Before the Federal Communications Commission Washington, D.C. 20554

In the Matter of)	
Safeguarding and Securing the Open Internet))	WC Docket No. 23-320
)	

COMMENTS OF INTERNET INFRASTRUCTURE COALITION (i2Coalition)

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EXECUTIVE SUMMARY

The Internet Infrastructure Coalition ("i2Coalition") supports the Federal

Communications Commission ("Commission" or "FCC") proposal to reinstate enforceable,
bright-line rules to prevent blocking, throttling, and paid prioritization under Title II authority.¹

As the Commission previously concluded, certain Internet Service Providers (ISPs) "function as
gatekeepers for both their end user customers who access the Internet, and for various transit
providers, CDNs, and edge providers attempting to reach the broadband provider's end-user
subscribers."² The Commission was concerned that ISPs have the economic incentive and
technical ability to leverage their position to anti-competitively discriminate against service
providers and network providers, disadvantage edge providers, and ultimately harm
consumers.³ With this in mind, we look forward to the Commission setting rules for Broadband
Internet Access Service (BIAS) to ensure the Internet remains open as an engine for innovation
and growth.

As the Commission moves forward, it must again make clear that certain key services

¹ Safeguarding and Securing the Open Internet, WC Docket No. 23-320, Notice of Proposed Rulemaking (rel. Oct. 20, 2023) (2023 Open Internet NPRM). The i2Coalition's support for the Commission's proposed reclassification of BIAS under Title II follows our prior advocacy for this approach in response to the 2014 NPRM. See Comments of the i2Coalition, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (July 15, 2014) (supporting protection of the open Internet with enforceable no blocking and anti-discrimination rules under the Commission's Title II authority).

² Protecting and Promoting the Open Internet, GN Docket No. 14-28, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601, 5628, para. 78 (2015) (2015 Open Internet Order) (emphasis added).

³ 2015 Open Internet Order, 30 FCC Rcd at 5628, para. 78; 2023 Open Internet NPRM at para. 123.

that are essential to the functioning of the Internet are not BIAS.⁴ The Commission previously concluded strongly, repeatedly and correctly that virtual private network services (VPNs), content delivery networks (CDNs), web hosting services, and data storage services are <u>not</u>

BIAS.⁵ The Commission explained that these services have historically been distinguished from "mass market" services and "do not provide the capability to receive data from all or substantially all Internet endpoints." The Commission also rightly concluded that domain name services (DNS) are not telecommunications services when offered on a standalone basis by entities other than the provider of Internet access services, and fall under the telecommunications system management exception when offered with BIAS. Moreover, providers of these various services have different business models, and do not have the same economic incentives as some ISPs or the same technical capabilities inherent in ISP infrastructure to block, throttle, discriminate against, or otherwise harm third-party traffic.

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⁴ See Commission's proposed definition of BIAS, 2023 Open Internet NPRM at 101 (Appendix A, Sec. 8.2 (a)(1)).

⁵ 2015 Open Internet Order, 30 FCC Rcd at 5684-5685, para. 190: "broadband Internet access service does not include virtual private network (VPN) services, content delivery networks (CDNs), hosting or data storage services, or Internet backbone services (to the extent those services are separate from broadband Internet access service)." (citing *Preserving the Open Internet; Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, 25 FCC Rcd 17905 (2010) (2010 Open Internet Order), at 17933, para. 47; Protecting and Promoting the Open Internet, GN Docket No. 14-28, Notice of Proposed Rulemaking, (2014 Open Internet NPRM) 29 FCC Rcd 5581, para. 58 (2014)); See also 2015 Open Internet Order, 30 FCC Rcd at 5749, para. 340.

⁶ 2015 Open Internet Order, 30 FCC Rcd at 5684-5685, para 190, (citing 2014 Open Internet NPRM, 29 FCC Rcd at 5581, para. 58; 2010 Open Internet Order, 25 FCC Rcd at 17933, para. 47).

