

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

<b>In the Matter of</b>	)	
	)	
<b>Protecting and Promoting</b>	)	<b>GN Docket No. 14-28</b>
<b>The Open Internet</b>	)	

**COMMENTS OF  
NTCA–THE RURAL BROADBAND ASSOCIATION**

August 5, 2015

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## SUMMARY

In 2010, the Commission imposed requirements on fixed and mobile broadband Internet access service providers regarding the effective disclosure of their network management practices; performance; and commercial terms (including rates and data caps) to consumers. In 2015, the Commission adopted “enhanced” transparency requirements, imposing greater requirements on providers’ communications about network performance and commercial terms.

The Commission recognized that the enhanced requirements might be burdensome for small providers, and therefore granted a temporary exemption for providers with 100,000 (one-hundred thousand) or fewer broadband subscribers as reported on Form 477, aggregated over all of the provider’s affiliates. On June 22, 2015, the Consumer and Governmental Affairs Bureau (CGB) issued a Public Notice seeking comment on the small business exemption from the enhanced transparency requirements. The CGB asks whether the enhancements impose burdens sufficient to warrant the continued exemption for small providers.

As explained herein, NTCA–The Rural Broadband Association determines that the burden of the enhancements outweighs any potential benefits that may accrue to those to whom the reported data of small companies would be directed, and therefore urges the Commission to sustain the exemption and make it permanent.

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To the Commission:

**I. INTRODUCTION**

NTCA–The Rural Broadband Association<sup>1</sup> (NTCA) hereby submits these comments in the above-captioned proceeding with specific regard to transparency requirements that are applicable to providers of broadband Internet access service. In 2010, the Commission adopted reporting requirements for providers of broadband internet access service; in 2015, the Commission adopted enhancements to those requirements, adding new obligations to the existing rules. The Commission included a temporary exemption from the enhanced obligations for small providers, and explained that exemption would be subject to subsequent review. NTCA addresses in these comments the following questions:

1. *What is the value of reporting packet loss and network performance data?*
  
2. *What purported value do customers of small providers gain by obtaining these data?*

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<sup>1</sup> NTCA represents nearly 900 rural rate-of-return regulated telecommunications providers. All of NTCA’s members are full service rural local exchange carriers (RLECs) and broadband providers, and many of its members provide wireless, cable, satellite, long distance and other competitive services to their communities. Each member is a “rural telephone company” as defined in the Communications Act of 1934, as amended.

3. *What is the cost to small providers of measuring and reporting these data?*
4. *Do the costs justify the purported benefits?*

As set forth below and in response to the questions, above, NTCA urges the Commission to make the small provider exemption permanent.

## **II. SUMMARY**

The 2010 *Open Internet Order*<sup>2</sup> imposed requirements on both fixed and mobile broadband Internet access service providers regarding the effective disclosure of their network management practices; performance; and commercial terms (including rates and data caps) to consumers. These requirements were upheld by the D.C. Circuit court when it otherwise rejected major aspects of the 2010 *Open Internet Order*.<sup>3</sup>

In 2014, the Commission proposed to “enhance” the transparency requirements that had survived judicial review.<sup>4</sup> In particular, the Commission proposed to impose greater requirements on providers’ communications about network performance and commercial terms to their customers. In adopting several of these proposals in the 2015 *Open Internet Order*,<sup>5</sup> the Commission added specificity to the information about commercial terms – price, other fees, and

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<sup>2</sup> *Preserving the Open Internet; Broadband Industry Practices: Report and Order*, Docket Nos. 09-191, 07-52, FCC 10-201 (2010) (2010 *Order*).

<sup>3</sup> *See, Verizon v. FCC*, 740 F.3d 623 (D.C. Cir. 2014).

<sup>4</sup> *Protecting and Promoting the Open Internet: Notice of Proposed Rulemaking*, Docket No. 14-28, FCC 14-61 (2014).

