



Integrated Public Alert and Warning System (IPAWS)

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What is IPAWS?

▶ IPAWS is a National System for Local Alerting

- Used by local, state, territorial, tribal, and federal agencies to send geo-targeted emergency alert and warning messages to the public by:
 - radio and television as *Emergency Alert System (EAS)* broadcasts
 - cellular phones as *Wireless Emergency Alerts (WEA)*
 - NOAA All Hazards Weather Radio
 - Internet applications and websites
- FEMA is responsible for*:
 - Development, operations and maintenance of the IPAWS
 - Partnering with the private sector communications industries
 - Providing technical assistance to State and local governments to insure that timely and effective disaster warning is provided

*in accordance with Public Law 114-143 - The IPAWS Modernization Act of 2015; Executive Order 13407 - Public Alert and Warning System; and the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Sec. 202. Disaster Warnings



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What isn't IPAWS?

- Not an app
- Not an SMS or email sign up service
- Not a subscription based mass notification system
- Does not dial phones phone
- Can not page or notify a distribution list
 - e.g. can't send a recall notice to a select group of employees

*IPAWS does not know
phone numbers or
people's location!*

IPAWS does “broadcast” type alert/warning

- Messages to all people in any given area
 - Residents and Visitors



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Who can use IPAWS?

- Public safety officials with coordinated authority to alert the public of emergency situations in their jurisdiction.
 - Local, State, Territorial, Tribal, Federal officials
 - Public safety officials: emergency management, law enforcement, homeland security, county, city, regional - *Other organizations at approval of local and/or state government of jurisdiction*

Is there a requirement to use IPAWS?

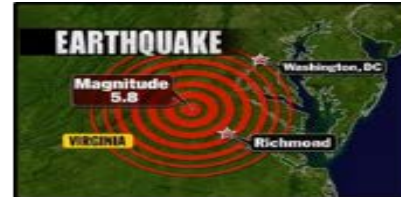
– No. IPAWS Use is voluntary



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When is IPAWS Used?

- When a public safety official need to alert or warn the public.



What does IPAWS Look Like to an Alerting Authority (aka IPAWS user)?

➤ typically a “mass notification system” that is IPAWS-Compatible

A few examples:

- AlertSense from MyStateUSA Inc
- CodeRED by OnSolve (formerly ECN)
- Emnet from ComLabs
- Everbridge Mass Notification and Nixle from Everbridge Inc.
- WebEOC with IPAWS add-in by Intermedix Corporation
- WENS - Wireless Emergency Notification System by Inspiron Logistics LLC
- Hyper-Reach from Asher Group
- GSS Alert Studio and Alert FM from Global Security Systems LLC
- DisasterLAN, NY Alert from Buffalo Computer Graphics, Inc
- The Communicator!, The Communicator! NXT and GeoCast Web, Cassidian Communications
- On-The-Go Alerting iPad app from KDEE Technology LLC
- Blackboard Connect
- FirstCall Emergency Notification System(FirstCall)
- AtHoc IWS
- Federal Commander Digital Systems (Federal Signal Alerting and Notification System)
- Rave Alert from Rave Wireless, Inc
- Roam Secure Alert Network Eaton Corporation
- Swift911 Emergency Notification System SwiftReach Networks, Inc

Not all tools support all IPAWS capabilities!

Vary widely in operational look & feel

Pick one that fits your operational plans and use cases!



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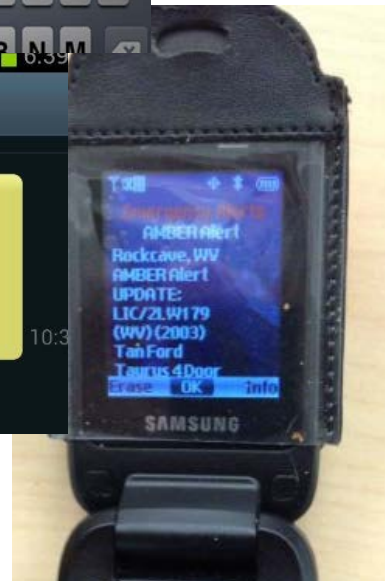
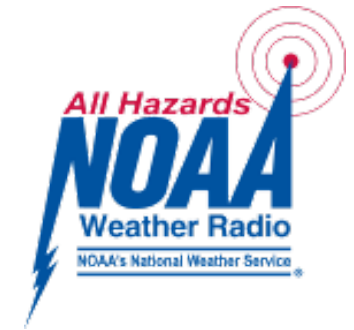


