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OIC Data Messaging Standards Guide for Requests for Proposals (RFPs)

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Introduction

This document provides a tool to assist emergency responders and procurement officers in developing appropriate requests for proposals (RFP) language requiring data messaging standards when purchasing emergency response-related systems.

The Office for Interoperability and Compatibility (OIC) within the Science and Technology Directorate of the Department of Homeland Security facilitates the development of Emergency Data Exchange Language (EDXL) data messaging standards based on requirements from emergency response practitioners. Data messaging standards improve information sharing among local, tribal, state, and Federal emergency responders when they are implemented into the systems used by the response community. This document provides an overview of the EDXL messaging standards to give technical staff a more detailed summary of the standards.

OIC partners with industry to encourage the implementation of standards into software and systems. Industry will be more active in implementing standards into its systems if procurement officers include specific language in RFPs - language that requires systems to use data messaging standards. This increased implementation of data messaging standards will in turn enhance the ability of emergency responders to seamlessly share information across jurisdictions and disciplines.

This document was developed with the OIC Practitioner Steering Group, or PSG. The PSG is comprised of emergency response representatives that were nominated by their respective national associations. The PSG provides an end-user perspective to OIC on data communications.

A solid RFP is developed based on requirements from end users for the future system. This tool will help procurement officers do the following: develop an RFP that will meet the needs of end users; solicit the most suitable proposals; and save time throughout the proposal process.

Emergency Data Exchange Language Overview

The goal of the EDXL standards is to facilitate information sharing and data exchange across local, tribal, state, Federal, and non-governmental organizations of different disciplines that provide emergency response and management services. EDXL accomplishes this goal by focusing on the standardization of specific Extensible Markup Language (XML) messages that are exchanged between two or more systems to facilitate emergency communication and coordination.

EDXL is a suite of emergency data messaging standards which include but are not limited to the following functions: alerting, resource queries and requests, situation status, hospital and resource availability, and message routing. EDXL focuses on cross-disciplinary, cross-jurisdictional information exchange related to emergency response.

Described below are the currently approved and adopted standards – the Common Alerting Protocol (CAP) and Distribution Element (DE). In addition, an overview of two standards pending approval, the Hospital Availability Exchange (HAVE) and Resource

Messaging (RM), are also described, along with the functions they support, for your future procurement planning purposes.

The implementation of EDXL data messaging standards will result in a system or application that will help responders respond to and manage incidents more effectively and will help save lives.

Distribution Element

The primary purpose of the Distribution Element (DE) is to facilitate the routing of any properly formatted XML emergency message to targeted recipients by geographic location or other user-specific business rules. DE acts as a message envelope by including key routing information; such as, recipient name/ID and location by specific location or broad area, to send a "container" to its targeted recipient(s). The "container" can include messages and files of any type; such as, resource requests, alerts, situation reports, damage assessments, graphics, and maps.

By implementing DE, other standardized messages can be more easily implemented because the routing mechanism, or envelope, is already in place.

Common Alerting Protocol

The Common Alerting Protocol (CAP) provides an open, non-proprietary digital message format for all types of alerts and notifications. It does not address any particular application or telecommunications method. The CAP format is compatible with emerging technologies, such as Web services, as well as existing formats including the Specific Area Message Encoding (SAME) used for the United States' National Oceanic and Atmospheric Administration (NOAA) Weather Radio and the Emergency Alert System (EAS), while offering enhanced capabilities.

Key benefits of CAP include reduction of costs and operational complexity by eliminating the need for multiple custom software interfaces to the many alerting and dissemination systems involved in all-hazard warning. The CAP message format can be converted to and from the "native" formats of numerous sensor and alerting technologies, forming a basis for a technology-independent national and international "warning system."

CAP and DE

It is recommended that DE standard be used as a routing mechanism for the distribution of all messages, including the EDXL standardized messages. The CAP standard does include a routing mechanism and can be implemented without DE, however, DE allows for additional routing functions and provides a more robust capability to route and receive both EDXL (including CAP messages) and non-EDXL payloads for information sharing among the emergency response community. It should also be noted that all future EDXL standards will leverage DE as a routing mechanism. .

It is recommended that the technical staff for the agency releasing the RFP determine if both DE and CAP will be required in the RFP. OIC does not want to discourage those who only want to implement the CAP standard.

Note that, if you would like to leverage the DE standard as the routing mechanism for the CAP message, please copy and paste the draft RFP language in the CAP section of this document AND the draft DE language into the appropriate standards section of the RFP.

EDXL Standards in the Approval Process

The standards below have been developed through OIC's practitioner-driven process. Final approval and release of the standards are expected in 2008. As new EDXL standards are developed and made final, implementation into new systems will be required in RFPs and grant guidance.

Hospital AVailability Exchange (HAVE) Standards

HAVE was submitted to the Organization for the Advancement of Structured Information Standards (OASIS) in January 2006. HAVE will enable the exchange of hospital status, capacity, and resource availability/utilization between medical and health organizations and emergency information systems. HAVE will enable dispatchers and emergency managers to make sound logistical decisions, such as where to route victims based on up-to-date information on which hospitals have the ability to provide the particular service needed by the victim. Final approval of the HAVE standards is anticipated in early 2008.