<sup>5</sup> *Protecting and Promoting the Open Internet: Report and Order on Remand, Declaratory Ruling, and Order*, Docket No. 14-28, FCC 15-24 (2015) (2015 *Order*).

data caps and allowances – that providers must share with their customers.<sup>6</sup> More challenging, however, are rules addressing network performance and network practices.

Specifically, the network performance rule requires disclosure of actual network performance. But, whereas the 2010 *Order* required providers to disclose speed and latency (the total delay between end points), the 2015 *Order* added packet loss.<sup>7</sup>

And, regarding network practices, the 2010 *Order* required disclosures relating to congestion management; application-specific behavior; device attachment rules; and security. In the 2015 *Order*, the Commission ruled that these disclosures must include practices that are applied to traffic that is associated with a particular user or group of users, including any application-agnostic degradation of service to a particular user – and also including the purpose of the practice and which users or data plans might be affected, and the actions or conditions that might trigger such provider actions.<sup>8</sup>

The Commission recognized that the enhanced requirements might be burdensome for small providers, and therefore granted a temporary exemption for providers with 100,000 (one-hundred thousand) or fewer broadband subscribers as reported on Form 477, aggregated over all of the provider’s affiliates. On June 22, 2015, the Consumer and Governmental Affairs Bureau (CGB) issued a Public Notice<sup>9</sup> seeking comment on the small business exemption from the

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<sup>6</sup> 2015 *Order* at para. 164.

<sup>7</sup> 2015 *Order* at paras. 166, 168.

<sup>8</sup> 2015 *Order* at para. 169.

<sup>9</sup> “Consumer and Governmental Affairs Bureau Seeks Comment on Small Business Exemption from Open Internet Enhanced Transparency Requirements,” Public Notice, DA 15-731, Docket No. 14-28 (Jun. 22, 2015).

enhanced transparency requirements. The CGB asks whether the enhancements impose burdens sufficient to warrant the continued exemption for small providers. For the reasons set forth below, NTCA urges the Commission to sustain the exemption.

**III. THE REPORTING OF COMPLEX DATA BY SMALL PROVIDERS WILL BE BURDENSOME AND WILL NOT DELIVER COMMENSURATE BENEFITS.**

**A. PACKET LOSS IS AN INHERENT DESIGN OF THE INTERNET, RENDERING POTENTIALLY CONFUSING RESULTS IF PROVIDERS STRIVE TOWARD A ZERO-LOSS REPORT.**

Packet loss refers to the failure of one or more packets to reach its destination while traversing the network. While it may facially seem to be a reasonable measure of performance, several factors warrant consideration as the costs of tracking, measuring and reporting packet loss to customers of small providers is considered. As explained below, the requirement to report packet loss could ironically set the stage for introduced inefficiencies in the network. Although the Commission’s bundling of packet loss with latency and bandwidth reporting requirements may mitigate against the tendency of providers to strive toward a potentially damaging zero-loss report rate,<sup>10</sup> the addition of packet loss to transparency obligations is at best of questionable value when applied to small providers.

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<sup>10</sup> As described below, packet loss reporting requirements can precipitate unintended adverse impacts. Although the placement of packet loss alongside latency and bandwidth reporting requirements may reduce incentives for providers to strive for zero packet loss (as consumer perceptions of packet loss might be balanced by reported latency and bandwidth levels), the benefit of the reporting requirement for customers of small providers is still questionable. Even if reporting this “trilateral relationship” (bandwidth; latency; packet loss) may reduce provider incentive to drive toward zero-loss reporting, it is not clear, as outlined further in these comments, below, that any usefulness to consumers that outweighs the costs of compliance can be found.

In the first instance, the Internet was designed to withstand packet loss. Internet protocol (IP) relies upon the practice of splitting messages into different packets that are each transmitted to their common destination across the most efficient routes available at the time of transmission. Necessarily, and by design, this includes sending packets over different routes and reassembling them into a single package at their destination.<sup>11</sup> With this protocol in mind, designers develop applications that can withstand the loss of packets without detrimental impact in the user experience. (In contrast, Transmission Control Protocol (TCP) is used specifically for applications that cannot bear the loss of any data that packet loss might cause; TCP not only ensures delivery, but guarantees that packets will be delivered in the order in which they are sent.) Packet loss can be caused by either packet congestion or packet corruption; the 2015 *Order* recognizes this by specifying that corrupted packets may be included in the packet loss report.<sup>12</sup> Packet loss caused by congestion, however, is an outcome related directly to the construction theories and design that underlie the Internet.

