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Related Work:

This specification is related to:

CAP 1.1 - <http://www.oasis-open.org/committees/emergency>

The Common Alerting Protocol (CAP) provides an open, non-proprietary digital message format for all types of alerts and notifications. CAP messages are recommended as one of the standardized forms for XML based message content, to be distributed by this Distribution Element.

Abstract:

This Distribution Element specification describes a standard message distribution framework for data sharing among emergency information systems using the XML-based Emergency Data Exchange Language (EDXL). This format may be used over any data transmission system, including but not limited to the SOAP HTTP binding.

Status:

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1 Introduction

2 1.1 Purpose

3 The primary purpose of the Distribution Element is to facilitate the routing of any properly formatted XML
4 emergency message to recipients. The Distribution Element may be thought of as a "container". It
5 provides the information to route "payload" message sets (such as Alerts or Resource Messages), by
6 including key routing information such as distribution type, geography, incident, and sender/recipient IDs.

7 1.2 History

8 The Disaster Management eGov Initiative of the Department of Homeland Security (DHS) determined in
9 2004 to launch a project to develop interagency emergency data communications standards. It called
10 together a group of national emergency response practitioner leaders and sought their guidance on
11 requirements for such standards. In June, 2004 the first such meeting identified the need for a common
12 distribution element for all emergency messages. Subsequent meetings of a Standards Working Group
13 developed detailed requirements and a draft specification for such a distribution element (DE).

14 During the same period the DM Initiative was forming a partnership with industry members of the
15 Emergency Interoperability Consortium (EIC) to cooperate in the development of emergency standards.
16 EIC had been a leading sponsor of the Common Alerting Protocol (CAP). Both organizations desired to
17 develop an expanded family of data formats for exchanging operational information beyond warning.

18 EIC members participated in the development of the DE, and in the broader design of the design of a
19 process for the development of additional standards. This was named Emergency Data Exchange
20 Language (EDXL).

21 The goal of the EDXL project is to facilitate emergency information sharing and data exchange across the
22 local, state, tribal, national and non-governmental organizations of different professions that provide
23 emergency response and management services. EDXL will accomplish this goal by focusing on the
24 standardization of specific messages (messaging interfaces) to facilitate emergency communication and
25 coordination particularly when more than one profession is involved. It is not just an "emergency
26 management" domain exercise.

27 It is a national effort including a diverse and representative group of local, state and federal emergency
28 response organizations and professionals, following a multi-step process. Just as a data-focused effort
29 targets shared data elements, the EDXL process looks for shared message needs, which are common
30 across a broad number of organizations. The objective is to rapidly deliver implementable standard
31 messages, in an incremental fashion, directly to emergency response agencies in the trenches, providing
32 seamless communication and coordination supporting each particular process. The effort first addresses
33 the most urgent needs and proceeds to subsequent message sets in a prioritized fashion. The goal is to
34 incrementally develop and deliver standards.

35 EDXL is intended as a suite of emergency data message types including resource queries and requests,
36 situation status, message routing instructions and the like, needed in the context of cross-disciplinary,
37 cross-jurisdictional communications related to emergency response.

38 The priorities and requirements are created by the DM EDXL Standards Working Group (SWG) which is a
39 formalized group of emergency response practitioners, technical experts, and industry.

1 The draft DE specification was trialed by a number of EIC members starting in October, 2004. In
2 November, 2004, EIC formally submitted the draft to the OASIS Emergency Management Technical
3 Committee for standardization.

4 **1.3 Structure of the EDXL Distribution Element**

5 The EDXL Distribution Element (DE) comprises an <EDXLDistribution> element as described hereafter,
6 optional <targetArea> elements describing geospatial or political target area for message delivery, and a
7 set of <contentObject> elements each containing specific information regarding a particular item of
8 content. The included content may be any XML or other content type or a URI to access the content.

9 The <EDXLDistribution> block may be used without content to form the body of a routing query to, or
10 response from, a directory service.

11 **1.3.1 <EDXLDistribution>**

12 The <EDXLDistribution> element asserts the originator's intent as to the dissemination of that particular
13 message or set of messages.

14 Note that use of the <EDXLDistribution> element does not guarantee that all network links and nodes will
15 implement the asserted dissemination policy or that unintended disclosure will not occur. Where sensitive
16 information is transmitted over distrusted networks, it should be encrypted in accordance with the Web
17 Services Security (WSS) standard [http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-](http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0.pdf)
18 [message-security-1.0.pdf](http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0.pdf) with any updates and errata published by the OASIS Web Services Security
19 Technical Committee http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wss, or some
20 other suitable encryption scheme.

21 **1.3.2 <targetArea>**

22 The <targetArea> is a container element for the geospatial or political area targeting of the recipient of the
23 message content. It contains data necessary to the originator's intent, based on location targeting, as to
24 the dissemination of that particular message or set of messages.

25 **1.3.3 <contentObject>**

26 The <contentObject> is a container element for specific messages. The <contentObject> element MUST
27 either contain an <xmlContent> content container or a <nonXMLContent> content container. Additional
28 elements (metadata) used for specific distribution of the <contentObject> payload or hints for processing
29 the payload are also present in the <contentObject> container element.

30 **1.4 Applications of the EDXL Distribution Element**

31 The primary use of the EDXL Distribution Element is to identify and provide information to enable the
32 routing of encapsulated payloads, called Content Objects. It is used to provide a common mechanism to
33 encapsulate content information.

34 **1.5 Terminology**

35 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD
36 NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in *Key words for*
37 *use in RFCs to Indicate Requirement Levels* [[RFC2119](#)].

1 In addition, within this Specification, the keyword “CONDITIONAL” should be interpreted as potentially
2 “REQUIRED” or “OPTIONAL” depending on the surrounding context. The term payload refers to some
3 body of information contained in the distribution element.

4 1.6 Normative References

5 [RFC2046]

6 N. Freed, *Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types*,
7 <http://www.ietf.org/rfc/rfc2046.txt>, IETF RFC 2046, November 1996.

8 [RFC2119]

9 S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*,
10 <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March 1997.

11 [RFC3066]

12 H. Alvestrand, *Tags for the Identification of Languages*,
13 <http://www.ietf.org/rfc/rfc3066.txt>, IETF RFC 3066, January 2001.

14 [WGS 84]

15 National Geospatial Intelligence Agency, Department of Defense World Geodetic
16 System 1984, http://earth-info.nga.mil/GandG/tr8350_2.html, NGA Technical Report
17 TR8350.2, January 2000.

18 [XML 1.0]

19 T. Bray, *Extensible Markup Language (XML) 1.0 (Third Edition)*,
20 <http://www.w3.org/TR/REC-xml/>, W3C REC-XML-20040204, February 2004.

21 [namespaces]

22 T. Bray, *Namespaces in XML*, <http://www.w3.org/TR/REC-xml-names/>, W3C REC-
23 xml-names-19990114, January 1999.

24 [dateTime]

25 N. Freed, *XML Schema Part 2: Datatypes Second Edition*,
26 <http://www.w3.org/TR/xmlschema-2/#dateTime>, W3C REC-xmlschema-2, October
27 2004.

28 1.7 Non-Normative References

29 EDXL General Functional Requirements

30 *EDXL General Functional Requirements*, [http://www.oasis-](http://www.oasis-open.org/committees/document.php?document_id=10031&wg_abbrev=emergency)
31 [open.org/committees/document.php?document_id=10031&wg_abbrev=emergency](http://www.oasis-open.org/committees/document.php?document_id=10031&wg_abbrev=emergency),
32 November 2004.

33 EDXL Distribution Element Implementer's Guide

34 *EDXL Distribution Element Implementer's Guide*, [http://www.oasis-](http://www.oasis-open.org/committees/document.php?document_id=14120&wg_abbrev=emergency)
35 [open.org/committees/document.php?document_id=14120&wg_abbrev=emergency](http://www.oasis-open.org/committees/document.php?document_id=14120&wg_abbrev=emergency),
36 August 2005.

2. Design Principles and Concepts (non-normative)

2.1 Design Philosophy

Below are some of the guiding principles of the Distribution Element:

- Provide an Open Container Model to enable dissemination of one or more emergency messages
- Provide flexible mechanisms to inform message routing and/or processing decisions
- Enable dissemination of messages based on geographic delivery area
- Use and re-use of data content and models developed by other initiatives
- Business process-driven specific messaging needs across emergency professions
- Supporting everyday events and incident preparedness, as well as disasters
- 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
- Multi-use format - One message schema supports multiple message types (e.g., alert / update / cancellations / acknowledgments / error messages) in various applications (actual / exercise / test / system message.)