The Internet



Digitally signed CAP messages

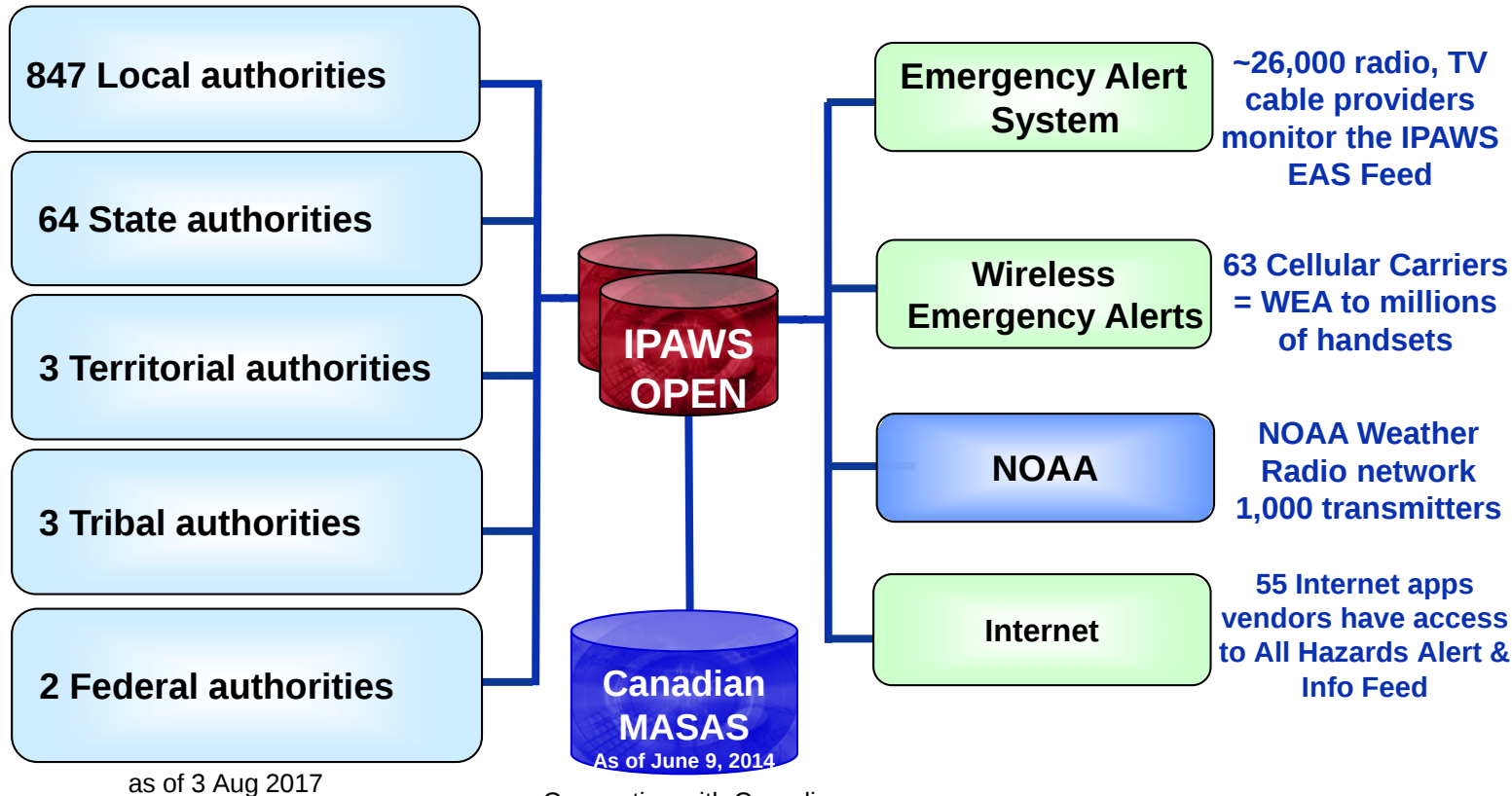
What does IPAWS Look Like to the Public?



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IPAWS Architecture

Users → *FEMA Gateway* → *Private Sector* → *People*

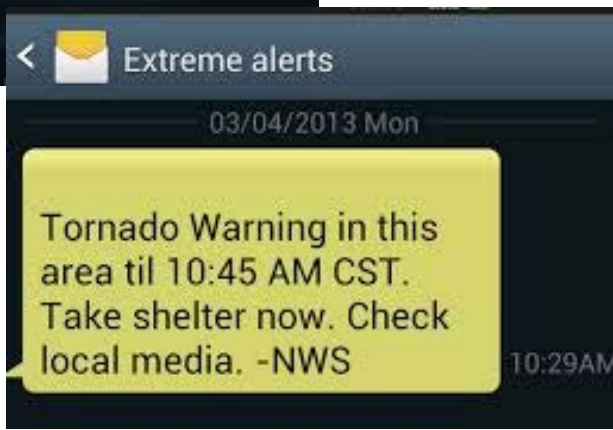
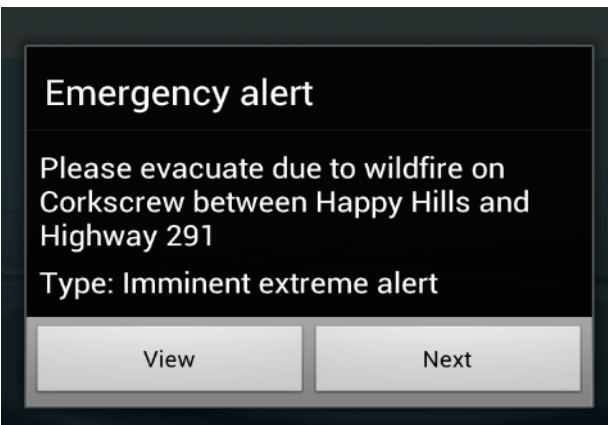


