Department of Homeland Security

Science and Technology Directorate

Emergency Data Exchange Language Overview

Denis Gusty
Program Manager

S&T Homeland Security Enterprise and Support for First Responders

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Agenda

- DHS Interoperability Challenge and Current Initiatives
- Current and Future EDXL Standards
- Value of Developing a Common Methodology for Standards Development
- The Gap Analysis as a Methodology
- Gap Analysis Case Study: Existing Standards and Emergency Response Community Requirements

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The DHS Interoperability Challenge

- Responders often cannot talk within their own agencies—let alone other agencies or across cities, counties, and states. Ineffective communications risk the lives of responders in the field, and can mean the difference between life and death for those awaiting help.
- There is no one “Silver Bullet” to solve the interoperability challenge.
- The interoperability landscape consists of 60,000 state and local public safety agencies, Federal agencies and other stakeholders.
- 60,000 agencies means 60,000 different sets of procurement regulations, budgets and equipment lifecycles.

- The challenge for DHS is to provide ALL stakeholders (Federal, state and local), with the right mix of policies, tools, methodologies and guidance to enable improved communications interoperability at all levels.

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OIC Major Data Initiative Programs

- **Information exchange standards:** A public-private partnership to create information sharing capabilities between disparate incident management software applications – ***Emergency Data Exchange Language (EDXL)***

- **Commercial Mobile Alert Service (CMAS)** – The WARN Act authorizes DHS S&T to investigate and develop the next generation of mass mobile alerts and warnings technologies and standards.

- **Integrated Public Alert and Warning System (IPAWS)** – The Nations next generation public alert and warning communications capability.

Emergency Data Exchange Language

- EDXL is a suite of messaging standards with technical rules governing how incident-related information is packaged for exchange
  - XML-based; business process-driven
  - Driven by practitioner-defined priorities and requirements
- The goal of the EDXL family of standards is to facilitate emergency information sharing and data exchange across the local, state, tribal, national and non-governmental organizations of different professions that provide emergency response and management services.
- EDXL will accomplish this goal by focusing on the standardization of specific messages (messaging interfaces) to facilitate emergency communication and coordination particularly when using disparate systems where more than one profession or governmental jurisdiction is involved.
- The EDXL family of standards is maintained by the Organization for the Advancement of Structured Information Standards (OASIS) standards body and can be found at http://edxlsharp.codeplex.com/.

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Value of Information Sharing

- Sharing information during emergencies is a critical part of emergency response
- Information sharing
  - Enables streamlined and efficient prevention of, response to, and recovery from all-hazards
  - Requires collaboration among multiple stakeholders
  - Consists of an inclusive and expansive list of emergency support functions

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Guiding Principles for EDXL Standards

- Creating open, non-proprietary public standards available at no cost
- Facilitating national standards **driven by practitioner-defined requirements and priorities**, not federal agencies or industry
- Ensuring an open architecture
- Creating a low cost approach to standards use and deployment
  - Build once – reuse often
  - Leverage existing efforts and protocols
  - Scalable from the local level to the federal level as needed
  - Enhances current infrastructures and systems without extensive updates, upgrades, training or costs
- Bridging the gap between the “Past and the Future” of incident response and management

EDXL Standards In Use

- **Common Alerting Protocol (CAP) Version 1.1**: CAP v1.1 was adopted as a standard on October 1, 2005. CAP provides the ability to exchange all-hazard emergency alerts, notifications, and public warnings, which can be disseminated simultaneously over many different devices and warning systems (e.g., computer systems, wireless, alarms, TV, radio)
  - CAP is being implemented in IPAWS – the Integrated Public Alert & Warning System, a DHS/FEMA effort
  - CAP was recommended for acceptance with the International Telecommunications Union (ITU) for a global alerting standard
  - May 31, 2007 - The Federal Communications Commission adopted an Order that requires Emergency Alert System (EAS) participants to accept messages using Common Alerting Protocol (CAP), the groundwork for Next Generation EAS delivery systems.

EDXL Standards In Use

- **Distribution Element (DE):** 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 a geographic area, or by other codes such as agency type (police, fire, etc.)
  - DE will be implemented in the DHS/FEMA effort IPAWS the Integrated Public Alert & Warning System
  - DHS Domestic Nuclear Detection Office (DNDO) uses CAP and the DE to share content with other federal, state and local partners
- **Hospital Availability Exchange (HAVE):** HAVE 1.0 was adopted as an OASIS standard in November 2008. HAVE specifies a document format that allows the communication of the status of a hospital, its services, and resources, including bed capacity and availability, emergency department status, and available service coverage. This assists hospital coordination and routing of patients to the right facilities for care during emergencies

EDXL Standards In Use

- **Resource Messaging (RM 1.0):** RM was adopted as an OASIS standard in November 2008. EDXL-RM describes a suite of standard XML messages for data sharing among emergency and other information systems that deal in requesting and providing emergency equipment, supplies, people, and teams. RM provides a total of 16 individual standard messages providing the capability for disparate systems to perform “transactional messaging” such as a Request for Resources and Response to Request for Resources.

