

**Before the  
FEDERAL COMMUNICATIONS COMMISSION**

In the Matter of	)	
	)	
Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications	)	PS Docket No. 11-153
	)	
Framework for Next Generation 911 Deployment	)	PS Docket No. 10-255
	)	
	)	
	)	

Greg Rogers  
Deputy General Counsel  
Bandwidth.com, Inc.  
900 Main Campus Drive, Suite 500  
Raleigh, NC 27606  
(919) 439-5399  
[grogers@bandwidth.com](mailto:grogers@bandwidth.com)

May 5, 2014

## Table of Contents

I.	INTRODUCTION/SUMMARY .....	1
II.	COMMENTS .....	2
A.	OTT Text-to-911 Solutions Should Not Depend Upon CMRS Providers or Their Networks. ....	2
B.	The Commission Should Promote Consistent and Technology Neutral Text-to-911 Platforms, That Will Serve as a Bridge to NG911 .....	4
C.	An IP-Enabled, Application-Centric Solution Best Accomplishes the Commission’s Goals. ....	6
1.	IP-Enabled, Application-Derived Location .....	9
D.	A Certification and Labeling Program .....	11
VII.	CONCLUSION .....	12

**Before the  
FEDERAL COMMUNICATIONS COMMISSION**

In the Matter of	)	
	)	
Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications	)	PS Docket No. 11-153
	)	
Framework for Next Generation 911 Deployment	)	PS Docket No. 10-255
	)	
	)	
	)	

**REPLY COMMENTS OF BANDWIDTH.COM, INC. TO THE FNPRM**

**I. INTRODUCTION/SUMMARY**

The Opening Comments demonstrate that there is general consensus among stakeholders that the Commission is heading in the right direction with its text-to-911 goals, yet the precise method to reach those goals is still subject to vigorous debate. In balancing these differing views, the Commission must keep in mind its overarching, long-term policy goals: (1) ensuring that every text messaging provider, whether a CMRS carrier or an over-the-top (“OTT”) provider, offers text-to-911 capability; (2) implementing forward-looking, technologically neutral requirements that promote innovation and consistency across diverse platforms;<sup>1</sup> and (3) drive widespread adoption of IP-based NG911. While some of the proposed solutions supported in comments may meet some of these goals in the near-term, the Commission should endorse only those solutions that enable text-to-911 as effectively as possible while simultaneously spurring a robust NG911 environment. Opening comments demonstrate that an application-centric solution, fortified with a clear regulatory framework and complimented by industry-based consensus solutions best meets this objective.

---

<sup>1</sup> See Comments of AT&T Inc., PS Docket No. 11-153 & PS Docket No. 10-255, at 1 (filed Apr. 4, 2014).

Limiting delivery options to existing CMRS networks would actually undermine important public policy objectives by creating disincentives for the industry to invest in more advanced and low-cost technological solutions that will integrate with NG911 platforms.<sup>2</sup> Similarly, limiting text-to-911 requirements only to CMRS providers eliminates a large portion of text messaging solutions, and, therefore, those subscribers, from the public safety benefits that can be achieved through more effective text-to-911 solutions.<sup>3</sup> Outcomes such as these are contrary to the Commission's stated goals. Therefore, Bandwidth encourages the Commission to consider broader application-centric solutions in this FNPRM.<sup>4</sup>

## II. COMMENTS

### A. OTT Text-to-911 Solutions Should Not Depend Upon CMRS Providers or Their Networks.

Comments opposed to expanding text-to-911 requirements to OTT providers generally fall into two different camps; 1) Wireless providers that are concerned about being required to provide access to their CMRS networks; and 2) Technology companies that assert that access to CMRS networks is essential for OTT text-to-911 capabilities.<sup>5</sup> This dynamic highlights some interesting issues for the Commission to resolve. On the one hand, most CMRS providers do not want the FCC to expand upon the Wireless Voluntary Agreement<sup>6</sup> or impose additional burdens

---

<sup>2</sup> See Comments of the National Emergency Number Association ("NENA"), PS Docket No. 11-153 & PS Docket No. 10-255 at 7 (filed Apr. 4, 2014).

<sup>3</sup> See AT&T Comments at 2-3.

<sup>4</sup> *Second Further Notice* at ¶1.

