



The Common Alerting Protocol (CAP)

presented

by Eliot Christian <Eliot.J.Christian@gmail.com>
in Riyadh, Saudi Arabia on 27 November 2019
at the "Regional Multi-stakeholder Workshop on
the Role of Telecommunication/ICTs for Disaster
Risk Reduction and Management for the Arab Region"



Presentation Outline

- 1 Online Media Replacing Mass Media
- 2 Identifying Official Sources
- 3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 Uptake of CAP
- 7 CAP in the NETP
- 8 CAP Alert Hubs



Warnings Via Commercial Media

Commercial TV
and radio send
warnings as
"crawl text"
and/or audio

What about
online media
users?





Online Solutions

Online media (e.g, Google, the Federation for Internet Alerts...) use their own capabilities to help alerting authorities send warnings to people using the Internet, at no charge



The National Weather Service has issued a
TORNADO WARNING
TAKE SHELTER IMMEDIATELY

KENT, MCCOMB, HARRIS, OTTOWA COUNTIES...

UNTIL WED, 5:18 PM EST

READ MORE »

THIS IS AN EXTREMELY DANGEROUS AND LIFE THREATENING SITUATION. IF YOU ARE IN THE PATH OF THIS LARGE AND... DESTRUCTIVE TORNADO TAKE COVER IMMEDIATELY.



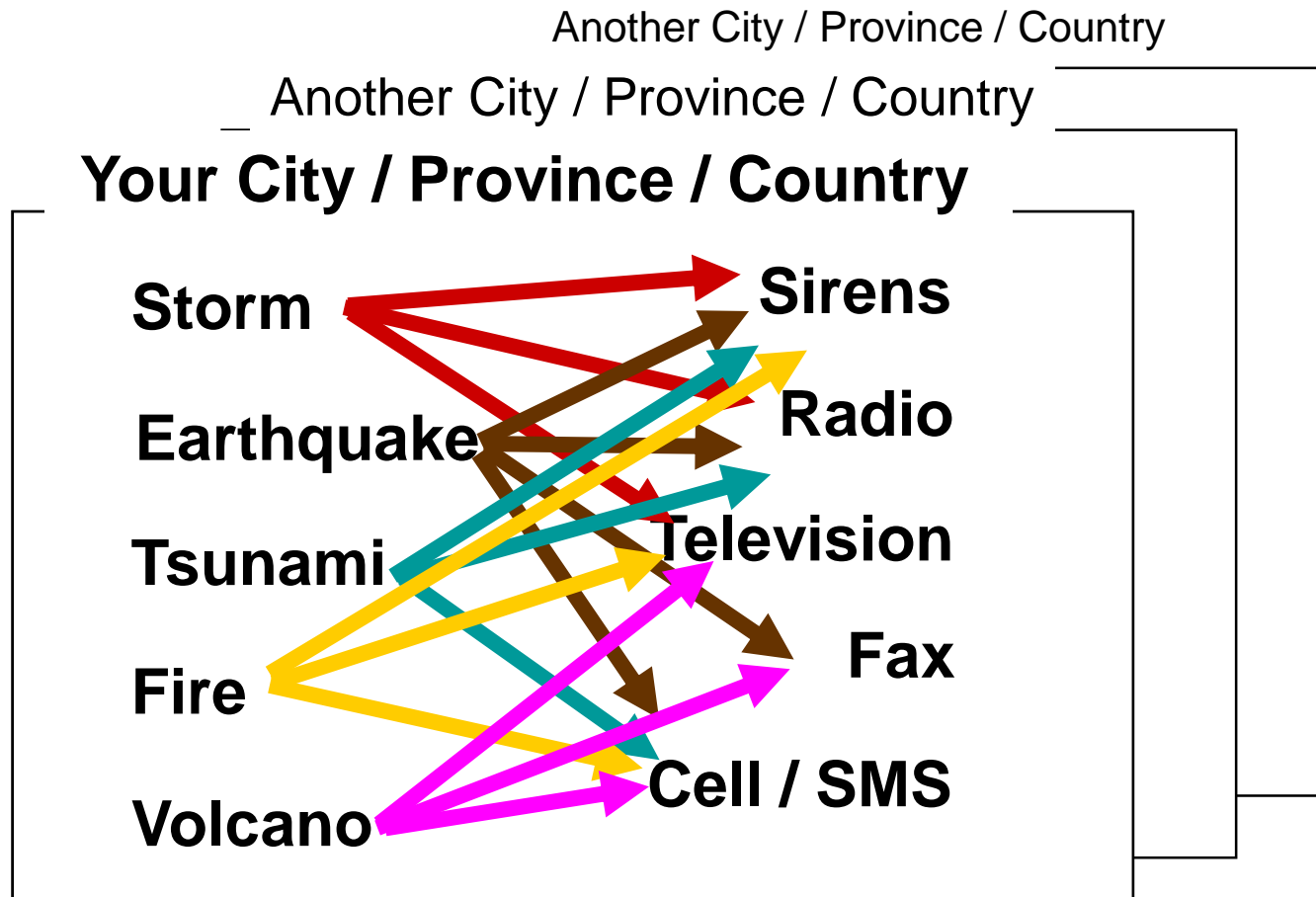
The Challenge of Alerting

All governments have various public alerting systems:

- **Earthquakes/tsunami** by e-mail, news wire, Web sites, pagers, telephone calls ...
- **Weather** by news wire, fax, radio, television, e-mail, SMS text on cell phones ...
- **Fire, Security, Transportation** by television, radio, sirens, police with bullhorns...



Across communities, nations, regions— a “public alerting patchwork”





What is CAP?

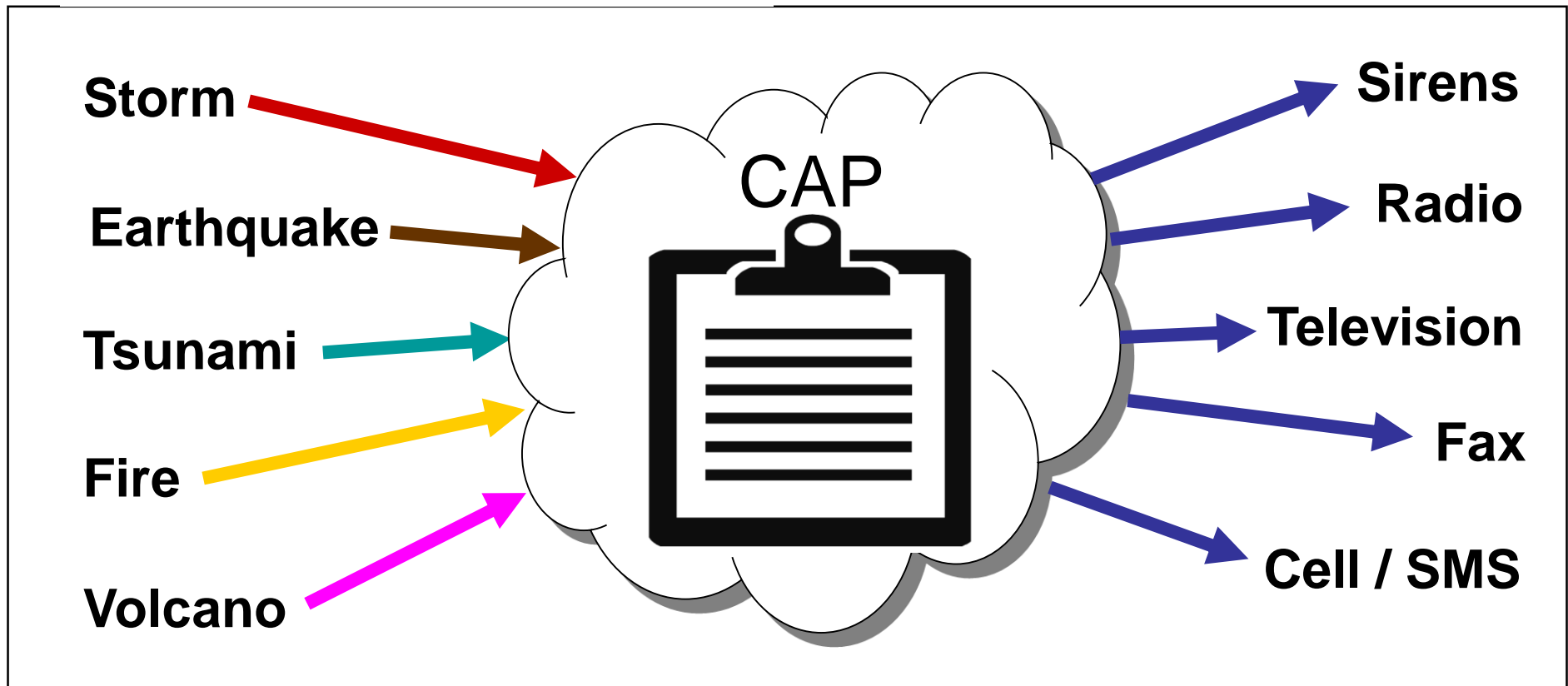
The Common Alerting Protocol (CAP) is a standard message format designed for All-Media, All-Hazard, communications:

- **over any and all media** (*television, radio, telephone, fax, highway signs, e-mail, Web sites, RSS "Blogs", ...*)
- **about any and all kinds of hazard**
(*Weather, Fires, Earthquakes, Volcanoes, Landslides, Child Abductions, Disease Outbreaks, Air Quality Warnings, Transportation Problems, Power Outages ...*)
- **to anyone:** the public at large; designated groups (civic authority, responders, etc.); specific people



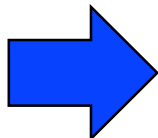
All-Hazards, All-Media Message Format

Any City / Province / Country





Presentation Outline

- 1 Online Media Replacing Mass Media
-  2 Identifying Official Sources
- 3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 CAP in the NETP
- 7 Uptake of CAP
- 8 CAP Alert Hubs



What is an Alerting Authority?

Any organization nationally authorized
to perform the function of alerting

U.S. example alerting authorities:

- EPA, Air Quality Alerts
- FEMA, Integrated Public Alert and Warning System
- NOAA, National Weather Service
- NOAA, National Tsunami Warning Center
- USGS, Earthquakes
- USGS, Volcano Hazards Program

How is the Register Maintained?


- Register of Alerting Authorities established by WMO and ITU
- WMO Member countries register alerting authorities they recognize
- WMO Permanent Representative designates editor to maintain entries



Register of Alerting Authorities

<http://www.wmo.int/alertingorg>

Print | Bookmark | RSS or ATOM | Zoom | Share | Recommend | GMap | Save page as PDF



World Meteorological Organization
Working together in weather, climate and water

WMO Search

HOME CONTACT US TOPICS LINKS UN SYSTEM FAQs HELP

Public Weather Services established this register of information about alerting authorities as identified by Members. For questions, please contact us. This page is using nested navigation, but is available without frames as well. Select a country to get started.

