



Interoperability Pavilion

November 14-15, 2005
Phoenix, Arizona

Final Report

Sponsored by IAEM, EIC and COMCARE

Interoperability Emergency Standards Demonstrated

Over twenty-two technology companies came together to exchange emergency messages

Phoenix, AZ -- The International Association of Emergency Managers (IAEM), COMCARE, and the Emergency Interoperable Consortium (EIC) completed the first successful trial of several new emergency data communications standards during the annual IAEM Conference. The demonstrations were conducted in an Interoperability Pavilion and Learning Center located in the exhibit hall. They included the exchange of emergency data messages based on three scenarios: a pandemic flu, a slow-moving Category 3 hurricane, and a terrorist explosion. Over 22 different technology companies participated, showing how standardized data messages can be exchanged by different emergency agency software systems and tools.

"This event showed that data standards are the key to interoperability, and that open standards will improve emergency response agencies' ability to communicate with one another. The Department of Homeland Security has shown great foresight in encouraging the development of these standards."

Richard Taylor,
COMCARE Chair
and Executive
Director of the
North Carolina
Wireless 9-1-1
Board

Lewis Stanton, Senior VP of Sales and Marketing of Roaming Messenger, one of the participating companies and co-sponsor of the Pavilion, stated: "It was inspiring to see companies who usually compete with one another working together to demonstrate the future of emergency response communications."

in other locations on the IAEM exhibit floor, and around the country exchanged alerts, resource requests, and hospital status information during the demonstrations. Participants demonstrated the interoperability value of the OASIS Common Alerting Protocol and three draft data standards being developed as part of a DHS Disaster Management Program-sponsored initiative in which IAEM, EIC and COMCARE are all participating. Detailed information about the pavilion, demonstrations scenarios, standards and participants may be found at www.eic.org and <http://www.comcare.org/IAEM.html>.

"Seeing this many competing companies exchange emergency data using an array of new data standards and draft standards was truly impressive."

Matt Walton
Chairman EIC



Setting up Interoperability Pavilion at the Annual IAEM conference in Phoenix, Arizona

Using actual and draft standards, 22 technology companies within the Pavilion,

Scenario-Based Demonstrations Make It Real

Messages were exchanged for a Terrorist Explosion, a Category 3 Hurricane and a Pandemic Flu Scenario.

The demonstrations were designed around three DHS training scenarios. They showed how the exchange of emergency data messages could enhance response efforts. Attendees could view these demonstrations at scheduled times or whenever they visited the Pavilion.

Explosion Scenario

Description

A car loaded with explosives detonates in the Phoenix downtown area. The explosion occurs in front of City Hall. Fires begin immediately in the affected area. The initial blast kills over 30 people. One block away from City Hall, a man wearing an explosive vest detonates himself inside the Maricopa County Courthouse. The blast kills over 40 people.

9-1-1 centers begin to receive hundreds of calls reporting an explosion in front of City Hall and inside the courthouse. Callers are reporting vehicle fires, numerous bloody individuals and many dead. There is complete panic.



Attendees watching the Explosion Demonstration

Law enforcement, fire, and EMS are dispatched to the scene. Officials at the Emergency Management Agency (EMA) are alerted. The command staff from the EMA begins to provide event and resource management coordination. A decision is

made to evacuate a 20-block radius around the area. It is the beginning of afternoon rush hour. A series of incident management and alerting systems are notified.

Standards Demonstrated

The EDXL Distribution Element (DE) with a Common Alerting Protocol* (CAP) payload is sent from the EMA to all agencies in the area with evacuation instructions. Alerts are sent to key personnel.

A DE with CAP payload is also sent to Departments of Transportation (DOTs) in the area asking them to change traffic signals to steer traffic away from the area and hospitals routes. DOTs acknowledge the request and send best navigable route information to EMA as well as EMS, Fire and Law Enforcement using DE and CAP.

Vendors Participating

RAMSAFE and Vayusphere exchanged messages using the Distribution Element prototype and the OASIS public review draft, respectively. RAMSAFE, Warning Systems, Squareloop, Codespear and DMIS used CAP 1.0; Long Branch Systems, Vayusphere and Warning Systems used the new CAP 1.1 release.

Hurricane Scenario

Description

The National Hurricane Center warns a Category 3 hurricane will make landfall in Southeastern Florida within days. As the threat gets closer, local, state, and regional Emergency Operations Centers (EOCs) rapidly gear up to respond to incidents that

"The ability to communicate by both voice and data during any emergency or disaster is key to a successful response. The educational value of demonstrating current interoperability standards to the profession and encouraging a cross networking is extremely beneficial to all involved. It makes no difference whether the person communicating is law enforcement, fire, public works or any other agency the ability to freely communicate needs and possible resolutions is critical to response and recovery."

