

**EAS-CAP Industry Group**  
**EAS-CAP Profile Recommendation EAS-CAP-0.1**

- I. **Abstract:** Public warnings intended for transmission over the Emergency Alert System (EAS) can be encoded in Common Alerting Protocol (CAP) messages in various ways. A consensus among EAS equipment manufacturers and warning practitioners regarding a single recommended pattern for compatible encoding—the “EAS-CAP Profile”—is documented along with related recommendations.
- II. **EAS-CAP Industry Group Participants and Activities:** In May, 2008 an ad-hoc Industry Group of EAS equipment manufacturers and other interested parties convened for the purpose of facilitating the incorporation of the Common Alerting Protocol version 1.1 into the national Emergency Alert System (EAS) by devising a workable “EAS-CAP Profile” and associated technical and procedural recommendations. The Industry Group conducted an initial telephone conference call and thereafter utilized an online forum for the discussion of issues and the drafting of this document. The membership of the EAS-CAP Industry Group is listed in Appendix A. Members of the Industry Group individually intend to adopt this EAS-CAP Profile in their respective software and services.
- III. **Disclaimer of Intellectual Property Claims:** The Common Alerting Protocol (CAP) version 1.1 specification is copyright 2005 by the Organization for the Advancement of Structured Information Standards (OASIS). The CAP Profile recommended herein specifies particular usages within the scope of that specification. The members of the Industry Group have represented that they make no individual or group claim of intellectual property regarding the Profile or to any of the other recommendations presented in this document.
- IV. **Terminology:** Clarification on terms used in this document:
  - A. The Key words MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL in this document are to be interpreted as described in RFC2119.

- B. The words warning, alert and message are used interchangeably throughout this document.
- C. EAS-CAP Profile Decoder means: A device or software application that performs one or more of the following tasks:
  - 1. Using the EAS-CAP Profile, converts a CAP alert into the CFR 47 Part 11 Emergency Alert System (EAS) format, commonly referred to as the ZCZC string.
  - 2. Using the EAS-CAP Profile, converts a CAP alert into a text string intended for display as video, or input into a Text to Speech converter, or as input for any other text display; and used in conjunction with an EAS alert.

**V. Source of each reference used in this document:**

- A. EAS-CAP Industry Group website: [www.eas-cap.org](http://www.eas-cap.org)
- B. OASIS Common Alerting Protocol (CAP) Version 1.1 Specification:  
[www.oasis-open.org/committees/download.php/15135/emergency-CAPv1.1-Corrected\\_DOM.pdf](http://www.oasis-open.org/committees/download.php/15135/emergency-CAPv1.1-Corrected_DOM.pdf)
- C. RFC2119: [www.ietf.org/rfc/rfc2119.txt](http://www.ietf.org/rfc/rfc2119.txt)
- D. FCC EAS Rules (CFR 47 Part 11): <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=7ffc540bc692d9481e0439c7e8d5ed9e;rgn=div5;view=text;node=47%3A1.0.1.1.11;idno=47;cc=ecfr>
- E. XML 1.0 Specification: [www.w3.org/2001/XMLSchema](http://www.w3.org/2001/XMLSchema)
- F. Date and Time + Time Zone Format used in CAP Messages:
  - 1. “dateTime” in XML Schema Part 2, Section 3.2.7:  
[www.w3.org/TR/xmlschema-2/#dateTime](http://www.w3.org/TR/xmlschema-2/#dateTime)

2. ISO 8601 Specification:

[http://isotc.iso.org/livelink/livelink/4021199/ISO\\_8601\\_2004\\_E.zip?func=doc.Fetch&nodeid=4021199](http://isotc.iso.org/livelink/livelink/4021199/ISO_8601_2004_E.zip?func=doc.Fetch&nodeid=4021199)

G. MP3 Licensing Information: [www.mp3licensing.com](http://www.mp3licensing.com)

- VI. **Discussion:** After careful consideration, certain items were either omitted or included in this Profile document. The following is a discussion of items that the Industry Group wishes to provide background details on:
- A. In the rendering of both text-to-speech and video display of EAS alerts from CAP messages, the Industry Group interprets FCC Rules Part 11.51(d) to still require the use of a sentence containing the Originator, Event, Location and the valid time period of the EAS message constructed from the EAS ZCZC Header Code. The Industry Group feels this generic information derived from the EAS Header Code is no longer viable or appropriate. The Industry Group has outlined in this document a method to announce and display much more useful and specific information derived from the CAP message elements that can be used as part of the EAS alert broadcast.
  - B. The Industry Group chose to include both a proprietary and non-proprietary audio format for use with attached audio files. While the non-proprietary WAV PCM audio files are free of any licensing fees, they will be significantly larger in file size than the proprietary, licensed-format MP3 files. This gives the individual CAP network architects the option to choose between low cost or low file size. The Industry Group has recommended MP3, with its small file size, as the preferred audio file format.
  - C. The Industry Group discussed offering methods to originate and render CAP alerts using additional languages for EAS alert use, but opted to wait on forthcoming decisions to be made by the FCC before addressing this issue.
  - D. The Industry Group considered publishing a list of recommended default values for the CAP Urgency, Severity, and Certainty element values to correspond with

each EAS Event Code, but decided that is best left to the individual origination system vendors and their alert origination clients.

- E. The Industry Group considers text-to-speech technology to be a valuable feature in an EAS-CAP Profile Decoder, as text-to-speech is a useful alternative for getting EAS audio on the air if there is no attached audio supplied. However, we did not take the step in this Profile to require text-to-speech technology for decoders. We believe the inclusion of text-to-speech technology in EAS-CAP Profile devices to be a marketplace or regulatory issue, and thus beyond the scope of this Profile.

