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November 2, 2005

Ms. Marlene H. Dortch
Secretary to the
Federal Communications Commission
Washington, D.C. 20554

Re: *Ex Parte* Communication
WT Docket No. 05-157

Dear Ms. Dortch:

Today, the attached *ex parte* communication was forwarded via electronic mail to the following individuals of the Wireless Telecommunications Bureau: Ms. Cathleen Massey, Ms. Jane Jackson, Mr. Michael Wilhelm, Mr. Scot Stone, Mr. Tim Maguire, Mr. John Evanoff and Mr. Paul Moon.

Respectfully,

John E. Logan

Attachment

TROPOS networks
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November 2, 2005

The Honorable Kevin J. Martin
Chairman of the
Federal Communications Commission
Washington, D.C. 20554

Re: In the Matter of Report to Congress- Section 7502(a) of the Intelligence Reform and Terrorism Prevention Act of 2004, WT Docket 05-157

Dear Chairman Martin:

As the Commission completes its report to Congress pursuant to the Intelligence Reform and Terrorism Prevention Act of 2004 addressing the communications needs of public safety agencies, I write to urge that the Commission put its emphasis on the critical role that wireless mesh broadband networks have already demonstrated and that adequate spectrum be made available for the broadband applications the technology delivers.

The need for affordable diverse and resilient networks, capable of expeditious recovery, and able to deliver the myriad of broadband applications while possessing an inherent interoperability capability, has placed wireless mesh technology in a pivotal position for emergency response communications. Wireless mesh embraces the universal standard built around the non-proprietary 802.11 protocols allowing the laptops, PDAs, VOIP phones and other devices, to be left to the discretion of the user. Combined with its ease of deployment, the technology presents innate flexibility and affordability while promoting interoperability across networks and devices. The New Orleans and Gulf Coast recovery efforts demonstrated how wireless mesh networks were deployed in 22 areas within days to provide voice and data service with the outside world to first responders, assisting agencies and victims.

Hurricane Katrina

Hurricane Katrina devastated the telecommunications infrastructure of the Gulf Coast, including networks relied upon by public safety agencies. It created a communications collapse with more than 3 million people losing wire line phone service and any Internet connectivity over those lines. The disaster caused one thousand wireless towers to collapse, making cell phone calls for help impossible. Several 911 communications centers, the foundation of emergency response, became inoperable. Embedded networks with large infrastructure and extensive proprietary equipment were unusable for lengthy periods of time and reflected the critical need for diverse networks and technology.

Prior to Hurricane Katrina, Wi-Fi mesh technology was providing the City of New Orleans broadband video and voice services, with 80% of the capacity devoted to delivering surveillance and 20% devoted to voice communications. The wireless mesh routers serving New Orleans survived Katrina. In the hurricane's aftermath the technology demonstrated a most robust communications system—one that will stay up the longest when a catastrophic event occurs and can be restored first to aid rescue efforts. Working with computer chip and equipment manufacturers, an Internet backbone provider, a provider of proprietary 5 GHz equipment, and a satellite provider, Tropos mesh technology was deployed in 22 locations in the Gulf region in a matter of days at costs (borne by these companies), of less than $100,000 for each deployment.

In short, this new technology delivered very tangible service. At sites in downtown New Orleans, Louis Armstrong Airport and the Chalmette Refinery, for example, 80% of capacity use was devoted to voice and 20% to data transmission. The technology was also deployed in other areas of Louisiana and Texas. Wi-Fi networks provided critical communications capability to emergency services, assisting agencies and those evacuated. The ease and speed by which these networks were deployed reflects the vibrancy and innovation of the technology. That the response and recovery resulted from the combined efforts of government agencies, incumbent wire line and wireless companies, legacy radio and computer equipment manufacturers, and new entrant manufacturers and service providers reflects the dedication of government and industry and the willingness to choose innovation over the status quo.

Detailed below is a description of the evolution of wireless mesh technologies to a facilities based provider and how today the technology is providing affordable broadband services to a range of sectors, the most significant of which are first responders.

Wireless Mesh Technology

At the center of mesh technology is the ability to transmit information, at high speeds and high service standards, through the most efficient route to its destination. Mesh technologies emerged in the late 1970s from the military, which had used it for interconnected communications from mobile point A to point B on a field of engagement. The technology was focused on ad hoc, peer to peer networks and used proprietary end user devices. The routing protocols were premised on communicating between mobile points, rather than accessing a wired network such as the Internet and therefore emphasized reducing if not eliminating the number of hops a communication would take across the network to its destination.

It is in the routing protocols where enormous efficiencies and capabilities have evolved to deliver wireless broadband. These advances have eliminated the excessive routing overhead and signal degradation associated with multiple hops, making possible much larger metro scale networks. It is the ability of the information to be transmitted over multiple hops that optimizes the data path between the wireless client device and the wireline servers. Because of the speed and quality of transmission between hops, an enormous broadband cost factor is eliminated- the need to connect each router point to the wired network. Instead, the information is transmitted across the wireless routers to the wireline connection. In a Tropos system, approximately 10% of the routers are connected to wireline backhaul.