2.2 Requirements for Design

The Distribution Element specification should:

1. Define a single compound XML structure (or an equivalent single structure if transcoded into another format) including the required and optional elements defined below.
2. Specify a desired geographic delivery area, expressed in geospatial coordinates or using political/administrative codes
3. Allow the ability to encapsulate a payload or set of payloads
4. Take a modular approach to the enumerations of element values which may evolve over time, e.g. by referring to a separate schema for those enumerations.
5. Specify unique distribution and sender identifiers
6. Specify the date and time the distribution was sent
7. Specify the actionability of the distribution message (e.g., real-world, test, exercise)
8. Specify the functional type of the distribution message (e.g., report, request, update, cancellation, etc.)
9. Specify that the following elements may be present in a valid payload:
 - a. A specification of the format of the distribution message (e.g., the URI of an XML Schema for the message)
 - b. The functional role and/or type of the sender of the distribution message
 - c. One or more functional role and/or type of desired recipients of the distribution message
 - d. A reference to one or more previous distribution messages
 - e. One or more types of response activity involved
 - f. A reference to the type of incident
 - g. One or more characterization of the etiology of the subject event or incident (e.g., terrorism, natural, under investigation, etc.)
 - h. The incident name or other identifier of one or more event or incident
 - i. A reference to one or more response types.
 - j. One or more specific recipient addresses (as a URI)
 - k. Specify an assertion of the confidentiality level of the combined payloads.
10. In addition, the Content Object element contained within the Distribution Element SHOULD:
 - a. Allow the encapsulation of one or more payloads in each of the Content Object elements.
 - b. Specify the functional role and/or type of the sender of each payload
 - c. Specify one or more functional roles and/or types of desired recipients of each payload

- 1 d. Specify an assertion of the confidentiality level of each payload.
- 2 11. Provide or refer to specific lists (enumerations) of values and their definitions for:
- 3 a. Types of incidents
- 4 b. Types of hazards and/or events
- 5 c. Types of agencies
- 6 d. Types of response activity
- 7 e. The functional role and/or type of the sender
- 8 f. The functional roles and/or types of desired recipients
- 9 g. The incident name or other identifier of one or more event or incident.

10 **2.3 Example Usage Scenarios**

11 Note: The following examples of use scenarios were used as a basis for design and review of the EDXL
12 Distribution Element Message format. These scenarios are non-normative and not intended to be
13 exhaustive or to reflect actual practices.

14 **2.3.1 Distribution of Emergency Message/s or Alerts Based on Geographic** 15 **Delivery Area and Incident Type**

16 The terror alert level has been raised to RED. Credible intelligence indicates that terrorist groups in the
17 Mid-Atlantic region are seeking to conduct an attack in the next 48 hours. The Department of Homeland
18 Security sends an emergency alert message, and using the Distribution Element, distributes it to all
19 emergency agencies in the specified area.

20 **2.3.2 Encapsulation and Distribution of One or More Emergency Messages or** 21 **Alerts or Notifications**

22 A Radiological sensor triggered at a prominent Tunnel toll booth. Radiation alarm levels indicates
23 possible dirty bomb. Authorities decide to send multiple messages to a number of jurisdictions. They send
24 an EDXL Distribution Element with two encapsulated CAP messages. The first one notifies the area
25 where the sensor has been triggered. The second one is an alert to emergency response agencies that
26 the state Emergency Operation Center (EOC) has been activated, and requests the agencies to be on
27 alert.

28 **2.3.3 Distribution of Resource Messages or Reports**

29 The Local EOC has a need for additional resource/support, but is unsure what specifically to request. A
30 free-form request for information and resource availability is prepared, and is sent to the state EOC and
31 other organizations (person to person) using the Distribution Element. The Local EOC receives an
32 acknowledgment message from the State EOC, as well as a request for Information on additional details
33 of the requested resource. Both of these messages are contained within a single Distribution Element.

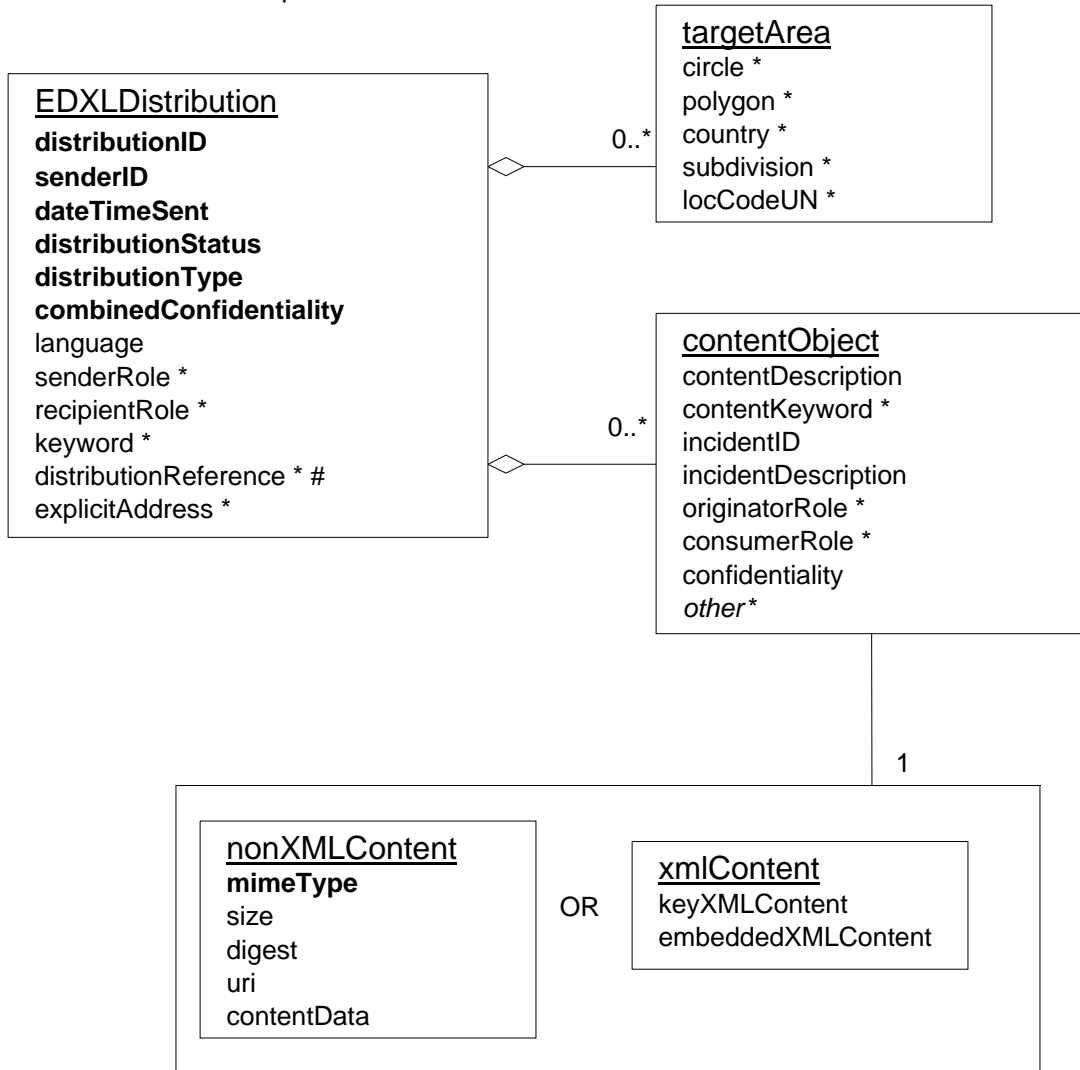
34 **2.3.4 Distribution of Well-Formed XML Messages**

35 A huge crash, involving a car and a HAZMAT truck, occurs at a busy junction on an inter-state freeway.
36 Separate automatic notifications of both the car crash and the HAZMAT carrier are sent using the
37 Vehicular Emergency Data Set (VEDS), contained in the Distribution Element. The Transportation
38 Management Center (TMC) shares information (related to the above incident) with the adjacent TMC,
39 using the IEEE 1512 Incident Management Message Set. These set of messages are exchanged using
40 the EDXL Distribution Element.

1 3. EDXLDistribution Element Structure (normative)

2 3.1 Document Object Model

- 3 **Bold** indicates required element.
- 4 *Italics* indicates one or more optional unspecified elements
- 5 # indicates conditional requirement
- 6 * indicates multiple instances allowed



7

1 3.2 Data Dictionary

2 Note: Unless explicitly constrained within this Data Dictionary, EDXL-DE elements MAY have null values.
3 Implementers MUST check for this condition wherever it might affect application performance.

4 3.2.1 EDXLDistribution Element and Sub-elements

5 The Distribution Message element, <EDXLDistribution> is the container element for all data necessary to
6 the originator's intent as to the dissemination of the contained message or set of messages.

Element	EDXLDistribution
Type	XML Structure
Usage	REQUIRED , MUST be used once and only once, top level container
Definition	The container of all of the elements related to the distribution of the content messages.
Comments	<ol style="list-style-type: none">1. The <EDXLDistribution> element may include one or more <targetArea> and <contentObject> blocks.2. Use of the <EDXLDistribution> element does not guarantee that all network links and nodes will implement the asserted dissemination policy or that unintended disclosure will not occur. Where sensitive information is transmitted over untrusted networks, it should be encrypted in accordance with the Web Services Security (WSS) standard (http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0.pdf) with any updates and errata published by the OASIS Web Services Security Technical Committee (http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wss), or some other suitable encryption scheme.
Sub-elements	<ul style="list-style-type: none">• distributionID• senderID• dateTimeSent• distributionStatus• distributionType• combinedConfidentiality• language• senderRole• recipientRole• keyword• distributionReference• explicitAddress• targetArea• contentObject
Used In	top level element

7

1

Element	distributionID
Type	xsd:string
Usage	REQUIRED , MUST be used once and only once
Definition	The unique identifier of this distribution message.
Comments	<ol style="list-style-type: none"> 1. Uniqueness is assigned by the sender to be unique for that sender. 2. The identifier MUST be a properly formed -escaped if necessary- XML string.
Used In	EDXLDistribution