⁷ 2015 Open Internet Order, 30 FCC Rcd at 5769-5770, para. 370 ("DNS falls within the telecommunications systems management exception"), and at fn. 1046 ("To be clear, we do not find that DNS is a telecommunications service (or part of one) when provided on a standalone basis by entities other than the provider of Internet access service").

The i2Coalition appreciates this opportunity to explain in more detail how these services work, and the current marketplace realities, in further support of the Commission's prior conclusions. There is no legal, policy, or technical reason that would justify changing these conclusions now.

Finally, the i2Coalition emphasizes that it is not aware of any other jurisdiction in the globe that treats VPNs, CDNs, web hosting, data storage and DNS services as BIAS. If the Commission were to come to a different conclusion it would not only be aberrational, but would create significant confusion, causing a ripple effect felt across the world.

COMMENTS

Founded in 2012 by a diverse group of Internet infrastructure companies, the i2Coalition is a global organization that supports and represents the companies that build, maintain, and operate the Internet's infrastructure. Members include cloud providers, data centers, web hosting companies, domain registries and registrars. Our members, most of whom are small- to medium-sized businesses, but who operate globally, create a fundamental layer upon which user-facing Internet applications, services and platforms rely, and enhance that layer for security. These types of services do not fall within the definition of BIAS. The Commission proposes to define BIAS as:

...a mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up internet access service. This term also encompasses any service that the Commission finds to be providing a functional equivalent of the service described in the previous sentence or that is used to evade the protections set forth in

this part.8

Quite simply, VPNs, CDNs, web hosting, data storage services, and DNS do not *provide the* capability to transmit data to and receive data from all or substantially all Internet endpoints.

In 2017, the Commission reversed the conclusions of the *2015 Open Internet Order*, finding that components of BIAS are so intertwined that it is impossible to distinguish and separate elements, making the entire service an "information service" under Title I.⁹ This is wrong from a technical perspective. Internet architecture is modular, and a close examination of technical details is necessary before determining whether applications and services are integrated with the underlying telecommunications service or are functionally separate.¹⁰ The critical question is whether "the products here are functionally integrated (like the components

⁸ 2023 Open Internet NPRM at 101, Appendix A, Sec. 8.2(a)(1)(emphasis added).

⁹ Restoring Internet Freedom, WC Docket No. 17-108, Declaratory Ruling, Report and Order, and Order, 33 FCC Rcd 311 (2017) (*RIF Order*).

¹⁰ See article by Scott Jordan, Professor of Computer Science at the University of California, Irvine, and the Commission's Chief Technologist from 2014-2016, advocating for a Title II framework. (The "assumptions--that telecommunications is an input to an information service and that information service functionality is intertwined with the underlying telecommunications--fail with the Internet...the central tenet of Internet architecture dictates that telecommunications service is separable from information services. Thus, any claim that these applications are 'functionally integrated' with and 'inextricably intertwined' with the underlying telecommunications, and hence that the underlying telecommunications is inseparable from these applications, is factually wrong. The separability follows from both the modularity of Internet architecture ... and the Internet standards for these applications. Separability is also evidenced by the offerings of these applications from entities unaffiliated with the broadband Internet access service provider. The end-to-end transmission of IP packets and applications such as email, web browsing, or cloud storage are not 'functionally integrated...By Internet standards themselves, the end-to-end transmission of IP packets is mandated to be separable from the applications that ride over it.") Jordan, Scott, Broadband Internet Access Service is a Telecommunications Service (August 27, 2018), Federal Communications Law Journal, vol. 71 issue 2, Feb 2019, pp. 155-252 ("FCC CT Article"), at 250-51 (footnotes omitted) (emphasis added).

of a car) or functionally separate (like pets and leashes)" and "[t]hat question turns not on the language of the Act, but on the factual particulars of how Internet technology works and how it is provided."¹¹

A deeper look at how these services work from a technical perspective, considered together with today's broadband market conditions, also reflects that these services are separated when offered by a provider other than the BIAS provider. The Commission has long held that a key factor to consider is "whether the service is used as a substitute for broadband Internet access service." As explained below, the technical review, and an assessment of how these services are used, support the continued exclusion from BIAS of VPNS, CDNs, web hosting services, data storage services, and DNS.¹³

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¹¹ Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967 at 991 (2005).