<sup>5</sup> See Comments of CTIA, PS Docket No. 11-153 & PS Docket No. 10-255 at 2-6 (filed Apr. 4, 2014); Comments of Twilio, Inc., PS Docket No. 11-153 & PS Docket No. 10-255 at 9-11 (filed Apr. 4, 2014).

<sup>6</sup> See Comments of Verizon and Verizon Wireless, PS Docket No. 11-153 & PS Docket No. 10-255 at 8 (filed Apr. 4, 2014) (stating that the FNPRM erroneously assumes that wireless providers are uniquely positioned to "coordinate" among the various players in the complex ecosystem of application developers, OS platforms and device manufacturers to ensure that each device model is capable of supporting a CMRS-based model); *See also* Comments of T-Mobile USA, Inc., PS Docket No. 11-153 & PS Docket 10-255 at 12-13 (filed Apr. 4, 2014) (stating that the Commission should not require such coordination); *See also* AT&T Comments at 1-3; *See also*

on CMRS providers to facilitate provision of text-to-911 by OTT providers, such as requiring API configurations or other modifications to enable OTT providers.<sup>7</sup> Yet, on the other hand, the comments filed by technology companies, application providers and similar innovative service providers, suggest that the only way OTT providers can provide E911 is to rely the CMRS providers.<sup>8</sup>

The fundamental problem with both of these positions in Bandwidth's view is that they narrowly focus on CMRS as the only solution available to enable text-to-911. Legacy systems, like the CMRS carriers' network, may be one way to enable text-to-911 or may be a viable solution for some providers<sup>9</sup>, but they are not the only solution, and particularly are not a preferred method for OTT text-to-911. Therefore, as the Commission considers OTT text-to-911 and NG911, rather than developing policies around legacy systems and solutions, the Commission should leverage the inherent advanced functionality of IP-based networks and IP-based applications.

As Verizon Wireless correctly points out, entities other than CMRS providers can and do play a critical role in implementing broad-based text-to-911. Verizon notes that it and other wireless providers have entered into arrangements with third-party 911 vendors to handle text-to-911 data and texts to PSAPs.<sup>10</sup> Bandwidth, and others, have similarly advocated the advantages of utilizing a third-party to provide routing and/or database functionality for text-to-911 and the

---

Letter from Terry Hall, APCO International, Barbara Jaeger, NENA, Charles W. McKee, Sprint Nextel, Robert W. Quinn, Jr., AT&T, Kathleen O'Brien Ham, T-Mobile USA, and Kathleen Grillo, Verizon, to Julius Genachowski, Chairman, Federal Communications Commission, and Commissioners McDowell, Clyburn, Rosenworcel and Pai; PS Docket 11-153, PS Docket No. 10-255, on Dec. 6, 2012. ("*Wireless Voluntary Agreement*")

<sup>7</sup> See Comments of Sprint Corporation, PS Docket No. 11-153 & PS Docket 10-255 at 2-5 (filed Apr. 4, 2014).

<sup>8</sup> Comments of Voice on the Net ("VON") Coalition, PS Docket No. 11-153 & PS Docket No. 10-255 at 2, 4-6 (filed Apr. 4, 2014); Comments of Microsoft Corporation, PS Docket No. 11-153 & PS Docket No. 10-255 at 3-5 (filed Apr. 4, 2014).

<sup>9</sup> Comments of the Association of Public-Safety Communications Officials-International, Inc. ("APCO"), PS Docket No. 11-153 & PS Docket No. 10-255 at 5 (filed Apr. 4, 2014).

<sup>10</sup> Verizon Comments at 9.

cost-saving and efficiencies created by doing so.<sup>11</sup> In addition, many OEMs include application programming interfaces and operating systems capable of enabling OTT text-to-911 services.<sup>12</sup> These existing functionalities, combined with other means as the record shows, many of the application-based OTT messaging solutions include their own location capabilities.

