Network Neutrality and Zero-rating

Barbara van Schewick

February 19, 2014

Whether network neutrality rules should prohibit zero-rating – i.e. the practice of not counting certain applications against users' monthly bandwidth caps – has become the next frontier in the net neutrality debate. Since the FCC adopted its Open Internet Rules in 2010, zero-rating has spread from developing countries and is now used by operators in almost all OECD and European countries where it is not explicitly prohibited.[1] As a result, zero-rating has become a key point of contention in network neutrality debates around the world. In the past year, regulators in Chile, the Netherlands, Slovenia and Canada explicitly prohibited zero-rating, while regulators in Germany, Austria and Norway publicly stated that zero-rating violates network neutrality.[2]

The FCC's 2010 Open Internet order prohibited fixed ISPs from charging application providers for zero-rating. The FCC's Fact Sheet does not explain how the FCC plans to address zero-rating – i.e. the practice of not counting certain applications against users' monthly bandwidth caps. While the Fact Sheet's description of the ban on paid prioritization could be read to include the zero-rating of applications against a fee, press reports suggest that the FCC intends to evaluate all forms of zero-rating under the general conduct rule.[3]

In this proceeding and in the press, ISPs have consistently asserted their desire to engage in zero-rating.[4] In a recent filing, Verizon argued that it appealed the Open Internet Rules because its lawyers recognized the order banned zero-rating for a fee and Verizon wanted to engage in this practice.[5] As a result, zero-rating in the US has generally been limited to wireless offerings. If the FCC does not address the issue, it is likely that zero-rating will expand rapidly, given the ISPs' interest in the practice. While interested parties could bring complaints under the general conduct rule, this solution would create considerable uncertainty and put the burden on the public to bring complaints. Given the considerable social costs associated with leaving zero-rating to later case-by-case adjudications, the FCC should explicitly ban those types of zero-rating now that are clearly harmful.

1. Zero-rating has a strong discriminatory effect.

Network neutrality rules aim to prevent network providers from distorting the playing field among applications or classes of applications, and from interfering with users' choices regarding the use of the network. Some commenters assume that zero-rating is less harmful than technical

[1] Drossos (2015); Digital Fuel Monitor (2014b) (listing 92 cases of zero-rating in OECD and EU countries).
[2] See, e.g., Meyer (2015b); Meyer (2015a); Meyer (2014a); Meyer (2014b); Drossos (2015).
[3] Higginbotham (2015); Brustein (2015).
[4] Bergen (2015).
[5] Verizon (2015).

forms of discrimination (such as slowing down or speeding up certain applications), because applications that are zero-rated continue to receive the same technical treatment as applications subject to the cap. However, while zero-rating operates slightly differently, the discriminatory effect is the same: Zero-rated applications are more attractive to users than applications that are not.

Evidence suggests that zero-rating has a powerful effect. For example, in a study commissioned by CTIA, "[n]early three-quarters of respondents (74%) report that they would be more likely to watch videos offered by a new provider if the content did not count against their monthly limit."[6] When Slate experimented with zero-rating and "told some would-be listeners that the podcast wouldn't count against the data plans on their smartphones […] users were 61% more likely to press play."[7]

This is not surprising. Consider an Internet service provider that zero-rates its own streaming video application, while the traffic of all other applications is counted towards subscribers' bandwidth cap, a common practice around the world.[8] For users who have not exhausted their monthly bandwidth allowance, watching a video that produces 2 gigabytes (GB) of traffic via an unaffiliated application brings those users 2 GB closer to exhausting their bandwidth cap. By contrast, watching the same video via the Internet service provider's application does not reduce the amount of bandwidth available to users before they reach the bandwidth cap. Users who have exhausted the monthly bandwidth allowance and watch the video using the unaffiliated application will have to bear the consequences of using another 2 GB (e.g., paying overage charges, having their traffic throttled, or being cut off from Internet access), while users watching the video via the affiliated application will not face any consequences. Thus, even if the data packets associated with different streaming video applications receive the same technical treatment in the network, the practice of counting only some streaming video applications towards the monthly bandwidth cap makes those applications relatively more attractive. The lower users' monthly caps, the stronger the pull.