¹² 2010 Open Internet Order, 25 FCC Rcd at 17933, para. 47 ("For example, an Internet access service that provides access to a substantial subset of Internet endpoints based on end users preference to avoid certain content, applications, or services; Internet access services that allow some uses of the Internet (such as access to the World Wide Web) but not others (such as e-mail); or a 'Best of the Web' Internet access service that provides access to 100 top websites could not be used to evade the open Internet rules applicable to 'broadband Internet access service.' Moreover, a broadband provider may not evade these rules simply by blocking end users' access to some Internet endpoints. Broadband Internet access service likely does not include services offering connectivity to one or a small number of Internet endpoints for a particular device, e.g., connectivity bundled with e-readers, heart monitors, or energy consumption sensors, to the extent the service relates to the functionality of the device. Nor does broadband Internet access service include virtual private network services, content delivery network services, multichannel video programming services, hosting or data storage services, or Internet backbone services (if those services are separate from broadband Internet access service). These services typically are not mass market services and/or do not provide the capability to transmit data to and receive data from all or substantially all Internet endpoints.") (footnotes omitted).

¹³ A recitation of the legal and regulatory history and evolution of key definitions and their significance can be found in the *FCC CT Article* at Section II, providing context for (1) the history and meaning of the FCC terms "basic service," "adjunct to basic service," and "enhanced

VPN Services Are Not BIAS

The primary purpose of VPNs is to enhance security. VPN services do not provide network connectivity. VPNs create a secure and private passage for data over the Internet that encrypts users' Internet traffic and protects it from third parties. In contrast, the main purpose of BIAS is the direct transmission of information as specified by the user. VPNs do not provide Internet access. Nor do they provide the same level of user-defined control over the specific transmission points of data content. Indeed, they are not a "launching pad to forward traffic to the destination identified by the user." Instead, VPNs act as intermediary services providing data security and anonymity, while BIAS providers, on the other hand, provide network connectivity and access to the Internet.

VPNs are over-the-top services and cannot independently transmit data. VPNs are over the top ("OTT") services because the transmission of signals is always carried out by the Internet service provider providing the Internet access service. VPNs do not have independent control over the transmission of the communication itself, and do not independently provide users the ability to send or receive communications. Users must first be connected to the Internet via an ISP to use the VPN service. While VPNs do reroute user Internet traffic through their servers, the conveyance of signals over the network – essential for communication -- is

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service"; (2) the history and meaning of the MFJ terms "telecommunications service" and "information service"; and (3) the Telecommunications Act of 1996 terms "telecommunications service" and "information service." *See FCC CT Article* at 159, 161-178).

¹⁴ 2023 Open Internet NPRM at 37, para. 67 (emphasis added).

always managed by the user's ISP. This means VPN service simply cannot perform without Internet access provided by ISPs, and does not in itself manage, control, or operate telecommunications systems or manage a telecommunications service. Additionally, the provision of a VPN does not involve the creation or extension of an electronic communications network; nor does it allow for user control over the specific endpoints of data transmission. The end user also does not have access to a different network when using the VPN versus without using a VPN.

exhibit fundamentally different approaches to data transmission. BIAS is designed to provide direct and unaltered transmission of data from users to various Internet endpoints. This direct transmission is the core function and primary purpose of BIAS. In contrast, for VPNs, rerouting and forwarding traffic through VPN servers is a mere byproduct of applying encryption protocols. Traffic forwarding from a server is a secondary consequence of providing data encryption, not a goal in itself. While VPNs are recommended, they are not a required service for using the Internet. For these reasons, VPNs are not "integral to transmitting data and delivering communications to Internet endpoints." Instead, they operate on top of existing data transmission pathways established by BIAS to provide an additional layer of security.

