IPAWS Broadcaster EAS-Device Alert Retrieval Interface Suggestion

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Background

I noticed that CAP Cancel messages were not matching over-the-air EAS messages. Sometimes it caused odd log messages on EAS devices, other times the over-the-air EAS message was relayed instead of matching the IPAWS cancel message. This currently happens infrequently, i.e. once or twice a year so far. Looking at a year's work of IPAWS CAP messages, I believe I understand what happened. As CAP updates and cancels become more common, this will likely happen more often with "triggered IPAWS" rapidly trying to retrieve CAP Alert from IPAWS or if National Weather Service alerts are added to the EAS CAP Retrieval feed. [1]

The OASIS Common Alerting Protocol v1.2 and EAS-CAP CAP Industry Group Recommendations for a CAP EAS Implementation Guide v1.0 generally assumed processing systems can refer to all previous CAP Alert, Update and Cancel messages. However, the IPAWS Broadcaster EAS CAP Retrieval Interface immediately replaces CAP XML messages when updated or canceled, and only the last alert, update or cancel CAP XML message is retrieved.

If for some reason EAS exchange partner did not retrieve the initial CAP Alert message, they are unable to generate an exact match for the EAS ZCZC string from just CAP Update or Cancel messages following the CAP EAS Implementation Guide. Each Update or Cancel messages contains slightly different CAP values, especially the <sent> date/time element. The duplicate detection algorithm developed by the EAS-CAP Implementor's Group depends on the <sent> value matching the time in the over-the-air EAS ZCZC string exactly.

Alert origination software could add new CAP XML data elements, but it's difficult to guarantee that all alert origination software is changed. The CAP alert, update and cancel life-cycle is complicated. Because the CAP XML message is digitally signed, the IPAWS Aggregation Service should not modify any CAP XML messages.

Recommended Change

I suggest the IPAWS Broadcaster EAS CAP Retrieval Interface generate and store the EAS ZCZC string in the ATOM XML <entry><title> metadata for the Alert, Update and Cancel message.

The IPAWS Environment would generate the EAS ZCZC metadata from the initial CAP Alert. If the original Alert message is replaced by a later Update or Cancel message, the original EAS ZCZC metadata from the Alert message would be used for the updated ATOM XML feed. Because the <entry><title> metadata is from the original CAP Alert message, in case it missed the original message, EAS exchange partners can use the EAS ZCZC metadata from the ATOM XML <entry><title> field.

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[1] The National Weather Service uses the <effective> time as the distribution time (used for Weather Radio), while the <sent> element is the time sent to IPAWS. Occasionally they have different times. If ever revised, the EAS-CAP IG v1.1 should use the <effective> time element if present, instead of <sent>, allowing better synchronization with other alert systems. Because the NWS Alert-v2 API returns ALL alert, update and cancel messages for up to seven days; that API doesn't have this problem.

EAS exchange partners could also use the ATOM XML <entry><title> metadata for fast duplicate checks during triggered EAS polling when the over-the-air EAS message arrives first. Saving bandwidth for broadcasters on very small circuits.

Using the ATOM XML <entry><title> for the EAS ZCZC metadata appears backward compatible with most EAS devices on the market. Current EAS devices appear to ignore the <entry><title> and use the <entry><category> elements.

Sample ATOM XML

```
<?xml version="1.0" encoding="UTF-8"?>
<feed xmlns="http://www.w3.org/2005/Atom">
      <title type="text">IPAWS EAS FEED</title>
      <updated>2019-02-27T21:00:12.420Z</updated>
      <id>https://apps.fema.gov/IPAWSOPEN_EAS_SERVICE/rest/feed</id>
      <entry>
            <title>ZCZC-WXR-SVR-024033-051153+0100-0582100-IPAWSCAP-</title>
            <link
            href="https://apps.fema.gov/IPAWSOPEN_EAS_SERVICE/rest/eas/10001"
            </link>
            <id>https://apps.fema.gov/IPAWSOPEN_EAS_SERVICE/rest/eas/10001</id>
            <updated>2019-02-27T21:00:12.420Z</updated>
            <category term="24" label="statefips"></category>
            <category term="51" label="statefips"></category>
            <category term="SVR" label="event"></category>
      </entry>
</feed>
```

An Update or Cancel severe thunderstorm message. Even when the <sent> or <expires>, the ATOM XML always maintains the same <entry><title> EAS ZCZC metadata from the original CAP Alert message.

```
<?xml version="1.0" encoding="UTF-8"?>
<feed xmlns="http://www.w3.org/2005/Atom">
      <title type="text">IPAWS EAS FEED</title>
      <updated>2019-02-27T21:14:19.132Z</updated>
      <id>https://apps.fema.gov/IPAWSOPEN_EAS_SERVICE/rest/feed</id>
      <entry>
            <title>ZCZC-WXR-SVR-024033-051153+0100-0582100-IPAWSCAP-</title>
            <link
            href="https://apps.fema.gov/IPAWSOPEN_EAS_SERVICE/rest/eas/10003"
            </link>
            <id>https://apps.fema.gov/IPAWSOPEN_EAS_SERVICE/rest/eas/10003</id>
            <updated>2019-02-27T21:14:19.132Z</updated>
            <category term="24" label="statefips"></category>
            <category term="51" label="statefips"></category>
            <category term="SVR" label="event"></category>
      </entry>
</feed>
```