Innovations in Resource Management and Mutual Aid Technology

PrepTech Talks

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July 22, 2021

National Alliance for Public Safety GIS (NAPSG) Foundation

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Webinar Prep

• Due to the large attendance, all participants are muted for the duration of the session to prevent background noise.
  • Please use the Q&A functionality within Zoom for questions that are relevant to the whole group.
  • We will address these Q&A at the end of the webinar!
Today’s Objectives

• Learn about FEMA’s National Resource Hub and how to gain access and start using the suite of resource management tools.

• Gain insight into how the National Resource Hub can connect and share data with your other incident management systems, situational awareness apps, and other 3rd party systems today and in the future.

• Learn what is in development to improve existing and innovate with new resource management and mutual aid technology tools and systems.

• Find out what’s new in version 3.0 of the Implementation Guide on Information Sharing Standards and how you can use the guide in informing your agency’s technology selection and acquisition process to ensure interoperability and seamless information sharing.

• Gain basic technical knowledge on the latest with the Emergency Data Exchange Language (EDXL) and how it supports building a National – and Global – network of interoperable incident management systems.
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>2:00pm</td>
<td>Introductions and Overview</td>
</tr>
<tr>
<td>2:10pm</td>
<td>National Resource Hub</td>
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<tr>
<td></td>
<td>- What It’s About</td>
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<td></td>
<td>- What It Can Do For You and Your Agency</td>
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<tr>
<td>2:25pm</td>
<td>What’s Coming in the Job Aid and Technical Guidance for Incident Management Technology</td>
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<td>2:35pm</td>
<td>Know the Basics on EDXL and Why it Matters</td>
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<tr>
<td>2:55pm</td>
<td>Actions &amp; Next Steps</td>
</tr>
<tr>
<td>3:00pm</td>
<td>Adjourned</td>
</tr>
</tbody>
</table>
Hosts and Panelists

• Charlotte Abel, Strategic Manager, NAPSG Foundation

• Harmon Rowland, Section Chief, FEMA National Integration Center

• Rebecca Harned, Vice President, 4 Arrows Consulting, Inc.

• Elysa Jones, Chair, OASIS Emergency Management Technical Committee
About NAPSG Foundation

Our Vision
A Nation of emergency responders and leaders equipped with the knowledge and skills in applying technology and data to change the outcome for survivors.

• 501(c)(3) Non-profit organization established in 2005
• +20,000 member network: Public Safety leaders, first responders, and GIS practitioners
• Board of Directors comprised of public safety & emergency management industry leaders
Decision Makers and First Responders need access to right actionable information at the right time.
Defining and promulgating consistent best practices

Fostering regional collaboration through implementation

Building capacity in using innovative technology

Transferring knowledge and skills

National Guidelines and Standards

Exercises & Simulations

Education & Training

Tech Assistance
Welcome to NAPSG’s Resource Library. Here you can access all of the key resources that NAPSG makes available to the community at no cost, to support you and your agency in advancing the use of location enabled decision support tools.

The Resource Library is organized by resource category. Simply click on the Category of interest and begin exploring available resources. You can also search for resources by entering in a keyword into the search box in the upper right hand side.
Local Focus – National Reach

- 20,000+ member network
- 12 primary national & international associations
- All disciplines
- All levels of government
- Private sector

Virtual Training participants with contact details redacted.
Background: Innovative Resource Management and Mutual Aid Policy & Technology

- **Goal:** Build from lessons learned in recent incidents and exercises to address some of the most pressing needs and requirements around the fusion of incident management policy, technology, and information sharing.

Incident Management Policy and Technology – All-Hazards, All Disciplines

Applying Information Sharing Standards to Incident Management and Mutual Aid Technology

Testing & Evaluating Interoperability Among Commonly Used Incident Management and Mutual Aid Technology

Intelligence-Driven Resource Management and Mutual Aid Planning
History

Winter 2017
Mutual Aid Information Requirements Report Released

Summer 2017
Conducted National Mutual Aid Technology Exercise (NMATE) & Issued After-Action Report

March 2018
Conducted Crisis Management Technology Meeting following 2017 disasters

May 2018
Conducted Workshop on Frameworks for Whole Community Information Sharing

April 2019
Conducted the first National Resource Management Summit

Fall 2019
Conducted NMATE and released the Mutual Aid Interoperability Action Plan

Winter 2019
Launched the FEMA NCG Technology Sub-group and the NIMS Technology Roles & Functions Study

January 2021
Released preliminary results from the Resource Management Maturity Study Report
Incident Management Policy and Technology Coordination

- Inaugural National Resource Management Summit (NRMS) - 2019
  - 18 agencies across the nation, plus FEMA NIC and DHS S&T
- Bi-Annual National Mutual Aid Technology Exercise (NMATE) - 2019
  - 14 agencies with 24 different resource management / mutual aid systems
- NCG Technology Sub Group - 2019-Ongoing
  - 15+ agencies represented, plus FEMA, DHS S&T, CISA, and US Forest Service
  - Define Technology-Related Roles within NIMS Structures
  - Resource Management Maturity Study
  - Guidance on Virtualizing EOCs
- 2nd National Resource Management Summit – 2021
  - 35 stakeholders across the nation, plus FEMA, DHS S&T, US Forest Service