It is for all of these reasons that the Commission has historically concluded that VPNs are not BIAS; there is no legal, policy, or technical, reason to change that conclusion now.¹⁶

¹⁵2023 Open Internet NPRM at 37, para. 67 (emphasis added).

¹⁶ 2010 Open Internet Order, 25 FCC Rcd at 17933, para. 47; 2014 Open Internet NPRM, 29 FCC Rcd 5561, 5568, para. 58 (2014); 2015 Open Internet Order, 30 FCC Rcd at 5684-5685, para. 190. See also: What is a VPN? (Source: NordVPN); What is a VPN? (Source: Cloudflare).

CDN Services Are Not BIAS

A content delivery network (CDN)¹⁷ is a set of servers that work together to speed up webpage loading and other content such as video streaming for data-heavy applications. When a user visits a website, data from that website's server travels across the Internet to reach the user's computer. Because of the global and intricate design of the Internet, communication traffic between websites and their users often has to move over large physical distances. When the user is located far from that website server, it could take a long time to load a large file, such as a video or website image.

A CDN improves efficiency by introducing intermediary servers between the client and the website server. A CDN can improve page load time, reduce bandwidth costs, and increase content availability by distributing the primary content source to multiple intermediary server locations away from the origin source and closer to the user. This distribution is useful when there are spikes in visitors to a website and improves website security in the face of Distributed Denial-of-Service (DDoS) attacks that try to take down applications by sending spikes of fake traffic to the website.

A CDN does not sell a "mass market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints." Most CDNs are customers of the ISP. CDNs cache data at endpoints geographically close to end

¹⁷ A CDN is sometimes referred to as a Content Distribution Network. *See* https://www.geeksforgeeks.org/what-is-a-content-distribution-network-and-how-does-itwork/

¹⁸ 2023 Open Internet NPRM at 101, Appendix A, Sec. 8.2(a)(1).

users, reducing congestion and latency to the benefit of users, content providers and BIAS providers. This type of content localization is neutral – it does not involve discrimination that the bright-line "no blocking, no throttling, no paid prioritization" rules are intended to prevent.¹⁹ At their core, CDN services are customized services that improve content delivery in particular, specialized circumstances. It is for these reasons that the Commission has repeatedly concluded that CDNs are not BIAS. There is no legal, policy, or technical reason to change that conclusion now.²⁰

Web Hosting Services Are Not BIAS

Web hosting services store websites or web applications and make them easily accessible across different devices such as desktop, mobile, and tablets. In so doing they are not operators of a backbone or a network. The web hosting service provider maintains, configures, and runs physical servers for rent for use with website and web application files such as images, videos, text, and code. Web hosting services typically provide additional support, such as security, website backup, and website performance.

Content providers may work through web hosting services for a range of reasons, such as efficiencies related to outsourcing server maintenance, management of hardware resources,

¹⁹ See also Comments of Akamai, RIF Proceeding, WC Docket No. 17-108 (July 17, 2017) at 10 ("CDNs cache data near end users and use software and algorithms to identify preferred locations for users to access content in a way that avoids congestion on the Internet. This is localization of content and does not constitute prioritization.")

²⁰ 2010 Open Internet Order, 25 FCC Rcd at 17933, para. 47; 2014 Open Internet NPRM, 29 FCC Rcd at 5568, para. 58; 2015 Open Internet Order, 30 FCC Rcd at 5684-5685, para. 190. See also, What is CDN? (Source: Hostinger); https://www.cloudflare.com/learning/cdn/what-is-a-cdn/ (Source: Fastly).

technical support, and outsourcing of security and compliance measures. Web hosting services are usually individualized plans that depend on the website or application size, number of daily users, peak traffic times, and required features.