2

Element	senderID
Type	xsd:string
Usage	REQUIRED , MUST be used once and only once
Definition	The unique identifier of the sender.
Comments	<ol style="list-style-type: none"> 1. Uniquely identifies human parties, systems, services, or devices that are all potential senders of the distribution message. 2. In the form actor@domain-name. 3. Uniqueness of the domain-name is guaranteed through use of the Internet Domain Name System, and uniqueness of the actor name enforced by the domain owner. 4. The identifier MUST be a properly formed -escaped if necessary- XML string. <p>Examples: dispatcher@example.gov, 0006.0e39.ad80@example.com</p>
Used In	EDXLDistribution

3

Element	dateTimeSent
Type	xsd:dateTime
Usage	REQUIRED , MUST be used once and only once
Definition	The date and time the distribution message was sent.
Comments	<ol style="list-style-type: none"> 1. The Date Time combination must include the offset time for time zone. 2. Must be in the W3C format for the XML [dateTime] data type. <p>Example: 2004-08-01T16:49:00-07:00</p>
Used In	EDXLDistribution

4

1

Element	distributionStatus
Type	xsd:string with restrictions
Usage	REQUIRED , MUST be used once and only once
Definition	The actionability of the message.
Comments	<ol style="list-style-type: none"> 1. Value must be one of: <ol style="list-style-type: none"> a. Actual - "Real-world" information for action b. Exercise - Simulated information for exercise participants c. System - Messages regarding or supporting network functions d. Test - Discardable messages for technical testing only. 2. The status MUST be a properly formed -escaped if necessary- XML string.
Used In	EDXLDistribution

2

Element	distributionType
Type	xsd:string with restrictions
Usage	REQUIRED , MUST be used once and only once
Definition	The function of the message.
Comments	<ol style="list-style-type: none"> 1. Value must be one of: <ol style="list-style-type: none"> a. Report - New information regarding an incident or activity b. Update - Updated information superseding a previous message c. Cancel - A cancellation or revocation of a previous message d. Request - A request for resources, information or action e. Response - A response to a previous request f. Dispatch - A commitment of resources or assistance g. Ack - Acknowledgment of receipt of an earlier message h. Error - Rejection of an earlier message (for technical reasons) i. SensorConfiguration - These messages are for reporting configuration during power up or after Installation or Maintenance. j. SensorControl - These are messages used to control sensors/sensor concentrator components behavior. k. SensorStatus - These are concise messages which report sensors/sensor concentrator component status or state of health. l. SensorDetection - These are high priority messages which report sensor detections. 2. The distribution type applies to the function of the content objects as a set. Those cases where payloads have different distribution types should be clustered in different distribution elements. 3. The type MUST be a properly formed -escaped if necessary- XML string.
Used In	EDXLDistribution

3

Element	combinedConfidentiality
Type	xsd:string
Usage	REQUIRED , MUST be used once and only once
Definition	Confidentiality of the combined distribution message's content.
Comments	<ol style="list-style-type: none"> 1. The <combinedConfidentiality> indicates the confidentiality of the combined <contentObject> sub-elements. Generally the combined confidentiality is the most restrictive of the <confidentiality> elements in the container <contentObject> element, but it can be more restrictive than any of the individual <confidentiality> elements. 2. The <combinedConfidentiality> element MUST be present if a <confidentiality> element is present in any of the <contentObject> elements. 3. Application specific mechanisms will be required to determine the minimum confidentiality level in cases where different confidentiality schemes are used in the <contentObject>. 4. Default value "UNCLASSIFIED AND NOT SENSITIVE" 5. The confidentiality MUST be a properly formed -escaped if necessary- XML string.
Used In	EDXLDistribution

1

Element	language
Type	xsd:string
Usage	OPTIONAL , MAY use once and only once
Definition	The primary language (but not necessarily exclusive) used in the payloads.
Comments	<ol style="list-style-type: none"> 1. Valid language values are supplied in the ISO standard RFC3066. 2. The language MUST be a properly formed -escaped if necessary- XML string. <p>Examples: FR, EN</p>
Used In	EDXLDistribution

2

1

Element	senderRole
Type	List and Associated Value(s)
Usage	OPTIONAL , MAY use multiple
Definition	The functional role of the sender, as it may determine message routing decisions.
Comments	<ol style="list-style-type: none"> The list and associated value(s) is in the form: <pre> <senderRole> <valueListUrn>valueListUrn</valueListUrn> <value>value</value> </senderRole> </pre> where the content of <valueListUrn> is the Uniform Resource Name of a published list of values and definitions, and the content of <value> is a string (which may represent a number) denoting the value itself. Multiple instances of the <value>, MAY occur with a single <valueListUrn> within the <senderRole> container. Multiple instances of <senderRole> MAY occur within a single <EDXLDistribution> container.
Sub-elements	<ul style="list-style-type: none"> valueListUrn value
Used In	EDXLDistribution

2

1

Element	recipientRole
Type	List and Associated Value(s)
Usage	OPTIONAL , MAY use multiple
Definition	The functional role of the recipient, as it may determine message routing decisions.
Comments	<ol style="list-style-type: none"> The list and associated value(s) is in the form: <pre> <recipientRole> <valueListUrn>valueListUrn</valueListUrn> <value>value</value> </recipientRole> </pre> where the content of <valueListUrn> is the Uniform Resource Name of a published list of values and definitions, and the content of <value> is a string (which may represent a number) denoting the value itself. Multiple instances of the <value>, MAY occur with a single <valueListUrn> within the <recipientRole> container. Multiple instances of <recipientRole> MAY occur within a single <EDXLDistribution> container.
Sub-elements	<ul style="list-style-type: none"> valueListUrn value
Used In	EDXLDistribution

2

1

Element	keyword
Type	List and Associated Value(s)
Usage	OPTIONAL , MAY use multiple
Definition	The topic related to the distribution message, as it may determine message routing decisions.
Comments	<ol style="list-style-type: none"> The list and associated value(s) is in the form: <pre><keyword> <valueListUrn>valueListUrn</valueListUrn> <value>value</value> </keyword></pre> where the content of <valueListUrn> is the Uniform Resource Name of a published list of values and definitions, and the content of <value> is a string (which may represent a number) denoting the value itself. Multiple instances of the <value>, MAY occur with a single <valueListUrn> within the <keyword> container. Multiple instances of <keyword> MAY occur within a single <EDXLDistribution> container. Examples of things <keyword> might be used to describe include event type, event etiology, incident ID and response type.
Sub-elements	<ul style="list-style-type: none"> valueListUrn value
Used In	EDXLDistribution

2

Element	distributionReference
Type	xsd:string
Usage	CONDITIONAL , MAY use multiple
Definition	A reference to a previous distribution message.
Comments	<ol style="list-style-type: none"> The <distributionID> and <senderID> and <dateTimeSent> of the referenced previous message, concatenated with a comma delimiter. This element should appear at least once in any message which updates, cancels or otherwise refers to another message. MUST be a properly formed -escaped if necessary- XML string. <p>Example: msgID0074,actor@domain-name,2004-08-01T16:49:00-07:00</p>
Used In	EDXLDistribution

3

Element	explicitAddress
Type	XML Structure
Usage	OPTIONAL , MAY use multiple
Definition	The identifier of an explicit recipient.
Comments	<ol style="list-style-type: none"> 1. Identifies human parties, systems, services, or devices that are all potential recipients of the distribution message. 2. The explicit address of a recipient in the form: <pre><explicitAddress> < explicitAddressScheme> explicitAddressScheme </ explicitAddressScheme> <explicitAddressValue> explicitAddressValue </ explicitAddressValue> </ explicitAddress ></pre> where the content of <explicitAddressScheme> is the distribution addressing scheme used, and the content of <explicitAddressValue> is a string denoting the addressee's value. 3. Multiple instances of the < explicitAddressValue >, MAY occur with a single < explicitAddressScheme > within the < explicitAddress > container. 4. Multiple instances of < explicitAddress > MAY occur within a single <EDXLDistribution> container.
Sub-elements	<ul style="list-style-type: none"> • explicitAddressScheme • explicitAddressValue
Used In	EDXLDistribution

2 3.2.2 targetArea Element and Sub-elements

3 The <targetArea> is a container element for the geospatial or political area targeting of the message
4 content. It indicates the originator's intent based on location targeting as to the dissemination of that
5 particular message or set of messages.

6 Geospatial Note:

7 Values for latitude and longitude shall be expressed as decimal fractions of degrees. Whole
8 degrees of latitude shall be represented by a decimal number ranging from 0 through 90. Whole
9 degrees of longitude shall be represented by a decimal number ranging from 0 through 180.
10 When a decimal fraction of a degree is specified, it shall be separated from the whole number of
11 degrees by a decimal point (the period character, "."). Decimal fractions of a degree should be
12 expressed to the precision available, with trailing zeroes being used as placeholders if required.
13 A decimal point is optional where the precision is less than one degree.

14 Some effort should be made to preserve the apparent precision when converting from
15 another datum or representation, for example 41 degrees 13 minutes should be represented as
16 41.22 and not 41.21666, while 41 13' 11" may be represented as 41.2197.

17 Latitudes north of the equator MAY be specified by a plus sign (+), or by the absence of a minus
18 sign (-), preceding the designating degrees. Latitudes south of the Equator MUST be designated
19 by a minus sign (-) preceding the digits designating degrees. Latitudes on the Equator MUST be
20 designated by a latitude value of 0.

1 Longitudes east of the prime meridian shall be specified by a plus sign (+), or by the absence of a
 2 minus sign (-), preceding the designating degrees. Longitudes west of the prime meridian MUST
 3 be designated by a minus sign (-) preceding the digits designating degrees. Longitudes on the
 4 prime meridian MUST be designated by a longitude value of 0. A point on the 180th meridian
 5 shall be taken as 180 degrees West, and shall include a minus sign.

