

Report of the 2024 CAP Implementation Workshop and Training

Background

[Traveller Information Services Association \(TISA\)](#), [U.S. Agency for International Development \(USAID\)](#), [U.S. National Oceanic and Atmospheric Administration \(NOAA\)](#), and [Alert-Hub.Org CIC](#) hosted the 2024 Common Alerting Protocol (CAP) Implementation Workshop. Co-sponsors were the [International Association of Emergency Managers \(IAEM\)](#) and the [OASIS](#) standards organization.



The 2024 CAP Implementation Workshop and Training were held 22-24 October in Leuven, Belgium. A Zoom Webinar was offered for those who could not participate in person.

The Workshop was a technical meeting intended solely for information sharing among experts. Accordingly, Workshop participants represented themselves; they did not formally represent any organizations with which they were affiliated.

The Workshop and Training events had about 800 persons registered as participants. They were from 142 countries/territories, and many international organizations, commercial companies, academic institutions, or other non-governmental organizations. About 50 people participated in person at the [Irish College](#) in Leuven, Belgium. The photo below shows in-person participants on 23 October. The party hats are in celebration of the 20th Anniversary of the CAP Standard.



Recordings of the 2024 CAP Workshop and Training Webinars are at the following links. Enter the passcode **CAP-Workshop-2024** when prompted.

Training Day: 22 October [link](#)

Workshop Day One: 23 October [link](#)

Workshop Day Two: 24 October [link](#)

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The following other documents might be also of interest:

- The [Programme](#) lists all of the Workshop agenda topics and links to the presentations;
- The list of [Speakers](#) includes speaker biographies, portraits and links to the presentations;
- The list of [Participants](#) gives name and organizational affiliation of registered participants.

Offers to Host the Next CAP Implementation Workshop

Workshop participants were invited to put forward offers for the location of a future CAP Implementation Workshop. The likely time frame for a 2025 Workshop is September - October. It is likely to be in Rome, Italy, and hosted by the Italian Civil Protection agency.

Report Process

At the Workshop, participants agreed on the process for producing this Workshop Report. The Workshop Chair, Eliot Christian, produced a draft Report in consultation with hosts and co-sponsors. The draft was shared among Workshop participants for one week, with the Chair making revisions based on any participant comments received. Thereafter, the Chair published the final Workshop Report and linked to it from the 2024 CAP Implementation Workshop [website](#).

Presentation Summaries by Agenda Item

3.1 [Public/Private Partnerships](#) (Charlotte Cardona and Cedrick Vero) [download the presentation recording \(45 MB\)](#)

This presentation starts by highlighting the increasing frequency and intensity of global disasters, which necessitates improved collaboration among various stakeholders for effective emergency alerting. The presenters argue that past methods have often been fragmented, lacking comprehensive stakeholder involvement, which has led to inadequate warning dissemination during disasters. The proposal here is establishment of public-private partnerships to enhance early warning systems through better data sharing and communication channels. This is expected to improve disaster response capabilities and enhance timely alerting, with the goal to ensure that the right messages reach the right people effectively. The practical steps start with Identifying key players in disaster resilience, including public authorities, private companies, and the general public. Then, it is necessary to foster broader stakeholder involvement to ensure effective communication and collaboration. The presentation also asserts that technology and data sources can be better leveraged to enhance the accuracy and timeliness of emergency alerts.

3.3 [CAP in the SAFERS Forest Fire Platform](#) (Claudio Rossi) [download the presentation recording \(115 MB\)](#)

The presentation outlines the SAFERS project, which stands for Structured Approaches for Forest Fire Emergencies in Resilient Societies. This initiative launched in October 2020 and ran until March 2024. It was coordinated by the LINKS Foundation and involved 14 partners from seven European countries, with a budget of 3.25 million euros. The primary motivation for the

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SAFERS project was the increasing susceptibility of regions to wildfires due to climate change, land use changes, and extreme weather conditions. These factors led to a rise in the frequency and intensity of wildfires globally, affecting economies, ecosystems, and communities. SAFERS aimed to develop an Integrated Platform that utilizes big data and AI to enhance emergency management for forest fires. The project had three phases. (1) Prevention and Preparedness: Establishing early warning systems and risk maps to prepare stakeholders and inform citizens; (2) Detection and Response: Using various data sources to monitor fire status and predict its spread, while facilitating real-time updates from citizens and responders through an intelligent chatbot; (3) Restoration and Adaptation: Assessing the impacts of wildfires on ecosystems and economies, and suggesting strategies for future resilience. The presentation details the technical architecture of the SAFERS platform, which includes a microservice architecture, decision support systems, real-time social media analysis, and various data integration methods. Demonstration and training sites were established in Italy, France, Spain, and Greece to test the platform's functionalities in real-world scenarios.

