



Common Alerting Protocol, v. 1.1

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Abstract:

The Common Alerting Protocol (CAP) is a simple but general format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks. CAP allows a consistent warning message to be disseminated simultaneously over many different warning systems, thus increasing warning effectiveness while simplifying the warning task. CAP also facilitates the detection of emerging patterns in local warnings of various kinds, such as might indicate an undetected hazard or hostile act. And CAP provides a template for effective warning messages based on best practices identified in academic research and real-world experience.

Status:

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Table of Contents

1	Introduction.....	4
1.1	Purpose.....	4
1.2	History.....	4
1.3	Structure of the CAP Alert Message.....	4
1.3.1	<alert>	5
1.3.2	<info>.....	5
1.3.3	<resource>	5
1.3.4	<area>	5
1.4	Applications of the CAP Alert Message.....	5
1.5	Terminology	5
1.6	Normative References	6
2	Design Principles and Concepts (non-normative).....	7
2.1	Design Philosophy	7
2.2	Requirements for Design	7
2.3	Examples of Use Scenarios.....	8
2.3.1	Manual Origination	8
2.3.2	Automated Origination by Autonomous Sensor System.....	8
2.3.3	Aggregation and Correlation on Real-time Map.....	8
2.3.4	Integrated Public Alerting	8
2.3.5	Repudiating A False Alarm.....	9
3	Alert Message Structure (normative).....	10
3.1	Document Object Model	10
3.2	3.2 Data Dictionary	10
3.2	3.2 Data Dictionary	11
3.2.1	"alert" Element and Sub-elements	11
3.2.2	"info" Element and Sub-elements.....	14
3.2.3	"resource" Element and Sub-elements	20
3.2.4	"area" Element and Sub-elements	22
3.3	Implementation Notes.....	24
3.3.1	WGS-84 Note	24
3.3.2	Coordinate Precision Note	Error! Bookmark not defined.
3.3.3	Security Note	24
3.4	XML Schema	24
	Appendix A. CAP Alert Message Example	28
A.1.	Homeland Security Advisory System Alert.....	28
A.2.	Severe Thunderstorm Warning	29
A.3.	Earthquake Report	30
A.4.	AMBER Alert	31
	Appendix B. Acknowledgments	32
	OASIS Emergency Management Technical Committee	32
	Appendix C. Revision History.....	34

1 Introduction

1.1 Purpose

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 techniques, 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 that include:

- Flexible geographic targeting using latitude/longitude shapes and other geospatial representations in three dimensions;
- Multilingual and multi-audience messaging;
- Phased and delayed effective times and expirations;
- Enhanced message update and cancellation features;
- Template support for framing complete and effective warning messages;
- Compatible with digital encryption and signature capability; and,
- Facility for digital images and audio.

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

1.2 History

The National Science and Technology Council report on "Effective Disaster Warnings" released in November, 2000 recommended that "a standard method should be developed to collect and relay instantaneously and automatically all types of hazard warnings and reports locally, regionally and nationally for input into a wide variety of dissemination systems."

An international working group of more than 130 emergency managers and information technology and telecommunications experts convened in 2001 and adopted the specific recommendations of the NSTC report as a point of departure for the design of a Common Alerting Protocol (CAP). Their draft went through several revisions and was tested in demonstrations and field trials in Virginia (supported by the ComCARE Alliance) and in California (in cooperation with the California Office of Emergency Services) during 2002 and 2003.

In 2002 the CAP initiative was endorsed by the national non-profit Partnership for Public Warning, which sponsored its contribution in 2003 to the OASIS standards process. In 2004, CAP version 1.0 was adopted as an OASIS Standard.

1.3 Structure of the CAP Alert Message

Each CAP Alert Message consists of an <alert> segment, which may contain one or more <info> segments, each of which may include one or more <area> segments. Under most circumstances CAP messages with a <msgType> value of "Alert" SHOULD include at least one <info> element. (See the document object model diagram in section 3.1, below.)

41 **1.3.1 <alert>**

42 The <alert> segment provides basic information about the current message: its purpose, its source and
43 its status, as well as unique identifier for the current message and links to any other, related messages.
44 An <alert> segment may be used alone for message acknowledgements, cancellations or other system
45 functions, but most <alert> segments will include at least one <info> segment.

46 **1.3.2 <info>**

47 The <info> segment describes an anticipated or actual event in terms of its urgency (time available to
48 prepare), severity (intensity of impact) and certainty (confidence in the observation or prediction), as well
49 as providing both categorical and textual descriptions of the subject event. It may also provide
50 instructions for appropriate response by message recipients and various other details (hazard duration,
51 technical parameters, contact information, links to additional information sources, etc.) Multiple <info>
52 segments may be used to describe differing parameters (e.g., for different probability or intensity “bands”)
53 or to provide the information in multiple languages.

54 **1.3.3 <resource>**

55 The <resource> segment provides an optional reference to additional information related to the <info>
56 segment within which it appears in the form of a digital asset such as an image or audio file.

57 **1.3.4 <area>**

58 The <area> segment describes a geographic area to which the <info> segment in which it appears
59 applies. Textual and coded descriptions (such as postal codes) are supported, but the preferred
60 representations use geospatial shapes (polygons and circles) and an altitude or altitude range, expressed
61 in standard latitude / longitude / altitude terms in accordance with a specified geospatial datum.

62 **1.4 Applications of the CAP Alert Message**

63 The primary use of the CAP Alert Message is to provide a single input to activate all kinds of alerting and
64 public warning systems. This reduces the workload associated with using multiple warning systems while
65 enhancing technical reliability and target-audience effectiveness. It also helps ensure consistency in the
66 information transmitted over multiple delivery systems, another key to warning effectiveness.

67 A secondary application of CAP is to normalize warnings from various sources so they can be aggregated
68 and compared in tabular or graphic form as an aid to situational awareness and pattern detection.

69 Although primarily designed as an interoperability standard for use among warning systems and other
70 emergency information systems, the CAP Alert Message can be delivered directly to alert recipients over
71 various networks, including data broadcasts. Location-aware receiving devices could use the information
72 in a CAP Alert Message to determine, based on their current location, whether that particular message
73 was relevant to their users.

74 The CAP Alert Message can also be used by sensor systems as a format for reporting significant events
75 to collection and analysis systems and centers.

76 **1.5 Terminology**

77 The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD
78 NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described
79 in [RFC2119].

80 The words *warning*, *alert* and *notification* are used interchangeably throughout this document.

81 The term “coordinate pair” is used in this document to refer to a comma-delimited pair of decimal values
82 describing a geospatial location in degrees, unprojected, in the form “[latitude],[longitude]”. Latitudes in
83 the Southern Hemisphere and longitudes in the Western Hemisphere are signed negative with a leading
84 dash.

85 1.6 Normative References

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110 <http://www.w3.org/TR/2002/REC-xmlenc-core-20021210/>, W3C
111 Recommendation, December 2002.

