Before the
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554

In the Matter of:	)	
	)	
Mozilla	)	RM - _____
	)	
Petition to Recognize Remote Delivery	)	
Services in Terminating Access Networks and	)	
Classify Such Services as Telecommunications	)	
Services Under Title II of the Communications Act	)	
	)	

PETITION TO RECOGNIZE REMOTE DELIVERY SERVICES IN TERMINATING ACCESS NETWORKS AND CLASSIFY SUCH SERVICES AS TELECOMMUNICATIONS SERVICES UNDER TITLE II OF THE COMMUNICATIONS ACT

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SUMMARY

Mozilla petitions the Federal Communications Commission to (i) recognize that the enabling of communications within a last-mile terminating access network between a remote endpoint and the local subscribers of an Internet access service provider constitutes a delivery service provided by that Internet access service provider to that remote endpoint; and (ii) declare such a service to be a telecommunications service subject to Title II of the Communications Act. This action will help preserve the future of technology innovation online, particularly for online video communications and smartphone applications and services.

The concept of privity in network operations has changed. No longer does a network operator interact only with those entities that directly connect to it. Now, relationships between the operator and remote hosts can play a significant role in network management, a context reinforced powerfully by the D.C. Circuit in its decision on the Commission's *Open Internet Order*. Meanwhile, regulatory developments and statutory language made decades ago, and not yet updated despite an evolving technology context, have left the federal agency charged with overseeing communications hobbled in overseeing these dynamics as they emerge.

Faced with a multi-sided market as described by the Court of Appeals, the Commission must determine, under the Communications Act and relevant precedent, the appropriate regulatory status of the services network operators provide to remote endpoints in enabling their last-mile network communications with local end user subscribers. As "overlay" services they use the same underlying physical function of network packet routing as local subscriber-facing Internet access services, yet are distinct logically and legally, and require independent evaluation. Both remote and local delivery services differ from interconnection and peering functions and associated services, which involve a distinct physical portion of the network

infrastructure.

Remote delivery services, like their local counterparts, include the transmission of communications. Unlike local delivery, remote delivery services include only that transmission, with no other integrated functions. They are offered to all remote Internet hosts, a class that includes anyone with an Internet connection in the peer-to-peer, many-to-many Internet we have today, where anyone can be a maker, not merely a consumer. Thus, their proper classification is as telecommunications services subject to Title II.

Classifying remote delivery services as Title II telecommunications is a minimal, yet necessary, action to realize the statutory goals of the Communications Act in the modern era of network management and market operations. It would not change established Commission orders and precedents. It would not expand Commission jurisdiction to new entities, but instead would help separate and safeguard edge and content services as outside the scope of the Commission's authority. And, with subsequent Commission proceedings to forbear from inapplicable provisions of Title II and to establish clear no-blocking and non-discrimination rules for network management, it would not levy undue burden on network operators, but rather would be narrowly tailored to advancing core policy goals previously articulated by the Commission.

Mozilla urges the Commission to take the proposed steps and establish clearly its authority under the Communications Act to safeguard the remote delivery of host services through terminating last-mile networks.

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Mozilla is a nonprofit organization that produces the Firefox web browser and Firefox OS smartphone operating system, together adopted by half a billion individual Internet users around the world. Mozilla is a foundation that educates and empowers Internet users to be the Web's makers, not just its consumers. Finally, Mozilla is a global community of technologists, thinkers, and builders who work together to keep the Internet alive and accessible. Our mission is to promote openness, innovation, and opportunity on the Web.[1]

The open Internet Mozilla is built to support relies on many technological and legal assumptions for its continued vitality. One of those assumptions is the idea that data packets associated with a remote, edge host will be delivered by every network operator along the way, including through the terminating network of the other point in the communication. This

[1] *See* "Mission," Mozilla, *at* https://www.mozilla.org/en-US/mission/.

assumption originated in the history of network routing, when fine-grained network management was infeasible. The emergence of technologies for real-time traffic management changed that reality. In its place is a new universe of potential services between last-mile network operators and remote hosts for the routing of data. These remote delivery services previously did not exist, as privity between these two entities was, formerly, nonsensical as a technical matter.