Element	targetArea
Type	XML Structure
Usage	OPTIONAL , MAY use multiple
Definition	The container element for location information.
Comments	1. Multiple <targetArea> blocks may appear in a single <EDXLDistribution> element, in which case the target area for the current message is the union of all areas described in the various <targetArea> structures.
Sub-elements	<ul style="list-style-type: none"> • circle • polygon • country • subdivision • locCodeUN
Used In	EDXLDistribution

6

Element	circle
Type	xsd:string
Usage	OPTIONAL , MAY use multiple
Definition	An enclosed geographic area within a given radius around a geographic point.
Comments	<ol style="list-style-type: none"> 1. Represented in the form "latitude, longitude, radius". (See Geospatial Note above) 2. The central point is represented by lat-long values conforming to the WGS84 coordinate reference system. [WGS 84] 3. The radius value is expressed in kilometers. 4. MUST be a properly formed -escaped if necessary- XML string. <p>Example: 38.26295, -122.07454 15</p>
Used In	targetArea

7

1

Element	polygon
Type	xsd:string
Usage	OPTIONAL , MAY use multiple
Definition	An enclosed geographic area within a simple closed polygon defined by an ordered set of vertices.
Comments	<ol style="list-style-type: none"> 1. Represented by a space-delimited series of latitude, longitude pairs, with the last pair identical to the first. (See Geospatial Note above) 2. The lat-long values conform to the WGS84 coordinate reference system. [WGS 84] 3. MUST be a properly formed -escaped if necessary- XML string. <p>Example: 42,-124.2102 42,-120.1 39,-120 35.0,-114.6328 34.35,- 120.4418 38.9383,-123.817 42,-124.2102</p>
Used In	targetArea

2

Element	country
Type	xsd:string
Usage	OPTIONAL , MAY use multiple
Definition	The code of the country.
Comments	<ol style="list-style-type: none"> 1. The two-character ISO 3166-1 Country Code for the country concerned. 2. More specific target location information can be defined in the <subdivision> elements. 3. MUST be a properly formed -escaped if necessary- XML string.
Used In	targetArea

3

1

Element	subdivision
Type	xsd:string
Usage	OPTIONAL , MAY use multiple
Definition	The ISO 3166-2 designator for the administrative subdivision concerned.
Comments	<ol style="list-style-type: none"> 1. The first two characters, before the hyphen, are the two character ISO 3166-1 Country Code for the country within which the designated subdivision is located. 2. The following one-to-three characters following the hyphen designate the particular subdivision. 3. MUST be a properly formed -escaped if necessary- XML string. <p>Examples: US-TX (U.S. State of Texas), DK-025 (Danish county Roskilde), MG-T (Antananarivo province, Madagascar)</p>
Used In	targetArea

2

Element	locCodeUN
Type	xsd:string
Usage	OPTIONAL , MAY use multiple
Definition	The UN/LOCODE designator for the location concerned.
Comments	<ol style="list-style-type: none"> 1. The two first digits are the two character ISO3166-1 Country Code for the country in which the place is located. 2. The following three characters are the UN/LOCODE designator for the particular location within that country. 3. No spaces or punctuation are used within this designator. 4. MUST be a properly formed -escaped if necessary- XML string. <p>Example: USFFB (Fairfield, Alabama, USA), USSUU (Fairfield, California, USA), GBFFD (Falfield, South Gloucestershire, UK)</p>
Used In	targetArea

3

4 3.2.3 contentObject Element and Sub-elements

5 The <contentObject> element is the container element for specific messages. The <contentObject>
6 element MUST either contain an <xmlContent> content container or a <nonXMLContent> content
7 container. Additional elements (metadata) used for specific distribution of the <contentObject> payload or
8 hints for processing the payload are also present in the <contentObject> container element.

1

Element	contentObject
Type	XML Structure
Usage	OPTIONAL , MAY use multiple
Definition	The container element for message data and content.
Comments	<ol style="list-style-type: none"> 1. The <contentObject> is the container element for specific messages. 2. The <contentObject> may have an optional attribute that defines a namespace prefix which resolves ambiguous element names. 3. The <contentObject> element MUST contain exactly one of the two content formats: <ol style="list-style-type: none"> a. <xmlContent>, for valid namespaced XML content or b. <nonXMLContent>, containing one or both of the elements <uri>, for reference to the content's location, and <contentData>, for data encapsulated in the message.
Sub-elements	<ul style="list-style-type: none"> • contentDescription • contentKeyword • incidentID • incidentDescription • originatorRole • consumerRole • confidentiality • nonXMLContent • xmlContent
Used In	EDXLDistribution

2

Element	contentDescription
Type	xsd:string
Usage	OPTIONAL , MAY use once and only once
Definition	The human-readable text describing the content object.
Comments	<ol style="list-style-type: none"> 1. MUST be a properly formed -escaped if necessary- XML string. <p>Examples: "CAP message from FEMA", "Map of affected area" or "Photo of missing child".</p>
Used In	contentObject

3

1

Element	contentKeyword
Type	List and Associated Value(s)
Usage	OPTIONAL , MAY use multiple
Definition	The topic related to the message data and content, as it may determine message distribution and presentation decisions.
Comments	<ol style="list-style-type: none"> The list and associated value(s) is in the form: <pre><contentKeyword> <valueListUrn>valueListUrn</valueListUrn> <value>value</value> </contentKeyword></pre> where the content of <valueListUrn> is the Uniform Resource Name of a published list of values and definitions, and the content of <value> is a string (which may represent a number) denoting the value itself. Multiple instances of the <value>, MAY occur with a single <valueListUrn> within the <contentKeyword> container. Multiple instances of <contentKeyword> MAY occur within a single <contentObject> container. <p>Examples of things <contentKeyword> might be used to describe include message processor, event stage, resource code and response type.</p>
Sub-elements	<ul style="list-style-type: none"> valueListUrn value
Used In	contentObject

2

Element	incidentID
Type	xsd:string
Usage	OPTIONAL , MAY use once and only once
Definition	The human-readable text uniquely identifying the incident/event/situation associated with the contentObject.
Comments	<ol style="list-style-type: none"> MUST be a properly formed -escaped if necessary- XML string.
Used In	contentObject

3

1

Element	incidentDescription
Type	xsd:string
Usage	OPTIONAL , MAY use once and only once
Definition	The human-readable text describing the incident/event/situation associated with the contentObject.
Comments	1. MUST be a properly formed -escaped if necessary- XML string.
Used In	contentObject

2

Element	originatorRole
Type	List and Associated Value(s)
Usage	OPTIONAL , MAY use multiple
Definition	The functional role of the message originator, as it may determine message distribution and presentation decisions.
Comments	<p>1. The list and associated value(s) is in the form:</p> <pre><originatorRole> <valueListUrn>valueListUrn</valueListUrn> <value>value</value> </originatorRole></pre> <p>where the content of <valueListUrn> is the Uniform Resource Name of a published list of values and definitions, and the content of <value> is a string (which may represent a number) denoting the value itself.</p> <p>2. Multiple instances of the <value>, MAY occur with a single <valueListUrn> within the <originatorRole> container.</p> <p>3. Multiple instances of <originatorRole> MAY occur within a single <contentObject> container.</p>
Sub-elements	<ul style="list-style-type: none"> • valueListUrn • value
Used In	contentObject

3

1

Element	consumerRole
Type	List and Associated Value(s)
Usage	OPTIONAL , MAY use multiple
Definition	The functional role of the message consumer, as it may determine message distribution and presentation decisions.
Comments	<ol style="list-style-type: none"> The list and associated value(s) is in the form: <pre><consumerRole> <valueListUrn>valueListUrn</valueListUrn> <value>value</value> </consumerRole></pre> where the content of <valueListUrn> is the Uniform Resource Name of a published list of values and definitions, and the content of <value> is a string (which may represent a number) denoting the value itself. Multiple instances of the <value>, MAY occur with a single <valueListUrn> within the <consumerRole> container. Multiple instances of <consumerRole> MAY occur within a single <contentObject> container. <p>Example: <valueListUrn>"http://www.dhs.gov/NiemRoleType"</valueListUrn>, <value>ICS Operations Branch</value></p>
Sub-elements	<ul style="list-style-type: none"> valueListUrn value
Used In	contentObject

2

Element	confidentiality
Type	xsd:string
Usage	OPTIONAL , MAY use once and only once
Definition	Special requirements regarding confidentiality of the content of this <contentObject>.
Comments	<ol style="list-style-type: none"> MUST be a properly formed -escaped if necessary- XML string.
Used In	contentObject

3

1

Element	<i>other</i>
Type	xsd:other
Usage	OPTIONAL , MAY be use to add an unlimited number of XML elements for enveloped signing process.
Definition	Special requirements allowing for signature of the content of a <contentObject>.
Comments	<ol style="list-style-type: none"> 1. There is no mandatory validation of the elements if the namespace reference can not be located. 2. MUST be a properly formed XML string – escaped, if necessary. 3. Element names cannot duplicate other element names in the contentObject. Such duplication would prevent validation due to the ambiguity introduced. 4. This element may be used for signatures. If this element is used for experimental extensions, such extensions may not be supported by all users or in future versions of EDXL-DE.
Used In	contentObject