112 2 Design Principles and Concepts (non-normative)

113 2.1 Design Philosophy

114 Among the principles which guided the design of the CAP Alert Message were:

- 115 • **Interoperability** – First and foremost, the CAP Alert Message should provide a means for
116 interoperable exchange of alerts and notifications among all kinds of emergency information
117 systems.
- 118 • **Completeness** – The CAP Alert Message format should provide for all the elements of an
119 effective public warning message.
- 120 • **Simple implementation** – The design should not place undue burdens of complexity on
121 technical implementers.
- 122 • **Simple XML and portable structure** – Although the primary anticipated use of the CAP Alert
123 Message is as an XML document, the format should remain sufficiently abstract to be adaptable
124 to other coding schemes.
- 125 • **Multi-use format** – One message schema supports multiple message types (e.g., alert / update /
126 cancellations / acknowledgements / error messages) in various applications (actual / exercise /
127 test / system message.)
- 128 • **Familiarity** – The data elements and code values should be meaningful to warning originators
129 and non-expert recipients alike.
- 130 • **Interdisciplinary and international utility** – The design should allow a broad range of
131 applications in public safety and emergency management and allied applications and should be
132 applicable worldwide.

133 2.2 Requirements for Design

134 Note: The following requirements were used as a basis for design and review of the CAP
135 Alert Message format. This list is non-normative and not intended to be exhaustive.

136 The Common Alerting Protocol SHOULD:

- 137 • Provide a specification for a simple, extensible format for digital representation of warning
138 messages and notifications;
- 139 • Enable integration of diverse sensor and dissemination systems;
- 140 • Be usable over multiple transmission systems, including both TCP/IP-based networks and one-
141 way "broadcast" channels;
- 142 • Support credible end-to-end authentication and validation of all messages;
- 143 • Provide a unique identifier (e.g., an ID number) for each warning message and for each message
144 originator;
- 145 • Provide for multiple message types, such as:
 - 146 – Warnings
 - 147 – Acknowledgements
 - 148 – Expirations and cancellations
 - 149 – Updates and amendments
 - 150 – Reports of results from dissemination systems
 - 151 – Administrative and system messages
- 152 • Provide for multiple message types, such as:

- 153 – Geographic targeting
- 154 – Level of urgency
- 155 – Level of certainty
- 156 – Level of threat severity
- 157 • Provide a mechanism for referencing supplemental information (e.g., digital audio or image files,
158 additional text);
- 159 • Use an established open-standard data representation;
- 160 • Be based on a program of real-world cross-platform testing and evaluation;
- 161 • Provide a clear basis for certification and further protocol evaluation and improvement; and,
- 162 • Provide a clear logical structure that is relevant and clearly applicable to the needs of emergency
163 response and public safety users and warning system operators.

164 **2.3 Examples of Use Scenarios**

165 Note: The following examples of use scenarios were used as a basis for design and
166 review of the CAP Alert Message format. These scenarios are non-normative and not
167 intended to be exhaustive or to reflect actual practices.

168 **2.3.1 Manual Origination**

169 “The Incident Commander at an industrial fire with potential of a major explosion decides to issue a public
170 alert with three components: a) An evacuation of the area within half a mile of the fire; b) a shelter-in-
171 place instruction for people in a polygon roughly describing a downwind dispersion ‘plume’ extending
172 several miles downwind and half a mile upwind from the fire; and c) a request for all media and civilian
173 aircraft to remain above 2500 feet above ground level when within a half mile radius of the fire.

174 “Using a portable computer and a web page (and a pop-up drawing tool to enter the polygon) the Incident
175 Commander issues the alert as a CAP message to a local alerting network.”

176 **2.3.2 Automated Origination by Autonomous Sensor System**

177 “A set of automatic tsunami warning sirens has been installed along a popular Northwest beach. A
178 wireless network of sensor devices collocated with the sirens controls their activation. When triggered,
179 each sensor generates a CAP message containing its location and the sensed data at that location that is
180 needed for the tsunami determination. Each siren activates when the combination of its own readings and
181 those reported at by other devices on the network indicate an immediate tsunami threat. In addition, a
182 network component assembles a summary CAP message describing the event and feeds it to regional
183 and national alerting networks.”

184 **2.3.3 Aggregation and Correlation on Real-time Map**

185 “At the State Operations Center a computerized map of the state depicts, in real time, all current and
186 recent warning activity throughout the state. All major warning systems in the state – the Emergency
187 Alert System, siren systems, telephone alerting and other systems – have been equipped to report the
188 details of their activation in the form of a CAP message. (Since many of them are now activated by way
189 of CAP messages, this is frequently just a matter of forwarding the activation message to the state
190 center.)

191 “Using this visualization tool, state officials can monitor for emerging patterns of local warning activity and
192 correlate it with other real time data (e.g., telephone central office traffic loads, 9-1-1 traffic volume,
193 seismic data, automatic vehicular crash notifications, etc.).”

194 **2.3.4 Integrated Public Alerting**

195 “As part of an integrated warning system funded by local industry, all warning systems in a community
196 can be activated simultaneously by the issuance by authorized authority of a single CAP message.

197 “Each system converts the CAP message data into the form suitable for its technology (text captioning on
198 TV, synthesized voice on radio and telephone, activation of the appropriate signal on sirens, etc.).
199 Systems that can target their messages to particular geographic areas implement the targeting specified
200 in the CAP message with as little ‘spill’ as their technology permits.