The Commission recognized in the FNPRM that “interconnected text providers face an array of choices in considering methods to relay a text to a PSAP.”<sup>13</sup> While CMRS providers will continue to play a critical role in handling text-to-911, it would be a mistake to structure the implementation of text-to-911 solutions for OTT services entirely upon CMRS providers or their networks. Given the range of potential IP-enabled options available to OTT text providers for text-to-911 capabilities and the industry goals to adopt NG911 as rapidly as possible<sup>14</sup>, it would be short-sighted to suggest OTT text-to-911 *must* rely upon CMRS infrastructure. In fact, one particularly stark example of why some of the most often cited promises of NG911 could be threatened by a dependence upon CMRS service providers is the wireless industry’s efforts to erect unnecessary barriers to MMS exchange with OTT messaging providers.<sup>15</sup>

## **B. The Commission Should Promote Consistent and Technology Neutral Text-to-911 Platforms That Serve as a Bridge to NG911**

The regulatory framework for text-to-911 must contemplate the interoperability of multiple platforms to avoid unnecessarily limiting the manner in which a covered OTT provider

---

<sup>11</sup> Comments of Bandwidth.com, Inc., PS Docket No. 11-153 & PS Docket No. 10-255 at 3-6 (filed March 11, 2013); Reply Comments of Bandwidth.com, Inc., PS Docket No. 11-153 & PS Docket 10-255 at 5-6 (filed Apr. 4, 2013).

<sup>12</sup> Comments of Motorola Mobility LLC, PS Docket No. 11-153 & PS Docket 10-255 at 3-4 (filed Apr. 4, 2014). Motorola Mobility LLC Comment at 3-4.

<sup>13</sup> *In the Matter of Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications; Framework for Next Generation 911 Deployment*, PS Docket No. 11-153, PS Docket No. 10-255, Policy Statement and Second Further Notice of Proposed Rulemaking, FCC 14-6 (rel. Jan. 31, 2014) (“*Second Further Notice*”).

<sup>14</sup> See Comments of Bandwidth.com, Inc., PS Docket No. 11-153 & PS Docket No. 10-255 at 3-6 (filed Apr. 4, 2014).

<sup>15</sup> *In the Matter of Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications; Framework for Next Generation 911 Deployment*, PS Docket No 11-153, PS Docket No. 10-255, *Further Notice of Proposed Rulemaking*, 26 FCC Rcd 15659, at ¶ 4 (2012).

can deliver data to PSAPs as well as the manner in which PSAPs can receive emergency texts. As NENA recommends, standardized and technology neutral approaches to the 911 obligations of Originating Service Providers (“OSPs”) will best serve the Commission’s stated goals.<sup>16</sup> PSAPs should not be saddled with an unmanageable burden of identifying and locating every existing or new OTT provider that could potentially serve customers in their area.<sup>17</sup> Further, the Commission should promote solutions that avoid requiring PSAPs to maintain multiple carrier-specific, proprietary text-to-911 solution interfaces as text-to-911 becomes more widely adopted. A structure that enables PSAPs in the least burdensome manner possible will produce the greatest benefit to the entire 911 community. Critically, this means that network and equipment sharing arrangements among participating service providers will be required.<sup>18</sup>

Developing industry standards that account for the interoperability of the myriad of unique text services, combined with the competing proposed text-to-911 solutions, will clearly take time.<sup>19</sup> Yet, the industry cannot wait idly by before moving ahead with text-to-911 and NG911.<sup>20</sup> Therefore, Bandwidth supports the Commission’s call for real-world voluntary experiments as a productive near-term step toward longer-term standardized solutions. During the experimentation phase, service providers should be encouraged to innovate rather than being constrained from innovating. Thus, Bandwidth recommends that the Commission clearly stated that CMRS-based text-to-911 solutions are optional rather than mandatory. Effective solutions must be allowed to develop in technology neutral ways.

While Bandwidth believes the CMRS-based models described in the FNPRM are not likely to be the most effective for OTT text-to-911 services, CMRS providers and their third-party partners will play a critical role in supporting OTT text-to-911 even in an application-

---

<sup>16</sup> See NENA Comments at 7.

<sup>17</sup> See Comments of Texas 911, PS Docket No. 11-153 & PS Docket No. 10-255 at 2 (filed Apr. 4, 2014).

<sup>18</sup> T-Mobile Comments at 2.

<sup>19</sup> See NENA Comments at 5.

