

CAP and EAS

*A New Generation of
Public Warning Systems*

The Common Alerting Protocol (CAP)

- An interoperability standard for all kinds of warning systems.
- A general-purpose digital warning format that can be converted into any kind of public warning deliver system.
- Provides *consistent* and *simultaneous* warning over multiple warning technologies.

The Common Alerting Protocol (CAP)

- Use in EAS mandated by FCC Second Report and Order, July 2007.
- Also the core technology for federal efforts in cellular alerting and NOAA Weather Radio integration.
- Standardized by OASIS organization, adopted by the International Telecommunications Union.

Why CAP for EAS?

Three reasons:

1. Interoperability with other warning systems.
 - Cellular, weather radio, telephone notification, sirens, etc..
2. Enhanced capabilities for the future
 - More complete information
 - Images, maps, data
 - Multilingual
3. Better Security

A CAP Alert:

- A text file in XML format.
- May attach audio, video, pictures, maps, etc.
- Can include SAME event and FIPS codes.
- Precise geographic targeting.

```
<?xml version="1.0" encoding="UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
  <identifier>1226340405765</identifier>
  <sender>cws@cws.cccounty.us</sender>
  <sent>2008-11-10T10:06:45-08:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  <info>
    <language>en-US</language>
    <category>Safety</category>
    <event>Administrative Message</event>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Likely</certainty>
    <eventCode>
      <valueName>SAME</valueName>
      <value>ADR</value>
    </eventCode>
    <effective>2008-11-10T10:06:45-08:00</effective>
    <expires>2008-11-10T11:06:45-08:00</expires>
    <senderName>Contra Costa County Sheriff</senderName>
    <headline>HazCollect TEST Message</headline>
    <description>THIS IS TEST MESSAGE NUMBER 1. THIS IS A TEST
OF THE CAPABILITY TO RELAY EMERGENCY MESSAGES FROM NON-NATIONAL
WEATHER SERVICE SOURCES USING DEPARTMENT OF HOMELAND SECURITY
AND NWS SYSTEMS.</description>
    <instruction>DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.</instruction>
    <contact>(925) 313-9622</contact>
    <area>
      <areaDesc>Vicinity of Contra Costa County</areaDesc>
      <polygon>38.0247,-121.8265 38.0182,-121.8255 38.016,-
121.8225 38.0042,-121.832 38.0074,-121.8474 38.0183,-121.8763
38.0223,-121.8756 38.0243,-121.8821 38.0325,-121.8802 38.035,-
121.8783 38.0247,-121.8265 38.0247,-121.8265</polygon>
      <geocode>
        <valueName>SAME</valueName>
        <value>006013</value>
      </geocode>
    </area>
  </info>
</alert>
```

What's Involved in using CAP?

1. New origination tools for officials.
2. New digital relay networks.
3. New security provisions.
4. Adapters or new EAS devices.

New Origination Tools

The screenshot shows a software interface for creating alerts. It includes a map with a highlighted area, a form for alert details, and a user login section.

Alert Type / Template: EAS - AMBER / Child Abduction

Response Type: Monitor

Expires in: 1 hour

Urgency: Immediate

Severity: Extreme

Public Safety Category: Public Safety

Certainty: Observed

Sending Agency: Contra Costa County Sheriff's Office

Headline: AMBER Alert from _COMMUNITY_

Area Description: Vicinity of Dow Chemical plant in Pittsburg in Contra Costa County

Description of Event / Hazard: This is an Amber Alert for a reported child abduction in _COMMUNITY_. The victim is _NAME_, a _RACE_ _MALE/FEMALE_, age _AGE_. The victim is _HEIGHT_ tall and weighs approximately _WEIGHT_ pounds. The victim has _COLOR_ hair and _COLOR_ eyes. The victim was last seen at _LOCATION_AND_TIME_, wearing _CLOTHING_DESCRIPTION_. _DISTINGUISHING_CHARACTERISTICS_SPECIAL_HEALTH_NEEDS_OR_DISABILITIES_. The suspect is _NAME_, a _RACE_ _MALE/FEMALE_, _AGE_ years old, _HEIGHT_ tall and weighing approximately _WEIGHT_ pounds. The suspect has _COLOR_ hair and

Instructions / Recommended Protective Action: If you see the victim or the suspect, do not approach them, but call 9-1-1 immediately.

