

VOICE AND DATA INTEROPERABILITY – INITIATIVES AND EMERGING STANDARDS

BY BILL LENT

One of the most crucial factors in responding to and recovering from any emergency or disaster is the ability to see and understand what is happening throughout the area involved. This understanding or “seeing” is what we call situational awareness. There are two ways to achieve this. Either through voice descriptions or through the exchange of “information” (data), and both are important to the overall understanding of what is going on and what needs to be done. The combination of the two can allow responders to better analyze the circumstances, review available options and make better and faster decisions.



Photo courtesy of FEMA

It would seem only logical that all voice and software (data) systems utilized for response to emergencies would allow direct and seamless communications between all of those participating in a response. That is, however, not the case. The 9/11 tragedy highlighted the problem when the police and fire departments could not communicate with each other because of different equipment and incompatible radio systems. Private sector companies that

supply the public safety community have had a vested interest in maintaining their products in such a way as to require that others wanting to communicate with their products use only their products. This is true for both voice and data communications.

The public sector already understands this situation cannot continue. Toward this end there are several government-sponsored standards being developed in both voice and data that will

eventually allow these disparate systems to seamlessly communicate. Multiple organizations are working together with several federal entities to accomplish interoperability in both voice and data communications and these various efforts are now being blended into a coordinated effort to achieve at least a mid level of interoperability through the use of middleware (software connections between legacy software). In an effort to promote interoperability, the Department of Homeland Security (DHS), the Department of Justice and others have initiated and supported interoperability efforts in both the voice and data arenas.

Voice Interoperability Standards

The Emergency Response Council is a group of local, state and federal responders, public safety associations, and other interested parties that come together to work on issues surrounding interoperable voice (and now data) communications. The ERC provides recommendations to the Executive Committee and the Practitioners Steering Group so that the executive-level governance bodies may provide input into the Office of Interoperability and Continuity and to the Office of Emergency Communications regarding their voice and data communications efforts.

The ERC met in Denver, Colorado on June 14, 2007, to forge agreements for a Nationwide Plan for Interoperable Communications. This effort was sponsored by the DHS Office of Interoperability and Compatibility and was an extension of the SAFECOM (one of the 25 key Office of Management and Budget e-government initiatives to improve public safety voice communications) programs. This effort was to provide voice interoperability for first responders and others. This was the first group of public safety practitioners to lead an effort toward a Nationwide Plan for Interoperable Communications (Voice). Key areas were established for practitioners across the nation for implementation of a “system of systems” approach to voice interoperability. These initiatives are:

1. **Leadership & Coordination:** Clear leadership structures to link all levels

of government and to coordinate resources must be put in place. Otherwise, emergency responders will continue to suffer from misdirection and inefficient use of resources.

2. **System Design and Interconnects:** Each system must be designed with integrity so it can interoperate with other systems when needed and as authorized, but have the ability to adapt to future technologies as they are developed.
3. **Standards & Certification:** For systems to interoperate seamlessly, technical standards must be in place, as well as a certification/testing program to verify these standards are correctly implemented in equipment and products.
4. **Standardization & Accreditation:** Standardization of protocol, procedures, and accreditation must be in place for responders to establish consistency of operations and common skill sets for personnel across the nation.

The ERC is also involved in Project 25, which is a set of standards produced through the joint efforts of The Association of Public Safety Communications Officials (APCO), the National Association of State Technology Directors (NASTD), the National Communications System (NCS) and selected federal agencies, and standardized under the Telecommunications Industry Association (TIA). It is an open architecture, user driven suite of system standards that define digital radio communications systems architectures capable of serving the needs of public safety and government organizations. These standards define the interfaces, operation and capabilities of any P25 compliant radio system. The P25 exists in the public domain, allowing any manufacturer to produce a P25 compatible radio product. P25 compliant radios operate in both digital and analog modes. Current standards include an RF Sub-System, Common Air Interface, Inter-System Interface, Telephone Interconnect Interface, Network Management Interfaces, Data Host or Network Interface, Data Peripheral Interface, Fixed Station Interface and Console Sub-System Interface. A full description of Project

25 and these standards may be found at www.danelec.com.

As a part of its responsibilities the ERC developed the “Continuum,” which is a verbal and graphic description of the process a jurisdiction would go through to accomplish true interoperability. The Continuum working group has recently recommended changes which would include a data element as a part of a revised Continuum.

Data Interoperability Standards

In the area of data interoperability there has been significant progress in the last couple of years. The various federal efforts at data standardization have been joined together by agreements to make

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all of the standards currently established National Information Exchange Model (NIEM)-compliant. There is now a set process for defining what information needs to be standardized, developing the schema to accomplish international standardization, and coordinating with the various software developers to write their software to the established standards.

The DHS Office of Interoperability and Compatibility is currently supporting practitioner involvement in the standards process. The OIC is currently implementing a Memorandum of Agreement (MOA) with the National Incident Management System (NIMS) and the National Information

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CURRENT DATA STANDARDS

Common Alerting Protocol (CAP) Version 1.1

CAP 1.1 was adopted as a standard on October 1, 2005. CAP provides the ability to exchange all-hazards emergency alerts, notifications, and public warnings, which can be disseminated simultaneously over many different warning systems (e.g., computer systems, wireless alarms, TV, radio). CAP is being implemented as a part of the Integrated Public Alert and Warning System (IPAWS) which is a DHS/FEMA effort. The FCC adopted an order that requires Emergency Alert System (EAS) participants to accept messages using CAP. This is the groundwork for the next generation EAS delivery system. Finally, CAP has been recommended for acceptance by the International Telecommunications Union (ITU) as a global alerting standard.

Distribution Element (1.0)

DE 1.0 was adopted as a standard in April, 2006. DE provides a flexible message-distribution framework for data sharing in emergency information systems. Messages may be distributed by specific recipients, by geographic area, or by other codes such as agency type (police, fire, etc.)

Hospital Availability Exchange (HAVE)

HAVE is a draft XML specification that allows the communication of the status of a hospital and its resources to be shared with other emergency agencies, including capacity and availability, emergency department status, the available service coverage, and the status of a hospital's facility and operations. This standard is currently out for public comment; the Organization for the Advancement of Structured Information Standards (OASIS) technical committee will continue to guide this standard through the approval process.

Resource Messaging (RM)

RM provides standard exchange of resource requests for the use, deployment, and return of assets (persons or things) needed to support emergency and incident preparedness, response and recovery. Adoption is expected in early 2008.

Situation Reporting Standard (SRS)

The SRS will address information gathered from a variety of sources, and provide a basis for incident management decision making. It will provide information on the current situation, the operational picture, and current response and resource status in an actionable form. This proposed standard is just beginning the development and acceptance process.

Exchange Model (NIEM). This MOA will result in an agreement on processes and standards, a unified grant guidance document, and standards compliance between all major programs.

There are current and in-process standards and there is an effort to include these standards as a requirement for federal grants as a part of published grant guidance. Other areas and subjects that are currently under consideration include the Health Information Technology Standards Panel Emergency Response Use Cases, World Health Organization guidance, Patient

Tracking issues, injured persons and notification and reunification efforts, and fatalities including identification and notification issues.

Coordinated efforts to achieve the ability to allow emergency responders from both the public and private sectors to freely exchange information through both voice and data channels will continue to move forward and will someday allow all who would be involved in the response to and recovery from emergencies and disasters to provide more efficient services to those we serve. The goal of these efforts is to improve

the efficiency of future responses, to decrease property damage and reduce loss of life.

ABOUT THE AUTHOR

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