



National Continuity Programs Directorate

Integrated Public Alert and Warning System (IPAWS)



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Integrated Alert and Warning System (IPAWS) Program

What is IPAWS?

During an emergency, alert and warning officials need to provide the public with life-saving information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure. IPAWS will integrate new and existing public alert and warning systems and technologies. Federal, State, territorial, tribal, and local government alert and warning systems will be able to integrate with the national alert and warning infrastructure providing a broader range of message options and communications pathways for the delivery of alert and warning information to the American people before, during, and after a disaster.



Executive Order 13407

Executive Order 13407 established as policy the requirement for the United States to have an effective, reliable, integrated, flexible, and comprehensive system to alert and warn the American people. FEMA is designated within the Department of Homeland Security to implement the policy of the United States for a public alert and warning system as outlined in Executive Order 13407 and has established a program office to implement IPAWS. FEMA and its federal partners, the Federal Communications Commission, the National Oceanic and Atmospheric Administration's National Weather Service and the DHS Science and Technology Directorate are working together to transform the national alert and warning system to enable rapid dissemination of authenticated alert information over as many communications channels as possible.

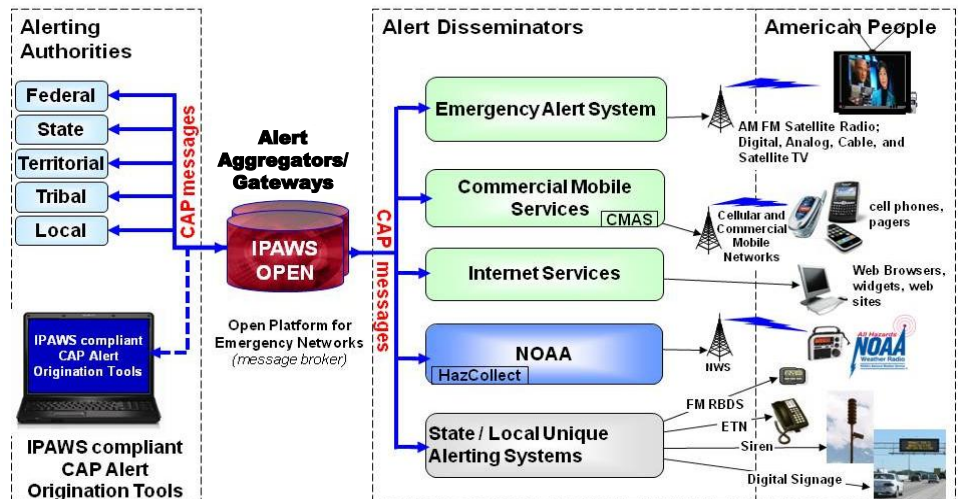
IPAWS Program Vision: Timely Alert and Warning to American People in the preservation of life and property.

IPAWS Program Mission: Provide integrated services and capabilities to local, state, and federal authorities that enable them to alert and warn their respective communities via multiple communications methods.

IPAWS Program Strategic Goals:

- Goal 1 – Create and maintain an integrated interoperable environment for alert and warning
- Goal 2 – Make alert and warning more Effective
- Goal 3 – Strengthen the Resilience of IPAWS Infrastructure

IPAWS Architecture: Standards Based Alert Message data exchange format, alert message aggregation, shared, trusted access & distribution networks, alerts delivered to more public interface devices





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Emergency Alert System

What is EAS?

The Emergency Alert System (EAS) is a national public warning system that requires broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service (SDARS) providers, and direct broadcast satellite (DBS) providers to provide the communications capability to the President to address the American public during a national emergency. The system also may be used by state and local authorities to deliver important emergency information, such as weather information, AMBER alerts, and local incident information targeted to specific areas.

FEMA, in partnership with the FCC and NOAA, is responsible for implementation, maintenance and operations of the EAS at the federal level. The President has sole responsibility for determining when the national level EAS will be activated. FEMA is responsible for national-level EAS, tests, and exercises.



EAS Modernization

The modernization of the EAS begins with the FEMA adoption of a new digital standard for the distribution of alert messages to the EAS participating broadcast community. IPAWS will use the Common Alerting Protocol (CAP) standard and new distribution methods to make the EAS more resilient and to provide enhanced alerting capabilities. This enhanced digital connectivity from the emergency management community to the public through the voluntary cooperation of the broadcast community provides timely alert and warning information to the American people.

National EAS Exercise

The IPAWS Program office is currently planning for the first ever nationwide exercise of the national EAS component. This exercise will serve two purposes for the IPAWS program. First, to demonstrate the readiness of the national EAS to provide a single Presidential alert message across all broadcast media in a short period of time. Second, to increase public awareness of the national alerting capability. While initial exercises will involve only traditional EAS, as the program progresses, all IPAWS components will be developed into regular exercise activities.