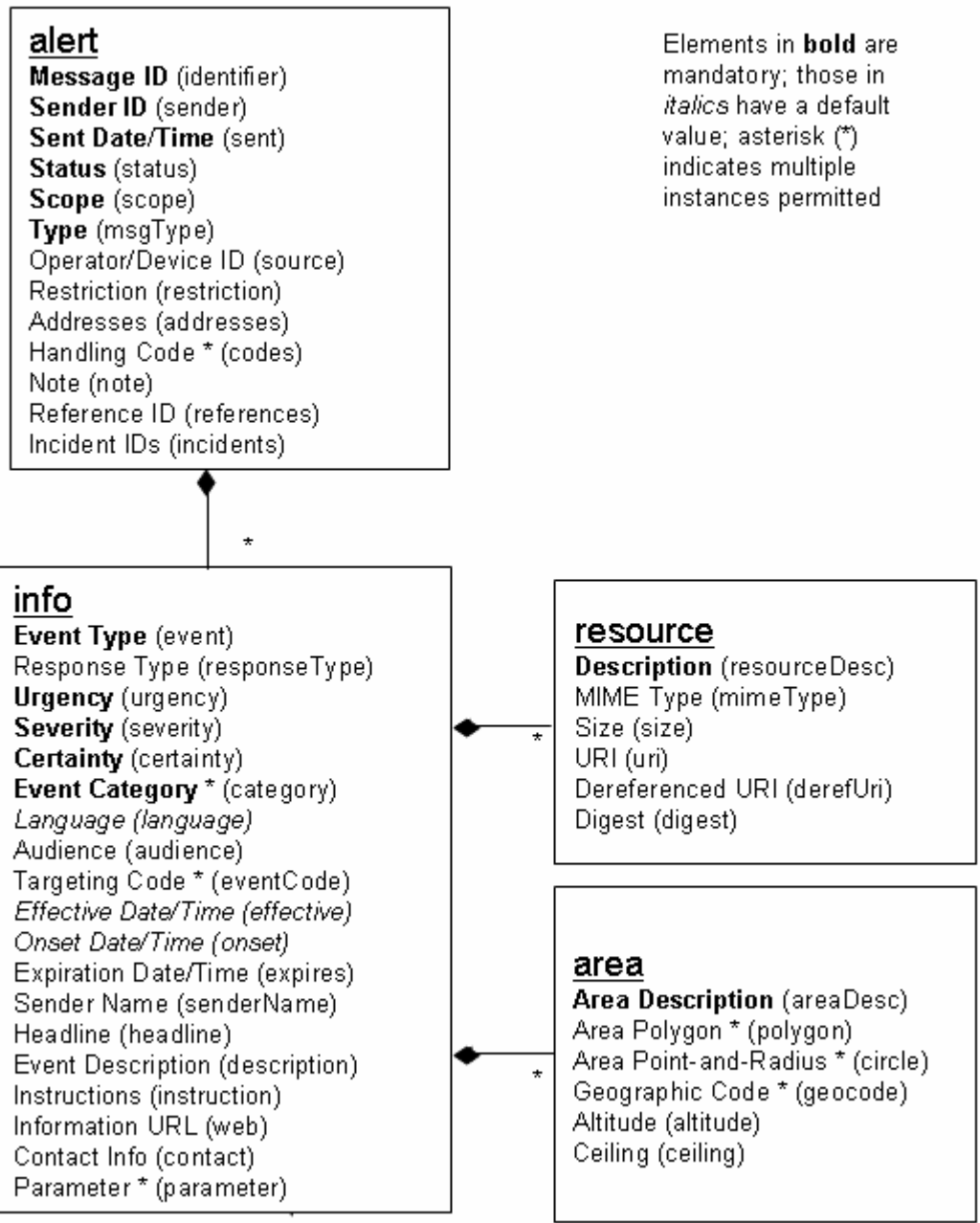
201 “In this way, not only is the reliability and reach of the overall warning system maximized, but citizens also
202 get corroboration of the alert through multiple channels, which increases the chance of the warning being
203 acted upon.”

204 **2.3.5 Repudiating a False Alarm**

205 “Inadvertently the integrated alerting network has been activated with an inaccurate warning message.
206 This activation comes to officials’ attention immediately through their own monitoring facilities (e.g., 2.3.3
207 above). Having determined that the alert is, in fact, inappropriate, the officials issue a cancellation
208 message that refers directly to the erroneous prior alert. Alerting systems that are still in the process of
209 delivering the alert (e.g., telephone dialing systems) stop doing so. Broadcast systems deliver the
210 cancellation message. Other systems (e.g., highway signs) simply reset to their normal state.”

211 **3 Alert Message Structure (normative)**

212 **3.1 Document Object Model**



213

215 **3.2 Data Dictionary**

216 Note: Unless explicitly constrained within this Data Dictionary or the XML Schema
 217 (Section 3.4), CAP elements may have null values. Implementers MUST check for this
 218 condition wherever it might affect application performance.

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
3.2.1 "alert" Element and Sub-elements			
alert	cap. alert. group	The container for all component parts of the alert message (REQUIRED)	(1) Surrounds CAP alert message sub-elements. (2) MUST include the xmlns attribute referencing the CAP URI as the namespace, e.g.: <pre><cap:alert xmlns:cap="http://www.incident.com/cap/1.1"> [sub-elements] </cap:alert></pre> (3) In addition to the specified sub-elements, MAY contain one or more <info> blocks.
identifier	cap. alert. identifier	The identifier of the alert message (REQUIRED)	(1) A number or string uniquely identifying this message, assigned by the sender (2) MUST NOT include spaces, commas or restricted characters (< and &)
sender	cap. alert. sender. identifier	The identifier of the sender of the alert message (REQUIRED)	(1) Identifies the originator of this alert. Guaranteed by assigner to be unique globally; e.g., may be based on an Internet domain name (2) MUST NOT include spaces, commas or restricted characters (< and &)
source	cap. alert. source. identifier	The text identifying the source of the alert message (OPTIONAL)	The particular source of this alert; e.g., an operator or a specific device.

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
sent	cap. alert. sent. time	The time and date of the origination of the alert message (REQUIRED)	The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT).
status	cap. alert. status. code	The code denoting the appropriate handling of the alert message (REQUIRED)	Code Values: "Actual" - Actionable by all targeted recipients "Exercise"- Actionable only by designated exercise participants; exercise identifier should appear in <note> "System" - For messages that support alert network internal functions. "Test" - Technical testing only, all recipients disregard
scope	cap. alert. scope. code	The code denoting the intended distribution of the alert message (REQUIRED)	Code Values: "Public" - For general dissemination to unrestricted audiences "Restricted" - For dissemination only to users with a known operational requirement (see <restriction>, below) "Private" - For dissemination only to specified addresses (see <address>, below)
restriction	cap. alert. restriction. text	The text describing the rule for limiting distribution of the restricted alert message (conditional)	Used when <scope> value is "Restricted"
addresses	cap. alert. addresses. group	The group listing of intended recipients of the private alert message (conditional)	(1) Used when <scope> value is "Private" (2) Each recipient SHALL be identified by an identifier or an address (3) Multiple space-delimited addresses MAY be included. Addresses including whitespace MUST be enclosed in double-quotes.

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
code	cap. alert. code	The code denoting the special handling of the alert message (OPTIONAL)	Any user-defined flag or special code used to flag the alert message for special handling.
msgType	cap. alert. type. code	The code denoting the nature of the alert message (REQUIRED)	Code Values: “Alert” - Initial information requiring attention by targeted recipients “Update” - Updates and supercedes the earlier message(s) identified in <references> “Cancel” - Cancels the earlier message(s) identified in <references> “Ack” - Acknowledges receipt and acceptance of the message(s) identified in <references> “Error” indicates rejection of the message(s) identified in <references>; explanation SHOULD appear in <note>
note	cap. alert. note. text	The text describing the purpose or significance of the alert message (OPTIONAL)	The message note is primarily intended for use with Cancel and Error alert message types.
references	cap. alert. references. group	The group listing identifying earlier message(s) referenced by the alert message (OPTIONAL)	(1) The extended message identifier(s) (in the form <i>sender,identifier,sent</i>) of an earlier CAP message or messages referenced by this one. (2) If multiple messages are referenced, they SHALL be separated by whitespace.

