphasis added)²⁵

This phrasing suggests that the enhanced service itself had to “employ,” “provide,” or “involve” the listed functionalities. This interpretation is supported by the FCC’s description of the category in its Computer II Final Decision:

Under this scenario, the regulatory demarcation between basic and enhanced services becomes relatively clear-cut. An enhanced service is any offering over the telecommunications network which is more than a basic transmission service. *In an enhanced service, for example, computer processing applications are used to act on the content, code, protocol, and other aspects of the subscriber’s information.*³³ *In these services additional, different, or restructured information may be provided the subscriber through various processing applications performed on the transmitted information, or other actions can be taken by either the vendor or the subscriber based on the content of the information transmitted through editing, formatting, etc.* Moreover, *in an enhanced service the content of the information need not be changed and may simply involve subscriber interaction with stored information.*²⁶ (emphasis added)

Second, “the Commission’s own words” cited by AT&T are taken out of context and unrelated to the provision of access to third-party databases by services that do not include information-processing or information-storage functionality of their own. Contrary to AT&T’s suggestion, they do not stand for the general proposition that offering access to a third-party database for purposes other than obtaining phone numbers was classified as an “enhanced service” under the FCC’s Computer II approach. As the sentences surrounding the quote in the FCC’s Order make clear, the FCC’s quote cited by AT&T summarizes the likely scope of the adjunct-to-basic category when a telephone company offering “basic” telephony service also provides access to a database *of its own*.²⁷ It does not describe cases in which a telephone company provides access to

²⁵ §64.702(a).

²⁶ Federal Communications Commission (1980), para 97.

²⁷ “When a customer uses directory assistance, that customer accesses information *stored in a telephone company data base*. Ordinarily, assuming the data base was in a computer, such a service would be considered enhanced. “Dial-it,” for example, was a service offered by AT&T which allowed information about news, stock prices, etc., to be stored within the network for retrieval by subscribers. In the Reconsideration, we found Dial-it to “constitute more than the common carrier offering of a channel of communication and [therefore to] clearly fall outside the scope of a basic service.” The only significant difference between Dial-it and directory assistance is that the latter service provides only that information about another subscriber’s telephone number which is necessary to allow use of the network to place a call to that other subscriber. An offering of access to a data base for the purpose of

a third-party database, nor does it describe the scope of the adjunct-to-basic category when the provider provides a different basic service such as basic packet-switching services.²⁸

Third, the “gateway” services offered by AT&T or local telephone companies that allowed customers to reach specific enhanced service providers were not classified as “enhanced services” on the grounds that they transmitted information to and from third-party providers of enhanced services, but because they included information-processing or information-storage functionalities of their own that met the definition of an enhanced service – functions that today’s Broadband Internet Access does not include.

AT&T discusses the classification of a “gateway” service planned by Bell Atlantic as “one example” of the FCC’s alleged policies that “an offering of access to a data base for most other purposes [i.e. other than for the purpose of obtaining telephone numbers] is the offering of an enhanced service” and that “any ‘gateway’ functionality designed to give end users access to third party databases was deemed an ‘enhanced service’” because providing access to a third-party database “involve[d] subscriber interaction with stored information.”²⁹ However, the classification decision does not mention either of these arguments.³⁰

Instead, the classification decision is based on three aspects of the “gateway” service itself: protocol conversion between the consumer’s device and the enhanced service providers that are available through the gateway service; the provision of information about the providers included in the service; and a way to search the database of providers available through the gateway service using key words. As the FCC explains in the Order, each of these aspects include information-processing and information-storage functionalities of their own that meet the definition of an “enhanced service.”

According to the FCC’s Order, the “gateway service [proposed by Bell Atlantic] will allow a customer with a personal computer and a communications capability to reach an array of enhanced services.”³¹

Protocol Conversion

At the time, packet-switched networks that transmitted data to and from enhanced service providers used a protocol called X.25. The computers hosting the enhanced service provider’s service attached to the networks used this protocol as well. However, many customers’ computers did not support the X.25 protocol. Instead, they used asynchronous protocols to send and receive data over ordinary phone lines. Thus, to allow customers of the gateway service to communicate with the enhanced service available through the service, someone needed to

obtaining telephone numbers may be offered as an adjunct to basic telephone service; an offering of access to a data base for most other purposes is the offering of an enhanced service.” (emphasis added; footnotes omitted) Federal Communications Commission (1985a), para 26.

²⁸ Contrary to AT&T’s characterization of the adjunct-to-basic exemption, the adjunct-to-basic category is not restricted to basic telephony services, but also applies to other basic services such as the transparent transmission of data packets.

²⁹ AT&T Services (2017), p. 67.

³⁰ Federal Communications Commission (1988), par. 5-7.

³¹ Federal Communications Commission (1988), para 3.

convert the data from the asynchronous protocols to X.25 and vice versa, a service called “protocol conversion.”³² In other words, because the devices of enhanced service providers and of the customers interested in these enhanced services did not speak the same language, someone needed to serve as a translator. In a gateway service, this functionality was offered by the gateway service itself.³³ Under the Computer Inquiries, however, the performance of this specific form of protocol conversion was classified as an “enhanced service.”³⁴ By contrast, if the gateway provider had merely been transporting X.25 data packets between customers and enhanced service providers or if it had been converting the asynchronous data received from the customer to X.25, transporting the data packets over X.25 packet-switched networks, and converting them back from X.25 to the asynchronous protocol before delivering them to the enhanced service provider, that service would have been classified as a basic service.³⁵

Today’s Broadband Internet Access services do not include the kind of protocol conversion offered by the gateway service because all computers attached to the Internet use the same protocol – the Internet Protocol (IP) – to communicate with each other, so the problem Bell Atlantic’s gateway service was addressing no longer exists. In other words, when everybody speaks the same language, there is no need for a translator. The functionality offered by today’s ISPs – the transparent transmission of data packets that enter and exit the network in the same protocol – has been consistently classified as a “basic service” (and, after the adoption of the 1996 Telecommunications Act, as a “telecommunications service”).