2 **3.2.4 nonXMLContent Element and Sub-elements**

Element	nonXMLContent
Type	XML Structure
Usage	CONDITIONAL , MUST use once if xmlContent is not used
Definition	Container for content provided in a non-XML MIME type.
Comments	<ol style="list-style-type: none"> 1. The <nonXMLContent> container MUST have one or both of the elements <contentData> and <uri>. 2. If the <uri> element is used in conjunction with the <contentData> element, it must reference a data location that contains the same data as is contained in the <contentData> element.
Sub-elements	<ul style="list-style-type: none"> • mimeType • size • digest • uri • contentData
Used In	contentObject

3

1

Element	mimeType
Type	xsd:string
Usage	REQUIRED , MUST be used once and only once
Definition	The format of the payload.
Comments	<ol style="list-style-type: none"> 1. MIME content type and sub-type as described in [RFC 2046]. 2. MUST be a properly formed -escaped if necessary- XML string. <p>Examples: application/pdf, application/mp3</p>
Used In	nonXMLContent

2

Element	size
Type	xsd:integer
Usage	OPTIONAL , MAY use once and only once
Definition	The file size of the payload .
Comments	<ol style="list-style-type: none"> 1. Value must be in bytes and represent the raw file size (not encoded or encrypted).
Used In	nonXMLContent

3

Element	digest
Type	xsd:string
Usage	OPTIONAL , MAY use once and only once
Definition	The digest value for the payload.
Comments	<ol style="list-style-type: none"> 1. Used to ensure the integrity of the payload. 2. Calculated using the Secure Hash Algorithm (SHA-1) 3. MUST be a properly formed -escaped if necessary- XML string.
Used In	nonXMLContent

4

1

Element	uri
Type	xsd:anyURI
Usage	OPTIONAL , MAY use once and only once
Definition	A Uniform Resource Identifier that can be used to retrieve the identified resource.
Comments	<ol style="list-style-type: none"> 1. May be a full absolute URI, typically a Uniform Resource Locator, that can be used to retrieve the resource over the Internet. 2. May be a relative URI naming a file. This may be just a pointer to a file or specifically to the file represented in the <contentData>.
Used In	nonXMLContent

2

Element	contentData
Type	xsd:base64Binary
Usage	OPTIONAL , MAY use once and only once
Definition	The base-64 encoded data content.
Comments	<ol style="list-style-type: none"> 1. MAY be used either with or instead of the <uri> element in contexts where retrieval of a resource via a URI is not feasible. 2. MUST be a properly formed -escaped if necessary- XML string.
Used In	nonXMLContent

3 3.2.5 xmlContent Element and Sub-elements

Element	xmlContent
Type	XML Structure
Usage	CONDITIONAL , MUST use once if nonXMLContent is not used
Definition	Container for valid-namespaced XML data.
Sub-elements	<ol style="list-style-type: none"> 1. keyXMLContent 2. embeddedXMLContent 3. An optional namespace attribute may be included.
Used In	contentObject

4

1

Element	keyXMLContent
Type	xsd:string
Usage	OPTIONAL , MAY use multiple
Definition	A container element for collected fragments of valid XML.
Comments	<ol style="list-style-type: none"> 1. Extracts must come from the XML document contained within the <embeddedXMLContent> element within the current <contentObject> block. 2. All content within this element MUST be explicitly namespaced as defined in the enclosing <contentObject> tag. 3. MUST be a properly formed -escaped if necessary- XML string.
Used In	xmlContent

2

Element	embeddedXMLContent
Type	xsd:string
Usage	OPTIONAL , MAY use multiple
Definition	The <embeddedXMLContent> element is an open container for valid XML from an explicit namespaced XML Schema.
Comments	<ol style="list-style-type: none"> 1. The content MUST be a separately-namespaced well-formed XML document. 2. The enclosed XML content MUST be explicitly namespaced as defined in the enclosing <embeddedXMLContent> tag. 3. Enclosed XML content may be encrypted and/or signed within this element.
Used In	xmlContent

3

1 **3.2.6 List and Associated Value(s)**

Element	valueListUrn
Type	xsd:string
Usage	CONDITIONAL , MAY use once and only once
Definition	The name of a certified list maintained by the Community of Interest (COI) for the value referenced.
Comments	1. MUST be a properly formed -escaped if necessary- XML string.
Used In	<ul style="list-style-type: none"> • EDXLDistribution/senderRole • EDXLDistribution/recipientRole • EDXLDistribution/keyword • contentObject/contentKeyword • contentObject/originatorRole • contentObject/consumerRole

2

Element	value
Type	xsd:string
Usage	CONDITIONAL , MAY use multiple
Definition	A value from a certified list maintained by the Community of Interest (COI) for the referenced element.
Comments	1. MUST be a properly formed -escaped if necessary- XML string.
Used In	<ul style="list-style-type: none"> • EDXLDistribution/senderRole • EDXLDistribution/recipientRole • EDXLDistribution/keyword • contentObject/contentKeyword • contentObject/originatorRole • contentObject/consumerRole

3

1 3.2.7 Explicit Addressing

Element	explicitAddressScheme
Type	xsd:string
Usage	REQUIRED , MUST use once and only once
Definition	Identifies the distribution addressing scheme used.
Comments	1. MUST be a properly formed -escaped if necessary- XML string. Examples for this type of distribution includes - email, military USMTF, etc. . .
Used In	explicitAddress

2

Element	explicitAddressValue
Type	xsd:string
Usage	REQUIRED , MAY use multiple
Definition	A properly formed -escaped if necessary- XML string denoting the addressees value.
Comments	1. MUST be a properly formed -escaped if necessary- XML string.
Used In	explicitAddress

Appendix A. XML Schema for the EDXLDistribution Element

```
<?xml version="1.0" encoding="UTF-8"?>

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="urn:oasis:names:tc:emergency:EDXL:DE:1.0"
targetNamespace="urn:oasis:names:tc:emergency:EDXL:DE:1.0"
elementFormDefault="qualified" attributeFormDefault="unqualified" version="1.0CD">

  <xsd:element name="EDXLDistribution">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="distributionID" type="xsd:string"/>
        <xsd:element name="senderID" type="xsd:string"/>
        <xsd:element name="dateTimeSent" type="xsd:dateTime"/>
        <xsd:element name="distributionStatus" type="statusValues"/>
        <xsd:element name="distributionType" type="typeValues"/>
        <xsd:element name="combinedConfidentiality" type="xsd:string"/>
        <xsd:element name="language" type="xsd:string" minOccurs="0"/>
        <xsd:element name="senderRole" type="valueListType" minOccurs="0"
maxOccurs="unbounded"/>
        <xsd:element name="recipientRole" type="valueListType"
minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="keyword" type="valueListType" minOccurs="0"
maxOccurs="unbounded"/>
        <xsd:element name="distributionReference" type="xsd:string"
minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="explicitAddress" type="valueSchemeType"
minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="targetArea" type="targetAreaType" minOccurs="0"
maxOccurs="unbounded"/>
        <xsd:element name="contentObject" type="contentObjectType"
minOccurs="0" maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:annotation/>
  <xsd:annotation/>

  <xsd:complexType name="contentObjectType">
    <xsd:sequence>
      <xsd:element name="contentDescription" type="xsd:string" minOccurs="0"/>
      <xsd:element name="contentKeyword" type="valueListType" minOccurs="0"
maxOccurs="unbounded"/>
      <xsd:element name="incidentID" type="xsd:string" minOccurs="0"/>
      <xsd:element name="incidentDescription" type="xsd:string" minOccurs="0"/>
      <xsd:element name="originatorRole" type="valueListType" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>

```

```

1      <xsd:element name="consumerRole" type="valueListType" minOccurs="0"
2 maxOccurs="unbounded" />
3      <xsd:element name="confidentiality" type="xsd:string" minOccurs="0" />
4
5      <xsd:choice>
6          <xsd:element name="nonXMLContent" type="nonXMLContentType" />
7          <xsd:element name="xmlContent" type="xmlContentType" />
8      </xsd:choice>
9
10     <xsd:any namespace="##other" processContents="lax" minOccurs="0"
11 maxOccurs="unbounded" />
12
13     </xsd:sequence>
14 </xsd:complexType>
15
16 <xsd:complexType name="nonXMLContentType">
17     <xsd:sequence>
18         <xsd:element name="mimeType" type="xsd:string" />
19         <xsd:element name="size" type="xsd:integer" minOccurs="0" />
20         <xsd:element name="digest" type="xsd:string" minOccurs="0" />
21         <xsd:element name="uri" type="xsd:anyURI" minOccurs="0" />
22         <xsd:element name="contentData" type="xsd:base64Binary" minOccurs="0" />
23     </xsd:sequence>
24 </xsd:complexType>
25
26 <xsd:complexType name="xmlContentType">
27     <xsd:sequence>
28         <xsd:element name="keyXMLContent" type="anyXMLType" minOccurs="0"
29 maxOccurs="unbounded" />
30         <xsd:element name="embeddedXMLContent" type="anyXMLType" minOccurs="0"
31 maxOccurs="unbounded" />
32     </xsd:sequence>
33 </xsd:complexType>
34
35 <xsd:complexType name="anyXMLType">
36     <xsd:sequence>
37         <xsd:any namespace="##other" processContents="lax" maxOccurs="unbounded" />
38     </xsd:sequence>
39
40     <xsd:anyAttribute namespace="##other" processContents="lax" />
41 </xsd:complexType>
42
43 <xsd:complexType name="valueListType">
44     <xsd:sequence>
45         <xsd:element name="valueListUrn" type="xsd:string" />
46         <xsd:element name="value" type="xsd:string" maxOccurs="unbounded" />
47     </xsd:sequence>
48 </xsd:complexType>
49
50 <xsd:complexType name="valueSchemeType">

