

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

In the Matter of:)
)
Protecting and Promoting the Open Internet) GN Docket No. 14-28
)

Reply Comments of Bret T. Swanson¹

September 15, 2014

As we have since 2004, we offer comments in the Commission’s important efforts to protect and promote the Open Internet.

Twitch Proves the Net Is Working

On August 25, 2014, Amazon announced its acquisition of Twitch for around \$1 billion. Twitch (twitch.tv) is a young but very large website that streams video games and the gamers who play them. The rise of Twitch demonstrates the Net is working and, we believe, also deals a severe blow to a central theory of the *Order* and NPRM.

The NPRM repeats the theory of the 2010 *Open Internet Order* that “providers of broadband Internet access service had multiple incentives to limit Internet openness.”² The theory advances a concern that small start-up content providers might be discouraged or blocked from opportunities to grow. Neither the *Order* nor the current NPRM considers or even acknowledges evidence or arguments to the contrary — that broadband service providers (BSPs) may have substantial incentives to *promote* Internet openness. Nevertheless, the Commission now helpfully seeks comment “to update the record to reflect marketplace, technical, and other changes since the 2010 Open Internet Order was adopted that may have either exacerbated or mitigated broadband providers’ incentives and ability to limit Internet openness. We seek general comment

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² Federal Communications Commission. *Preserving and Protecting the Open Internet*. GN Docket 14-28. Paragraph 42.

on the Commission's approach to analyzing broadband providers' incentives and ability to engage in practices that would limit the open Internet."³

The continued growth of the Internet, and the general health of the U.S. Web, content, app, device, and Internet services markets — all occurring in the absence of Net Neutrality regulation — more than mitigate the Commission's theory of BSP incentives. While there is scant evidence for the theory of bad BSP behavior, there is abundant evidence that openness generally benefits all players throughout the Internet value chain. The Commission cannot ignore this evidence.

The rise of Twitch is a perfect example. *In three short years, Twitch went from brand new start-up to the fourth largest single source of traffic on the Internet.*⁴ Google had previously signed a term sheet with Twitch, but so great was the momentum of this young, tiny company, that it could command a more attractive deal from Amazon. At the time of its acquisition by Amazon, Twitch said it had 55 million unique monthly viewers (consumers) and more than one million broadcasters (producers), generating 15 billion minutes of content viewed a month.⁵ According to measurements by the network scientist and Deepfield CEO Craig Labovitz, only Netflix, Google's YouTube, and Apple's iTunes generate more traffic.

The Commission's theory said providers of video content, because of the large bandwidth requirements compared to other content types, were especially vulnerable to bad BSP behavior. Twitch is just such an online video player, yet it achieved hyper-growth and spectacular financial success in the absence of Net Neutrality rules. A firm that didn't exist at the time of the 2010 *Order* is born and blossoms to become an Internet giant, courted by at least two of the world's very largest Internet companies — all in the short time that courts, commissions, and companies are haggling over the rules. This is just one of many pieces of evidence demonstrating start-up firms — specifically start-ups that consume massive amounts of bandwidth — are thriving on the Internet.

Another piece of recent evidence bolsters the case that BSPs have incentives to promote, and in fact maintain, openness. In the second quarter of 2014, *cable broadband subscribers for the first time ever outnumbered cable TV subscribers.*⁶ Broadband is now not just the cable industry's *best* product, it is its *biggest* product. It is popular because consumers can access the diverse bounty of the Web and the Net, and subscribers are voting with their feet.

³ Id. Para 39.

⁴ Swanson, Bret. "Amazon, Twitch, and the Title II Threat to Web Video." Forbes.com. September 5, 2014. <http://bit.ly/AMZNtwitchII>

⁵ "Amazon.com to Acquire Twitch." August 25, 2014. <http://phx.corporate-ir.net/phoenix.zhtml?c=176060&p=irol-newsArticle&ID=1960768>

⁶ See, for example, "The Internet Is Officially More Popular Than Cable In The U.S." Wired.com. August 15, 2014. <http://www.wired.com/2014/08/the-internet-is-now-officially-more-popular-than-cable-in-the-u-s/>

The health of the Internet economy is a major blow to the theory. In an attempted rebuttal, the Commission might argue that although enforceable rules were not in place, BSPs were operating in an environment in which new rules were a possibility. This possibility, the Commission might assert, encouraged good behavior. Perhaps. Yet new rules to combat or discourage anticompetitive or anti-consumer behavior are always on the table. And many general laws and rules already exist to protect competition and consumers no matter the industry. The Perhaps the theory is far less powerful than the NPRM assumes.

