# Survey of Other Common Alerting Protocol (CAP) Implementations

Presented Augsut 24, 2016 in Bangkok by

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My name is Eliot Christian. The title of this presentation is: "Survey of Other Common Alerting Protocol (CAP) Implementations". In this, I will include CAP systems that are operational now or are soon-to-be operational.

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### *What is a "CAP Implementation"*

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 ➢ A "CAP Implementation" is a facility
 that sends or receives alerts in the
 CAP standard format (ITU X.1303)
 ➢ Typically, CAP alerts are accessible
 through Internet news feeds, e.g.
 https://alerts.weather.gov/cap/us.php?x=0

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First, I want to be clear on what it means to have a "CAP Implementation"

A "CAP Implementation" is a facility that sends or receives alerts
in the CAP standard format (ITU X.1303).

Each CAP alert is a kind of news story. So, to publish that news story
most CAP Systems offer CAP alerts as an Internet news feed. This is
the same way that all news has been offered on the Internet since 1999.

For example, the CAP news feed for the U.S. National Weather Service
is at the URL shown here.

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## *Outline*
### *Survey of Other CAP Implementations*

➤ National Systems

  ➤ Americas

  ➤ Europe, Middle East, Africa

  ➤ Asia/Pacific

➤ NGO and Commercial

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Let me state at the outset that there are many CAP systems not included here, for the simple reason that I am not aware of them.

There is no "master list" of CAP implementations, although that is needed for Alert Hubs. We also know that WMO intends to start tracking CAP implementation.

Here is the outline I will follow in presenting my survey of CAP systems. I focus on the level of National governments, grouped in three slices:

  first, the Americas; followed by

  Europe, the Middle East, and Africa; and

    ending with Asia and the Pacific.

Then I will survey some of the interesting CAP systems led by Non-Governmental Organizations and by Commercial organizations.

I realize this approach neglects international governmental organizations with global scope. But, of these, there is only one official source that I know that uses CAP extensively: The World Health Organization (WHO).

CAP is the messaging base for the WMO Global Health Information Network, which was modeled on the CAP-based Public Health Information Network of the U.S. Centers for Disease Control. These public health networks exchange CAP messages privately, not to the public.

There is also an unofficial source of CAP alerts, the Global Disaster Alert and Coordination System (GDACS). GDACS is operated by the European Commission Joint Research Commission, in Ispra, Italy.

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### Countries/Territories with Operational or In-Progress CAP Implementations

## Americas

Anguilla (UK), Antigua and Barbuda, Argentina, Aruba (Netherlands), Brazil, Canada, Chile, Colombia, Cuba, Dominica, Guyana, Jamaica, Mexico, Montserrat (UK), Puerto Rico (US), Sint Maarten (Netherlands), Trinidad and Tobago, United States, US Virgin Islands

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So, let's look at the Americas.

Here I list 18 countries or territories with operational or in-progress CAP implementations.

I should note that some of the designations are complex. For example, British and Dutch overseas territories in the Caribbean are listed here rather than in Europe.

I will highlight a few of these CAP implementations that have not already been presented during this CAP Workshop.

We have already haerd from Canada, where the Weather Network and its French equivalent, Meteo Media, distribute CAP messages from the offciial alerting authorities in Canada. These CAP messages are disseminated over TV and radio stations, as well as cable and satellite distributors, throughout Canada.

We also heard the Open Broadcaster presentation yesterday that Canada uses extensively the free technology for unattended messaging of CAP alerts.

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## 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)