VII. **EAS-CAP Profile:** The following practices SHALL be observed when encoding CAP messages intended for EAS broadcast:

- A. All content intended for EAS broadcast SHALL be placed in the first CAP <info> block within an Alert, and in the first <area> block within that first <info> block.
- B. Conventions regarding case-sensitivity:
  - 1. XML specifications require that all CAP element names are case sensitive.
  - 2. Except where explicitly noted, <valueName> and <value> are not case sensitive.
- C. The EAS Header Code information, as defined in FCC Part 11.31, SHALL be included in the CAP message as follows:
  - 1. The EAS Originator Code field (ORG) SHALL be included in the <value> element of a CAP <info><parameter> block with a <valueName> of “EAS-ORG”.
  - 2. The EAS Event Code field (EEE) SHALL be represented using the CAP <info><eventCode> element with a <valueName> of “SAME”.

- a. *Clarification:* The EAS Event Code <value>, such as CAE or CEM, is case sensitive.
3. Each EAS County Location Code field (PSSCCC) SHALL be included in the <value> element of a separate CAP <area><geocode> element with a <valueName> of “SAME”.
  - a. *Clarification:* This <value> is understood to be the 6-digit EAS/SAME Location Code, comprised of the standard FIPS Code with a leading digit indicating the 1/9<sup>th</sup> area sub-division.
4. The EAS Time Alert Issued field (JJJHHMM) SHALL be represented using the CAP <alert><sent> element in the ISO 8601 format per the OASIS CAP 1.1 specification.
  - a. *Origination Requirement:* While the ISO 8601 format considers indication of Time Zone to be optional, the <alert><sent> element in an EAS-CAP Profile message MUST include a Time Zone in the format indicated in the CAP 1.1 Standard. An EAS-CAP Profile Decoder will reject a message containing an <alert><sent> element that does not indicate a Time Zone.
5. The EAS Duration (TTTT) SHALL be computed by subtracting the CAP <alert><sent> element from the CAP <info><expires> element in the ISO 8601 format per the OASIS CAP 1.1 specification.
  - a. *Origination Recommendation:* The interval between the CAP <alert><sent> and <info><expires> elements SHOULD be one of the intervals permitted for the “TTTT” parameter in FCC Part 11.31(c).
  - b. *Origination Recommendation:* While the ISO 8601 format considers indication of Time Zone to be optional, the <info><expires> element in an EAS-CAP Profile message SHOULD include a Time Zone in the format indicated in the CAP 1.1 Standard. An EAS-CAP Profile Decoder will be forced to use a default duration of 1 Hour if the correct EAS Duration can

not be calculated due to an <info><expires> element that does not indicate a Time Zone.

6. The EAS Station ID Code field (LLLLLLLL) SHALL be included in the <value> element of a CAP <info><parameter> block (complex element) with a <valueName> of “EAS-STN-ID”.
  - a. *Origination Recommendation:* The Station ID SHOULD adhere to the character set limitations as defined in FCC Part 11.31(b), for example, the “+” and “-” characters are not permitted.
- D. Messages for which the Governor’s “must carry” authority is invoked SHALL be marked by the inclusion of an additional CAP <info><parameter> block with a <valueName> of “EAS-Must-Carry” and a <value> of “True”.
- E. Recorded Audio: Where a recorded audio message intended for EAS use accompanies the CAP message in a CAP Resource block:
  1. The audio SHALL be encoded as either an MP3 file as mono, 64 kbit/s data, preferably sampled at 22.05 kHz or otherwise at 44.1 kHz, or as a WAV PCM file as mono, 16-bit, sampled at 22.05 kHz.
  2. The CAP <resourceDesc> element <value> SHALL be “EAS Audio”.
  3. The audio SHOULD be a reading of the same text as that in the CAP elements described below, so that the recorded audio message will match the video display message:
    - a. A sentence containing the Originator, Event, Location and the valid time period of the EAS message as represented in the EAS ZCZC Header Code as required in FCC Rules Part 11.51(d), followed by,
    - b. The words “This is the” followed by the full text of, or at least the first ten words from, the CAP <senderName> element, or if a <senderName> is not used by the words “Emergency Alert System”, followed by,

- c. The full text of, or at least the first ten words from, the CAP <headline> element, followed by,
  - d. The full text of, or at least the first ten words from, the CAP <event> element, followed by,
  - e. The full text of, or at least the first one hundred words from, the CAP <areaDesc> element, followed by,
  - f. The full text of, or at least the first one hundred words from, the CAP <description> element; followed by,
  - g. The full text of, or at least the first one hundred words from, the CAP <instruction> element.
  - h. Whenever the text included from the CAP <headline>, <areaDesc>, <description> or <instruction> elements is shorter than the full original text, any deletion SHALL be indicated by a one-second pause immediately following the shortened section of text.
  - i. In the section above, the calculation for the maximum number of words in two minutes is based on 120 WPM. However, the FCC Part 11 two-minute limit on EAS messages will be enforced regardless of the speed used or the number of words.
  - j. There SHALL be an absolute maximum of the first 200 words recorded resulting from the combination of all of the above elements.
- F. Streaming Audio: Where a streaming audio message intended for EAS use accompanies the CAP message in a CAP <resource> block, such as for an EAS EAN message:
- 1. The CAP <resourceDesc> element value SHALL be “EAS Streaming Audio”.
  - 2. The audio SHALL use one of the following streaming methods:

- a. MP3 streaming as either http progressive-download streaming, or
  - b. MP3 streaming from a streaming server such as a Shoutcast™/Icecast™-compatible streaming server.
- G. Except as noted below, all EAS alerts SHALL be sent using a CAP <status> element <value> of “Actual”. This includes Event Codes: ADR, DMO, NMN, NPT, RMT, and RWT. The exception is that a CAP <status> element <value> of “Test” MAY be used with any Event Code for the sole purpose of testing CAP message reception. Such a message will be logged by the receiving EAS-CAP Profile Decoder, but will not be rendered to an EAS broadcast message.
- H. CAP routing systems may determine whether and where to deliver CAP messages based on CAP-required elements such as <status>, <category>, <urgency>, <severity> and <certainty> values. While this Profile does not make specific recommendations for the values to be used for the majority of EAS Event Codes, origination systems implementing the EAS-CAP Profile SHOULD encourage the sender to set those CAP-required elements to an appropriate <value> for each particular situation. However, in order to help prevent non-EAS-CAP users from reacting to EAS test functions based on the <urgency>, <severity>, and/or <certainty> values used, this Profile does establish the low-priority element values in the next paragraph for use with EAS test codes.
- I. EAS Event Codes DMO, NMN, NPT, RMT, and RWT SHALL use the following CAP element values:
1. CAP <status> element <value> of Actual.
  2. CAP <urgency> element <value> of Unknown.
  3. CAP <severity> element <value> of Minor.
  4. CAP <certainty> element <value> of Unknown.