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
incidents	cap. alert. incidents. group	The group listing naming the referent incident(s) of the alert message (OPTIONAL)	<ul style="list-style-type: none"> (1) Used to collate multiple messages referring to different aspects of the same incident (2) If multiple incident identifiers are referenced, they SHALL be separated by whitespace. Incident names including whitespace SHALL be surrounded by double-quotes
3.2.2 "info" Element and Sub-elements			
info	cap. alertInfo. info. group	The container for all component parts of the info sub-element of the alert message (OPTIONAL)	<ul style="list-style-type: none"> (1) Multiple occurrences are permitted within a single <alert>. If targeting of multiple "info" blocks in the same language overlaps, information in later blocks may expand but may not override the corresponding values in earlier ones. Each set of "info" blocks containing the same language identifier SHALL be treated as a separate sequence. (2) In addition to the specified sub-elements, MAY contain one or more <resource> blocks and/or one or more <area> blocks.
language	cap. alertInfo. language. code	The code denoting the language of the info sub-element of the alert message (OPTIONAL)	<ul style="list-style-type: none"> (1) Code Values: Natural language identifier per [RFC 3066]. (2) If not present, an implicit default value of "en-US" SHALL be assumed. (3) A null value in this element SHALL be considered equivalent to "en-US."

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
category	cap. alertInfo. category. code	The code denoting the category of the subject event of the alert message (REQUIRED)	<p>(1) Code Values:</p> <p>“Geo” - Geophysical (inc. landslide)</p> <p>“Met” - Meteorological (inc. flood)</p> <p>“Safety” - General emergency and public safety</p> <p>“Security” - Law enforcement, military, homeland and local/private security</p> <p>“Rescue” - Rescue and recovery</p> <p>“Fire” - Fire suppression and rescue</p> <p>“Health” - Medical and public health</p> <p>“Env” - Pollution and other environmental</p> <p>“Transport” - Public and private transportation</p> <p>“Infra” - Utility, telecommunication, other non-transport infrastructure</p> <p>“CBRNE” – Chemical, Biological, Radiological, Nuclear or High-Yield Explosive threat or attack</p> <p>“Other” - Other events</p> <p>(2) Multiple instances MAY occur within a single <info> block.</p>
event	cap. alertInfo. event. text	The text denoting the type of the subject event of the alert message (REQUIRED)	

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
responseType	cap. alertInfo. responseType. code	The code denoting the type of action recommended for the target audience. (OPTIONAL)	<p>(1) Code Values:</p> <p>“Shelter” – Take shelter in place or per <instruction></p> <p>“Evacuate” – Relocate as instructed in the <instruction></p> <p>“Prepare” – Make preparations per the <instruction></p> <p>“Execute” – Execute a pre-planned activity identified in <instruction></p> <p>“Monitor” – Attend to information sources as described in <instruction></p> <p>“Assess” – Evaluate the information in this message. (This value SHOULD NOT be used in public warning applications.)</p> <p>“None” – No action recommended</p> <p>(2) Multiple instances MAY occur within a single <info> block.</p>
urgency	cap. alertInfo. urgency. code	The code denoting the urgency of the subject event of the alert message (REQUIRED)	<p>(1) The “urgency”, “severity”, and “certainty” elements collectively distinguish less emphatic from more emphatic messages.</p> <p>(2) Code Values:</p> <p>“Immediate” - Responsive action SHOULD be taken immediately</p> <p>“Expected” - Responsive action SHOULD be taken soon (within next hour)</p> <p>“Future” - Responsive action SHOULD be taken in the near future</p> <p>“Past” - Responsive action is no longer required</p> <p>“Unknown” - Urgency not known</p>

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
severity	cap. alertInfo. severity. code	The code denoting the severity of the subject event of the alert message (REQUIRED)	<p>(1) The “urgency”, “severity”, and “certainty” elements collectively distinguish less emphatic from more emphatic messages.</p> <p>(2) Code Values:</p> <p>“Extreme” - Extraordinary threat to life or property</p> <p>“Severe” - Significant threat to life or property</p> <p>“Moderate” - Possible threat to life or property</p> <p>“Minor” - Minimal threat to life or property</p> <p>“Unknown” - Severity unknown</p>
certainty	cap. alertInfo. certainty. code	The code denoting the certainty of the subject event of the alert message (REQUIRED)	<p>(1) The “urgency”, “severity”, and “certainty” elements collectively distinguish less emphatic from more emphatic messages.</p> <p>(2) Code Values:</p> <p>“Observed” – Determined to have occurred or to be ongoing.</p> <p>“Likely” - Likely (p > ~50%)</p> <p>“Possible” - Possible but not likely (p <= ~50%)</p> <p>“Unlikely” - Not expected to occur (p ~ 0)</p> <p>“Unknown” - Certainty unknown</p> <p>(3) For backward compatibility with CAP 1.0, the deprecated value of “Very Likely” SHOULD be treated as equivalent to “Likely.”</p>
audience	cap. alertInfo. audience. text	The text describing the intended audience of the alert message (OPTIONAL)	

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
eventCode	cap. alertInfo. event. code	A system-specific code identifying the event type of the alert message (OPTIONAL)	<p>(1) Any system-specific code for event typing, in the form:</p> <pre><eventCode> <valueName>valueName</valueName> <value>value</value> </eventCode></pre> <p>where the content of "valueName" is a user-assigned string designating the domain of the code, and the content of "value" is a string (which may represent a number) denoting the value itself (e.g., valueName = "SAME" and value="CEM").</p> <p>(2) Values of "valueName" that are acronyms SHOULD be represented in all capital letters without periods (e.g., SAME, FIPS, ZIP).</p> <p>(3) Multiple instances MAY occur within a single <info> block.</p>
effective	cap. alertInfo. effective. time	The effective time of the information of the alert message (OPTIONAL)	<p>(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT).</p> <p>(2) If this item is not included, the effective time SHALL be assumed to be the same as in <sent>.</p>
onset	cap. alertInfo. onset. time	The expected time of the beginning of the subject event of the alert message (OPTIONAL)	The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT).
expires	cap. alertInfo. expires. time	The expiry time of the information of the alert message (OPTIONAL)	<p>(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16:49 PDT).</p> <p>(2) If this item is not provided, each recipient is free to set its own policy as to when the message is no longer in effect.</p>

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
senderName	cap. alertInfo. sender. name	The text naming the originator of the alert message (OPTIONAL)	The human-readable name of the agency or authority issuing this alert.
headline	cap. alertInfo. headline. text	The text headline of the alert message (OPTIONAL)	A brief human-readable headline. Note that some displays (for example, short messaging service devices) may only present this headline; it SHOULD be made as direct and actionable as possible while remaining short. 160 characters MAY be a useful target limit for headline length.
description	cap. alertInfo. description. text	The text describing the subject event of the alert message (OPTIONAL)	An extended human readable description of the hazard or event that occasioned this message.
instruction	cap. alertInfo. instruction. text	The text describing the recommended action to be taken by recipients of the alert message (OPTIONAL)	An extended human readable instruction to targeted recipients. (If different instructions are intended for different recipients, they should be represented by use of multiple <info> blocks.)
web	cap alertInfo. information. identifier	The identifier of the hyperlink associating additional information with the alert message (OPTIONAL)	A full, absolute URI for an HTML page or other text resource with additional or reference information regarding this alert
contact	cap. alertInfo. contact. text	The text describing the contact for follow-up and confirmation of the alert message (OPTIONAL)	