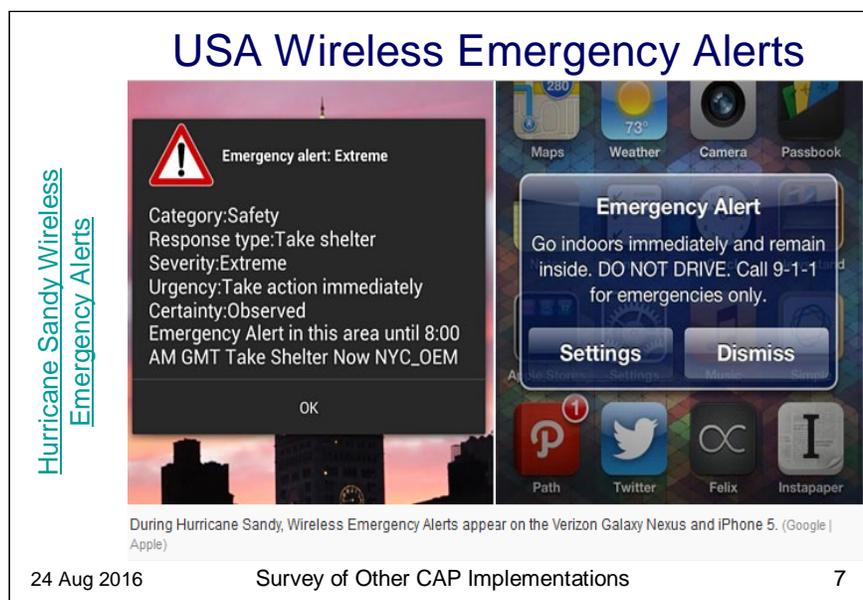24 Aug 2016      Survey of Other CAP Implementations      6

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Here you see the CAP Feed URL for several United States CAP feeds maintained by alerting authorities listed in the Register of Alerting Authorities. Two are operated by the National Oceanic and Atmospheric Administration (NOAA): the National Weather Service CAP and the National Tsunami Warning Center CAP news feed. The CAP feed for the Pacific Tsunami Warning Center is not yet operational, but it is expected soon.

The Earthquakes news feed from the United States Geological Survey (USGS) was one of the first CAP alert sources. A very recent addition from USGS is the CAP news feed for the Volcano Hazard Program.

The Environmental Protection Agency has a CAP feed source for Air Quality Alerts. EPA is extending this approach to many cities worldwide through its AirNow initiative.

As we heard in the presentation by Scott, the Integrated Public Alert and Warning System (IPAWS) aggregates CAP alerts from about 700 sources. I understand about 150 vendors of CAP software have products validated as IPAWS-compliant.

IPAWS has its own public-facing interface for retrieving CAP alerts. IPAWS **does not support** an Internet-standard news feed.

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

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The Wireless Emergency Alerts (WEA) system is operated by all major wireless service providers throughout the United States. This facility uses Cell Broadcast to disseminate CAP alerts aggregated by IPAWS.

This shows how CAP Wireless Emergency Alerts appear on smart-phones. These messages were delivered extensively in October 2012 to people in the US affected by Hurricane Sandy.

## Mexico

- 2013: Interior Ministry to implement Mexico's National Alert System
- National Civil Protection Coordination was lead agency with CAP use supported by CIRES (Centro de Instrumentacion y Regsitro Simico) A.C.
- Now - IFT (Intituto Federal de Telecommunicaciones) has lead role for CAP in Mexico, supported by CIRES, CONAGUA-SMN, and Others

CAP Feed URL:
CONAGUA - Servicio Meteorologico Nacional de Mexico

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## [Following item presented at 2016 CAP Workshop.]

We heard from Mario about Mexico implementing CAP as part of its National Alert System, through the leadership of Mexico's Federal Institute for Telecommunications (IFT).

Here you see the CAP Feed URL for Mexico.

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### Americas,
### - Caribbean

SmartAlert freeware from Finnish
Meteorological Institute planned

➢      Antigua and Barbuda
➢      Cuba
➢      Jamaica

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In the Caribbean, the CAP-enabled SmartAlert freeware from Finnish
Meteorological Institute is installed and being tested in Antigua and
Barbuda, and in both Cuba and Jamaica.

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**Americas
- Caribbean**

➤ Anguilla: Disaster
Management Anguilla
➤ Aruba
➤ Dominica
➤ Montserrat
➤ Puerto Rico
➤ Sint Maarten
➤ Trinidad and Tobago
➤ U.S. Virgin Islands

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Elsewhere in the Caribbean, there are four interlinked CAP Servers in Anguilla, Aruba, Montserrat, and Sint Maarten.

CAP is being implemented with freeware in Trinidad and Tobago, and in Dominica.

CAP is also operational in Puerto Rico and the U.S. Virgin Islands, as part of IPAWS.

## Americas
## - South America

➢ Argentina: Servicio Meteorologico Nacional
➢ Brazil: Alert-AS
➢ Chile
➢ Colombia: UNGRD (National Unit for Disaster Risk Management)
➢ Guyana: Hydrometeorological Service

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In South America, CAP is implemented in Argentina, Brazil, Chile, and Colombia. A CAP implementation in Guyana is in its final testing.