The task of the Federal Communications Commission as an independent agency is to interpret and apply the statutory goals set out by Congress within its expertise. In the recently remanded *Open Internet Order*, the Commission held that its obligations under the Communications Act and the Telecommunications Act of 1996 justified preserving and protecting last-mile network communications against blocking and discrimination;[2] this interpretation was upheld by the D.C. Circuit, though the rules themselves were remanded over jurisdictional issues.[3] In response, the Commission is exploring how best to restore those essential protections within the bounds of its Congressional authority.[4]

This petition contends that remote delivery services provided by last-mile network operators to arms-length edge hosts, allowing them to communicate with that operator's subscribers, represent a distinct legal category of services from user-facing Internet access services and from interconnection and peering. The Commission must therefore determine the appropriate regulatory framework for these services. The functionality of these services is limited to the delivery of traffic, subject in theory to prioritization or throttling based on payment or lack thereof. At the same time, in a world where any Internet user can also be a host, the services are undoubtedly offered "directly to the public, or to such classes of users as to be

[2] *Preserving the Open Internet*, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, 25 FCC Rcd 17905, 17941-51 paras. 62-79 (2010).
[3] *Verizon v. FCC*, No. 11-1355 (D.C. Cir. Jan 14, 2014), slip op. at 4, 17-31.
[4] *New Docket Established to Address Open Internet Remand*, DA 14-211, GN Docket No. 14-28, Public Notice (Feb. 19, 2014).

effectively available directly to the public."[5] Therefore, under statutory language and past decades of interpretation as upheld by numerous court cases, remote delivery services are telecommunications services subject to Title II of the Communications Act.

The proposed determination would establish clear jurisdiction for achieving the Commission's stated policy goals, furthering the statutory duty of Section 706 to "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans."[6] Simultaneously, it would clearly delineate Commission authority, creating space for experimentation with pricing and other features of consumer-facing Internet access services, while at the same time separating information-only services further from the core of Commission jurisdiction. It would bring American telecommunications law more in line with the rest of the world, improving the climate for global investment and trade. Finally, it would empower the Commission to protect the pro-innovation, pro-competition benefits of the original network routing assumptions, while allowing the Internet's various markets for services across many layers to evolve, with appropriate supervision.

I. HISTORY AND CHANGE

In the Internet's early years, routing of data packets operated according to the end-to-end principle. One endpoint (whether client or server) would send a packet to its Internet access provider; the packet would then travel according to a determined route to the Internet access provider serving its intended destination, and all intermediary network operators would use their "best efforts" to forward traffic along. Once at its terminating network, the final Internet access provider would deliver the packet to its intended destination. Some of the steps along this path

[5] 47 U.S.C. § 153(53).
[6] 47 U.S.C. § 1302.

were performed pursuant to paid contractual relationships; others were done for free, relying as much on a social contract as formal agreements or any compensation. In this world, a network operator, or Internet service provider, provided a service to, or "served," two types of entities: end users and interconnection/peering partners. Only with these entities could an Internet Service Provider (ISP) be considered to have privity – that concept was directly and inextricably tied to a physical connection. This structure offered tremendous benefits for flexibility and experimentation. It produced a creative, competitive, inventive, and user-friendly Internet world.

Over time, technologies and markets have changed. Among the changes are some significant benefits. Online video and communications tools are merging and transforming, creating a new world of opportunity for global social, commercial, and political exchange. In parallel, user-generated content has become a major driving force for economic activity and consumption. Wikipedia, Facebook, and YouTube are 3 of the 6 most popular Internet sites for the entire world.[7] Through these two revolutions in communications and creation, the Internet today is far from a one-to-many distribution medium, like television. Instead, it is a vibrant, dynamic, evolving many-to-many universe. And, the forthcoming emergence of WebRTC and the continued centrality of mobile access will take these changes to the next level. Mozilla is working to build the future of WebRTC and smartphones, alongside many other organizations large and small in the technology industry.