A critical strength of the Tropos router is dynamically identifying the most efficient path from router to router across multiple hops to achieve the highest throughput between the user's device and the wired backhaul connection. The routing protocol adapts based on changing interference or fading conditions or when new backhaul is added to expand coverage. In contrast to wireline networks, the technology encompasses a built in resiliency against link and node outages and ensures that there is no system-level point of failure.

The range of wireless mesh broadband applications currently being used by public safety agencies include video, photographs, VOIP, Internet access, secured data base access, surveillance, report transmission and monitoring. The technology delivers symmetrical service, up to 15 Mbps of concurrent subscriber capacity per square mile with peak data rates of up to 54 Mbps. In a typical public safety environment there are approximately 20 routers per square mile, with the cost per square mile less than $100,000.

Implementation

Contributing to the significant cost savings of wireless mesh networks is the ease of construction and build out, a critical element in response and recovery efforts. Each router of the mesh network is the size of a breadbox and is attached to a lamppost, telephone pole or other fixture with a power source. There are no large towers. There are no zoning ordinance or variance approvals required. There is no specialized skilled required to install them. There are no multiple truck rolls needed once the installation is completed. Implementation averages 15 minutes. Back up power supply, whether through battery or solar panels, can be affixed at the time of installation or later. The equipment is designed and built for environmental extremes. If the network expands or is altered, there is no need to return to adjust the routers already in place. Expeditious and straightforward construction, combined with the lack of wireline connection to each router presents not only enormous cost savings over wireline and licensed wireless alternatives but a deployment timeframe conducive to emergency circumstances.

Deployment efficiencies also emanate from the non-proprietary character of the technology. Designed and built around the 802.11 Wi-Fi standard, an agency is able to select the laptop, PDA device, VoIP phone or other device, virtually all of which are now manufactured to the standard, contributing further to affordability and ease by which it can be installed and made operational.

Moreover, the base of 802.11 Wi-Fi equipment now in service in the public safety sector and broader commercial markets stems from a competitive environment among broadband providers, including incumbents. The investment base in the 802.11 standard and supporting devices is enormous; currently 802.11 radios are a 50 million unit per year market. That agencies are protected against obsolescence is reflected by the backward integration of improvements in 802.11 technology. In five years, a backwardly compatible 802.11g chip offers about 25x the performance at about 1/20th the price of first generation radios. These low price points are leading to increased market opportunities, lower prices and more services.

Interoperability

The great challenge to public safety communications is that it operates in an environment of scarce spectrum resources yet demands diverse and redundant networks with the ability to communicate across agencies, networks and devices. Expeditiously dispatching the proper resources and expertise depends on quality wireless communications and interoperability among agencies. Because spectrum is so valuable, it also must be used for daily operations. Added to the challenge is the catastrophic event, such as Hurricane Katrina, that destroys the infrastructure, where the priority turns to restoring capability immediately. Proprietary networks and devices run counter to fulfilling these demands and propound the silo effect of current networks. The image of stockpiling radios and distributing them at an event defies the reality that more is possible.

Hurricane Katrina's aftermath showed that a functioning broadband communications system can be deployed from scratch in just a few days. The infrastructure consisting of wireless mesh routers, laptop computers, VoIP and satellite phones, 5 GHz licensed spectrum and 2.4 GHz unlicensed spectrum and a wireline connection provided real time access to the Internet, voice and data communications to public safety, assisting agencies and victims. The fundamental underlying this capability is the open standards radio technology reflected by Wi-Fi. It is a fundamental that should be the underpinning of large and small scale interoperability needs. The lack of proprietary devices and the flexible deployment capability of wireless mesh delivering the range of broadband applications provides agencies effective interoperability capability.

Summary

Hurricane Katrina demonstrated the need for diverse networks possessing inherent flexibility to provide a broad range of broadband applications. The old ways of connecting government officials, first responders, and relief agencies were shown not to be capable of meeting the test of a modern-day disaster. By contrast, wireless mesh demonstrated that it is a reliable, resilient and innovative technology that will speed response. We urge the Commission, in its report to Congress addressing the communications needs of the Nation's public safety agencies to recognize the importance of the technology and its need for quality spectrum. Its tangible contribution to emergency response has been shown to make a difference this time. If deployed throughout the country, it will do so again.

Respectfully submitted,

Ellen M. Kirk
Vice President – Marketing
Tropos Networks

Copy Provided to:
Catherine W. Seidel, Acting Chief Wireless Telecommunications Bureau
Cathleen Massey, Wireless Telecommunications Bureau
Michael J. Wilhelm, Chief, Public Safety and Critical Infrastructure Division
Scott Stone, Deputy Chief, Public Safety and Critical Infrastructure Division