The CAP system in Brazil is called "Alert-AS" because is intended to be used freely by any nation throughout South America.

The CAP system in Chile is provided by a commercial firm in Israel.

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### *Countries/Territories with Operational or In-Progress CAP Implementations*

#### Europe, Middle East, Africa

Botswana, Burundi, France,
Germany,  Ireland, Israel, Italy,
Kenya, Kuwait, Malawi, Mauritius,
Nigeria, Norway, Rwanda, Serbia,
South Africa, Sweden, Tanzania,
Togo, United Kingdom, Zimbabwe

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Now let's turn to Europe, the Middle East, and Africa.

I am aware of operational or in-progress CAP Implementations in these 21 countries.

Finland is not in my list, but we know that the Finnish Meteorological Institute (FMI) has been actively donating and installing CAP freeware known as "SmartAlert" to many countries throughout the world.

FMI is also leading a new project called: "South East European Multi-Hazard Early Warning Advisory System". This project includes implementing CAP in 17 countries, which gets underway at meeting in Croatia this October.

I would like to also highlight Norway for its financial support of many CAP Jump Start training sessions worldwide, under its Climate Change funding initiative.

## France

> ➤ France: Information Alert System for People (SAIP)
>
> ➤ Free smartphone application, Will soon be CAP-enabled
>
> ➤ Alert users to terrorist attacks, nuclear incidents, dam failures, or other exceptional events
>
> ➤ Way too slow when used during the mass killing in Nice

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In France we heard mention of the new, Free smartphone application called  Information Alert System for People (SAIP). SAIP will soon be CAP-enabled.

SAIP is intends to alert users to terrorist attacks, nuclear incidents, dam failures, or other exceptional events. However, the distribution arrangement were found to be way too slow (up to 3 hours late!) when SAIP was used during the mass killing in Nice.

## Elsewhere in Europe and the Middle East

➢ Germany: Deutsche Wetterdienst
➢ Ireland
➢ Israel
➢ Italy
➢ Kuwait Meteorological Department
➢ Norway
➢ Serbia
➢ Sweden
➢ United Kingdom

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Elsewhere in Europe and the Middle East we have CAP operational or in-progress in Germany, Ireland, Israel, Italy, Kuwait, Norway, Serbia, Sweden, and the United Kingdom.

We heard from Guido about the MeteoAlarm system, a graphic Web page operated on behalf of 33 European national weather services.

> ## *Countries/Territories with Operational or In-Progress CAP Implementations*
>
> ### Africa
>
> Botswana, Burundi, Kenya,
> Malawi, Mauritius, Nigeria,
> Rwanda, South Africa,
> Tanzania, Togo, Zimbabwe
>
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Turning to Africa, I am aware of eleven countries with operational or in-progress CAP implementations:

Botswana, Burundi, Kenya, Malawi, Mauritius, Nigeria, Rwanda, South Africa, Tanzania, Togo, and Zimbabwe.

## Countries/Territories with Operational or In-Progress CAP Implementations

### Asia/Pacific

Australia, China, Fiji, Hong Kong,
India, Indonesia, Kuwait, Maldives,
Myanmar, Nepal, New Zealand,
Papua New Guinea, Philippines,
Samoa, Solomon Islands, Sri Lanka,
Taiwan, Thailand, Tonga, Vanuatu

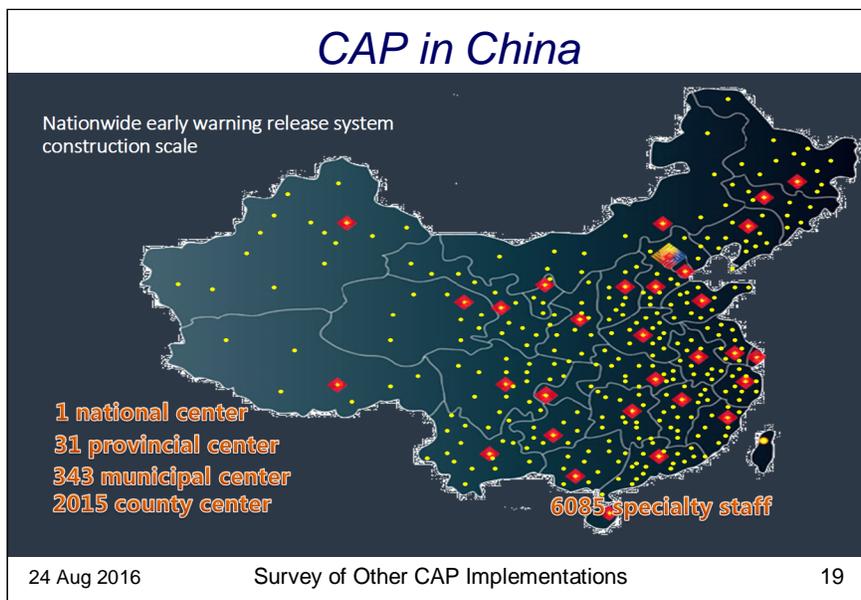24 Aug 2016          Survey of Other CAP Implementations          17

