

Interoperable and Fail-Safe

Multi-jurisdictional emergency communications network represents unique achievement for St. Louis area.

Emergency responders bear significant responsibility in a disaster. Given the wide variety of potential emergencies they could face on any given day, they need the most accurate, up-to-date information as quickly as possible to help shape their response. Emergency medical teams, hospitals, firefighters, police officers and others benefit from the ability to communicate with each agency involved in the response.

In fact, Nick Gragnani, executive director of the St. Louis Area Regional Response System (STARRS), said a system of interoperability for a geographic region can greatly enhance desired outcomes in a disaster.

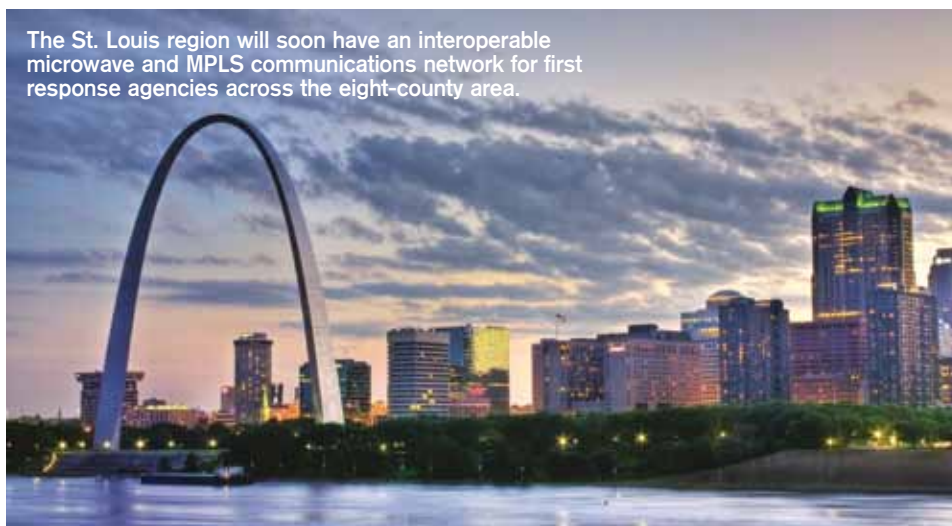
“A reliable communications network that responders know to go to and use in the event of an emergency is our benchmark for the St. Louis region,” he said.

Prior to the terrorist attacks of September 2001, emergency managers knew that communication between responding agencies in a disaster was a critical issue that needed to be addressed. Following that devastating series of events, and subsequent natural disasters including Hurricane Katrina, interoperability gained advocates in all sectors of the community.

East-West Gateway Coordinates St. Louis Area Response

The East-West Gateway Council of Governments (EWG) was formed in the 1960s as a regional planning agency to oversee the development of the interstate highway system in the St. Louis area. EWG is governed by a board of directors made up of elected representatives from four counties in Missouri (Franklin, Jefferson, St. Charles and St. Louis counties), three counties in Illinois (Madison, Monroe and St. Clair counties), and the city of St. Louis.

In recent years, EWG’s scope has broadened along with the growth of the region. It



The St. Louis region will soon have an interoperable microwave and MPLS communications network for first response agencies across the eight-county area.

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now manages grants in several policy areas, including disaster response. STARRS, the coordinating agency for regional emergency response plans in the eight-county St. Louis area, manages security-related grants provided by the federal government on behalf of EWG.

Moving Toward a Coordinated Response

Like many regions across the country, leaders in and around St. Louis agreed that they should work toward an interoperable system to facilitate communications in the event of an emergency. More challenging, however, was gaining consensus on how to move forward given this complex group of autonomous jurisdictions. While this kind of network has been built elsewhere in the country, unifying this number of decision-makers — across multiple agencies and even across state lines — makes this network one of a kind.

Gragnani explained that a core group of agency representatives, consisting of policymakers along with skilled technicians,

came together to draw up specifications that respected each entity’s individual needs, while moving collectively toward regional interoperability.

Chief among the requirements they agreed upon for their network was a fault-tolerant microwave communications system, with multiple levels of redundancy. Within this network, each county needed its own separate data pipeline, segregated from and independent of the traffic coming from other organizations. At the same time, it had to include capabilities for regionwide communications in the event of an emergency.

Unique System Within a System

This “system of systems” design with distinct communications portals for each entity, coupled with regional interoperability, needs to span 76 different tower locations. Redundancy over this broad geographic area must ensure that even in the case of a connection failure, the system can automatically compensate and repair itself within milliseconds.

System failure, said Gragnani, simply cannot occur. “The system cannot go down at

any time because if it does, that could mean the calls of a firefighter trapped in the basement of a burning building or a police officer standing in a dark alley requesting assistance will go unanswered," Gragnani said. "That can't happen."

The MPLS Solution

East-West Gateway officials reviewed a number of proposals for this ambitious project and felt that communications technology provider Alcatel-Lucent best understood their needs, and could deliver a solution that enhanced their original vision.

"This solution allows different governmental entities to communicate with each other through one clear communications network that is shared, while also providing private communications channels for each organization," said Neal Salzman, assistant vice president of sales for Alcatel-Lucent.

STARRS decision-makers were satisfied that Alcatel-Lucent could deliver a system with the redundancy they sought. "We said 'break it,' and they did. We said 'break it again,' and they showed us what their next level response was. We said 'break it a third time,' and they had a third level of response," explained Gragnani. "They had contingency upon contingency to demonstrate that they could meet our needs for reliability."

Not only is Alcatel-Lucent providing EWG with a 6 GHz high-capacity microwave solution that spans the region, the company is also providing an MPLS switching layer on top of this that adds additional capabilities. MPLS, which stands for multi-protocol label switching, manages the movement of all communications (voice, data and video)

in a secure pipeline. It further ensures that certain classes of traffic, like from different governmental bodies within EWG, are kept separate from one another.

In addition, MPLS provides flexibility that helps make the most of network bandwidth. MPLS networks utilize available bandwidth to transmit information, even if it requires more bandwidth than is normally allocated for that type of data. In essence, it borrows available bandwidth to

Emergency managers in St. Louis hope to eventually add long term evolution (LTE) broadband wireless capabilities to significantly enhance both the speed and capacity of communication with emergency personnel. Recognized as the next-generation standard for mobile communications, LTE takes 3G one step further, improving on many 3G features, and incorporating newer enhancements that have come about since 3G came on the scene.

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Nick Gragnani, executive director, St. Louis Area Regional Response System

transmit data across the network, and returns it once the transmission is complete. This lets EWG make the most efficient use of its network, without jeopardizing vital communications. With MPLS, priority for transmissions always follows the hierarchy set by the agency.

Phase One Under Way

The St. Louis region is currently in the first phase of installation in a three-phase process to achieve regional interoperability. Microwave equipment installation is now taking place in Madison, Monroe and St. Clair counties in Illinois. Gragnani predicts that the entire network will be complete and up and running within two years.

While the system being deployed in the EWG area will not initially have LTE traffic to support, it could in the future. In fact, this microwave and MPLS system provides the required foundation for efficient LTE traffic backhaul support. The LTE upgrade depends on federal funding for homeland security. And this funding stream is uncertain, given the state of the economy. For now, however, the region has a lot to be proud of.

"Nothing like this exists anywhere in North America," said Gragnani, citing how unusual this kind of large-scale collaboration of so many autonomous governmental bodies across two states is. "It has been painstaking, but once we pull this off, it will be a significant achievement for this region."

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