Beth Armstrong
Executive Director, IAEM

the hurricane might spawn. Warnings have been disseminated to the public, the media, and to all emergency agencies. The EOC issues evacuation orders.

As the slow-moving hurricane hits with 150 M.P.H. winds, the initial devastation is immense. The local first responders become victims themselves as several fire stations receive damage; large numbers of patrol cars are disabled. Because fallen trees and debris are blocking roadways, many communities are isolated with no communications or electricity. Reports begin to come in regarding looting in some counties that were evacuated. Public Works needs heavy equipment to unblock roadways. The County EOC needs help from the National Guard to control looting.

Search and rescue teams have been activated and are transporting victims to local shelters. As the shelters become full, there is a need for tent cities to accommodate an additional 100,000 people. Because of extensive damage, outside resources will be deployed for an extended period of time.

Standards Demonstrated

Common Alerting Protocol* (CAP) messages are sent out to agencies and the public within the target area by a wide variety of systems using an initial message from the National Weather Service. Emergency response agencies retransmit those notifications to key personnel.

Public Works sends out an EDXL Resource Message Order for heavy equipment to the state EOC and Department of Transportation (routed with an EDXL DE). The County EOC sends a resource request to the State EOC for National Guard assets; the State EOC sends a resource request to FEMA to establish tent cities for 100,000 people. Each receiving agency acknowledges the request with a return Resource Message. The state EOC dispatches heavy equipment and National Guard assets.

Vendors Participating

Buffalo Computer Graphics (BCG), Roaming Messenger, ESS, MyStateUSA, PolarLake and NC4 used CAP 1.0 for alert messages. PolarLake, MyStateUSA, Oracle and Roaming Messenger exchanged the

new draft EDXL Resource Message standards.



Attendees watching the Hurricane Demonstration

Pandemic Flu Scenario

Description

An outbreak of a severe respiratory illness is identified in a small village overseas. Specimens collected from some patients are sent to The World Health Organization (WHO) Reference Center for Influenza at the Centers for Disease Control and Prevention (CDC) in Atlanta. The CDC determines it is a new strain of influenza and sends samples to the Food and Drug Administration (FDA) to begin work on producing a reference strain for vaccine production.

Toronto health authorities sent an alert to the CDC stating that a number of Canadian airline passengers arriving from overseas have the isolated virus and note that many passengers on the same airline were US citizens. Although vaccine manufacturers have gone into full production, few people are vaccinated before the pandemic flu hits.

Shortly, other cities start reporting similar cases. Public health agencies send out alerts specifying potential symptoms and treatment options. State EOCs send out alerts to emergency response agencies within their states urging them to vaccinate personnel and activate all available resources. Agency systems pass along the standardized message to key personnel. Messages are also sent to all hospital and healthcare facilities asking for frequent bed availability reports.

Standards Demonstrated

The EDXL Distribution Element (DE) with a Common Alerting Protocol* (CAP) payload is sent from the Public Health Agency of Canada to the CDC.

The CDC sends out messages to all state public health agencies, and all other agencies (including State EOCs) that have registered in the shared Emergency Provider Access Directory (EPAD) to receive such messages. The alerts specify symptoms and treatment options.

Hospitals and healthcare facilities send the necessary bed availability reports using the EDXL HAVE prototype message.

Vendors Participating

FMTI, COMCARE's EPAD Connect, EmerGeo and ESI exchanged messages using the draft distribution element and CAP 1.0. DGI exchanged messages using the OASIS public review draft of DE along with CAP 1.1. Denver Health and Oracle exchanged messages using the EDXL HAVE prototype standard.

* An OASIS approved standard

Standards Developed by the Practitioners Themselves

All phases of emergency response would benefit from having real time data from a variety of sources. This need for data underscores the need for data standards. Without data standards, widespread information sharing cannot occur. By standardizing data elements across the many emergency professions ("domains"), the data interoperability dream can become a reality across the entire emergency response community.

Messaging standards specify "how" electronic messages should be formatted or structured.

Terminology standards deal with the content or vocabularies of the actual data elements, basically the "what" of the message.

Importance of Open Standards

An open standard means that the standard was developed and approved using a transparent, published and vendor-neutral process that utilizes public comment and input. It is available in stable, persistent versions.

By using and supporting open standards, an emergency organization can increase the value of its technology investments, especially greater data interoperability. Standards provide emergency agencies with a critical part of a data interoperability

blueprint. Agencies can leverage their existing technology by having their vendors modify systems to meet new standards instead of developing one-off interfaces for each agency with which they want to communicate.

"COMCARE has been facilitating practitioner-based processes for developing standards for a few years. It has proven to be a successful approach that results in faster adoption of the standards because they solve everyday needs."