EDXL Standards in Development

- **Situational Reporting**
  - Critical data about an incident
  - Reportable to on-site commanders, politicians, officials and press
  - Consistent type of information

- **Tracking Emergency Patients**
  - Patient location and tracking
  - Evacuation Status

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Sample of EDXL Implementations

- DHS S&T Integrated Chemical, Biological, Radiological and Nuclear Detection Demonstration Program
  - City of Los Angeles Fire Department deployed hand-held sensors using CAP and DE to send real-time data to mobile command centers
- DHS Domestic Nuclear Detection Office (DNDO)
  - DNDO uses CAP and DE to send and share sensor and other critical data to it national operations center and to share information with other federal, state and local partners
- National Oceanic and Atmospheric Administration (NOAA) All-Hazards Warning System (HazCollect)
  - HazCollect systems allows local emergency managers to electronically and securely submit all hazards warnings in a CAP format for broadcast over NOAA Weather Radio
  - NOAA estimates they have reduced the time it takes to send a warning from 7 minutes under the manual process to under 2 minutes utilizing CAP
- Federal Communications Commission (FCC) mandated CAP for use in the next generation Emergency Alert System (EAS)
- The State of Washington designed its state-wide alert and warning system around the CAP standard
- The International Telecommunications Union (ITU) has adopted CAP
- Over 100 commercial vendors with known EDXL implementations

Goal: Establish a common framework and methodology for standards development

A standards development framework and methodology mitigates standards development challenges by:

- ***Providing prioritization and focus:*** Focuses on developing standards that address the most critical business processes first
- ***Avoiding duplication and redundancy of efforts:*** Helps to share information and make it visible to the community, reducing duplication of efforts and resources
- ***Providing alignment in the community or domain:*** Provides broader alignment and creates a shared understanding among members community members once they validate the common framework

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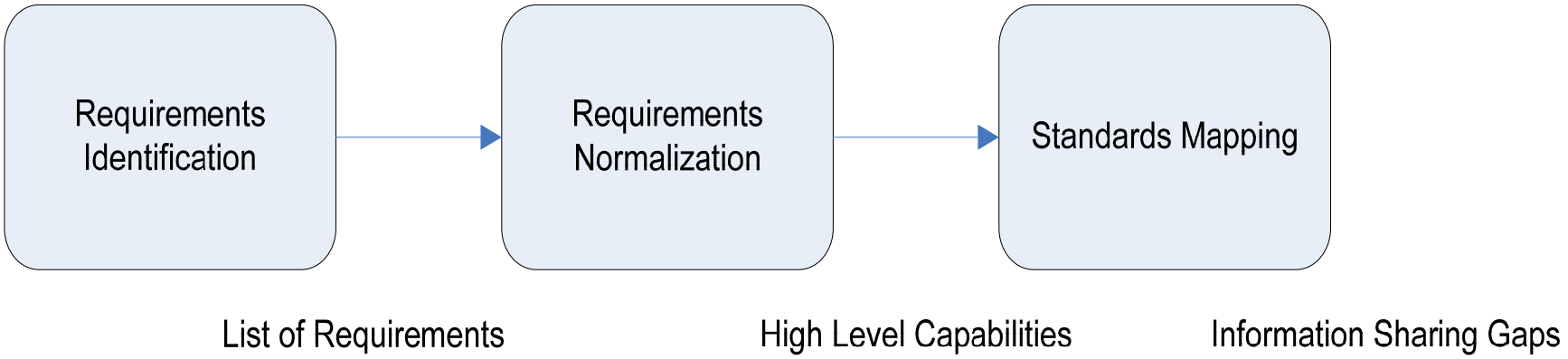
Methodology Selected: Gap Analysis

Gap Analysis Process Overview



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List of Emergency Response Capabilities & Functional Requirements

Capabilities

Requirements

- General Alerting & Notification
- Vehicular Emergency
- Sensor Information

- Situation Reporting
- Incident Information/Updates

- Resource Ordering and Acquisition
- Resource Tracking and Monitoring
- Resource Utilization/Facility Status

- Patient/Victim Tracking
- Credentialing of Responders

- Traffic Information and Advisory
- Weather Information and Forecasts
- Geospatial
- Criminal Information
- Clinical Information

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High Level Results

Capability Category	Capabilities	High level Findings
Alerting and Notification	General Alerting and Notification	**Gaps May Exist**
	Vehicular Emergency Alerting	**Gaps May Exist**
	Sensor Information Notification	**Gaps May Exist**
Resource Management	Resource Ordering and Acquisition	**Gaps May Exist**
	Resource Tracking and Monitoring	**Draft Standard**
	Facility Status/Resource Utilization	**Gaps May Exist**
Decision Support Information	Traffic Information and Advisory	**Approved Standard(s)**
	Weather Information and Forecast	**Approved Standard**
	Facility and Site Assessment Information	**Gaps May Exist**
	Suspicious Activity Information	**Voluntary standard**
	Vehicular Information	**Approved Standard**
Situational Awareness and Reporting	Situation Reporting and Awareness	**Standard in Development**
	Incident Information/Incident Status	**Gaps May Exist**
Personal Information	Patient/Victim Information and Tracking	**Gaps May Exist**
	Responder Credentials	**Gaps May Exist**
	Citizen Information	**Gaps May Exist**

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Federal Partners

- Federal Emergency Management Administration (FEMA)
- Department of Homeland Security Science & Technology Directorate (DHS S&T) Chemical and Biological Detection Research and Development
- DHS Domestic Nuclear Detection Office
- National Oceanic and Atmospheric Administration (NOAA)
- Federal Communications Commission (FCC)
- Pacific Northwest National Laboratory (PNNL)
- Argonne National Laboratory

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