Alerting authorities by WMO Member or Organization

To monitor updates to this Register, subscribe to the [RSS](#) or [ATOM](#) news feed.

<input type="radio"/> Afghanistan	<input type="radio"/> Albania	<input type="radio"/> Algeria	<input type="radio"/> Angola	<input type="radio"/> Antigua and Barbuda
<input type="radio"/> Argentina	<input type="radio"/> Armenia	<input type="radio"/> Australia	<input type="radio"/> Austria	<input type="radio"/> Azerbaijan
<input type="radio"/> Bahamas	<input type="radio"/> Bahrain	<input type="radio"/> Bangladesh	<input type="radio"/> Barbados	<input type="radio"/> Belarus
<input type="radio"/> Belgium	<input type="radio"/> Belize	<input type="radio"/> Benin	<input type="radio"/> Bhutan	<input type="radio"/> Bolivia
<input type="radio"/> Bosnia and Herzegovina	<input type="radio"/> Botswana	<input type="radio"/> Brazil	<input type="radio"/> Brunei Darussalam	<input type="radio"/> Bulgaria
<input type="radio"/> Burkina Faso	<input type="radio"/> Burundi	<input type="radio"/> Cambodia	<input type="radio"/> Cameroon	<input type="radio"/> Canada
<input type="radio"/> Cape Verde	<input type="radio"/> Central African Republic	<input type="radio"/> Chad	<input type="radio"/> Chile	<input type="radio"/> China
<input type="radio"/> Colombia	<input type="radio"/> Comoros	<input type="radio"/> Congo	<input type="radio"/> Cook Islands	<input type="radio"/> Costa Rica
<input type="radio"/> Cote d'Ivoire	<input type="radio"/> Croatia	<input type="radio"/> Cuba	<input type="radio"/> Cyprus	<input type="radio"/> Czech Republic
<input type="radio"/> Democratic People's Republic of Korea	<input type="radio"/> Denmark	<input type="radio"/> Djibouti	<input type="radio"/> Dominica	<input type="radio"/> Dominican Republic
<input type="radio"/> Ecuador	<input type="radio"/> Egypt	<input type="radio"/> El Salvador	<input type="radio"/> Eritrea	<input type="radio"/> Estonia
<input type="radio"/> Ethiopia	<input type="radio"/> Fiji	<input type="radio"/> Finland	<input type="radio"/> France	<input type="radio"/> French Polynesia

WMO Register of Alerting Authorities [home]

OID: 2.49.0.0.840.0 WMO Member: United States of America ISO 3166: US USA 840

Issuing Organization: National Oceanic and Atmospheric Administration (NOAA), National Weather Service

Hazard Categories: Geo Met Fire Health Env CBRNE hazards

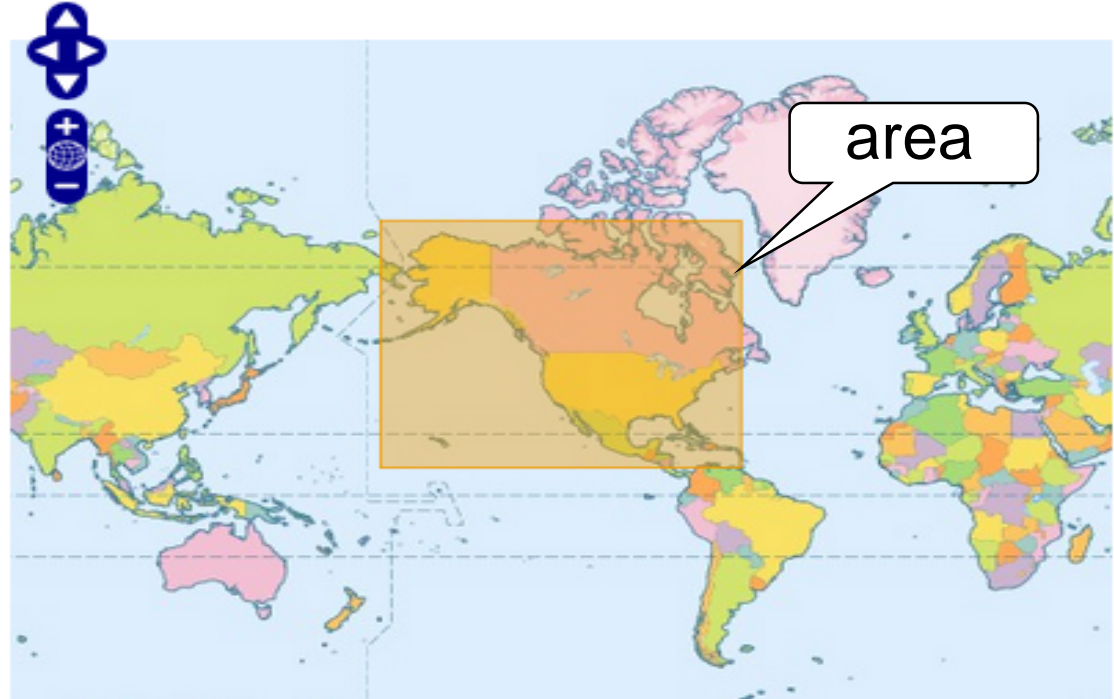
Authorization Basis: The National Weather Service Organic Act of 1890, currently codified as amended in section 313 of title 15 of the federal statutory code (called the United States Code) authorizes the National Weather Service to issue and distribute ~~warnings of environmental hazards. The authority is summarized as: The National Weather Service (NWS) provides weather~~
Act, codified as amended sections 5121 to 5206 of title 42 of the United States Code.

CAP Feed URL(s):
Language: English URL: <https://alerts.weather.gov/cap/us.php?x=0> CAP feed URL

Forecasts URL: <http://www.worldweather.org/093/m093.htm>

Alerting Area (NWSE): 73 -176 11 -61

Map view of the typical area for this alerting authority.



- Hazard Categories
- Geo:** Geophysical (earthquakes, volcanoes, tsunamis, etc., includes landslide)
 - Met:** Meteorological (weather, storms, etc. includes flood)
 - Safety:** General emergency and public safety
 - Security:** Law enforcement, military, homeland and local/private security
 - Rescue:** Rescue and recovery
 - Fire:** Fire suppression and rescue
 - Health:** Medical and public health
 - Env:** Pollution and other environmental
 - Transport:** Public and private transportation
 - Infra:** Utility, telecommunication, other non-transport infrastructure
 - CBRNE:** Chemical, Biological, Radiological, Nuclear or High-Yield Explosive threat or attack
 - Other:** Other events

The screenshot shows the NOAA National Weather Service website. The header includes the NOAA logo, the text "National Oceanic and Atmospheric Administration's National Weather Service", and the "weather.gov" URL. A navigation bar contains "Site Map", "NewsOrganization", a search box, and "NWS" and "All NOAA" buttons. The left sidebar lists various services like "Local forecast by City, St", "Sign-up for Email Alerts", "XML RSS Feeds", "Warnings", "Observations", "Forecasts", "Text Bulletins", and "Forecast Models". The main content area is titled "NWS Public Alerts in XML/CAP v1.1 and ATOM Formats" and includes an "Overview" section with text about CAP and ATOM feeds, a table of links for different states, and a "Service Description Document" link.

<http://alerts.weather.gov/>



Using CAP Sources

weather.gov

NOAA

Watches, Warnings or Advisories for the United States Marine Zones

NATIONAL WEATHER SERVICE

Site Map News Organization Search ONWS

Local forecast by "City, St"

City, St Go

Sign-up for Email Alerts

XML RSS Feeds

Warnings

Current

By State/County...

UV Alerts

Observations

Radar

Satellite

Snow Cover

Surface Weather...

Observed Precip

Forecasts

Local

Graphical

Aviation

Marine

Hurricanes

Severe Weather

Space Weather

Fire Weather

Text Bulletins

By State

Home > Alerts > the United States Marine Zones

Watches, Warnings or Advisories for the United States Marine Zones

This page shows alerts *currently* in effect for the United States Marine Zones and is normally updated every two-three minutes. Please see [here](#) for other state and listing by county.

Last updated: 02:46 PDT on 09-08-2017

<p>Small Craft Advisory Issued: September 08 at 12:04AM AKDT Areas affected:Cross Sound</p>	<p>Urgency: Expected Status: Actual</p>
<p>Small Craft Advisory Issued: September 08 at 12:04AM AKDT Areas affected:Northern Chatham Strait</p>	<p>Urgency: Expected Status: Actual</p>
<p>Small Craft Advisory Issued: September 08 at 12:04AM AKDT Areas affected:Southern Chatham Strait</p>	<p>Urgency: Expected Status: Actual</p>
<p>Small Craft Advisory Issued: September 08 at 12:04AM AKDT Areas affected:Frederick Sound</p>	<p>Urgency: Expected Status: Actual</p>

<http://alerts.weather.gov/cap/mzus.php?x=1>




CAP News Feed (MS Internet Explorer)

Current Watches, Warnings and Advisories for the United States Marine Zones Issued by the National Weather Service

You are viewing a feed that contains frequently updated content.

When you subscribe to a feed, it is added to the Common Feed List. Updated information from the feed is automatically downloaded to your computer and can be viewed in Internet Explorer and other programs. Learn more about feeds.

 [Subscribe to this feed](#)

Click here to subscribe

Displaying 88 / 88

All 88

Sort by:

Date

Small Craft Advisory issued September 08 at 2:46AM PDT until September 09 at 12:00PM PDT by NWS

Today, September 08, 2017, 49 minutes ago | w-nws.webmaster@noaa.gov

...SMALL CRAFT ADVISORY REMAINS IN EFFECT FROM 3 PM THIS AFTERNOON TO NOON PDT SATURDAY... * WINDS...N INCREASING TO 20 KT BY LATE THIS AFTERNOON AND CONTINUING THROUGH SATURDAY MORNING. * WAVES...STEEP N BUILDING TO 5 TO 7 FT AT 7 SECONDS BY TONIGHT WITH A W TO NW SWELL OF 5 FT AT 13 SECONDS.

Small Craft Advisory issued September 08 at 2:46AM PDT until September 10 at 5:00AM PDT by NWS

Today, September 08, 2017, 49 minutes ago | w-nws.webmaster@noaa.gov

<http://alerts.weather.gov/cap/mzus.php?x=0>



CAP News Feed (Firefox)



Subscribe to this feed using

Always use Live Bookmarks to subscribe to feeds.

