Nos. 24-7000 (lead), 24-3449, 24-3450, 24-3497, 24-3508, 24-3510, 24-3511, 24-3519, and 24-3538

IN THE UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

IN RE: MCP NO. 185; OPEN INTERNET RULE (FCC 24-52)

OHIO TELECOM ASSOCIATION, ET AL.,
Petitioners,

v.

FEDERAL COMMUNICATIONS COMMISSION AND UNITED STATES OF AMERICA,
Respondents,

On Petitions for Review of an Order of
the Federal Communications Commission

BRIEF OF FORMER FCC CHIEF TECHNOLOGIST JON M. PEHA AS *AMICUS CURIAE* IN SUPPORT OF RESPONDENTS

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CORPORATE DISCLOSURE STATEMENT

Pursuant to Local Rule 26.1, the undersigned makes the following disclosure with respect to *Amicus Curiae* Jon M. Peha:

1. Is said party a subsidiary or affiliate of a publicly owned corporation? No.
2. Is there a publicly owned corporation not a party to the appeal that has a financial interest in the outcome? No.

Dated: September 18, 2024

s/ Sarah R. Goetz

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INTEREST OF *AMICUS CURIAE*[1]

Amicus curiae Jon M. Peha is Professor of Electrical and Computer Engineering and Director of the Center for Executive Education on Technology Policy at Carnegie Mellon University ("CMU"). He previously served, from 2008 to 2010, as the Federal Communications Commission's ("FCC's" or "Commission's") Chief Technologist. He has held numerous other positions in government, academia, and the private sector related to his expertise in communications networks and the Internet, including Assistant Director of the White House Office of Science and Technology Policy, chief technology officer of three different Internet-related companies, and Associate Director of the CMU Center for Wireless and Broadband Networks.

Dr. Peha has studied communications networks since the 1980s, authoring more than two hundred publications in that time. He has

[1] Pursuant to Federal Rule of Appellate Procedure 29(a)(4)(E), no party's counsel authored this brief in whole or in part, no party or party's counsel contributed money intended to fund this brief, and no person other than *Amicus* and his counsel contributed money intended to fund its preparation or submission. All parties consent to the filing of this brief.

addressed open Internet issues for more than 20 years. He has taught dozens of engineering courses related to communications networks at CMU. He is a Fellow of the Institute for Electrical and Electronics Engineers, a Fellow of the American Association for the Advancement of Science, and a recipient of the FCC's "Excellence in Engineering Award" for contributions to the U.S. National Broadband Plan. He received a Ph.D. in electrical engineering from Stanford.

Given his expertise and decades of experience studying communications networks and open Internet issues, Dr. Peha is well-positioned to provide insights that may assist the Court in resolving this matter, specifically with respect to the factual and technical arguments regarding the proper classification of Broadband Internet Access Service ("BIAS").

INTRODUCTION AND SUMMARY OF ARGUMENT

If in 1996 Congress had wanted to explicitly specify whether Internet access was to be governed by Title I or Title II of the Communications Act of 1934, 47 U.S.C. §§ 151 *et seq.* ("Communications Act"), it could have done so. Instead, the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 ("1996 Act"), mandates that

such a determination be made according to whether a service meets the statutory definition of "telecommunications service" or "information service." This framing dictates how all regulated services must be classified, even when new services emerge or old services change. The inquiry is factual: whether today's Internet service should be classified as a telecommunications service because the technical characteristics of Internet service—as it is offered today—are consistent with the statutory definition.

The answer is yes. The core function of BIAS is IP packet transfer, which, for the reasons explained below, meets the statutory definition of telecommunications. And neither bundling BIAS with applications, nor conducting certain information-processing functions, nor providing Domain Name System ("DNS"), caching, or content delivery network ("CDN") services is sufficient to reclassify BIAS as an information service. To the contrary, Internet standards dictate that these offerings are separable, not inextricably intertwined, or else fall within the telecommunications systems management exception. Finally, mobile BIAS is a commercial mobile service because it is provided for profit and

makes interconnected service available on the single public switched network.[2]

ARGUMENT

I. Today's broadband Internet is vastly different from the dial-up Internet of 1996.

Petitioners and their *amici* contend that historical conceptions of Internet access services should govern their classification today. *See* Pet'rs Br. 39-42; O'Rielly Br. 4-8. But that makes little sense given that today's broadband Internet access services bear little resemblance to the Internet services offered in 1996.