3.4 [Esri CAP Connector](#) (Olivier Cottray) [download the presentation recording \(130 MB\)](#)

The presentation proceeds from the tenet that enhanced GIS capabilities and collaborative frameworks built on open, interoperable systems have the potential to transform emergency management, including disaster risk management. This contrasts with past methods wherein limited integration and real-time data sharing led to inefficiencies and missed opportunities in decision-making. The presenter argued for: Establishing a system for managing and sharing geographic information; Utilizing mapping and visualization tools for better analytics; Implementing real-time measurements and monitoring for timely reporting; Fostering customer engagement through accessible platforms; and, Promoting open and interoperable systems to drive innovation and efficiency.

Interactive discussion with Workshop participants emphasized that the Esri "CAP Connector" tool transforms any CAP Alert Hub feed into a dynamic, near-real-time GIS Feature Layer (available [here](#)). Such a service facilitates GIS analysis and advanced functions such as geofencing. Having CAP alerts easily integrated in GIS will greatly facilitate use of CAP alerts in Situation Awareness resources used by Emergency Operation Centers (EOCs) in cities, provinces, countries, and regions throughout the world.

3.5 [Early Warnings for All](#) (Fred Branski) [download the presentation recording \(431 MB\)](#)

The presentation, couched in a WMO context, opens by declaring "Warning and alerting are at the pinnacle of the services delivery chain, arguably the most vital thing [National Meteorological and Hydrological Services (NMHSs)] do." It asserts that developing and coordinating practices that enhance service delivery for the general public and government authorities supports the informed decision-making that is vital to protecting lives, property, and the environment. The presenter highlights the need for cooperation among countries, organizations, and institutions to improve alerting capabilities. He notes global and local perspectives of the UN Early Warnings for All (EW4All) initiative, and underscores the steps necessary for national implementation. The

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presenter puts special emphasis on the urgency of adopting CAP across all countries as a primary requisite to enhancing early warning capabilities and saving lives.

3.6 [Perceptions of warning information sources from a global dataset](#) (George Karagiannis) [download the presentation recording \(407 MB\)](#)

The research sketched in this presentation focuses on understanding how individuals perceive and trust various sources of warning information. It was based on a biennial global risk perception survey (World Risk Poll) conducted in 121 countries, using probability-based sampling to ensure representation of the civilian adult population. This was in contrast to past methods that primarily involved localized studies with limited scope, often failing to capture a comprehensive view of risk perception across diverse populations. This research revealed that local news and emergency services are the most preferred and trusted sources of disaster information, indicating a strong reliance on familiar and accessible channels for risk communication. This insight can inform better disaster communication strategies

3.7 [MeteoAlarm's Progress and Engagement in the RODEO Project](#) (Johannes Fleisch) [download the presentation recording \(46 MB\)](#)

The presenter explains that MeteoAlarm focuses on enhancing public access to weather warnings through a collaborative framework that aggregates warnings from 38 National Meteorological and Hydrological Services. It features a three-color code system for easy public understanding. The consortium maintains strong collaboration with tech companies like Google and AccuWeather that are leaders in dissemination of warnings. Recent innovations include launching of features such as an Impact-based Warning Expert Team and extended warning displays. MeteoAlarm performance metrics indicate significant increases in website traffic and user engagement, supporting the MeteoAlarm goals of improved public awareness and safety. The presenter also sketched the RODEO project which is focused on enhancing access to meteorological datasets. These datasets are now declared as “High Value Datasets” in Europe.

3.8 [Effective CAP Protocol Implementation in EU Security Projects](#) (José Diego) [download the presentation recording \(122 MB\)](#)

The presentation highlights the need for effective implementation of CAP in EU-funded security projects, leading to enhanced collaboration and understanding among stakeholders. In particular, it advocates for early involvement of practitioners and technical partners from the project's inception to ensure better understanding and integration of CAP, as would be evident in operational interfaces within systems and among systems. These objectives can be supported by: Engaging technical partners early in the project lifecycle; Fostering collaboration between real-world practitioners and project technical teams; Developing tools and operational interfaces tailored to end-user needs; and, Conducting workshops and training sessions to enhance understanding of CAP.