Click here to subscribe

Current Watches, Warnings and Advisories for the United States Marine Zones Issued by the National Weather Service

[Small Craft Advisory issued September 08 at 12:04AM AKDT by NWS](#)

Friday, September 08, 2017, 4:04 AM

Southeast Alaska Coastal Waters from Dixon Entrance to Cape Suckling out 100 nm Wind forecasts reflect the predominant speed and direction expected. Sea forecasts represent the average of the highest one-third of the combined windwave and swell height. UPDATED

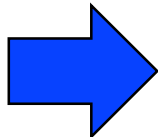
[Small Craft Advisory issued September 08 at 12:04AM AKDT by NWS](#)

Friday, September 08, 2017, 4:04 AM

Southeast Alaska Coastal Waters from Dixon Entrance to Cape Suckling out 100 nm Wind forecasts reflect the predominant speed and direction expected. Sea forecasts represent the average of the highest one-third of the combined windwave and swell height. UPDATED

<http://alerts.weather.gov/cap/mzus.php?x=0>

Presentation Outline

- 1 Online Media Replacing Mass Media
- 2 Identifying Official Sources
-  3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 CAP in the NETP
- 7 Uptake of CAP
- 8 CAP Alert Hubs



Alerting Areas are more Precise

People should not miss out on alerts, and, they should only get alerts intended for them

Without CAP:

text-based alerting not precise enough

With CAP:

precise alerting area with polygons or circles in addition to text description

CAP Quicker and Easier to Issue Alerts

Without CAP:

making phone calls, sending Faxes, sending e-mails, posting to a Web page, posting to Facebook and Twitter, ...

With CAP:

posting a single message can trigger most alerting methods



People with Special Needs or a Language Barrier

Without CAP:

public alerting may neglect people who are blind, deaf, or cognitively impaired, and people who do not understand the local language

With CAP:

CAP data features enable custom messaging, automated translation



Situational Awareness is Better Shared

Emergency management assimilates many types of information from many sources, at a broad range of scales, and a lot of that information involves alerting

Without CAP:

alerts are difficult to ingest, use, and share

With CAP:

sharing of alert information is much easier



Common Operating Picture

Get Directions My Maps

Save to My Maps

Displaying content from nb-masas.ess-host.com

The content displayed below and overlaid onto this map is provided by a third party, and Google is not responsible for it. Information you enter below may become available to the third party.

New Brunswick MA-SAS KML Feed

- [Be On the Look-Out For a 2008 Yellow Hummer \(H3\)](#)
Sent: 3/23/2010 10:12:41 AM (GMT)Sender:
- [Accident](#)
Sent: 3/23/2010 7:48:19 AM (GMT)Sender: Denis
- [Gondola Point Ferry Service Reduction](#)
Sent: 3/22/2010 8:33:06 AM (GMT)Sender:
- [New Missing Person Symbol](#)
Sent: 3/23/2010 6:11:36 PM (GMT)Sender:
- [Bedford City Airport Closure](#)
Sent: 3/22/2010 11:13:26 AM (GMT)Sender:
- [test_002](#)
Sent: 3/23/2010 1:05:10 AM (GMT)Sender: Denis
- [Air Canada Flight](#)
Sent: 3/23/2010 6:42:02 PM (GMT)Sender:
- [Miramichi Airport Snow Clearing](#)
Sent: 3/22/2010 8:37:08 AM (GMT)Sender:
- [AMBER Alert](#)
Sent: 3/23/2010 6:54:58 PM (GMT)Sender:
- [High Tides - Alama](#)
Sent: 3/22/2010 8:55:00 AM (GMT)Sender:
- [test_003](#)
Sent: 3/23/2010 7:44:26 AM (GMT)Sender: Denis
- [Sour Gas release](#)
Sent: 3/23/2010 7:20:10 PM (GMT)Sender:
- [Sent: 3/23/2010 9:21:26 AM \(GMT\)Sender:](#)
- [Fire - Forest Fire, Jacques Doiron, Exercise](#)
Sent: 3/23/2010 5:22:28 PM (GMT)Sender:
- [Explosion](#)
Sent: 3/22/2010 3:26:12 AM (GMT)Sender: PEI
- [causeway closed](#)
Sent: 3/22/2010 12:02:59 PM (GMT)Sender:
- [417 East Bound Closed at Boundary Road](#)
Sent: 3/22/2010 3:42:58 PM (GMT)Sender:

View in Google Earth Print Send Link

Traffic More... Map Satellite Terrain

Confederation Bridge Wind Watch

Sent: 3/23/2010 5:34:09 AM (GMT)
Sender: Trans@GNB
Status: Actual
Scope: Public
Description: Commencing approximately 22:00hrs, March 23, 2010 winds are projected in the 60-80KM range gusting to 90KM. Forecast indicates conditions will remain the same until approximately 10:00hrs, March 24, 2010.
Instruction: wind conditions on March 23, 2010 may result in restrictions of traffic on the Bridge.
Download: [CAP XML](#), [HTML](#)
Directions Search nearby Save to... more

©2010 Google - Map data ©2010 Google, Tele Atlas - Terms of use Report a problem



Alerting of Sudden-onset Events

Seconds are critical for sudden-onset events, e.g., earthquakes, tornadoes, tsunami, flash floods, volcanoes, landslides, avalanches, terrorism

Without CAP:

life-saving messages might arrive too late

With CAP:

an alert can be disseminated in seconds

Because a CAP alert is digital, receivers can include devices -- sirens, highway signs, train controls, and other automated mechanisms that help save lives



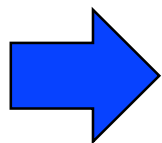
Breakthrough Standard

- Technical innovation ([~300 U.S. Patents](#))
- CAP alerts are being used to reach
 - landline and cellular telephones
 - radio and television sets
 - alerting sirens and lights
 - digital signage (highways, etc)
 - pagers of emergency responders
 - networks of law enforcement
 - "home all-hazards alarm" (next generation of today's home fire alarm)



Presentation Outline

- 1 Online Media Replacing Mass Media
- 2 Identifying Official Sources
- 3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 CAP in the NETP
- 7 Uptake of CAP
- 8 CAP Alert Hubs





Sample CAP Message

```
<?xml version="1.0" encoding="UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
  <identifier>KSTO1055887203</identifier>
  <sender>KSTO@NWS.NOAA.GOV</sender>
  <sent>2003-06-17T14:57:00-07:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  - <info>
    <category>Met</category>
    <event>SEVERE THUNDERSTORM</event>
    <responseType>Shelter</responseType>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Observed</certainty>
    <expires>2003-06-17T16:00:00-07:00</expires>
    <senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
    <headline>SEVERE THUNDERSTORM WARNING</headline>
    <description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR
      INDICATED A SEVERE THUNDERSTORM OVER SOUTH CENTRAL ALPINE
      COUNTY...MOVING SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG
      DAMAGING WINDS ARE LIKELY WITH THIS STORM. </description>
    <instruction>TAKE COVER IN A SUBSTANTIAL SHELTER UNTIL THE STORM
      PASSES.</instruction>
    <contact>BARUFFALDI/JUSKIE</contact>
  - <area>
    <areaDesc> EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA,
      EXTREME NORTHEASTERN CALAVERAS COUNTY IN CALIFORNIA,
      SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA </areaDesc>
    <polygon>38.47,-120.14 38.34,-119.95 38.52,-119.74 38.62,-119.89 38.47,-
      120.14</polygon>
    </area>
  </info>
</alert>
```



Sample CAP Message

```
<?xml version="1.0" encoding="UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
  <identifier>KSTO1055887203</identifier>
  <sender>KSTO@NWS.NOAA.GOV</sender>
  <sent>2003-06-17T14:57:00-07:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  - <info>
    <category>Met</category>
    <event>SEVERE THUNDERSTORM</event>
    <responseType>Shelter</responseType>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Observed</certainty>
    <expires>2003-06-17T16:00:00-07:00</expires>
    <senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
    <headline>SEVERE THUNDERSTORM WARNING</headline>
    <description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR
      INDICATED A SEVERE THUNDERSTORM OVER SOUTH CENTRAL ALPINE
      COUNTY...MOVING SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG
      DAMAGING WINDS ARE LIKELY WITH THIS STORM. </description>
    <instruction>TAKE COVER IN A SUBSTANTIAL SHELTER UNTIL THE STORM
      PASSES.</instruction>
    <contact>BARUFFALDI/JUSKIE</contact>
  - <area>
    <areaDesc> EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA,
      EXTREME NORTHEASTERN CALAVERAS COUNTY IN CALIFORNIA,
      SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA </areaDesc>
    <polygon>38.47,-120.14 38.34,-119.95 38.52,-119.74 38.62,-119.89 38.47,-
      120.14</polygon>
  </area>
  </info>
</alert>
```



Sample CAP Message

```
<?xml version="1.0" encoding="UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
  <identifier>KSTO1055887203</identifier>
  <sender>KSTO@NWS.NOAA.GOV</sender>
  <sent>2003-06-17T14:57:00-07:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  - <info>
    <category>Met</category>
    <event>SEVERE THUNDERSTORM</event>
    <responseType>Shelter</responseType>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Observed</certainty>
    <expires>2003-06-17T16:00:00-07:00</expires>
    <senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
    <headline>SEVERE THUNDERSTORM WARNING</headline>
    <description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR
      INDICATED A SEVERE THUNDERSTORM OVER SOUTH CENTRAL ALPINE
      COUNTY...MOVING SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG
      DAMAGING WINDS ARE LIKELY WITH THIS STORM. </description>
    <instruction>TAKE COVER IN A SUBSTANTIAL SHELTER UNTIL THE STORM
      PASSES.</instruction>
    <contact>BARUFFALDI/JUSKIE</contact>
  - <area>
    <areaDesc> EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA,
      EXTREME NORTHEASTERN CALAVERAS COUNTY IN CALIFORNIA,
      SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA </areaDesc>
    <polygon>38.47,-120.14 38.34,-119.95 38.52,-119.74 38.62,-119.89 38.47,-
      120.14</polygon>
  </area>
  </info>
</alert>
```



Sample CAP Message

```
<?xml version="1.0" encoding="UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
  <identifier>KSTO1055887203</identifier>
  <sender>KSTO@NWS.NOAA.GOV</sender>
  <sent>2003-06-17T14:57:00-07:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  - <info>
    <category>Met</category>
    <event>SEVERE THUNDERSTORM</event>
    <responseType>Shelter</responseType>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Observed</certainty>
    <expires>2003-06-17T16:00:00-07:00</expires>
    <senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
    <headline>SEVERE THUNDERSTORM WARNING</headline>
    <description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR
      INDICATED A SEVERE THUNDERSTORM OVER SOUTH CENTRAL ALPINE
      COUNTY...MOVING SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG
      DAMAGING WINDS ARE LIKELY WITH THIS STORM. </description>
    <instruction>TAKE COVER IN A SUBSTANTIAL SHELTER UNTIL THE STORM
      PASSES.</instruction>
    <contact>BARUFFALDI/JUSKIE</contact>
  - <area>
    <areaDesc> EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA,
      EXTREME NORTHEASTERN CALAVERAS COUNTY IN CALIFORNIA,
      SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA </areaDesc>
    <polygon>38.47,-120.14 38.34,-119.95 38.52,-119.74 38.62,-119.89 38.47,-
      120.14</polygon>
    </area>
  </info>
</alert>
```