For More Information Contact: Tune to local radio or television for further information.

User ID: abott

Password: *****

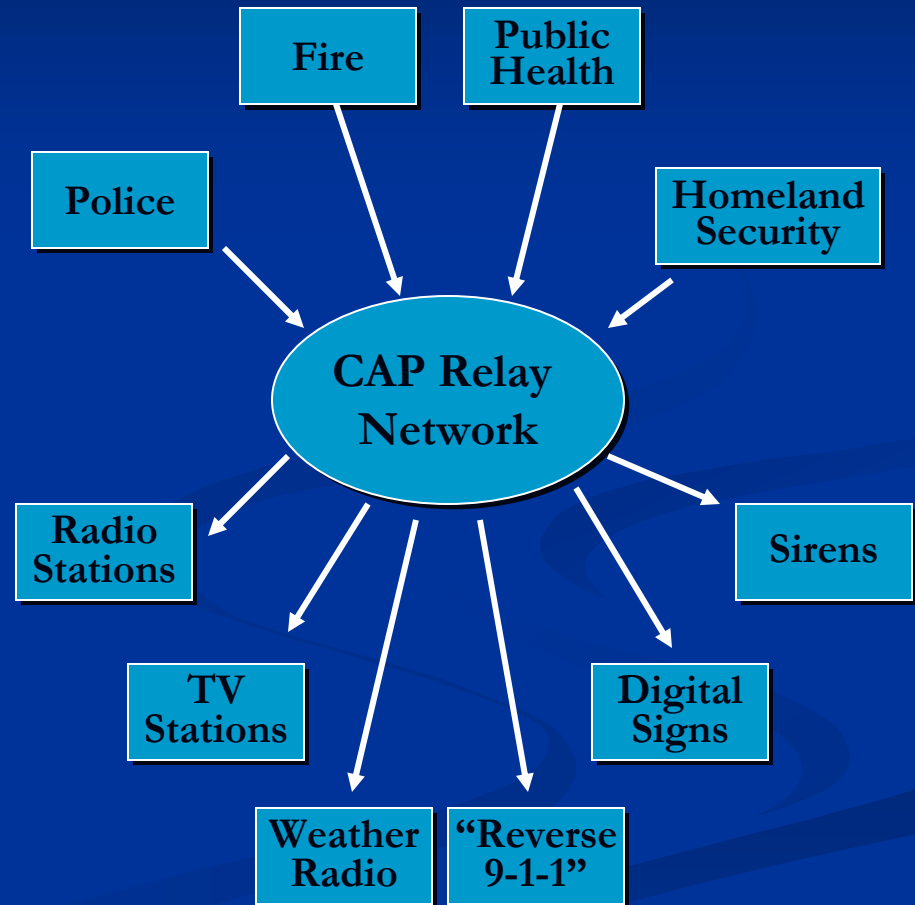
Status: Actual

Send

- Mapping to target precise audience.
- Templates to help ensure clean and complete messages.
- Authentication and “non-repudiation” of messages ensure responsible use.