The theory of future bad behavior continues to be just that. The Commission is grasping at “might be’s.” But the reality of a healthy Internet economy demonstrates the success of the open Internet every day. The Commission should more heavily weight the mountains of accumulating evidence that BSPs have major incentives to promote openness. Similarly, as evidence piles up against it, the Commission should discount its previous theory of BSP behavior. We may argue over the relative incentives for BSPs to constrain or promote Internet openness. But no legitimate rule making can ignore the substantial incentives in favor of openness.

Given the manifest success of the entire value chain, the Chairman’s proposed case-by-case review process, under Section 706, is far preferable to the intrusive omni-regulatory regime of Title II.

Wireless Is Different

The Commission has so far wisely chosen not to apply its heaviest Net Neutrality rules to wireless networks. But it has asked for comment on the proposal that it do so.

A new paper by Jeffrey H. Reed and Nishith D. Tripathi shows just how complex today’s mobile networks are — and how they require even more intensive network management than wired networks.⁷ It adds to the overwhelming testimony of the technical community that “wireless is different” and that wireless networks, businesses, and devices would be especially harmed by intrusive Net Neutrality rules.

The number of wireless devices is moving quickly past 10 billion connections. In several years, the Internet of Everything could grow to 30, 50, or even 100 billion devices, nearly all connected wirelessly.⁸ The sheer numbers will only exacerbate the existing complexity of wireless networking. “From millisecond to millisecond,” write Reed and Tripathi,

⁷ Reed, Jeffrey H. and Nishith D. Tripathi. “Net Neutrality and Technical Challenges of Mobile Broadband Networks.” September 4, 2014. <http://www.ctia.org/docs/default-source/default-document-library/net-neutrality-and-technical-challenges-of-mobile-broadband-networks-9.pdf>

⁸ See, for example, Adam Thierer. “The Internet of Things and Wearable Technology: Unlocking the Next Wave of Data-Driven Innovation.” AEI-UNL-FCC Conference. September 11, 2014. http://www.aei.org/files/2014/09/12/-thierer-final-internet-of-things-presentation_104713970943.pdf

handsets with differing capabilities, consumers with different usage patterns, applications that utilize different aspects and capabilities of both the handset and the network, and content consumption, including video, must be integrated with the network and managed adroitly to deliver a world-class broadband experience for the customer. Now imagine that millisecond to millisecond process happening while the consumer is in motion, while the handsets vary in capability (think flip-phone to smartphone), while the available network changes from 3G to 4G and from one available spectrum band to another, while traffic moves into and out of a cell sector, and while spectrum capacity is limited. This entire process — the integration of all these different variables — is unique to mobile broadband.⁹

Now imagine adding dozens of new types of devices to the network, generating and consuming many types of data, with varied capacity, latency, and jitter requirements. All interacting on and moving between networks using licensed and unlicensed spectrum. All posing increasingly intense challenges of radio interference and data congestion.

Like the example of Twitch, the mobile Internet is a demonstrable success story. It is, however, even more vulnerable to misguided regulation. The burden of proof is on those who would impose regulation to show that new rules would somehow improve wireless from its existing position of strength, and that new rules, contrary to the overwhelming witness of the technical community, would not harm the mobile arena.

Netflix, Mozilla, and Title II ¹⁰

Two of the most prominent and forceful advocates of new Internet regulation are Netflix, the movie and TV-show streaming firm, and Mozilla, maker of the Firefox web browser. Though differing on a few details, each organization has proposed regulating the Internet as a Title II monopoly telephone service.

We admire both organizations for their innovative contributions to the digital universe. Because they are leading the charge for the government to oversee the Internet as never before, however, it is important to understand — and to refute, where warranted — their positions. Here we select and scrutinize just a few of the technical and economic arguments and assertions from their first-round comments.

Mozilla says: the FCC should “recognize a new type of service” — a so-called “remote delivery service,” defined as the connection between an “edge provider” and a broadband ISP’s subscriber. This downstream link would be regulated as a common carrier under Title II.

⁹ Reed and Tripathi. p. 1.

¹⁰ This section is adapted from a recent analysis: Bret Swanson. “A closer look: Netflix, Mozilla, and Title II.” TechPolicyDaily.com. <http://bit.ly/NFLX-MOZ-T2>

Mozilla thinks defining a new remote delivery service can both avoid the fraught re-classification of traditional broadband links and also wall off the rest of the Internet from the very real burdens of Title II. It seems to us not just a bad idea substantively, but too clever for its own good. For starters, in the many-to-many world that Mozilla describes, everyone is an edge provider in some sense. This makes it hard to avoid that, despite its best intentions, every network link will get swallowed up by Title II. Even Netflix says, correctly, that the “universe of potential edge providers is extremely heterogeneous.”

