



Motorola E-Zine Government

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Mission Critical Voice Demands
a No-Excuses Technology

VoIP over the air has to prove itself in the commercial sector before it is adopted for public safety seamless connectivity.

By Pam Baker

Mission critical voice communication reflects the harsh realities on the emergency management scene: when every other commercial system is down, you expect mission critical voice to be there. The exacting standards for mission critical networks and devices disqualify many nascent technologies and devices in favor of proven, reliable standards. In a mission critical environment, all aspects of a device or technology must achieve interoperability, reliability, coverage, capacity, control and instant, real-time communications.

“In an emergency, mission critical voice remains the single most powerful tool public safety and government agencies have at their disposal to ensure the safety and well-being of first responders and the citizens they protect,” says Thomas Quirke, director of Solutions Marketing at Motorola.

Voice Over IP Has a Long Way to Go

While some say voice over Internet Protocol (VoIP) over the radio interface could be the next big thing in mission critical communications, in fact, VoIP has a long way to go before it meets mission critical standards in the same way the global customer driven standards devices do today.

Today, VoIP is successfully deployed in indoor, enterprise applications, but it is an emerging technology in the mobile wireless domain outside the four walls. In the cellular world, handsets and devices are dominated by digitally vocoded circuit switched voice, which is the base for what exists in mission critical voice today.

Public safety agencies adopted the digital circuit switched techniques after the technology was proven in the cellular domain. Eventually, cellular operators demonstrated confidence in digital circuit switched voice technology by turning off their analog networks and rolling out digital to millions of subscribers. Once proven in the cellular environment, digital circuit switched voice was hardened via specific public safety standards bodies to meet the additional demands of mission critical voice. Similarly, where VoIP is concerned, the actions of cellular operators need to demonstrate proof that VoIP is robust for commercial usage.

Pam Montanari, the radio systems manager for Pinellas County, Fla., is responsible for the Pinellas County radio and data system, a 53-channel voice and three-channel data system that serves more than 9,800 users. The countywide system has 81 different agencies operating on it.

“One of the things we found out, as you move into these new technologies, especially emerging technologies, they really need to be proven,” Montanari says. “I see the same thing happening in VoIP. While it’s working well with some of the phone companies and providers, it really hasn’t proven to be a mission critical system where you have redundancies built in.”

Today, there are more than 2.5 billion cellular subscribers worldwide; by the end of 2008, more than half the world’s population is expected to have access to a mobile phone. Yet, fewer than 1 percent of those subscribers are using VoIP. In a November 2007 report, Disruptive Analysis predicts there will be 3.5 billion cellular subscribers by the year 2012 and that the number of VoIP (over 3G networks) users could grow to more than 250 million by the end of 2012. And even that figure for VoIP represents just 7 percent of all the projected mobile subscribers. The more optimistic analysts do not see cellular VoIP surpassing cellular circuit switched within the next 10 years. And of the more than 700 mobile operators operating GSM (Global System for Mobile communications) circuit switched technology in the world, not one has stated plans to switch off their circuit switched networks in preference for a cellular VoIP equivalent. Such a change over would require many years of planning.

In practice, many cellular operators have recently refreshed their digital circuit switched radio infrastructure and so it is unlikely that we will see a transition happen in the foreseeable future. And confidence needs to be demonstrated by the commercial sector before VoIP can be considered and improved for public safety usage.

“Until the [VoIP] system is more robust and redundancies and additional capabilities required for public safety are tested and put into place, it’s not something where you’re going to see public safety jump on the bandwagon,” Montanari says. “Public safety doesn’t tend to suddenly switch to a new technology because it’s available if it’s not proven and tested.”

Standards Make True Interoperability Possible

And some also say VoIP and specifically IP is the easy way to interoperability, but is it really the magic bullet claimed? According to the Public Safety Wireless Network (PSWN), true interoperability allows public safety personnel in different agencies or jurisdictions to communicate with each other on demand, in real time.

It also means the ability to facilitate instant communication among multiple responders and agencies with more coordination, regardless of network type or agency affiliation that is based on the same open standard. Interoperability also allows all responders seamless access to voice and data intelligence when and where it is needed, so that they can communicate as a team with the touch of a button and a coordinated response can happen in seconds, not minutes or hours.

“Until you know you’re dealing with apples to apples, you can’t say that once you implement VoIP everybody’s going to be compatible,” Montanari says. “For instance, the radios may be compatible, but the infrastructures may not be.”

Interoperability is made possible with a standards-based, shared system in which all agencies can communicate with one another. Most public safety agencies utilize systems based on customer-driven open standards, and these are digital benchmarks for wireless communication networks to ensure the safety and security of communities around the world. With an open-standard network, standards-based equipment (e.g., two-way radios) from different manufacturers used in various agencies are operationally compatible.

“The best way to achieve interoperability is through standardization,” Quirke says. “Everyone agrees to work to a standard. It takes time and upfront planning from the vendors, the standards agencies and the public safety agencies. They’d have to have protocols for how they would bring all the different agencies together. Interoperability requires a big investment of time spent on upfront standardization.”

Standards-based networks are in operation throughout the world providing interoperability of voice and data. Being ‘always available’ makes the difference in a crisis. With an always-available critical network, police, fire, ambulance and other response organizations can count on mission critical voice calls going through. And so it goes that the current standards-based networks and devices will be the first-responders first choice for voice for the foreseeable future.

Today, disparate systems are being successfully connected via [gateways](#) or bridges that enable protocols to be translated. These do include translating one version of IP to another. As long as the Mission Critical features such as an emergency alert can be passed through the gateway (rather than voice alone) they play a vital part in interoperability.

Interoperability Delivered Today with MOTOBRIDGE

In an emergency, there’s no time for first responders to worry about their technology. They need to communicate seamlessly across multiple agencies and jurisdictions to mount an effective joint response. Federal, state and local agencies with incompatible voice

systems can communicate immediately with the [MOTOBRIDGE IP](#) Interoperable Solution, linking disparate systems in support of day-to-day operations and emergency response.

With its robust distributed architecture, MOTOBRIDGE enables any number of authorized users to simultaneously set up talk-paths in under a few seconds, since commands do not need to route through a centralized switch. Its diverse functionality enables direct communication between users from a broad range of devices, including radio, cell phone, IP phone, land-line phone and personal computer.

Complex emergency communication plans can be preconfigured and activated at the click of a mouse the moment an emergency occurs. Intuitive, windows-based applications provide easy configuration, full-featured dispatch when needed, and sophisticated network management for maintaining larger systems. MOTOBRIDGE continues to provide mission critical features such as advanced signaling and superior audio quality, while offering new functionality like remote dispatch and video and logging enhancements.

Motorola's highly scaleable, standards IP-based MOTOBRIDGE solution is currently deployed for public safety agencies in over 10 states, including Alaska and Florida, with many more installations pending.

Contact Motorola to see how MOTOBRIDGE can make a network of networks when you need it. MOTOBRIDGE is part of Motorola's MOTOA4 mission critical portfolio which provides technology that's second nature by enabling seamless connectivity, real-time information, directly in the hands of users.