Primary Entry Point (PEP) Expansion

Primary Entry Points are broadcast stations located throughout the country with a direct connection to FEMA and resilient transmission capabilities. These stations provide the initial broadcast of a Presidential EAS message. FEMA is increasing the number of PEP facilities to provide direct coverage to at least 90% of the American people.



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Commercial Mobile Alert System

What is CMAS?

The Commercial Mobile Alert System (CMAS) is one of the major components of the IPAWS. The CMAS component will provide an interface to participating cellular mobile service and paging service providers for delivery of critical alert information to customers located in an affected area. Specifically, the IPAWS CMAS capability will provide Federal, State, territorial, tribal and local government officials the ability to send 90 character, geographically targeted text alerts to the public, warning of imminent threats to life and property. The cellular industry, the FCC, and DHS S&T are critical partners with FEMA in developing this new alerting capability. The initial requirements of the system were developed by an advisory committee established by the FCC in accordance with the Warning, Alert and Response Network (“WARN”) Act of 2006. The Commercial Mobile Service Alert Advisory Committee (CMSAAC) conducted meetings during 2008 with findings published in three FCC Report and Order documents.



Commercial Mobile Alert

Although CMAS capability appears similar to popular text and email subscription alert message services, the key differences are in how the mobile devices will receive alert messages and that CMAS does not require individual subscription.

Subscription-based alert messaging services currently available in some localities must first locate each individual subscriber handset and then send the message to that handset. Although this takes place at computer network speeds, it does take time to deliver a single message to a each subscriber handset in turn. In addition to not being subscription based, CMAS also utilizes different protocols to deliver an alert message to any and all mobile devices within range of the towers in an area of an emergency incident.

The IPAWS Program worked with DHS S&T and the Alliance of Telecommunications Industry Solutions (ATIS) and the Telecommunications Industry Association (TIA) during 2009 to establish a specification for the interface between the IPAWS alert aggregator/gateway and participating commercial mobile service provider gateways. In November 2009, the ATIS/TIA Joint CMAS Working Group approved the specifications for the interface between IPAWS and the commercial mobile service providers. An announcement adopting those specifications was published in a joint FEMA and FCC press release on December 7, 2009. This press release initiated the 28-month period during which participating commercial mobile service providers must develop, test and deploy their capability to deliver CMAS alerts to mobile devices.

The FEMA IPAWS team continues to working with the ATIS/TIA Joint CMAS Working Group to define a CMAS Interface Test and Certification Spec and to implement the CMAS requirements in the IPAWS OPEN alert aggregator/gateway infrastructure. The IPAWS Program Office expects to have an initial IPAWS CMAS gateway operating capability in early 2011.



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Alert Origination Tools

What is Alert Origination?

Alert origination tools are software products used by emergency managers, public safety officials, and other alerting authorities to create and send critical life saving messages to the public. These IPAWS CAP compliant messages go through the IPAWS Alert Aggregator to reach the public through radio, TV, cellular mobile devices, internet based communications, and other CAP compliant alerting systems.



Commercial Alert Origination Software Tools

Many incident management systems and tools available today have, or can incorporate, CAP based alerting functions. These tools used by state and local emergency managers will be able to connect to and send and receive IPAWS CAP compatible alerts with the IPAWS Alert Aggregator. This interoperation will enable state, local, territorial and tribal emergency managers to take advantage of the radio, TV, commercial mobile, and internet alerting connections and capabilities that IPAWS maintains.

Disaster Management Interoperability Services (DMIS) Tools

DMIS Tools is an interoperability platform and a set of basic incident management tools available for free download and use by qualified emergency management organizations. The DMIS Tools provides emergency managers and responders with the capability to use and share a common situational awareness picture and generate and release CAP-standard alerts to alert and warning systems and exchange partners. The DMIS tool includes a Non Weather Emergency Messaging (NWEM) capability for generation of alerts for broadcast over NOAA All Weather Hazards radio networks.

IPAWS Framework Tool

A new web-based replacement for DMIS currently in development. IPAWS Framework will provide a basic tool set for situational awareness, emergency management collaboration, and alert origination. The new system will be accessible via web browser and provided free for emergency management organizations.

Geo-Targeted Alerting System (GTAS)

NOAA is developing a tool in partnership with IPAWS for plume modeling and collaboration. GTAS will quickly estimate the affected area during a HAZMAT incident using current weather conditions and allow for the rapid creation of a CAP message for public alerting. GTAS also provides collaboration tools for emergency managers to leverage the expertise of their supporting National Weather Service Weather Forecast Office



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IPAWS Alert Aggregator

What is the Alert

Aggregator?