Last, I would like to address the Asia-Pacific region.

I am aware of these twenty countries/territories with operational or in-progress CAP implementations.
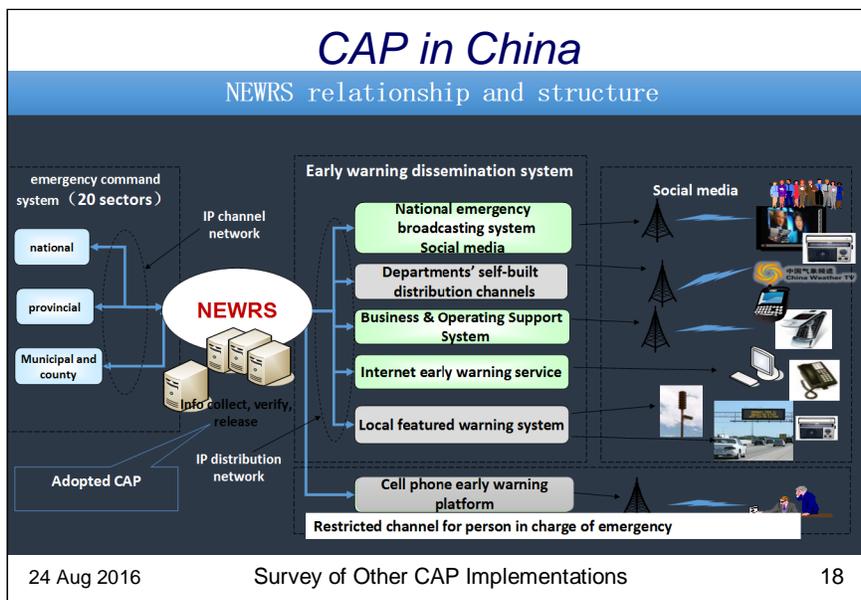
I would like to dwell on China for a bit here .

China implemented CAP-enabled alerting for all hazards nationwide. Their National Early Warning Release System (NEWRS) gathers information from emergency command sectors and disseminates the information to the public and emergency management personnel throughout China.

**CAP in China**

Nationwide early warning release system construction scale

1 national center
31 provincial center
343 municipal center
2015 county center

6085 specialty staff

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This is the world's most extensive CAP-enabled warning system--comprised of 1 national, 31 provincial, 343 municipal, and 2015 county centers.

**CAP in China**

Suggestions for Roadmap of Sendia Framework

**Project :** Establish a worldwide unified early warning release system via CAP which has been proved  availible in China, with the most complicated disasters.  WMO should consider to support the project of the system construction, and CMA glad to take part in.

**Promote:** coordinated development of digital model and forecasting technology all of the world, promote scientific research ability.

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This NEWRS presentation, presented earlier this year in Geneva, included a very interesting proposal:


"Establish a worldwide unified early warning release system via CAP ... WMO should consider to support [..] the system construction, and [China Meteorological Administration would be] glad to take part in [that project]."

## Asia/Pacific - Smart Alert (FMI)

SmartAlert freeware from Finnish
Meteorological Institute planned
- ➢ Fiji
- ➢ Papua New Guinea
- ➢ Samoa
- ➢ Solomon Islands
- ➢ Tonga
- ➢ Vanuatu

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The CAP-enabled SmartAlert freeware from Finnish Meteorological Institute is installed and being tested in Samoa. Over the next three months it will be also installed in Fiji, Tonga, Vanuatu, Papua New Guinea, and the Solomon Islands.