Mozilla uses an analogy in which a “doorman in a high-end condominium” holds package deliveries for the condo residents. The broadband ISP is the doorman, in Mozilla’s story, and his only job is to forward the packages to the residents. He may not charge the sender of the package to speed the delivery to Mrs. Smith on the 18th floor, nor can he threaten to slow down the package absent payment. But ISPs are not passive doormen or toll booth operators, and their broadband policy statements all commit not to degrade anyone’s service. They invest \$60 billion in the U.S. each year to build networks, data centers, software, and services. The analogy isn’t perfect, but an ISP is in reality more like FedEx. It takes a lot of money to build the infrastructure to transport packages, or bits, and customers pay for the service.

One of the motivations behind Mozilla’s “remote delivery service” definition, it says, is to protect everyone else in the ecosystem from the ravages of Title II. Such an admission is a deep self-indictment. It is difficult to see how the proposal is anything more than a tool to regulate one’s business rivals and/or suppliers — a decidedly non-neutral policy.

Mozilla says: a determination that bans prioritization “would not prevent network operators from seeking new revenue models, or enabling services that require higher standards for delivery. It would instead require these services to be separated from the access service and structured as specialized services. So long as such services do not generate congestion or degrade traffic for the access service, they would fall outside the scope of Title II classification proposed in the Mozilla petition.”

The 2010 Open Internet rules addressed this point and made room for specialized or managed services outside the scope of net neutrality. We suppose this is better than not allowing room for special services that might require higher levels of capacity, or lower latency tolerances, or other premium options. We addressed this carve out idea in [Reply Comments in November of 2010](#):

“The Commission should consider several unintended consequences of moving down the path of explicitly defining, and then exempting, particular ‘specialized’ services while choosing to regulate the so-called ‘basic,’ ‘best-effort,’ or ‘entry level’ ‘open Internet.’

“Regulating the ‘basic’ Internet but not ‘specialized’ services will surely push most of the network and application innovation and investment into the unregulated sphere. A

'specialized' exemption, although far preferable to a Net Neutrality world without such an exemption, would tend to incentivize both CAS [content, application, and service] providers and ISP service providers to target the 'specialized' category and thus shrink the scope of the 'open Internet.'

"In fact, although specialized services should and will exist, they often will interact with or be based on the 'basic' Internet. Finding demarcation lines will be difficult if not impossible. In a world of vast overlap, convergence, integration, and modularity, attempting to decide what is and is not 'the Internet' is probably futile and counterproductive. The very genius of the Internet is its ability to connect to, absorb, accommodate, and spawn new networks, applications and services. In a great compliment to its virtues, the definition of the Internet is constantly changing.

"Moreover, a regime of rigid quarantine would not be good for consumers. If a CAS provider or ISP has to build a new physical or logical network, segregate services and software, or develop new products and marketing for a specifically defined 'specialized' service, there would be a very large disincentive to develop and offer simple innovations and new services to customers over the regulated 'basic' Internet. Perhaps a consumer does not want to spend the extra money to jump to the next tier of specialized service. Perhaps she only wants the service for a specific event or a brief period of time. Perhaps the CAS provider or ISP can far more economically offer a compelling service over the 'basic' Internet with just a small technical tweak, where a leap to a full-blown specialized service would require more time and money, and push the service beyond the reach of the consumer. The transactions costs of imposing a 'specialized' quarantine would reduce technical and economic flexibility on both CAS providers and ISPs and, most crucially, on consumers.

"Or, as we wrote in our previous Reply Comments about a related circumstance, 'A prohibition of the voluntary partnerships that are likely to add so much value to all sides of the market – service provider, content creator, and consumer – would incentivize the service provider to close greater portions of its networks to outside content, acquire more content for internal distribution, create more closely held "managed services" that meet the standards of the government's "exclusions," and build a new generation of larger, more exclusive "walled gardens" than would otherwise be the case. The result would be to frustrate the objective of the proceeding. The result would be a less open Internet.'

"It is thus possible that a policy seeking to maintain some pure notion of a basic 'open Internet' could severely devalue the open Internet the Commission is seeking to preserve."

Mozilla says: it urges “the Commission to ban paid prioritization and to apply the same open Internet rules to mobile wireless access services as to fixed services.”

Even technicians who have supported robust net neutrality regulation say applying the rules to wireless would be a mistake. The 2010 Open Internet rules exempted wireless. And for good reason. Wireless is a tricky and constrained environment. Wireless technologies use all sorts of prioritization schemes to ration capacity on what are shared networks. Mozilla says it would allow for reasonable network management techniques. But a host of other technical and commercial arrangements could be put in jeopardy. For example, what about “sponsored data” plans where content firms like ESPN could subsidize a user? In January, AT&T announced a sponsored data template, and in the past month T-Mobile has partnered with several digital music providers. The Mozilla and Netflix proposals could ban such partnerships that provide value to all three parties — consumer, network, and content provider.