The technical characteristics of today's Internet services differ greatly from those of 1996. Today, the FCC's open Internet rules apply to *broadband* Internet access services—not to dial-up Internet. By contrast, in 1996, nearly all consumer Internet service was dial-up. Unlike broadband, dial-up Internet requires the use of an underlying

[2] *See generally* Barbara A. Cherry & Jon M. Peha, *The Telecom Act of 1996 Requires the FCC to Classify Commercial Internet Access as a Telecom Service*, Comment on Protecting and Promoting the Open Internet, Notice of Proposed Rulemaking, 29 FCC Rcd. 5561 (Dec. 22, 2014); Jon M. Peha, *The Network Neutrality Battles That Will Follow Reclassification*, I/S: A Journal of Law and Policy for the Information Society, at 11-43 (2015).

telephone service. Dial-up speeds were a thousand times slower than broadband, and therefore too slow for the applications that dominate Internet use today, such as video streaming and sophisticated social media platforms. BIAS is always on, whereas dial-up only works while the phone line is engaged, which precluded the operation of some applications. Today's Internet applications are very different from anything that the Internet service of 1996 could accommodate.

Moreover, today's consumers use the Internet to communicate with a vast ecosystem of commercial content and application service providers that are distinct from Internet service providers ("ISPs"). That was not true in 1996. At that time, the world wide web was immature: The first commercial web browser (Netscape) was only two years old. Google did not exist. Pioneering social media platforms like Facebook and MySpace did not exist. Video and audio streaming platforms like Netflix, YouTube, and Spotify did not exist. The first voice-over-Internet company (VocalTex) was just one year old, and more successful versions like Skype did not exist. Commercial videoconferencing-over-Internet services like Zoom and Microsoft Teams did not exist.

As a result, many dial-up ISPs offered their *own* content and applications to give users reason to subscribe. Email, for example, was a dominant application in 1996. While some information-sector employees and college students had professional email accounts through their employer or university, residential Internet subscribers typically relied on email services hosted by their ISP for personal email accounts, whereas today's subscribers primarily use non-ISPs like Google and Microsoft. The leading dial-up ISPs also offered proprietary content and chat rooms to attract consumers, to compensate for the limited content then available from non-ISPs.

II. Previous classifications of BIAS as an information service relied on assumptions about technology that are no longer valid.

Because ISPs of the 1990s attracted customers by offering proprietary content and applications, the FCC concluded in 1998 that dial-up ISPs offered "information services" under the 1996 Act. *Stevens Report*, 13 FCC Rcd. 11501, ¶¶ 80-81 (1998). The *Stevens Report* supported that conclusion using examples of information services offered from ISP computers that the FCC considered to be—at the time—inherent parts of Internet access:

- "When subscribers store files *on Internet service provider computers* to establish 'home pages' on the World Wide Web, they are" using an information service. *Id.* ¶ 76 (emphasis added).

- "The same is true when Internet service providers offer their subscribers access to Usenet newsgroup articles. An Internet service provider receives and stores these articles . . . *on its own computer facilities*. . . . In providing this service, the Internet service provider offers" an information service. *Id.* ¶ 77 (emphasis added).

- "(E)lectronic mail utilizes data storage as a key feature of the service offering. The fact that an electronic mail message is *stored on an Internet service provider's computers* in digital form offers the subscriber extensive capabilities for manipulation of the underlying data. . . . The service thus provides" an information service. *Id.* ¶ 78 (emphasis added).

Subsequent classifications of Internet access service as information services were founded on facts and assumptions from the *Stevens Report*. For example, the *Cable Modem Order*, 17 FCC Rcd. 4798 (2002), relied heavily on the *Stevens Report* to conclude that a cable modem service was also an information service, that included telecommunications. *See id.* ¶¶ 37-38. And portions of the Supreme Court's decision in *National Cable & Telecommunications Ass'n v. Brand X Internet Services* also relied on the conclusion that Internet access is at least in part an information service—a finding that comes

either directly from the *Stevens Report* or indirectly via the *Cable Modem Order*. *See* 545 U.S. 967, 968 (2005).