Supporting Resources

• Defined information requirements for mutual aid
  • Summary Report
• Developed and released practical Guidance on Resource Management Dashboards
  • Interactive Version AND Print Version
• Conducted 2017 and 2019 National Mutual Aid Technology Exercise
  • 2019 NMATE Situational Manual
• Released strategic and tactical NMATE After-Action Report and Improvement Plan
  • 2019 NMATE AAR and Improvement Plan
• Developed and release the Resource Management Planning Tool
  • Resource Management Planning Tool & Developer Toolkit
• Implementation Guidance on Information Sharing Standards for Crisis Management Systems
  • Implementation Guidance (Version 2.0)
  • Version 3.0 Coming Soon! Job Aid and Technical Guidance for Incident Management Technology
The National Integration Center (NIC) develops doctrine and tools to lead the whole community implementation of the National Preparedness System (NPS) and the National Incident Management System (NIMS).

National Resource Hub

Hank Rowland | FEMA’s National Integration Center
The National Integration Center (NIC) develops doctrine and tools to lead the whole community implementation of the National Preparedness System (NPS) and the National Incident Management System (NIMS).

NIMS Guiding Principles

- Coordinate across agencies, jurisdictions, and disciplines
- Scale to any incident
- Coordinate to achieve common objectives
- Provide support while maintaining individual authority
- Improve integration and connectivity
- Foster cohesion among organizations
- Enable effective communication

Source: National Incident Management System (2017), page 3
The National Integration Center (NIC) develops doctrine and tools to lead the whole community implementation of the National Preparedness System (NPS) and the National Incident Management System (NIMS).

### NIMS Components

- **Resource Management**
  - Resource Management Preparedness
  - Resource Management During an Incident
  - Mutual Aid

- **Communications and Information Management**
  - Communications Management
  - Incident Information
  - Communications Standards and Formats

- **Command and Coordination**
  - NIMS Management Characteristics
  - Incident Command System (ICS)
  - Emergency Operations Centers (EOC)
  - Multiagency Coordination Group (MAC Group)
  - Joint Information System (JIS)
  - Interconnectivity of NIMS Command and Coordination Structures

Source: National Incident Management System (2017), page vii
Resource Management – Preparedness vs. Incident

Preparedness directly feeds into and supports response

Resource Management for ***Preparedness***

- Acquiring, storing, and inventorying resources
- Identifying and typing resources
- Planning for Resources
- Qualifying, certifying, and credentialing personal

Resource Management for ***Incident Management***

- Incident Objectives
  - Strategies
  - Tactics
  - Identify Requirements
  - Order and Acquire
  - Mobilize
  - Demobilize
  - Track and Report

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*Resource Management – Preparedness vs. Incident*
Why Resource Management - Preparedness

• A comprehensive resource management preparedness strategy provides the following benefits:
  • Allows the supplying organization, or provider, to understand expectations of a resource based on the capabilities outlined in resource typing
  • Allows the receiving organization, or requestor, to receive a preassembled and predetermined resource that meets the minimum capabilities for the specified resource type
  • Serves as the foundation for creating and establishing Mission Ready Packages (MRPs)
  • Integrates resource management into day-to-day organizational and jurisdictional operations, making the national mutual aid process a seamless continuation of resource management to support incident operations
The National Resource Hub is a suite of web-based tools that support a consistent approach for the resource management preparedness process.

- Accessing and automating the use of National Incident Management System (NIMS) resource typing definitions, position qualification sheets, and position task book templates.
- Inventorying individual resources—personnel, equipment, teams, supplies, and facilities.
- Managing personnel qualifications, certification, and credentials.
- Supporting existing resource management-related guidance, policies, practices, and mutual aid compacts.

Basics

What It Does
• Ensures organizations and resource owners retain full ownership and control over their resources and resource information/data.

• Consolidates and integrates existing FEMA-provided systems for resource management preparedness activities: inventorying, typing resources, managing personnel qualifications, and credentialing.

• Stores information in a secure cloud-hosted, government-authorized environment.

• Offers a no-cost solution for all state, local, tribal, and territorial government agencies and non-governmental organizations.

What It Doesn’t Do
• Organizations and resource owners do not lose control or ownership over their resources or resource information/data.

• Is not a deployment system. The National Resource Hub does not support resource requests, deployments, or resource tracking.

• Since it is not a deployment system, it does not allow any agency or individual to request or deploy resources and personnel through the system.

• Does not change or modify any existing mutual aid agreements or compacts.
Resource Management Preparedness Process

- Resource management is the cornerstone of preparing for and responding to incidents that require mutual aid among agencies and jurisdictions.
- Resources refer to: personnel, teams, equipment, supplies, and facilities.

Jurisdictions and organizations acquire, store and inventory resources for day-to-day operations, in addition to stockpiling resources for incidents.

