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October 28, 2014

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Open Internet Remand Proceeding, GN Docket No. 14-28*
Framework for Broadband Internet Service, GN Docket No. 10-127
Technology Transitions, GN Docket No. 13-5
A National Broadband Plan for Our Future, GN Docket No. 09-51
State of Wireless Competition, WT Docket No. 13-135
Broadband Industry Practices, WC Docket No. 07-52

Dear Ms. Dortch:

In comments filed in the above-captioned proceedings, Golden Frog, a provider of virtual private network (VPN) services, alleged that "broadband Internet access providers are currently throttling and blocking Internet users' traffic," and specifically alleged that an unnamed mobile broadband provider "is interfering with its users' ability to encrypt their SMTP email traffic" and that U.S. Internet access providers, including Verizon, are throttling Netflix Internet traffic.[1] At least with respect to Verizon, Golden Frog's allegations are unfounded.

Golden Frog's Encryption-Blocking Claim

In its comments, Golden Frog claims it has "new evidence" that an unspecified mobile wireless company is "blocking the use of a common email encryption technology."[2] In particular, Golden Frog alleges that "this provider is using network equipment to block the STARTLLS command from enabling the encryption of SMTP (Simple Mail Transfer Protocol) traffic."[3] As evidence, Golden Frog provides two redacted computer screen shots of DOS

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1 *See* July 18, 2014 Golden Frog Comments at 1-2.
2 Golden Frog Comments at 7-8.
3 Golden Frog Comments at 7.

commands and responses that it claims show that the unnamed mobile wireless company somehow overrode Golden Frog's attempt to initiate encryption.[4]

While, without more detail, it is difficult to know what may have caused the results Golden Frog claims it observed, we can confirm that Verizon does not have a policy or practice of blocking end users' chosen encryption. Period.

Moreover, based on the information included in the Golden Frog comments, our engineers have attempted to replicate the steps described by Golden Frog to ensure that no blocking was inadvertently taking place. The network team ran the same routines that Golden Frog apparently ran. Using those routines, we successfully enabled encryption on both our wireless and wireline networks. While our tests confirmed that the allegation is not true with respect to Verizon's network, in the view of our network engineers, Golden Frog's computer screenshots and accompanying explanation do not provide enough information to say why Golden Frog apparently could not enable encryption or to demonstrate that an ISP's policy or practice was responsible. For example, the information provided by Golden Frog's screen shots could just as easily be consistent with an issue with network conditions and settings controlled by Golden Frog or a remote network.

Golden Frog's Throttling Allegation

Golden Frog's comments also erroneously claim that Verizon throttled Netflix traffic over subscribers' last-mile connections—a baseless allegation that Verizon has previously rebutted. As evidence, Golden Frog relies on the blog of a FiOS customer claiming that in July of this year he experienced significantly faster Netflix streaming speeds when he used Golden Frog's VyperVPN than when he did not use the VPN.[5] Golden Frog asserts that this proves that the customer's "Netflix traffic is being throttled on Verizon's FiOS service" and Golden Frog provides a diagram suggesting that Verizon has a "congested network."[6] Golden Frog's claims are inaccurate and misleading.

As researchers at MIT led by David Clark recently noted, there is not a "widespread congestion problem among the U.S. providers."[7] The MIT report also noted that congestion on the Internet often resulted from "decisions by content providers [such as Netflix] as to how to route content," which can result in sudden congestion problems.[8] As explained in Verizon's opening comments, our investigation into the cause of slow Netflix streaming experienced by

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4 Golden Frog Comments at 8-10, Attach. B.

5 Golden Frog Comments at 1, 5-6.

6 Golden Frog Comments at 1, Attach. A.

7 MIT Information Policy Project, *Measuring Internet congestion: A preliminary report*, at 2 (2014), https://ipp.mit.edu/sites/default/files/documents/Congestion-handout-final.pdf (last visited Oct. 27, 2014).

8 *Id.*

another FiOS customer earlier this year confirmed the MIT report's view.[9] We found that the congested Netflix traffic was caused by Netflix's previous decision to route its traffic over a handful of transit providers who had not made arrangements for connections that could handle Netflix's traffic volumes, while the other peering and transit providers and content providers interconnecting with Verizon's network in the customer's area were not experiencing congestion.

In April, Verizon and Netflix entered a voluntary commercial arrangement to directly interconnect with each other. With this arrangement, Netflix directly hands off its traffic destined for subscribers on Verizon's broadband networks, thus establishing a stable and predictable way of handling the large volumes of traffic associated with Netflix service and improving the consumer experience. And now that the agreement has been substantially implemented, that is exactly what has happened. This agreement provides further evidence that the existing and long-standing process for handling Internet interconnection through voluntary, commercial negotiations works, providing incentives for all parties to reach efficient interconnection arrangements that serve end-user consumers well.

Here, the customer evidence cited by Golden Frog is consistent with Verizon's previous findings related to Netflix's reliance on congested peering ports to reach Verizon customers. In particular, when the customer went directly to the Netflix site, the traffic sent by Netflix likely was directed over peering ports that, at the time, were experiencing substantial levels of congestion. In contrast, when the same customer used a VPN to access Netflix, it is very likely that the VPN travelled over a different interconnection path that did not include those same congested peering ports. So, by way of illustration, when accessing Netflix via a VPN, the interconnection path may have looked something like this:

Netflix → Transit Provider 1 → VPN → Transit Provider 2 → Verizon → customer

If there is no congestion in these interconnection paths, including on the various transit providers' networks and at the points where each of the various networks interconnect, then the customer would experience high quality speeds for the Netflix traffic even though he was accessing the traffic via a VPN. In contrast, if the customer does not use the VPN and receives the Netflix traffic directly, the interconnection path may have looked more like this:

Netflix → Transit Provider 3 → Verizon → customer

If there is congestion on Transit Provider 3's network or if Transit Provider 3 has not secured adequate interconnection capacity with Verizon to handle its traffic, then that congestion may reduce the customer's Netflix streaming speeds. This was precisely the situation earlier in the year as Netflix traffic was sent through peering partners who had failed to obtain interconnection capacity with Verizon adequate to handle the high volumes of traffic they were sending.

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[9] *See* David Young, *Why is Netflix Buffering? Dispelling the Congestion Myth*, VERIZON POLICY BLOG, http://publicpolicy.verizon.com/blog/entry/why-is-netflix-buffering-dispelling-the-congestion-myth (last visited Oct. 27, 2014).

Thus, contrary to Golden Frog's claims, the different Netflix speeds experienced by the FiOS customer with and without the VPN do not "prove" that Verizon was throttling the customer's Netflix traffic, and Verizon did not do so. Instead, the evidence cited by Golden Frog simply confirms that interconnection paths matter, and that the customer experience can be adversely affected where content providers and others do not ensure that they have interconnection capacity capable of handling the volumes of traffic that they direct to another network.

Respectfully submitted,

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