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# Public Safety and First Responders for Law Enforcement and Emergency Response

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The term ‘mission-critical’ is often overused, but not in the world of public safety and first responders. When it comes to law enforcement agencies, fire departments, emergency medical service providers and other public safety organizations, effective communications are often literally a matter of life and death. Which is why these agencies are constantly in search of networking solutions that increase both their response time and effectiveness.

In the past, first responders were limited to voice communications with each other and with command and control, often resulting in a dangerous lack of situational awareness. More recently, the available options have expanded to narrowband data, text messaging, satellite video and other forms of communications. But the benefits of broadband wireless networking have been beyond their reach.

No longer. Now broadband wireless networking can be leveraged for public safety communications. And unlike traditional networks that use Wi-Fi access points to share a limited amount of bandwidth, Firetide’s wireless mesh network solutions form instantaneously and automatically, healing themselves when a link is interrupted or broken to deliver seamless voice, data and video. Compatible with any existing equipment, network or software, Firetide solutions are ideal for municipalities, federal government, public safety officials and emergency responders.

Firetide solutions are based upon the patented AutoMesh™ platform that makes flexible, reliable and high-performance wireless networks possible in environments that would otherwise be too demanding or costly for traditional wired networking approaches.

Firetide, the leader in commercial wireless mesh networking for businesses and service providers offers the HotPort® wireless mesh nodes, which support the 4.9 and 5.9 GHz public safety band. This application note highlights some of the many ways public safety agencies can utilize a HotPort mesh network for both routine operations and incident response. As will be shown, the full potential of sophisticated field communications for public safety personnel is now a practical and affordable reality with the HotPort mesh network.

### **Jurisdictional Overlay Networks**

HotPort mesh networks can be deployed throughout an entire jurisdiction to provide broadband wireless communications on a routine, daily basis, or to supply a backhaul link to an on-scene incident response network. Designed for maximum performance, scalability and ease of use, the wireless mesh

creates an overlay network that can cover all or just a critical portion of any jurisdiction—from a small town to an entire county. Multiple mesh networks can be inter-connected temporarily or permanently where greater coverage is required, potentially linking multiple agencies and/or jurisdictions in a mutual aid situation.

To provide broad coverage, jurisdictional mesh networks employ HotPort outdoor mesh nodes permanently mounted on rooftops, power or telephone poles, or telecommunications towers. HotPort outdoor nodes feature weatherproof enclosures and dual 10/100 Ethernet ports equipped with industry standard Power over Ethernet (PoE). The use of Ethernet ports affords maximum compatibility with commercial off-the-shelf (COTS) systems, including digital video surveillance cameras or access points, or for interfacing with other networks. Throughput of up to 300 Mbps, combined with traffic prioritization and other traffic management features, enables the HotPort mesh networks to support concurrent data and video/voice-over-IP (VoIP) multimedia communications.

Potential applications for the widespread broadband wireless access afforded by a jurisdictional mesh overlay network include:

- Remote access to centralized servers containing maps, national and local crime databases, motor vehicle registrations, hazardous material data, building blueprints, procedures, checklists, contact directories, rosters, skill set information, reports, etc.
- Video surveillance and recording with stationary or roving digital cameras
- Multimedia Instant Messaging to units in the field
- Broadcast of alerts and bulletins to precincts/stations and first responders
- On-line record retention to aid in filing reports or for planning purposes
- Backhaul communications between first responders on the scene and headquarters for enhanced situational awareness

A jurisdictional HotPort mesh network can provide broadband communications for both intra-agency and interoperable multi-agency needs, including mutual aid. Any organization authorized for 4.9 GHz—local/state police, SWAT, National Guard, fire, EMS, hospitals, FEMA, mass transit, utilities and others—can utilize the license granted to the jurisdiction. HotPort indoor nodes, which operate seamlessly with HotPort outdoor nodes, can be used to extend the jurisdictional mesh into command centers, city halls and other facilities on a temporary or permanent basis.