**Solution: Resource Inventory System**

Jurisdictions develop plans for identifying, managing, estimating, allocating, ordering, deploying and demobilizing resources. This involves identifying resource requirements based on threats to, and vulnerabilities of, the jurisdiction or organization.

**Solution: Future Development in National Resource Hub**

By identifying and typing resources, jurisdictions build a common understanding of a specific resource and its capabilities. This process primarily focuses on resources that deploy across jurisdictional boundaries.

**Solution: Resource Typing Library Tool**

Uses a performance-based approach that focuses on verifying the capabilities of personnel to perform as required in incident-related positions. It incorporates education, training, and experience to build proficiency and establishes performance as the primary qualification criterion.

**Solution: OneResponder**
Resource Management Technology Tools

1. **Resource Typing Library Tool**
   - Access and automate integration of NIMS resource typing definitions, position qualification sheets, and position task book templates
     - Centralized database and primary source for 508s, 509s, and PTB templates
     - Serves as foundational data model and database for RIS
     - Publicly available API for 3rd party systems to consume live data feed from RTLT

2. **Resource Inventory System (RIS)**
   - Centralized software tool for inventorying individual resources, including personnel
     - Supports the inventorying of teams, personnel, equipment, facilities, and supplies.
     - **June 2021** - Online version of RIS – Resource Inventory System – is available for use by request. A version 2.0 of the Resource Inventory System is in development and will be released in the near future.

3. **Personnel Qualifications Management System OneResponder**
   - Provides a common language and approach for managing personnel qualifications and credentials in support of NQS
     - Supports the personnel qualifications, certification, and credential management
     - **June 2021** - OneResponder now consumes the RTLT API, ensuring real-time alignment with 509s and PTB Templates published by FEMA.
The National Integration Center (NIC) develops doctrine and tools to lead the whole community implementation of the National Preparedness System (NPS) and the National Incident Management System (NIMS).

Current Architecture

PrepToolkit ATO Boundary - Centralized, cloud-hosted, secure, and FEMA authorized environment

Resource Inventory System

Personnel Qualifications Management / OneResponder

Legacy IRIS as Downloadable Software

Direct Connection

Resource Typing Library Tool

Public API from RTLT to 3rd Party Systems Outside of PrepToolkit ATO Boundary

EMAC Systems

Other 3rd Party Systems, Technology Providers and local IRIS Instances
Update: Resource Inventory Technology

- June 2021 – Released version 1 of the centrally cloud-hosted Resource Inventory System (RIS) as part of the National Resource Hub.
- RIS v1 pilot implementation phase underway Summer-Fall 2021.
  - Available for use by organizations that do not require a multi-agency hierarchy or established organization relationship model (parent/child)
  - Agencies submit RIS Access Request Form and conduct a Scoping & Orientation Session
  - Each request is reviewed to assess feasibility of the deployment given system limitations
- Access to RIS is legacy IRIS users will not be impacted since the software is locally hosted and managed however, legacy IRIS users are encouraged to transition to RIS.
- Updated and improved version of RIS is in development that will be capable of supporting larger, more scalable implementations.
The National Integration Center (NIC) develops doctrine and tools to lead the whole community implementation of the National Preparedness System (NPS) and the National Incident Management System (NIMS).

**Next Generation: Resource Inventory Technology**

**Legacy IRIS – Transitioning to RIS**
- FEMA cloud-hosted, secure environment
- Legacy IRIS

**New Resource Inventory System – Version 1.0 Available**
- FEMA centralized, cloud-hosted, secure environment
- RIS

**Transition Underway**
- Legacy Downloadable Software Model for Resource Inventorying

NEW Secure, Centralized, and Cloud-Hosted Resource Inventory Solution

- Local
- State
- Tribe or Territory
- NGO or Other Organization
RIS Technology Capabilities

RIS Capabilities & Functionality
• A centralized, secure, and cloud-hosted solution that is hosted within a FEMA authorized environment.
• Automatically uses the NIMS resource typing definitions cataloged in the RTLT.
• Create local definitions when NIMS definitions or position qualification sheets do not align or apply.
• Local definitions populate to a common library for viewing by all organizations using RIS.
• Includes a basic “Resource Typing Calculator” to aid in confirming which NIMS resource typing definition resource aligns to when inventorying.
• Able to configure an agency’s inventory and manage its users and their roles/permissions.
• Limited resource viewing across organizations is defined in the Terms of Use.

RIS Limitations
• Does not currently support relationships between organizations.
  • Does not have any hierarchal organization model or parent/child relationships between multiple organizations/agencies/jurisdictions.
• User management and organization assignment process is time-consuming for larger/multi-agency implementations.
• Only static data exports available in the following formats: CSV, KML, XML.
• Does not yet have a pre-configured API or live web service as a data “export” option.
• When migrating legacy IRIS data into RIS, most but not all, data fields will migrate when running bulk imports.
Gain Access to the Systems

- **Resource Typing Library Tool**
  - Publicly Available System

- **Resource Inventory System (RIS)**
  - Submit RIS Access Request Form
  - FEMA creates the AHJ’s organization in RIS, and the “Organization Administrator” from that AHJ manages their users and resource inventory

- **OneResponder**
  - Organization managers can take ownership of their jurisdiction’s account by reaching out to their state’s OneResponder administrator or by contacting FEMA-NIMS@fema.dhs.gov.
  - New responder accounts are issued by invitation only. Individuals interested in using the system should contact their qualifications manager to find out if their jurisdiction uses the system.