<sup>20</sup> See Microsoft Comments at 3-5, 11-13; T-Mobile at 3, 6; APCO Comments at 4-5; NENA Comments at 9.

centric environment. Thus, CMRS-based providers should not be permitted to prevent access to their networks or discriminate unfairly if other service providers request access in order to facilitate Interconnected OTT text-to-911 capabilities.<sup>21</sup> Parties should be permitted to enter into mutually agreeable arrangements at reasonable, market-based rates. However, if one party is allowed to unilaterally withhold participation it would threaten the viability of a widespread adoption of Interconnected OTT text-to-911 services. For example, as NTCA and T-Mobile point out, the absence of full interconnection and interoperability between Text Control Center (“TCC”) providers and PSAPs may hinder their ability to implement text-to-911.<sup>22</sup> And rather than mandating how such access should take place, T-Mobile recommends the Commission allows parties to negotiate appropriate terms for such access through commercial negotiations.<sup>23</sup> Bandwidth agrees with those providers who highlight the importance of interoperability and encourages the Commission to be very clear in requiring fair, reasonable and non-discriminatory access to critical network components and functions after receipt of valid requests necessary to deploy Interconnected OTT text-to-911 capabilities.

**C. An IP-Enabled, Application-Centric Solution Best Accomplishes the Commission’s Goals.**

Many of the arguments against extending text-911 to Interconnected OTT services in the Opening Comments can be addressed by an application-centric solution. For example, Sprint, T-Mobile and Verizon say it is not possible to provide text-to-911 when roaming within the existing CMRS network.<sup>24</sup> Because location lookup occurs in the home network, location lookups will fail when roaming. However, if the Commission adopts an application-centric

---

<sup>21</sup> See APCO Comments at 4; T-Mobile Comments at 11; VON Comments at 4.

<sup>22</sup> See Comments of NTCA – The Rural Broadband Association (“NTCA”), PS Docket No. 11-153 & PS Docket No. 10-255 at 6-7; See also T-Mobile Comments at 2.

<sup>23</sup> See T-Mobile Comments at 11-12.

<sup>24</sup> See Sprint Comments at 10-12; T-Mobile Comments at 8-10; Verizon Comments at 14-15.

regime, these issues can be avoided. In an application-centric model, location would be derived from IP-based functionality that exists within a given IP-enabled platform. Thus, “roaming” as defined within the CMRS context would not exist.

This would remain true irrespective of whether a PSAP was NG911 capable or not. For pre-NG911 PSAPs, the application-centric approach would deliver text-to-911 to a TCC supporting that PSAP. Assuming non-discriminatory network access is available, application-centric OTT services would interface readily with the current CMRS architecture and leverage existing investments in TCCs as well as the network between the TCCs and pre-NG911 PSAPs. Then, in the NG911 scenario the application-centric approach would deliver text-to-911 directly to NG911 PSAPs and avoid the requirements of the TCC. NG911 architectures and standards readily support integration at the PSAP workstation, and deliver the fastest possible delivery to a dispatcher. This includes a NG911 interface on the ingress side and real-time sharing of the database containing PSAP information including text-to-911 readiness and NG911 capabilities.

As the Commission and some commenters recognized, more and more of the intelligence of communications devices and applications is moving to the edge of the network.<sup>25</sup> Early work on standardizing NG911 architectures anticipated that an intelligent edge device could determine its location, use that location to directly request routing instructions, and use the routing information returned to complete the call. This model was tested as part of the Department of Transportation’s Proof of Concept.<sup>26</sup> This NG911 architectural model takes advantage of the intelligence in the edge device, and, more importantly, the communications applications it hosts. This IP-Enabled, application-centric architecture should form the base to build OTT text-to-911 capabilities pursuant to this FNPRM.

---

<sup>25</sup> *Second Further Notice* at ¶1.