Connection with Canadian equivalent of IPAWS for cross border sharing of warning information



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Wireless Emergency Alerts (WEA)



Wireless Emergency Alerts (WEA)



- ▶ 90 character emergency alert text message broadcast to cellular phones by cell tower

- ▶ **“Cell Broadcast”** technology

- Not affected by cell site network congestion
- Different protocol/channel than used for voice, SMS, web/app data communications
- One way Broadcast protocol

- ▶ Cellular carrier participation voluntary
 - Most Commercial Mobile Service Providers (CMSP) have opted into WEA
- ▶ U.S phones are delivered opted-in
 - Citizens may opt-out of receiving alerts

- ▶ **IPAWS is the only interface for Wireless Emergency Alerts (WEA)**

- ▶ **WEA is free – no usage or text message charges**



- ▶ Significantly different from SMS/email based alerting systems

- ▶ **Not subscription based –**

- true location based alerting - sends alerts to all phones in a cell coverage area - not to a database of phone numbers
- No sign-up or registration
- No app
- No tracking or delivery info or status feed back



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WEA - Technical Note!

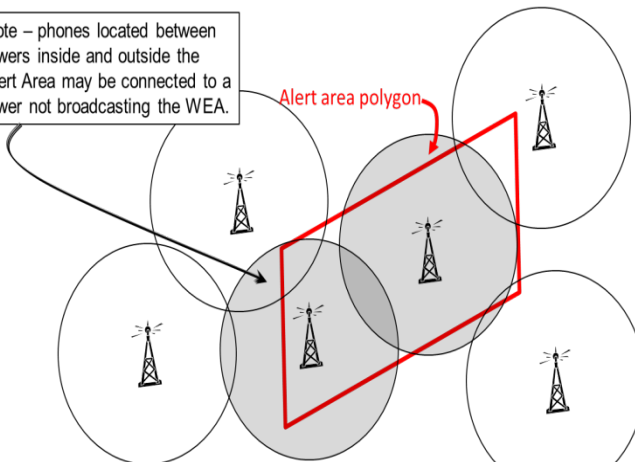
>> how carriers target alerts to cell phones

- *Wireless carriers technical implementation of WEA varies*
 - *The geo area a WEA is sent to and number of phones receiving the WEA depends on how a carrier has implemented WEA*
 - *Major carriers use “cell broadcast”*
 - *Some smaller carriers send WEA via a special “app”*
- Notional example implementations:

WEA broadcast only from towers located inside alert area

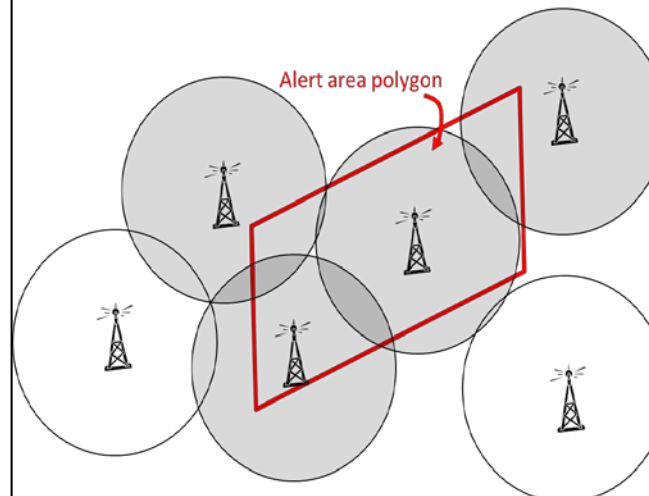
WEA is broadcast from towers in shaded circles only.

Note – phones located between towers inside and outside the Alert Area may be connected to a tower not broadcasting the WEA.



WEA broadcast from towers with coverage in to the alert area

WEA is broadcast from towers in shaded circles only.