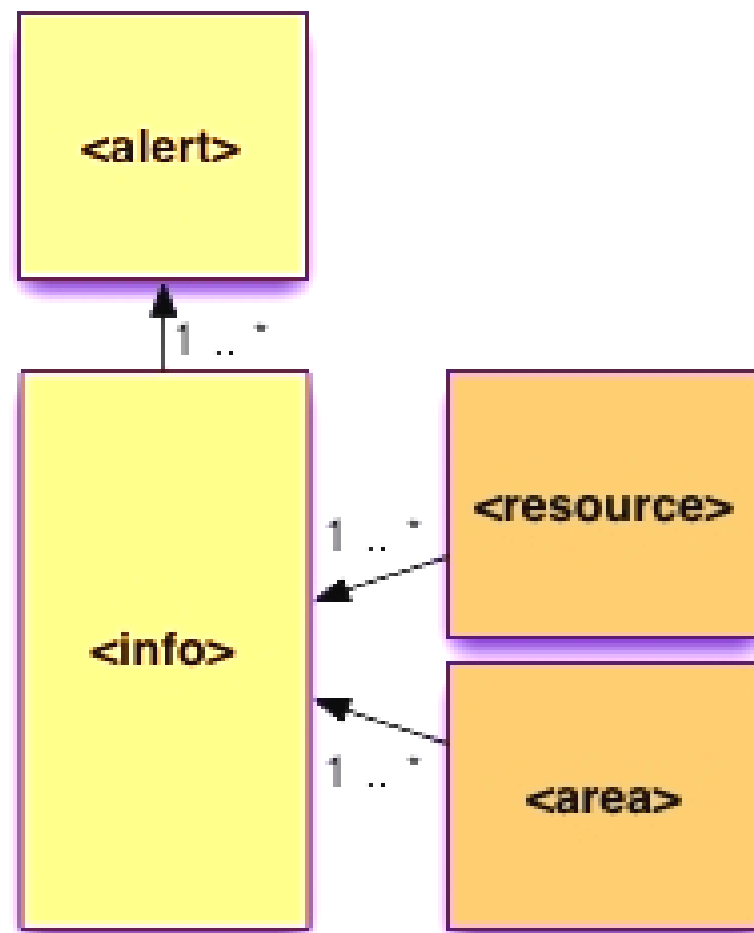
Sample CAP Message

```
<?xml version="1.0" encoding="UTF-8"?>
<alert xmlns="urn:oasis:names:tc:emergency:cap:1.1">
  <identifier>KSTO1055887203</identifier>
  <sender>KSTO@NWS.NOAA.GOV</sender>
  <sent>2003-06-17T14:57:00-07:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  - <info>
    <category>Met</category>
    <event>SEVERE THUNDERSTORM</event>
    <responseType>Shelter</responseType>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Observed</certainty>
    <expires>2003-06-17T16:00:00-07:00</expires>
    <senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
    <headline>SEVERE THUNDERSTORM WARNING</headline>
    <description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR
      INDICATED A SEVERE THUNDERSTORM OVER SOUTH CENTRAL ALPINE
      COUNTY...MOVING SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG
      DAMAGING WINDS ARE LIKELY WITH THIS STORM. </description>
    <instruction>TAKE COVER IN A SUBSTANTIAL SHELTER UNTIL THE STORM
      PASSES.</instruction>
    <contact>BARUFFALDI/JUSKIE</contact>
  - <area>
    <areaDesc> EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA,
      EXTREME NORTHEASTERN CALAVERAS COUNTY IN CALIFORNIA,
      SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA </areaDesc>
    <polygon>38.47,-120.14 38.34,-119.95 38.52,-119.74 38.62,-119.89 38.47,-
      120.14</polygon>
  </area>
  </info>
</alert>
```

Structure of a CAP Message

CAP Messages contain:

- Text values for human readers, such as "headline", "description", "instruction", "area description", etc.
- Coded values useful for filtering, routing, and automated translation to human languages



Relative Priority of this Message

- **Urgency:** Timeframe for responsive action
(*Immediate, Expected, Future, Past*)
- **Severity:** Level of threat to life or property
(*Extreme, Severe, Moderate, Minor*)
- **Certainty:** Probability of occurrence
(*Very Likely, Likely, Possible, Unlikely*)

*Common Practice - High Priority ("Red Alert")
only if: people must act within 1 hour, situation
is life-threatening, and probability > 50%*



Satellite Alert Channel



EUMETSAT Volcanic Ash CAP Alert

Volcanic ash detection report

Summary

Identifier: EUM.MET09.VASH.1
 Sender: ops@eumetsat.int
 Sent: 2008-09-26T11:35:00-00:00
 Status: Actual
 Message Type: Alert
 Scope: Public

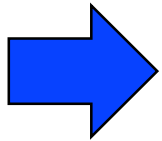
Additional Details:

Category: Geo
 Event: Volcanic ash
 Urgency: Immediate
 Severity: Moderate
 Certainty: Likely
 Effective: 2008-09-26T11:15:00-00:00
 Expires: 2008-09-26T11:30:00-00:00
 Sender Name: EUMETSAT
 Headline: Volcanic ash detection report
 Description: Volcanic ash has been detected in the region of 50.0 deg North, 9.8 deg East at 8:56 PM Universal Time Coordinated on Friday, September 26, 2008. (This is a computer generated report and has not been reviewed by a human.)
 Web: http://www.eumetsat.int/Home/Main/Access_to_Data/Meteosat_Meteorological_Products/Product_ListGP_1195473535618?lang
 Parameter: Volcano type Stromboli
 Parameter: Plume coverage 1800 ha
 Parameter: Plume orientation 321 deg
 Description: 1800 ha (2 pixels) with centre of mass located at 50.0 deg North, 9.8 deg East
 Polygon: 49.9750,9.7875 49.9750,9.8125 50.0000,9.8125 50.0000,9.7875 49.9750,9.7875
 Polygon: 50.0000,9.7875 50.0000,9.8125 50.0250,9.8125 50.0250,9.7875 50.0000,9.7875

Sample web page
containing volcanic
ash CAP message

Presentation Outline

- 1 Online Media Replacing Mass Media
- 2 Identifying Official Sources
- 3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 CAP in the NETP
- 7 Uptake of CAP
- 8 CAP Alert Hubs



Typical CAP-based Alerting System

Based on CAP, [Alerting Solutions Inc](#) (ASI) supports many delivery methods:

U.S. Emergency Alert System (EAS), local radio station, local cable TV, sirens, strobe lights, e-mail, SMS, voice telephone, intercom / digital telephony, computer pop-up's, Web sites, social media (Twitter, Facebook, Myspace...), Emergency Call Boxes, reverse Weather Radio, building loudspeakers, voice fire speakers, police car loudspeakers, 800 Number/Hotline, LED signs and LCD screens



CAP Implementations

- National Systems
 - Americas
 - Europe, Middle East, Africa
 - Asia/Pacific
- NGO and Commercial

Americas

Anguilla (UK), Antigua and Barbuda, Argentina, Aruba (Netherlands), Bahamas, Barbados, Brazil, Canada, Colombia, Cuba, Curacao (Netherlands), Dominica, Guyana, Honduras, Jamaica, Mexico, Montserrat (UK), Peru, Puerto Rico (US), Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten (Netherlands), Trinidad and Tobago, United States, Virgin Islands (UK, US)

United States of America

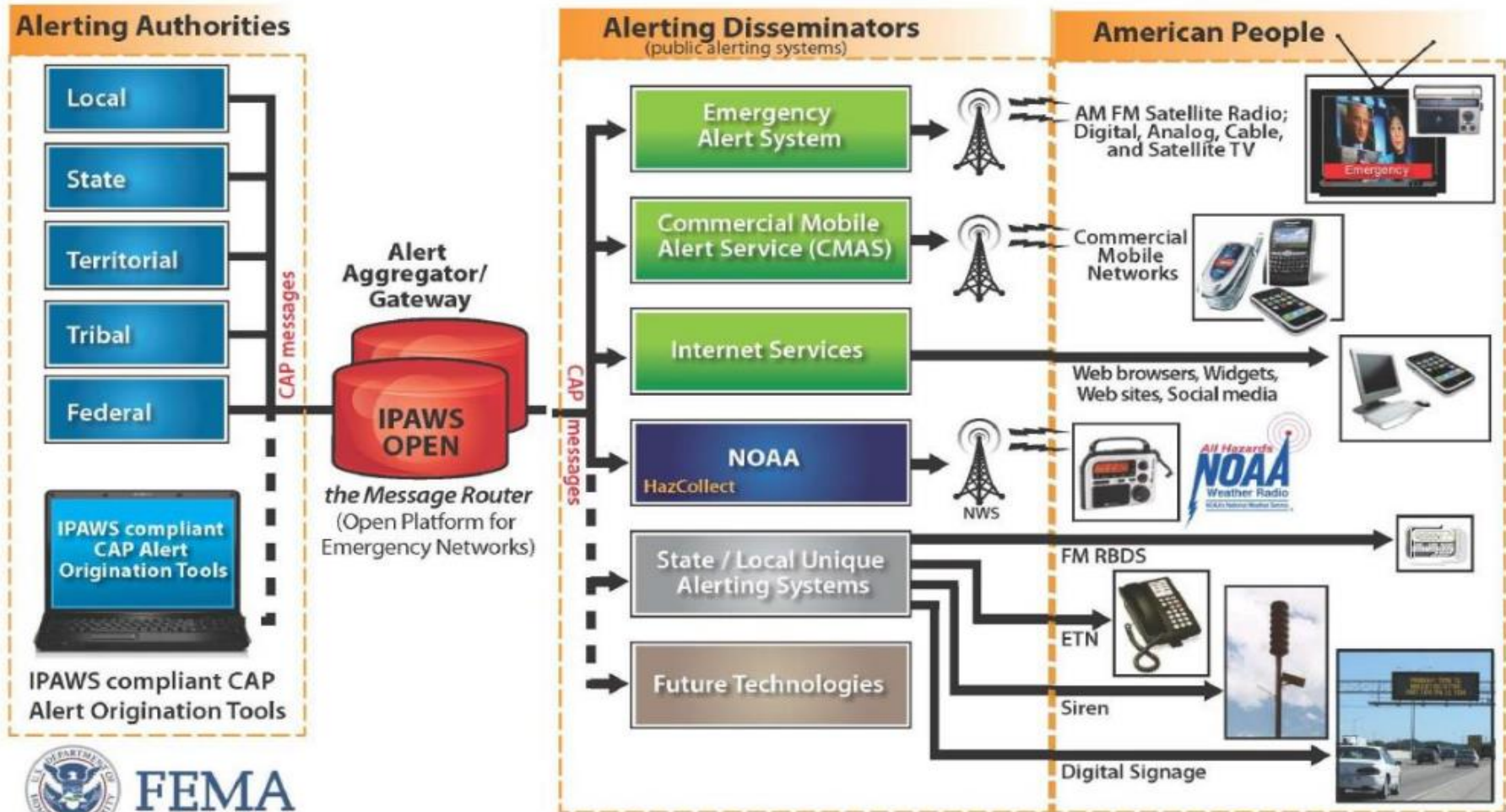
- National Oceanic and Atmospheric Administration (NOAA), National Weather Service
- NOAA National Tsunami Warning Center
- United States Geological Survey (USGS), Earthquakes
- USGS Volcano Hazard Program
- Environmental Protection Agency, Air Quality Alerts
- Federal Emergency Management Agency, Integrated Public Alert and Warning System (IPAWS)