The level of sophistication in edge devices and applications has reached a point that allows us to implement this kind of a model now. Demonstrating this reality, in his 2012 address at the Consumer Electronics Show, Paul Otellini, the CEO of Intel, observed that, “a Smartphone today has more computing power than all of NASA did when it put a man on the moon in 1969.”<sup>27</sup> Going forward, Apple, Microsoft, the Google ecosystem, and application developers around the world will continue to increase the sophistication and intelligence of edge devices and applications thus enhancing their ability to fully support text-to-911 and other types of media envisioned by the architects of NG911. By way of example, the Samsung Galaxy S4, with an Octa-Core processor, supports a wide range of advanced technologic features include multiple sensors. The S4 includes the following capabilities: (i) GPS to track your location, (ii) A Proximity Sensor that turns the screen off when you hold it to your face, (iii) an Ambient Light Sensor that automatically adjusts brightness, (iv) an Accelerometer that senses movement and orientation, (v) a Barometer that measures pressure, (vi) a Temperature Sensor, (vii) a Humidity Sensor, (viii) a Magnetic Sensor measures the magnetic field, (ix) a Gesture Sensor that senses your hands to navigate, (x) an Infrared Sensor that turns the phone into a remote control, (xi) an Eye Tracker that pauses video when you look away, (xii) a NFC (Near Field Communication) that shares data by touching two phones and also enables mobile payments. (xiii) Dual Cameras, and (xiv) Dual Microphones - one microphone for voice and the other to listen to the ambient noise and create anti-noise using the noise-cancelling system.<sup>28</sup> This level of technological sophistication will continue to grow and it should be harnessed to help identify emergency situations and provide emergency responses far more effectively in the future.<sup>29</sup>

The application-centric approach also addresses concerns expressed in several comments related to undue burdens being place on the CMRS carriers and issues of cost recovery. For

---

<sup>27</sup> <http://forwardthinking.pcmag.com/ces/292745-intel-enters-smartphone-chip-race-for-real>

<sup>28</sup> [http://www.samsung.com/latin\\_en/consumer/mobile-phones/mobile-phones/smartphone/GT-I9500ZKLTPA-spec](http://www.samsung.com/latin_en/consumer/mobile-phones/mobile-phones/smartphone/GT-I9500ZKLTPA-spec)

<sup>29</sup> *Id.*

example, AT&T points out that even as an interim solution for OTT text providers, delivery models that rely on the CMRS network would entail high levels of direct CMRS carrier involvement.<sup>30</sup> Sprint agrees with this position by asserting that the Commission should refrain from adopting text-to-911 requirements for OTT providers in the near term if compliance by OTT providers would be primarily contingent on placing additional regulatory burdens on CMRS providers.<sup>31</sup> The application-centric approach successfully addresses these concerns by lifting some of the burdens from CMRS providers.

Moreover, an IP-enabled, application-centric approach promotes the broadest possible coverage for text-to-911. As opposed to some of the significant challenges for supporting OTT text-to-911 with CMRS networks, any texting application hosted on an Internet-enabled device with access to a Wi-Fi network should be readily able support text-to-911. Virtually every intelligent device and platform that can host a communications application that has CMRS capabilities also supports Wi-Fi, however, only a subset of intelligent devices and platforms that support Wi-Fi also support CMRS. On the other hand, any technical approach that is dependent on an underlying CMRS network dramatically constrains support for text-to-911 on non-CMRS platforms, which are proliferating the marketplace more and more all the time.<sup>32</sup> If the commission's goal is to provide text-to-911 services on the broadest range of platforms<sup>33</sup>, the application-centric approach is far superior to any other alternative.

## **I. IP-Enabled, Application-Derived Location**

---

<sup>30</sup> See AT&T Comments at 3.

<sup>31</sup> See Sprint Comments at 4.

<sup>32</sup> See <http://gigaom.com/2012/03/20/sorry-carriers-9-out-of-10-tablets-sold-are-wi-fi/>; See also <http://www.macrumors.com/2013/05/30/apple-reaches-milestone-of-100-million-ipod-touch-units-sold/>

<sup>33</sup> *To that end, the 2012 Further Notice sought to ensure that consumers ultimately have access to the same text-to-911 capabilities on the full array of texting applications that they use for everyday communication – regardless of provider or platform.*”

Originally developed primarily to support commercial services for marketing and advertising, dynamic end-user location determination has seen dramatic improvements in speed and accuracy in recent years. A range of options currently exist for applications to determine an end-user's location:

*Platform-derived location options:* Phones and tablets from most OEMs make some form of location determination available to applications hosted on the device. A GPS chip is common on most smart phones. In some platforms, location is derived using a database of Wi-Fi hotspots. Knowing the router providing Wi-Fi service, the platform can derive location by querying the database. It is commonly understood that Apple operates such a database for use by platforms it supports and makes this platform-derived location information available to all hosted applications as well.