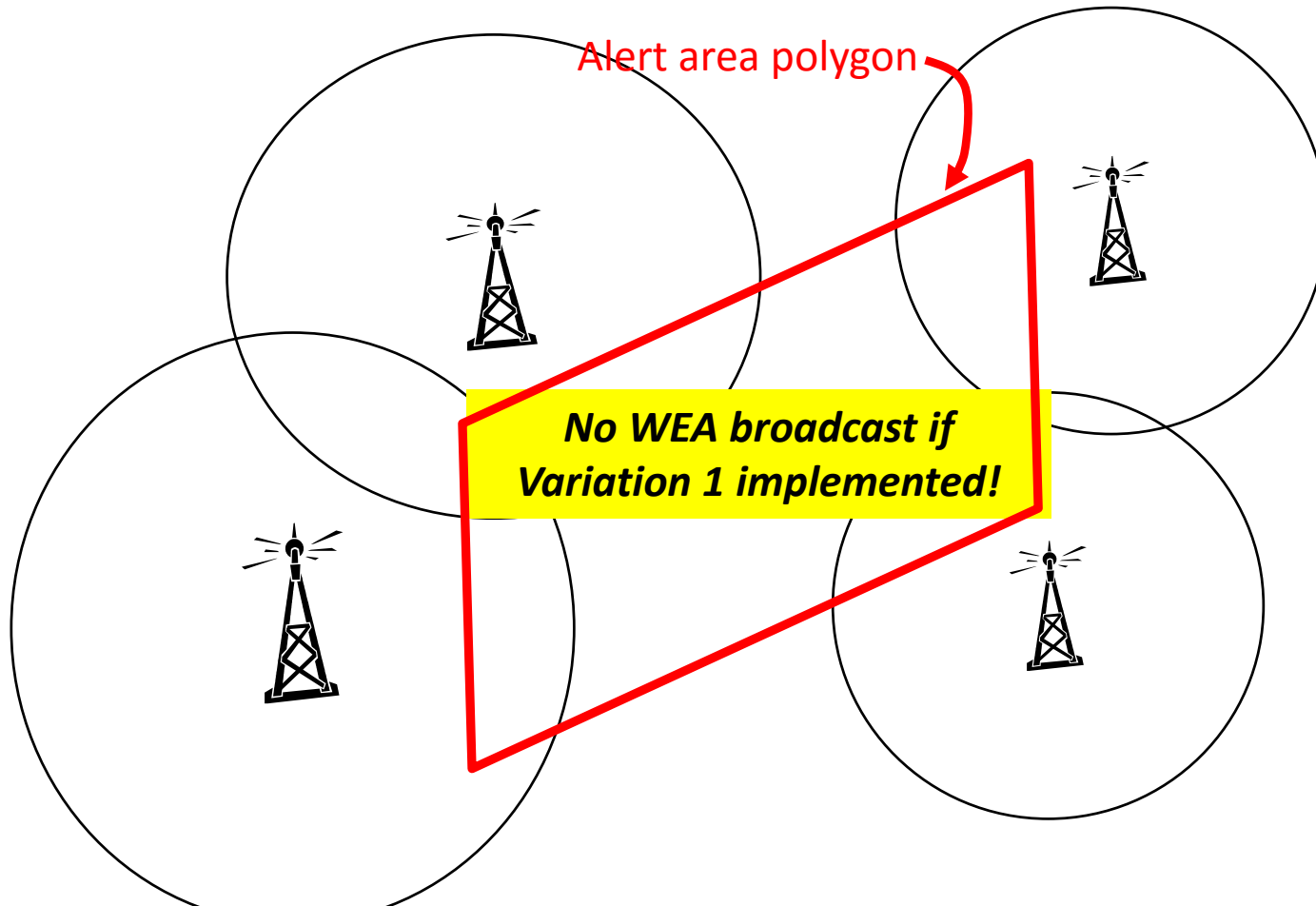
Carrier app on phone

Custom App deployed on carriers' smart phones

- An application that communicates with the carrier's alert database and if phone is in a WEA alert area, WEA message is delivered via SMS text
 - This variation is dependent upon SMS channel availability potential for alert delivery to be affected by SMS congestion in local wireless network
 - WEA Roaming may not be supported by app based WEA implementation

Rural Consideration for WEA:

- *Cell towers are fewer and farther apart in rural areas*
- *WEA may not be broadcast if the defined alert area does not encompass a cell tower location*



Thank you!

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Integrated Public Alert and Warning System



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Emergency Alert System (EAS)



- all FCC licensee's monitor the IPAWS EAS feed
- IPAWS supports additional content delivery to EAS devices:

- text for screen crawl and display
- audio attachments (mp3)
- URL/links to additional content and information

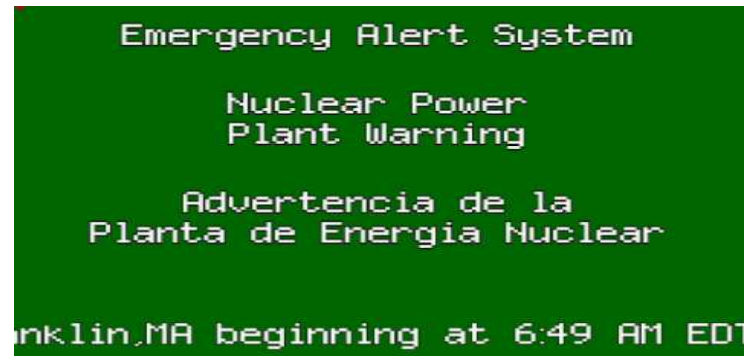


Requires Local Coordination & Partnership

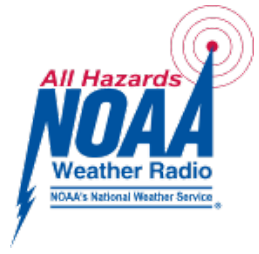
- Broadcasters are not required to air all alerts



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NOAA All Hazards Weather Radio



Non-Weather Emergency Messages (NWEM) from local alerting authorities can be routed through IPAWS to NOAA for broadcast to NOAA Weather Radio Network

- 1,000 NOAA Weather Radio transmitters nationwide
- Variety of consumer radios available
- Some radios have feature to wake up radios in the the night for specified message types (e.g. Tornado Warning)



- Permission to access NOAA Weather Radio transmitters via IPAWS must be coordinated and approved through the NWS in coordination with your local Weather Forecast Office (additional info at <http://www.nws.noaa.gov/os/hazcollect/>)

NWEM via IPAWS is temporarily off line!