Note - RIS and OneResponder use a single sign-on with PrepToolkit. Users only need one set of credentials to log-in to the systems. An approved PrepToolkit account must be established before a user can sign into RIS or OneResponder.
ACHIEVING INTEROPERABILITY FOR INCIDENT MANAGEMENT TECHNOLOGY

REBECCA HARNED | 4 ARROWS CONSULTING, INC.
**Problem**

- **During an incident, speed is life.** The speed by which the right and accurate information is available to Leaders and Managers directly influences the outcome for survivors.

- The public safety community continues to experience challenges applying incident management technology, not because of a lack of technology, but due to the **insufficient use of interoperability and information exchange standards** for system-to-system data exchange.
**SOLUTION**

- Help leaders and managers inform the acquisition and selection of technology that applies the appropriate incident management information sharing standards - thereby improving interoperability among the public safety community nationwide.

**Approach**

- Provide public safety leaders with a simple guide to map their decision-making needs to the appropriate information and sharing standard(s).
- Provide guidance for technologists/vendors to use in implementing the standards within relevant systems/technology.
WHY ARE STANDARDS IMPORTANT?

• Leaders and managers cannot assume that interoperability is inherent in the products being promoted by technology providers and vendors.

• Ensuring interoperability increases the longevity of the technology investment and overall sustainability.

• Since standards do not change frequently, upgraded software/technology does not need to be purchased as often.

• While user interface and functionality requirements are important, the underlying data, how it is managed and shared, provide the true longevity of any system.

• Standards provide an agreed upon data format that knowledgeable groups have vetted through a series of community-involved reviews and can allow systems to speak easily to one another.

• Reduces the need for customization and development that will often come as an offer with the software or system - which in turn reduces cost.
GUIDANCE

• GOAL - Equip leaders and managers with requisite knowledge to inform the acquisition and selection of incident management technology that apply information sharing requirements and standards - thereby improving overall interoperability among the public safety community nationwide.

• Current Version 2.0 – Single document that covers:
  • Basics of the data standards and how they map to situational awareness and resource management
  • Which data and elements need to be considered
  • How to send data and elements across systems
  • Where/how to have systems communicate
  • Communication Protocol: MQTT or HTTP

• Future Version 3.0 - Coming September 2021
  • Job Aid: Incident Management Technology Acquisition & Interoperability
  • Technical Guide: Information Sharing Standards Implementation in Incident Management Technology

9/4/2019
Situational Awareness

<table>
<thead>
<tr>
<th>Workflow Considerations</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed Event Information</td>
<td>Is detailed information needed about a specific event, including current status and location, future predictions and impact area, and how to respond to a specific event?</td>
</tr>
<tr>
<td>General Event Information</td>
<td>Is more summary level, current information needed about an event?</td>
</tr>
<tr>
<td>Health Facility Status</td>
<td>Is detailed information needed about a specific health care facility, including bed status, ER capacity, EMS response availability, etc.?</td>
</tr>
<tr>
<td>General Infrastructure Status</td>
<td>Is a general status needed for a specific infrastructure facility, such as Power Plant X, or for a general infrastructure category, such as communication?</td>
</tr>
<tr>
<td>Detailed Other Infrastructure Status</td>
<td>Is detailed information, similar to the type of information in health facility status, needed for a specific, non-health infrastructure facility?</td>
</tr>
<tr>
<td>Social Vulnerability and Demographic Trends</td>
<td>Is information needed about socially vulnerable, demographic trends, or demographic information within an area of interest?</td>
</tr>
</tbody>
</table>

Resource Management

<table>
<thead>
<tr>
<th>General Category</th>
<th>Resource Information Requirements for SA</th>
<th>Workflow Considerations</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mutual Aid</td>
<td>Resource Kind, Resource Response Availability, Resource Readiness, Deployment Time, Resource Cost</td>
<td>Mutual Aid Request</td>
<td>Is a request and response for aid needed, including costing?</td>
</tr>
<tr>
<td>Tasking</td>
<td>Status of taskings during the response</td>
<td>Tasking</td>
<td>Is the ability to task a responding resource needed?</td>
</tr>
<tr>
<td>Current Status</td>
<td>Resource Kind, Resource Response Availability, Resource Readiness</td>
<td>Location + Status</td>
<td>Is the current status and location of a specific resource needed?</td>
</tr>
<tr>
<td>General Status</td>
<td>Resource Kind, Resource Response Availability, Resource Readiness</td>
<td>General Resource Information</td>
<td>Is a general status about a specific responding resource and/or all responding resources?</td>
</tr>
</tbody>
</table>
List of identified standards to be applied to incident management and mutual aid technology