- J. Originators of EAS-CAP messages are encouraged to study the next section of this document to gain an understanding of how their messages will be handled on the receiving end. In particular, CAP elements <senderName>, <headline>, <event>, <areaDesc>, <description>, <instruction>, <expires>, <msgType> and the CAP <status> element <value> “Test” all affect how an EAS-CAP Profile Decoder will react to an incoming CAP message. Unintended consequences can result if EAS-CAP message originators are uninformed regarding these CAP elements.

### VIII. CAP Message Processing for EAS:

- A. One of the main purposes of this Profile is to ensure that CAP messages are rendered in EAS such that duplicate messages can be detected once the message is forwarded in the EAS domain. This means that for a given CAP message, all vendors must emit the exact same CFR 47 Part 11 “ZCZC” string. All characters, starting with the ZCZC header and ending with the hyphen before the LLLLLLLL field, must be identical.
- B. Further, the Profile defines the content of the text string used as input to a Text-To-Speech element, or to a video character generator element. While there may be some local user and vendor customization, the intent here is that the generated audio and video is as similar as possible between EAS vendors. This intentional consistency among vendors allows CAP origination software to offer its users a reliable “preview” of what an EAS alert will look and sound like on air, regardless of which vendors equipment is used at the receiving end.
- C. Any EAS Event Code MAY be sent with a CAP <status> element <value> of “Test”, in which case that alert SHALL not be broadcast as a valid alert but treated as a log-only event.
- D. All values for EAS Event Code SHALL be passed through by EAS-CAP Profile devices, even if the Event Code is not shown in FCC Part 11.31, as long as the value is a three-letter code. This acknowledges the possible existence of non-Part

- 11 codes which appear in a State EAS Plan and are approved for special use by the FCC.
- E. Multiple EAS County Location Codes: The values from multiple CAP <geocode> elements with a <valueName> of “SAME” SHALL be assembled in the order received during conversion to the EAS format.
  - F. If a message is received with an interval between the CAP <sent> and <expires> elements that does not conform to one of the intervals permitted for the “TTTT” parameter in FCC Part 11.31(c), the EAS-CAP Profile Decoder SHALL round the interval to the next highest permitted interval up to 99 hours, 30 minutes. (FCC Part 11 did not place an upper limit on EAS Duration, so we are interpreting that as allowing 9930.)
  - G. If the optional <expires> field is missing, an EAS-CAP Profile Decoder SHALL use 0100 for the TTTT field.
  - H. The presence of the EAS-STN-ID does not require the EAS-CAP Profile Decoder to use the Station ID. A Part 11 relay device must substitute its own ID for the LLLLLLLL field. The EAS-STN-ID value MAY be used in non-Part 11 environments, for example, a public safety origination point.
  - I. If the EAS-STN-ID code contains an improper character, such as “+” or “-”, that character SHALL be replaced with the “/” character. Note: In general, an EAS-CAP Profile Decoder will substitute its own ID when transmitting a message generated from a CAP message. The above rendering requirement applies only to CAP messages that originate directly to EAS, rather than relay through EAS.
  - J. If the text of the EAS-STN-ID does not comply with the conditions above, the EAS-CAP Profile Decoder SHALL use the algorithm described in the Appendix B description of the EAS-STN-ID element.
  - K. Use of CAP <msgType> element values Update and Cancel: While not required to be considered in adherence with this EAS-CAP Profile, it is

RECOMMENDED that origination and rendering system manufacturers implement use of the CAP <msgType> element values Update and Cancel.

1. An EAS-CAP Profile Decoder receiving an Update message SHOULD discontinue further relay and display of the original message content, and instead relay and display the content of the Update message. An Update message SHOULD be rendered to an EAS message.
  2. An EAS-CAP Profile Decoder receiving a Cancel message SHOULD discontinue display of the original message and abort any pending relay of the original message. A Cancel message is not intended to be rendered to an EAS message.
  3. Messages intended to be actionable by the public SHOULD use <msgType> element <value> Alert.
- L. Use of CAP <msgType> element values Error and Ack: The CAP Standard defines a method for a CAP receiver to send status information back to a CAP sender, that is, messages with a <msgType> of Error or Ack. This Profile does not require the use of that facility. However, if return messages are generated they SHALL conform to the syntax rules in Appendix B, “EAS-CAP Message Result States”.
- M. Constructing the EAS Message Audio from a CAP Alert:
1. If attached audio with a CAP <resourceDesc> element <value> of “EAS Audio” is present, the EAS-CAP Profile Decoder SHALL use that attached audio as the audio portion of the EAS alert.
  2. If attached EAS Audio is not present, and the EAS-CAP Profile Decoder supports text-to-speech technology, then text-to-speech audio SHALL be rendered as described in the “Constructing Text-to-Speech Audio from a CAP Alert” section below and used as the audio portion of the EAS alert.

3. If none of the CAP elements required to construct a text-to-speech audio message as outlined below are present, then the expansion of the generated EAS message SHALL be used as the text, and rendered as text-to-speech.
  4. If there is no attached EAS Audio, and the Decoder does not support text-to-speech, the alert SHALL be sent as EAS-codes-only with no audio.
  5. If an EAS Audio URL can not be accessed in a reasonable amount of time, then text-to-speech audio SHALL be rendered as described in the “Constructing Text-to-Speech Audio from a CAP Alert” section below and used as the audio portion of the EAS alert. If the Decoder does not support text-to-speech, the alert SHALL be sent as EAS-codes-only with no audio. The individual decoder user will decide what value to enter into the reasonable-amount-of-time value in that particular decoder.
- N. Constructing Text-to-Speech Audio from a CAP Alert: Where the CAP message is to be converted to audio using text-to-speech technology the delivered message SHALL consist of, and in the following order:
1. A sentence containing the Originator, Event, Location and the valid time period of the EAS message constructed from the EAS ZCZC Header Code as required in FCC Rules Part 11.51(d), followed by,
  2. The words “This is the” followed by the full text of, or at least the first ten words from, the CAP <senderName> element, or if a <senderName> is not provided by the words “Emergency Alert System”, followed by,
  3. The full text of, or at least the first ten words from, the CAP <headline> element, followed by,
  4. The full text of, or at least the first ten words from, the CAP <event> element, followed by,
  5. The full text of, or at least the first one hundred words from, the CAP <areaDesc> element, followed by,