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
parameter	cap. alertInfo. parameter. group	A system-specific additional parameter associated with the alert message (OPTIONAL)	<p>(1) Any system-specific datum, in the form:</p> <pre><parameter> <valueName>valueName</valueName> <value>value</value> </parameter></pre> <p>where the content of "valueName" is a user-assigned string designating the domain of the code, and the content of "value" is a string (which may represent a number) denoting the value itself (e.g., valueName = "SAME" and value="CIV".)</p> <p>(2) Values of "valueName" that are acronyms SHOULD be represented in all capital letters without periods (e.g., SAME, FIPS, ZIP).</p> <p>(3) Multiple instances MAY occur within a single <info> block.</p>

3.2.3 "resource" Element and Sub-elements

resource	cap alertInfoResource. resource. group	The container for all component parts of the resource sub-element of the info sub-element of the alert element (OPTIONAL)	<p>(1) Refers to an additional file with supplemental information related to this <info> element; e.g., an image or audio file</p> <p>(2) Multiple occurrences MAY occur within a single <info> block</p>
resourceDesc	cap. alertInfoResource. resourceDesc. text	The text describing the type and content of the resource file (REQUIRED)	The human-readable text describing the content and kind, such as "map" or "photo," of the resource file.
contentType	cap. alertInfoResource. contentType. identifier	The identifier of the MIME content type and sub-type describing the resource file (OPTIONAL)	MIME content type and sub-type as described in [RFC 2046] . (As of this document, the current IANA registered MIME types are listed at http://www.iana.org/assignments/media-types/)

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
size	cap. alertInfoResource. size. integer	The integer indicating the size of the resource file (OPTIONAL)	Approximate size of the resource file in bytes.
uri	cap. alertInfoResource. uri. identifier	The identifier of the hyperlink for the resource file (OPTIONAL)	A full absolute URI, typically a Uniform Resource Locator that can be used to retrieve the resource over the Internet OR a relative URI to name the content of a <derefUri> element if one is present in this resource block.
derefUri	cap alertInfoResource. derefUri. data	The base-64 encoded data content of the resource file (CONDITIONAL)	(1) MAY be used either with or instead of the <uri> element in messages transmitted over one-way (e.g., broadcast) data links where retrieval of a resource via a URI is not feasible. (2) Clients intended for use with one-way data links MUST support this element. (3) This element MUST NOT be used unless the sender is certain that all direct clients are capable of processing it. (4) If messages including this element are forwarded onto a two-way network, the forwarder MUST strip the <derefUri> element and SHOULD extract the file contents and provide a <uri> link to a retrievable version of the file. (5) Providers of one-way data links MAY enforce additional restrictions on the use of this element, including message-size limits and restrictions regarding file types.
digest	cap. alertInfoResource. digest. code	The code representing the digital digest ("hash") computed from the resource file (OPTIONAL)	Calculated using the Secure Hash Algorithm (SHA-1) per [FIPS 180-2]

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
3.2.4 "area" Element and Sub-elements			
area	cap. alertInfoArea. area. group	The container for all component parts of the area sub-element of the info sub-element of the alert message (OPTIONAL)	(1) Multiple occurrences permitted, in which case the target area for the <info> block is the union of all the included <area> blocks. (2) MAY contain one or multiple instances of <polygon>, <circle> or <geocode>. If multiple <polygon>, <circle> or <geocode> elements are included, the area described by this <area> is the union of those represented by the included elements.
areaDesc	cap. alertInfoArea. area. text	The text describing the affected area of the alert message (REQUIRED)	A text description of the affected area.
polygon	cap. alertInfoArea. polygon. group	The paired values of points defining a polygon that delineates the affected area of the alert message (OPTIONAL)	(1) Code Values: The geographic polygon is represented by a whitespace-delimited list of [WGS 84] coordinate pairs. (See WGS-84 Note at end of this section.) (2) The first and last pairs of coordinates MUST be the same. (3) See Coordinate Precision Note at end of this section. (4) Multiple instances MAY occur within an <area>.
circle	cap. alertInfoArea. circle. group	The paired values of a point and radius delineating the affected area of the alert message (OPTIONAL)	(1) Code Values: The circular area is represented by a central point given as a [WGS- 84] coordinates pair followed by a space character and a radius value in kilometers. (See WGS-84 Note at end of this section.) (2) See Coordinate Precision Note at end of this section. (3) Multiple instances MAY occur within an <area>.

Element Name	Context. Class. Attribute. Representation	Definition and (Optionality)	Notes or Value Domain
geocode	cap. alertInfoArea. geocode. code	The geographic code delineating the affected area of the alert message (OPTIONAL)	<p>(1) Any geographically-based code to describe message target area:</p> <pre data-bbox="898 426 1385 562"><parameter> <valueName>valueName</valueName> <value>value</value> </parameter></pre> <p>where the content of "valueName" is a user-assigned string designating the domain of the code, and the content of "value" is a string (which may represent a number) denoting the value itself (e.g., valueName = "SAME" and value="006113").</p> <p>(2) Values of "valueName" that are acronyms SHOULD be represented in all capital letters without periods (e.g., SAME, FIPS, ZIP).</p> <p>(3) Multiple instances MAY occur within a single <info> block.</p> <p>(4) This element is primarily for compatibility with other systems. Use of this element presumes knowledge of the coding system on the part of recipients; therefore, for interoperability, it SHOULD be used in concert with an equivalent description in the more universally understood <polygon> and <circle> forms whenever possible.</p>
altitude	cap. alertInfoArea. altitude. quantity	The specific or minimum altitude of the affected area of the alert message (OPTIONAL)	<p>(1) If used with the <ceiling> element this value is the lower limit of a range. Otherwise, this value specifies a specific altitude.</p> <p>(2) The altitude measure is in feet above mean sea level per the [WGS- 84] datum.</p>
ceiling	cap. alertInfoArea. ceiling. quantity	The maximum altitude of the affected area of the alert message (conditional)	<p>(1) MUST NOT be used except in combination with the <altitude> element</p> <p>(2) The ceiling measure is in feet above mean sea level per the [WGS- 84] datum.</p>

220 3.3 Implementation Notes

221 3.3.1 WGS-84 Note

222 Geographic locations in CAP are defined using **[WGS 84]** (World Geodetic System 1984), equivalent to
223 EPSG (European Petroleum Survey Group) code 4326 (2 dimensions). CAP does not assign
224 responsibilities for coordinate transformations from and to other Spatial Reference Systems. See section
225 1.5 Terminology for the format of coordinate pairs within CAP elements.