U.S. Integrated Public Alert and Warning System (IPAWS)

IPAWS Architecture

Standards based alert message protocols, authenticated alert message senders, shared, trusted access & distribution networks, alerts delivered to more public interface devices





USA Wireless Emergency Alerts

Hurricane Sandy Wireless
Emergency Alerts



During Hurricane Sandy, Wireless Emergency Alerts appear on the Verizon Galaxy Nexus and iPhone 5. (Google | Apple)

Cell Broadcast

- Standard cellular phone service
- Broadcast from cell tower to all cell phones in alerting area; no service subscription is needed
- Message is immediately broadcast to all; not one-at-a-time like SMS messages
- Cell Broadcast public warning: Canada, Chile, China, Israel, Japan, Lithuania, Oman, Netherlands, South Korea, Taiwan, Turkey, USA



Americas - South America

- Argentina: [Servicio Meteorologico Nacional](#)
- Brazil: [Alert-AS](#)
- Colombia: [UNGRD \(National Unit for Disaster Risk Management\)](#)
- Guyana: [Hydrometeorological Service](#)



CAP Operational or In-Progress

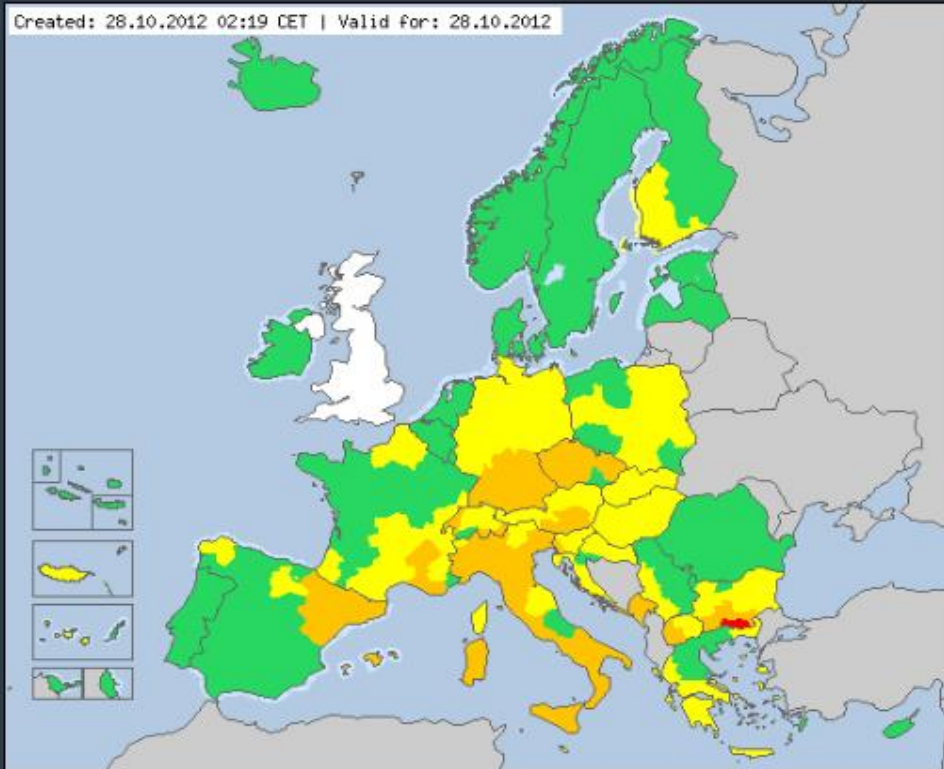
Europe, Middle East, Africa

Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Comoros, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, DR Congo, Egypt, Estonia, Eswatini, Finland, France, Gambia, Germany, Greece, Guinea, Guinea-Bissau, Hungary, Iceland, Iran, Ireland, Israel, Italy, Kenya, Kuwait, Latvia, Lithuania, Luxembourg, Macedonia, Malawi, Malta, Mauritius, Moldova, Montenegro, Netherlands, Norway, Oman, Poland, Portugal, Romania, Saudi Arabia, Senegal, Serbia, Sierra Leone, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, United Kingdom, Zimbabwe

MeteoAlarm

» Europe:

Created: 28.10.2012 02:19 CET | Valid for: 28.10.2012



Weather warnings: Europe

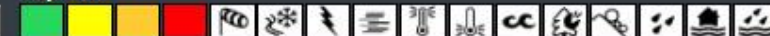
Awareness Reports - You can find detailed information about the warnings in the awareness reports issued for each country. Select the relevant country.

AT						IT				
BE						LU				
BG						LV				
CH						ME				
CY						MK				
CZ						MT				
DE						NL				
DK						NO				
EE						PL				
ES						PT				
FI						RO				
FR						RS				
GR						SE				
HR						SI				
HU						SK				
IE						UK				
IS										

awareness types:

Display:

Caption:



Africa

Botswana, Comoros, Côte d'Ivoire,
DR Congo, Eswatini, Gambia,
Guinea-Bissau, Kenya, Malawi,
Mauritius, Senegal, Sierra Leone,
South Africa, Tanzania, Zimbabwe



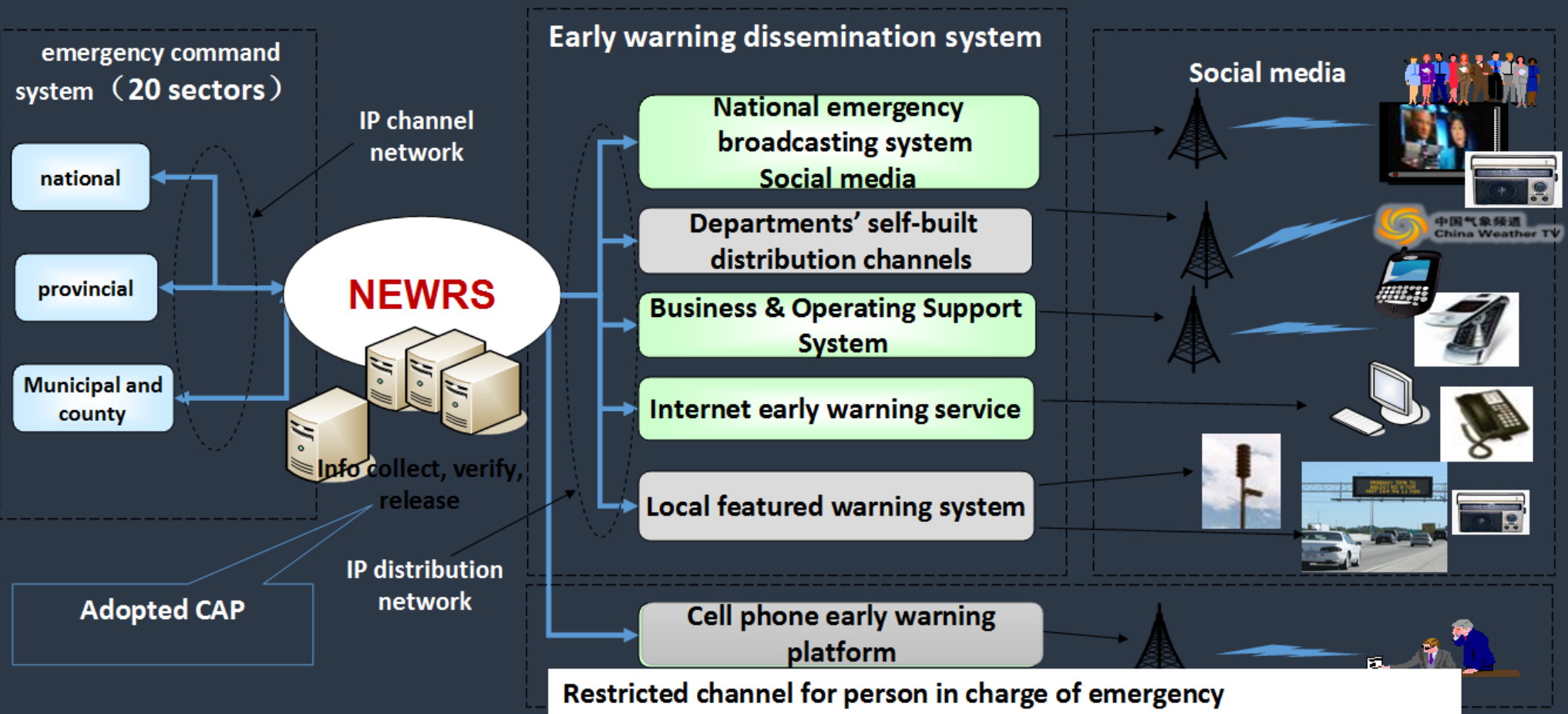
CAP Operational or In-Progress

Asia/Pacific

Afghanistan, American Samoa (US), Australia, China, Fiji, Hong Kong, India, Indonesia, Kazakhstan, Kyrgyzstan, Maldives, Madagascar, Marshall Islands, Micronesia, Myanmar, Nepal, New Zealand, Papua New Guinea, Philippines, Russia, Samoa, Solomon Islands, Sri Lanka, Taiwan, Tajikistan, Thailand, Tonga, Tuvalu, Uzbekistan, Vanuatu