Indonesia: Earthquakes CAP feed
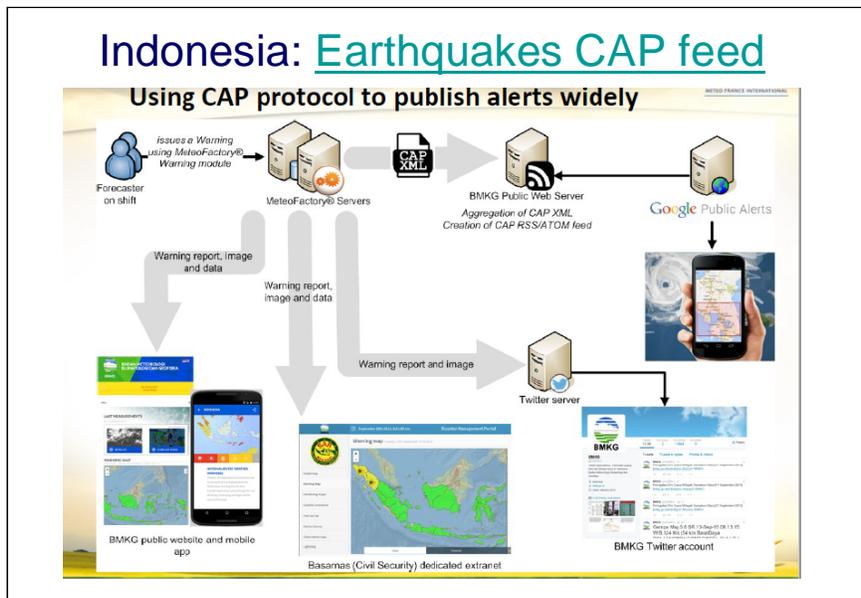
As shown in this example, Indonesia creates CAP alerts using an off-the-shelf system called MeteoFactory that is provided by MeteoFrance International.

## Elsewhere in Asia/Pacific

- Australia
- Hong Kong
- India
- Maldives
- Myanmar Department of Meteorology and Hydrology
- Nepal

- New Zealand MetService
- GNS Science (earthquakes)
- Philippines
- Sri Lanka
- Taiwan
- Thailand

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We have just heard about CAP implementations in Australia, the Maldives, Myanmar, Taiwan, and Thailand.

There are two CAP alert feeds operational in New Zealand: one for New Zealand MetService and one for GNS Science, which alerts about earthquakes.

Elsewhere in the Asia/Pacific region, there are CAP implementations in progress for Hong Kong, India, Nepal, and Sri Lanka.

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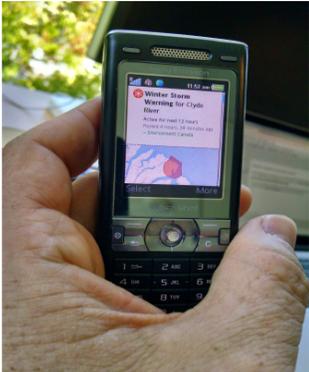> 24 Aug 2016      Survey of Other CAP Implementations      24

Now let me turn to CAP systems that are led by Non-Governmental Organizations and by Commercial organizations.

But, before getting into actual systems, I'd like to mention a very interesting new prospect: adoption of CAP throughout civil aviation. This makes a lot of sense, given the reliance of civil aviation on weather alerting, which has already moved decisively to adopt CAP.

In this year, the International Civil Aviation Organization (ICAO) has mandated operational support for XML, which makes it very easy for them to also leverage CAP alerts. It will be fascinating to see what new applications arise from the intersection of all-hazards alerting with this key component of the transportation industry.

Google uses CAP to offer authoritative alert data across Google products.

Google also offers an open source CAP tool for easy message authoring.

As of a year ago ago, here's what Google said they are working on:
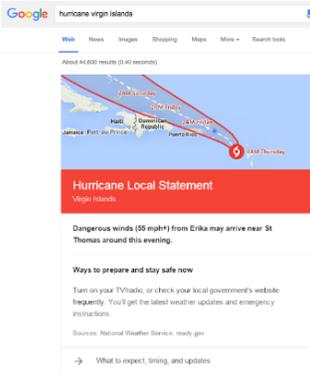
- Bring CAP alerts to more countries & users;
- Continue to make alerts more actionable

### IFRC Universal App Program

**The Red Cross Emergency App**

Real-time severe weather alerts and safety information, all in one app.