List of providers available through the gateway

Bell Atlantic’s proposed gateway service connected customers dialing into the gateway service to a computer operated by the provider of the gateway service that “provides a menu that lists enhanced service providers available through the gateway. [...] From the menu, the customer may view a description of the [enhanced] provider’s service and pricing structure.”³⁶ According to the FCC’s classification of the service, this functionality “involve[s] interaction with stored

³² Federal Communications Commission (1985b), par. 11-22.

³³ Providers of gateway services were not the only providers offering these services. For example, in the mid-1980s, enhanced service providers were offering these services themselves, and the Bell Operating Companies offered services that combined asynchronous/X.25 protocol conversion with the transport of data packets over X.25 networks. See Federal Communications Commission (1985b), pp. 1058-1059, paras 1-3.

³⁴ “In addition, the gateway employs protocol processing that the Commission defines as enhanced.” FCC 1988 Atlantic Gateway Order, p. 6046, para 7. That’s because there is a net protocol conversion (i.e. data enters the gateway provider’s network in one format (asynchronous protocol) and leaves it in another format (X.25 protocol) and vice versa) and none of the FCC’s categories for nevertheless treating the protocol conversion as basic apply. For a discussion of the reasoning underlying the classification of asynchronous to X.25 protocol conversion as an enhanced service, see Federal Communications Commission (1985b) (Classifying protocol conversion between asynchronous protocols and X.25 as an enhanced service).

³⁵ See, e.g., Federal Communications Commission (1985b), par. 78-79 and p. 1066, para 21 (“Were the networks merely to perform such asynchronous to X.25 conversion at one end of a call, and perform the reverse conversion at the other end, the end-to-end service would be basic under Computer II because no net protocol conversion would occur.”).

³⁶ Federal Communications Commission (1988), par. 4.

information” and “provide[s] the subscriber additional, different, or restructured information” as required by the definition of an enhanced service.³⁷

This functionality is not part of today’s Broadband Internet Access services. Today’s Internet service providers do not offer a comprehensive list of all of the Internet applications, content, and services accessible through their Internet access service. Instead, they provide access to the full Internet, allowing subscribers to send and receive IP data packets to and from any computer attached to the Internet. ISP subscribers independently identify the applications, content, and services they want to use, and simply use broadband Internet access service to communicate with these services.

Keyword search of listings for services available through the gateway

When it connected customers dialing into the gateway service to a computer operated by the provider of the gateway service, that computer also provided customers with a key word index – an alternative way to view the enhanced service providers available through the gateway. From the key word index, the customer could view the subset of enhanced service providers associated with a specific key word. According to the FCC, this “involve[s] subscriber interaction with stored information and content restructuring under the [enhanced services] definition.”³⁸

According to AT&T, this key word search functionality is comparable to today’s DNS service, an argument we reject below.

In sum, Bell Atlantic’s gateway service was classified as an enhanced service because it provided information-processing and information-storage functionalities of its own, not simply because it involved subscriber interaction with third-party databases or provided access to third-party enhanced services. Today’s broadband Internet access does not include equivalent functionality. Thus, the classification of Bell Atlantic’s gateway service is not instructive for the classification of today’s broadband Internet access services.

5. The information/data processing functions included by ISPs in the product offered to subscribers do not turn BIAS into a single, integrated information service.

³⁷ Federal Communications Commission (1988), par. 6-7.

³⁸ Federal Communications Commission (1988), par. 5.

Opponents of Title II classification emphasize that Bias offerings include a variety of data processing functions. Firstly, these include consumer-facing applications such as “email, data storage, parental controls, unique programming content, spam protection, pop-up blockers , instant messaging services, on-the-go-access to WiFi hotspots and various widgets, toolbars and application”.³⁹ Secondly, they also include data processing functions within the network. Finally, DNS and caching receive particular attention.⁴⁰

By suggesting that the data processing functionalities associated with BIAS transform the entire product into an information service, these comments misrepresents the classification framework applicable under the Telecommunications Act. This framework distinguishes between *three* possible classification outcomes: Firstly, one might conclude that relevant data processing functions qualify as network management services, such that the product is solely a telecommunications service. Secondly, as opponents of Title II would have it, one might conclude that the telecommunications component is not “offered” as a separate service but instead is “part and parcel” of a single, integrated information service.⁴¹ There is a third possibility, however: the product may simply be bundled offering comprised of separate, distinct information and telecommunication services As recognized by the FCC in the Stevens Report, distinguishing between the second and third outcomes turns on the question “whether, on the one hand, an entity is providing a single information service with communications and computing components, or, on the other hand, is providing two distinct services, one of which is a telecommunications service.”⁴² It is this final question that the industry comments fail to address, and which ultimately precludes

³⁹ AT&T Services (2017), p. 8081.

⁴⁰ Comcast Corporation (2017) p. 17 (DHCP and DDoS Protection), p. 22 (firewalls, IPv4 to IPv6 conversion). Federal Communications Commission (2017). AT&T Services (2017) p. 71 (protocol conversion). Verizon (2017), fn. 118 (IP address generation & assignment, security measures.)

⁴¹ Supreme Court of the United States (2005), p. 2692.

⁴² Federal Communications Commission (1998a), par. 60 (‘Stevens Report’).

the aforementioned data processing functions from transforming BIAS into a single, functionally integrated information service.

The Court in *Brand X* offers important guidance on how to distinguish between these two cases: “The entire question is whether the products here are functionally integrated (like the components of a car) or functionally separate (like pets and leashes).”⁴³ “That question”, the Court explains “turns not on the language of the Act, but on the factual particulars of how Internet technology works.”⁴⁴ Further on, the Court specifies that this question of “functional integration” turns on whether the telecommunications component retains an independent function besides the transmission of the bundled information service, noting that “the high-speed transmission used to provide cable modem service is a functionally integrated component of that service because it transmits data *only in connection with* the further processing of information and is necessary for Internet service.”⁴⁵ In short, therefore, a telecommunications component is becomes part of a single, integrated information service if it can be used exclusively to make use of said information service. Conversely, it is functionally separate when it can also be without those services.⁴⁶ As will be addressed below, BIAS is not functionally integrated with any of the information services offered by ISPs, leading to the conclusion that BIAS is a bundled offering of separate telecommunications and information services.