NOAA testing in process to re-enable capability soonest.

Local officials may still use NWR by calling/coordinating with the local Weather Forecast Office.



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IPAWS All-Hazards Info Feed

- ▶ Internet and web services/applications monitoring alerts for the public
- ▶ Web services may distribute or publish alert info to apps, websites, email lists, text messaging groups, social media, etc.
- ▶ Sample of companies with access to the All-Hazards Alert Feed:

- | | | |
|-----------------------------------|--|---|
| • AtHoc, Inc. | • Grandpaham.com | • Spectacular Media |
| • ATI Systems, Inc. | • Interop Solutions, LLC | • Spectrum Solutions |
| • Avalution Consulting, LLC | • KDEE Technology, LLC | • Swan Island Networks, Inc. |
| • Broadcast Television Group, LLC | • MIR3, LLC | • TechRadium, Inc. |
| • Burli Software, Inc. | • MyStateUSA, Inc. | • The Weather Channel Companies |
| • Callaway GraphicSoftware | • National Public Radio | • Thunder Eagle, Inc. |
| • City of Lakewood | • Omnilert, LLC | • TriStateAlerts, LLC |
| • CommPower, Inc. | • PIER Systems LLC | • Weather Message Software |
| • Deaf Link Inc. | • Public Alerter, LLC | • WHDT World Television Service |
| • Dotomi | • Rapid Notify, Inc. | • Wisemen Multimedia |
| • EZ Automation | • Rave Wireless | • WRAL-TV, Capitol Broadcasting Company, Inc. |
| • Facebook | • SafeT, Inc. | |
| • Twitzip | • Samsung Information Systems America Inc. | |
| • Geo-Comm | • Singlewire Software LLC | |
| • Global Security Systems | • Skitter Inc. | |



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WEA Changes on the way:

- Increase message length from 90 to 360 characters
 - 360 for 4G/LTE networks, 90 for legacy networks
- Add new alert category, “Public Safety Messages”
 - Lower than Imminent Threat category
- Allow URLs and phone numbers
 - Text allowed at first, “clickable” in the future
- Support for Spanish language messages
 - Alert Originator will translate, will follow phone setting
- Enable a local WEA test code
 - Will be disabled by default



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Further Notice of Proposed Rulemaking

i.e. Changes Under Consideration:

- **Geo-fencing, matching broadcast to geographic alert area**
 - Reach 100% of phones in targeted area with no more than 0.1 mile overshoot
- **Alert Message Preservation on the phone**
 - Messages retained for recall on the phone
- **Multimedia Alert Content**
 - Picture delivered with alert message
- **Defining the Carrier scope of Participation in WEA**
 - What do “in whole” and “in part” really mean?
- **Carrier Infrastructure Functionality**
 - Is WEA really available everywhere there’s coverage?
- **Multilingual message support**
 - beyond English and Spanish
- **Earthquake Prioritization**
 - ShakeAlerts delivery to phones in less than 3 seconds
- **Disaster Relief Messaging**
 - Many-to-one messaging