Some of the changes have been much more mixed. In particular, once-straightforward relationships between ISPs and their end users and interconnection partners are becoming more complicated. Flat fees for unlimited access are becoming usage-based access plans, sometimes

[7] *E.g.* "The top 500 sites on the web," *Alexa*, http://www.alexa.com/topsites.

with "sponsored" exceptions.[8] Routing within a terminating access network can no longer always be assumed to be purely end-to-end and best efforts, as the Commission has faced several high-profile incidents of targeted blocking and throttling of specific applications and protocols.[9] Outside the United States, governments force network operators to block specific network addresses, protocols, and services.[10] Interconnection practices have (d)evolved from best efforts relationships among peers, to unpleasant disagreements between unequal entities.[11]

The future of WebRTC, smartphones, and the Internet as we know it depends on the assumption that remote hosts will be able to communicate with end user Internet access subscribers, an assumption that as a result of these changes is less certain than it once was. If this assumption breaks down and WebRTC host traffic is regularly blocked or throttled in a last mile terminating access network, that future will not emerge. If smartphone users in the United States are frequently unable to send and receive video content, or use new networked applications and services, the next generation of mobile innovation will flourish in other countries around the world – but not here. Meaningful protections for the remote delivery of all traffic within its terminating access network are essential, because new and small providers have no negotiating leverage. Permitting individual entities to negotiate is not a solution in a many-to-many network where innovation may come from a start-up or individual as readily as an established company.

It is against this backdrop that Mozilla requests the Commission evaluate the changed nature of the services and privity associated with the provision of Internet access service.

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[8] Russell Brandom, "Sponsored Data: AT&T will now let companies buy out your data charges for specific videos and apps," *The Verge* (Jan. 6, 2014), *at* http://www.theverge.com/2014/1/6/5279894/at-t-announces-net-neutrality-baiting-sponsored-data-mobile-plans.

[9] Marvin Ammori, "Yes, Net Neutrality Is A Solution To An Existing Problem," *TechDirt* (Apr. 15, 2014), *at* http://www.techdirt.com/articles/20140413/15112526896/yes-net-neutrality-is-solution-to-existing-problem.shtml.

[10] *See generally* "Freedom on the Net," *Freedom House*, *at* http://www.freedomhouse.org/report-types/freedom-net.

[11] Kyle Russell, "Netflix CEO Blasts Comcast Over Net Neutrality," *Business Insider* (Mar. 20, 2014), *at* http://www.businessinsider.com/netflix-ceo-reed-hastings-blasts-comcast-2014-3.

II. THE MANY-SIDED MARKET OF INTERNET ACCESS SERVICES

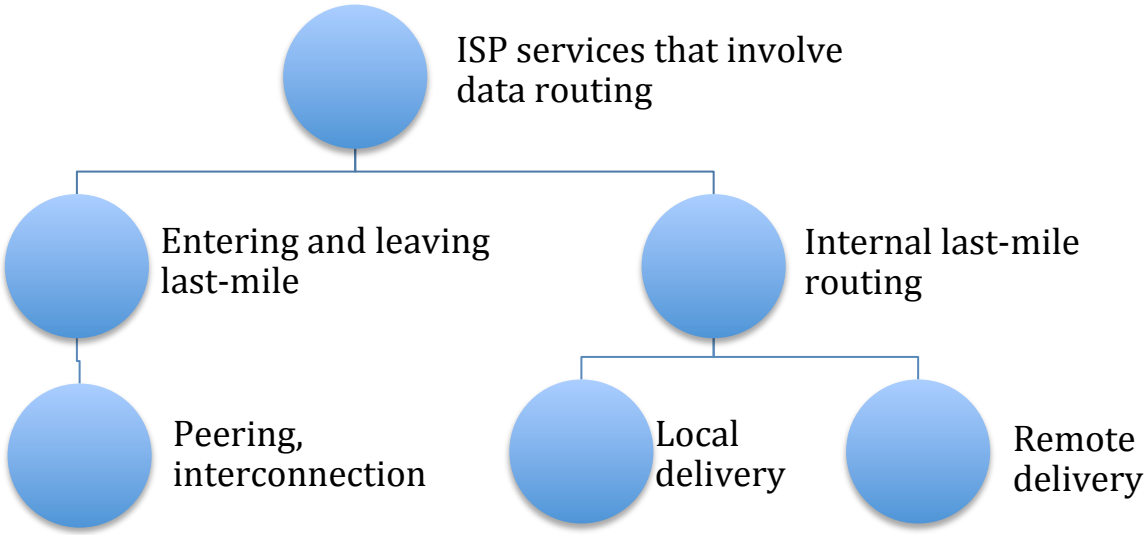
The D.C. Circuit's decision regarding the *Open Internet Order* effectively declared that Internet access is a two-sided market, in that Internet service providers (ISPs) have potential commercial relationships with not only their direct end-user customers, but also with arms-length remote hosts including website operators, email service providers, and all endpoints connecting to the Internet through other Internet service providers. This potential relationship exists on one level because of the possibility of direct interconnection between a once-remote endpoint and an Internet service provider. But it also exists, separately and independently, as a potential prioritization or carriage service for the delivery of traffic associated with the remote endpoint in the last mile, terminating network. It need not include any direct connection to that endpoint, which may remain at arms length, because of the increasing ubiquity of deep packet inspection technology,[12] along with other technical advancements in network management.