6. The full text of, or at least the first one hundred words from, the CAP <description> element; followed by,
  7. The full text of, or at least the first one hundred words from, the CAP <instruction> element.
  8. Whenever the text included from the CAP <senderName>, <headline>, <event>, <areaDesc>, <description> or <instruction> elements is shorter than the full original text, any deletion SHALL be indicated by a one-second pause immediately following the shortened section of text.
  9. In the section above, the calculation for the maximum number of words in two minutes is based on 120 WPM. However, the FCC Part 11 two-minute limit on EAS messages will be enforced regardless of the speed used or the number of words.
  10. There SHALL be an absolute maximum of the first 200 words rendered from the combination of all of the above elements.
- O. Constructing Video Display Text from a CAP Alert: Where the CAP message is to be converted to text on a video display the delivered message SHALL consist of, and in the following order:
1. A sentence containing the Originator, Event, Location and the valid time period of the EAS message constructed from the EAS ZCZC Header Code as required in FCC Rules Part 11.51(d), followed by,
  2. The words “This is the” followed by the full text of, or at least the first 60 characters from, the CAP <senderName> element, or if a <senderName> is not provided by the words “Emergency Alert System”, followed by,
  3. The full text of, or at least the first 60 characters from, the CAP <headline> element, followed by,

4. The full text of, or at least the first 60 characters from, the CAP <event> element, followed by,
  5. The full text of, or at least the 900 characters from, the CAP <areaDesc> element, followed by,
  6. The full text of, or at least the first 900 characters from, the CAP <description> element; followed by,
  7. The full text of, or at least the first 900 characters from, the CAP <instruction> element.
  8. Whenever the text included from the CAP <senderName>, <headline>, <event>, <areaDesc>, <description> or <instruction> elements is shorter than the full original text, any deletion SHALL be indicated by an ellipsis (“...”) immediately following the shortened section of text.
  9. There SHALL be an absolute maximum of the first 1800 characters rendered from the combination of all of the above elements.
- P. All CAP messages received SHALL be subjected to EAS-CAP Profile Validation Criteria, as outlined in Appendix B of this document. If a message contains flaws, the message could be rejected by the EAS-CAP Profile Decoder and not be rendered to an EAS alert. See Appendix B for specific conditions.

## IX. Other Recommendations:

- A. **EAS Relay Network Security:** While the EAS-CAP Industry Group does not propose to specify relay network or networks for EAS, it does make the following recommendations regarding EAS network security:
1. Section 3.3.2.1 of the OASIS CAP 1.1 Specification includes the W3C recommendation for Digital Signatures and specifies an “enveloped” digital signature as the preferred mechanism for ensuring CAP message authenticity

and integrity. The Industry Group RECOMMENDS the implementation of this technique.

2. The above recommendation is not meant to preclude the use of additional methods for encryption and authentication within EAS Relay Networks.

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**Appendix A: Membership of the EAS-CAP Industry Group**

**Digital Alert Systems, LLC**

- Bruce Robertson
- Tom Wood

**Hormann America, Inc.**

- Efraim Petel
- Tomer Petel

**iBiquity Digital Corporation**

- Marek Milbar

**Monroe Electronics, Inc.**

- Jim Heminway
- Jon Rue

**MyStateUSA**

- Claudia Bittner
- Matt Farlow

**Sage Alerting Systems, Inc.**

- Harold Price
- Jerry LeBow

**SpectraRep, LLC**

- Adam Cranson
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**Non-voting Participants:**

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**Appendix B: CAP-V1.1 to EAS Validation Criteria**

**B1 Introduction**

Incoming CAP-V1.1 messages SHALL be subjected to a validation step prior to acceptance for translation to an FCC Part 11 EAS alert. The purpose of this step is to determine whether or not to continue the translation based upon basic syntax and semantic requirements. It is recommended that the EAS-CAP Profile Decoder log any useful information about message validation.

This step does not address message authentication. The source will be trusted based upon other authentication steps taken in a different layer of the communication.

**B1.1 Validation Philosophy**

In this document we discuss the rules for validation of EAS-CAP Profile messages. There are also assumed rules for basic CAP validation. As of this writing, the “conformance rules” are not part of the CAP 1.1 Specification. There may be conformance rules that are being generated as part of future type acceptance of CAP 1.1 devices.

This EAS-CAP Industry Group has wrestled with the issue of strict adherence to the CAP schema versus the potential rejection of a valid alert due to a trivial formatting error. We do not further address the issue of CAP conformance here, other than to say that if there are rules for CAP conformance that affect certification of EAS-CAP devices, then validation based on those rules will be performed first.

**B1.2 Error Signaling Philosophy**

We realize that EAS-CAP is a part of the larger CAP community, and that messages that are in error for EAS renderers are not necessarily errors to the CAP community. Therefore, we have taken the following approach: if a message has an error that would be an error to any CAP receiver, we signal an error. If the message is in error only to an EAS-CAP Profile Decoder, we signal acceptance of the message, but do not act on it. Our intent is that the CAP community is not subjected to what they would consider to be erroneous Error messages. See the discussion on “EAS-CAP Message Result States” below to see how this is implemented.

The result states optionally involve the generation of a return CAP 1.1 message with a <msgType> element of Error or Ack. The EAS-CAP Profile does not mandate the implementation of this facility. Furthermore, a particular CAP 1.1 source may not

require or accept these messages. CAP 1.1 servers that accept return messages will allow an EAS-CAP Profile Decoder a ready mechanism to support server side validation of processed alert messages. If return messages are generated, they SHALL conform to the syntax rules in section B3 – “EAS-CAP Message Result States”. This does not infer that other methods may or may not be used in addition to or instead of the CAP 1.1 Ack/Error facility. This methodology will be reviewed by the EAS-CAP Industry Group before further recommendation.