David Aylward
Director, COMCARE

The EDXL Process

The Emergency Data eXchange Language (EDXL) process brings together leaders from a wide diversity of national emergency response practitioner organizations to create detailed requirements and draft specifications for information exchange among all emergency response agencies and professions based on specific emergency response needs and scenarios. COMCARE has been the facilitator of this process since the summer of 2004. IAEM has been actively involved. Technical input is provided by the technology vendor community, led by EIC. The EDXL process has been sponsored by the Department of Homeland Security's Disaster Management E-Gov Initiative.

EDXL is focused on message structure – the "how" discussed above. Its messages draw on the content (the "what") developed by other initiatives such as the Global Justice project. Other projects in

which COMCARE, IAEM and EIC are involved focus on architecture and the "sending" issues.

Once draft message standards are completed by the detailed process COMCARE has been facilitating, they are confirmed by a broader audience of practitioners and validated by the technology vendor community through live demonstrations. Then they are submitted to an official standards development body, such as OASIS. The OASIS Emergency Management Technical Committee solicits and addresses broader (even international) public comments concerning the specifications. At the end of the comment period, the standard is amended, voted on, and made available for broad scale use. Vendors can incorporate the standard into their current product offerings; agencies can require the use of the standard when procuring technology products.

Descriptions of Standards Used

OASIS Common Alerting Protocol (CAP) is a simple, flexible data interchange format for collecting and distributing "all-hazard" safety notifications and emergency warnings over emergency information networks and public alerting systems. In early 2004, COMCARE members were the first to conduct field trials of CAP. Later in 2004, CAP version 1.0 was adopted as an OASIS international standard; CAP 1.1 was formally adopted in October 2005. CAP is being adopted and used by a growing number of organizations.

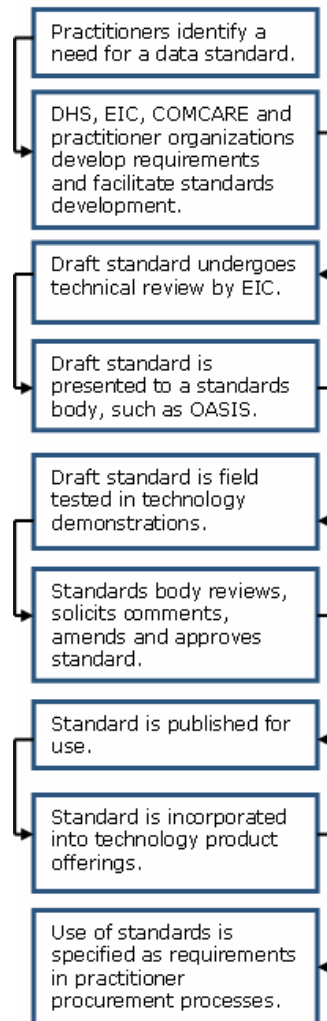
The Emergency Data eXchange Language (EDXL) is a growing suite of specific message standards developed by emergency practitioners. After they

develop detailed requirements for each needed message, and leading technology companies (led by the Emergency Interoperability Consortium – EIC) are consulted, the proposed standards are submitted to an official standards development body. EDXL messages are designed for IP (Internet Protocol) data communications between all emergency professions. The following three draft standards have been developed in the EDXL process thus far:

- The primary purpose of the Distribution Element (DE) is to facilitate the routing of any properly formatted XML emergency message. The Distribution Element may be thought of as a "container". It provides the information to route "payload" message sets (such as CAP alerts or Resource Messages), by including key routing information such as agency type, geographical area covered by target agencies, incident type, and sender/recipient ID's. The Distribution Element continues to be demonstrated during interoperability field tests. It has just completed the OASIS public comment process. It is hoped to be approved as an official standard in early 2006.

- The EDXL Resource Message (EDXL RM) effort began in early 2005 and has created a series of seven draft messages that allow local, tribal, state, federal and non-governmental agencies, stakeholders, and systems providers to rapidly share information on incident and event management

Standards Development Process



resources. The Resource Message set facilitates requests, orders, and requests for resource information, demobilization and tracking of all types of resources (human, vehicles, equipment, supplies, and facilities, as well as packages/teams composed of many of these) – and seeks to support machine to machine communication, and thus avoid multiple entries of the same information. Resource Messaging facilitates coordination of resource requests across multiple incidents or events (i.e. management of scarce resources). The Resource Messaging standard set of seven messages has been submitted to the OASIS Emergency Management Technical Committee for consideration. A concurrent effort is underway to field test the draft messages to ensure validity with both practitioners and the technology vendors that will be implementing the standards.