```

```

1      <xsd:sequence>
2          <xsd:element name="explicitAddressScheme" type="xsd:string"/>
3          <xsd:element name="explicitAddressValue" type="xsd:string"
4 maxOccurs="unbounded"/>
5      </xsd:sequence>
6  </xsd:complexType>
7
8  <xsd:complexType name="targetAreaType">
9      <xsd:sequence>
10         <xsd:element name="circle" type="xsd:string" minOccurs="0"
11 maxOccurs="unbounded"/>
12         <xsd:element name="polygon" type="xsd:string" minOccurs="0"
13 maxOccurs="unbounded"/>
14         <xsd:element name="country" type="xsd:string" minOccurs="0"
15 maxOccurs="unbounded"/>
16         <xsd:element name="subdivision" type="xsd:string" minOccurs="0"
17 maxOccurs="unbounded"/>
18         <xsd:element name="locCodeUN" type="xsd:string" minOccurs="0"
19 maxOccurs="unbounded"/>
20     </xsd:sequence>
21 </xsd:complexType>
22
23 <xsd:simpleType name="statusValues">
24     <xsd:restriction base="xsd:NMTOKEN">
25         <xsd:enumeration value="Actual"/>
26         <xsd:enumeration value="Exercise"/>
27         <xsd:enumeration value="System"/>
28         <xsd:enumeration value="Test"/>
29     </xsd:restriction>
30 </xsd:simpleType>
31
32 <xsd:simpleType name="typeValues">
33     <xsd:restriction base="xsd:NMTOKEN">
34         <xsd:enumeration value="Report"/>
35         <xsd:enumeration value="Update"/>
36         <xsd:enumeration value="Cancel"/>
37         <xsd:enumeration value="Request"/>
38         <xsd:enumeration value="Response"/>
39         <xsd:enumeration value="Dispatch"/>
40         <xsd:enumeration value="Ack"/>
41         <xsd:enumeration value="Error"/>
42         <xsd:enumeration value="SensorConfiguration"/>
43         <xsd:enumeration value="SensorControl"/>
44         <xsd:enumeration value="SensorStatus"/>
45         <xsd:enumeration value="SensorDetection"/>
46     </xsd:restriction>
47 </xsd:simpleType>
48 </xsd:schema>

```

Appendix B. EDXL-DE Examples

B.1 EDXL-DE With CAP Payload

The following is a speculative example in the form of an EDXL-DE XML message.

```
4 <EDXLDistribution xmlns="urn:oasis:names:tc:emergency:EDXL:DE:1.0">
5   <distributionID>ieam_e3_2</distributionID>
6   <senderID>XML2005</senderID>
7   <dateTimeSent>2005-11-15T16:53:00-05:00</dateTimeSent>
8   <distributionStatus>Exercise</distributionStatus>
9   <distributionType>Update</distributionType>
10  <keyword>
11    <valueListUrn>http://www.niem.gov/EventTypeList</valueListUrn>
12    <value>Explosion</value>
13  </keyword>
14  <targetArea>
15    <polygon>33.4745,-112.1174 33.4745,-112.0238 33.4238,-112.0238 33.4238,-112.1174 33.4745,-
16 112.1174 </polygon>
17  </targetArea>
18  <contentObject>
19    <contentDescription>CAP message from DOT advising best alternate Routes
20  </contentDescription>
21    <xmlContent>
22      <embeddedXMLContent>
23        <alert xmlns = "urn:oasis:names:tc:emergency:cap:1.1">
24          <identifier>Vendor generated</identifier>
25          <sender>AZ DOT</sender>
26          <sent>2005-11-15T16:58:00-05:00</sent>
27          <status>Exercise</status>
28          <msgType>Update</msgType>
29          <scope>Public</scope>
30          <info>
31            <category>Transport</category>
32            <event>Traffic Routes</event>
33            <urgency>Immediate</urgency>
34            <severity>Moderate</severity>
35            <certainty>Likely</certainty>
36            <description>Traffic adjustments ensure clear routes to St. Josephs Hospital
37 and Phoenix Childrens Hospital on Thomas Rd. </description>
38            <area>
39              <areaDesc>Best Routes</areaDesc>
40              <polygon>38.91655012246089,-77.02016267943407 38.91655012246089,-
41 77.0117098391165 38.907662564641285,-77.0117098391165 38.907662564641285,-77.02016267943407
42 38.91655012246089,-77.02016267943407 </polygon>
43            </area>
44          </info>
45        </alert>
46      </embeddedXMLContent>
47    </xmlContent>
48  </contentObject>
49 </EDXLDistribution>
```

1 B.2 EDXL-DE With Multiple Encrypted Payloads

2 The following is a speculative example in the form of an EDXL-DE XML message.

```
3 <?xml version="1.0" encoding="UTF-8" standalone="no"?>
4 <EDXLDistribution xmlns="urn:oasis:names:tc:emergency:EDXL:DE:1.0">
5   <distributionID>Sandia001</distributionID>
6   <senderID>dellis@sandia.gov</senderID>
7   <dateTimeSent>2005-08-07T18:05:00-07:00</dateTimeSent>
8   <distributionStatus>Actual</distributionStatus>
9   <distributionType>Report</distributionType>
10  <senderRole>
11    <valueListUrn>urn:sandia:gov:sensors:senderRole</valueListUrn>
12    <value>SENTRY sensor managment system</value>
13  </senderRole>
14  <!--
15  This demonstrates the provison to allow multiple values under the same
16  Value List. <value> is repeated three times, since Warning and reporting
17  systems want CAP content, Hazard Prediction systems want detailed sensor
18  outputs, and situational awareness systems want the location and type of event.
19  -->
20  <recipientRole>
21    <valueListUrn>urn:sandia:gov:sensors:reciepentRole</valueListUrn>
22    <value>Warning and Reporting Devices</value>
23    <value>Hazard Prediction applications</value>
24    <value>Situational Awareness applications</value>
25  </recipientRole>
26
27  <!--
28  This key word can be used by subscribing systems or applications
29  to get distribution of one or more of the enclosed <contentObject>
30  container elements.
31  -->
32
33  <keyword>
34    <valueListUrn>urn:sandia:gov:sensors:keywords</valueListUrn>
35    <value>SNM Detection</value>
36  </keyword>
37
38  <!--
39  The elements explicitAddress used in this example are DMIS COGs and e-mail.
40  Routing of EDXL Distribution is just being designed and there are no good
41  way to show real scheme in this example.
42  -->
43  <explicitAddress>
44    <scheme>DMIS COGs</scheme>
45    <value>1734</value>
46    <value>3520</value>
47  </explicitAddress>
48
49  <explicitAddress>
50    <scheme>e-mail</scheme>
51    <value>dellis@sandia.gov</value>
52  </explicitAddress>
53
54  <!-- In a real messaging system this would probably be FOUO or higher
55  based on the sensitivity of a SNM detection. The current confidentiality
56  is all unclassified in this example for distribution purposes.
57  -->
58  <combinedConfidentiality>Unclassified</combinedConfidentiality>
59
60  <!-- In a real message more than one <targetArea> elements would be present.-->
61  <targetArea>
62    <!--
63    These need to have the correct ISO 3166 codes added
64    -->
65    <country>US</country>
66    <subdivision>California</subdivision>
```

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<locCodeUN>USA-SF</locCodeUN>
</targetArea>

<!--
This is a XLST transformed CAP 1.0 message for legacy systems. The message is used by
publish/subscription software like NuParadigm Foundation engine in the DoD Alerting Framework.
Legacy Warning and reporting systems would not be able to process a CAP 1.1
message and therefore a transform was accomplished.