CAP in China

NEWRS relationship and structure



CAP in China

NEWRS <http://www.12379.cn/>

1 national center

31 provincial centers

343 municipal centers

2,015 county centers

10,126 specialty staff



CAP Implementations

- National Systems

 - Americas

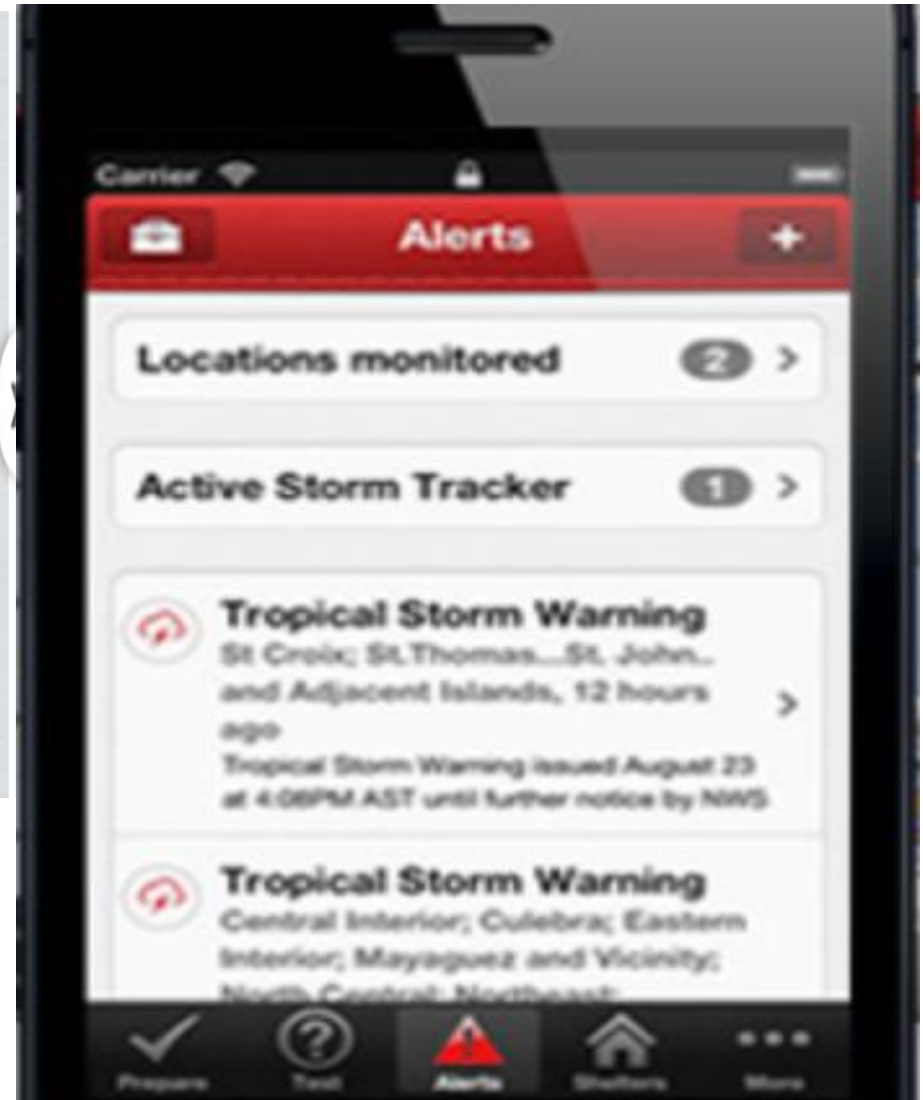
 - Europe, Middle East, Africa

 - Asia/Pacific

- ➔ NGO and Commercial



IFRC Universal App Program

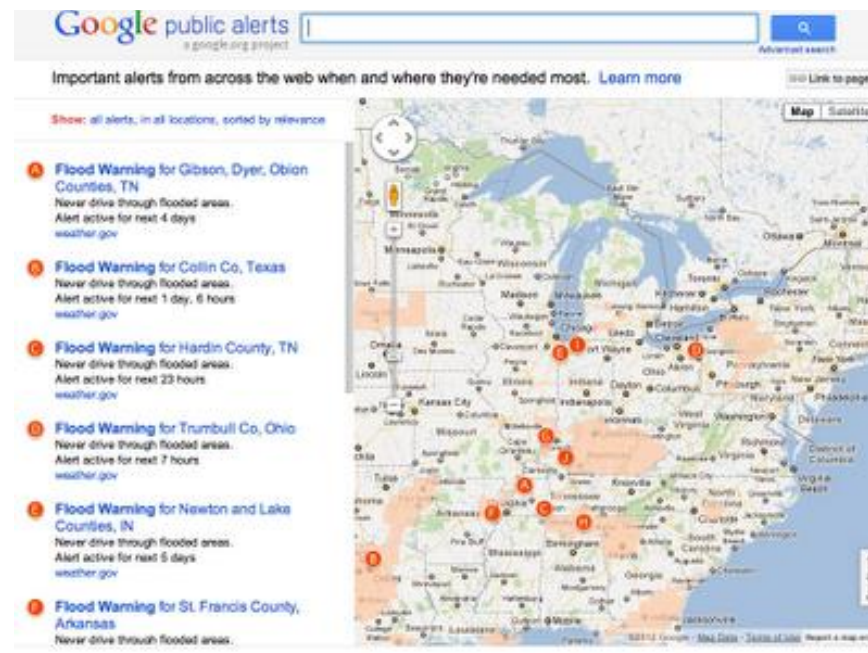


American Red Cross Mobile Apps (example)

Google Public Alerts

- Platform designed to bring users relevant emergency alerts when and where they are using Google tools
- Whether user sees an alert depends on search query, which alerts are active, and the event importance
- To see all active alerts, go to homepage ➔

<http://www.google.org/publicalerts>



What Now Service (IFRC + Google)

- Data feed of actionable and contextualized messages on how to prepare and respond to local hazards
20 hazards; 78 languages; 192+ countries
- Designed specifically to complement CAP messages
- Uses [IFRC Public Awareness and Public Education Messages](#), for example:

1. Prepare to evacuate, and know when and where to evacuate
2. Turn off utilities and gas tanks. Unplug small appliances
3. Never try to drive through flood waters. Turn around and go the other way



Commercial Weather Alerting

- AccuWeather
- MeteoFrance Vigilance
- MeteoFrance International, MeteoFactory
- The Weather Company

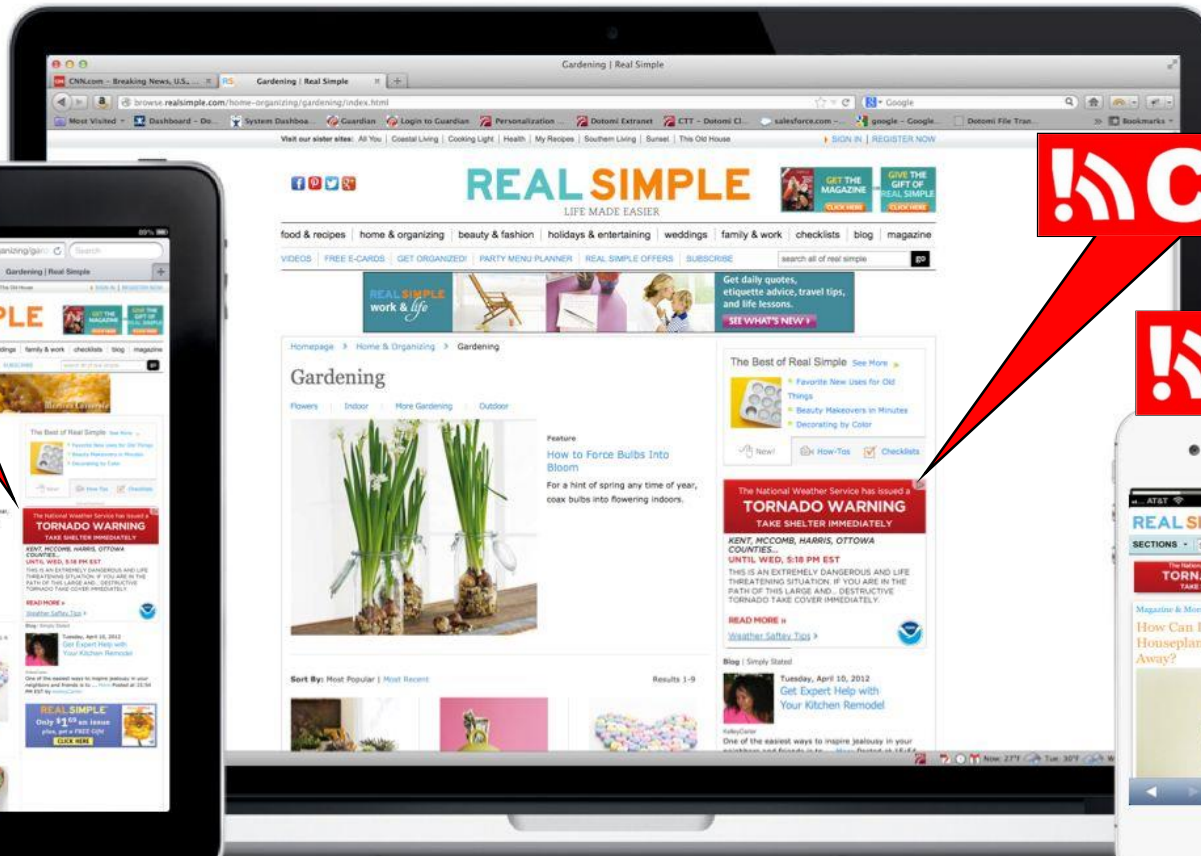
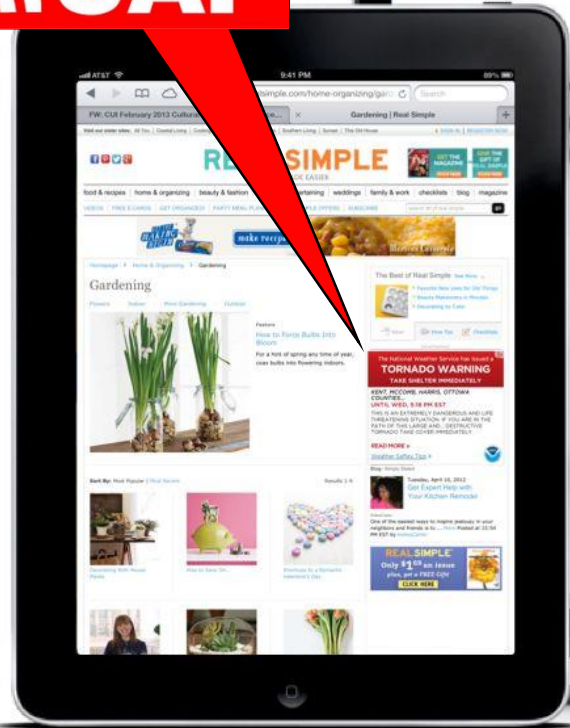


Sensors that Emit CAP Alerts

- In-home monitors becoming all-hazard alarms
 - Halo+ smoke alarm
 - Speck sensor
- Earth Networks (lightning detection)
- Earthquake Building Damage Assessment



Federation for Internet Alerts



Introducing CAP



CAP in Pinkertons



Moderating twitter filtered queue:

Category: Security

Order by: Highest score, Newest articles

csepeasy

0 Edit Text · 1 Show Original

US: Phoenix, AZ - Police search activity

Sep. 22, 2015 02:15 AM PDT

<p>Source: https://twitter.com/csepeasy/statuses/646250548384043008</p><p> Note: Pinkerton is not responsible for the content contained in external sites.</p>

2

3 Category

Safety

4 Urgency

Immediate

5 Severity

Moderate

6 Certainty

Possible

33.4875641

-112.03021910000

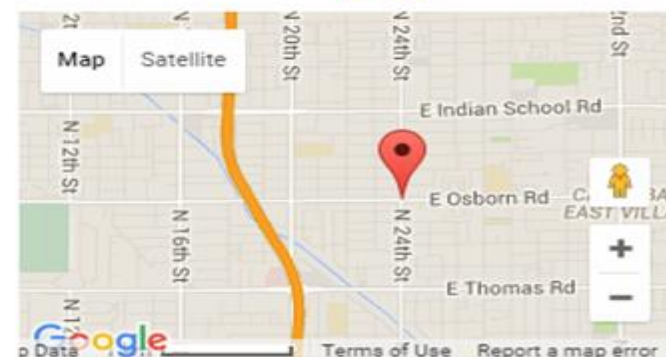
9 Lookup address

Osborne & 24th Pho

Latitude

Longitude

9 Lookup address



Ignore

Escalate

57

CAP production described in: "Providing alerts based on unstructured information methods and apparatus" [Patent US 20160119370 A1](#)

Other CAP-based Systems

- IBM Intelligent Operations Center for Emergency Management [video](#) [Users Guide](#)
- [Microsoft CityNext](#)
- Hate Group Monitoring
- Neighborhood Watch
- [RSOE Emergency and Disaster Information Service](#)

RSOE EDIS Alert Map



The information is updated every 6 minutes. There is no need to reload the page.