Packet loss can be avoided by capturing packets and holding them until the collection of packets, transmitted across different routes, arrive at their common destination. For many applications, designers accommodate the likelihood of dropped packets and configure their offerings so that the absence of some packets is not noticeable. By contrast, other applications, such as voice or video, may require a larger proportion of packets to arrive at the destination without loss. Users who have watched the word “buffering” flash on a screen understand that steps taken to preserve the full data stream can ultimately slow user experience. Therefore, where

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<sup>11</sup> The redundancies inherent in this process are, in fact, at the heart of the original Defense Applied Research Projects Agency (DARPA) intent to create secure networks.

<sup>12</sup> 2015 *Order* at fn. 418.



necessary, buffering (the practice of absorbing packet bursts in order to avoid packet loss) can be an answer to guarding against packet loss that causes diminished user experience in applications such as voice or video. Striving to zero-loss (a predictable outcome if providers are compelled to report low numbers), however, can degrade total network experience, either by slowing traffic that could have withstood the loss of packets, or by “bufferbloat;” “bufferbloat” occurs when packets are buffered for too long, ultimately clogging the network that would have remained open had the packets simply been dropped.

Engineers can devise a proper balance, but that balance recognizes the need to drop packets in certain instances. By contrast, measures taken to either reduce packet loss where the application can withstand lost packets without degradation, or to aim for the lowest measure of loss possible across *all* applications, generally, may degrade the user experience. Transparency requirements that obligate providers to report packet loss could well encourage providers to aim for a reported number at zero, which for the reasons described above may harbor an opposite impact on network performance and consumer benefit than the Commission desires.

The following analogy offered by Steven Bellovin of Columbia University is instructive when considering packet management:

Imagine a multilane superhighway, with an exit ramp to a low-speed local road. A lot of cars want to use that exit, but of course it can't handle as many cars, nor can they drive as fast. Traffic will start building up on the ramp, until a cop sees it and doesn't let more cars try to exit until the backlog has cleared a bit.

Now imagine that every car is really a packet, and a car that can't get off at that exit because the ramp is full is a dropped packet. What should you do? You could try to build a longer exit ramp, one that will hold more cars, but that only postpones the problem. What's really necessary is a way to slow down the desired exit rate. Fortunately, on the Internet we can do that, but I have to stretch the analogy a bit further.

Let's now assume that every car is really delivering pizza to some house. When a driver misses the exit, the pizza shop eventually notices and sends out a replacement pizza, one that's nice and hot. That's more like the real Internet: web sites notice dropped packets, and retransmit them. You rarely suffer any ill effects from dropped packets, other than lower throughput. But there's a very important difference here between a smart Internet host and a pizza place: *Internet hosts interpret dropped packets as a signal to slow down*. That is, the more packets are dropped (or the more cars who are waved past the exit), the slower the new pizzas are sent. Eventually, the sender transmits at exactly the rate at which the ramp can handle the traffic. The sender may try to speed up on occasion. If the ramp can now handle the extra traffic, as is well; if not, there are more dropped packets and the sender slows down again. Trying for a zero drop rate simply leads to more congestion; it's not sustainable. Packet drops are the only way the Internet can match sender and receiver speeds.<sup>13</sup>

Accordingly, answering the first question posed above:

1. *What is the value of reporting packet loss and network performance data?*

*NTCA submits that a requirement to report packet loss is of questionable value, as it can create perverse incentives for providers to take actions that degrade actual customer experience.*

**B. THE INTENDED TARGETS OF THE COMMISSION'S REPORTING PERFORMANCE AND PRACTICES REQUIREMENTS ARE NOT SERVED BY INCLUDING SMALL PROVIDERS IN THE OBLIGATIONS**