⁴³ Supreme Court of the United States (2005), p. 2705.

⁴⁴ Supreme Court of the United States (2005), p. 2705.

⁴⁵ Supreme Court of the United States (2005), p. 2692.

⁴⁶ Supreme Court of the United States (2005), p. 2692.

6. The inclusion of applications with the product does not turn BIAS into a single, integrated information service.

ISPs offer various applications in conjunction with their BIAS service, such as “email, data storage, parental controls, unique programming content, spam protection, pop-up blockers, instant messaging services, on-the-go- and various widgets, toolbars and application”.⁴⁷ These applications may qualify as information services, to the extent that they “offe[r] a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications.”⁴⁸ However, these perks are not “functionally integrated” with the telecommunications component of internet access, since BIAS users are able to use their connection for the purpose of third-party apps, and do so “without” using any their ISPs’ applications.⁴⁹

Opponents of Title II classification suggest that this element of user choice is irrelevant, citing the Cable Modem Order’s claim that cable modem service is an information service “regardless of whether subscribers use all of the functions provided as part of the service, such as e-mail or web-hosting, and regardless of whether every cable modem service provider offers each function that could be included in the service.”⁵⁰ A similar view is also suggested in the NPRM.⁵¹

However, this construction misrepresents the Cable Modem Order, and also defies the FCC’s subsequent explanation of this order in *Brand X*, and, ultimately, the Supreme Court’s own

⁴⁷ AT&T Services (2017), p. 80-81.

⁴⁸ 47 U.S.C. § 153(24).

⁴⁹ Supreme Court of the United States (2005), p. 2709.

⁵⁰ Federal Communications Commission (2002), par. 38. See also: AT&T Services (2017) p. 81; Comcast Corporation (2017) p. 18-19.

⁵¹ Federal Communications Commission (2017), par. 28.

interpretation of that Order in that case. In each of these instances, the classification of BIAS as an information service was ultimately premised on the finding that it cannot be used without an information service provided by the ISP, namely DNS. This is evident in the language of the Cable Modem Order itself, which notes that “some cable modem service users may choose not to use the e-mail or webhosting, for example, that is provided with their cable modem service” but, “nearly every cable modem service subscriber, however, accesses the DNS that is provided as part of the service.”⁵² The FCC further clarified the meaning of this passage in their brief for Brand X:

“As provided to the end user,” the “telecommunications component” of cable modem service is not offered “separate[ly] from the data-processing capabilities of the service,” but “is part and parcel of” the service being offered. Thus, “the transmission of information to and from” the cable operator’s “computers may constitute telecommunications,” as does the transmission of information in connection with a traditional ISP or other information service. *But, because the cable operator does not offer transparent transmission capacity in such a way that the subscriber can use it without a corresponding change in the form or content of the information transmitted, the cable operator is not providing a telecommunications service.*⁵³ (emphasis added)

The Supreme Court then followed the same approach in *Brand X*, noting that “the high-speed transmission used to provide cable modem service is a functionally integrated component of that service because it transmits data *only in connection with* the further processing of information and

⁵² Federal Communications Commission (2002), fn. 153.

⁵³ Federal Communications Commission (2005a), p. 23-24.

is necessary for Internet service,” and therefore upholding the Commission’s classification since “[a] user cannot reach a third-party’s Web site without DNS.”⁵⁴

The centrality of DNS to the above precedents is Prepaid Calling Card Orders of 2005. Here, the FCC further clarified its understanding of the Cable Modem Order, driving home the point that telecommunications components are not functionally integrated with an information service so long as they can be used independently of said service:

We also disagree with AT&T’s argument that our Cable Modem Ruling stands for the proposition that a service that makes information available cannot be classified as a telecommunications service, even if the information capability is not used. In that case, the Commission stated that not all cable modem subscribers use e-mail or web-hosting that is provided with the service, but that nearly every subscriber uses the domain name system that is provided. Given the availability and use of these functions, the Commission found that cable modem service is offered to customers as a single, integrated information service, and that the underlying telecommunications cannot be separated from the data processing capabilities.⁵⁵

Following this same logic, the FCC concluded that calling cards, which offered users ordinary mobile telephony as well as the additional option to listen to carrier-supplied information services relating to e.g. current news and stocks, include a separate offering of telecommunications.⁵⁶ In the 2006 order, for instance, the FCC observed that “an individual may use [the calling card service] to make a long distance call *without* obtaining [information services] or otherwise

⁵⁴ Supreme Court of the United States (2005), p. 2709. (emphasis added)

⁵⁵ Federal Communications Commission (2005b), par. 20.

⁵⁶ Federal Communications Commission (2005b), par. 20.

accessing the information made available with the card. That card and other menu-driven prepaid calling cards are offered to consumers, in large part, as separate and distinct telecommunications service that is packed with additional capabilities. But even if those additional capabilities are classified as an information service, the packaging of these multiple services does not itself transform the telecommunications component of these cards into an information service.”⁵⁷ (emphasis added). The same conclusion was also reached 2008 Intercall Order, which concerned a joint offering of videoconferencing combining various call management features such as validation functions, collect billing and participant information: “Consistent with the decision in the *Prepaid Calling Card Order*, these separate capabilities are part of a package in which the customer can still conduct its conference call *with or without accessing these features*. These features, therefore, are not sufficiently integrated into the offering to convert the offering into an information service.”⁵⁸ (emphasis added)

Finally, the above theory was recently reaffirmed and elaborated on in the *Cisco Webex Order*, which concerned a joint offering of over-the-top video conferencing features via a desktop application (“the Desktop Application”) with a PSTN telephony feature (“PSTN Minutes”).⁵⁹ PSTN Minutes could be used independently of the Desktop Application to perform regular voice calls. Critically, the FCC concluded that Cisco’s PSTN telephony feature was a “telecommunications service” when used without the Desktop application (i.e. the information service). The FCC concluded that the PSTN telephony component lost its independent identity as a distinct telecommunications service and became part of a single, integrated information service only insofar as it is used in conjunction with the Desktop Application. Crucially, the FCC observed

⁵⁷ Federal Communications Commission (2006), par. 15.
See, generally: Federal Communications Commission (1985b).