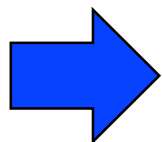


Current Emergencies



Presentation Outline

- 1 Online Media Replacing Mass Media
- 2 Identifying Official Sources
- 3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 CAP in the NETP
- 7 Uptake of CAP
- 8 CAP Alert Hubs



NETP Defined

A National Emergency Telecommunications Plan (NETP) is a strategic plan on how to best manage the risk of disasters during the mitigation, preparedness, response and recovery phases, by promoting communication and information sharing across all levels of government, within communities at risk, and between public and private organizations.

Major Sections of the Document

1. Document overview
2. NETP: Step by step
3. Overall Risk Assessment
4. National disaster management
5. Telecom/ICT legislation and regulation
- 6. Telecom/ICTs for emergencies**
7. International cooperation and coordination
8. Development of capacities and drills
9. Support for people with specific needs

6. Telecom/ICTs for emergencies

- CAP enables all-hazards alerting and warning over all kinds of media
- CAP communicates key facts of any hazard threat and recommended actions
- CAP implementation is implicit in NETP Recommendation 3:
"include communication protocols essential to implementation"

6.4. Common Alerting Protocol

- CAP enables authorities to warn immediately, and up to global scale
- People receive CAP-originated warnings through mobile and landline telephones, Internet, smartphone apps, online advertising, Internet of Things devices, sirens, broadcast radio and television, cable television, emergency radio, amateur radio, satellite direct broadcast, and digital signage, among others

6.4. Common Alerting Protocol

- CAP defines a “business form” for the key facts of any emergency: What is it? Where is it? How soon is it? How bad is it? How sure are the experts? What should people do?
- CAP alert messages carry *in one message* human-friendly **information** plus machine-friendly **data**, e.g., area text plus polygons or circles
- CAP can be disseminated over any kind of network, public or private, using a fully scalable architecture



Aggregated CAP Feeds, Example

U.S. National Weather Service publishes several thousand CAP news feeds, and those CAP alerts are also published as one aggregated CAP feed

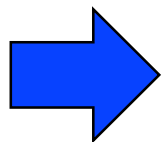
↳ That aggregated CAP feed is aggregated with 1300+ other CAP feeds published by other U.S. Federal agencies, U.S. states and many cities

↳ That aggregated CAP feed is aggregated with 90+ national news feeds published in global-scale CAP Alert Hubs, e.g. <http://alert-hub.org>



Presentation Outline

- 1 Online Media Replacing Mass Media
- 2 Identifying Official Sources
- 3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 CAP in the NETP
- 7 Uptake of CAP
- 8 CAP Alert Hubs

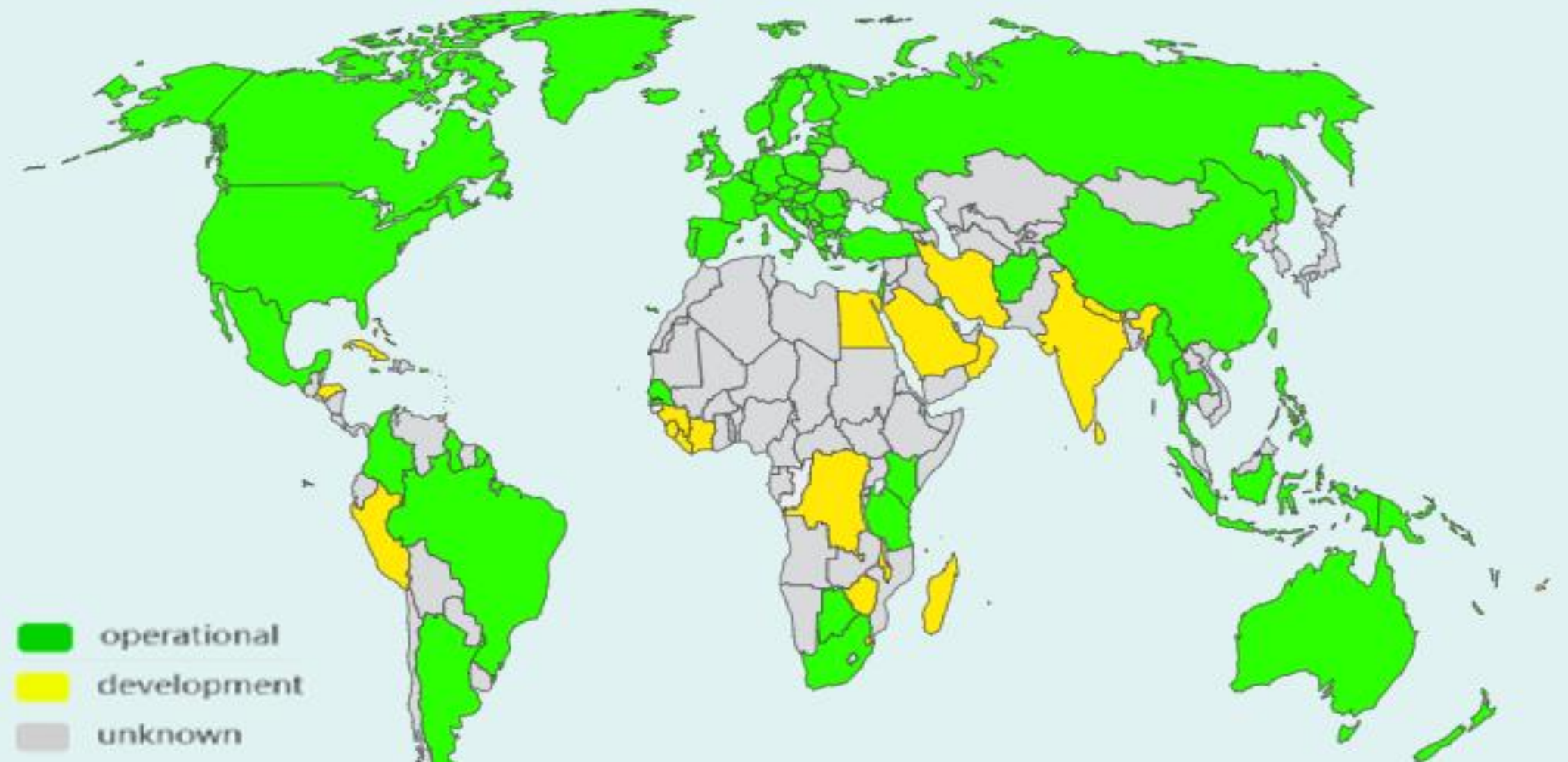




CAP Uptake at Global Scale

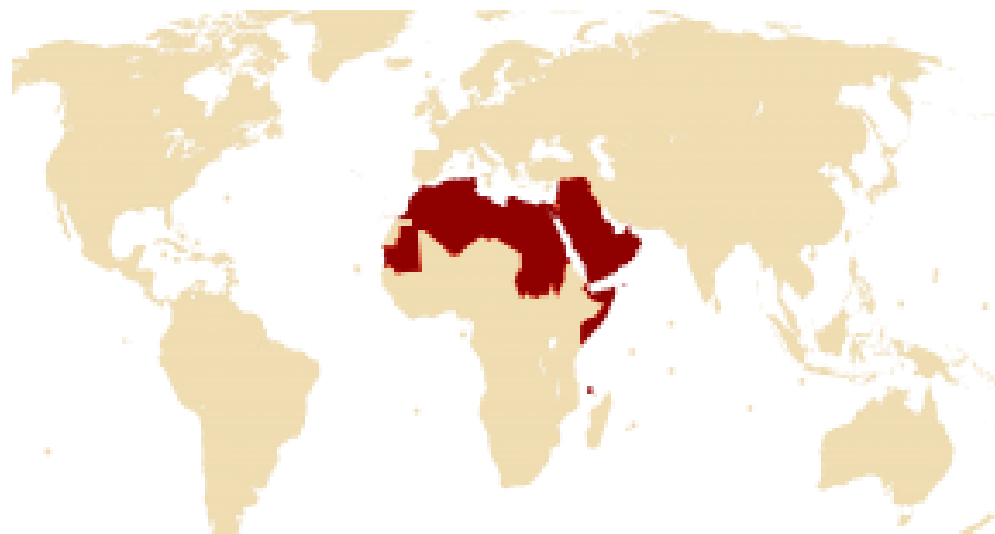
- ITU promotes CAP in guidance for preparing a National Emergency Telecommunications Plan
- WMO and commercial services (*AccuWeather, The Weather Company...*) urge CAP for weather, water, and climate hazards
- IFRC (Red Cross/Red Crescent) strongly promotes CAP; IFRC Hazards App built on CAP
- Google Public Alerts also prefers CAP; Google Crisis Response Team strongly promotes CAP

CAP Uptake at National Scale



- 50% have at least one official CAP news feed
- 25% actively implementing CAP today