226 3.3.2 Security Note

227 Because CAP is an XML-based format, existing XML security mechanisms can be used to secure and
228 authenticate its content. While these mechanisms are available to secure CAP Alert Messages, they
229 should not be used indiscriminately.

230 Note that this section adds two tags to CAP by reference. These are: "Signature" and "EncryptedData".
231 Both elements are children of the <alert> element and are optional. If the "EncryptedData" element
232 exists, no other elements will be visible until after the message is decrypted. This makes the minimal
233 CAP message an alert element which encloses an EncryptedData element. The maximal CAP message,
234 if an EncryptedData element is present is an <alert> element enclosing a single EncryptedData element
235 and a single Signature element.

236 3.3.2.1 Digital Signatures

237 The alert element of a CAP Alert Message MAY have an Enveloped Signature, as described by XML-
238 Signature and Syntax Processing **[XMLSIG]**. Other XML signature mechanisms MUST NOT be used in
239 CAP Alert Messages.

240 Processors MUST NOT reject a CAP Alert Message containing such a signature simply because they are
241 not capable of verifying it; they MUST continue processing and MAY inform the user of their failure to
242 validate the signature.

243 In other words, the presence of an element with the namespace URI **[XMLSIG]** and a local name of
244 "Signature" as a child of the alert element must not cause a processor to fail merely because of its
245 presence.

246 3.3.2.2 Encryption

247 The alert element of a CAP Alert Message MAY be encrypted, using the mechanisms described by XML
248 Encryption Syntax and Processing **[XMLENC]**. Other XML encryption mechanisms MUST NOT be used
249 in CAP Alert Messages; however, transport-layer encryption mechanisms may be used independently of
250 this requirement.

251 3.4 XML Schema

```
252 <?xml version = "1.0" encoding = "UTF-8"?>  
253 <!--Generated by Turbo XML 2.4.1.100. Conforms to w3c http://www.w3.org/2001/XMLSchema-->  
254 <schema xmlns = "http://www.w3.org/2001/XMLSchema"  
255   targetNamespace = "http://www.incident.com/cap/1.1"  
256   xmlns:cap = "http://www.incident.com/cap/1.1"  
257   xmlns:xs = "http://www.w3.org/2001/XMLSchema"  
258   elementFormDefault = "qualified"  
259   attributeFormDefault = "unqualified">  
260   <element name = "alert">  
261     <annotation>  
262       <documentation>CAP Alert Message (version 1.1)</documentation>  
263     </annotation>  
264     <complexType>  
265       <sequence>  
266         <element name = "identifier" type = "string"/>  
267         <element name = "sender" type = "string"/>  
268         <element name = "sent" type = "dateTime"/>  
269         <element name = "status">  
270           <simpleType>  
271             <restriction base = "string">
```



```

273     <enumeration value = "Actual"/>
274     <enumeration value = "Exercise"/>
275     <enumeration value = "System"/>
276     <enumeration value = "Test"/>
277   </restriction>
278 </simpleType>
279 </element>
280 <element name = "msgType">
281   <simpleType>
282     <restriction base = "string">
283       <enumeration value = "Alert"/>
284       <enumeration value = "Update"/>
285       <enumeration value = "Cancel"/>
286       <enumeration value = "Ack"/>
287       <enumeration value = "Error"/>
288     </restriction>
289   </simpleType>
290 </element>
291 <element name = "source" type = "string" minOccurs = "0"/>
292 <element name = "scope" minOccurs = "0">
293   <simpleType>
294     <restriction base = "string">
295       <enumeration value = "Public"/>
296       <enumeration value = "Restricted"/>
297       <enumeration value = "Private"/>
298     </restriction>
299   </simpleType>
300 </element>
301 <element name = "restriction" type = "string" minOccurs = "0"/>
302 <element name = "addresses" type = "string" minOccurs = "0"/>
303 <element name = "code" type = "string" minOccurs = "0" maxOccurs = "unbounded"/>
304 <element name = "note" type = "string" minOccurs = "0"/>
305 <element name = "references" type = "string" minOccurs = "0"/>
306 <element name = "incidents" type = "string" minOccurs = "0"/>
307 <element name = "info" minOccurs = "0" maxOccurs = "unbounded">
308   <complexType>
309     <sequence>
310       <element name = "language" type = "language" default = "en-US" minOccurs = "0"/>
311       <element name = "category" maxOccurs = "unbounded">
312         <simpleType>
313           <restriction base = "string">
314             <enumeration value = "Geo"/>
315             <enumeration value = "Met"/>
316             <enumeration value = "Safety"/>
317             <enumeration value = "Security"/>
318             <enumeration value = "Rescue"/>
319             <enumeration value = "Fire"/>
320             <enumeration value = "Health"/>
321             <enumeration value = "Env"/>
322             <enumeration value = "Transport"/>
323             <enumeration value = "Infra"/>
324             <enumeration value = "CBRN"/>
325             <enumeration value = "Other"/>
326           </restriction>
327         </simpleType>
328       </element>
329       <element name = "event" type = "string"/>
330       <element name = "responseType" minOccurs = "0">
331         <simpleType>
332           <restriction base = "string">
333             <enumeration value = "Shelter"/>
334             <enumeration value = "Evacuate"/>
335             <enumeration value = "Prepare"/>
336             <enumeration value = "Execute"/>
337             <enumeration value = "Monitor"/>
338             <enumeration value = "None"/>
339           </restriction>
340         </simpleType>
341       </element>
342       <element name = "urgency">
343         <simpleType>
344           <restriction base = "string">
345             <enumeration value = "Immediate"/>
346             <enumeration value = "Expected"/>
347             <enumeration value = "Future"/>
348             <enumeration value = "Past"/>
349             <enumeration value = "Unknown"/>
350           </restriction>
351         </simpleType>
352       </element>
353       <element name = "severity">
354         <simpleType>