Technology and services have changed. Consumers today turn almost entirely to providers *other* than their ISP for email service, web-page hosting, discussion forums, and the countless other content and application services for which they use the Internet. *See 2015 Order*, 30 FCC Rcd. 5601 (2015). When a BIAS subscriber uses Gmail, no email is "stored on an Internet service provider's computers," as the *Stevens Report* assumed; rather, Google stores the email, so it is Google that provides the information service. Similarly, it is usually some entity other than the ISP that provides an information service by storing user home pages, and the modern equivalent of newsgroup articles. *Id.* The *Stevens Report*'s findings—and therefore Petitioners' reliance on it—is no longer valid.

III. BIAS meets the statutory definition of "telecommunications service," regardless of whether ISPs combine BIAS service with other capabilities.

A. The core function of BIAS—IP packet transfer—is telecommunications, making BIAS a telecommunications service under the 1996 Act.

The fundamental function of Internet service is to transfer information from sender to intended recipient. Each subscriber uses an ISP to transfer information from her device to one owned by some other entity, which might be another consumer (as occurs with applications like Skype), or a commercial content provider (like Netflix). That other entity can then use an ISP to transfer information back to the subscriber. Information moves through the Internet in chunks of data known as Internet Protocol ("IP") packets. Every webpage a consumer views and every email sent is transmitted as a series of IP packets. Thus, the fundamental service of the Internet is *IP packet transfer*: "A network provides IP Packet Transfer when it transfers IP packets from an ingress point that is receiving IP packets from the sender, to an egress point that can send IP packets to the intended recipient." Peha, *Network Neutrality Battles*, at 11-43. As so understood, IP packet transfer meets the definition of "telecommunications" under the Act. *See*

47 U.S.C. § 153(43) ("the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.").

First, a user (or, equivalently, the user's software running on the user's computer)—not an ISP—chooses what information to put in each packet. Each IP packet includes "payload" information, i.e., information that the sender wishes to transfer, and "control" information, including the IP address of the intended recipient. IP packets are created by the user's software and transmitted by the user's computer to an ISP, which is responsible for transferring each packet to a device associated with that IP address. Internet standards require that the IP packet delivered to the destination be the same as the packet received from the sender, *see* Internet Engineering Task Force ("IETF"), Internet Protocol (IP) Specification, RFC 791 (Sept. 1981), https://tinyurl.com/324afkk8, so there is no change in "form or content of the information," 47 U.S.C. § 153(43).

One of Petitioners' *amici* contends that ISPs *must* "'change . . . the form or content of the information as sent and received' . . . in order to turn that information into a format usable by consumers," suggesting

that BIAS providers "must reconfigure packets of data retrieved from websites so that it shows up on the computer screens of the internet users who are requesting it," Senator Cruz Br. 7. That is not how the technology works. BIAS providers do not change the form or content of packets. Packets are never "reconfigured." The many software and hardware elements required to take information from arriving packets and produce images on a computer screen, including the web browser and display circuitry, lie within the Internet user's computer—*not* within the BIAS provider's network.

Second, and contrary to yet another of Petitioners' *amici*, *see* Yoo Br. 11, IP packet transfer transmits information between or among points specified by the user. The *user* (or, equivalently, the user's software) places the IP address of the packet's intended recipient in each IP packet, which is how the end point(s) are "specified by the user." *See* Peha, *Network Neutrality Battles*, at 11-43. The destination IP address's role in Internet service is analogous to the telephone number in telephone service. In most cases, the sender already knows the packet recipient's IP address, because the user's software has stored that IP address on the user's computer during previous exchanges.

Otherwise, when the IP address is not already stored, the sender's software obtains the IP address through the DNS lookup process (described in Section III.D., *infra*) and then retains that IP address on the user's computer for future use. Either way, the user, not the ISP or the DNS provider, specifies the end point.

Petitioners' *amici* contradict their own argument that the DNS provider specifies the end point by claiming that "[t]he plain meaning of 'point' is a discrete physical location," Yoo Br. 4, for neither a DNS provider nor a user for that matter ever specifies a "discrete physical location." Consider the meaning of "point" with respect to telephone service: The telephone number indicates the "point" specified by the user, and a caller cannot determine a "discrete physical location" from a telephone number—especially for a cellphone. A single telephone number might even be associated with multiple physical locations, e.g., multiple call centers for the same toll-free number, and multiple telephone numbers might be associated with a single physical location. The same can sometimes be true of an IP address. But that does not change the fact that a user uses a telephone number and IP address to

specify the end point with which they wish to communicate for both telephone and Internet services.