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IPAWS Lab

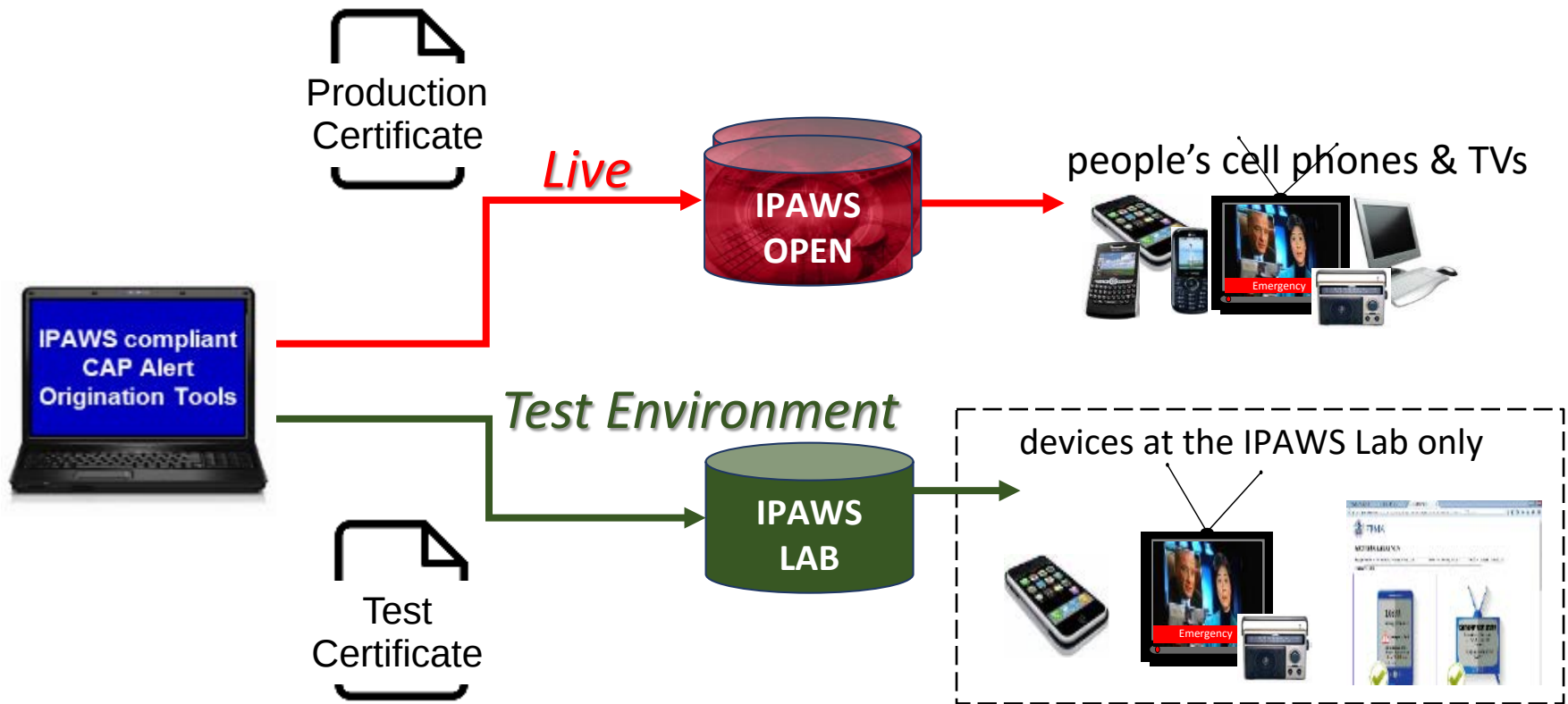
- IPAWS Test Lab supports alert and warning system evaluation, demonstration, exercises, testing, and practice
 - Offline version of IPAWS with closed network alert broadcast systems
 - Alert viewer website –practice sending alerts and see system results



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Lab provides “offline” version of IPAWS

...Practice sending alerts, seeing results



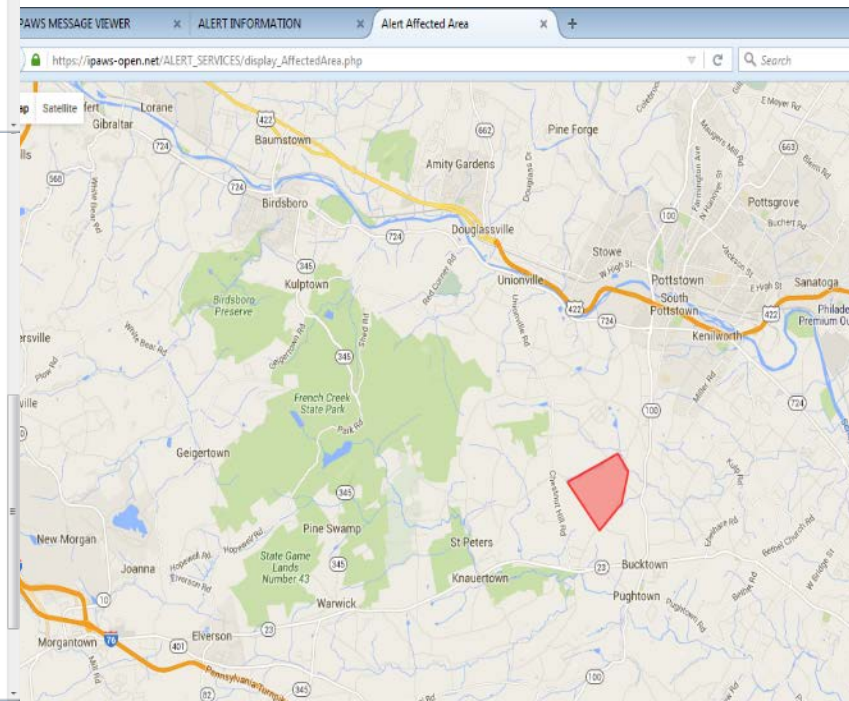
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IPAWS Lab - Test Alert Viewer

Web page that shows alerts processed via the IPAWS Lab environment in real time.