AVAILABLE RIGHT NOW ON

App Store    Google play

American Red Cross Mobile Apps (example)

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We heard from Omar Abou-Samra about the Universal App Program of the International Federation of Red Cross and Red Crescent Societies.

Eighteen RC/RC National Societies have already implemented the Hazard apps, including: Indonesia, Myanmar, Philippines, United States, Vietnam, and 12 countries in the Caribbean area. Four other IFRC National Societies have Hazard apps in development: Argentina, Canada, Suriname, and New Zealand.

Hazards App will also have a capability to issue CAP alerts by publishing as Internet news feeds. This feature can be used by any Red Cross/Red Crescent National Society, all of which are now included in the international Register of Alerting Authorities maintained by WMO.

This CAP alert publishing capability of the Hazards App can be shared with other alerting authorities in the country as well.

## Commercial Weather Alerting

➢ AccuWeather

➢ MeteoFrance Vigilance

➢ MeteoFrance International, MeteoFactory
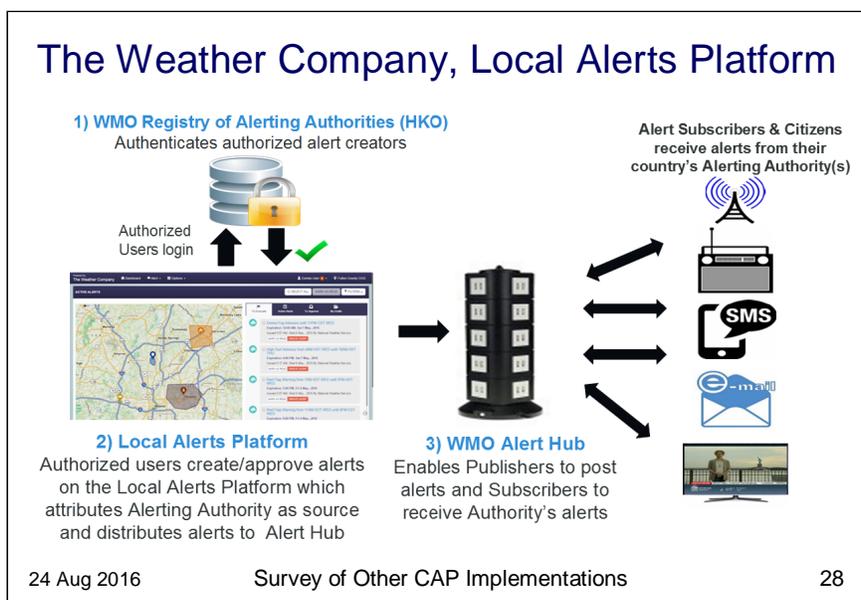
➢ The Weather Company

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AccuWeather has integrated publicly available warnings from the governments of over 50 countries, many using CAP, into AccuWeather.com. AccuWeather apps and partner apps reach 1.5 billion people globally in over 100+ languages. AccuWeather plays a role in "last mile distribution" of weather warnings to end users in China

The MeteoFrance Vigilance system is moving to CAP as well. Vigilance has been in use since 2001 and adopted by a number of countries, including Madagascar. MeteoFrance has a strong relationship with the national civil security organization, and 90 % of French people know about the Vigilance map.

MeteoFrance International also supports CAP alert creation and dissemination. This is primarily through their product suite known as MeteoFactory. MeteoFactory is in use within 13 countries (Cambodia, Egypt, France, India, Indonesia, Kenya, Lebanon, Libya, Madagascar, Qatar, South Africa, Swaziland, and Viet Nam).

The Weather Company, an IBM business, distributes meteorological alerts and forecasts, powering over 2+ billion global mobile devices.

They are developing a free cloud-hosted tool, known as the "Local Alerts Platform" to enable meteorological alerting authorities to create and communicate all-hazards alerts.

Here is a diagram showing how this cloud-based software works with other alert dissemination components.

## 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

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I am aware of two examples where in-home monitors are picking up CAP alerts in order to become all-hazard alarms.

The Halo in-home smoke sensor is a network device, designed for emerging economies. It already has the capability to pick up CAP alerts from the U.S. National Weather Service, so it is straightforward to make it into an all-hazards alarm.

Another device, called Speck, detects fine particulate matter in the indoor environment. The device has network connectivity and the company told me they are already working on adding an all-hazards alerting capability.