⁵⁸ Federal Communications Commission (2008b), par. 13.

⁵⁹ Federal Communications Commission, 2016 #9218}, par. 7-9.

that numerous features of the service were available only when both components were used in conjunction, since the Desktop Application interacts closely with the data stream provided through the PSTN Minutes calls, enabling users to display “meeting participants, whose phone is muted, the audio option each participant used to join the meeting, which participants are sharing video and which are actively speaking,” and to “mute, unmute, eject participants, grant and remove access to chat and sharing features, shift the focus of the video option, and transfer host status to another participant.”⁶⁰ In this light, the FCC concluded that the PSTN Minutes were functionally integrated in the service *when used in conjunction with the Desktop Application*:

“[T]he only way to receive this fully integrated functionality is to buy and use the Desktop Application the Cisco PSTN Minutes, rather than some other audio option. Although it is possible to sue the Cisco PSTN Minutes without the collaboration service, we do not believe that this mere possibility diminishes the functional integration when the Desktop Application and the Cisco PSTN Minutes are used together. Unlike the services in the *Prepaid Calling Card Order* which were incapable of being used simultaneously, here the services are capable of – and are – used together and exhibit functional integration when they are so used. Rather, the Minutes are integrated into the Desktop Application in a way that provides WebEx users *with functionality that is not available to users who opt to use an audio solution other than the Cisco PSTN Minutes*.⁶¹

The notion that the bundled offering information service applications by ISPs transform BIAS into an integrated information service would not only be a radical departure from controlling precedent; it is also be plainly unreasonable. After all, such a construction of the Act would allow providers

⁶⁰ Federal Communications Commission (2016), par. 22.

⁶¹ Federal Communications Commission (2016), par. 24. (emphasis added)

of telecommunications services to evade Title II regulation altogether simply by adding one or more extraneous information services to the overall package offered to their customers. Thus, effectively, this reading would therefore allow service providers to evade regulation under Title II altogether. For instance, one outcome of this logic is that telephony providers could qualify as integrated information services simply by including a bundled offer of voicemail service, or some other edge service that “offer[s] a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications.”⁶² In sum, therefore, to ensure that Title II retains any meaning, the Telecommunications Act must be interpreted such that a telecommunications component is not considered “part and parcel” of a single integrated information service merely because it is sold in conjunction to complimentary applications that are sold in conjunction by the ISP. Instead, telecommunications services can only be considered functionally integrated if and when they “transmi[t] data only in connection with the further processing” of bundled information services and are specifically integrated with that service.⁶³

7. The data processing activities performed as part of IP data transport do not turn BIAS into a single, integrated information service.

Various comments claim that the data processing activities performed as part of IP data transport do not turn BIAS into a single, integrated information service. Comcast argues, for instance that

⁶² 47 U.S.C. § 153(24). Cf. Supreme Court of the United States (2005), p. 2692 (Noting that the Cable Modem Order is not unreasonable, since it does not “allo[w] any communications provider to evade common-carrier regulation simply by bundling information service with telecommunications.”)

⁶³ Supreme Court of the United States (2005), p. 2692. This condition is not sufficient. For example, the calling card orders rejected the argument that the addition of an advertising message or a time-of-day announcement at the beginning of each call was sufficient to turn the whole calling card service into an information service. See the 2005 and 2006 FCC Prepaid Calling Card Orders.

“[t]he acquisition and retrieval of information involved in the provision of BIAS also occurs at a deeper network level; for instance, Internet routers, which determine whether and how packets are to be processed, forwarded, or dropped, “acquir[e]” information when they receive “packets, routing updates, Quality of Service parameters, end-point location, and load balancing information,” and “retriev[e]” information such as “software updates,” “DNS updates,” and “network management information.”⁶⁴ However, ample FCC precedent confirms that such data processing does not affect the analysis of Title II classification.

Under the pre-1996 framework, the FCC has consistently treated data processing features necessary for the operation of a packet-switched network as “adjunct-to-basic” components, which therefore do not affect the classification of basic services. Already in the Second Computer inquiry, the Commission concluded in more general terms that “[u]se internal to the carrier's facility of companding techniques, bandwidth compression techniques, circuit switching, message or packet switching, error control techniques, etc. that facilitate economical, reliable movement of information does not alter the nature of the basic service.”⁶⁵ Accordingly, the 1982 Basic Packet Switching Order held that “[t]here is no question that Computer II permits AT&T to offer a packet switching service such as BPSS in the network as a basic service”, with the stated aim that the FCC “d[id] not intend to discourage AT&T from incorporating packet switching technologies in the network.”⁶⁶ These findings were subsequently reaffirmed in the Third Computer Inquiry, as well as the Frame Relay Order of 1995, with the latter holding that “[t]he use of packet switching and error control techniques ‘that facilitate the economical, reliable movement of [such]

⁶⁴ Comcast Corporation (2017), p. 12-13.

⁶⁵ Federal Communications Commission (1980), par. 95.

⁶⁶ Federal Communications Commission (1982), par. 27, 32. See generally: Federal Communications Commission (1983).

information [do] not alter the nature of the basic service.”⁶⁷ In sum, then, the available precedents regarding adjunct-to-basic classification illustrate that the information processing performed by routing equipment and other network hardware for purposes related to IP transport do not affect the classification of BIAS as a telecommunications service.