Users:

- log in with COG ID to view alerts
- can test, exercise, and train on alerting software and procedures,
- practice using tools, creating alerts



For more information on IPAWS

- ▶ Email the IPAWS inbox: IPAWS@fema.dhs.gov
- ▶ IPAWS Website: <http://www.fema.gov/ipaws/>
- ▶ EMI Independent Study Courses:
 - **IS-247a: *IPAWS Introduction***
<https://training.fema.gov/EMIWeb/IS/is247a.asp>
 - **IS-248: *IPAWS for the American Public***
<http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=IS-248>
 - **IS-251: *IPAWS for Alerting Authorities***
<http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=IS-251>
- ▶ IPAWS Stakeholder Information and Webinar Mailing Lists:
<https://www.fema.gov/integrated-public-alert-warning-system-program-management-office-get-involved>



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NOAA types send via IPAWS WEA :

WEA Messages Originated by NWS

Extreme

Warning Type	WEA Message
Tsunami Warning*	Tsunami danger on the coast. Go to high ground or move inland. Listen to local news. -NWS
Tornado Warning	Tornado Warning in this area til hh:mm tzT. Take shelter now. Check local media. -NWS
Extreme Wind Warning	Extreme Wind Warning this area til hh:mm tzT ddd. Take shelter. -NWS
Hurricane Warning	Hurricane Warning this area til hh:mm tzT ddd. Check local media and authorities. -NWS
Typhoon Warning	Typhoon Warning this area til hh:mm tzT ddd. Check local media and authorities. -NWS
Flash Flood Warning	Flash Flood Warning this area til hh:mm tzT. Avoid flooded areas. Check local media. -NWS
Dust Storm Warning	Dust Storm Warning in this area til hh:mm tzT ddd. Avoid travel. Check local media. -NWS

Severe

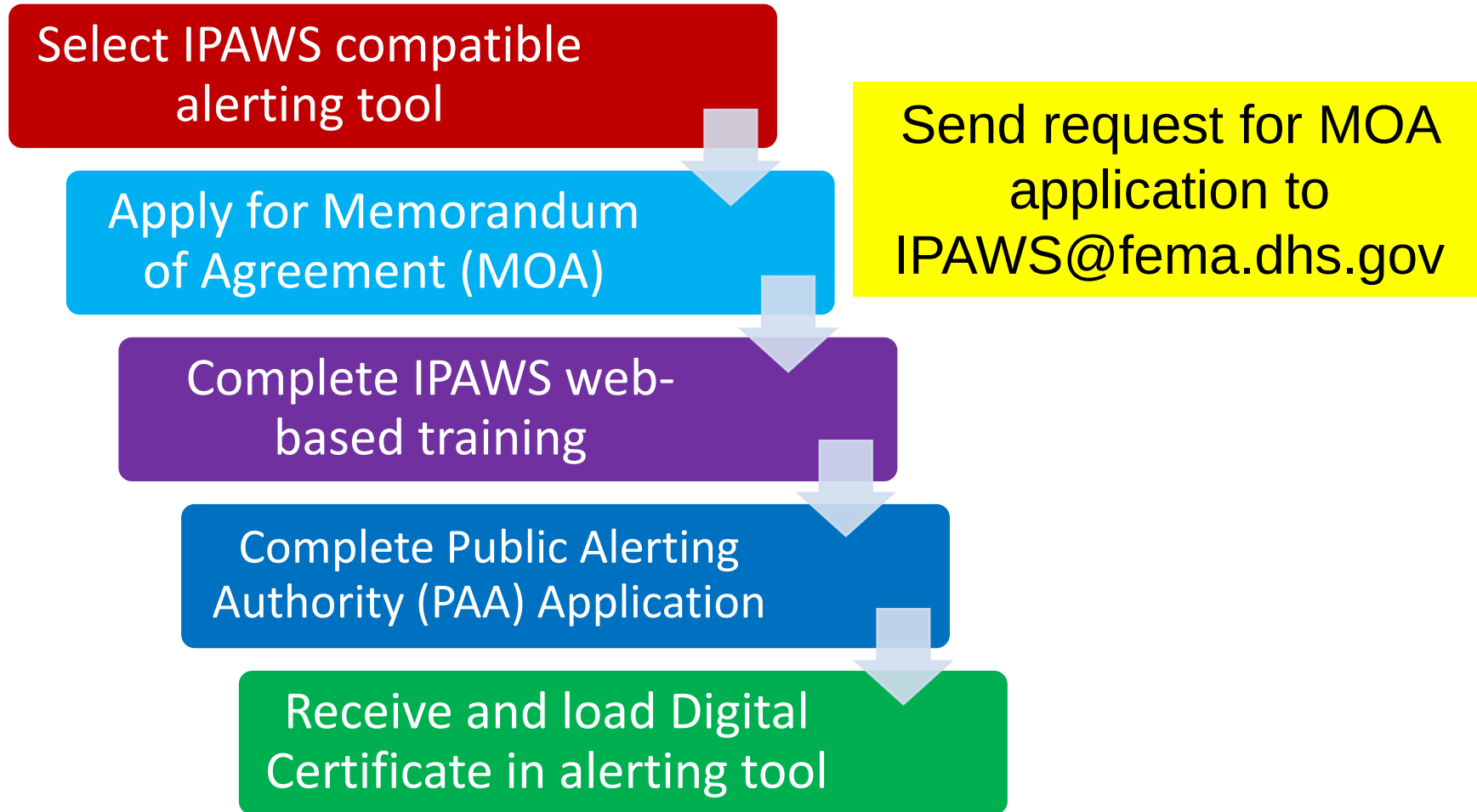
Legend

tzT = timezone
ddd= three letter abbreviation
for day of the week

*WEA activated for Tsunami Warnings when Tsunami Watch or Tsunami Advisory not previously in effect.

