

**Communicate. Locate.
Interoperate.**



**MeshNetworks Enabled Architecture (MEA™) Solutions
for Law Enforcement Agencies**

INTRODUCTION

Today's Public Safety vehicles have become mobile offices. Built-in mobile data terminals (MDTs) are used to access, download and transmit information to assist officers and command staff in their daily tasks. However, today's low speed data networks are limited to text-only and other low bandwidth applications. Every day, Law Enforcement officials are disadvantaged by not having access to applications like streaming video, multimedia e-mail and content-rich databases. These innovative tools of the trade would allow them to more effectively carry out their duties. The fact is that these applications are available today, but the bandwidth available from CDPD and "next generation cellular" data services needed to support them is not.

THE CHALLENGE

On Aug. 8, 2002, the Federal Communications Commission announced the end of CDPD (Cellular Digital Packet Data) services - a specification for supporting wireless access to the Internet and other public packet-switched networks. Public cellular operators are attempting to persuade Law Enforcement agencies to switch from the CDPD network to data overlay networks such as GPRS and 1xRTT. These data services are built on top of cellular voice networks, hence they still only offer low bandwidth (typically 30 to 60 KBPS). In addition, they do not offer the same coverage as CDPD, yet come with a much higher monthly service and equipment fee.

Some Law Enforcement agencies are looking to Wi-Fi - but these solutions anchor Law Enforcement officers to tiny, pre-defined "hot spot" areas. Wi-Fi solutions do not offer the high bandwidth connectivity where Law Enforcement officers need it most – en route, or at the scene of the incident. These agencies have been tasked to provide officers with tactical data communications tools that enable them to better protect their communities, serve the public interest and ensure their own safety.

Law Enforcement agencies are also challenged to keep their operations continuously up and running during emergency situations. Protecting the public depends on continuity of communications i.e., being able to access information and immediately respond with high situational awareness in the event of a disaster.

In a field survey conducted by McKinsey & Company in 2002 of 453 police officers who responded to the World Trade Center September 11th attacks, 50% reported that their radios failed after WTC Tower 1 collapsed. The public safety communications infrastructure was severely overloaded and then damaged, as the event ran its course.

When choosing a data communications solutions, law enforcement agencies have learned that large-scale responses require effective coordination and communication among different agencies and levels of government.

“...nothing is more important in times of cataclysmic events than the ability of public entities to speak to one another.”

- FCC Commissioner, Kathleen Abernathy, December, 2001 Conference on Homeland Security

Clearly there is an urgent need to resolve interoperability issues between personnel of different public safety agencies. Recent high profile incidents have tested the ability of government and public safety organizations to implement a well-coordinated response. In many cases, it was the shortcomings in the existing communications networks that hindered effective response and coordination between these various institutions.

The Solution

Responding to the need of Law Enforcement agencies, MeshNetworks Enabled Architecture (MEA™) technology offers an integrated wireless communications solution that provides a high performance, survivable broadband network. By leveraging technology originally developed for battlefield communications, MEA supports high-speed data, video, voice messaging and geo-location services for fixed and mobile users. MeshNetworks' MEA solution improves the efficiency and responsiveness of Law Enforcement assets, while increasing their safety. All elements in a MEA network come together to create a wireless mesh of coverage that offers the following benefits:

High-Speed Data, Video and Voice Services

MeshNetworks' mobile broadband products wirelessly deliver high-speed data connectivity, with burst rates up to 6 Mbps. All MEA products support end-to-end Internet Protocol (IP), so any IP device or application works seamlessly in the network. This makes it possible for personnel with MDTs, PDAs, laptops and other mobile platforms to connect to local, state and federal databases and networks. It also supports mobile high-speed links to the Internet at data rates previously available only over wired broadband connections such as DSL and cable modems.

Robust and Survivable Networking

MeshNetworks' products use a patented peer-to-peer technology that eliminates single-points of failure. Every device in the MEA network acts as a router/repeater for all other devices in the network. This means that each device and user can "hop" through neighboring devices to communicate with each other - and to reach network access points that can connect them to other data and voice networks.

This distributed topology eliminates the single points of failure and bottlenecks found in public cellular data networks by creating an interconnected private web between devices. This capability creates a robust, distributed network that automatically routes around congestion. In essence, every MeshNetworks enabled user makes the network more scalable and more robust.