As explained by the Commission's former Chief Technologist, web hosting is a service distinct from BIAS: "The Internet's architecture guarantees that the IP packet transfer service, which provides end-to-transmission of information of the user's choosing, is separable from the applications (such as webpage hosting, caching of newsgroup articles, and email) riding over it."²¹

Web hosting is not a mass market service to provide the capability to transmit data to and receive data from all or substantially all Internet endpoints. Instead, it is an individualized service to support file storage and other functionality; it is not a service that is purchased for Internet access. It is for these reasons that the Commission has repeatedly concluded that web hosting services are not BIAS; there is no legal, policy, or technical reason to change that conclusion now.²²

²¹ FCC CT Article at 192. Jordan continues: "Protocols at the physical, data link, and network layers are designed separately from Internet applications. The Internet Protocol that transmits packets from one end of the Internet to another end is standardized and is independent of all of the Internet applications that are offered through it. Protocols at the physical, data link, and network layers are implemented in the operating systems of end user devices and are not in any way integrated in those operating systems with Internet applications. The result is that Internet applications may be offered by entities other than broadband Internet access service providers." Id. (footnotes omitted).

²² 2010 Open Internet Order, 25 FCC Rcd at 17933, para. 47; 2014 Open Internet NPRM, 29 FCC Rcd 5561, 5568, para. 58; 2015 Open Internet Order, 30 FCC Rcd at 5684-5685, para. 190. See also: What is Web Hosting? (Source: Hostinger).

Data Storage Services Are Not BIAS

Data Storage Services should similarly be excluded from the definition of BIAS. Data storage service is sometimes referred to as "storage as a service." The Commission defined data storage service as "provision of access to data storage platforms." Storage can be provided "on premises," with storage infrastructure assigned to a specific customer. Today, it is common to use cloud-based storage, which allows users to store, access, and maintain their data from any location that offers an Internet connection, rather than confining files to a single location or device. Cloud storage vendors allow users to rent storage space on networks of remote data servers based on their usage needs. Users pay cloud vendors for the ability to run applications, host services, and back up data to the cloud and usually adhere to usage limits that can be expanded for an additional fee, enabling them to scale their storage needs as necessary.

Data storage service is not a mass market service to provide the capability to transmit data to and receive data from all or substantially all Internet endpoints. Instead, it is an individualized service to support data storage and other functionality; it is not a service that is purchased for Internet access. It is for these reasons that the Commission has previously concluded that data storage services are not BIAS; there is no legal, policy or technical reason to change that conclusion now.²⁴

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²³ 2023 Open Internet NPRM at para. 67, note 227.

²⁴ 2010 Open Internet Order, 25 FCC Rcd at 17933, para. 47; 2014 Open Internet NPRM, 29 FCC Rcd 5561, 5568, para. 58; 2015 Open Internet Order, 30 FCC Rcd at 5684-5685, para. 190. See also: What is Cloud Storage? (Source: Cloudflare).

DNS Services Are Not BIAS

The Domain Name System (DNS) is like the Rosetta Stone of the Internet. It performs a critical translation function, taking human-readable, memorable domain names, such as www.example.com, and mapping them to numeric IP addresses that are readable by machines, such as, for illustrative purposes, 12.345.67.8910.²⁵ Humans can remember the names, and computers can read the numerical address.

The DNS is split into two types of DNS nameservers that work together.

- (1) The recursive DNS server is user-facing and involved in every DNS query. A computer's operating system is configured to use one or more recursive DNS servers; these recursive DNS servers are often provided by an ISP or a company's IT department. When you type a domain name, e.g., example.com, ²⁶ into a browser, the recursive DNS server doesn't know the IP address of the domain, but it does know where to go to find that information. To find an IP address, the recursive DNS server connects to an authoritative DNS server.
- (2) The Authoritative DNS server is domain-owner facing. A domain name, such as example.com, is purchased for use from an organization called a registrar. Once a domain name is purchased, a company must set up authoritative DNS servers and provide the list of the servers to the registrar. The company may have several authoritative DNS servers. The

²⁵ Note – "12.345.67.8910" is for illustrative purposes and not intended to reflect an actual IP address. *See 2015 Open Internet Order,* 30 FCC Rcd at 5758-5759, para. 357, fn. 972 ("DNS is most commonly used to translate domain names, such as 'nytimes.com,' into numerical IP addresses that are used by network equipment to locate the desired content. *See Cable Modem Declaratory Ruling,* 17 FCC Rcd at 4810, para. 17 n.74; *see also Brand X,* 545 U.S. at 987, 999.")