**1. The Usefulness of the Performance Requirement is Not Clear When the Targets of the Report are Considered**

The factors noted above must be considered when approaching the Commission's directive that "disclosures [be] sufficient *both* to enable 'consumers to make informed choices regarding use of [broadband] services' *and* 'content, application, service, and device providers to

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<sup>13</sup> Steven Bellovin, "Packet Loss: How the Internet Enforces Speed Limits," CircleID (Feb. 28, 2015) ([http://www.circleid.com/posts/20150228\\_packet\\_loss\\_how\\_the\\_internet\\_enforces\\_speed\\_limits/](http://www.circleid.com/posts/20150228_packet_loss_how_the_internet_enforces_speed_limits/)) (last viewed July 24, 2015, 14:11).

develop, market and maintain Internet offerings.”<sup>14</sup> This requirement begs the question of how this information can be reported meaningfully by small providers.

Regarding consumers of small providers, it is not clear that packet loss data will be meaningful or informative to the average consumer. Transparency is successful when the meaning of the conveyed information is understood by the recipient. The discussion set forth in Section II, above, illustrates the challenge of successfully conveying the impact of packet loss to the reasonable consumer. A reasonable consumer might ask, “What is a packet?” That question might be answered by explaining the inherent design of packet switching and the Internet. But, a complete answer to, “What is packet loss?” could be necessitate an exposition of why packet loss occurs and the balance between allowing and preventing it in amounts that best enable overall network performance.

As described above, packet loss is a design of the network, and steps taken to minimize packet loss beyond necessary points can cause degraded network performance. Accordingly, it stands to reason that any report of raw packet loss data would not be meaningful to the average consumer. And, it is not clear that explanations of sufficient length and complexity to disclose adequately the tensions and balances between packet loss, buffering, latency and bandwidth would be of any better usefulness. Therefore, answering the second question posed above:

2. *What purported value do customers of small providers gain by obtaining these data?*

*NTCA submits that the nature of packet switching and the role it plays in IP networks may be of insubstantial value to ordinary consumers, since their familiarity or understanding of the related technical background may not support their appreciation or usefulness of the reports; similarly,*

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<sup>14</sup> 2015 *Order* at para. 176.

*background explanations of sufficient length and detail may be too long to capture the attention or interest of the ordinary consumer. Accordingly, it is not clear that consumers of small providers or application developers gain value from reports of small providers.*

As regards requirements to inform “content, application, service and device providers,” those obligations, too, are of questionable usefulness when applied to small providers. It is unlikely that most content and application developers will focus their attention on the performance of small provider networks as their products are developed for the mass market. Rather, it can be anticipated reasonably that they will focus their attention on the performance of large, National networks as applications and devices are prepared for the benefit of the millions of eyeballs that sit on the edge of those National networks.

## **2. The Costs of the Reported Performance and Practice Data Outweigh Any Perceived Benefit**

Having addressed the relative value of reporting requirements, NTCA now addresses the burdens and demonstrates that even if a benefit of reporting *could* be identified, the *associated costs* overshadow any potential gains.

In the first instance, the characteristics of companies such as NTCA members warrant recollection: small, locally-operated, and often employing local personnel to serve as technicians and customer service representatives. In these instances, the provider has incentives to ensure that service is offered as advertised, including profit and social motives to satisfy customers who may well have personal knowledge and relationships with the service provider. In these instances, corporate commitments to the customer could well be mistaken for personal commitments to the community. With this in mind, the threshold need for regulatory intervention is lowered substantially. One NTCA member observes,

[O]ne of the advantages rural customers have, is that their broadband provider is very responsive to their needs. That is most apparent when they have a problem with their service. Our customers contact us directly for help, not a call center several hours or several countries away. In many cases, we can deliver same day or next day service. At the same time, it is not unusual for our customers to be our friends, neighbors and social peers, which lends itself to another means of communication with our customers. It is not uncommon in our company to have discussions in our strategy meetings that are centered on what a customer shared about a service issue with one of our employees over a neighborhood barbeque or at a church outing.