Understanding this modern reality contrasts with core assumptions of those who view the interconnection and peering relationship as encapsulating an obligation to provide last-mile delivery of all packets, regardless of their endpoints. In this view, the ISP has two separate duties in its last mile network management: a duty to the end user, and a duty to peering and interconnection partners. Originally, this characterization was undoubtedly accurate, because these two were the only contexts in which an ISP exerted deliberate activity. Other than with respect to these two parties, all traffic was treated "neutrally" and not discriminated or blocked according to its type, remote origin or destination, or any other criteria. The ISP had cognizable privity only with its subscribers and interconnection partners.

[12] *See, e.g.*, M. Chris Riley and Ben Scott, "Deep Packet Inspection: The End of the Internet as We Know It?," *Free Press* (Mar. 2009), *at* http://www.freepress.net/sites/default/files/fp-legacy/Deep_Packet_Inspection_The_End_of_the_Internet_As_We_Know_It.pdf.

However, this history is past, and gone with it is the assumption that it is sufficient to view a last-mile network operator as having only two duties, to interconnection/peering partners and to end users. Now, technology enables fine-grained network management creating potential commercial relationships with remote, arms length endpoints. Therefore, a last-mile operator must be viewed as having a separate duty with respect to remote endpoints, in addition to its duties to end users and interconnection/peering partners. Privity in network traffic management has been changed, fundamentally, through deep-packet inspection and other advanced network management technologies. And it is that change that the Commission must address.

The actual and potential services between an ISP and a remote endpoint enable that endpoint to communicate with the ISP's local subscribers. This represents a "side B" or "remote delivery" service in the "two sided" Internet access service structure. It is logically and legally distinguishable – but not physically separable – from the "side A" or "local delivery" service offered by Internet service providers to their end user customers, which includes routing of the same traffic in exchange for payment, along with possibly other services such as the assignment of a temporary network address, domain name resolution, and provision of an email address.



The local "side A" and remote "side B" delivery services, as described, do not correspond to separate physical network segments, or separate directions of traffic flow, or any other "hard" technical distinctions. They are separable from interconnection and peering, as they apply only to the delivery of traffic within the network controlled by a single operator.[13]

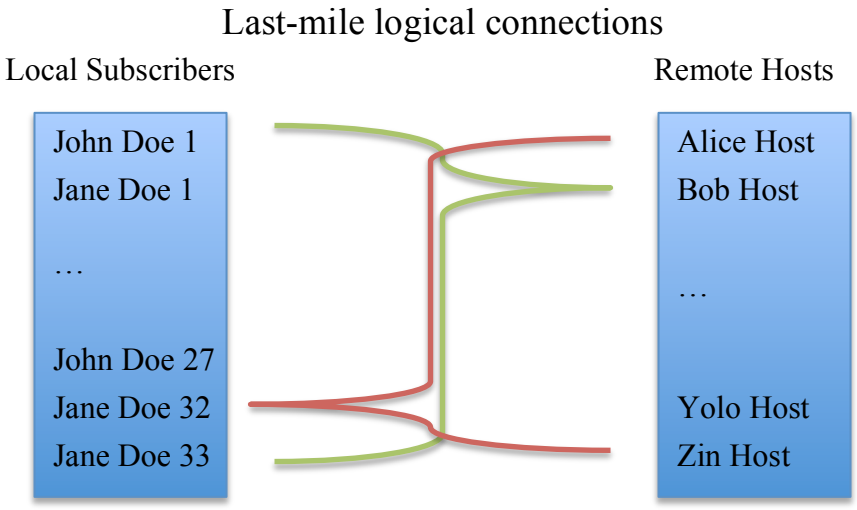
The local "side A" and remote "side B" delivery services may best be understood as "overlay" services, logical services that share infrastructure (including routing, caching, and congestion control mechanisms) but are separable and distinct. Both the local "side A" and remote "side B" delivery services utilize the underlying transport functionality offered by the network – just as both utilize the switches in that network, the housing cabinet and machinery holding and cooling those switches, the physical cables connecting those switches, and the electricity powering the entire apparatus.