Firetide HotPoint® access points can optionally be deployed indoors or outdoors to provide first responders and other public safety officials with commercial Wi-Fi communications. Because the mesh is a multipoint-to-multipoint network, and not point-to-point, FCC restrictions on permanent installations do not apply. This same characteristic also allows a HotPort mesh to overcome the many line-of-sight obstructions that cause problems with other wireless technologies.

### Incident Response Communications

At the core of the Firetide solution is our patented AutoMesh platform that enables businesses, governments and industrial customers to support both inside and outside environments, handle fixed and mobile assets, and view live, high-bandwidth video feeds reliably, securely and with low latency.

The Firetide solution is ideal for temporary or ad hoc communications at the scene of any incident—in any terrain, whether metropolitan or rural. The nature of the incident can range from a fairly localized accident, stakeout, hostage or rescue situation to a major, widespread disaster caused by a fire, earthquake, storm, terrorist act or other catastrophic event. In the latter case, the only form of communications available may well be the mobile, self-forming incident response mesh network that accompanies first responders to the scene.

Incident response mesh networks employ HotPort indoor mesh nodes that are plenum-rated for mounting in trunks, under seats or elsewhere in vehicles or mobile command centers. The built-in 4-port 10/100 Ethernet switch can support mobile data terminals, digital video cameras, GPS receivers and most other on-board multimedia communications systems. HotPort outdoor mesh nodes equipped with high gain antennas can be mounted to portable stands to extend the range of the mesh and provide outdoor connectivity for video cameras and access points. With the exception of PoE, indoor and outdoor units also share the same robust HotPort feature set, including support for strong encryption, access control, traffic prioritization, Virtual LANs, LAN/WAN internetworking, mobility and more.

Possible applications for the instantaneous broadband wireless communications provided by an ad hoc HotPort mesh network include:

- On-the-fly creation of an on-scene Incident Command Center
- Full situational awareness by first responders on the scene, optionally integrated with GPS/GIS for real-time resource tracking
- Live video feeds of the incident from digital cameras, including those mounted on robotic vehicles
- On-scene collaboration, potentially with whiteboarding and videoconferencing
- Multimedia Instant Messaging for peer-to-peer and peer-to-group communications
- Incident area-wide broadcast of alerts and bulletins



### Self-forming Networks Speed Responses

A HotPort incident response mesh network begins to form immediately and automatically as the first two responders reach the scene. The mesh continues to grow and adapt as first responders come and go, or move about the area. Security provisions can restrict participation, if required, or the mesh can be made available to all units and/or agencies. The network can scale to support 50 participants or more, and with its many available paths, a mesh topology becomes even more resilient as it grows.

Where backhaul is provided by an overlay jurisdictional mesh network or other means, first responders on the scene have access to the same server-based information listed above. Similarly, access points can be attached to the HotPort mesh to provide access for Wi-Fi enabled computers and PDAs that utilize commercial, unlicensed frequencies of 2.4 GHz and 5 GHz.

The Firetide HotPort mesh networks provide a reliable, high-performance wireless infrastructure for public safety jurisdictions. Instant deployment and mobility also enables first responders to set up temporary incident response communications at the scene of an incident.

## Firetide Public Safety Advantage

Here are just some of the capabilities public safety agencies get with a HotPort mesh network:

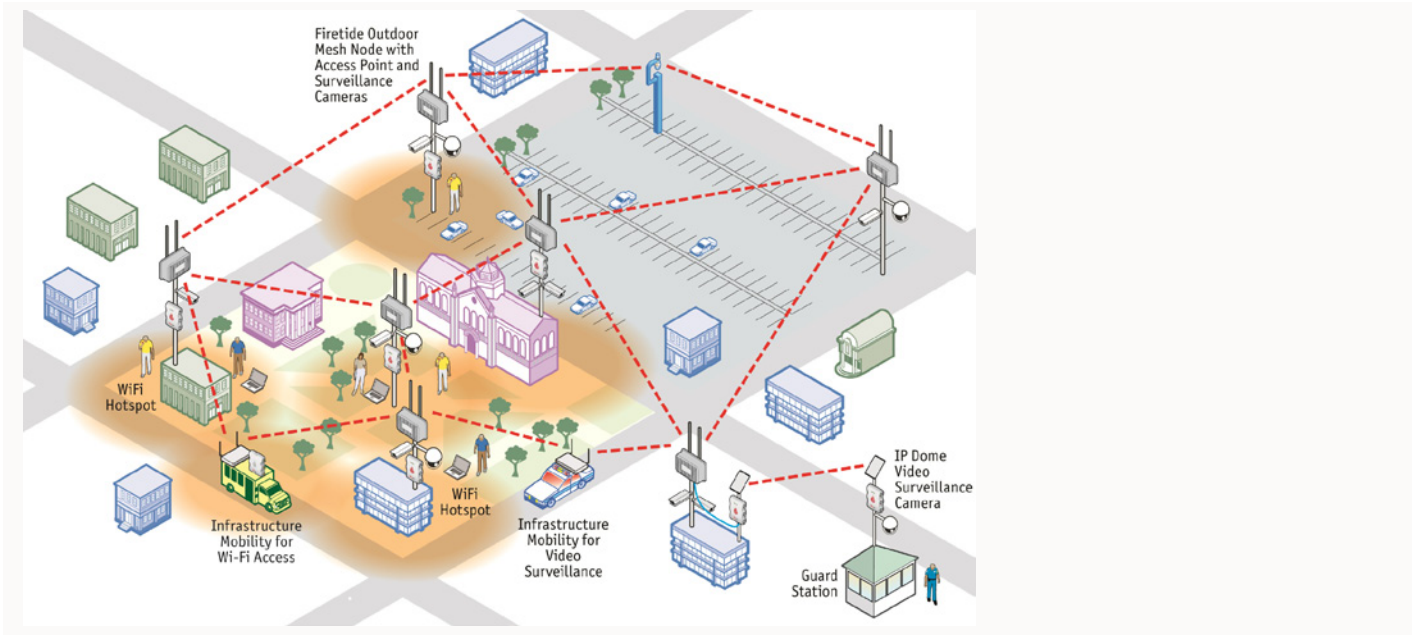
- Genuine broadband communications to support enhanced multimedia (data/video/voice) applications in a fully wireless environment
- Mission-critical stability and dependability with a fully self-healing mesh network that is remarkably resilient to outages and obstructions
- Solid security in any situation with provisions for strong encryption, rigorous access control and Virtual LAN segmentation  
Scalable capacity to create a jurisdictional/incident response mesh network environment with up to 1000 nodes
- Ease of use with a self-configuring, self-managing network
- Firetide HotPort mesh nodes are FCC Part 90 DSRC C-mask certified
- Full mobility to accommodate moving vehicles or vessels within range of the jurisdictional overlay and/or incident response mesh network

- Seamless compatibility with existing communication systems, protocols (e.g. IP, IPX, XNS, NetBEUI, etc.) and commercial off-the-shelf equipment, including mobile data terminals, laptop computers, and digital video cameras
- An industry-leading low total cost of ownership (TCO) based on a relatively modest capital expenditure and minimal on-going operational expenditures

## About Firetide

Firetide, headquartered in Silicon Valley, has more than 10,000 customers in 40 countries around the globe, including Seoul Metropolitan Rapid Transit, the City of Chicago and the world's longest mesh network at the Thailand Royal Irrigation Department. The Atlanta Police Department deployed a Firetide wireless mesh video surveillance network to help control vehicle traffic and protect more than 500,000 fans during the 2013 NCAA Final Four basketball tournaments.

For more information, visit [www.firetide.com](http://www.firetide.com) or follow Firetide at @firetide on Twitter.



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