²⁶ The example of example.com is provided for illustrative purposes only.

configuration of authoritative DNS servers requires creating and uploading a DNS zone file to the registrar. This zone file lists all the translations for the hostnames in the domain. For example.com, the zone file includes translations for the hostnames www.example.com, mail.example.com, and others.²⁷ Once the IP address is located within the zone file, the authoritative DNS server sends this information back to the recursive DNS server. The recursive server then sends the answer to the web browser, which has the information to display the web page.

None of this describes a mass market service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints.²⁸ In 2015, the Commission observed that DNS is not a necessary component of BIAS. IP packet transfer can work without DNS, and DNS lookup is available from third parties.²⁹ This has not changed.

We acknowledge the Commission's tentative conclusion that "companion services" to BIAS, "such as DNS and caching, when provided with BIAS" and offered to the public by a BIAS provider may be classified within the telecommunications systems management exception to the definition of an information service under the Communications Act. 30 While that conclusion may be justified in some circumstances, the Commission must again conclude that DNS is not

²⁷ Examples provided for illustrative purposes only.

²⁸ How the Domain Name System (DNS) Works (Source: Verisign); What is DNS? (Source: Cloudflare); https://www.akamai.com/glossary/what-is-dns (Source Akamai).

²⁹ 2023 Open Internet NPRM at 43, para. 77 (citing 2015 Open Internet Order, 30 FCC Rcd at 5769-70, para. 370).

³⁰ *2023 Open Internet NPRM* at 42, para. 75.

part of BIAS when offered on a stand-alone basis by entities other than the provider of Internet access service.

The Commission reached this conclusion in the 2015 Open Internet Order based on the same rationale underlying its conclusions in the 2023 Open Internet NPRM: "we do not find that DNS is a telecommunications service (or part of one) when provided on a stand-alone basis by entities other than the provider of Internet access service. In such instances, there would be no telecommunications service to which DNS is adjunct, and the storage functions associated with stand-alone DNS would likely render it an information service." 31

In other words, the Commission found that while DNS services, when offered as part of the suite of services provided by a BIAS provider, do "not convert the broadband Internet access service offering into an integrated information service," DNS services offered on a standalone-basis without the provision of BIAS are nevertheless "likely" information services, and certainly not a telecommunications service governed by Title II of the Communications Act.

After all, in the stand-alone scenario, "there would be no telecommunications service to which DNS is adjunct, and the storage functions associated with stand-alone DNS would likely render it an information service."

For the legal, policy, and technical reasons stated above, the Commission must again conclude that DNS is not BIAS. We support the Commission's tentative conclusion in the *2023*Open Internet NPRM to follow the 2015 precedent that, when provided with BIAS, DNS would fall under the telecommunications systems management exception to the "information service"

³¹ See 2015 Open Internet Order, 30 FCC Rcd at 5769-5770, para. 370, fn. 1046; see also 2023 Open Internet NPRM at 42-44.

definition in the Communications Act, as its fundamental purpose is to route information.

CONCLUSION

The i2Coalition supports the Commission's proposal to reinstate enforceable, bright-line rules for BIAS under Title II to protect the open Internet. We urge the Commission to again make clear that certain key infrastructure services – VPNs, CDNs, web hosting services, data storage services, standalone DNS, and other similarly situated services – are not BIAS because such services 1) are not mass market services providing the capability to transmit data and receive data from all or substantially all Internet endpoints; 2) are technically separable; and 3) do not have economic incentives to block, throttle or discriminate against third party traffic. Furthermore, the Commission should also make clear that DNS, when offered with BIAS, falls under the telecommunications system management exception. To conclude otherwise would be contrary to law, the Commission's policies, technical realities, and global norms.

Respectfully submitted,

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