Thus, zero-rating is a powerful tool to favor some applications over others and causes the same problems as technical forms of differential treatment. Like technical forms of discrimination, zero-rating may be used in one of three ways:

- An ISP can offer applications providers to pay for zero-rating.
- An ISP can zero-rate selected applications in a class of similar applications without charging the providers of the zero-rated applications.
- An ISP can zero-rate all applications in a class without charging the providers of the zero-rated applications.

[6] CTIA - The Wireless Association (2014).
[7] Knutson (2014).
[8] Digital Fuel Monitor (2014a).

Like the different kinds of technical discrimination, these different kinds of zero-rating pose different problems, and should be evaluated separately.

2. Zero-rating in exchange for edge-provider payment

ISPs have expressed their interest in offering application providers the opportunity pay to have traffic affiliated with their application exempted from the cap. In the US, AT&T offers a program called "sponsored data," that allows any interested application provider to pay for zero-rating.

Zero-rating against a fee harms the start-up innovation ecosystem and free speech

Fees in exchange for zero-rating pose the same threat to innovation and free speech as fees in exchange for technical forms of preferential treatment.[9] As the record shows, start-ups, small businesses and low-cost speakers will often be unable to pay to be in the fast lane; they won't be able to pay for zero-rating, either. But if some companies can pay so that their content loads faster or does not count against users' bandwidth cap, then those who can't pay won't have a chance to compete and be heard. For this reason, start-ups have consistently asked the FCC to ban this type of zero-rating, too.[10]

Zero-rating against a fee harms users

Proponents of zero-rating argue that allowing application providers to pay for zero-rating will benefit consumers by allowing ISPs to lower prices for mobile Internet services.[11] Like arguments that allowing ISPs to be in the fast lane will result in profits that ISPs will use to lower the price of Internet access or deploy more and better broadband networks, this argument is highly questionable. There is no guarantee that ISPs will use the additional profits to lower the price of mobile Internet service. Economic theory suggests that ISPs' incentive to pass through any profits to users depends on the strength of competition in the market for Internet services. Thus, any benefit in the forms of lower prices is highly speculative. In addition, application providers don't exist in a vacuum. Application providers will have to recoup the costs of zero-rating somehow – e.g., through higher prices or more advertising on the site. Thus, users will ultimately pay the price.

At the same time, there are strong indications that allowing ISPs to charge application providers for zero-rating will harm consumers. If ISPs can charge application providers to be zero-rated, they would have an incentive to lower monthly bandwidth caps or increase the per-byte price for unrestricted Internet use in order to make it more attractive for application providers to pay for zero-rating. The resulting reduction in bandwidth caps harms users and

---

[9] van Schewick (2014); van Schewick & Weiland (2015), p. 87.

[10] See, e.g., Letter from Nick Grossman, Union Square Ventures, GN Docket Nos. 14-28 & 10-127, Feb. 18, 2015; Letter by Vimeo, Cogent Communications, Inc., Contextly, Inc., Distinc.tt1, Dwolla, Inc., Engine Advocacy, Kickstarter, Inc., OpenCurriculum, Inc., and Tumblr, Inc, filed by Michael Chea, Vimeo, GN Docket Nos. 14-28 & 10-127, Feb. 18, 2015.

[11] Knutson (2014).

providers of applications that do not pay for exclusion from the cap.[12] This effect can already be observed in Europe.[13] As Digital Fuel Monitor has documented, ISPs that zero-rated their own applications have either restricted the amount of bandwidth that users can pay to low bandwidth caps of 5-10GB, not allowing users to buy more, or increased the per-bandwidth price of unrestricted Internet access so that it becomes more difficult to buy additional bandwidth that can be used without restrictions.[14]

By contrast, shortly after the Dutch regulator prohibited ISPs from zero-rating their own applications, KPN doubled its monthly bandwidth cap for mobile Internet access from 5 to 10 GB at no additional cost. It was about to introduce its own mobile TV application, and had planned to zero-rate it. But with zero-rating off the table, KPN faced a choice of offering an application that users can't use (because the bandwidth caps were too low), or increase the bandwidth cap so that users can actually use KPN's application - but in a way that allows users to choose freely among competing applications.[15] Thus, banning zero-rating ultimately benefits all users (even those that aren't interested in using the zero-rated application) and all applications, by making more unrestricted bandwidth available.

Ultimately, regulators face a trade-off: Allowing zero-rating against a fee harms start-up innovation and small businesses. It fundamentally changes the environment for free expression online. It creates an incentive to lower bandwidth caps, which harms users and anybody who can't pay for zero-rating. It might, in rare cases, lower the price for mobile Internet access, but users will ultimately pay the price through different channels.