Most recent information is added to the beginning of the Distribution in this example to
allow rapid determination of most recent key <contentObject> container elements.
-->
<contentObject>
  <!-- <contentKeyword> is added to allow referencing between <contentObject>s -->
  <contentKeyword>
    <valueListUrn>"urn:sandia.gov:sensor:detection.event.id"</valueListUrn>
    <value>10.2.2.1:2005-08-07T18:00:00Z</value>
  </contentKeyword>
  <!--
This could be eliminated since it provides no distribution value but was retained
to demonstrate the <keyXMLContent> would have to be transformed in CAP 1.1 to CAP 1.0
Conversions
-->
  <confidentiality>Unclassified</confidentiality>
  <xmlContent>
    <embeddedXMLContent xmlns:cap1.0="http://www.incident.com/cap/1.0">
      <EncryptedData xmlns="http://www.w3.org/2001/04/xmlenc#"
Type="http://www.w3.org/2001/04/xmlenc#Element">
<EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#tripleDES-cbc"/>
<KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
<KeyName>deskey.bin</KeyName>
</KeyInfo>
<CipherData>
<CipherValue>GSCinwYBtwJxp6kcZPGqE6rybCfsnvI6Lz+IZVPqnRfnIlhWq7cI2WT4Bs jBBQCu
TE68pCQ/keOGtvYJ5yNVZEUAnIhOf370EiqklrcBARXb03LCYv1XYKA1zmEC5yFT
CUcyCMV146G4eNU1H7F+wbMjbsGhJ0YgYe+rpjOVYAK9Gs4Uj+CWhi j jxpr5Y/vX
1NEtHFhLsXC9cSfhXWVmi3veXwbDycC+Qt cvQL/Rfr45bDwsJnCcutTzfmogFlCS
BgYUi6osW+XhoRkAttzKbRADVZ6bG5SMkZN0SKiwSaCyKyMKjdpjQwYQh jUXUoAn
veBylXREqfmt0Im/pT7Y45pabWNG913al jil8P7qZ5Y26Q0X+i0U+eEGuafHrMVb
S/QBpAkNbp5/f9UR3B4t5t7hL0svDXdr6CWFBNsrczLjz7YC20+g1Hb18YsQdREA
And3PKgoy8Q1Kv6ZLA+aJzQpSvzbSu3btgN6vyF3GGPgKprVIYRFouaJHYgJL81zn
zZovnH41ubwa+YPgD0H48a/FM2LaA8euPzMFdWIKi0fm5DoZZzYcMpkmfLJS10RG
lUKzW0svDw8I1AwX6LBssPm+hoBa7HzTnuM40FD+vsmET+p0bqBtaUSnDhrHXLzp
P6TrcNr5R5cxQ4C+shwezFQDNKbloYc6m5PaTH/6qh1Tme32vP8ySNMKvL74QCfP
w8hTzXwq9UvLpQ2WKJcI0Phcle3HoYkBTpVk9OUf/CVaxMXGOiXReeLXGPC1IQnn
a6xw7ImkgeCFY+rcttq2fE3UqWtc5R6J16/Jv666K9fgCbXRvhaBdMDYpz0GKFa
gMJulUK6zTtah+bidtUrf31UWAX+wqIqmDFJlivJaRbLEiEVCrt0jKw0juR41dDD
VS5j2BuvmZ5T1LnOnHFU6H4GudnwjpL01eLrWELsFkmbQmUx2A0L6NBj9SRkXXHW
onZV6uX+c3CR460ekvYyM1rxE2zQPykfh/mELRhGgyDvtqDFQwhDx2Klu+Gh2z
3nC51yn37laI05KsVl5Gkb6jxFVrcUvrcp4pX5czw7/VWbxWoRPy7Bus3akhPu+I
/jchv7SiVRP5mX4Ewh+yeduYX+UZLo07m5zhAMtmFdiLJV9tgHVTJf7ZJ3bGWP+h
Et0N198hGV362cSRhkoLJwNmOgIpGXSMO6T5nA1MzhJ6CkCP8QV1zpKRLVJSRZrn
fffbjd18CzipzjE05JVkbyfbq9I33fkWmbda+Vo9ZMiDinOee6KxnDnx119ca9Lg
+d19J0qjJz5VwnWLRCEprsOxt+LlmeHC60NjgRarhidlrfuxmONM+QZTk4ZQGIPD
fsk5ftJtzvHgW5G/wN7fxyLh1AqQuCW13IASmfWuJS0+HntYZVoXqGjRg1sK6snx
zteJm6a20yG/M5RvLAEVhOKWyU2+9h jzts8ySg6Qb2+KrUTRQ8JBmVBeSjR2svv
2AWyBYj29JAdAikX9gfGDDvTG9GqJr+jFE9mfObtg71sdLezQKvVNMsnm6RdSpu
dA3vL8uB1liGBNJZS0OKr06BXp6Pjbl6Ov47Ebofvp8Vm9vKQD7PmjPaIbn1bUr9
V9cHUQ5h6LSecnAy/FZQMLdcamNAIhpiEgoQcwEmaa+1/wTv7LppqxZkFVQQbI2m
nc9Ujcd08g2Qyh+0YCHP50SbCwDe2W+CYBi7QBDDf3qt45zaZnHyRm/yXhVWCJX1
+0WY/+OukquhaWJ8Y0fygAlyk7Jyqqpu2XU9X0Vu8oETQ1L/+37mEzy/beL9VNNr
eU7bfQBAnYw1CkeXs5rAcc1vl1ZEU22Uqg3H5saOQLEHgv1NXL+0C+A9/Q2ZsaFI
BDDiH+f6+6aUno6fotGUA==</CipherValue>
</CipherData>
</EncryptedData>
  </embeddedXMLContent>
</xmlContent>
  <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
<SignedInfo>
<CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
<SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
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<Reference>
<Transforms>
<Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
</Transforms>
<DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1"/>
<DigestValue>przigAg811cHIqSXpIrFglBGx20=</DigestValue>
</Reference>
</SignedInfo>
<SignatureValue>BH8MGSS9QAlgg7a7I7PF5XjKsqadumTt3cSWxBmwErByvQuaarOgH6MMf1VLkG0Y
tv6zaOqR6Kis4giTqtZBo8QckGukpre2gurdi3Ws0yO3Wt8nWrcH3QAu1lhocXpV
gXahZ8MzHc9zuJq9+bl+S72czTjS0UdCvk/MMRV/xhwZ/1QSn+ffh0s3RU6Cn1Q0
aYsUdtX5mAGUWazJghKgK/qSM5jF4c233g7M4m+Rul3C+QOFBOMGmp+NoDnG9b0z
hycJGVdUpY0a+1r0quu2pmdLZnIQVY1stWNFS3wI9Rzds1wzoGP9/nRARGS0kLf1
De+WB4Xdar48A9WJwng0iA==</SignatureValue>
<KeyInfo>
<KeyName>rsaKey.pem</KeyName>
</KeyInfo>
</Signature></contentObject>
<!--
This is the original CAP 1.1 message produced by the SENTRY system.
There was sufficient data to warrant the alert.
In reality the CAP messages would not be Public, however, It is used in this
for simplicity
-->
<contentObject>
<contentKeyword>
<valueListUrn>"urn:sandia:gov:sensor:detection.event.id"</valueListUrn>
<value>10.2.2.1:2005-08-07T18:00:00Z</value>
</contentKeyword>
<confidentiality>Unclassified</confidentiality>
<xmlContent>
<embeddedXMLContent xmlns:cap1.1="urn:oasis:names:tc:emergency:cap:1.1">
<EncryptedData xmlns="http://www.w3.org/2001/04/xmlenc#"
Type="http://www.w3.org/2001/04/xmlenc#Element">
<EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#tripleDES-cbc"/>
<KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
<KeyName>desKey.bin</KeyName>
</KeyInfo>
<CipherData>
<CipherValue>MiKRuFl1Yb3Vw9JcewTAYVnYT3Zh2Tf9d0fhRyGreJW0FwOxR1/27AXFXBTmZC/2
hw9cMMFAGKeXNrltK00s1Lozx9uZZYoF5UINH18KD/WnNbpwk+ttK3TwRcxBfowm
lzzClMn5suHeUM2PpfiCl1lWup8cSfwAqptXVF3sZrLAMSQWJmGfyGYyCiaZ+P3NZ
hiVFamDB7D9id5HJ3qHLNcxucGNFA5TfOwe/euP701ah9Q7Rp2nxsXF9PaQYziSS
G4I/J+v+FwuJXhbLqU1PcbP4ofCLg+s6tph2kXfArGSX9u3k7FHvp3tLZnskXCw
iYRGDqrSGrmL7tTmMf/IhFQc4x0ae4ldVEN999uQ6KnDyd22KdUJhupRH8UqZz
+sKVJF3+yatOsroCwOcjTe/GqnNRZntG59dGC5D247LH2AVn/6WU+txFflZhuG0z
A0PElImicguTRAeAIDGJF/QvqzTElr3iYgHXIGfgEhQiiX35ZURWUTcATrKyNFFe
/CD8+v6YHGbkRgeJdnvJ5AqjZSU1NaJOpCtbbWQm1D878OhjCN+T689PZPB2X2nz
flkupkZ/Fq6Z6aF77j0xp4wB7bpFW5ssWUHySwdg5vYw4hS3Geg5wn3AQViqTGI8
oRaDa3wT9byHq+cq83Wqa3aroJOXzD/HQCmKNhmPFqYj503JH3aZcWNRDxHyBQRr
Libv4o9v4LCGviaKT/2y0S25t5KkL/MJA2c6LIngmhHKQFr1sruWgSrjHn9KtagU
KeYqYlqK6s56X+PHQvusXoxpgDLjXpVvHnpF/mR+h86J4zY3JAicfIZJQ05DjvX
io2iZY/hstzkTfY5+CPvKH7FmuYqeoU7Nano7+EGSB4w0TnSoDfm9D/RIsAtwdpu
7WonmeguEK37u0bNuuQnYi9LZTELD0L2HtkPVdo4BYq26WMe5vZdwkV6up92AIEQ
7KvADQZUGDVoKA3Njt90S56g+a14wcHqx+FS8veacDsYFrmhs+0WYlyWtDJERL
+y0qtHlmsi/kTdYoKRGx+/lyU18FIfqOnk2dk3BicbQ3kyEbnGv3qHBrYqrVITTB
eMUKxL3wB50kcCn3u6Nqun14QFmf809KEZGXZZqdQs7jz6MV3yjpVzelmLs9nbCm
3eXFGrS1HbbwCLQBconzDWgfoN6W/1TRv3z8RmTg+Z+3CjK2MRt6x5XZTcDqk4JW
wozh2btLz4Yc2xUbc1btVd3muOhBq3eSsGXC6xX4fxW0cuqi6UsOZRA2kiKJHY+V
2KPO9/y3x4arscIsBwfmNVZYT6bcCoy/Or0yva49yV/A//8JFN7aGLh530Dt53J4H
bcsQln3q7kxir5VLuNj0aZYHjtGu7gzPalUpPAJ0trqro4qinspnkdRueW7SQCyd
uF5OG4GMI+VvjX4MnOMogNiAaZqrBoH3B5t7bAKesZVPS6S9NPFkzxlnkqminG
/Z/hBpmsFlcUls+qylXU7umHvssE2juaplNQUaL6IyHQ0tZzsQd0e6mYkDuzNNbH
419czPXXfvcKRJnJ0Yho9j30YfBwyl1F67SMewYhcnG35tAbstXe+Ghg+D/TVcd
SZ4r1Cmk49IQE3SNwIO6vGUTmhmCJGq+yJx891fMLiJzRBr18exdQ1hoVeQ+YzyY
rZ/e6PTZHVkbcHGLsd+InyBdz3MTCmaYLGgG6gGtL42nJYmXDUiWTAfXcWo0jDh
HO280imZg8QGhiSAAC8uXzwbTjVHIJTC27e6iqldNxnYDoNWDZxVjI3fcccBVUwmz
702I+4Kb/n5M1X5RXeMZ120v1RRnQi7nhZuTeTMEBrIzHptWP5yse3LcNjRJ2Jr2</CipherValue>
</CipherData>
</EncryptedData>
</embeddedXMLContent>
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</xmlContent>
  <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
<SignedInfo>
<CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
<SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
<Reference>
<Transforms>
<Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
</Transforms>
<DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
<DigestValue>N7NvgXfahdGZPjb9o0XvvejLI5o=</DigestValue>
</Reference>
</SignedInfo>
<SignatureValue>Tg8zP+/1Cg/3MR9iSareJb7snexQ3DjBxGSL3xH+Kf3Kh5NQq/Uwagw/fmI2wcxc
ac/2fz893HeTkXGn8mShg+wmdoRwNykp5uHptAzcfBklh3v7FemtM9M73XbX7KsY
fm0J+RTHUxp4tTMYUPogSEJWiSGSGVbp+MALtUH799fGqqqOREyuljfvIILvvCog
wOd6n7J8S2sHjyRXEw5AVFnxL6k02TgjztbEuoLu+qvEZOIGXmj9yfy4nj41RNXe
HMOS1IAcOQgx5vNzju2slFIWzlmvjqq+7aVg5hy0yBiXJuljvigtOxrwHSCaYW8o
HDpQHwM6EXbgW3uaWnf9Kg==</SignatureValue>
<KeyInfo>
<KeyName>rsakey.pem</KeyName>
</KeyInfo>
</Signature></contentObject>
  <contentObject>
    <contentDescription>Photo image from Sensor: RADDET-01, Site: Golden Gate Bridge, having a
Detection class of SNM</contentDescription>
    <contentKeyword>
      <valueListUrn>"urn:sandia:gov:sensor:detection.event.id"</valueListUrn>
      <value>10.2.2.1:2005-08-07T18:00:00Z</value>
    </contentKeyword>
    <confidentiality>Unclassified</confidentiality>
    <nonXMLContent>
      <mimeType>image/jpeg</mimeType>
      <uri>http://sentry/photoCapture/10.2.2.1:2005-08-07T18:00:00Z</uri>
    </nonXMLContent>
    <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
<SignedInfo>
<CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
<SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
<Reference>
<Transforms>
<Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
</Transforms>
<DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
<DigestValue>io7Katgoo77YNfQYdZMB8taoeKg=</DigestValue>
</Reference>
</SignedInfo>
<SignatureValue>AjQXGgp9h5TC2D+bh9w59sbmtUpge/IeZVdDQM+zI58XT2RPb70XAAABni78WduA
uP6nxL6k+BBo4G+TgaqWvCQIqldlDO+qyMnM0ExPui5eg00jstbwiSeYxSt2VQqS2
RD2vR8l1at0XwIkMpugSftKNJBZgB9mhRqQgP+E0ndJJPNYDz0bLjJp0J/EDxn4H
6qx6GpDKgDc//53jVhOb4zZPIERsTLjPxp0OnBK31cs5Rf6vU9MyOObTHZgpvoza
muhejWlCIJfyjd/OoKQ9Hiv4MCX4v/dX7n6ePHZaDxNeCccDIjovYrAHEWxQ9hE6
rqrIugNLZ3Lh8sUzhZLTyg==</SignatureValue>
<KeyInfo>
<KeyName>rsakey.pem</KeyName>
</KeyInfo>
</Signature></contentObject>
  <!-- This is the based 64 encode image of the Suspect vehicle with SNM.
This data is provide for Law Enforcement sensitive systems to redistribute
on private systems which do not have internet access.
-->
  <contentObject>
    <contentDescription>Photo image from Sensor: RADDET-01, Site: Golden Gate Bridge, having a
Detection class of SNM</contentDescription>
    <contentKeyword>
      <valueListUrn>"urn:sandia:gov:sensor:detection.event.id"</valueListUrn>
      <value>10.2.2.1:2005-08-07T18:00:00Z</value>
    </contentKeyword>
    <confidentiality>Unclassified</confidentiality>
    <nonXMLContent>
      <mimeType>image/jpeg</mimeType>
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<contentData>
  /9j//gAoaAkAAAAAAECMWv/mOzNdGAAAAAAAAAAAAAAAAAAAAAAAAAAD/2wBDAAgGBgcGBQgH
  BwcJCQgKDBQNDAAsLDBkSEw8UHRofHh0aHBwgJC4nICIsIxwckDcpLDAxNDQ0Hyc5PTgyPC4zNDL/
  AYG3nGaeEI5BoACp6gmmgKwOBzQBFIcRUZxIwOKAE8s jmms5Uc0AU5JwTioxLjpQBHIc5qpJQBGGr
  YNSgjFACbuacQctAEIXDVO0lACgUuAaAG4xVbUP+Qdc/9czQB//Z
</contentData>
</nonXMLContent>
  <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
<SignedInfo>
<CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
<SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
<Reference>
<Transforms>
<Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
</Transforms>
<DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
<DigestValue>PkrjafckUd027EETVu5JwqlubcA=</DigestValue>
</Reference>
</SignedInfo>
<SignatureValue>NvqlkBLs4GpM+t+uoWQ53rmjNT43qdwBMsEoiB0a2BRwqkmyNkQDbA2eIHmxfBfo
xe+q+15v/2IGQQw+5XmWtMx8QIQkGBELsdlybOKibxBqNuWH+J6yR1mIA6bOmBE+
+F2zA9DuvKZVLa8El1pUGke6FeIzoMC7TdDcBtmSAkRMXxe8MjxjxApm3vnMst9A
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<KeyInfo>
<KeyName>rsaKey.pem</KeyName>
</KeyInfo>
</Signature></contentObject>
  <!--
  The following content object contains the readings from a UNWD radiation Portal
  The Detection ID is being used to correlate other contentObject container elements to
  the data found in this detection