If the packet's sender and recipient are both customers of the same ISP, that is the entire story. If, as is often the case, an IP packet travels through several networks before reaching its destination, these networks collectively send the packet to the point specified by the sender. Each network along the path sends the packet to the next network en route to the end point specified by the user. Telephone networks function similarly when users place long-distance calls: information travels through a local exchange carrier, then a long-distance carrier, then another local exchange carrier. Just as each of these telephone carriers along the way provides telecommunications, so, too, does each ISP that provides IP packet transfer.

Accordingly, commercial BIAS is the offering of IP packet transfer, i.e., telecommunications, to the public for a fee, meeting the statutory definition of a telecommunications service.

B. ISP bundling of BIAS with applications does not transform BIAS into an information service because Internet standards dictate that the telecommunications underlying Internet applications must be separable from those applications.

ISPs offering bundled applications with the separate and distinct telecommunications component of BIAS does not exempt them from being regulated under Title II. As the Court explained in *Brand X*, "[t]he entire question is whether the products . . . are functionally integrated (like the components of a car) or functionally separate (like pets and leashes)." 545 U.S. at 991. As explained below, the contemporary Internet requires separation of these products. Earlier authority suggested that information service functionality may be intertwined with telecommunications to the extent that an information service no longer transmits intelligence of a customer's own design and choosing, and thus is not telecommunications. *See Computer II*, 77 F.C.C.2d 384, ¶ 120 (1980); *United States v. Am. Tel. & Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983), *aff'd sub nom. Maryland v. United States*, 460 U.S. 1001 (1983); *see also* Scott Jordan, *Broadband Internet Access Service Is a Telecommunications Service*, 71 Fed. Commc'ns L.J. 155, 185 (2019). Such intertwining was possible with some distributed

computing applications of the 1980s and 1990s, *see Computer II* ¶ 110; Jordan, *Broadband*, at 249-50, but—crucially—not with Internet access.

First, Internet design requires that network services are organized into *network layers* and that interfaces to lower-layer network services are *standardized*. Layering is a form of modular architecture, which frees designers of one module from needing to understand the way in which services provided by other modules are implemented. Further, accepted Industry Protocol ("IP"), as developed by the Internet Engineering Task Force, provides for standardized functions and standardized interfaces to other protocols. Standardized software interfaces are the software equivalent of standardized modular telephone plugs. They make possible interoperability of devices and software designed by different entities. *See* Jordan, *Broadband,* at 192-93.

The IP standard dictates that IP packet transfer service *must* be separable from Internet applications. IETF, Requirements for Internet Hosts—Communications Layers, RFC 1122 (Oct. 1989), https://tinyurl.com/2djkcs4y. In other words, this end-to-end transfer of packets cannot depend on applications. Separability of applications and

IP packet transfer is also apparent from Internet standards for applications like email and web browsing, none of which contains any details related to how IP packets are moved from one part of the Internet to another. *See, e.g.*, IETF, Simple Mail Transfer Protocol, RFC 5321 (Oct. 2008), https://tinyurl.com/3fp4xfd4; IETF, Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing, RFC 7230 (June 2014), https://tinyurl.com/537fef3v; IETF, Network News Transfer Protocol, RFC 3977 (Oct. 2006), https://tinyurl.com/yc7478hr.

This modularity and interface standardization make the Internet ecosystem possible. *See* Jordan Reply Comments 20 (Suppl. App. 2144). Edge providers can design applications without coordination with or permission from BIAS providers who offer the lower-layer IP packet transfer service. Edge providers know that ISPs will provide an IP packet transfer service in accordance with the standard, thereby transferring packets to intended recipients without change in form or content. Similarly, BIAS providers select equipment without coordination with or permission from providers of applications and content. BIAS and applications are separable by design.

The relationship is not symmetric. In a layered architecture, while a service may rely on services provided by lower layers, it cannot rely on services provided by higher layers. For example, email applications rely on IP packet transfer to convey packets, but IP packet transfer cannot rely on applications such as email. *Id*. at 9. Hence, BIAS does not depend on applications.

The end-to-end transfer of IP packets is therefore not "functionally integrated" with applications like email, web browsing, or cloud storage. A complete understanding of Internet functioning reveals that Petitioners fail to satisfy *Brand X*'s test for determining that the telecommunications component of the service is inextricably intertwined with information capabilities of the service.[3]

C. The information processing functions necessary for, and bundled with, BIAS are not sufficient to classify BIAS as an information service because they fall within the telecommunications systems management exception.