These same principles have continued to guide classifications under the Telecommunications Act of 1996, and as applied to internet access service. For instance, the ADSL Order of 1998 noted that “[t]he Commission has repeatedly held that specific packet-switched services are “basic services”, that is to say, pure transmission services. xDSL and packet switching are simply transmission technologies. To the extent that an advanced service does no more than transport information of the user's choosing between or among user-specified points, without change in the form or content of the information as sent and received, it is “telecommunications,” as defined by the Act.”⁶⁸

In light of the above, the data processing functions performed in connection with IP data transport fall squarely within the concept of “telecommunications”, including those necessary for the routing function itself and the updates necessary to perform them, as well as supporting measures for purposes such as security and congestion management. Furthermore, in line with their prior classification as adjunct-to-basic, these functions cannot qualify as “information services”, since they all fall squarely within the network management exception as implementing “the management, control, or operation of a telecommunications system or the management of a telecommunications service”⁶⁹ After all, functions cited all have the purpose of “facilitat[ing] the

⁶⁷ Federal Communications Commission (1980), par. 10. Frame Relay Order Federal Communications Commission (1995a), par. 11.

⁶⁸ Federal Communications Commission (1998b), par. 35.

⁶⁹ 47 USC 153(24). See *id.*, at fn. 56.

economical, reliable movement of [data packets]”, and “and therefore “[do] not alter the nature of the basic service.”⁷⁰

For the FCC to now hold otherwise would constitute a radical departure from established precedent. Furthermore, this reading would be plainly unreasonable, since it would effectively undermine the functioning of Title II. Classifying BIAs as an information service based on the information processing performed in the network would require the same conclusion for most modern telephony services, since these also incorporate substantial computing components including packet-switching technologies. Furthermore, this reading would fundamentally undermine the purpose and effect of Title II, since telecommunications providers would be able to evade regulation simply by incorporating processing functions in their network. In this light, therefore, it would be unreasonable for the FCC to conclude that the data processing performed as a part of IP data transport transforms BIAS into a single, integrated information service.⁷¹

8. The offering of DNS by ISPs does not turn BIAS into a single, integrated information service.

The offering of DNS by ISPs cannot transform BIAS into a single, integrated information service. Firstly, DNS falls squarely within the network management exception and therefore does not qualify as an information service in the first place. And secondly, even if one were to misidentify DNS as an information service, this service is not functionally integrated with BIAS. Although the opposite was held in the Cable Modem Order, the factual premises underlying this decision have

⁷⁰ Federal Communications Commission (1995a), par. 11.

⁷¹ Cf. Supreme Court of the United States (2005), p. 2692 (Noting that the Cable Modem Order is not unreasonable, since it does not “allo[w] any communications provider to evade common-carrier regulation simply by bundling information service with telecommunications.”)

changed such that this classification is no longer applicable to present-day offerings.

DNS offered by ISPs meets the network management exception

The network management exception applies to “any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.”⁷² This exception, which follows the pre-1996 category of “adjunct-to-basic” features, applies to services that (1) are intended to facilitate the use of traditional telephone service and (2) do not alter the fundamental character of telephone service.⁷³ As the FCC correctly concluded in the Open Internet Order of 2015, DNS, “when provided with broadband Internet access services, fit[s] squarely within the telecommunications systems management exception”.⁷⁴

DNS is closely analogous to the “directory assistance”, an adjunct-to-basic service offered by telephony providers, which enabled users to request the dialing information of other users. The FCC first classified this service as adjunct-to-basic in the Second Computer Inquiry of 1980 and reaffirmed this holding in the NATA/Centrex Order of 1985. Here, the FCC explained even though directory assistance allowed the “customer [to] acces[s] information stored in a telephone company data base”, “the stored telephone numbers specified by the customer and the customer's interaction with that stored information serve but one purpose: facilitating establishment of a transmission.”⁷⁵

DNS performs a directly equivalent function in BIAS networks: the stored information (IP

⁷² 47 USC 153(24).

⁷³ E.G.: Federal Communications Commission (1995b), par. 27

⁷⁴ Federal Communications Commission (2015), par. 356.

⁷⁵ Federal Communications Commission (1985a), par. 26.

addresses) serves no purpose other than to facilitate the connection desired by the user (querying the desired domain). Given that the scope of the adjunct-to-basic exception transfers directly onto the definition of “information services” for the purposes of the Telecommunications Act of 1996, DNS therefore qualifies as a network management service.⁷⁶

AT&T attempts to distinguish DNS from directory assistance by arguing that “DNS, of course, offers access to databases for purposes that are almost always unrelated to obtaining telephone numbers.”⁷⁷ This highly restrictive reading of the network management exception would limit its scope to services that support telephony, to the exclusion of all services supporting other telecommunications services. This reading is unsupported by the NATA/Centrex decision or any other Commission precedent. It outright contradicts the Computer II Final Decision, which states that interprets basic service as transmission services “regardless of whether subscribers use it for voice, data, video, facsimile, or other forms of transmission”.⁷⁸ Furthermore, it clearly contradicts the Telecommunications Act’s technology-neutral definition of telecommunications service, which applies “regardless of the facilities used”.⁷⁹ AT&T cannot escape the fact that the exception was termed “adjunct-to-basic” and not, as they might prefer, “adjunct-to-telephony”.

AT&T also attempts an analogy of its own between DNS and the “key word” search function offered as part of Bell Atlantic’s gateway service. In their words, this service, “allowed consumers to enter “key words” into home or office equipment as an intuitive means of reaching third-party enhanced service providers over Bell Atlantic’s data network.”⁸⁰ Accordingly, they claim that

⁷⁶ Federal Communications Commission (1996).

⁷⁷ AT&T Services (2017), p. 77 (Citing Federal Communications Commission (1988))

⁷⁸ Federal Communications Commission (1980), par. 94.

⁷⁹ 47 U.S.C. 153(50).

⁸⁰ AT&T Services (2017) p. 66-67.

“‘key word’ enhanced service was a direct analogue to today’s DNS lookup functionality, which likewise enables end users to reach third-party databases by means of intuitive web addresses.”⁸¹ This highly generalized description of the key word function search ignores the significant differences between this service and DNS: unlike DNS, it did not merely yield specific addresses corresponding to individual plain-language commands, but instead provided a list of relevant services associated with the desired key word.⁸² Furthermore, the key word search function did not merely provide the address details necessary to enable transmission of third party content, but offered additional information about the service including a prose description and pricing information.⁸³ In this light, key word search is far from a “direct analogue” to DNS. Rather than straining for such remote analogies, the FCC should recognize that the case of DNS is far better understood through the closely comparable directory assistance service described above.