Mozilla says: “To contend that edge providers offer nothing of value to access service providers would go against the Commission’s core broadband tenets as well as common sense.”

No one contends this.

Mozilla says: failure to enact its favored policy could produce “an outcry from public interest organizations and technology companies citing promises that were broken.”

This is an odd justification for a push to regulate a healthy industry.

Netflix says: “There can be no doubt that Verizon owns and controls the interconnections that mediate how fast Netflix servers respond to a Verizon Internet access customer’s request.”

This is false. As Netflix correctly notes just paragraphs before, “It is called the *Inter*-net for a reason. That is, the *Inter*-net comprises interconnections between many autonomous networks” An inter-connection between two networks means precisely that the two “autonomous” networks have agreed to terms to connect. By its nature, no single entity “owns and controls the interconnections.” It is a partnership. The journey of an Internet data packet, or stream of many packets, moreover, usually takes place over multiple networks, thus traversing several interconnections. In fact, factors *outside* the ownership and control of last mile ISPs are often most crucial to the quality and speed of Netflix streams (see “[Netflix and the Net Neutrality Promotional Vehicle](#)”).

Netflix says: “ISPs, not online content providers, set the universe of available pathways into their networks.”

This is only partially true. Yes, ISPs determine with whom they interconnect. But the existence of other successful networks sets the universe of possible pathways, and the economics and culture of the Net mean broadband ISPs want their customers to reach as much content as possible, so ISPs in general want to connect to lots of other networks. Regardless, Netflix has often *chosen* to use congested pathways into the broadband ISPs, even though a large number of other well known, capacious pathways (CDNs, transit providers) were also available. In most of the cases when Netflix’s service seemed slow, it was these poor network architecture choices that caused deterioration in “how fast Netflix servers respond[ed]” to an “Internet access customer’s request.”

Netflix says: “There is still one and only one way to reach Comcast’s subscribers: through Comcast.”

Netflix similarly has a monopoly in the market of Netflix customers.

Netflix says: “Prioritization has value only in a congested network.” The ability to prioritize “creates a perverse incentive for ISPs to forego network upgrades in order to give prioritization value.” And in a similar vein, “Prioritization is inherently a zero-sum practice.”

First, it must be said that paid priority is getting far too much attention. It’s not really the key question. We may use prioritization techniques for some applications in the future — HD video conferencing, gaming, remote medical procedures — but most broadband ISPs do not today prioritize much, if any, traffic on their last mile access links. It’s just not the central point of contention so many have made it to be.

Second, priority is a commonplace concept. It’s true, in a world of unlimited supply, priority doesn’t matter. In the real world, it does. We prioritize in every business setting, and in everyday life. We certainly prioritize on the Internet. Voice over IP packets get tagged. Websites and online video providers use content delivery networks (CDNs) for faster delivery. Financial firms build direct fiber links to speed stock market trades. The examples are endless: FedEx’s next morning delivery versus three-day ground. First class versus coach. Airplane versus automobile. Now versus later. It’s crucial that we’re allowed to pay more — and that we’re allowed to pay less when we don’t want or need immediacy.

Third, the argument is a bit circular. And it’s not supported by good economics. The theory is that ISPs will offer an increasingly dilapidated product to consumers so that they can charge

content providers for fast lanes. But consumers do have other choices, and dilapidated products aren't popular. We have multiple wireline choices, and multiple wireless choices that are increasingly robust substitutes. Are broadband service providers really eager to anger their huge customer base in order to make a few extra bucks from a relatively small number of content providers? The math doesn't look good.

The FCC NPRM, however, asserted, without empirical or theoretical foundation, that ISPs have an incentive to underinvest, congest the network, and degrade service. The FCC did not contemplate, let alone give ample weight to, counter arguments and facts showing incentives working in just the opposite, and much happier, direction.

If we make broadband a highly regulated industry, however, we can expect less market entry, less competition, less investment, less new capacity. (See the experience of Europe today.) A world of artificial scarcity will prompt more stingy prioritization schemes (rationing) than a world of investment and innovation, though some forms of priority will exist in any world this side of heaven.

Priority, price discrimination, product differentiation — these things actually allow us to match consumers with their needs and to create an economically rational system that can support growth.

Contrary to blanket assertions, there are many small start-ups who might value various forms of paid priority, sponsored data, or premium services. Perhaps these tools will help them launch into markets faster than they otherwise would. They may not have the large in-house data centers and CDN networks of a Google or Netflix, so perhaps they utilize third party CDN services or establish partnerships or buy super-fast connections.

Lastly, priority is not zero-sum. To the extent consumers and businesses are allowed to pay for priority (and save money when we don't need it), the value of the entire system increases and allows further investment. Don't force grandma who checks her email once a day to subsidize the affluent round-the-clock video gamer.