Like telephone services, BIAS requires mechanisms for management, control, or operations that involve storage or processing of

[3] This technical separation between applications and BIAS is consistent with consumer perception. Consumers understand that most content and applications they want are provided by third parties.

information. For example, ISPs use stored information to produce monthly bills, determine network route from sender to recipient, and assign IP addresses to customers. This is all irrelevant to classification of BIAS. Providers of telephone service similarly use stored information to produce monthly bills, determine network route from sender to recipient, and assign telephone numbers to customers. The statute specifies that any mechanism "for the management, control, or operation of a telecommunications system or the management of a telecommunications service" is not an information service when bundled with a telecommunications service. 47 U.S.C. § 153(24). As with telephone service, the only "information processes" that are inextricably intertwined with BIAS are intertwined precisely because they support "management, control or operation" of IP packet transfer (which, for the reasons explained above, is a telecommunications service), and therefore, fall within the telecommunications systems management exception.

D. The domain-name-to-IP-address-translation service provided by DNS is not sufficient to classify BIAS as an information service.

DNS is the global directory service that allows users to map human-readable domain names, such as "www.fcc.gov," into IP addresses. These IP addresses can then be placed in the header of an IP packet, so the IP packet transfer system can send the packet to the recipient. It is the Internet Corporation for Assigned Names and Numbers ("ICANN") and not BIAS providers that oversees the global system of DNS servers that provides IP addresses upon request from any Internet user for free. Petitioners argue that DNS is indispensable to BIAS, and that DNS is an information service when offered with BIAS. Pet'rs Br. 36-38. These assertions are incorrect. DNS is useful, but the BIAS provider's role in DNS is small and superfluous.

No involvement from BIAS providers is required in DNS, contrary to the erroneous claim by one of Petitioners' *amici*, *see* Bennett Br. 13. While common, it is not necessary for U.S. BIAS providers to place servers in their network that respond to subscriber requests for an IP address, often using information obtained from the authoritative DNS servers (which, again, are not operated by BIAS providers).

In any event, BIAS does not become an information service even if the BIAS provider operates DNS servers, for three reasons.

First, DNS is not inextricably intertwined with BIAS. Internet architects deliberately created DNS to be entirely independent from the IP packet transfer function.[4] DNS was designed as just another application, like email, that is separate—by design—from IP packet transfer. Like email, Internet users do not need to get the service from their ISP.

In *Brand X*, the Court said that a "user cannot reach a third-party's Web site without DNS, which . . . matches the Web site address . . . with the IP address." 545 U.S. at 999. But this alone does not make DNS functionally integrated with Internet access. A user cannot reach a third party's website without oxygen, because she would suffocate, but oxygen is not inextricably intertwined. Like DNS, oxygen is functionally distinct and readily available without an ISP. At the time *Brand X* was decided, cable modem subscribers got DNS from their

[4] In fact, per the protocol a BIAS provider need not specify a DNS server at all. *See* IETF, Dynamic Host Configuration Protocol, RFC 2131, at 5 (Mar. 1997), https://tinyurl.com/mryzx8ta.

ISPs, and the Court may have assumed that this was the only way to get DNS. But that is not true today.

Today, if BIAS does not include its own DNS, then BIAS customers can simply send DNS requests to someone else. Indeed, the ability to use non-ISP DNS providers has been facilitated by two major developments since the *Brand X* decision. The first occurred in 2009, when Google began offering DNS for free to all Internet users. By 2014, Google was receiving four billion DNS requests per day. *See Google Public DNS and Location-Sensitive DNS Responses*, Google Search Central (Dec. 15, 2014), https://tinyurl.com/293fzh9s. Other companies have followed Google's lead. The second was the emergence of a new, more secure approach for making DNS queries, under which a user's software makes DNS requests to providers other than their ISP using a secure protocol. *See* Peha Comments 4-5 (Suppl. App. 1781-82). The standards documents underlying this protocol were written in 2016 and 2018. *See* P. Hoffman & P. McManus, *DNS Queries over HTTPS (DoH)*, RFC 8484 (Oct. 2018), https://tinyurl.com/vrjzf5fx. Since then, many companies have added secure DNS to their software. Today, some of these applications use secure DNS by default, while others use the ISP's

DNS as the default, but both subscriber and application provider have the ability to easily switch DNS provider.