Most are from the Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) suite of standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Authoritative Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Alerting Protocol (CAP) - OASIS</td>
<td><a href="http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.html">http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.html</a></td>
</tr>
<tr>
<td>Hospital Availability Exchange (HAVE v2) - OASIS and HL7®</td>
<td><a href="https://docs.oasis-open.org/emergency/edxl-have/v2.0/edxl-have-v2.0.html">https://docs.oasis-open.org/emergency/edxl-have/v2.0/edxl-have-v2.0.html</a></td>
</tr>
<tr>
<td>Distribution Element (DE) - OASIS</td>
<td><a href="http://docs.oasis-open.org/emergency/edxl-de/v2.0/edxl-de-v2.0.html">http://docs.oasis-open.org/emergency/edxl-de/v2.0/edxl-de-v2.0.html</a></td>
</tr>
<tr>
<td>Resource Messaging (RM) - OASIS</td>
<td><a href="http://docs.oasis-open.org/emergency/edxl-rm/v1.0/EDXL-RM-SPEC-V1.0.html">http://docs.oasis-open.org/emergency/edxl-rm/v1.0/EDXL-RM-SPEC-V1.0.html</a></td>
</tr>
<tr>
<td>Situation Report (SitRep) - OASIS</td>
<td><a href="http://docs.oasis-open.org/emergency/edxl-sitrep/v1.0/edxl-sitrep-v1.0.html">http://docs.oasis-open.org/emergency/edxl-sitrep/v1.0/edxl-sitrep-v1.0.html</a></td>
</tr>
<tr>
<td>Tracking Emergency Patients (TEP) - OASIS</td>
<td><a href="http://docs.oasis-open.org/emergency/edxl-tep/v1.1/edxl-tep-v1.1.html">http://docs.oasis-open.org/emergency/edxl-tep/v1.1/edxl-tep-v1.1.html</a></td>
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<tr>
<td></td>
<td>NIEM Releases - <a href="https://niem.github.io/niem-releases/">https://niem.github.io/niem-releases/</a></td>
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</tbody>
</table>
HOW STANDARDS APPLY TO INCIDENT MANAGEMENT TECHNOLOGY & OPERATIONS

Figure 7 - Scenario Standards Overview
TECHNOLOGY DECISION-MAKING

- Requirements Gathering & Definition Process
- System Requirements Specification Document
- Procurement & Acquisition Process
- Technology Selection Process
- Technology Implementation Process
- Full Scale Adoption & Operational Use
STEPS TO ASSESS INFORMATION SHARING REQUIREMENTS

Step 1: • Determine Your Agency’s Need for Information Sharing

Step 2: • Determine How the System(s) Need to Communicate to Share Information

Step 3: • Identify What Interoperability Elements Are Most Important

Step 4: • Incorporate Results from Steps 1-3 into Your System Requirements Specification Document
ASK YOURSELF AND YOUR TEAM THE RIGHT QUESTIONS

Self-Assess Your Information Needs

• What information do you need for better decision-making?
  • Situational Awareness Information
  • Resource Management Information

• Who has that information?

• Among whom does that information need to be shared?
  • How will your agency and your mutual aid partners need to consume and use that information?

• How do you need to analyze that information for decision-making?
  • What are the thresholds and metrics that you use to inform operational decisions?
SELF-ASSESS YOUR INCIDENT MANAGEMENT TECHNOLOGY SYSTEM

If you already have a system, work with your team to answer these questions

• Does your system contain the information you need to inform decision for operational planning and response?
• What information gaps do you need to address in your system?
• Where can get the data to fill those gaps?
• Is that data available in interoperable formats?
• What information and data do you have in your system that would benefit your mutual aid partners if shared?
• What standard formats do you need to share/exchange that data?
ASK YOUR TECHNOLOGY PARTNERS/VENDORS THE RIGHT QUESTIONS

If you are updating an existing system or procuring a new system, be sure to talk with your technology partners and vendors.

Ask hard questions about how their technology supports (or doesn’t) interoperable information sharing standards

**Situational Awareness Information**
- Can you connect to live feeds?
- What data formats are acceptable?
- How easy is it to consume open data from other sources? Are you able to visualize and analyze that information?

**Resource Management Information**
- How does your technology you store and technically manage resources? Is it a relational database model or a flat file structure?
- How do you load data into your system?
- How do you ensure resources are aligned to the FEMA Resource Typing?
  - Do you connect to RTLT through the RTLT API? If so, how frequently does your system run updates?
- Is your database constructed using open standards?
ASK ABOUT INFORMATION SHARING

• How does your technology support bi-directional information sharing?
• Does your technology make a live service or API available?
  • What is required to access and use the API (i.e. level of user access)?
  • Does it apply open interoperable standards?
• Do you publish web services?
  • If so, in what formats and for what information/data?
  • Does it apply open interoperable standards?
• Are there other export capabilities? If so, what formats?
APPLY THE GUIDANCE

Don’t assume your technology partners and vendors are up-to-speed on the latest interoperable standards for information sharing.