### **B1.3 Validation Overview**

The CAP-to-EAS message validation procedure described below details the minimum requirements to enforce basic message verification. Specifically, the purpose of this validation step is to:

1. reject improperly formatted, improperly constructed, or damaged CAP messages.
2. ignore messages that do not contain sufficient information for the generation of a unique EAS message.
3. ignore CAP messages that are not intended for EAS translation.

Once a CAP message passes the validation step, it may be subjected to an additional set of filters that will decide if a particular alert is to be placed on the air by a particular user. This step in the process is not further addressed in this document.

The EAS-CAP validation procedure gives the order of the validation steps. The intent of the entire EAS-CAP Profile is to ensure that any EAS-CAP Profile Decoder will respond to a CAP message in the same manner– in the rendering of the message as well as error signaling. The validation order is an important part of that process.

#### **B1.3.1 CAP Required Elements**

In the EAS-CAP Profile, we do not require that all CAP-required elements be present. We assume that a processing element in the chain before the EAS-CAP Profile Decoder has verified the format of the alert, and that the authentication scheme has delivered an intact message to the EAS-CAP Profile Decoder.

Specific CAP message elements are defined by the CAP 1.1 Standard as required, as shown in BOLD in Figure B-1 below. A minimum subset of these elements is applicable to EAS translation, as indicated by “\*\*\*” in Figure B-1 below. Not all CAP required elements are relevant to EAS translation in the manner prescribed by FCC Part 11. Therefore, the validation does not base this step upon strict adherence of a CAP message, based upon CAP required elements, to the CAP standard (though device certification may require it.) This profile requires that any element that is needed by the EAS-CAP Profile is valid if it is present.

### **B1.3.2 EAS-CAP Required Elements**

In order to translate a CAP message into an EAS message, another set of optional CAP elements are required. These elements have been defined in the EAS-CAP Profile in order to guarantee consistent translation into an EAS message. These elements of the CAP message are not necessarily required as elements in CAP, but are required by EAS. Some elements are required for proper translation into an EAS message, and thus are included in a specific minimum set of EAS-CAP required elements. Other elements may be considered of lesser importance. Some of these elements will have defined default values.

If any of the minimum set of Required EAS compatible CAP elements are present, they are examined for validity; if any are invalid, the message is in error. If the elements are missing, and a proper EAS alert cannot be generated, the message is ignored. The rationale is that such a message may not be intended for EAS, and therefore, missing EAS elements are not considered an error condition in the non-EAS-CAP community. See the discussion in “EAS-CAP Message Result States” below to see how this is implemented.

An example of a message that is correct based on the CAP schema, but is not correct for the EAS-CAP Profile, is an Area block that contains a geocode with value name of SAME but has a value not matching the format of the CFR 47 Part 11 PSSCCC code.

### **B1.3.3 Logging**

Logging is an implementation detail for each vendor. Logging requirements for CAP messages are not yet defined by the FCC or other certification authorities. It is recommended that an EAS-CAP Profile Decoder SHOULD log all received CAP messages, along with a notation of the CAP message result states, as defined later in this document.

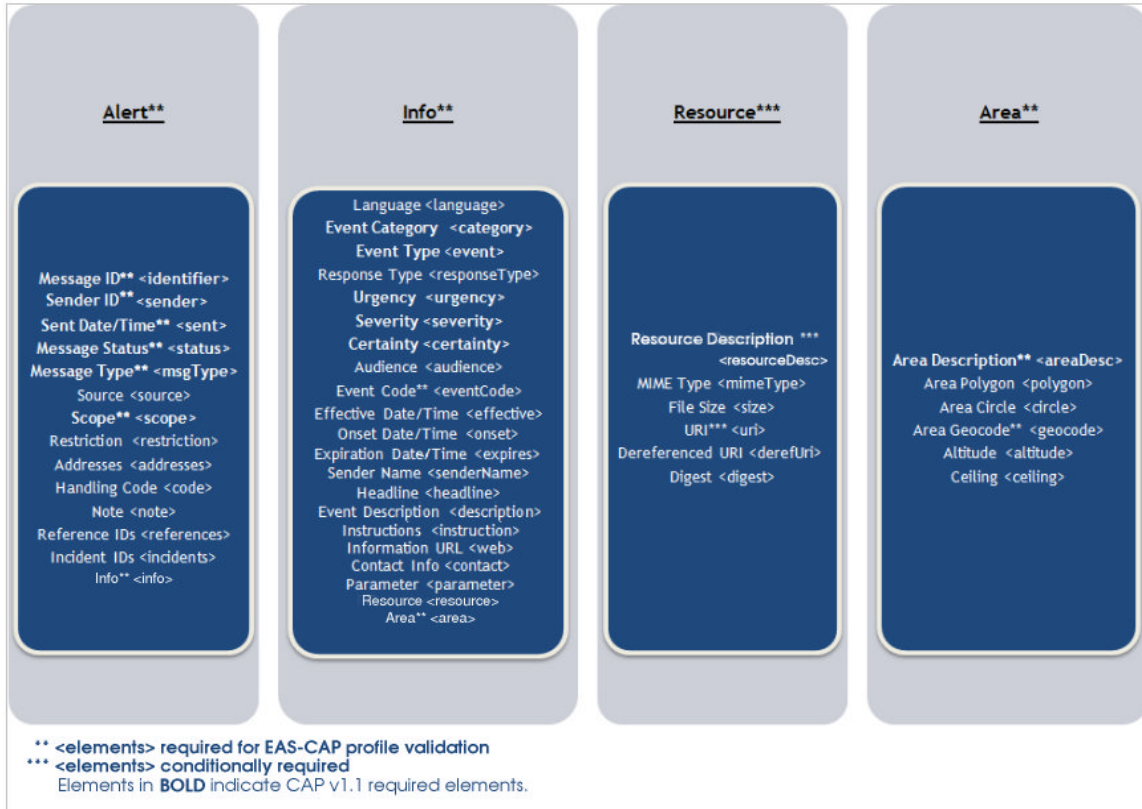


Figure B-1: CAP v1.1 Message Structure and EAS-CAP Profile Required Elements

## B2 EAS-CAP Message Validation Procedure

Each of the following validation steps results in a new message state. The default is that the message is passed to the next verification step. The three states are Rejected, Ignored, or Accepted. The action taken in those states is the following section of this document. For information on validation of specific elements, see the notes column under the “CAP to EAS Validation Table” below.