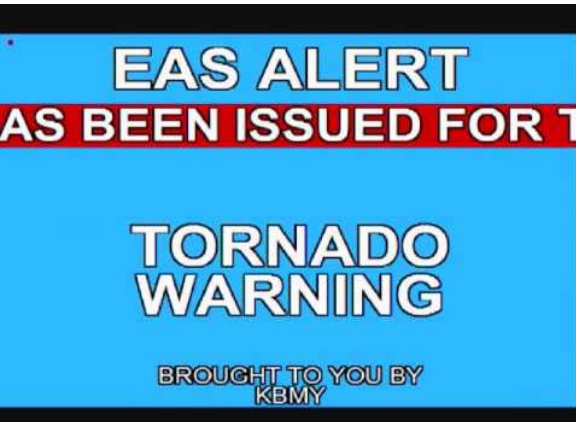
Local WFO's do not have control of the message text sent for weather WEAs. Warning message is automatically generated to IPAWS by central NOAA application when a WFO generates any of the 7 warning types above.

Process to become an IPAWS User



<http://www.fema.gov/how-sign-ipaws>

IPAWS is the only system providing rapid, geo-targeted, broadcast of information to the public over multiple communications channels simultaneously



THE NATIONAL WEATHER SERVICE HAS IS
NON-WEATHER EMERGNECY MESSAGE

BULLETIN - EAS ACTIVATION REQUESTED
SHELTER IN PLACE WARNING
DANE COUNTY 911 EMERGENCY COMMUN
CENTER
RELAYED BY NATIONAL WEATHER SERVIC
MILWAUKEE/SULLIVAN WI
100 AM CDT MON APR 07 2003



N PLACE WARNING NEAR THE
DANE COUNTY REGIONAL AIF
ING MESSAGE IS BEING TRAN
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TIONS CENTER DUE TO A TO

EMERGENCY SERVICES HAS ISSUED A
ARNING. THERE HAS BEEN A RELE
FROM XYZ CHEMICAL PLANT. THE
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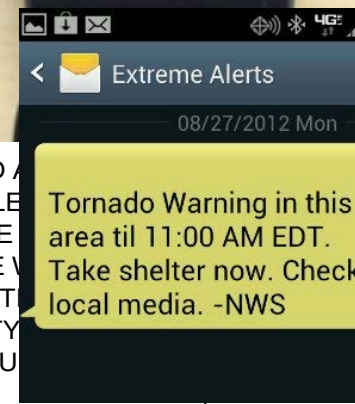
SHELTER.

SHELTER IN PLACE WARNING ACTIONS:

1. GO INSIDE
2. CLOSE ALL DOORS AND WINDOWS
3. TURN OFF ALL VENTILATION SYSTEMS
4. TUNE TO LOCAL NEWS MEDIA FOR FURTHER



EATHER SERVICE IN SPRINGF
ING FOR...
NEWTON COUNTY IN SOUTHW
CHEROKEE COUNTY IN SOUT
JASPER COUNTY IN SOUTHW
S THE CITY OF JOPLIN...



CAUTIONARY/PREPAREDNESS ACTIONS...

YOU ARE IN OR NEAR JOPLIN TAKE COVER



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- Reverse Dial Telephone systems
- Email and SMS registration systems
- Local Websites / Message Boards
- Social Media - Face book, Twitter, etc
- Local media coverage
- Sirens and Giant Voice systems
- Local Emergency Alert System (EAS)
- Local National Weather Service All Hazards Weather Radios

Evolution of Public Warning and Information in the United States



1951 - 1963
CONELRAD

1963 - 1997
EBS

1997 - Present -
EAS IPAWS



Originally called the “Key Station System,” the **CONTROL of ELectromagnetic RADiation (CONELRAD)** was organized a network of **AM radio** stations with special procedures for warning citizens and providing emergency instructions and information in the event of a national catastrophic emergency.

EBS expanded emergency warning to include **radio and TV** stations providing the President with an expeditious method of warning the public during a national emergency.

Later expanded to enable state and local officials to alert local populations during local emergencies and provide for better and more accurate handling of alert reception and rebroadcast.

EAS modernized the EBS providing automation of alert transmission and activation to **radio and TV** stations with the adoption of the Specific Area Message Encoding (SAME) protocol and provided better integration with National Weather Service and state and local alert systems.

IPAWS integrates and expands public alert and warning from just **radio and TV**, to **wireless devices, Internet applications**, NOAA All-Hazards **Weather Radios**, and **future communications technologies** using an international open standard for information exchange - the Common Alerting Protocol or CAP.

IPAWS enables public safety officials at all levels of government to warn citizens via a diverse and integrated network of private sector communications systems.

IPAWS enhances and extends a national infrastructure and capability to local, state, territorial, and tribal officials for public alerting and warning



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