The Alert Aggregator is essentially an alert message broker that will accept and authenticate IPAWS CAP compliant messages from authorized alerting authorities and communicate those messages to dissemination and media communications networks such as radio, TV, mobile communications providers, and internet based services which can alert the public. The IPAWS Alert Aggregator can also broker messages among alerting officials for situational awareness information. This IPAWS services will be provided free to qualified emergency management organizations and authorized alerting officials.



Alert Aggregator

The IPAWS Alert Aggregator utilizes the Open Platform for Emergency Networks (OPEN) to move standards based alert and information messages between alert and warning systems. The OPEN supports four basic messaging formats or structures:

- Common Alerting Protocol (CAP) - Emergency messaging for public alert and warning through CAP compatible applications and systems
- Non-Weather Emergency Messages (NWEM) - Emergency messaging for public alerting distributed via NOAA Weather Radio and EAS
- Emergency Data Exchange Language Distribution Element (EDXL-DE) – Emergency management information messages used to coordinate between alerting authorities and responders prior to release of a public alert.
- Administration – information exchanges between applications and systems for retrieval and updating of basic system information

The standards used by the OPEN platform are developed and maintained by the Organization for the Advancement of Structured Information Standards (OASIS), <http://www.oasis-open.org>



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Common Alerting Protocol

What is CAP?

The Common Alerting Protocol (CAP) is a digital format for exchanging emergency alerts that will allow a consistent alert message to be disseminated simultaneously over many different communications systems. FEMA has worked with the Organization for the Advancement of Structured Information Standards (OASIS) to develop a profile to the standard that defines a specific way of using the standard for IPAWS purposes.



CAP provides a standard around which our nations alert and warning capabilities can be integrated

Three documents currently define CAP as it will be implemented and used in IPAWS:

- OASIS CAP Standard v1.2
- IPAWS Specification to the CAP Standard (CAP v1.2 IPAWS USA Profile v1.0)
- CAP to EAS Implementation Guide

The FCC has defined a compliance window for EAS broadcasters to be able to receive an IPAWS CAP message, commencing with FEMA's adoption of CAP as the new format for alert messages.

IPAWS CAP Conformity Assessment Program

The Conformity Assessment Program assesses vendor products for adherence to, and appropriate application of the IPAWS CAP Profile for alert message creation and dissemination. This will allow FEMA to verify that systems conform to the CAP Profile, a requirement to interface properly with the IPAWS Alert Aggregator and to interoperate with other alerting applications and systems. Products that conform will have a Supplier's Declaration of Conformity (SDoC) posted to the FEMA Responders Knowledge Base (RKB) website along with a description of their product and contact information. The Conformity Assessment Program will provide Federal, State, territorial, tribal and local officials the ability to view a list of pre-screened products when considering alert and warning system purchases or upgrades. Emergency management officials, broadcasters, and other EAS equipment users are encouraged to learn more about the program and to access test reports on the FEMA RKB website (<https://www.rkb.us>) before making alert and warning system purchases. Vendors are encouraged to access the IPAWS Conformity Assessment Program website to apply for testing: www.nimssc.org/ipawconform.

Additional information about the CAP Standard can be found on the web site of the OASIS open standards development body at <http://www.oasis-open.org>



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Inventory and Evaluation

What is the IPAWS Inventory and Evaluation?

The IPAWS Program Office is conducting a survey to inventory, evaluate and assess alert and warning systems used across the nation by Federal, State, tribal, territorial and local emergency management and first responder organizations in accordance with Executive Order 13407. Inventory analysis results will be used to identify needed changes, modifications and upgrades to future IPAWS programs and projects to continually improve and integrate alert and warning capabilities across the nation. The inventory data will allow the IPAWS Program to plan additional capabilities, necessary policies and procedures and resources to address gaps and improve alert and warning interoperability at all levels of government.



Alert and Warning Capability Inventory and Evaluation

In order to integrate and improve alert and warning capabilities across the nation, the need exists to collect information and evaluate what is presently being used to advise the public of potential and imminent danger. Initial data collection efforts are to inventory alerting capabilities at up to 2,200 Federal, State, tribal, territory, and local Emergency Operation Centers (EOC). An Office of Management and Budget (OMB) approve survey instrument in accordance with the Paperwork Reduction Act (PRA), Control No. 1660-0106, is being used for the collection effort. OMB approved FEMA Form 142-1-1 is used to:

- Catalog and evaluate existing Federal, State, territorial, tribal, and local government alert and warning systems
- Assess how well the infrastructure meets the needs of emergency managers
- Record capabilities and limitations of current alert and warning systems
- Identify shortfalls between required, actual, and/or planned capabilities

The initial focus of the inventory is on the hurricane and tornado-affected areas as defined by the National Oceanic and Atmospheric Association (NOAA).