EAS-CAP validation is performed in the following order:

- 1) CAP conformance.
  - a) Check for legal XML format.
  - b) If required by rules specified by a certification authority, check for the presence and validity of ALL CAP required elements.

If a message fails this step, the message SHALL be Rejected.

- 2) CAP / EAS validation:
  - a) *Minimum set of CAP Required elements*: If a CAP element that is required by CAP and is also required by the EAS-CAP Profile is missing, the message SHALL be Rejected. See Figure B-1 above to determine the CAP Required and EAS Required elements.
  - b) *Minimum set of Required EAS compatible CAP elements*: If any of the minimum set of Required EAS compatible CAP elements are present, they are examined for validity, and if any are invalid, the message SHALL be Rejected. Validity in general means that the value is a recognized CAP or EAS-CAP Profile value. If any of these required elements are missing, the message SHALL be Ignored. Note: A missing optional EAS-CAP element will have a default defined by the Profile and is not cause for a Reject or an Ignore.
- 3) Acceptance:
 

A message that has passed the previous validation steps SHALL be Accepted. Once the message is accepted, in most implementations it will be further subjected to various EAS rendering filters to decide if the alert is to be aired by a particular user. Such filters are in the EAS rendering domain only, and are beyond the scope of this profile.

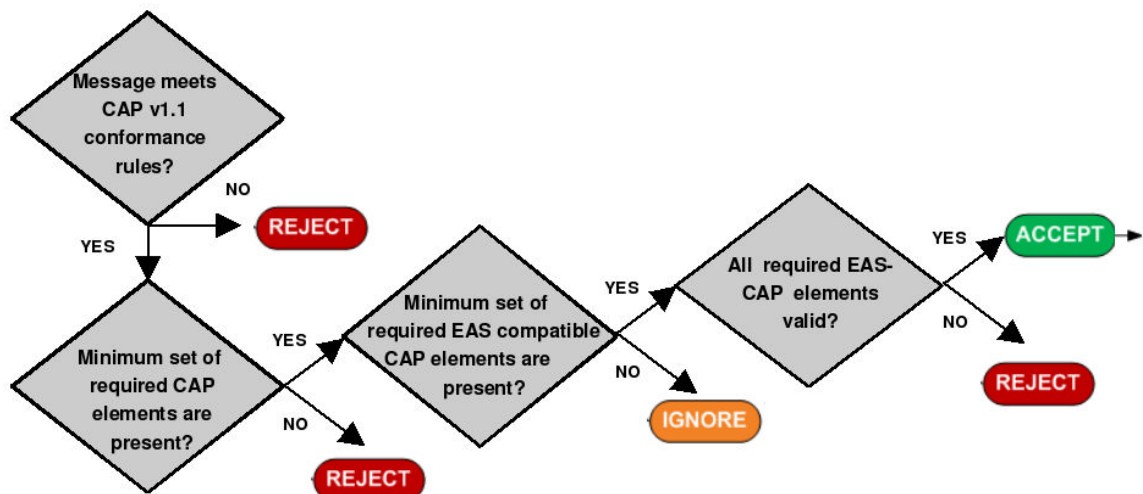


Figure B-2: Basic CAP-to-EAS Validation Process

### **B3 EAS-CAP Message Result States**

Based on the procedure above, the validation steps result in three states, Rejected, Ignored, or Accepted. The resulting actions that MAY be taken are described below. Returning a result provides a valuable mechanism for message validation to the sender, but note that CAP servers are not required to support this option. If the EAS-CAP Profile Decoder does send the optional return message, it SHALL conform to the syntax rules described below. This methodology will be further reviewed by the EAS-CAP Industry Group before further recommendation.

#### **Rejected:**

An EAS-CAP Profile Decoder SHALL NOT further process or render a rejected message. It MAY generate a return message and the syntax SHALL be a <msgType> of “Error”, a <note> element describing the issue, and a <references> element containing the extended message identifier (in the form *sender,identifier,sent*) of the Rejected message.

#### **Ignored:**

An EAS-CAP Profile Decoder SHALL NOT further process or render an ignored message. It MAY generate a return message and the syntax SHALL be a <msgType> of “Ack”, a <note> of “Ignored” (“Ignored” MAY be followed by a colon (“:”) and a text description of the issue), and a <references> element containing the extended message identifier (in the form *sender,identifier,sent*) of the Ignored message.

#### **Accepted:**

An EAS-CAP Profile Decoder MAY generate a return message and the syntax SHALL be a <msgType> of “Ack”, a <note> of “Accepted”, and a <references> element containing the extended message identifier (in the form *sender,identifier,sent*) of the Accepted message.

If the EAS-CAP Profile Decoder places the alert on the air, it MAY generate an additional return message with a <msgType> of “Ack”, a note of “Aired on” followed by the FCC Call Sign(s) of the station(s) that the alert was sent on, and a <references> element containing the extended message identifier (in the form *sender, identifier, sent*) of the aired message. This may result in multiple “Ack” messages in the case where an EAS-CAP Profile Decoder controls more than one broadcast outlet.