Functionality Supported by HAVE

- Allows for the standardized exchange of information on the status and capabilities of a hospital at a given point in time. Examples include:
    - Resource status and availability—Number of available beds by type (e.g., burn beds), status of emergency department, etc.
    - Status of service capabilities—Cardiology, orthopedic, burn, surgical services, and others
    - Status of the facility, in general, and clinical and facility operations

Resource Messaging (RM) Standards

RM was submitted to OASIS in August 2005. RM standards will enable the seamless exchange of resource information, such as requests for personnel or equipment, needed to support emergency and incident preparedness, response, and recovery. RM standards assist emergency information sharing and data exchange across the local, state, tribal, Federal, and non-governmental organizations of different disciplines that provide emergency response and management service. RM standards were developed based on business processes across the emergency response community. In addition, the RM standards support response to everyday events and incident preparedness, as well as to disasters.

Functionality Supported by RM

- Enables dissemination of messages based on geographic delivery area, discipline type, etc.
- Provides the ability to request, receive, track, and return an asset, including a person, team, or equipment.
- Provide separate, specific formats for the distinct resource message types.

- Allows for the use and re-use of data content and models developed by other initiatives.

How to Use the RFP Language Tool

The RFP language tool includes a three step process. Emergency responders must first develop the high level functional requirements for the system or application they plan to procure (Step 1 in the illustration below). Once the functional requirements for the future system are identified, specific requirements can be matched with a data messaging standard that will enable the desired functionality. (Refer to the table in Step 2 on the following page.) The lead emergency responder/end user for the system and technical staff should partner with the procurement officer to identify the appropriate requirements and related standard(s).

After the appropriate data messaging standards are identified, the related RFP language can be found for inclusion in the RFP (Step 3). The associated RFP language outlines questions for the vendor and requests for supporting materials to verify that the vendor correctly implemented the standard and can execute the functions that the standard was supposed to enable. Implementation instructions are also identified for vendors who have not yet put the standard into effect.

In summary, the steps for using this document are:

The three steps are outlined in detail below.

The identification of the functional requirements for the end users' new system or application is a key step in developing an RFP. The group that is planning to purchase the new system should coordinate with the key end users to define requirements for the system and thus the RFP. Procurement officers need requirements and input from users to ensure the system will meet the needs and intent of the personnel who will be using it. (For detailed considerations on RFP development, see the SAFECOM *Guidelines for RFP Development* at www.safecomprogram.gov, as well as the U.S. General Services Administration at www.GSA.gov.)

Once end users have identified the functional requirements of the future system, the table below can be referenced to determine the related data messaging standard(s) and

the appropriate language to include in the RFP. The data messaging standards can be implemented in a variety of emergency response-related systems. These include, but are not limited to: emergency operations center (EOC) systems, transportation systems, and computer-aided dispatch (CAD) systems or public-alert and notification systems.

Functional Requirement of New Application or System	Related Messaging Standard
Sending an alert to emergency agencies in a specific area	Common Alerting Protocol
Multi-lingual and multi-audience messaging	Common Alerting Protocol
Phased and/or delayed effective times and expirations	Common Alerting Protocol
Enhanced message update and cancellation features	Common Alerting Protocol
Template support for composing complete and effective warning messages	Common Alerting Protocol
Compatible with digital encryption and signature capability	Common Alerting Protocol and/or Distribution Element
An open container model to enable dissemination of one or more emergency messages	Distribution Element
Flexible geographic targeting using latitude/longitude shapes and other geospatial representations in three dimensions Enabling of dissemination of messages based on geographic delivery area	Distribution Element
Sending report, map, digital images, generic file, audio files, or free-form text to narrowly targeted and/or large distribution groups	Distribution Element
Flexible mechanisms to help make message routing and/or processing decisions	Distribution Element
Use and re-use of data content and models developed by other initiatives	Distribution Element
Specific, business-process-driven messaging across emergency professions	Distribution Element
Emergency information sharing and data exchange across the local, tribal, state, Federal, and non-governmental organizations of different professions that provide emergency response and management services	Distribution Element
Multi-use format: One message schema that supports multiple message types (e.g., alert/update/cancellations/acknowledgments/error messages) in various applications (actual/exercise/test/system message.)	Distribution Element

Language for the Distribution Element and Common Alerting Protocol standards are in separate sections below. Based on the identified functional requirements and matching standard(s) in the table, you can copy and paste the appropriate requirements language into the relevant section of an RFP

Distribution Element

If the functional requirements for the system point to the Distribution Element (DE) messaging standard, cut and paste the following language into the appropriate standards section of the RFP:

Emergency Data Exchange Language (EDXL) is a suite of standards developed directly from practitioner input and approved by the Organization for the Advancement of Structured Information Standards (OASIS), an internationally recognized Standards Development Organization (SDO). OIC is continually working with practitioners and end users to identify and draft new data messaging standards to improve emergency response.