CAP in ITU Arab Region



Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen

CAP Operational in: Kuwait

CAP Under Development in: Comoros, Egypt, Oman, Saudi Arabia



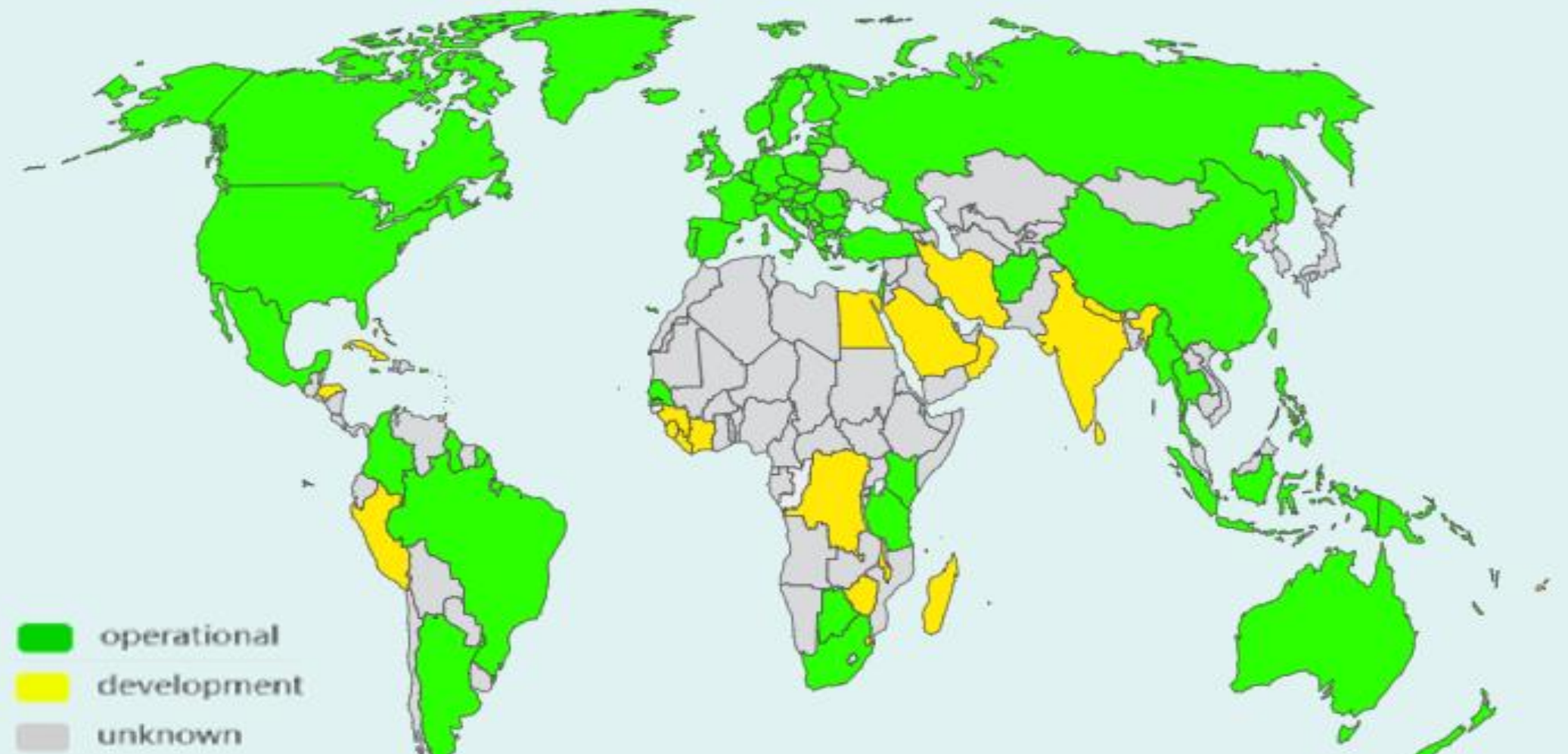
CAP Uptake at Other Scales

Unknown: CAP-enabled systems at scales smaller than national

For example, city scale:

- Microsoft CityNext
- IBM Intelligent Operations Center for Emergency Management

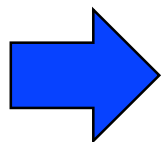
CAP Uptake in LDCs: Much Too Low



- Among LDCs, CAP uptake rate is only 22%
- We must assure all LDCs know about CAP

Presentation Outline

- 1 Online Media Replacing Mass Media
- 2 Identifying Official Sources
- 3 Benefits of CAP
- 4 Features of a CAP Message
- 5 CAP-enabled Alerting Systems
- 6 CAP in the NETP
- 7 Uptake of CAP
- 8 CAP Alert Hubs





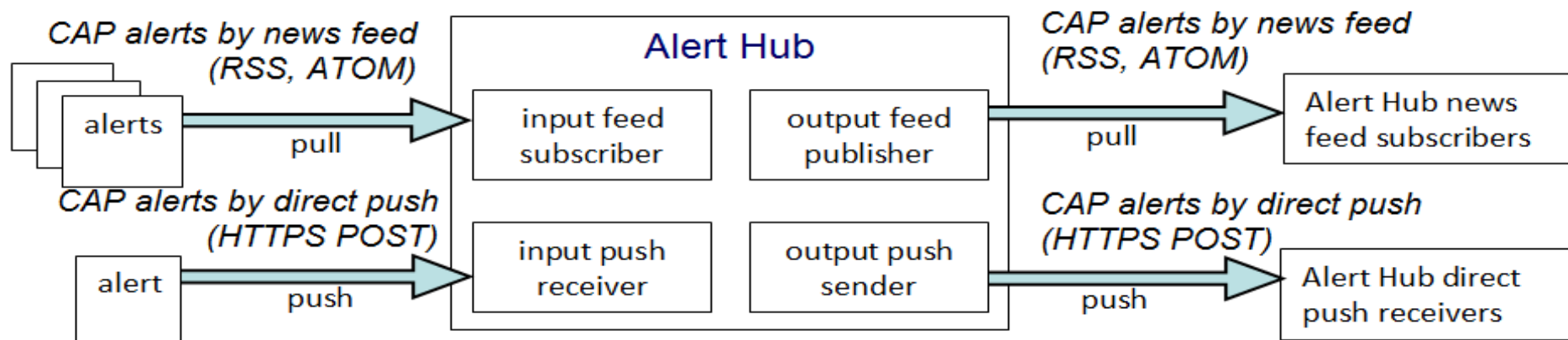
CAP Alert Hubs

- Free service aggregating alerts and other emergency information, can push updates to all subscribers
- A CAP Alert Hub will have alerts from official sources as listed in the Register of Alerting Authorities
- Benefits :
 - Speed
 - Scale (performance, reliability, availability)
 - Redundancy
 - Security and Authenticity
 - Analytics



Filtered Alert Hub (freeware)

- Aggregate all CAP alerts, filtered by location, language, any other criteria (e.g., "official and high priority")
- Cloud-based: Highly Available, Reliable, Secure
- To minimize delay, sources can push alerts to the Hub, and the Hub can push to subscribers





Free Tool for CAP Alert Creation and Publishing

<https://cap.alert-hub.org>

identifier
sender
msgType **scope** **language**
status **category** **responseType**
event
urgency **severity** **certainty**
sent **expires**

[Text templates for headline, description, instruction.](#)

headline

description

instruction

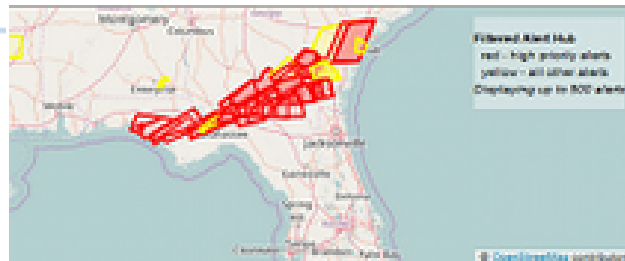
areaDesc

circle
polygon

lat,long<space>radius SW SE NE NW SW (lat,lon points)



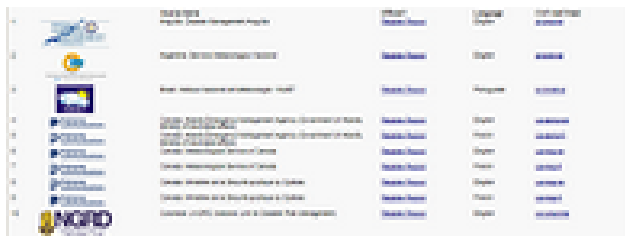
Filtered Alert Hub <http://alert-hub.org>



The cloud-based Filtered Alert Hub aggregates emergency alerts worldwide. Click [here](#) for recent alerts.



This Hub allows for filtering aggregated alerts to fit a particular purpose. For example, the prototype now makes a separate news feeds containing official, public, high-priority alerts in a specific language for each country and each of 1870 cities. Click [here](#) for these feeds.



At present, the prototype gathers alerts from 20+ sources, and more are expected in the coming months. Click [here](#) for current alert sources.



Development of the Filtered Alert Hub is part of the NOAA Big Data Project. Click [here](#) for the project Wiki, and to access the free, open source software.



Part of NOAA's Big Data Project



- Collaborative project with working prototype now
- Team includes: AccuWeather, Amazon Web Services, Brazil/INMET, Facebook, Hong Kong Observatory, IBM/The Weather Company, MeteoAlarm, OASIS, Open Commons Consortium, USAID/OFDA
- Core components are *Free Open Source Software*
- [Contact Project Lead \(Eliot Christian\)](#)



Review of Key Points

- Online Media Replacing Mass Media
- Identifying Official Sources
- Benefits of CAP
- Features of a CAP Message
- CAP-enabled Alerting Systems
- CAP in the NETP
- Uptake of CAP
- CAP Alert Hubs



CAP Implementation Workshops

Link	Host	City	Co-sponsors
2019	Mexico City Civil Protection	Mexico City, Mexico	IAEM, IFRC, ITU, OASIS, WMO
2018	Hong Kong Observatory	Hong Kong, China	IAEM, IFRC, ITU, OASIS, WMO
2017	Italian National Fire Corps	Rome, Italy	IAEM, IFRC, ITU, OASIS, WMO
2016	Asian Institute of Technology	Bangkok, Thailand	IFRC, ITU, OASIS, WMO
2015	Italian National Fire Corps	Rome, Italy	IFRC, ITU, OASIS, WMO
2014	LIRNEasia	Negombo, Sri Lanka	ITU, OASIS, WMO
2013	WMO	Geneva, Switzerland	ITU, OASIS, WMO
2012	Environment Canada	Montreal, Canada	ITU, OASIS, WMO
2011	WMO	Geneva, Switzerland	ITU, OASIS, WMO
2009	WMO	Geneva, Switzerland	ITU, OASIS, WMO
2008	WMO	Geneva, Switzerland	ITU, OASIS, WMO
2006	ITU	Geneva, Switzerland	ITU, OASIS



CAP Information Resources

<http://preparecenter.org/resources/cap>

- [CAP Implementations by Country](#)
- [CAP Introduction \(video, 15 minutes\)](#)
- [CAP Basics course \(online\)](#)

Contact me:

Eliot Christian <Eliot.J.Christian@gmail.com>