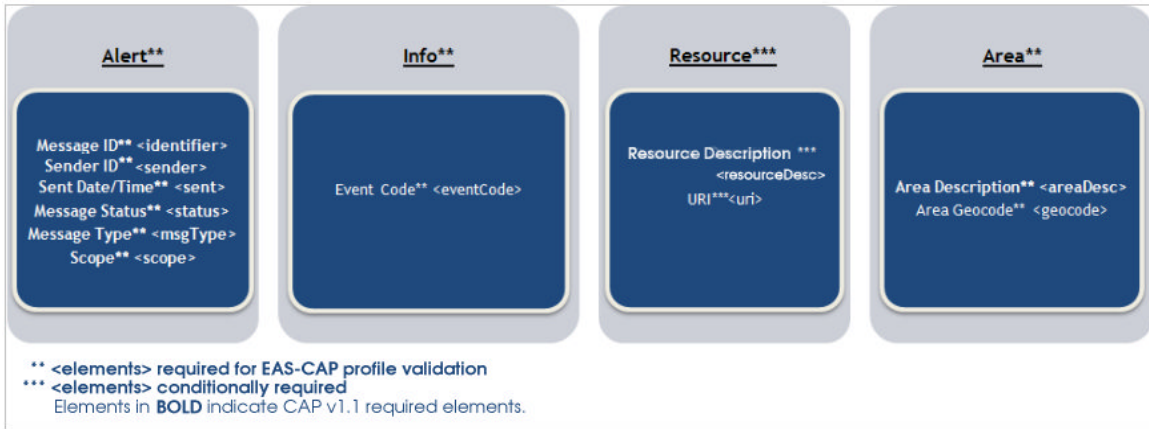
**B4 CAP to EAS Required Elements**

Below in summary are the minimum elements required within a valid EAS-CAP Profile message. If any of these elements is missing, the message SHALL be ignored; if invalid, the message SHALL be rejected.

<alert> , <identifier> , <sender> , <sent> , <status> , <msgType> , <scope>  
<info> , <eventCode>  
<area> , <areaDesc> , <geocode>

In addition there are two conditional required elements if the optional <resource> element is used. If any of these elements is missing, the message SHALL be ignored; if invalid, the message SHALL be rejected.

<resourceDesc> , <uri>



**Figure B-3: Minimum EAS-CAP Profile Elements**

## **CAP to EAS Validation Table**

R = Required, O = Optional, E = Extension, NU = Not Used, U = Used, C = Conditional

\* = Items that map into the EAS ZCZC string.

CAP fields in this table:

1) Are in the EAS-CAP validation process

or

2) Have recommended values meant to be useful to non-EAS user – in particular, those used in conjunction with the various EAS “test” messages. See the discussion on EAS Test messages elsewhere in this document.

CAP Standard Element Name and definition	CAP Required	EAS-CAP Required	CAP to EAS Mapping and Validation Notes
<b>Alert Block</b>			
<alert> Identifies XML message as a CAP Standard message.	R	R	Must follow CAP defined syntax. Must be version 1.1. Example: <alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
<identifier> Each message must contain a number or string uniquely identifying that message.	R	R	Recommended that the identifier value be stored as state information for an active CAP message in the EAS-CAP Profile Decoder. Must be used with <sender> and <sent> to match an existing alert during <msgType> Update, Cancel, Ack, or Error.
<sender> Identifies the originator of an alert. Guaranteed by assigner to be unique globally. Can be an email address.	R	R	Recommended that the sender value be stored as state information for an active CAP message in the EAS-CAP Profile Decoder. Must be used with <identifier> and <sent> to match an existing alert during <msgType> Update, Cancel, Ack, or Error.
<sent> Sent time. Format: “2007-05-24T16:49:00-07:00” = 24 May 2007 at 16:49 PDT	R	R	*Must be converted to EAS <b>JJHHMM</b> Effective Date/Time. If cannot be converted due to missing time zone or a syntax error then message SHALL be rejected.
<status> Alert handling code. Possible Values: Actual, Exercise (for participants), System (internal functions), Test (all should ignore), Draft (not actionable).	R	R	“Actual” SHALL be used for any alert destined for EAS forwarding – including all EAS test messages such as RWT, RMT, NPT, DMO, and NMN. “Test” may be used to test CAP reception. Use of the other CAP defined values is not defined yet.
<msgType> Nature of alert. Possible Values: Alert, or Update, Cancel, Ack, Error. (The latter four are applied to the alert identified in <references> below, and explained in <note> below.)	R	R	Valid range for values must be “Alert” or “Update”, or “Cancel”.  Messages missing <msgType> SHALL be rejected; messages with incorrectly valued <msgType> SHALL be ignored.
<scope> Intended distribution. Possible Values: Public, Restricted, Private.	R	R	Messages with a value other than Public SHALL be ignored.
<info> CAP allows multiple Info Blocks. The EAS-CAP Profile will only use the information in the first info block. See below for Info Block elements.	O	R	One info block only. Second or more info blocks will be not be processed. The presence of more than one info block SHALL NOT cause the message to be rejected or ignored. See below for Info Block elements.
<b>Info Block elements</b>			Only the information in the first info block will be used.
<language> Code denoting the language the alert is in. CAP assumes “en-US” if blank.	O	O	Usage is not defined in this version of the EAS-CAP Profile.