In the context of the debate over edge provider payments for priority or other forms of technical treatment, the FCC's answer has been clear: We are not willing to allow practices that are bound to harm users, innovation and free speech in the hope that this might potentially lead to lower prices or more deployment. The same arguments are directly applicable here.

The solution: ban zero-rating in exchange for edge-provider payment

Thus, any network neutrality rules should explicitly prohibit ISPs from charging application providers for zero-rating. To realize this goal in the FCC's current proposal, the bright-line rule banning paid prioritization should prohibit ISPs from charging application providers for any form of preferential treatment, including zero-rating.

The problems that drive a ban on zero-rating in exchange for edge-provider payment exist regardless of whether an ISP offers the opportunity to pay for zero-rating to all applications (as in AT&T's sponsored data offering), to all applications in a class of similar applications (i.e. to all music streaming applications) or exclusively to some, but not all applications within a class

[12] See, e.g., Ananny, et al. (2015), p. 3.
[13] Rewheel (2014a); Rewheel (2014b); Digital Fuel Monitor (2015).
[14] Drossos (2015) (summarizing the findings); Rewheel (2014a) (summarizing the findings); Rewheel (2014b) (documenting the price increase).
[15] Digital Fuel Monitor (2015).

of similar applications (i.e. only to YouTube, but not to Netflix). Thus, the rules should categorically ban all forms of zero-rating for a fee, regardless of how they are being offered.

In the US, not banning zero-rating against a fee would be a significant step back from the FCC's 2010 Open Internet rules. The text of the order effectively prohibited ISPs from striking deals with application providers "to directly or indirectly favor some traffic over other traffic."[16] As Verizon explained in a recent ex parte letter, the Open Internet rules prohibited it from entering into commercial arrangements that would allow application providers to pay for zero-rating; Verizon appealed the rules because it was interested in exploring such arrangements.[17]

Congressman Waxman's October 2014 letter proposed banning zero-rating against a fee as well.[18]

3. Zero-rating of selected applications within a class of similar applications without charging edge providers

In a second type of zero-rating ISPs zero-rate selected applications within a class of similar applications without charging the providers of the zero-rated application.

This practice appears in two variants:

First, ISPs might zero-rate their own applications, while counting all other applications against the cap. In the US, Comcast's zero-rating of its XFinity App for the Xbox is an example of this approach. The Xfinity App is zero-rated, while other online streaming applications like HBO Go, Netflix or Hulu count towards the cap. According to research by Digital Fuel Monitor, 36 ISPs in the OECD and in Europe zero-rate their own online video applications. Ten ISPs zero-rate their own cloud storage applications, while uploads to competing applications like DropBox or Google Drive count towards the cap.[19]

Second, ISPs might zero-rate one or more unaffiliated applications without charging the providers of the zero-rated application for the benefit. This practice is very common in Latin America, where ISPs often zero-rate the top three social messaging applications or the top three social networks, while continuing to count all other similar applications towards the cap.[20]

---

[16] FCC Open Internet Order, p. 43, para 76.

[17] Verizon (2015) ("As we explained to the court in our briefs, the Commission's earlier rules foreclosed voluntary business arrangements, such as 'innovative arrangements (such as advertiser-supported services) that would help recover the costs of building and maintaining broadband networks.' These types of 'sponsored data' arrangements – where online content or service providers voluntarily pick up the tab for usage associated with their traffic, rather than the end user doing so – also hold promise for saving consumers money and enabling interested providers to differentiate themselves and better compete.", ibid. at 2)

[18] Waxman (2014), p. 11 ("The FCC should adopt a separate bright-line rule that outlaws paid prioritization. The rule would prohibit broadband providers from entering into "pay-for-play" schemes with content providers and bar the use of access charges for obtaining preferential treatment such as faster speeds, guaranteed quality of service, exemptions from data plan limits, or other favorable terms and conditions.")

[19] Digital Fuel Monitor (2014a); Digital Fuel Monitor (2014d); Digital Fuel Monitor (2014c); Drossos (2015) (summarizing the findings).

[20] See Ex parte letter by Ademir Pereira, GN Docket No. 14-28, filed February 19, 2015 (attached to this letter).