The emergence of Secure DNS accelerated use of non-ISP DNS. IBM conducted a study that examined DNS usage in two U.S. cities in 2022, and found that DNS services run by Google, Cloudflare and Cisco alone accounted for 41% of DNS look-ups in Washington, D.C., and 35% in Atlanta. *See* Ben Ball, *Global DNS Traffic Report: What We Found in 7.54 Trillion DNS Queries*, NS1 (Mar. 14, 2023), https://tinyurl.com/547dfbuf; *see also* NS1, Global DNS Traffic Report—Insights into the Health of Networks in 2023 (2023). The same study found that these percentages were even higher globally, far exceeding usage of DNS services from what the report calls "telecom giants" such as AT&T, T-Mobile and Comcast. *Id.* U.S. users still rely more on "telecom giants" than users in other nations for historical reasons, but this artifact of the past need not continue.

If all BIAS providers in the United States stopped offering DNS services, these standards would facilitate a complete switch to non-ISP providers. Popular web browsers like Chrome, Edge, and Firefox, and popular operating systems like Windows and MacOS already have this

capability built in. Some of these systems already use non-ISP DNS by default, without their owner's knowledge. For others, many software providers could switch to non-ISP sources for DNS in the next software update, and most users would not notice the change. *See* Peha Comments (Suppl. App. 1781-82). A BIAS provider's DNS is extraneous.

Second, even when offered by an ISP, DNS capability is only there in support of the core function—IP packet transfer. Under the 1996 Act, a function that might otherwise be an information service will not be considered as such if it is merely used, as here, "for the management, control, or operation of a telecommunications system or the management of a telecommunications service," 47 U.S.C. § 153(24). A BIAS provider benefits from operating a DNS server, since it reduces the volume of DNS queries passing through its network. It also reduces customer support costs by preventing a customer from calling her BIAS provider for assistance with DNS when the problem lies with the customer's DNS provider. Thus, DNS supports "management, control, or operation" of BIAS.

Third, DNS is to BIAS what directory-assistance service is to telephone service. In both cases, users name the entity they want to communicate with, and the service provides the corresponding number that the network requires. *See* Peha, Network Neutrality Battles, at 11-43. Both involve storing and processing information. Both make the network more valuable to users but do not affect the transfer of information without change of form or content. Both could be offered by third parties having nothing to do with the network. If adding DNS makes BIAS an information service, then adding directory services would make telephone service an information service, which it definitively is not.

E. BIAS providers offering CDN service, or caching, or both, is not sufficient to classify BIAS as an information service.

1. CDN service and caching are different and must be considered separately.

Some of Petitioners' *amici* argue that combining BIAS with CDN service and caching makes BIAS an information service. But their arguments rest on a strawman: a non-existent service that has some properties of CDNs and some properties of caching. CDNs and caches differ from a technical perspective, from a business perspective, and

from a legal and regulatory perspective, as explained below, and hence they must be considered separately.

2. Use of caching by BIAS providers is not sufficient to classify BIAS as an information service, because caching falls within the telecommunications system management exemption.

ISP caching was once common. It works as follows. ISPs store webpages that have been frequently requested in the past in devices known as "caches" within their networks. Once a webpage is stored, when other users request the same page, it can be sent from a cache close to the user, rather than from the original source (which may be thousands of miles away). This mechanism is hidden from the user requesting the information, and from the original source.[5] ISPs do not charge for this hidden function.

The primary reason for a BIAS provider to employ caching is to reduce its costs. *See* Peha Comments (Suppl. App. 1783). Through caching, a BIAS provider can sometimes avoid transferring a web page more than once over an expensive backhaul link or paying transit costs. Although ISP caching sometimes has the added benefit of reducing

[5] Indeed, the word "cache" comes from the French *cacher*, "to hide."

response time to the end user, BIAS providers do not employ ISP caching to attract or retain customers, because customers have no way of knowing which BIAS provider offers better caching. Caching does not affect traditional "speed" tests that measure quality of an Internet service, and subscribers cannot tell if any web pages they receive came from an ISP-operated cache. *Id.* Thus, users cannot choose their BIAS provider or choose to pay extra based on caching.

Given that providers employ caching to reduce operating costs, ISP caching falls within the telecommunications systems management exemption. Indeed, BIAS providers themselves routinely describe ISP caching as "network management" practices.[6] Thus, it is not an information service in its own right.