• Equip them with information and guidance to inform systems engineering.
• Don’t speak tech talk?
  • Communicate the operational benefit and importance of developing your system to support interoperability
  • Give them this guidance
  • Include detailed information about your information sharing needs and the applicable standards in your System Requirements Specification Document.
    • This should be part of your procurement/acquisition documentation and can be included in your agency’s RFP.
• Developing an RFP for System Upgrades or a New System?
  • Include specific requirements for development using interoperable standards and data/API formats
  • Require technology partners/vendors to build to open standards
  • Require technology partners/vendors to support your team’s information needs
START USING THE GUIDANCE

• Version 2.0 Available Today

• Version 3.0 - Coming September 2021
  • Stay Tuned!
Basics on the Emergency Data Exchange Language – Why it Matters

Elysa Jones | OASIS Emergency Management Technical Committee
National Alliance for Public Safety GIS (NAPSG)
PrepTech Talk: Innovations in Resource Management & Mutual Aid Technology
Know the Basics on EDXL and Why it Matters
7/22/2021

Elysa Jones, Chair
OASIS Emergency Management Technical Committee (EMTC)
elysajones@yahoo.com
Agenda

- OASIS - Organization for the Advancement of International Standards
- Data Interoperability
- CAP Around the World
- EDXL – Emergency Data Exchange Language
- Why EDXL
- References
Established presence, Current agenda

- Nonprofit consortium
- Founded 1993
- Global
  - 2,000+ participants
  - 70+ communities, 6 continents
- Home of 70+ Technical Committees
- Broad portfolio of standards: security, privacy, Cloud, M2M, IoT, content technologies, energy, eGov, legal, emergency management, finance, Big Data, healthcare, + other areas identified by members
Internationally recognized

- EU classifies OASIS as “one of the top three ICT consortia”.
- EU Regulation 1025/2012 allows OASIS specs to be referenced in public procurement
- OASIS is permanent member of EC’s European Multi-Stakeholder Platform on ICT Standardization
- OASIS TC Process is ANSI-accredited.
Technical Committee Process

OASIS Technical Committees enable members to develop specifications and related deliverables in an open process with a path to recognition in international policy and procurement.

- Lightweight process to ensure integrity of work while allowing for rapid progress
- All TC work is publicly accessible and provided without fee
- Membership is open to any organization or individual
- Democratic; all TC members have same rights and obligations
- ‘All You Can Eat’ membership
- Proposers choose IPR mode when TC is formed:
  - RAND
  - RF on RAND
  - RF on Limited Terms
  - Non-Assertion

https://www.oasis-open.org/policies-guidelines/ipr
## OASIS → de jure

<table>
<thead>
<tr>
<th>OASIS Standard</th>
<th>Also Approved As:</th>
</tr>
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<tr>
<td>Advanced Message Queuing Protocol (AMQP)</td>
<td>ISO/IEC 19464</td>
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<tr>
<td>ebXML Collaborative Partner Profile Agreement</td>
<td>ISO 15000-1</td>
</tr>
<tr>
<td>ebXML Messaging Service Specification</td>
<td>ISO 15000-2</td>
</tr>
<tr>
<td>ebXML Registry Information Model</td>
<td>ISO 15000-3</td>
</tr>
<tr>
<td>ebXML Registry Services Specification</td>
<td>ISO 15000-4</td>
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<tr>
<td>Security Assertion Markup Language (SAML)</td>
<td>ITU-T Rec. X.1141</td>
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<tr>
<td>Extensible Access Control Markup Language (XACML)</td>
<td>ITU-T Rec. X.1142</td>
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<td>OpenDocument Format (ODF)</td>
<td>ISO/IEC 26300</td>
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<tr>
<td><strong>Common Alerting Protocol (CAP)</strong></td>
<td>ITU-T Rec. X.1303</td>
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<tr>
<td>Computer Graphics Metafile (WebCGM)</td>
<td>W3C WebCGM</td>
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<tr>
<td><strong>EDXL Tracking of Emergency Patients (TEP) 1.1</strong></td>
<td>HL7 Implementation Guide – Bi-Directional Transformation Specification</td>
</tr>
<tr>
<td><strong>EDXL Hospital Availability Exchange (HAVE)</strong></td>
<td>HL7 Cross Paradigm Implementation Guide</td>
</tr>
</tbody>
</table>
The Data Sharing Challenge

- Ineffective communications makes
  - Preparedness collaboration difficult
  - Response decision-making slow; and
  - Risks lives

- Emergency Management, Public Health, Hospitals, and First Responders cannot “talk” (share data) across agencies, professions, or jurisdictions
  - Most have their own disparate Systems & technologies due to separate procurement, budget, and asset lifecycles.

- Voice interoperability efforts are improving, but data-sharing needs are not only growing, but a must.