In the US, T-Mobile offers subscribers to its voice only data plans the ability to user unlimited Facebook for free. Thus, users can use as much Facebook as they want, but they can't access anything else on the Internet.

Zero-rating selected applications within a class of similar applications without charging edge providers distorts competition and user choice and harms start-up innovation, small businesses and free speech online

The competitive effect of this practice is significant:

When European ISPs zero-rate their own, bandwidth-intensive applications, they set the bandwidth caps so low that use of the competing applications becomes effectively impossible. Thus, users have a choice: They can use an unlimited amount of the zero-rated application, while use of competing applications would exhaust their cap in a few hours. [21] In these cases, the anticompetitive effect is obvious.

If ISPs zero-rate social networking or social messaging applications, these types of applications generally don't use a lot of bandwidth, so users can still use competing applications even though if the cap is low. But because the draw of zero-rating is at last in part a psychological one (users hate to worry about hitting their caps, even if the caps are large enough) the zero-rating exerts a powerful draw in favor of the zero-rated applications, reinforcing their already dominant market position. Beyond the obvious competitive distortion in individual cases, allowing ISPs to zero-rate selected applications is going to systematically hurt start-ups and small businesses, and will marginalize speakers with less popular views. When they don't zero-rate their own applications (which serves a different purpose), ISPs will choose applications for zero-rating that they think will most appeal to their customers. Like the Latin American ISPs, they will zero-rate the top applications in a class. These applications effectively pay with their own brand and get their already dominant position reinforced in return. New applications that are yet unknown won't have the option. In markets that are subject to economies of scale or network effects, unseating the incumbent is difficult enough. Being up against a zero-rated incumbent will make it even harder for start-ups to succeed.

Zero-rating selected applications does not address the needs of underserved communities

Some commenters argue that at least one type of zero-rating in this class – giving users access to Facebook even if they haven't bought a mobile Internet plan – is beneficial for underserved communities. Having "free" access to Facebook, they argue, is better than not having no access to the Internet at all.

This argument does not apply to the zero-rating of ISPs own applications, so it shouldn't prevent the FCC from adopting a ban on these practices. But even for plans that give users "free" access to Facebook, the argument that these plans benefit minorities is wrong for two reasons:

[21] Digital Fuel Monitor (2014c) (documenting the effect for cloud storage applications); Drossos (2015) (providing data for online video applications).

First, users of these plans don't get Facebook for free. The price of the bandwidth is rolled into their voice subscription.

And second, the argument suggests a false choice. The choice is not between granting low-income communities free access to Facebook or no Internet access at all. Instead of allowing free access to Facebook, ISPs could offer low-cost, limited options that give users free, but limited access to the entire Internet.

Zero-rating Facebook doesn't meet the needs of underserved communities. Now more than ever, Internet access is necessary to secure full participation in American economy and democracy. However, access to Facebook is not the same as access to the Internet. Low-income families need access to the Internet to do homework, communicate with teachers, search for jobs, sign up for health insurance, and register to vote. Minority communities, who have historically been left out of broader social and political discourse, need the Internet to organize, create, educate and innovate online. Facebook alone does not allow them to do this.

If ISPs want to help underserved communities, there are better options that are entirely compatible with meaningful network neutrality rules. Plans that offer "free," unlimited use of Facebook or similar applications are based on calculations about the average amount of data users use for this application. Rather than giving away bandwidth that can only be used for Facebook, wireless providers could give away a comparable amount of bandwidth that can be used to access the full Internet. These minimal plans would cost the providers the same as zero-rating.

Alternatively, providers could offer subsidized plans that are only available to low-income customers. For example, most German providers offer mobile data plans for students that include more monthly data than regular plans at lower costs. These alternatives would come at no extra cost to providers, but they would provide enormous benefit to low-income communities.

Ultimately, allowing ISPs to zero-rate certain applications as a tool to help spread the digital divide sets a dangerous precedent. Carriers like AT&T, T-Mobile, and GoSmart are currently marketing their zero-rated plans heavily to minority communities who rely on cell phones as their primary way of accessing the Internet. African-Americans and Hispanics are significantly more likely to rely on their phone for Internet connection than non-Hispanic whites, according to a 2013 Pew Research poll. These customers welcome free access to Facebook. What they're not told is that providers could give them free (albeit limited) access to the full Internet – at the same cost as their current, zero-rated plans. As zero-rating becomes more popular, it will spread to wired broadband services in homes that don't have any access at all. This is only the illusion of progress. Low-income families, both on their computers and on their phones, will be restricted to sites that providers choose for them. It will shuttle already marginalized communities into "walled gardens" – cutting them off from free information and full participation. The FCC should not allow this, especially when providers could provide full access at no additional cost.