Earth Networks produces CAP alerts for thunderstorms. These alerts are generated based on sensors that monitor radio emissions from lightning (in-cloud and cloud-to-ground).

At the CAP Workshop in Rome last year, we heard about real time sensors for earthquake damage assessment, where CAP is used to send alerts to central command and control systems.

## Other CAP-based Systems

➢ Sighting of Bombers in Syria
➢ Hate Group Monitoring
➢ Neighborhood Watch
➢ Microsoft CityNext
➢ Federation for Internet Alerts
➢ RSOE Emergency and Disaster Information Service

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One of the newer implementations is operated by volunteers that watch the sky and report sightings of bombers heading for targets in Syria.

One of the *earliest* implementations of CAP was for the monitoring of hate groups in Germany, operated by ED Zimmerman and reported at the first CAP Implementation Workshop, in 2006.

Phil Petree has an extensive CAP implementation supporting Neighborhood Watch--a very local facility for people to inform each other about events they observe personally.

The Federation for Internet Alerts has presented at CAP Workshops about their facility for displaying CAP alerts as overpays of online ads. This is expected to eventually expand beyond the United States, where it is now used for tornado CAP alerts from the National Weather Service.

There are also very sophisticated applications of CAP in the analysis of news. We have seen how Microsoft CityNext uses CAP, which becomes a source for security services like Pinkertons. Another example of a system that makes CAP alerts out of thousands of news outlets and other sources is the Hungarian National Association of Radio Distress-Signalling and Infocommunications (RSOE), which operates an Emergency and Disaster Information Service (EDIS).
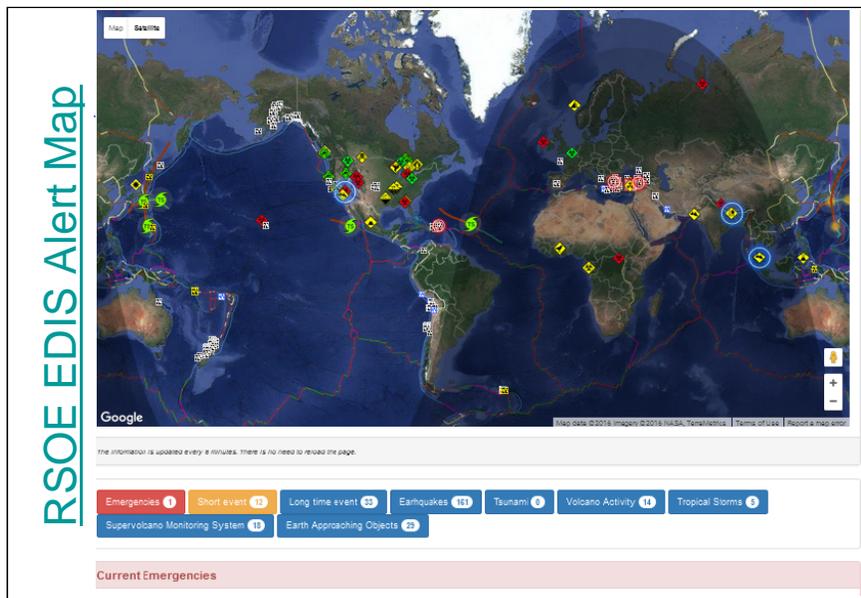
RSOE EDIS Alert Map

And here we see the EDIS Alert Map. This site includes potential extreme events such as Supervolcanoes and Earth approaching objects in the next 30 days.

## CAP in Pinkerton's

Pinkerton's corporate risk management is active in over 100 countries and services 80 of the world's 100 largest companies. All of Pinkerton alerting is CAP-enabled. Here we see Pinkerton's extracting risk information from Twitter and converts it into a CAP alert.

There are 35,000 Pinkerton agents and its parent company, Securitas, provides 300,000 Securitas guards for hire.

Marcia pointed out to me that the guards here at AIT are part of Securitas. So, it may well be that the AIT security guards themselves are using CAP.

## Questions?

### CAP Implementations by Country

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Now I am ready to conclude this presentation.

Let me state again: A "CAP System" sends or receives alerts in the CAP standard format. To leverage the many ways that such alerts can be sent and received, CAP alerts should be accessible through Internet standard news feeds.

Here is a link to a report on CAP Implementations by Country that I maintain.

Are there any questions?