Emergency Data Exchange Language Overview

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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.
The Value of Standards

DHS is:

• Facilitating national standards driven by practitioner-defined requirements and priorities, not federal agencies or industry
• Creating open, non-proprietary public standards available at no cost
• 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
OIC Major Data Initiative Programs

- **Information exchange standards:** A public-private partnership to create information sharing capabilities between disparate incident management software applications – *Emergency Exchange Data 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 Nation’s 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.
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
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 its 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**
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
March OASIS SIG Presentation

Your Host:
Scott Shoup
FEMA Data Architect

March 17, 2010
FEMA Information Sharing Problems

- Information Technology autonomy and diversity
  - Nationwide & within FEMA
- Nearly limitless customer base (State and Local)
- Large suite of mission areas hard to organize
- No data management program
- No information sharing standards
# FEMA Domain Decomposition

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<tr>
<th>Recovery</th>
<th>Response</th>
<th>Mitigation</th>
<th>Preparedness</th>
<th>Mission Support</th>
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<tr>
<td>Public Assistance Planning</td>
<td>Disaster Emergency Comm. Planning</td>
<td>Mitigation Planning</td>
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<td>Business Architecture</td>
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<td>Logistics Planning &amp; Exercises</td>
<td>EHP Policy</td>
<td>Grant Programs Coordination</td>
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<td>Risk Management Oversight</td>
<td>National Integration Center Management</td>
<td>Financial Management</td>
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<td>Facilities Management</td>
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<td>Disaster Emergency Comm. Monitoring</td>
<td>Continuity Program Lifecycle Management</td>
<td>Target Capabilities List Management</td>
<td>IT Governance</td>
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<td>EHP Oversight</td>
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<td>Preparedness Coordination</td>
<td>Legal</td>
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<td>External Affairs</td>
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<td>Continuity Programs Development And Testing</td>
<td>Preparedness Technical Assistance</td>
<td>Acquisitions</td>
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<td>Grant Programs Support And Training</td>
<td>Accounting</td>
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<td>Facilities Maintenance</td>
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<td>IT Operations</td>
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<td>Regional Operations</td>
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**FEMA SOA Initial Focus:**

- **Grants**
- **Not Grants**
FEMA Systems Component Diagram

User Access Management
- ISAAC
- NACS
- FAMS

Org. Mgmt. (DFSC)
- Padlock
- Active Directory
- ADD
- Choice Point

Business Support
- DATS/ASD
  - ACSIS
  - AMPS
  - C-DB
  - DAD BB
  - HMIMS
  - PA-STAT
- NEFRLS
- CIS
- NSS
- FEMA HR
- MANAR
- TAV
- BureauNet
- DMARTS
- Risk Map
- FEMA GIS
- LIMS
- Map Srvcs Center

Emergency Coordination (EC)
- IAM
- PDA
- NIMS
- IMCAD

Grants
- EMIS/EHP
  - NEMIS-IA (IAPSS)
  - EMMIE Admin
- NEMIS-ES (DFSC)
- NEMIS-PA
  - AFG
- ADAMS
- ND Grants
- eGrants

MT Support
- FMA
- HMGP
- HMGP Historical

IA Support (IAPSS)
- Auto Determination
- DARAC
- DAIP
- DAIP
- JACS
- ACE3
- IVR
- IM Web
- IM Admin Web

Finance
- IFMIS
- NEMIS-ES Support (DFSC)
- ProTrac
- N2I
- Ref. Data Mgmt

Reporting
- SQA Net
- EDW
- ODS
- NFIRS

External To FEMA
- ONFA
- US Banks
- CLC
- ISO

OFA
- SSA
- DOD
- SBA
- OJP
- GMS
- HHS
- SmartLink
FEMA Information Sharing Solutions

Collapse IT into large operations (EADIS, COMMIT, SETA) and large programs (DAIP, DM-OPEN)

Embrace NIEM and EDXL for information sharing standards, reusability

Embrace EM Domain Governance to establish strategic State and Local cooperation

Work with Executive Policy and Planning Branch to identify mission and business functions

Evangelize and integrate with FEMA Program Offices
NIEM and EDXL Value

Mission Response Speed and Flexibility
  Reusable Service-Oriented Architecture (SOA) Services (NIEM, EDXL ready)

Information Technology (IT) Improvements
  Lower development costs

Improve Communications (EDXL) with and between Feds, States and Locals
  DM Open, DAIP

Better FEMA Knowledge Management over time
  Historical record of data exchanges

Grants Programs will become more efficient
  Enhanced information sharing, historical records
Emergence of Data.gov

Public Assistance Grant Program

Declarations Summary

Hazard Mitigation Grant Program

Soon:

Public Assistance Grant Program Project-level Summary
Solution # 1 DM-OPEN

- Disparate Systems, Devices, Networks
- CAP Alerts
- CAP Alerts Wrapped in EDXL-DE
- EDXL-HAVE Form Wrapped in EDXL-DE
- NIEM IEPD Amber Alert Wrapped in EDXL-DE
- Demo: IPAWS CAP Profile through EAS
- CAP Alerts to Instant Messaging Platform

Inter-system Information Sharing & Collaboration via a Network of Networks
Solution # 2 Disaster Assistance Improvement Program (DAIP)

Locate and Apply for Disaster Relief

Take Pre-Screening Questionnaire
Take an anonymous questionnaire to obtain and apply for the most accurate list of disaster forms of assistance for which you may be eligible.

Apply for Assistance Immediately
Complete an online application, create an account, and apply for disaster assistance.

OR

Take Questionnaire
Start Registration
Solution #3 Information Sharing Portal

Business Process composition; choreography; business state machines

Services atomic and composite

Service Components

Operational Systems

UNCLASSIFIED
<table>
<thead>
<tr>
<th>Pre Disaster Gross Income</th>
<th>A data type for an amount of money.</th>
<th>nc:AmountType</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrant</td>
<td>A data type for a person, organization, or thing capable of bearing legal rights and responsibilities.</td>
<td>nc:EntityType</td>
</tr>
<tr>
<td>Registration</td>
<td>The text describing the ENROLLMENT TYPE.</td>
<td>scr:Enrollment</td>
</tr>
<tr>
<td>Registration Damage</td>
<td>A property item that is registered.</td>
<td>nc:RegistrationItem</td>
</tr>
<tr>
<td>Registration Damage List</td>
<td>A state or appearance of an item.</td>
<td>nc:ItemConditionText</td>
</tr>
</tbody>
</table>
Solution # 5 Grants Language

• NIEM Exchange Requirement Criteria

• Grants to Allow for NIEM Development Costs
Contact Information

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