OIC also coordinates with the National Information Exchange Model (NIEM) by leveraging the NIEM data dictionary and Naming and Design Rules. In addition, OIC uses and updates NIEM Emergency Management Domain content.

The DE and the CAP data messaging standards have been vetted and approved by OASIS. They have also been accepted by the practitioner-based Technical Working Group of the National Incident Management Systems (NIMS). As new standards are developed and made final by OASIS, implementation of such standards will also be required at contract award.

In addition, it is recommended that DE be used as a routing mechanism for the distribution of all messages, including the EDXL standardized messages: Common Alerting Protocol (CAP), Hospital Availability Exchange (HAVE), and Resource Messaging (RM). DE allows for comprehensive routing functions. It also provides a consistent capability to route and receive both EDXL and non-EDXL payloads for information sharing among the emergency response community.

Distribution Element (DE)

DE 1.0 was adopted in April 2006 as a standard by OASIS. DE provides a flexible message-distribution framework for data sharing among emergency response-related information systems. DE acts as a message envelope by including key routing information to send a "container" by specific recipient(s), by a geographic area, or by other codes such as agency type (police, fire, EMS, etc.) The "container" can contain messages and files of any type (such as resource requests, alerts, situation reports, damage assessments, graphics, maps, etc.)

i. Please describe how your product implemented the DE standard.
ii. Please describe which versions of your system comply with the EDXL standards.
iii. Please describe how your product exchanges data with other systems.
iv. Please explain how your system will be updated to implement future EDXL standards.
v. Provide validation that the system is able to exchange information across two or more different systems:
    a. Please provide the standards evaluation report from the National Incident Management System for the DE standard.
vi. Please present all certification credentials for standards implementation.
vii. If you have not yet implemented the DE standard, please include your plan for implementation, along with associated timelines.

DE Implementation Instructions

Implementation documentation and instructions for DE 1.0 can be found at: http://docs.oasis-open.org/emergency/edxl-de/v1.0/EDXL-DE_Spec_v1.0.pdf

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Common Alerting Protocol

If the functional requirements for the system point to the Common Alerting Protocol (CAP) messaging standard, you may cut and paste the language below into the appropriate section of your RFP.

Emergency Data Exchange Language (EDXL) is a suite of standards developed directly from practitioner input and approved by the Organization for the Advancement of Structured Information Standards (OASIS), an internationally recognized Standards Development Organization (SDO). OIC is continually working with practitioners and end users to identify and draft new data messaging standards to improve emergency response.

OIC also coordinates with NIEM by leveraging the NIEM data dictionary and naming and design rules. In addition, OIC uses and updates NIEM emergency management domain content.

OASIS has vetted and approved the DE and CAP data messaging standards. The practitioner-based Technical Working Group of NIMS has also accepted the standards. As OASIS develops and makes final new standards, implementation of such standards will also be required at contract award.

In addition, it is recommended that DE be used to route the distribution of all messages, including the EDXL standardized messages: CAP, HAVE, and RM. DE allows for comprehensive routing functions. It also provides a consistent capability to route and receive both EDXL and non-EDXL payloads for information sharing among the emergency response community.

Common Alerting Protocol (CAP)

CAP permits the exchange of all-hazard 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 allows for increased warning effectiveness while simplifying the warning task. In addition, the Federal Communications Commission (FCC) release of FCC Order Docket No. 04-296 requires EAS, or Emergency Alert System, participants to accept messages using the CAP.

i. Please describe how your product implemented the CAP standard.
ii. Please describe which versions of your system comply with the EDXL standards.
iii. Please describe how your product exchanges data with other systems.

iv. Please explain how your system will be updated to implement future EDXL standards.
v. Provide validation that the system is able to exchange information across two or more different systems.
    a. Please provide the standards evaluation report from the National Incident Management System for the CAP standard.
vi. Please present all certification credentials for standards implementation.
vii. If you have not yet implemented the CAP standard, please include your plan for implementation, along with associated timelines.

CAP Implementation Instructions

Implementation documentation and instructions for CAP version 1.1 can be found at:
http://www.oasis-open.org/committees/download.php/15135/emergency-CAPv1.1-Corrected_DOM.pdf

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Conclusion

The inclusion of appropriate standards in an RFP encourages vendors to leverage standards that meet the needs of their customers. The emergency response community benefits from the implementation of standards because standards enable responders to exchange information with whomever they choose, regardless of the applications or systems they use.

This document was developed with the OIC PSG. The PSG is comprised of emergency response practitioners, and provides an end-user perspective to OIC on data communications. In addition, OIC solicited input from industry representatives to ensure the language is also relevant to industry.

The *OIC Data Messaging Standards Guide for RFPs* is a living document. It will be updated as new standards are developed and made final. It is important to ensure the most recent version of the document is used to encourage the broadest implementation of standards into emergency response applications and systems. The most recent version of this document can be found at www.safecomprogram.gov.