

Hints When Consuming Common Alerting Protocol (CAP) Messages

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Robustness Principle (RFC1122)

"Be conservative in what you send, be liberal in what you accept"

Software should be written to deal with every conceivable error, no matter how unlikely; sooner or later a packet will come in with that particular combination of errors and attributes, and unless the software is prepared, chaos can ensue. In general, it is best to assume that the network is filled with malevolent entities that will send in packets designed to have the worst possible effect. This assumption will lead to suitable protective design, although the most serious problems in the internet have been caused by unenvisioned mechanisms triggered by low-probability events; mere human malice would never have taken so devious a course!

Suggested XML and Unicode Constraints While Consuming CAP Alerts

XML, Unicode and UTF encodings have many potential security issues. This does not attempt to cover the issues. For security reasons, exchange partners should reject CAP messages with invalid XML or Unicode encodings early.

Exchange partners and distribution channels may have different technical capabilities to render characters from different Unicode character blocks. IPAWS Exchange partners must support the Unicode Basic Latin block (ASCII) and should support at least the Unicode Latin-1 Supplement block. Supporting additional Unicode blocks is desirable, but due to the enormity of Unicode essentially no implementation is able to render every part of Unicode.

Exchange partners must support Info blocks with the default (not present) or U.S. English (en-US) language identifier. They should also support Info blocks with the U.S. Spanish (es-US) language identifier. Supporting additional languages is desirable. Exchange partners should ignore, i.e., not process or reject, Info blocks in unsupported languages.

Exchange partners should render Plain Text as written, even when characters are from different languages. When encountering a valid, but unsupported Unicode character, in a Plain Text string exchange partners should attempt to render the text string according to their technical capabilities following the Unicode recommendations. Exchange partners do not translate Plain Text strings in to different languages.

Exchange partners should avoid transliterating valid Unicode characters, but Unicode transliteration is almost always better than rendering garbage. For example, IPAWS CMAS/WEA transliterates a limited set of characters from Plain Text fields to the GSM 7-bit alphabet when distributing alerts to cellular mobile providers. IPAWS CMAS/WEA replaces unsupported Unicode characters with a blank or question-mark. Another example, older EAS broadcaster video graphic generators often support only ASCII in television text scrolls. EAS systems sometimes, but shouldn't, render unsupported Unicode characters with various garbage characters in text scrolls.

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Exchange partners should render translations of Coded Text values in different languages. For example, EAS exchange partners create required header text from the three-letter SAME Event Code and six-digit SAME Geocode elements in English, Spanish or French. Likewise, WEA creates default alert text from Coded Text in the Response Type and SAME Event Code elements in English.

Exchange partners should be prepared to liberally handle semi-Coded Text elements in CAP messages. The controlled vocabulary in semi-Coded Text elements is loosely controlled, likely to change frequently and require local variations. Exchange partners should process reserved keywords in semi-Coded Text elements and treat unrecognized values as Plain Text. For example, this document suggests treating IPAWS channel names (CMAS, EAS, NWEM, PUBLIC) as reserved keyword prefixes in Resource Descriptions. Other string values in Resource Descriptions could be used as general-purpose names for captions or hyperlinks anchor text. Some national CAP variants use reserved keywords in Area Descriptions to control including and excluding parts of alert areas.