I&E Survey Processes

Prior to engagement with any state or local EOC, coordination with the FEMA Regional offices and state emergency management agency is conducted. The state level alerting capabilities are documented first, and then the territorial, tribal, and local emergency managers are interviewed to capture their alert and warning resources. The aggregation of data is confidential and accessible only to FEMA personnel for alert and warning capabilities information. At present, over 900 surveys have been conducted during the first eight months of the project. The IPAWS Program Office truly appreciates the cooperation of all the emergency managers during the initial stages of project implementation and welcomes continued support as the alert and warning capability inventory survey continues.



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Americans with Disabilities

What is IPAWS doing to improve alerting to Americans with

Disabilities?
FEMA recognizes that special needs organizations and agency representatives are a critical part of the nation's emergency management team.

The adoption of CAP as the core alert message interoperability glue provides the capability for rich multi-media attachments and links to be included in alert message disseminated through out the IPAWS infrastructure, via radio, TV, cellular mobile devices, internet based communications, and other CAP compliant alerting systems.

It is incumbent upon FEMA's Integrated Public Alert and Warning System (IPAWS) to reach out to the American people to ensure all segments of the American population know and understand IPAWS – how it works and how they can use the system during times of crisis.



FEMA IPAWS

FEMA recognizes that disability organizations and agency representatives are a critical part of the nation's emergency management team. Executive Order 13407 requires FEMA to “include in the public alert and warning system the capability to alert and warn all Americans, including those with disabilities.”

Therefore, the FEMA IPAWS program has and will continue to establish, develop and maintain collaborative working relationships with various disabilities organizations and agencies.

The FEMA Integrated Public Alert and Warning System booth is designed to demonstrate the IPAWS concept of operations, alert origination, and alert aggregation utilizing the IPAWS Open Platform for Emergency Networks (IPAWS-OPEN), and alert dissemination technologies. Multiple types of Emergency Alert System (EAS) devices, including NOAA Weather Radio, a variety of commercial encoder/decoder devices, and alerting technologies for persons with disabilities, monitor the IPAWS-OPEN system for CAP messages with the appropriate content to trigger equipment based on the message types and geo-location information contained in the messages.

IPAWS Conference and Demonstration Activities:

The IPAWS booth supports both audio and visual alerting technology, as well as accessible collateral materials and displays. An IPAWS informational video containing captions is prominently displayed during the demonstrations. The IPAWS PMO is continually working toward integrating additional technologies to meet access and functional needs of Americans with disabilities.



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IPAWS Schedule and Milestones

When will IPAWS be ready?

The initial operating capability of IPAWS will begin approximately six months after the official adoption of the CAP standard by FEMA., planned for September 2010.

The second milestone in IPAWS implementation will be the participation of commercial mobile carriers beginning in the first quarter of 2012.

The expansion of the national EAS PEP network to cover 90% of Americans directly is planned for completion in 2011.

Planning for future integration and inclusion of internet service alerting capabilities to the IPAWS suite is on-going .



IPAWS Program Accomplishments to Date

In the past year, IPAWS, in close coordination with private sector partners, made several important advancements to the integration of public alert and warning systems, increasing the ability of local and emergency managers to provide the public with life-saving alerts.

Recent accomplishments include:

- IPAWS Technical Specification to Common Alerting Protocol v1.2 (Nov 2009)
- Commercial Mobile Alerting System Interface Specification (Dec 2009)
- Conducted live code exercise of national EAS (EAN) in Alaska (Jan 2010)
- First Expansion Primary Entry Point station brought online (August 2010)
- DM-OPEN v 2.0 brought online in FEMA data center (August 2010)
(note: DMIS / OPEN v1.0 remains online for transition period)
- Accepted the ECIG CAP to EAS Implementation Guide (August 2010)

In the short term, IPAWS planned milestones include:

- Formally Adopt the CAP Standard (September 2010)
- Roll out the IPAWS CMAS Gateway for carrier testing (February 2011)
- Complete expansion of PEP stations to provide direct FEMA coverage to 90% of the American population (2012)
- Conduct the first ever nation-wide exercise of the national Emergency Alert System (2011)

Looking ahead, IPAWS will continue to further the goals of creating and maintaining an integrated interoperable environment for alert and warning, making alert and warning more effective, and strengthening the resilience of alert and warning infrastructure through:

- Continued inventory and evaluation of state and local EOC alert and warning capabilities
- Conformance testing of vendor products to IPAWS CAP Profile
- Incorporation of alert and warning capabilities thru internet services
- Evaluation of new alert and warning technologies

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