```

```

355         <restriction base = "string">
356             <enumeration value = "Extreme"/>
357             <enumeration value = "Severe"/>
358             <enumeration value = "Moderate"/>
359             <enumeration value = "Minor"/>
360             <enumeration value = "Unknown"/>
361         </restriction>
362     </simpleType>
363 </element>
364 <element name = "certainty">
365     <simpleType>
366         <restriction base = "string">
367             <enumeration value = "Observed"/>
368             <enumeration value = "Likely"/>
369             <enumeration value = "Possible"/>
370             <enumeration value = "Unlikely"/>
371             <enumeration value = "Unknown"/>
372         </restriction>
373     </simpleType>
374 </element>
375 <element name = "audience" type = "string" minOccurs = "0"/>
376 <element name = "eventCode" minOccurs = "0">
377     <complexType>
378         <sequence>
379             <element ref = "cap:valueName"/>
380             <element ref = "cap:value"/>
381         </sequence>
382     </complexType>
383 </element>
384 <element name = "effective" type = "dateTime" form = "qualified" minOccurs = "0"/>
385 <element name = "onset" type = "dateTime" minOccurs = "0"/>
386 <element name = "expires" type = "dateTime" minOccurs = "0"/>
387 <element name = "senderName" type = "string" minOccurs = "0"/>
388 <element name = "headline" type = "string" minOccurs = "0"/>
389 <element name = "description" type = "string" minOccurs = "0"/>
390 <element name = "instruction" type = "string" minOccurs = "0"/>
391 <element name = "web" type = "anyURI" minOccurs = "0"/>
392 <element name = "contact" type = "string" minOccurs = "0"/>
393 <element name = "parameter" minOccurs = "0" maxOccurs = "unbounded">
394     <complexType>
395         <sequence>
396             <element ref = "cap:valueName"/>
397             <element ref = "cap:value"/>
398         </sequence>
399     </complexType>
400 </element>
401 <element name = "resource" minOccurs = "0" maxOccurs = "unbounded">
402     <complexType>
403         <sequence>
404             <element name = "resourceDesc" type = "string"/>
405             <element name = "mimeType" type = "string" minOccurs = "0"/>
406             <element name = "size" type = "integer" minOccurs = "0"/>
407             <element name = "uri" type = "anyURI" minOccurs = "0"/>
408             <element name = "derefUri" type = "string" minOccurs = "0"/>
409             <element name = "digest" type = "string" minOccurs = "0"/>
410         </sequence>
411     </complexType>
412 </element>
413 <element name = "area" minOccurs = "0" maxOccurs = "unbounded">
414     <complexType>
415         <sequence>
416             <element name = "areaDesc" type = "string"/>
417             <element name = "polygon" type = "string" minOccurs = "0" maxOccurs = "unbounded"/>
418             <element name = "circle" type = "string" minOccurs = "0" maxOccurs = "unbounded"/>
419             <element name = "geocode" minOccurs = "0" maxOccurs = "unbounded">
420                 <complexType>
421                     <sequence>
422                         <element ref = "cap:valueName"/>
423                         <element ref = "cap:value"/>
424                     </sequence>
425                 </complexType>
426             </element>
427             <element name = "altitude" type = "string" minOccurs = "0"/>
428             <element name = "ceiling" type = "string" minOccurs = "0"/>
429         </sequence>
430     </complexType>
431 </element>
432 </sequence>
433 </complexType>
434 </element>
435 </sequence>
436 </complexType>

```

```
437 </element>
438 <element name = "valueName" type = "string"/>
439 <element name = "value" type = "string"/>
440 </schema>
441
```

442

Appendix A. CAP Alert Message Example

443

A.1. Homeland Security Advisory System Alert

444

The following is a speculative example in the form of a CAP XML message.

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```
<?xml version = "1.0" encoding = "UTF-8"?>
<alert xmlns = "http://www.incident.com/cap/1.1">
  <identifier>43b080713727</identifier>
  <sender>hsas@dhs.gov</sender>
  <sent>2003-04-02T14:39:01-05:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  <info>
    <category>Security</category>
    <event>Homeland Security Advisory System Update</event>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Likely</certainty>
    <senderName>U.S. Government, Department of Homeland Security</senderName>
    <headline>Homeland Security Sets Code ORANGE</headline>
    <description>The Department of Homeland Security has elevated the Homeland Security Advisory
System threat level to ORANGE / High in response to intelligence which may indicate a heightened
threat of terrorism.</description>
    <instruction> A High Condition is declared when there is a high risk of terrorist attacks. In
addition to the Protective Measures taken in the previous Threat Conditions, Federal departments
and agencies should consider agency-specific Protective Measures in accordance with their
existing plans.</instruction>
    <web>http://www.dhs.gov/dhspublic/display?theme=29</web>
    <parameter>
      <valueName>HSAS</valueName>
      <value>ORANGE</value>
    </parameter>
    <resource>
      <resourceDesc>Image file (GIF)</resourceDesc>
      <uri>http://www.dhs.gov/dhspublic/getAdvisoryImage</uri>
    </resource>
    <area>
      <areaDesc>U.S. nationwide and interests worldwide</areaDesc>
    </area>
  </info>
</alert>
```

484 **A.2. Severe Thunderstorm Warning**

485 The following is a speculative example in the form of a CAP XML message.

```
486 <?xml version = "1.0" encoding = "UTF-8"?>
487 <alert xmlns = "http://www.incident.com/cap/1.1">
488   <identifier>KSTO1055887203</identifier>
489   <sender>KSTO@NWS.NOAA.GOV</sender>
490   <sent>2003-06-17T14:57:00-07:00</sent>
491   <status>Actual</status>
492   <msgType>Alert</msgType>
493   <scope>Public</scope>
494   <info>
495     <category>Met</category>
496     <event>SEVERE THUNDERSTORM</event>
497     <responseType>Shelter</responseType>
498     <urgency>Immediate</urgency>
499     <severity>Severe</severity>
500     <certainty>Observed</certainty>
501     <eventCode>
502       <valueName>same</valueName>
503       <value>SVR</value>
504     </eventCode>
505     <expires>2003-06-17T16:00:00-07:00</expires>
506     <senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
507     <headline>SEVERE THUNDERSTORM WARNING</headline>
508     <description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A SEVERE
509 THUNDERSTORM OVER SOUTH CENTRAL ALPINE COUNTY...OR ABOUT 18 MILES SOUTHEAST OF KIRKWOOD...MOVING
510 SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG DAMAGING WINDS ARE LIKELY WITH THIS
511 STORM.</description>
512     <instruction>TAKE COVER IN A SUBSTANTIAL SHELTER UNTIL THE STORM PASSES.</instruction>
513     <contact>BARUFFALDI/JUSKIE</contact>
514     <area>
515       <areaDesc>EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA, EXTREME NORTHEASTERN
516 CALAVERAS COUNTY IN CALIFORNIA, SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA</areaDesc>
517       <polygon>38.47,-120.14 38.34,-119.95 38.52,-119.74 38.62,-119.89 38.47,-120.14</polygon>
518       <geocode>
519         <valueName>fips6</valueName>
520         <value>006109</value>
521       </geocode>
522       <geocode>
523         <valueName>fips6</valueName>
524         <value> 006009</value>
525       </geocode>
526       <geocode>
527         <valueName>fips6</valueName>
528         <value> 006003</value>
529       </geocode>
530     </area>
531   </info>
532 </alert>
```

535 A.3. Earthquake Report

536 The following is a speculative example in the form of a CAP XML message.