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3.9 [Strengthening Resilience: Red Cross Engagement for CAP Implementation](#) (Paola Yela) [download the presentation recording \(58 MB\)](#)

The presenter emphasized the importance of effective communication in disaster risk management, particularly through CAP to ensure that actionable and timely warning messages in local languages reach vulnerable communities. She asserted that community resilience and safety can be strengthened by improving responsiveness of communities to alerts provided by emergency warning systems, and by integrating community feedback that enhances warning relevance and effectiveness. This does require a higher level of collaboration among various stakeholders, but ultimately leads to more effective and efficient emergency management. In that regard, she offered that Red Cross and Red Crescent National Societies can be engaged to help implement CAP more effectively. She also noted that attention needs to be paid to enhancing the quality of CAP alerts at global, national, and local levels, in service of the goal to better protect communities through timely warnings.

3.10 Google Public Alerts (Kasia Mohammed and Yoli Spigland) [download the presentation recording \(44 MB\)](#)

This presentation, from the Google Public Alerts team, provides an overview of their crisis response initiatives related to CAP. It includes an agenda that outlines key topics such as highlights of the relevant Google services and an overview of Google alerting products. The presentation emphasizes the importance of Google as a resource for information during crises, showcasing examples like Typhoon Yagi in the Philippines and wildfires in Chile. The presentation mentions various types of alerts provided by Google, including SOS Alerts, Public Alerts, and Earthquake Alerts, et al. The objective across these products and services is to connect communities with vital information during emergencies. For Public Alerts, Google outlines recommended practices for CAP, such as use of standardized event codes and ensuring that severity, certainty, and urgency fields are not set to "unknown". More information can be found [here](#).

3.11 [CAP and the Galileo Emergency Warning Satellite Service](#) (Laurent Arzel) [download the presentation recording \(81 MB\)](#)

This presentation is about broadcasting emergency warnings via the Galileo Emergency Warning Satellite Service (EWSS), thereby adding a reliable, satellite-based dissemination option that operates independently of terrestrial infrastructure. This is an important supplement to terrestrial networks for emergency alerts, which can be unreliable during disasters. However, substantial collaboration is necessary among various stakeholders, including civil protection authorities and technology providers, to ensure successful implementation and operation. There can be many kinds of Galileo EWSS receivers, and these can be also integrated into Digital Panels, Long-Range Acoustic Devices, and Indoor Warning Systems. A major constraint is that EWSS has very limited messaging bandwidth. This necessitates definition of an EWSS messaging chain that is interoperable with CAP messaging. To initiate that CAP interoperability work, developers are validating system functionality in three use case demonstrations. These are based on a study of synergies between Galileo EWSS and the Copernicus Emergency Management Service.

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Interactive discussion with Workshop participants focused on how to progress the work on defining Galileo EWSS messaging so that it is interoperable with CAP-based emergency alerting systems worldwide.

3.12 [CAP in Mexico 2024](#) (Mario Ruiz) [download the presentation recording \(42 MB\)](#)

The presentation concerns implementation of CAP in Mexico, including a regulatory framework established by the Telecommunications Federal Institute (IFT) and guidelines for collaboration among various stakeholders in emergency situations. The presenter also sketches specific cases, such as Hurricane OTIS in 2023 and Hurricane John in 2024, which illustrate how use of CAP can effectively reduce risks and improve response times. The presentation also mentions promotion of CAP through national and international conferences, and the value of collaborating with telecommunications providers to ensure timely dissemination of alerts.

3.13 [Australian Broadcasting Corporation: A Practical Perspective on Managing and Utilising Diverse Data Streams](#) (Mark McIntyre and Abdul Rehman Mohammad) [download the presentation recording \(99 MB\)](#)

The presenters walked through the practical approach to public information dissemination used by Australian Broadcasting Corporation (ABC) to ingest emergency alerts in diverse formats with a reduced level of manual intervention and streamlined data handling. This stands in contrast to traditional data ingestion techniques that were not attuned to real-time data handling, and that often lead to inconsistencies and inefficiencies in handling diverse data formats. The ABC Emergency Warnings Data Platform features a harvester that standardizes incoming data into a common ABC format, enhancing accessibility and usability across platforms (news app, web, etc.). Metrics on the ABC system indicate increased efficiency and reliability in data processing, which support ABC goals of timely public communication.