With that in mind, one can address the operational perspective of small providers offering latency-sensitive services, such as VoIP, which presumably will have already assessed delay, jitter and packet loss in their networks *prior* offering the services to consumers. Given the sensitivity of voice services to those disruptions, it would border on inconceivable that a firm, particularly one that is locally operated and therefore with close and accessible ties to the community such as members of NTCA, would provide to the public a service that is poised for poor quality. The nature of access that customers have to their locally-operated providers obviates the need for enhanced regulatory intervention, and supports the continuing exemption for small providers.

Having established a high degree of accountability already owed by locally-operated small providers to their customers, the discussion can now focus on the costs of reporting, so that a cost/benefit analysis might be taken. The process and attendant costs of packet loss measurement are not minimal. The related expenses, which presumably would be recovered in end-user rates, would visit a greater (and disproportionate) rate impact on customers of small companies than upon customers of larger firms.

From a general standpoint, network operators can measure performance by observing active elements of the network and establishing inferences based upon those observations; this

method may be characterized as a passive approach. Alternatively, operators can actively initiate “test traffic” and measure the performance of those specific transmissions. As a threshold matter relating to network performance and practices, companies monitor, report and address these issues in a more aggregate fashion at the network level. Small companies endeavoring to comply with the Commission requirements, especially those contemplating more granular detail, would require investment in additional software and equipment. It is anticipated to be a burdensome cost to small providers that would be very difficult to recover with the volume of their customers, unlike the larger providers that can spread that cost over hundreds of thousands of customers.

In addition to the hard costs associated with monitoring the network at a user level, additional personnel would be needed to compile and review the data provided by such systems and then, as noted above, develop that data further in order to render it compliant with Commission requirements that it be understandable to the ordinary consumer. Accordingly, answering the third question posed above:

3. *What is the cost to small providers of measuring and reporting these data?*

*The cost to small providers of measuring and reporting these data include the purchase and installation of new software and equipment, as well as administrative work time related to gathering the data, compiling reports, and assembling materials for the ordinary consumer and content, application, service and device developers; it is anticipated that materials that are understandable to the ordinary consumer will be costly and time-consuming to create, and of uncertain ultimate value.*

Taking the reasons and conditions set forth above, NTCA proposes the answer to the fourth question posed above:

4. *Do the costs justify the purported benefits?*

*NTCA submits that the costs do not support the purported benefits. At the outset, a packet loss metric is of inherently questionable value and may encourage operators to strive to zero-loss levels that have a detrimental impact on network performance. Even if this risk were mitigated to some degree by the bundling of packet loss with capacity and latency data, the topic of packet loss is sufficiently unfamiliar to the ordinary consumer as to render reports of it either meaningful or useful. In the case of small providers, the substance of network performance can be and is conveyed more effectively by personal contact with provider representatives when the need arises. Further, even reports tendered to content, application, service and device developers are of small use as those entities would look toward how their products operate on the Nation's largest networks, rather than how they might be developed with the standards and use on smaller networks.*

**IV. CONCLUSION**

The value of transparency is to ensure that consumers have access to information they can use, and that is useful to them. As described above, the particulars of packet loss require significant exposition to render them useful to the average consumer. Moreover, such issues as network performance or network practices among NTCA members can often be best addressed through personal inquiries to the provider when the need arises. The Commission's goal to facilitate more informed choices for consumers will be more likely to occur when the customer communicates directly with the small provider about needs and services that are available to meet those needs. Neither the supposed benefit nor the anticipated costs of the enhanced requirements support elimination of the existing exemption for small providers. Rather, the low threshold of benefits, coupled with the increased costs, supports making the exemption

permanent. Elimination of the exemption will not improve the user experience for NTCA member customers, but, instead may impose higher costs and add confusion to the provider/customer interaction. For these reasons, NTCA urges the Commission to retain the exemption and make it permanent.

Respectfully submitted,



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