  Because there is no provision for Location information in the current metadata situational
  awareness systems would have to extract location for the contents of related CAP messages.
  -->
</EDXLDistribution>
```

1 Appendix C. Acknowledgments

2 C.1 OASIS Emergency Management Technical Committee:

- 3 • John Aerts, LA County Information Systems Advisory Body
- 4 • Patti Aymond, IEM
- 5 • William Beavin, The Boeing Company
- 6 • Art Botterell, Individual
- 7 • Rex Brooks, HumanMarkup.org, Inc.
- 8 • Thomas Bui, The Boeing Company
- 9 • Len Bullard, Individual
- 10 • Scott Came, Individual
- 11 • Mark Carlson, Conneva, Inc.
- 12 • Eliot Christian, US Department of the Interior
- 13 • James Bryce Clark, OASIS
- 14 • Robin Cover, OASIS
- 15 • David Danko, ESRI
- 16 • Paul Denning, Mitre Corporation
- 17 • Mike Dillon, Drummond Group, Inc.
- 18 • Matthew Dovey, Oxford University
- 19 • Sukumar Dwarkanath, Individual
- 20 • Scott Edson, LA County Information Systems Advisory Body
- 21 • David, Ellis, Individual
- 22 • Jeff Flading, Anteon Corporation
- 23 • Jack Fox, US Department of Homeland Security
- 24 • Lawrence Freudinger, NASA
- 25 • Gerald Golden, Raytheon Technical Services Company
- 26 • Tim Grapes, Science Applications International Corporation
- 27 • Gilbert Green, USAMC Logistics Support Activity
- 28 • Gary Ham, Disaster Management Interoperability Services
- 29 • Adam Hocek, Individual
- 30 • Travis Hubbard, Disaster Management Interoperability Services
- 31 • Renato Iannella, NICTA
- 32 • Stephen Jepsen, Oracle
- 33 • Elysa Jones, Warning Systems, Inc.
- 34 • Hong-Eng Koh, Sun Microsystems
- 35 • Jeff Kyser, Warning Systems, Inc.
- 36 • Louis Lagonik, Lockheed Martin
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- 38 • Richard Masline, IBM
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- 42 • John Moehrke, GE Healthcare
- 43 • Russell Moody, Science Applications International Corporation
- 44 • James Morentz, Science Applications International Corporation
- 45 • Raajmohan Na, EDS
- 46 • Bona Nasution, MTG Management Consultants, LLC.
- 47 • Ash Parikh, Raining Data Corporation
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- 2 • Michelle Raymond, Individual
- 3 • Carl Reed, Open GIS Consortium (OGC)
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- 12 • Michael Thompson, The Boeing Company
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- 14 • Brett Trusko, OASIS
- 15 • Rick Tucker, Mitre Corporation
- 16 • Richard Vandame, US Department of Homeland Security
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- 18 • Sylvia Webb, Individual
- 19 • Jerry Weltman, IEM
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1 **Appendix D. Revision History**

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Revision	Date	Editor	Changes Made

3