CAP Standard Element Name and definition	CAP Required	EAS-CAP Required	CAP to EAS Mapping and Validation Notes
<event> Text denoting type of event of the alert.	R	O	Used in construction of crawl text or other visual display. See CAP Message Processing section.
<urgency> Possible values: Immediate, Expected, Future, Past, Unknown	R	NU	For test alerts (RWT, RMT, NPT, DMO, and NMN) value SHOULD be set to <i>Unknown</i> by originator. CAP to EAS translation does not use this field.
<severity> Possible values: Extreme, Severe, Moderate, Minor, Unknown.	R	NU	For test alerts (RWT, RMT, NPT, DMO, and NMN) value SHOULD be set to <i>Minor</i> by originator. CAP to EAS translation does not use this field.
<certainty> Possible values: Observed, Likely, Possible, Unlikely, Unknown.	R	NU	For test alerts (RWT, RMT, NPT, DMO, and NMN) value SHOULD be set to <i>Unknown</i> by originator. CAP to EAS translation does not use this field.
<eventCode> System-specific code for event.  Subfields <valueName> of SAME and <value> define the code, a 3 letter code.	O	R	*One eventCode, with a valueName of SAME and a 3 letter value is required. Maps to EAS <b>EEE</b> Event Code field. Range is any uppercase alphabetic characters. Depending upon the specific EAS-CAP Profile Decoder implementation, message validation may or may not validate against the FCC defined EAS codes. Provisions for state defined EEE values can be handled optionally. Example: <pre>&lt;eventCode&gt;   &lt;valueName&gt;SAME&lt;/valueName&gt;   &lt;value&gt;CAE&lt;/value&gt; &lt;/eventCode&gt;</pre> If the implementation does not handle the EEE code, the message SHALL be ignored.
<expires> Expiration time of the information of the alert.	O	O	*Used to derive <b>EAS Valid Time Period (TTTT)</b> . Round resulting duration up to next valid EAS Duration length. EAS Duration Range: If less than 1 hr '15,30,45 mins' else every half hour from '1hr' to '99hrs 30 mins'  If this optional field is not present, the EAS-CAP Profile Decoder SHALL assume that the expired time is one hour greater than the value in the <sent> element, and the value of the EAS Valid Time Period SHALL be 0100, and if there are no other errors, the message SHALL be accepted.
<senderName> Human-readable name of agency or authority.	O	O	Used in construction of crawl text or other visual display. See CAP Message Processing section.
<headline> Direct and actionable brief human-readable headline.	O	O	Used in construction of crawl text or other visual display. See CAP Message Processing section.
<description> Extended human-readable description of event.	O	O	Used in construction of crawl text or other visual display. See CAP Message Processing section.
<instruction> Extended human-readable recommended action for targeted alert recipients.	O	O	Used in construction of crawl text or other visual display. See CAP Message Processing section.
<parameter> Any system-specific datum associated with alert.	O		EAS-CAP Profile defines two <valueName> fields: 1. <b>EAS-ORG</b> and 2. <b>EAS-STN-ID</b> See below

CAP Standard Element Name and definition	CAP Required	EAS-CAP Required	CAP to EAS Mapping and Validation Notes
<parameter><valueName> <b>EAS-ORG</b> </valueName> <value> EAS, CIV, WXR, or PEP </value>	O, E	O	*Maps to 3 letter <b>EAS ORG</b> code. Range is; EAS, CIV, WXR, or PEP. Example <parameter> <valueName>EAS-ORG</valueName> <value>CIV</value> </parameter>  Note: If this optional field is not present, the EAS-CAP Profile Decoder SHALL assume that the originator is CIV, and if there are no other errors, the message SHALL be accepted.
<parameter><valueName> <b>EAS-STN-ID</b> </valueName> <value> up to 8 characters </value>	O, E	O	*Maps to 8 letter <b>EAS L-code</b> . Range of EAS-STN-ID value is up to 8 printable characters. Translation to <b>EAS L-code</b> must pad with the space character to 8 full bytes. Can not use a dash '-' or plus '+' character. Dash characters in the EAS-STN-ID value SHALL be converted in <b>EAS L-code</b> to '/' as per CFR 47 Part 11.31. The '+' character SHALL be converted in <b>EAS L-code</b> to space character. Note: If this optional field is not present, the EAS-CAP Profile Decoder may create the <b>EAS L-code</b> as 8 space characters or some other system defined value.
<parameter><valueName> <b>EAS-Must-Carry</b> </valueName> <value> TRUE </value>	O, E	C	If this parameter is present and the value is TRUE, then the CAP message has come from a state governor's office and the EAS system must place the message on air.
<resource> CAP allows multiple Resource Blocks.	O	O	Multiple resource block instances allowed. See below for Resource Block elements.
<area> CAP allows multiple Area Blocks. The EAS-CAP Profile will only use the information in the first area block. See below for Area Block elements.	O	R	One area block only. Second or more area blocks will not be processed. The presence of more than one area block SHALL NOT cause the message to be rejected or ignored. Basic syntax example (also see below): <area> <areaDesc>Arlington, VA</areaDesc> <geocode> <valueName>SAME</valueName> <value>022292</value> </geocode> </area> See below for Area Block elements.
<b>Resource Block elements</b> Refers to additional file with supplemental info			Only needed if audio file or stream is sent.
<resourceDesc> Human-readable description of resource, e.g. "map", or "photo".	C	C	Required if there is a <b>Resource Block</b> , e.g. mp3, wav or streaming asset. Valid values for resource intended for EAS use are: "EAS Audio" "EAS Streaming Audio"
<mimeType> Identifies MIME content type describing resource.	O	O	
<size> Approximate size of resource file in bytes.	O	O	

CAP Standard Element Name and definition	CAP Required	EAS-CAP Required	CAP to EAS Mapping and Validation Notes
<uri> Hyperlink to the resource file; URL on the Internet, or reference to <derefUri> location within the message.	O	C	Needed if alert data is referenced. Required if <info><resource> is present.
<derefUri> The actual resource file data, if sent within the message.	C	C	Needed if alert data is sent within message.
<digest> Digital digest "hash" code	O	O	
<b>Area Block elements</b> CAP permits more than one.			Only the information in the first area block will be used.
<areaDesc> Text describing the affected area.	R	R	Used in construction of crawl text or other visual display. See CAP Message Processing section. Example: <areaDesc>Contra Costa</areaDesc>
<geocode> Any geographically-based code to describe target area.  valueName = user-defined domain of code. value = string denoting the value itself.	O	R	*At least one <geocode> with <valueName> of SAME and one <value> string representing the 6-digit EAS Location code must be defined. The location code must be constructed as defined in CFR 47 Part 11, that is a 5-digit <b>FIPS</b> code and a leading digit indicating the 1/9 <sup>th</sup> area sub-division (6 total digits). Each one maps to one EAS Location Code defined as <b>PSSCCC</b> . The geocodes SHALL be placed into the EAS ZCZC string in the order that they are encountered in the CAP message. This is required to allow duplicate EAS messages to be detected. Example of <geocode> <pre> &lt;geocode&gt;   &lt;valueName&gt;SAME&lt;/valueName&gt;   &lt;value&gt;006013&lt;/value&gt; &lt;/geocode&gt; </pre> A message with no geocodes, or a message with geocodes but no valueName of SAME SHALL be ignored. A message with a valueName of SAME where the value is not in PSSCCC format SHALL be rejected.