*Off-Platform location determination:* As an alternative to platform-derived location or for location determination on platforms with no such capabilities, off-platform services are available to application developers. A good example of a provider of off-platform location determination capabilities is Skyhook Wireless ("Skyhook").<sup>34</sup> Skyhook provides a software developer's toolkit that enables any application to determine its location. The company originally began by working on Wi-Fi location and evolved with the idea that hybrid positioning technology, which incorporates Wi-Fi, GPS, cell towers, IP address and device sensors, could improve their location services. Research conducted at the IT University of Copenhagen, Denmark<sup>35</sup> concluded that Skyhook's location accuracy is as good as GPS and is superior in some test cases. The study also concludes that the Skyhook service can determine location more quickly than GPS requiring only 1 second in most cases. In the Location Accuracy rules

---

<sup>34</sup> <http://www.skyhookwireless.com>

<sup>35</sup> <https://blog.itu.dk/SPVC-E2010/files/2011/08/11skyhookperformace.pdf>

promulgated by the FCC in July 2011<sup>36</sup> “the Commission announced that after the conclusion of the eight-year implementation period in early 2019, it will sunset the existing network-based rule and require all wireless carriers to meet the more stringent location accuracy standards in the handset-based rule.”<sup>37</sup> Innovative services like Skyhook’s off-platform capabilities are readily available today and will almost certainly continue to improve over time.

#### **D. A Certification and Labeling Program**

The rollout of text-to-911 will be confusing to consumers. At any given time, some PSAPs will accept text-to-911, others won’t. Some PSAPs that are part of a NG911 system will be able to get update location information periodically, others in legacy E911 networks will not. The four largest wireless carriers are enabling services in advance of the smaller wireless carriers, but all wireless solutions will be deployed over an extended period of time it appears.<sup>38</sup> Some texting applications are interconnected and may provide text-to-911, others that are not interconnected may not. Applications covered by either a voluntary agreement or an FCC mandate developed in the United States will provide text-to-911, those that are developed in other countries may not. End-users will find it difficult to comprehend all of these scenarios as it relates to their ability to take advantage of texting 911.

While adopting the application-centric approach can reduce some of the confusing inconsistencies (e.g. roaming, limitation of platforms, dearth of NG911, etc.), a certification and labeling program can be an excellent tool to limit user confusion. For example, establishing a standard icon that can be displayed in an application designating its support for text-to-911 will make it clearer that the service is available. Limiting the use of a Commission-approved icon to those applications that have “certified” their text-to-911 service will facilitate market forces that

---

<sup>36</sup> <http://www.fcc.gov/document/fcc-strengthens-e911-location-accuracy-wireless-services>

<sup>37</sup> *Id.*

<sup>38</sup> *Second Further Notice*, ¶ 18.

encourage broader adoption. It may be desirable to approve a limited set of icons that not only indicate text-to-911 is supported, but also communicate other features available in the service such as location accuracy.

A certification and labeling program may also be useful in addressing other challenges identified in other filings. For example, the clear liability protection sought by virtually every commenter, could be tied to a certification and labeling program. The strongest available protections could be granted to those application providers that have certified their text-to-911 service with the Commission and prominently displayed an approved icon. Certification and labeling can also help address concerns expressed about compliance by non-US OTT developers down the road.

Effective consumer education will be a key component of the rollout of text-to-911. A clear, concise, labeling program can be extremely helpful in setting consumer expectation. As new communications services are introduced, consumers will wonder about the applications ability to reach emergency services. An effective labeling program would be a user-friendly manner to readily communicate OTT capabilities to support text-to-911.

## **VII. CONCLUSION**

For the foregoing reasons, Bandwidth continues to support the Commission's fundamental objectives to meet consumers' expectations and enhance emergency services as the industry transitions to an all-IP environment. The most effective way for the Commission to achieve its goal of enabling ubiquitous text-to-911 capabilities for consumers is to endorse a technology neutral application-centric model that can be initiated pursuant to voluntary agreements and refined by industry-developed standards over time. The Commission should avoid competing proposals that are inherently tied to CMRS services and CMRS regulations, and

instead embrace forward looking innovative solutions for today's OTT services that will naturally lead to tomorrow's NG911 networks.

Respectfully Submitted,

/s/

---

Greg Rogers  
Deputy General Counsel  
Bandwidth.com, Inc.  
900 Main Campus Drive, Suite 500  
Raleigh, NC 27606  
(919) 439-5399  
[grogers@bandwidth.com](mailto:grogers@bandwidth.com)

May 5, 2014