In sum, like technical discrimination that singles out specific applications for special treatment, zero-rating certain applications artificially makes these applications more attractive than others.[22] And just like technical discrimination, zero-rating selected applications, but not other, competing applications allows ISPs to tilt the market in favor of specific applications and to "pick winners and losers" on the Internet. This is exactly the kind of harm that network neutrality rules are designed to prevent.

These plans aren't beneficial for underserved communities, either. Plans that offer consumers the ability to use Facebook for "free" aren't free. They don't meet the needs of minorities or other underserved communities who need access to the full Internet. If ISPs really want to help these communities, they have alternatives that are equally cost-effective, but that do not similarly restrict users to a walled garden, distorting competition and user choice in the process.

The solution: Ban zero-rating of selected applications within a class of similar applications without charging edge providers.

For these reasons, the rules should explicitly prohibit ISPs from zero-rating selected applications within a class of similar applications without charging the providers of the zero-rated application. This ban should apply regardless of whether the zero-rated applications are affiliated with the ISP or not.

Congressman Waxman's October 2014 letter proposed prohibiting ISPs from zero-rating affiliated applications, but would have allowed the zero-rating of unaffiliated applications in the absence of an edge-provider fee.[23] However, the harm from the practice is the same, regardless of whether an ISP is affiliated with the application or not.

4. Zero-rating of all applications in a class that does not involve edge-provider payments

Third, while zero-rating all applications in a class is likely to be harmful as well, the harms from the practice may not be as obvious. If the FCC feels unprepared to fully evaluate this practice in advance, it could evaluate this type of zero-rating under the general conduct rule. T-Mobile's Music Freedom program, which seems to allow any interested music streaming application to apply to be zero-rated without payment, seems to belong to this category.

Conclusion

The FCC's rules should explicitly ban two types of zero-rating:

(1) zero-rating in exchange for edge-provider payment; and

[22] van Schewick (2015), pp. 30-33; van Schewick & Weiland (2015), pp. 89-90.

[23] Zero-rating in exchange for a fee would have been prohibited by his proposed ban on paid prioritization. Waxman (2014), p. 11 ("Arrangements between a broadband provider and an affiliate that give the affiliated entity prioritization should also be considered a violation of this ban [on paid prioritization]." The footnote following this sentence clarified that "[a]ffiliates of broadband providers already have a monetary relationship with the provider and thus [are] subject to the ban on paid prioritization." Ibid., footnote 34).

(2) zero-rating of selected applications within a class of similar applications without charging edge providers.

These types of zero-rating are clearly harmful and should be banned now.

A third type of zero-rating – zero-rating of all applications in a class that does not involve edge-provider payments – should be reviewed under the general conduct rule.

References

Ananny, Mike, Jonathan Askin, Patricia Aufderheide, Jonathan B. Baker, Carliss Y. Baldwin, Jack Balkin, et al. 2015. *Protecting and Promoting the Open Internet.* Attachment to Ex Parte letter in the Matter of Protecting and Promoting the Open Internet submitted February 2, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001025192

Bergen, Mark. 2015. "Net Neutrality Policy Likely to Permit Sponsored Data Programs." *Advertising Age.* February 12. http://adage.com/article/digital/net-neutrality-policy-permit-sponsored-data/297071/

Brustein, Joshua. 2015. "The Biggest Hole in the FCC's New Internet Rules." *Bloomberg Business.* February 4. http://www.bloomberg.com/news/articles/2015-02-04/the-biggest-hole-in-the-fcc-s-new-internet-rules?hootPostID=962f636dad43921dc7acb50dc565385f

CTIA - The Wireless Association. 2014. *CTIA Mobile Wireless Service Survey.* http://www.ctia.org/docs/default-source/default-document-library/2014-ctia-mobile-wireless-service-survey-final.pdf

Digital Fuel Monitor. 2014a. *92 Vertically Discriminated Zero-Rated Mobil Services in OECD, November 2014.* http://dfmonitor.eu/downloads/92_vertically_discriminated_zerorated_mobile_services_OECD_Q42014_PUBLIC.pdf