ISP caching is now uncommon, further undermining any argument that today's classification of BIAS should depend on it. Today, most Internet traffic is encrypted.[7] As use of encryption on the

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[6] AT&T, for example, describes its caching as a "a reasonable network management video optimization technique." *Information About the Network Practices, Performance Characteristics & Commercial Terms of AT&T's Mass Market Broadband Internet Access Services*, AT&T, https://tinyurl.com/yc59kfx9.

[7] Google reports a 96% encryption rate as of 2024. *HTTPS Encryption on the Web*, Google Transparency Rep., https://tinyurl.com/bdfw249h.

Internet increased, caching became less useful. Typically, when content is encrypted, it is sent to each recipient in a form that can be decrypted by applying a code known only to that recipient. A cache cannot do that unless it has access to the content in unencrypted form, which requires close coordination with the content provider, and a relationship that is so trusted that proprietary content can go unprotected. This is not possible with traditional ISP caching.

Petitioners say that "[c]aching, meanwhile, 'work[s] hand-in-hand with the ISP's DNS servers,'" Pet'rs Br. 37 (quoting App. 773), and "*Brand X* recognized that caching . . . is part of 'the Internet service,'" *id.* (quoting *Brand X*, 545 U.S. at 999). But the cited document actually describes how a CDN (and not an ISP cache) might work with DNS servers. In reality, the caching function recognized by *Brand X* has nothing to do with DNS.

3. Use of CDNs by BIAS operators is not sufficient to classify BIAS as an information service, because CDNs are not inextricably intertwined with BIAS.

Content delivery networks emerged in the 2000s. Although both ISP caching and CDNs attempt to provide information from servers close to the requesting users, and both are hidden from end users, they

are different. One critical difference is that the CDN is not hidden from the content provider. Indeed, content providers pay CDN operators to disseminate content. Thus, content providers (not BIAS subscribers) are the customers of CDN service. Content is selected for storage in a CDN because a content provider selected that specific content, not because the content has been found to be popular among Internet users as occurs with ISP caching.

CDNs are never mentioned in *Brand X*. Moreover, CDN service is inconsistent with the Court's description of caching in *Brand X*: "the Internet service provided by cable companies facilitates access to third-party Web pages by offering consumers the ability to store, or 'cache,' popular content on local computer servers." 545 U.S. at 999. CDN service is offered to content providers, not consumers, and content in a CDN need not be popular.

CDNs lease storage space to edge providers. As the FCC's *2015 Order*, *2018 Order*, and the *Order* challenged here explain, CDN service is distinct from the ISP caching that BIAS providers employ and is separate from BIAS. *See, e.g.*, *2015 Order* ¶ 372; App. 12. As stated in

the *Order* challenged here, "Caching used by BIAS providers is distinct from [CDN] caching." App. 87.

Although some BIAS providers operate their own CDN, market leaders among CDNs, such as Akamai, are *not* BIAS providers, so CDN service is separable from BIAS. Thus, if a network operator chooses to offer both BIAS and CDN services, they would be properly viewed as separate offerings to different customers. Provider-offered CDN services do not change the classification of BIAS.

IV. Mobile BIAS is a commercial mobile service because it is provided for profit and makes interconnected service available to the public.

By statute, mobile BIAS is a "commercial mobile service" if it is a "mobile service . . . provided for profit and makes interconnected service available . . . to the public." An "interconnected service" is a "service that is interconnected with the public switched network." 47 U.S.C. § 332(d). Mobile BIAS satisfies these statutory requirements.

A. There is a single public switched network that includes networks used to provision telephone exchange service, telephone toll service, mobile voice service, and BIAS.

Petitioners assert that "[t]here are no internal connections between the elements of the internet and the elements of the telephone

network." Pet'rs Br. 50. This is untrue. Not only are there elements of the Internet and telephone network that are interconnected, but fixed phone service, mobile phone service, fixed BIAS, and mobile BIAS are often provisioned over the same physical infrastructure. Fixed telephone and BIAS are provisioned over the same copper or fiberoptic cables from subscriber premises to central office or cable head-end. Mobile telephone and BIAS are provisioned over the same wireless links from the subscriber's device to a cell tower. All of these services are provisioned over the same regional infrastructure, which interconnects central offices and cell towers, and over the same national infrastructure, including terrestrial fibers that run from East Coast to West. Jordan Comments 52-53 (Suppl. App. 1890-91).