New Digital Relay Networks

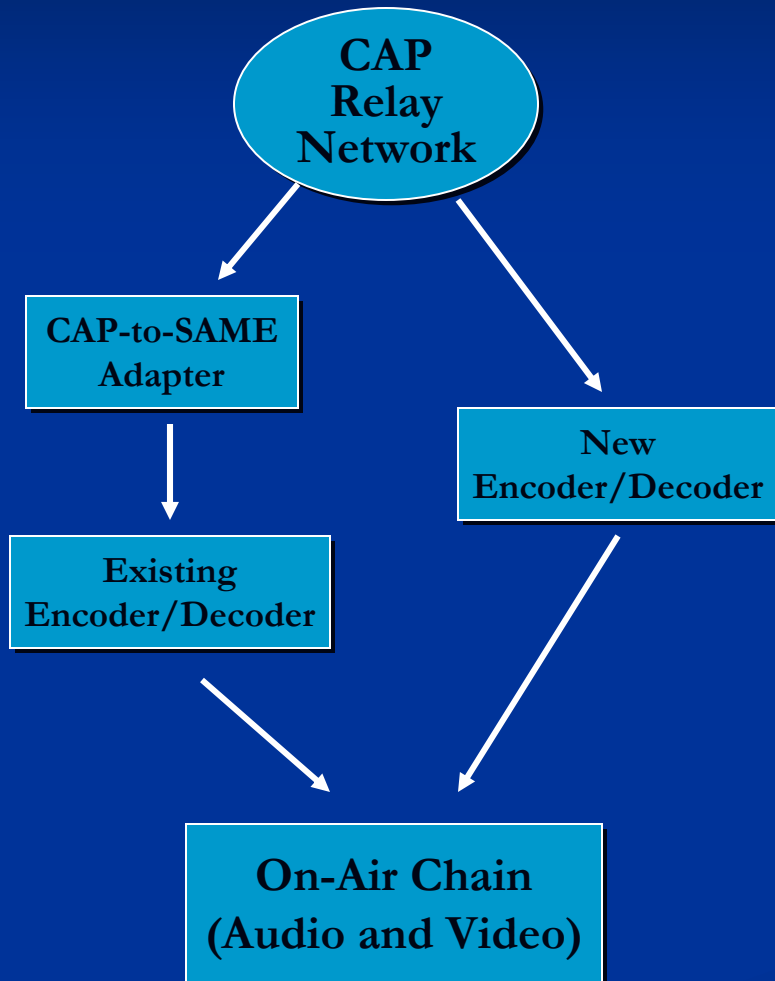
- CAP message is digital.
- Single message goes to multiple stations, other delivery systems.
- Can use satellite, data broadcast, wireless or ordinary Internet with encryption



New Security Provisions

- CAP alerts can be “digitally signed” to ensure they haven’t been distorted or forged.
- Encryption key management system (“public key infrastructure” or “PKI”) required.
- Credentialing of authorized officials for authority and training before issuing keys.
- Who will do this? Unclear so far!

Adapters or new encoders



- For now, on-air presentation the same
- Adapters may let new relay network “drive” existing ENDECs
- Or entirely new ENDECs with CAP network interface

When will this happen?

- FEMA says it will publish CAP “profile” in first quarter of 2009.
- FCC provides 180 days thereafter for stations to be able to accept CAP alerts.

BUT...

- FEMA is making no promises about when standards for a relay network or PKI might be in place.

What will it cost?

- Manufacturers have suggested new ENDECs will cost about the same as old ones, probably a couple of thousand dollars per station.
- Not clear yet who'll be building relay networks or what technology will be used.
- CAP origination is being built into a lot of popular emergency management software, including some that's free.

How do we get ready?

- Don't panic! This is really just a new relay network. Basic EAS procedures aren't changing for now.
- Need to lobby for FEMA to clarify plans regarding CAP transmission and security for local alerts. (Or else give it back to the FCC?)
- Stay in touch with SBE, NAB, NASBA, and other organizations to track these issues.

And then what?

Once the relay network issue is addressed, we can talk about:

- Improved training for broadcasters and warning originators alike.
- How digital broadcast services can use the richer content available in CAP to provide more detailed and useful messages.
- How receivers can be improved to allow more precise targeting and minimize program interruption.

CAP Resources

- OASIS CAP 1.1 Specification
 - <http://www.oasis-open.org>
- The “CAP Cookbook” (resource page)
 - <http://www.incident.com/cap/>
- DHS/FEMA IPAWS Web Page
 - <http://www.fema.gov/emergency/ipaws/>

Questions and Discussion

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