3.14 [OASIS Event Terms](#) (Norm Paulsen) [download the presentation recording \(41 MB\)](#)

The presentation is focused on the OASIS Event Terms List, which is designed to enhance interoperability in alerting systems, especially those based on CAP. It outlines the guidance provided by an OASIS Committee Note regarding event information, including terms and codes that can be used to identify various alert-able events globally. The presenter offers definitions of “events” and “alert-able events” and explains what he means by different “views” when describing events, illustrated with examples like hurricanes and avalanches. Additional topics are related to multi-event situations, emergency scenarios, and naming conventions for alerts. The presentation also notes work on a forthcoming User’s Guide to assist CAP practitioners in using the Event Terms List effectively. OASIS is inviting interested parties to be reviewers for the forthcoming guide.

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3.15 [Use of CAP in France](#) (Patrick Mignotte)

[download the presentation recording \(40 MB\)](#)

The presentation provides an overview of the FR-ALERT system, which has been implemented in France since June 2022. This system is designed to send real-time alerts to individuals in danger zones, helping them understand how to protect themselves in various situations. The presenter explains the historical context and the scope of the system, which aims to protect the entire national territory, including various regions and overseas territories. He also outlines the types of risks and threats that FR-ALERT addresses, such as technological, natural, health-related, and security threats. The presentation discusses the use of CAP specifically, detailing how alerts are disseminated through multiple channels like mobile phones, social media, and traditional media. It also describes the alert process, which involves validation, processing, and distribution of alerts, emphasizing the simplicity and flexibility of a CAP-based alerting system.

3.16 [CAP and Early Warning System Progression in Malaysia: A Decade of Context](#)

(Rabieahtul Abu Bakar)

[download the presentation recording \(51 MB\)](#)

The presentation offers an overview of Malaysia's disaster management evolution and the integration of modern technology into early warning systems. It traces the historical evolution of early warning systems in Malaysia back to the 14th century with the use of traditional drums as an alarm system. More recently, the Public Warning System (PWS) was adopted from British practices, but faced limitations, particularly during the pandemic emergency of COVID-19. The presenter notes that the Heightened Alert System, operated by the Malaysia Ministry of Health, uses indicators such as transmission rates and hospital capacity to manage resources effectively. HAS represents a significant advancement in disaster preparedness, and in improving response times and resource allocation during emergencies. The presenter also noted mobile applications associated with emergency alerting systems, and the implementation of real-time monitoring through coastal camera networks. It was also noted that implementation of such systems requires substantial coordination among various agencies, which is usually quite a challenge.

3.17 [ITU Perspective](#) (Amélie Grangeat)

[download the presentation recording \(52 MB\)](#)

The presenter talked about the goal to improve warning dissemination and communication by leveraging modern telecommunications and information technologies, in support of the UN goal of Early Warning for All by 2027. She emphasized that integration of CAP in multi-hazard early warning systems (MHEWS) represents a significant advancement in effective and authoritative emergency alerting, which is crucial for timely responses to disasters. As sketched by the presenter, MHEWS implementation requires substantial effort in terms of assessment, planning, and capacity building, but it is essential for establishing robust EWS. She asserted that an effective MHEWS requires assessing current warning dissemination practices, integrating CAP into existing systems, and enhancing multi-channel communication strategies to ensure alerts reach at-risk populations effectively. Specific actions include: Conducting assessments of current legislation and standard operating procedures (SOPs) related to warning dissemination; Analyzing the use of various warning channels (e.g., mobile, TV, sirens) and identifying all necessary steps for CAP integration; Developing a National Emergency Telecommunication

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Plans (NETP) to enhance disaster risk management capabilities; and, Providing capacity building through training and drills for media outlets and other stakeholders involved in disseminating warnings.

3.18 [CLEAR Global Work on Marginalised Languages](#) (Alice Castillejo) [download the presentation recording \(184 MB\)](#)

The presentation discusses the significance of language inclusivity in the context of creating effective warnings, particularly in disaster situations. It emphasizes the need for basing communication choices on accurate language-use data to ensure that warnings are understandable and accessible to all. The presenter points out that relying solely on dominant languages and written form is not enough, as less literate community members (particularly women) in various regions, such as Mozambique, North East Nigeria, and Pakistan, struggle to understand written or spoken warnings in the official languages. The presentation also highlights the importance of using detailed language-use data to inform disaster response strategies and improve communication during emergencies. This involves understanding the linguistic landscape of affected areas so that warnings can be tailored appropriately. The presenter offered practical solutions in the form of a new API to enable language-use data to be automatically integrated into CAP alerts, and a new tool to enable collective language data sharing for Text-to-speech and Speech-to-text functionality, to enable audio alerts and the analysis of voice-based information.