Various ISPs, in their response to this NPRM, point to the additional functionalities included in their DNS service, which supposedly “does much more” than the regular IP address lookup features that is analogous to directory assistance. In addition to the regular and best-known DNS function, also referred to as “DNS Lookup”, they point towards “reverse DNS lookup”, which allows users to identify the domain name associated with an IP address, rather than vice-versa.⁸⁴ Again, however, prior precedent reveals that this additional feature has no bearing on classification of BIAS; the FCC in *US West Communications* considered a precisely analogous function in the context of directory assistance; a “reverse search capability” where “customers would input one telephone number at a time and the system would provide the name and address associated with

⁸¹ AT&T Services (2017) p. 67.

⁸² Federal Communications Commission (1988), par. 3-4.

⁸³ *Id.*

⁸⁴ Comcast Corporation (2017), p. 16. AT&T Services (2017), p. 78-79. Throughout this document, the term ‘DNS’ refers exclusively to DNS lookup functionality provided by ISPs, unless otherwise specified.

the requested telephone number”.⁸⁵ The FCC concluded that this feature qualified as an enhanced service, and indeed they might now for reverse DNS lookup. However, this does not affect the status of regular DNS service as a network management service – after all, the provision of reverse lookup does nothing to change the nature or functionality of ordinary DNS lookup, and therefore is nothing more than a bundling of distinct, separate services. More broadly, this decision also establishes that the provision of a reverse lookup service does not affect the classification of the basic service with which it is bundled; after all, the provision of reverse search capability was not found to transform PSTN into a basic service.

A similar argument is made regarding DNS Assist, “a feature that “suggests to Internet access customers the sites they may want to reach” without their having entered a complete web address.”⁸⁶ Here, the network management exception applies for the same reason as it applies to ordinary DNS and directory assistance: “the [stored information] and the customer's interaction with that stored information serve but one purpose: facilitating establishment of a transmission.”⁸⁷ Furthermore, even notwithstanding the network management exception, this same objection applies as with Reverse DNS Lookup: it is merely an additional information service lacking any functional integration with internet access as such. Thus, to the extent that the DNS system is used to offer additional information service functionalities beyond ordinary DNS lookup, these are *prima facie* no different from the other bundled applications discussed above.

Some commenters argue that it would be contradictory for DNS to qualify as a network management service when provided by ISPs, but as an information service when offered by

⁸⁵ Federal Communications Commission (1995b), par. 13.

⁸⁶ Comcast Corporation (2017), p. 17. See also: AT&T Services (2017), p. 78-89.

⁸⁷ Federal Communications Commission (1995b), par. 13.

independent third parties.⁸⁸ AT&T proclaims, for instance, that “[t]he same functions and capabilities offered in connection with the same service cannot be given *opposite* classifications depending on which party offers them.”⁸⁹ AT&T cites no source for this claim, nor could they. Past precedents offer no support for this claim, and in fact reveal precisely the opposite: numerous adjunct-to-basic services have been identified as enhanced once provided by third parties. For instance, packet switching services was considered adjunct-to-basic when provided by BOCs, but not by third parties, as established *inter alia* in the Frame Relay Order.⁹⁰ Accordingly, there can be no reasonable objection to finding the same as regards DNS.

Regardless of the legal classification of DNS, BIAS is not functionally integrated with this feature

Even if the FCC decided to depart from established precedents and radically re-interpret the network management exception to exclude DNS, this still could not justify a reclassification of BIAS. Although the Cable Modem Order premised its classification decision on the notion that BIAS is functionally integrated with DNS, this conclusion is no longer available because the factual circumstances have changed.

As explained previously, the relevant test for a finding of “functional integration” is whether the telecommunications service is used “only in connection with” the ISP’s information service. As evident in the Supreme Court decision in *Brand X*, the FCC’s own filings in the case, and in the

⁸⁸ AT&T Services (2017), p. 80. Comcast Corporation (2017), p. 19-20.

⁸⁹ AT&T Services (2017), p. 80.

⁹⁰ Federal Communications Commission (1995a).

Cable Modem Order itself, this is how cable modem service was understood to interact with DNS at the time.⁹¹ At present, however, it is patently untrue to claim that BIAS is used “only in connection with” ISPs’ DNS service, since an abundance of third party DNS providers have become available in the interim.⁹² Indeed, many popular services including Google DNS and FreeDNS are now available to the public for free. The effort required for users to switch is trivial; simply by entering the DNS’ client IP address, alternative providers can be reached instantly, at zero cost, and by any internet user.⁹³ Thus, these third parties services provide a perfectly interchangeable substitute to ISPs’ DNS.⁹⁴ (Although Comcast cites the 2016 decision in *Weinstein v. Republic Iran* as describing DNS in “similarly essential terms” to Brand X, this case is inapposite since it pertains to the general root service operated by ICANN in order to maintain the DNS system as a whole, rather than the consumer-facing DNS lookup service offered to individual end-users.⁹⁵) This literal abundance of DNS providers represents such a profound shift

⁹¹ Supreme Court of the United States (2005), p. 2709. Federal Communications Commission (2002), fn. 153.

⁹² Supreme Court of the United States (2005), p. 2709.

⁹³ It is worth noting that Google’s DNS Client occupies the IP address ‘8.8.8.8’, making it particularly convenient for users to reach this provider.

⁹⁴ As noted in the Joint Comment of Internet Engineers, these third party services are in fact considered more secure and reliable than ISPs’ in-house offerings. See Internet Engineers (2017), p. 15-17.

⁹⁵ See Comcast Corporation (2017), p. 15, citing United States Court of Appeals (2016).