Digital Fuel Monitor. 2014b. *Google, telcos and the push for a vertically integrated non-neutral internet – Friends, not foes.* http://dfmonitor.eu/insights/2014_nov_premium_google/

Digital Fuel Monitor. 2014c. *Still not convinced that some EU telcos are trying to foreclose the mobile cloud storage market?* Digital Fuel Monitor. http://dfmonitor.eu/downloads/Still_not_convinced_that_some_EU_telcos_are_trying_to_foreclose_the_mobile_cloud_storage_market_09062014_PUBLIC.pdf

Digital Fuel Monitor. 2014d. *Zero-rated mobile applications/services in EU28, October 2014.* http://dfmonitor.eu/downloads/Zero_rating_list_EU28_Q4_2014_public.pdf

Digital Fuel Monitor. 2015. *In the Netherlands, where zero-rating is banned, KPN just doubled (free of charge) the mobile internet volume caps to encourage a carefree usage of its online videos.* http://dfmonitor.eu/downloads/Banning_zerorating_leads_to_higher_volume_caps_06022015.pdf

Drossos, Antonios. 2015. "Guest blog: the real threat to the open Internet is zero-rated content." *World Wide Web Foundation.* February 17. http://webfoundation.org/2015/02/guest-blog-the-real-threat-to-the-open-internet-is-zero-rated-content/

Higginbotham, Stacey. 2015. "The FCC's net neutrality proposal is awesome, but has a loophole." *GigaOm.* February 4. https://gigaom.com/2015/02/04/the-fccs-net-neutrality-proposal-is-awesome-but-has-a-loophole/

Knutson, Ryan. 2014. "Will Free Data Become the Next Free Shipping?" *The Wall Street Journal.* October 24. http://www.wsj.com/articles/will-free-data-become-the-next-free-shipping-1414105542

Meyer, David. 2014a. "In Chile, mobile carriers can no longer offer free Twitter, Facebook or WhatsApp." *GigaOm.* May 28. https://gigaom.com/2014/05/28/in-chile-mobile-carriers-can-no-longer-offer-free-twitter-facebook-and-whatsapp/

Meyer, David. 2014b. "Pro-net neutrality Norway advises carriers to avoid zero-rating." *GigaOm.* November 18. https://gigaom.com/2014/11/18/pro-net-neutrality-norway-advises-carriers-to-avoid-zero-rating/

Meyer, David. 2015a. "Canada cracks down on zero-rating in two net neutrality rulings." *GigaOm.* January 29. https://gigaom.com/2015/01/29/canada-cracks-down-on-zero-rating-in-two-net-neutrality-rulings/

Meyer, David. 2015b. "Dutch and Slovenian regulators nail carriers over net neutrality." *GigaOm.* January 27. https://gigaom.com/2015/01/27/dutch-and-slovenian-regulators-nail-carriers-over-net-neutrality/

Rewheel. 2014a. *EU28 & OECD mobile internet access competitiveness report Q4 2014.* http://dfmonitor.eu/insights/2014_nov_premium_q4_update/

Rewheel. 2014b. *Mobile Internet usage price rankings & internet speeds EU 28 & OECD mobile operators - Q4 2014.* http://dfmonitor.eu/insights/2014_nov_premium_q4_update/

van Schewick, Barbara. 2014. *The FCC Changed Course on Network Neutrality. Here is Why You Should Care.* . Attachment to Barbara van Schewick's Notice of Ex Parte Conversation In the Matter of Protecting and Promoting the Open Internet submitted April 25, 2014 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=7521099988

van Schewick, Barbara. 2015. "Network Neutrality and Quality of Service: What a Nondiscrimination Rule Should Look Like." *Stanford Law Review,* 67(1).

van Schewick, Barbara & Morgan Weiland. 2015. "New Republican Bill Is Network Neutrality in Name Only." *Stanford Law Review.* January 20. http://www.stanfordlawreview.org/sites/default/files/online/articles/67_Stan_L_Rev_Online_85_vanSchewick_Weiland.pdf

Verizon. 2015. Letter to Federal Communications Commission. GN Dkt. No. 14-28. February 11. http://apps.fcc.gov/ecfs/document/view?id=60001028587

Waxman, Henry. 2014. Letter to Federal Communications Commission. GN. Dkt. No. 14-28. October 3. http://apps.fcc.gov/ecfs/document/view?id=60000871538