But they serve separate customers and separate purposes. The "side A" services connect local customers to the entire, outside Internet, while the "side B" services offer to remote endpoints the ability to reach the ISP's local subscriber customers. The functional operations of last-mile Internet routing connect *all* of the ISP's local subscribers to *all* of the Internet's remote hosts; the potential connections between these sets form a complete bipartite graph.[14] A local "side A" delivery service connects a subscriber to all remote endpoints, while a remote "side B" delivery service connects a remote host to all local subscribers. In the diagram below, the "red" arc is the service that allows Jane Doe 32 to communicate with Alice, Bob, Yolo, Zin, and other hosts; the "green" arc is the service that allows Bob Host to communicate with John Doe 1-27

[13] For interconnection and peering, one option would be to view and treat Internet access service as a *three*-sided market, in that Internet access service providers have cognizable and distinct privity with their direct subscribers; with interconnection and peering partners; and, separately, with remote hosts. Another option would be to treat interconnection and peering as a component or adjunct function to the services that network operators provide to subscribers or remote hosts. However, as the focus of this petition is on last-mile network delivery only, the treatment of interconnection and peering need not be resolved at this time.

[14] https://en.wikipedia.org/wiki/Complete_bipartite_graph

and Jane Doe 1-33. All green arcs combined together constitute the complete bipartite graph of all relationships, just as all red arcs together would.



In the deregulatory orders of the 2000s, the Commission declared end-user facing, "side A" local services to be Title I information services.[15] However, the scope of these decisions does not reach "side B" remote delivery services. The crux of the Commission's information services designation, as upheld by the Supreme Court, was the additional features offered to the end user, and in particular the integration of capabilities to browse the Web, to transfer files, to send emails, and to access domain name resolution capabilities.[16] Because remote endpoints gain these capabilities from their direct, local Internet access service provider – not from the ISP serving their distant communications partners – they are not integrated in the same way. As a result, they are outside the category of services previously designated by the Commission.

Thus the question to be resolved is: **What are "side B" remote delivery services, as a regulatory matter?**

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[15] The so-called "Cable Modem Declaratory Ruling" was the first of these, in 2002. *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities et al*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798 (2002). It was followed by related orders in 2005 and 2007. The Supreme Court ultimately upheld the Cable Modem classification under *Chevron* deference. Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967, 125 S. Ct. 2688, 162 L. Ed. 2d 820 (2005) (*Brand X*).

[16] *Brand X*, *supra* note 15, Opinion of the Court, pp. 15-17.

III. CLASSIFICATION

Viewed through the lens of Commission precedent, the only possible classification for remote delivery services is telecommunications services subject to Title II. Combining the text of the Communications Act with recent decades of Commission and court precedent, a service is a "telecommunications service" if it meets a three-prong test: The service must include a "transmission"; it must be offered "directly to the public"; and it must not include, or must be separated from, any additional information services. Remote delivery services as defined meet all three of these prongs.

A. Prong 1: Transmission

The core of telecommunications is "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." Just as the local Internet access service offered to end-users includes telecommunications capability, so must the remote delivery service. The only distinction between the two services for purposes of this prong is the identity of the "user"; with a subscriber-facing service, it is the ISP's customer, while with a remote delivery service, it is the remote endpoint who the ISP's customer is communicating with. Because this is still a cognizable "user" and the "choosing" and "transmission" still reflect communications associated with the remote host, that portion of this prong applies to remote delivery services for the same reason it applies to Internet access services.