DNS lookup is a user-facing service provided by ISPs and a range of third parties including Google and FreeDNS, which allows users to connect with SLDs by translating the human-readable domain names into their corresponding machine-readable IP addresses. This was the ‘DNS’ service at issue in *Brand X*. However, the root server operated by ICANN at issue in *Weinstein v. Republic of Iran* is something else entirely, however, namely the domain at the top of the entire global DNS hierarchy. This ‘root’ delegates the operation of all Top-Level Domains (TLDs, .e.g ‘.com’, ‘.gov’ and ‘.ir’) to their respective operators. In turn, these operators control the allocation of individual Second-Level Domains (SLDs, such as ‘savetheinternet.com’ or ‘fcc.gov’) which are listed in appointed ‘Authoritative Name Servers.’ Finally, at the bottom of this hierarchy, these authoritative name servers provide input to the countless client servers operated by ISPs and other service providers, which perform lookup service in response to individual user requests.

The DC Circuit fairly characterizes ICANN’s activities as essential to internet access. If a TLD is removed from the root, internet users will have difficulty accessing the associated addresses – there is no easy fix, since ICANN retains exclusive control over the allocation of top-level domains. And this is what the language from *Weinstein* cited by Comcast Corporation (2017) refers to, as is apparent when the quote is read in its full context: “Because ‘the vast majority of Internet users,’ [...] query the root servers when searching for a particular TLD, “[t]he root [zone file] determines which TLDs are visible” to most Internet end users world-wide. Because an end-user cannot use the DNS to locate a particular web page without first accessing its TLD—i.e., an end-user cannot locate “google.com” *476 without first locating “.com”—the root zone file effectively enables an end-user to access most

in the technical and economic functioning of the Internet, that BIAS can no longer be considered “functionally integrated” with DNS. Quite the opposite, in fact: users can still enjoy their Internet access to the fullest while foregoing ISPs’ DNS entirely, with no inconvenience at all beyond a few keystrokes.

9. The offering of caching by ISPs does not turn BIAS into a single, integrated information service

The offering of caching by ISPs cannot transform BIAS into a single, integrated information service. Firstly, caching falls squarely within the network management exception and therefore does not qualify as an information service in the first place. And secondly, even if one were to misidentify caching as an information service, this service is not functionally integrated with BIAS.

Caching offered by ISPs meets the network management exception

The caching feature offered by ISP involve “the storing of copies of content at locations in the network closer to subscribers than their original sources.”⁹⁶ By copying popular content close to its audience, ISPs can avoid repeatedly transmitting the same information and reduce the burden on their networks. Therefore, although caching involves the “the “capability for ... acquiring,

existing Internet web pages. Any TLD not “listed in the root ... become[s] effectively invisible,” keeping both that TLD and its registered SLDs beyond the reach of a typical end-user.” (*Weinstein v. Republic of Iran*, p. 487.) For user-facing DNS providers, by contrast, there is an abundance of providers. Even the largest DNS providers service only a small portion of the entire online public. And if any given DNS server decides to terminate or restrict its lookup service, its end users can switch to alternative providers with trivial effort and at zero cost. Therefore, the conclusions drawn in Weinstein about the ‘essential nature’ of ICANN’s root server do not transfer to the generic lookup services of BIAS providers.

⁹⁶ Federal Communications Commission (2002), fn. 76.

[storing] ... retrieving [and] utilizing information”, it clearly qualifies as a network management service, since this capability is offered exclusively “for the management, control, or operation of a telecommunications system or the management of a telecommunications service.”⁹⁷ The sole function of caching is to facilitate “economical, reliable movement of information” requested by the user, and in doing so does nothing that would “alter the nature” of internet access, such that it cannot be qualified as an information service.⁹⁸ Caching is merely a tool for internet service providers to “manag[e]” network congestion and ensure the timely transmission of third party information.⁹⁹

Regardless of the legal classification of caching, BIAS is not functionally integrated with this feature

ISP caching activities fail to transform BIAS into a single, integrated information service, since BIAS is primarily used *without* ISP caching features. Firstly, ISP caching by its very nature is limited to traffic aimed at repeat usage, and does nothing to facilitate content that is only used once – vast swathe of internet traffic including email and all real-time communications such as Voice-over-IP (VOIP), and IPTV. Encrypted traffic is also ineligible for caching. Even for webpages, caching is limited to “static” content and cannot capture dynamic content. Caching is limited to content that is “repeat play”, and therefore irrelevant to many crucial applications of internet access. Secondly, even where caching services are applied, this service is by no means crucial for

⁹⁷ 47 USC 153(24), 47 USC(50).

⁹⁸ Federal Communications Commission (1980), par. 95.

⁹⁹ 47 USC 153(24).

transmitting the data in question. Caching merely expedites the process, primarily benefiting the ISP in managing network congestion and perhaps offering a marginal improvement in delivery times for the end user. In light of all this, therefore, the functionalities available through BIAS are largely identical “with or without” the inclusion of ISP caching. This component does nothing to “alter the nature” of the BIAS service, and it is certainly inaccurate to state that BIAS “transmits data *only in connection with* the further processing” of ISP caching services, or that BIAS is available “[only] because their service provider offers” ISP caching.”¹⁰⁰ Clearly, therefore, BIAS cannot reasonably be considered to be a functionally integrated component of ISP caching that would transform their joint offering into a single, integrated information service.

Various comments seek to rely on *Brand X* in order to argue the opposite: AT&T, for instance, interprets this judgment to hold that “caching[.] is a sufficient basis for concluding that “the service that Internet access providers offer to members of the public is Internet access”¹⁰¹ A similar reading is also suggested in the NPRM itself.¹⁰² These summaries misrepresents the actual decision, however. A closer reading reveals that the *Brand X* court did not view caching as dispositive. Recall that, in this decision, the Court upheld as reasonable the FCC’s classification of cable modem service as an information service, on the premise that “subscribers can reach third-party Web sites via “the World Wide Web, and browse their contents, [only] because their service provider offers the “capability for ... acquiring, [storing] ... retrieving [and] utilizing ... information.”¹⁰³ Nowhere does the Court explicitly state, however, that caching is decisive to this determination. Indeed, the Court’s own discussion of caching suggests that is not, since it merely notes that this feature “facilitates” access to online content by “obviat[ing] the need for the end

¹⁰⁰ Supreme Court of the United States (2005), par. 2693.