Technologically, there is a single network that includes both PSTN and Internet, and that is used to provision both telephone service and BIAS. Under the Communications Act and a long string of Commission Orders, as well as in the technical literature, the communications network used to provision a telecommunications service is distinct from the telecommunications service itself. *See* Scott Jordan, *Mobile Broadband Internet Access Service is a Commercial*

Mobile Service, and Hence Must Be Regulated as a Common Carrier Service, 27 Info. & Commc'ns Tech. L. 304, 304-66 (2018). The same communications network may be used to provision multiple telecommunications services, and other services, too. Jordan Comments 53-54 (Suppl. App. 1891-92).

Petitioners assert that "[t]he public switched network' is a term of art with a clear meaning: the 10-digit telephone network." Pet'rs Br. 49. But the Communications Act states that the term "public switched network" is defined by regulation by the Commission, 47 U.S.C. § 332(d)(2), and the Commission defines it as "the network that includes any common carrier switched network, whether by wire or radio, including local exchange carriers, interexchange carriers, and mobile service providers, that use[s] the North American Numbering Plan, or public IP addresses, in connection with the provision of switched services," App. 145 (internal citation omitted). A single network does not necessitate that all devices use a uniform addressing space, e.g., the 10-digit North American Numbering Plan ("NANP"). Networks using different addressing spaces are connected to form a larger single network. The PSTN uses NANP addresses in the wireline

portion of the PSTN, paging network addresses in paging networks, and a variety of cell phone network addresses in cell phone networks. Jordan, *Mobile Broadband*, at 353-54. In addition, a device often has multiple network addresses. For instance, smartphones are typically assigned a NANP address, a private IP address, and a cellular network address. *Id.*

B. Mobile BIAS is interconnected with the public switched network.

"Interconnected service" is "service that is interconnected with the public switched network," 47 U.S.C. § 332(d)(2), with the Commission defining the term "interconnected" as "[d]irect or indirect connection through automatic or manual means (by wire, microwave, or other technologies such as store and forward) to permit the transmission or reception of messages or signals to or from points in the public switched network." 47 C.F.R. § 20.3.

Mobile BIAS is an interconnected service; it is a service that is directly or indirectly connected to permit the transmission or reception of message to or from points in the public switched network. Indeed, an end user who has subscribed to mobile BIAS has the capability to communicate to and from other users who are subscribers to BIAS and

are using devices capable of using that service. *U.S. Telecom Ass'n v. FCC*, 825 F.3d 674, 722 (D.C. Cir. 2016).

Petitioners assert that "[t]o provide 'interconnected' service, a mobile service must enable "communicat[ion] to . . . and from *all* other users of the public switched network." Pet'rs Br. 53. They ignore the definition of "interconnected," which does not require communication to *and* from, nor require communication with *all* other users. Nevertheless, mobile BIAS gives subscribers the capability to communicate to or receive communications from *all* other users on the public switched network, provided that the parties have acquired the necessary telecommunication services and customer premises equipment. *See* Jordan Reply Comments 32-33 (Suppl. App. 2156-57). There are many options for doing so. Mobile BIAS subscribers may use an app that is capable of addressing, configuring, and maintaining connections with communicating parties, such as Skype, Google Voice, Cisco WebEx, or GoToMeeting. Alternatively, the party with which the mobile BIAS subscriber wishes to communicate may use a voice forwarding service, such as an email-to-voice service. *Id.*

In addition, the major mobile service providers no longer offer voice-only cell plans. Even their most basic plans include data. Thus, anyone with almost any cellphone on almost any recent cellphone plan has access to mobile BIAS. Jordan, *Mobile Broadband*, at 359.

CONCLUSION

For the foregoing reasons, the Court should deny the petitions for review.

Dated: September 18, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that on September 18, 2024, an electronic copy of the foregoing brief was filed with the Clerk of the Court using the CM/ECF system, which will send notification of such filing to all counsel of record in this matter.

Dated: September 18, 2024

s/ Sarah R. Goetz

CERTIFICATE OF COMPLIANCE

I certify that this brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7) because, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(f), it contains 6,252 words.

I further certify that the brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5), and the type-style requirements of Federal Rule of Appellate Procedure 32(a)(6), because it has been prepared in a proportionally spaced typeface using Microsoft Word 365 in 14-point Century Schoolbook font.

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Dated: September 18, 2024

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