Supports Agency & Application Interoperability

Self-forming, scalable, IP-based networks allow public safety agencies to share information and mission critical applications. When two agencies with MeshNetworks enabled devices converge on an incident, a single network can be formed between every device - increasing coverage, communications, and situational awareness instantly.

Mobile Connectivity

MeshNetworks offers a true wide area mobile wireless solution to Law Enforcement agencies. Data connectivity and geo-location are available throughout the network to both stationary and mobile users, even at speeds in excess of 150 mph!

Cost Effective and Efficient

MeshNetworks enabled systems are less expensive to implement and more robust than conventional cellular or other wireless alternatives. With MeshNetworks, every device in the network can connect directly, or "hop" through the network to reach any other device. This is also known as peer-to-peer networking. Peer-to-peer networks eliminate the need for vulnerable and expensive radio towers. Since there are no centralized bottlenecks in a MeshNetworks enabled wireless solution, user data rates and capacities are very high.

MESHNETWORKS ENABLED APPLICATIONS

A MeshNetworks' communications and location network provides Law Enforcement agencies with wireless networking solutions that can make initial dispatch, incident response and field reporting activities more productive and efficient. In fact it makes a whole host of new applications and capabilities available that will increase effectiveness of the entire organization.

Wide Area Data Connectivity

MEA networks are the perfect solution for agencies being forced to find a CDPD replacement. They offer high-speed broadband capabilities that can support today's and tomorrow's data intensive dispatch and incident reporting applications.

Asset Tracking and Location

MeshNetworks' MEA technology is the only solution that provides reliable, mobile, wireless communications and geo-location in an integrated solution. Dispatch can track each MeshNetworks enabled vehicle and individual to increase his or her safety. Location information can also assist in the deployment of resources, giving a visual map of asset positions at an incident or across an entire city. Location information is generated quickly and accurately: typically +/- 10 meters or better in under one second.

Supports Desktop Applications in the Field

E-mails with attachments, database look-ups, instant messaging, routine reporting and file transfers can be sent or received by mobile units. High-speed data rates and end-to-end IP protocol support create a desktop-like experience in the vehicle or on the street.

Real-time Video Monitoring and Surveillance

MEA networks provide bandwidth needed to enable field officers to wirelessly receive video feeds from helicopters, public safety vehicles, building security systems and traffic cameras. Likewise, video from dashboard video systems can be sent back to dispatch and monitored in real-time, improving the safety of the officer.

Voice Back Up

Voice messaging can provide an emergency back up to the primary voice communications network. Instant messaging and email support also can be used until the primary voice service has been restored.

Instant Tactical Networking

MEA technology enables instant incident communications networks to be deployed anywhere, anytime. Routes and links are automatically formed between users, no pre-installed network infrastructure is needed. SWAT, incident response and other specialized units can deploy a broadband tactical data communications network, simply by turning on their MeshNetworks enabled devices. Video from supporting aircraft can be sent wirelessly to the ground units to improve situational awareness.

PARTNERING FOR COMPLETE SOLUTIONS

MeshNetworks has working relationships with many partners who provide custom and total solutions to meet Law Enforcement's needs. Network engineering, applications, devices and other services are available from this team to meet the requirements of the smallest or largest organizations.

SUMMARY AND CONCLUSIONS

Law Enforcement agencies are faced with convergence of several issues that are putting more demands on their resources. Increased responsibilities for local Homeland Defense, tight budgets and the demise of the CDPD network are all challenging the ability of these agencies to meet their primary mission: to protect the lives and property of the public. New communications technologies can play a vital part in addressing all of these needs. However, these new systems must also address the shortcomings of existing wireless networks. Survivability, support for desktop data speeds and integrated location services are obviously required, but these must come at a price that make deployment affordable.

MeshNetworks' MEA solutions offer a complete mobile, IP-based network for high-speed data, video, voice messaging and location services. Its Multi-hopping® peer-to-peer architecture makes it ideal for both wide area and tactical incident communications. Originally developed for the military, MEA provides survivable and cost-effective networking by leveraging a distributed meshed infrastructure. MeshNetworks, along with its partners, are offering these solutions today.

To learn more about MeshNetworks and its partners, MEA products and other MeshNetworks enabled solutions, please visit <http://www.meshnetworks.com/>.