¹⁰¹ AT&T Services (2017), p. 79.

¹⁰² Federal Communications Commission (2017), e.g. par. 37.

¹⁰³ Supreme Court of the United States (2005), p. 2710.

user to download anew information from third-party Web sites”.¹⁰⁴ Plainly, therefore, the Court did not understand this feature as strictly necessary for access to third party content. This can be contrasted with DNS, which is indeed described in essential terms: “A user cannot reach a third-party’s Web site without DNS”.¹⁰⁵ By the Court’s very own logic, therefore, caching cannot be determinative for the classification of BIAS. Furthermore, as noted in the Open Internet Order, in a reading of *Brand X* that reaches a different conclusion, the Court’s conclusion that “caching” is indeed considered as enabling “subscribers [to] reach third-party Web sites via the World Wide Web, and browse their contents, [only] because their service provider offers the capability for . . . acquiring, [storing] . . . retrieving [and] utilizing information” would be technically inaccurate.¹⁰⁶

Since the time of the Cable Broadband Order and the *Brand X*, caching has become even less important to internet access service. By now, this practice has largely been supplanted by third party content-distribution network (CDN) services, which arrange for dedicated storage and transport capacities for affiliated edge providers and thus reduce the need for caching provided by ISPs. Furthermore, caching is losing even its *technical* relevance due to the widespread adoption of encryption technology. As noted in the Joint Comment of Internet Engineers submitted to this proceeding, “[i]n 2010 less than 2% of traffic on the Internet was encrypted, but by February of 2017 over half of Internet traffic was encrypted.”¹⁰⁷ Indeed, as a result of its diminished utility, most ISPs no longer even perform caching as a part of their BIAS service.

¹⁰⁴ Supreme Court of the United States (2005), p. 2710.

¹⁰⁵ Supreme Court of the United States (2005), p. 2709.

¹⁰⁶ Open Internet Order 2015 Federal Communications Commission (2015), fn. 1051.

¹⁰⁷ Internet Engineers (2017), p. 14.

In sum, then, the offering of caching by ISPs has never served as a basis to classify BIAS as an information service; has never been considered as such by for the Commission or the Court; and the case for doing so now is weaker than ever before.

III. BIAS INCLUDES A DISTINCT TELECOMMUNICATIONS SERVICE.

Having established that BIAS includes a telecommunications component, and that this component is not functionally integrated with any information service provided by ISPs, it follows that BIAS is a bundled offering of two distinct services. Accordingly, the telecommunications component of BIAS qualifies as a telecommunications service in that it qualifies as an “offering of telecommunications for a fee directly to the public.”¹⁰⁸

The fact that information and telecommunications services are “mutually exclusive categories”, noted by the NPRM and by opponents of Title II classification, is no objection.¹⁰⁹ This language, which stems from the Stevens Report, merely stands for the claim that offerings of information services do not necessarily include a telecommunications service as well, merely by force of being provided “via telecommunications”.¹¹⁰ Where information services providers purchased telecommunications at retail in order to offer their information services at retail, the Stevens Report sought to avoid the conclusion that this necessarily included a separate telecommunications service. It is in this context that the Stevens Report held that these services are “mutually exclusive”, in the sense that “when an entity offers transmission incorporating

¹⁰⁸ 47 USC 153(50).

¹⁰⁹ Federal Communications Commission (2017), par 40. AT&T Services (2017), p. 69. Comcast Corporation (2017), p. 20. Verizon (2017), p. 28.

¹¹⁰ Federal Communications Commission (1998a), par. 36. 47 USC 153(24).

the ‘capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information, [...] it offers an ‘information service’ even though it uses telecommunications to do so.”¹¹¹ Thus, instead of identifying a telecommunications service in every single information service, the Steven’s Report chose to focus on whether the telecommunications component was “offered” as a separate service – an interpretation that was subsequently restated by the FCC in the Cable Modem Order and affirmed by Supreme Court in *Brand X*.¹¹² Understood in its context, then, this phrase merely stands for the finding that information services are not necessarily telecommunications services. It does not preclude the holding that these mutually distinct services may be sold in a bundle.¹¹³

In sum, it follows from the above that the FCC cannot classify BIAS as a single, integrated information service. Both the majority and dissent in *Brand X* agreed that the classification of telecommunications and information services turns on the question of whether the telecommunications component is “offered”, which depends on whether it is functionally integrated or functionally separate. Where the Court disagreed, was the application of this doctrine to the “factual particulars” of Internet access; whereas Scalia’s dissent rejected the Commission’s assessment and posited his own understanding of the service, the majority deferred to the Commission on this point and upheld their conclusion as reasonable under the second step of *Chevron*. Should the Commission wish to return to this interpretation of the Act, they may do so, but they do not enjoy the same discretion as regards “the factual particulars of how Internet technology works and how it is provided.”¹¹⁴ They cannot ignore, therefore, that the technological and commercial landscape of Internet access has changed significantly, not in the least part due to

¹¹¹ Federal Communications Commission (1998a), par. 39. (‘Stevens Report’)

¹¹² Supreme Court of the United States (2005), p. 2704. Federal Communications Commission (2002), par. 7.

¹¹³ Federal Communications Commission (1998a), par. 60 (‘Stevens Report’).

¹¹⁴ *Brand X* Supreme Court of the United States (2005), p. 2705.

the proliferation of third-party DNS. This being so, the FCC can no longer reasonably conclude that BIAS is “functionally integrated” with any particular information service offered by ISPs.¹¹⁵ Established precedent therefore necessitates the conclusion that BIAS, as of 2017, is a bundled offering of two distinct services, one of which is a telecommunications service.

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¹¹⁵ In this light, the FCC could only reclassify BIAS as an information service through a substantial revision of the Telecommunications Act, in particular as to the nature of “offering” in the definition of “telecommunications service”. To the extent that the NPRM does not propose to revise the current definition, any such change would violate the Administrative Procedure Act. And, as argued above, under the current definition, the NPRM’s proposed classification is unsupportable.

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