- EDXL is a family of standards, providing a common language, or interface, for data exchange across disparate emergency-related systems
Interoperability Approach:
Single System

No single system can meet all needs
Interoperability Approach: Custom Interfaces

Cost prohibitive to build custom interfaces between every system
Interoperability Approach: System of Systems

Standards provide a common interface for different systems to share information
All-Hazards, All-Media
Where is CAP in use today?

About 70% of the world’s people live in a country with one or more national-level CAP feeds [map] [report]
Implementations

- **National**
  - Americas: Anguilla (UK), Antigua and Barbuda, Argentina, Aruba (Netherlands), Bahamas, Barbados, Brazil, Canada, Chile, Colombia, Cuba, Curacao (Netherlands), Dominica, Grenada, Guyana, Jamaica, Mexico, Montserrat (UK), Puerto Rico (US), Saint Kitts and Nevis, Saint Lucia, Sint Maarten (Netherlands), Trinidad and Tobago, United States, US Virgin Islands. South America: Argentina, Brazil, Chile, Colombia, and Guyana.
  - Europe, Middle East, Africa: Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Burundi, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kenya, Kuwait, Latvia, Lithuania, Luxembourg, Macedonia, Malawi, Malta, Mauritius, Moldova, Montenegro, Netherlands, Nigeria, Norway, Poland, Portugal, Romania, Rwanda, Serbia, Slovakia, South Africa, Spain, Sweden, Switzerland, Tanzania, Togo, United Kingdom, Zimbabwe
Implementations

▪ National - continued
  – Asia/Pacific: Australia, China, Fiji, Hong Kong, India, Indonesia, Kazakhstan, Kyrgyzstan, Maldives, Madagascar, Myanmar, Nepal, New Zealand, Papua New Guinea, Philippines, Russia, Samoa, Solomon Islands, Sri Lanka, Taiwan, Tajikistan, Thailand, Tonga, Uzbekistan, Vanuatu

▪ NGO and Commercial
  – International Federation of Red Cross and Red Crescent Societies (IFRC)
  – Google Public Alerts
  – Federated Internet Alerts

▪ Commercial Weather Alerting
  – AccuWeather
  – MeteoFrance Vigilance
  – MeteoFrance International, MeteoFactory
  – The Weather Company
Implementations

- **Sensors that Emit CAP**
  - In-home monitors becoming all-hazard alarms
    - Halo+ smoke alarm
    - Speck sensor
  - Earth Networks (lightning detection)
  - Earthquake Building Damage Assessment

- **Other CAP-based Systems**
  - IBM Intelligent Operations Center for Emergency Management [video Users Guide](#)
  - Microsoft CityNext
  - Hate Group Monitoring
  - Neighborhood Watch
  - RSOE Emergency and Disaster Information Service
CAP Information Resources

- CAP Implementations by Country
- CAP References (PrepareCenter.Org)
- CAP Video (10 minutes, made by IFRC)
- Guidelines for Implementation of CAP-Enabled Emergency Alerting (PWS-27) free to download in English, Arabic, French, Russian, Spanish
- CAP Training Courses – contact Eliot Christian eliot.j.christian@gmail.com
EDXL was developed by Emergency and Health Practitioners

- In 2003 the first Practitioner Steering Group (PSG) was formed to address this need
- Emergency Data Exchange Language (EDXL) Process

Practitioner Steering Group (PSG) → Standards Working Group (SWG) → Scenario Teams → Emergency Interoperability Consortium (EIC) → OASIS → Testing and Live Exercises → Customers

- Emergency and Healthcare Practitioners
- Local, State & Federal Government
- Industry - Product Providers
EDXL family of Emergency Management Standards

1. CAP (CAPital Awareness Program)
2. Distribution Element
3. Patient Tracking
4. Reunification
5. Resources (EDXL-RM)
6. Evacuees
7. Situation Reporting (EDXL-SitRep)

Alerts & Warnings

Equipment, Supplies, Teams

Situation Information

Casualty & Illness Summary

Decision Support

Shelters

Self-Register

Registry Systems & Call-in Centers

Evacuee Tracking (EDXL-TEC)

Reunification

People Finder (EDXL-TEC)

Registry Systems

Register

Shelter In Place Self-Evacuate

Evacuees

Which Hospitals are Available?

Hospital Availability (EDXL-HAVE)

Patient Tracking (EDXL-TEP)

Patient

Care Giver

Vehicle

Track

Patient Status

Resources

Field Observation

Response Resources

Field Observation

Response Resources

Casualty & Illness Summary

Decision Support

2015 Proprietary
Emergency Data Exchange Language (EDXL)
EDXL is a family of standards, providing a common language, or interface, for data exchange across emergency-related systems

1. Common Alerting Protocol (CAP)
   - Emergency alerts, notifications, and public warnings

2. Distribution Element (EDXL-DE)
   - Wrap and route any emergency information (XML and non-XML)

3. Hospital Availability Exchange (EDXL-HAVE)
   - Hospital status, services, resources

4. Tracking of Emergency Patients (EDXL-TEP)
   - Emergency patient and EMS tracking information

5. Resource Messaging (EDXL-RM)
   - Emergency resource information

6. Tracking of Emergency Clients (EDXL-TEC)
   - Emergency Evacuee tracking and Shelter information

7. Situation Reporting (EDXL-SitRep)
   - Situation / incident / event and response information
EDXL Specifications for Health Care
TEP Context

Continuum of Patient Movement

EDXL-TEP

Emergency Response

Emergency Management

State, Local, Federal
ESF-8

EDXL-HAVE

Emergency Hospital Availability Exchange

HL7 Communications

OASIS Communications
Emergency Services monitor local hospital availability.
EDXL-HAVE enables communication on the status of a hospital, its services, and its resources.