```
537 <?xml version = "1.0" encoding = "UTF-8"?>
538 <alert xmlns = "http://www.incident.com/cap/1.1">
539   <identifier>TRI13970876.1</identifier>
540   <sender>trinet@caltech.edu</sender>
541   <sent>2003-06-11T20:56:00-07:00</sent>
542   <status>Actual</status>
543   <msgType>Alert</msgType>
544   <scope>Public</scope>
545   <incidents>13970876</incidents>
546   <info>
547     <category>Geo</category>
548     <event>Earthquake</event>
549     <urgency>Past</urgency>
550     <severity>Minor</severity>
551     <certainty>Observed</certainty>
552     <senderName>Southern California Seismic Network (TriNet) operated by Caltech and
553     USGS</senderName>
554     <headline>EQ 3.4 Imperial County CA - PRELIMINARY REPORT</headline>
555     <description>A minor earthquake measuring 3.4 on the Richter scale occurred near Brawley,
556     California at 8:53 PM Pacific Daylight Time on Wednesday, June 11, 2003. (This is a computer-
557     generated solution and has not yet been reviewed by a human.)</description>
558     <web>http://www.trinet.org/scsn/scsn.html</web>
559     <parameter>
560       <valueName>EventID</valueName>
561       <value>13970876</value>
562     </parameter>
563     <parameter>
564       <valueName>Version</valueName>
565       <value>1</value>
566     </parameter>
567     <parameter>
568       <valueName>Magnitude</valueName>
569       <value>3.4 Ml</value>
570     </parameter>
571     <parameter>
572       <valueName>Depth</valueName>
573       <value>11.8 mi.</value>
574     </parameter>
575     <parameter>
576       <valueName>Quality</valueName>
577       <value>Excellent</value>
578     </parameter>
579     <area>
580       <areaDesc>1 mi. WSW of Brawley, CA; 11 mi. N of El Centro, CA; 30 mi. E of OCOTILLO
581       (quarry); 1 mi. N of the Imperial Fault</areaDesc>
582       <circle>32.9525,-115.5527 0</circle>
583     </area>
584   </info>
585 </alert>
586
```

587 A.4. AMBER Alert (Including EAS Activation)

588 The following is a speculative example in the form of a CAP XML message.

```
589 <?xml version = "1.0" encoding = "UTF-8"?>
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591   <identifier>KAR0-0306112239-SW</identifier>
592   <sender>KARO@CLETS.DOJ.CA.GOV</sender>
593   <sent>2003-06-11T22:39:00-07:00</sent>
594   <status>Actual</status>
595   <msgType>Alert</msgType>
596   <source>SW</source>
597   <scope>Public</scope>
598   <info>
599     <category>Rescue</category>
600     <event>Child Abduction</event>
601     <urgency>Immediate</urgency>
602     <severity>Severe</severity>
603     <certainty>Likely</certainty>
604     <eventCode>
605       <valueName>SAME</valueName>
606       <value>CAE</value>
607     </eventCode>
608     <senderName>LOS ANGELES POLICE DEPT - LAPD</senderName>
609     <headline>AMBER ALERT</headline>
610     <description>DATE/TIME: 06/11/03, 1915 HRS. VICTIM(S): KHAYRI DOE JR. M/B BLK/BRO 3'0", 40
611     LBS. LIGHT COMPLEXION. DOB 06/24/01. WEARING RED SHORTS, WHITE T-SHIRT, W/BUE COLLAR.
612     LOCATION: 5721 DOE ST., LOS ANGELES, CA. SUSPECT(S): KHAYRI DOE SR. DOB 04/18/71 M/B, BLK HAIR,
613     BRO EYE. VEHICLE: 81' BUICK 2-DR, BLUE (4XXX000).</description>
614     <contact>DET. SMITH, 77TH DIV, LOS ANGELES POLICE DEPT-LAPD AT 213 485-2389</contact>
615     <area>
616       <areaDesc>Los Angeles County</areaDesc>
617       <geocode>
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619         <value>006037</value>
620       </geocode>
621     </area>
622   </info>
623 </alert>
624
625
```

626 **Appendix B. Acknowledgments**

627 **OASIS Emergency Management Technical Committee**

628 John Aerts, LA County Information Systems Advisory Body
629 Patti Aymond, IEM
630 Mark Benemerito, Sungard Availability Services
631 Jeff Berg, Motorola
632 Art Botterell, Partnership for Public Warning
633 Chris Branton, IEM
634 Rex Brooks, HumanMarkup.org, Inc.
635 Thomas Bui, The Boeing Company
636 Len Bullard, Individual
637 Charles Campbell, Individual
638 Richard Carlton, Individual
639 Eliot Christian, US Department of the Interior
640 Marc Connolly, Oracle
641 Robin Cover, OASIS
642 Michael Daconta, US Department of Homeland Security
643 David Danko, ESRI
644 Paul Denning, Mitre Corporation
645 John Dias, Lawrence Livermore National Laboratory
646 Matthew Dovey, Oxford University
647 Sukumar Dwarkanath, Individual
648 Scott Edson, LA County Information Systems Advisory Body
649 Nasseam Elkarra, Individual
650 David, Ellis, Individual
651 Paul Embley, Individual
652 Jack Fox, US Department of Homeland Security
653 Lawrence Freuding, NASA
654 Gary Ham, Disaster Management Interoperability Services
655 Travis Hubbard, Disaster Management Interoperability Services
656 Stephen Jepsen, Oracle
657 Elysa Jones, Warning Systems, Inc.
658 Joyce Kern, Sungard Availability Services
659 Hong-Eng Koh, Sun Microsystems
660 Jeff Kyser, Warning Systems, Inc.
661 Louis Lagonik, Lockheed Martin
662 Kim Lambert, LMI Government Consulting
663 Richard Masline, IBM
664 Carl Mattocks, Individual
665 Maurice McGinley, Individual
666 Tom Merkle, Lockheed Martin
667 Bona Nasution, MTG Management Consultants, LLC.
668 Steve Ollis, Individual
669 Ash Parikh, Raining Data Corporation
670 Brian Pattinson, Unisys Corporation
671 Gary Poindexter, Individual
672 Walid Ramadan, Individual
673 Michelle Raymond, Individual
674 Carl Reed, Open GIS Consortium (OGC)
675 Kent Reed, NIST
676 Jeffrey Ricker, Individual
677 David Roberts, Unisys Corporation

678 Dave Robinson, Wells Fargo
679 Eleanor Robinson, Anteon Corporation
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681 Barry Schaeffer, Individual
682 William Schroeder, ESRI
683 John Silva, Individual
684 Kwasi Speede, Anteon Corporation
685 Michael Thompson, The Boeing Company
686 Rob Torchon, E Team
687 Brett Trusko, OASIS
688 Rick Tucker, Mitre Corporation
689 Richard Vandame, US Department of Homeland Security
690 Jerry Weltman, IEM
691 Preston Werntz, Individual
692 Konstantin Wilms, Individual
693 Bob Wyman Individual
694 Jack Zhang Beijing Harmony Technologies Co, Ltd
695

Appendix C. Revision History

Rev	Date	By Whom	What
1.1	2005-01-04	Art Botterell	Messaging Subcommittee approved v. 1.1 draft for submission to full Technical Committee: <ul style="list-style-type: none">• Added <responseType> element• Made <category> element mandatory• Amended enumerated values for the <certainty> element• Deleted the <password> element• Various editorial corrections and clarifications
1.0	2004-04-01	Art Botterell	CAP 1.0 adopted as OASIS Standard