- Hospital AVailability Exchange (HAVE) is a draft XML specification that allows

the communication of the status of a hospital and its resources to other emergency agencies, including bed capacity and availability, emergency department status, the available services, and the status of a hospital's facility and operations. It emerged from a process initially sponsored by the Agency for Health Research and Quality (AHRQ) of the US Department of Health and Human Services. Combining forces, COMCARE and the AHRQ team developed a draft specification that was then put through the DHS-sponsored EDXL process, and thus exposed to a broader array of emergency agencies. Most recently it was submitted to national organizations in the medical, EM and EMS domains to solicit additional input. Now it will be presented to EIC and then to the OASIS standards organization for its consideration and promulgation as a standard. At the same time, demonstrations are planned to validate it from a technical standpoint.

Interoperability Pavilion Participants

- **Buffalo Computer Graphics (BCG)**
(www.disasterlan.com)
- **Codespear** (www.codespear.com)
- **COMCARE*** (www.comcare.org)
- **Defense Group Inc. (DGI)**
(www.defensegroupinc.com/cobra)
- **Denver Health** (www.denverhealth.org)
- **EIC*** (www.eic.org)
- **EmerGeo** (www.emergeo.com)
- **ESi** (www.esi911.com)
- **ESS** (www.ess-home.com)
- **Fire Monitoring Technologies International Inc. (FMTI)**
(www.openaccess.ca)
- **IAEM*** (www.iaem.com)
- **Long Branch Systems**
(www.longbranchsystems.com)
- **MyStateUSA** (www.mystateusa.net)
- **NC4 Public Sector, LLC** (www.nc4.us)
- **Oracle USA** (www.oracle.com)
- **PolarLake** (www.polarlake.com)
- **RAMSAFE** (www.ramsafe.com)
- **Roaming Messenger***
(www.roamingmessenger.com)
- **SquareLoop, Inc.**
(www.squareloop.com)
- **Vayusphere** Instant Response Server (IRIS) (www.vayusphere.com)
- **Warning Systems, Inc.**
(www.warningsystems.com)

* A Pavilion Sponsor

Take the Standards Quiz

1. If standards are only used by some agencies, then value is reduced.	TRUE	FALSE
2. Separate domain standards initiatives need to be harmonized to maximize interoperability value.	TRUE	FALSE
3. Interoperable emergency data communications allows responders to spend less time on the radio and telephone, and more time on response.	TRUE	FALSE
4. Open standards are vendor neutral and not dependent on any specific product.	TRUE	FALSE
5. There are all types of standards.	TRUE	FALSE
6. CAP is used for public warning and alerting.	TRUE	FALSE
7. EDXL is a growing suite of message standards developed by emergency practitioners, sponsored by the Department of Homeland Security's Disaster Management E-Gov Initiative.	TRUE	FALSE
8. Messaging standards specify "how" electronic messages should be formatted or structured.	TRUE	FALSE
9. Terminology standards ("data dictionaries") deal with the "what" of the message.	TRUE	FALSE
10. Emergencies demand real time data.	TRUE	FALSE
11. Demonstrations are important parts of the standards development process.	TRUE	FALSE
12. HAVE provides hospital status and resources to agencies during an emergency event.	TRUE	FALSE
13. OASIS stands for Organization for the Advancement of Structured Information Standards	TRUE	FALSE
14. The Interoperability Pavilion is about open standards used in an open architecture.	TRUE	FALSE
15. Interoperable data communications can help emergency managers make better decisions.	TRUE	FALSE

ANSWERS: All answers are TRUE.



The people who made the Interoperability Pavilion a success. Thank you.

IAEM is a non-profit organization representing 3,000+ emergency management and homeland security professionals for local communities, state and federal disaster officials, private sector, non-governmental organizations and others involved in preparing for, responding to, and recovering from all types of disasters including acts of terrorism. IAEM provides access to the largest network of emergency management experts who can provide advice and assistance; the Certified Emergency Manager® program; annual scholarships; a comprehensive monthly newsletter; and more. For more details on the IAEM 53rd Annual Conference & EMEX Exhibit, see www.iaem.com.

The Emergency Interoperability Consortium (EIC) was launched in October 2002 to address our nation's lack of consistent technical interoperability and standards for emergency and incident management. Now comprised of over 60 private entities, public agencies and non-profit organizations, the EIC is promoting the development and adoption of standards for using Web services, Extensible Markup Language (XML), and existing relevant standards that will enable emergency industry interoperability. For more information, visit www.eic.org.

COMCARE is a national non-profit alliance dedicated to advancing emergency response. COMCARE's 100+ organizational members represent the wide diversity of the emergency response community. For more information, visit www.comcare.org.

Detailed information about the Pavilion, demonstrations scenarios, standards and participants may be found at <http://www.comcare.org/IAEM.html>, or www.eic.org.