- Multiple use
  - Flexible format that can be used during disasters, everyday emergencies, reporting, etc.

- Joint OASIS/HL7 work

- EDXL-HAVE 2.0
  - Incorporates additional hospital resources.
  - Addresses the exchange between
    - EDXL-based Emergency stakeholders
    - HL7 v2-based Hospital systems
As EMS encounters patients, data is collected and shared on triage, treatment, and/or transport.
Routing decisions are relayed based on hospital availability, and patients are transported and tracked.
EDXL-TEP
Tracking of Emergency Patients

- Provides tracking for Emergency Medical Services (EMS) and others across the emergency medical care continuum
  - From patient encounter to patient release, hospital admission or morgue
- Can be used for all types of events
  - Day-to-day (e.g., EMS, patient transfers)
  - Mass casualty incidents
  - Hospital evacuations
- Facilitates cross-jurisdiction and cross-profession information sharing, collaboration, and coordination
Patient information is transmitted to each destination emergency department.
Arrival Confirmation

Confirmation of patient arrival is transmitted back to emergency and dispatch centers.
EDXL-TEP 1.1/HL7 2.7.1 ADT Transform

- Joint effort between OASIS Emergency Management Technical Committee (EM-TC) and HL7 Public Health and Emergency Response (PHER) Working Group
  - Data transform between OASIS EDXL-TEP 1.1 and HL7 2.7.1 Messaging

- Bridges the electronic gap between the emergency management services and the hospital communities
  - Bidirectional data exchange
  - Eliminates need to enter patient information received from EMS upon arrival

- Facilitates ER preparation
  - Tracks incoming patients from emergency services in the field

- Used in day-to-day transfers, Mass Casualty Events (MCEs), and hospital evacuation
Why EDXL

- Cross-domain/jurisdiction automated, real-time data exchange
- Eliminate manual data entry & errors
- Consistent interface between/among providers
- “Force Multiplier” & resource optimizer
- Leverage existing systems
- International
Ongoing & Upcoming Work

- EDXL Framework Toolkit
- CAP Event Terms List Committee Note
- Mobile Alerting Practices Guide Committee Note
- Adoption
- 2021 CAP Workshop
- Strategy Project
OASIS Emergency Data Exchange Language

- Guiding Principles for an Emergency Management Framework (EMF) using EDXL
  1. Empower people to obtain and secure their own personal data
  2. Empower people to share information with each other in an emergency
  3. Emergencies don’t respect government or organizational boundaries.
  4. Any and all levels of “emergency” response should be supported, from the national, state and local or tribal jurisdictional context.
  5. All phases of an emergency should be supported including planning, situational awareness, action, assessment and recovery.
OASIS Emergency Data Exchange Language

- Guiding Principles for an Emergency Management Framework (EMF) using EDXL

6. Smart devices should be supported by EDXL as a common language that is interoperable, flexible and extensible.

7. The modern EDXL-based EMF should include working software that includes both a front end running on smart devices and backend support services to serve as a reference implementation.

8. The EMF should be an open-source, community effort, supported by, but independent of, any third party organization or government.

9. The EMF should provide an open architecture to enable users, organizations, partners to expand support and extend the basic framework capabilities.

10. The EMF should be freely available to all at no cost.
Resources

- OASIS EDXL Tracking of Emergency Patients: https://www.oasis-open.org/standards#edxl-tep-02
- OASIS EDXL Hospital Availability Exchange: https://www.oasis-open.org/standards#edxl-have-20
Questions

Elysa Jones, EMTC Chair
elysajones@yahoo.com
## Actions and Next Steps

<table>
<thead>
<tr>
<th>Action</th>
<th>Link</th>
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<tbody>
<tr>
<td>Explore the National Resource Hub</td>
<td><a href="https://preptoolkit.fema.gov/web/national-resource-hub">https://preptoolkit.fema.gov/web/national-resource-hub</a></td>
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<tr>
<td>Register for August 4th Member Innovations Webinar</td>
<td><a href="http://events.r20.constantcontact.com/register/event?oeidk=a07ei7vueha2d0464b0&amp;llr=nplxpbdab">http://events.r20.constantcontact.com/register/event?oeidk=a07ei7vueha2d0464b0&amp;llr=nplxpbdab</a></td>
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Questions?

Contact Today’s Speakers

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