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Via Electronic Submission

October 12, 2011

Mr. Dereck Orr
Office of Law Enforcement Standards
National Institute of Standards and Technology
325 Broadway
Boulder, Colorado 80305

Re: Request for Comment – Docket No: 110727437-1433-01

Dear Mr Orr:

This letter is in response to NIST's Notice and Request for Comment.

In the request for comment, three of the features listed (as defined exactly in the Notice) stood out:

1. *Resiliency: The ability of operable systems to recover from mishap, change, misfortune, or variation in mission or operating requirements.*
2. *Compatibility with Commercial Infrastructure: The utilization of a variety of commercial services when public safety is in areas not covered by the public safety broadband network.*
3. *Network Sharing: The shared use of infrastructure between commercial and public safety users.*

Layer 2 Connections has previously shared with NIST and with the FCC its opinions that described ways in which the safety and productivity of first responders might be improved.

Our recommendation tied to the specific features above is that we suggest NIST delve deeper in its research and testing of commercially-available solutions that create what we call Virtual Wide Area Networks (VWANs).

In our definition, a VWAN allows multiple similar or dissimilar networks – whether wired, wireless or satellite – to be connected together to act and behave as one.

This is relevant to the Public Safety community because the quality and quantity of wireless data bandwidth available to users can be significantly enhanced by allowing them to simultaneously or serially connect to multiple commercial or private networks (wired, wireless or satellite) in addition to the 700 MHz Public Safety Broadband Network (PSBN). VWANs can enable first responders to leverage both the future Public Safety Broadband Network AND any existing commercial/ private wired and

wireless networks. This provides improved resilience in connectivity and an increase in the overall bandwidth available to the user by bonding the dissimilar network assets together with a single IP address and combined total bandwidth and QOS policy.

We stress that these capabilities would ease the future challenges to be faced by those who migrate from existing public or private systems to the PSBN, and would support failover once the public safety broadband network is built out.

As a related point of reference, on June 29, 2011, Layer 2 Connections representatives met with FCC Public Safety and Homeland Security Bureau representatives (James Barnett, Jennifer Manner, Genaro Fullano and Behzad Ghaffari). This was one of several meetings with the PSHSB. In that meeting, we offered comments on several topics:

1. *TOPIC: The transition from commercial and private networks used by public safety agencies today to the emerging 700 MHz Public Safety Broadband network(s).*

   We commented that this transition was the most important time for establishing best practice for inter-network handoff because public safety agencies will be grappling with an important migration from a variety of public and private wireless data network technologies to the LTE Public Safety Broadband Network. The ability for these agencies to leverage a hybrid of both existing private and commercial networks used today and emerging networks simultaneously and seamlessly will significantly mitigate any coverage, reliability and capacity issues during the transition period.

2. *TOPIC: How both the definition of seamless network handoff – for both Intra-RAT (Radio Access Technology) and Inter-RAT handoff – and the timing of these requirements are important to first responders.*

   We commented that an important part of providing handoff between networks (regardless of what technology on which they are based) is the gathering of metrics that assist in making decisions about when to use networks and when to avoid them. Steering an agent from a network that is viable but congested onto a network that is not viable will cause difficulties. We commented that performance metrics need to be gathered in real-time because network performance can change both rapidly and drastically based on a variety of external factors. We commented that the handoff must be so seamless to the user that it will not be noticeable even when using real-time protocols such as VoIP and Video; this requires the alternative bearer to be queued and ready before the handoff occurs.

   The above together describes a "Make-before-break" handoff. We reiterated that an FCC or perhaps NIST standard requiring that a network handoff be a Make-before-Break seamless handoff (vs. allowing any break at all) is crucially important to the situational awareness, productivity and safety of the first responder. We also encouraged the FCC to pull forward the requirements of inter-network handoff (currently termed Inter-RAT handoff, although it is our opinion that this term requires further definition) into the current rulemaking, as there is no-

more important time than the transition from existing commercial and legacy networks to enable seamless Make-before-Break handoff. In this way, legacy networks can continue to be used for resilience once the PSBN is built out.

3. *TOPIC: The impact that over-the-top VPNs were likely to have on the quality of service mechanisms being considered for the LTE Public Safety Broadband Network.*

   We commented that we believed a considerable number of public safety agencies are likely to require applications to use a specific VPN technology which will encrypt packets streams in a manner that may make it difficult or impossible for LTE QoS mechanisms to be effective. We commented that we believed that additional work was needed to better define the role of over-the-top VPNs in public safety communications in order to better understand the significant impact that they may have in delivering effective and efficient communications. We encouraged the FCC (as we now encourage NIST as well) to consider a view of the End-to-End experience for a first responder, inclusive of the backhaul and any internetwork connections that applications and over the top VPNs will be required to traverse. We stressed that Inter-RAT handoff can be best achieved today via mobile-tolerant VPNs that will work with the PSBN and other commercial and private wired, wireless and satellite data networks.

Our multiple Ex Parte notices and corresponding presentations with the FCC can be found at the following address:

http://fjallfoss.fcc.gov/ecfs/comment_search/execute?proceeding=06-229&applicant=Layer+2+Connections&lawfirm=&author=&disseminated.minDate=&disseminated.maxDate=&recieved.minDate=10%2F12%2F10&recieved.maxDate=&address.city=&address.state.stateCd=&address.zip=&daNumber=&fileNumber=&submissionTypeId=&__checkbox_exParte=true

Layer 2 Connections is a small, woman-owned business based in North Carolina with experience serving the public safety community with voice and data communications. Layer 2 Connections represents commercially-available VWAN technology. If you have any questions or comments regarding these comments, please do not hesitate to contact me.

Sincerely,

/s/ Pascal de Hesselle

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