With both subscriber-facing Internet access services, for which this prong is indisputably met, and remote, host-facing delivery services, there is no change to the form or content of the information as sent and received, and no modifications are offered to the remote host with respect to the content itself, only the possibility of prioritization, caching, and other features to

improve performance that maintain the content in full and in its original semantic state.

B. Prong 2: Public

The second central prong of Title II analysis is that the service is not a private service, but rather one that is offered to the public, or generally to a broad class of entities so as to be effectively offered to the public.[17] Whereas it may be debated whether interconnection and peering partners constitute a sufficiently large class as to be considered "the public," it is undeniable that the category of Internet hosts is such a class, because any organization and any individual can be a remote "host" for Internet traffic.[18] Additionally, any individual may be the endpoint of a peer-to-peer WebRTC (or other protocol) video communication, and thus a "remote host" from the point of view of the other party's Internet service provider. Thus, the remote delivery service must be considered offered to the public.

C. Prong 3: Not integrated with other services

Internet access services offered to local end-user subscribers are considered to include a telecommunications component, yet were classified by the Commission as information services because they are integrated with non-telecommunications capabilities.[19] This is the central factor that the Commission has relied on in the past to categorize Internet access services for end-user subscribers as information services: the inclusion of additional capabilities, specifically domain name resolution, email services, hosting services, and other featured services.

Remote delivery services include no such additional services. The other features included with local services play no role in the delivery of packets between their source and destination.

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[17] 47 U.S.C. § 153(53).

[18] Mozilla is helping to ensure and empower all Internet users to be hosts through our Webmaker programs, which train and assist anyone with becoming a web publisher. *See* Mozilla Webmaker *at* https://webmaker.org/.

[19] *See supra* notes 15-16 and accompanying text.

As a technical matter, remote delivery services between an end-user-facing ISP and a remote host consists solely of transport of packets, and the only functionality offered to a potential remote delivery customer is that transmission. Thus, they cannot be considered "information services" on the grounds that they include other, non-transmission services.

IV. MINIMAL, YET NECESSARY, ACTION

Classification of remote delivery services as telecommunications services subject to Title II is a minimal, yet necessary, action to realize the statutory goals of the Communications Act in the modern era of network management and market operations. Such classification is definitively not "reclassification," as that term is commonly used, because it does not change the commercial relationships between ISPs and their subscribers, which can remain information services subject to Title I consistent with the arguments raised herein.[20]

The privity that has been established between ISPs and remote endpoints in the modern world of finely tailored network management allows the Commission to declare Title II authority for services between these two classes of entities without overruling the *Cable Modem Order* and its successors. Furthermore, to fulfill its statutory duties as applied to the modern Internet, the Commission must be able to govern ISP management of traffic associated with remote endpoints.

Thus far, ISP action through local network management mechanisms to block, discriminate against, or discriminate in favor of remote endpoints has been conceptualized as a fine-grained interference with the local subscriber's Internet access service (whether any other

[20] The question of whether the "information services" designation remains appropriate for Internet access services facing direct subscribers is currently widely debated. This petition takes no position on the merits of such arguments.

portion of the user's service is noticeably affected or not).[21] Although such interference certainly impacts the end-user subscriber, at the same time the impact on the remote endpoints is more direct, cognizable, and significant. Focusing on the issue from the perspective of the network operator's relationship with the remote endpoint, rather than its relationship with the local subscriber, is not only a legally valid path, it is also germane and targeted to the proximate impact.

Designating the delivery of remote endpoint data within a last-mile terminating access network as a Title II service would provide the Commission with a clear and sustainable jurisdictional basis for addressing that impact. The Commission could then proceed to adopt an appropriate framework for dealing with potential harms of practices such as blocking and discrimination of lawful Internet traffic.

V. CONCLUSION

Mozilla requests the Commission issue a declaratory ruling that remote delivery services are telecommunications services subject to Title II of the Communications Act. Mozilla also suggests the Commission move promptly to forbear from any inapplicable or undesirable provisions of Title II for remote delivery services, to adopt rules articulating clear prohibitions for blocking and discrimination of remote delivery services based on this authority, and to establish enforcement mechanisms to permit Internet users and organizations to seek redress of violations of statutory or administrative obligations.

[21] The arguably tenuous nature of this connection may have contributed to legal and political difficulties faced by supporters of open Internet protections.