3.19 [Mobile Alerting / CAP to Cell Broadcast](#) (Thomas Wood and Mark Wood) [download the presentation recording \(75 MB\)](#)

The “Mobile Alerting and Cell-Broadcast” presentation asserts that Cell-Broadcast (CB) is an important component of all-media public alerting, especially in contrast to traditional location-based SMS. CB avoids the mobile network network traffic overload condition that is common during a major emergency, which often leads to drastically delayed or out-of-order messages. However, implementing Cell-Broadcast in a CAP-enabled alerting context requires careful planning for proper integration into existing mobile networks. The presentation explains what Cell-Broadcast is and its advantages for mobile emergency alerts. It then discusses the limitations of non-CB mobile alert systems, particularly during high-demand situations, and sketches mechanisms that address technical challenges related to network congestion and signaling.

The “CAP to Cell Broadcast Translation” presentation shed light on the translation process from CAP messaging to the Cell Broadcast technology used on Mobile Networks. This process is somewhat complicated because directly transmitting CAP messages over Cell Broadcast (CB) is limited by data size constraints and missing information. Consequently, different CB implementations performed the necessary adjustments differently, leading to inconsistencies and inefficiencies. The presenter proposes a systematic mapping of CAP parameters to those required by Cell Broadcast Centers, ensuring compatibility and effective communication. The approach involves multiple steps: Identify necessary CAP parameters for Cell Broadcast transmission; Develop a mapping protocol that aligns CAP segments with Cell Broadcast requirements; Implement translation mechanisms at national aggregator and gateway units; and, Document practices and variations across different countries in the Mobile Alerting Practices report, now available in draft from the OASIS Emergency Management Technical Committee.

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3.20 [In-vehicle Map alerts via TPEG2 Emergency Alerts and Warnings Standard](#)

(Teun Hendriks)

[download the presentation recording \(47 MB\)](#)

This presentation introduces TISA (Travel Information Services Association) and its vision of achieving 100% accurate traffic and travel information for all roads. The presenter discussed the challenges faced in effectively reaching travelers, particularly those who may not speak the local language or are unfamiliar with the geography. These are addressed in the ISO standard by the TPEG (Transport Protocol Experts Group) titled Emergency Alerts and Warnings (EAW). TPEG2-EAW is fully compatible with CAP, which helps to ensure that alerts are understandable and accessible to non-native speakers. The presentation emphasizes the importance of providing location-aware information in the context of driver safety, such as advising on detours and distributing real-time information through various channels. The presentation provides valuable insights from industry experts, which should lead to ever stronger collaborative efforts to improve travel safety by leveraging CAP-based emergency alerting worldwide.

3.21 [Brazil's Alert for All Strategy](#) (Ricardo Branco)

[download the presentation recording \(157 MB\)](#)

The presentation outlines Brazil's National Strategy for Early Warnings, focusing on the role of Civil Defense in alerting the population about potential disasters. It highlights Brazil's geographical challenges, including its vast territory and varying rainfall patterns, which contribute to the risk of disasters such as floods and landslides. Key points include the establishment of a National Early Warning Communication Strategy that leverages CAP for effective alert dissemination. The document details the infrastructure in place for public alerts, including a platform that integrates various technologies for reaching citizens, training programs for alert dissemination, and a history of alerts generated since 2017. The presentation also discusses the evolution of alert strategies through different mediums such as SMS, social media, and digital platforms, emphasizing the importance of real-time communication to ensure the safety of those living in risk-prone areas.

3.22 [Big Data can Supercharge CAP-enabled emergency warning](#) (Eyitayo Alimi)

[download the presentation recording \(84 MB\)](#)

This presentation focused on the increasing importance of timely and accurate warnings in the face of natural disasters, emphasizing the role of Big Data (including social media, sensor networks, et al) in enhancing the speed and accuracy of emergency alerting systems. While the implementation may require substantial initial effort, the long-term benefits in efficiency and effectiveness justify the investment in view of the objective to save lives and livelihoods in the event of emergencies. Specific recommendations are to: Identify and integrate various relevant data sources; Use modern tools to process and analyze large volumes of data in real-time; Implement machine learning techniques to predict and respond to emergency situations effectively; and, Develop best practices for the deployment of Big Data solutions in emergency management contexts.

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3.23 [OASIS Emergency Management Technical Committee](#) (Elysa Jones and Jacob Westfall)
[download the presentation recording \(24 MB\)](#)

OASIS and the EMTC celebrate the 20th anniversary of CAP as an OASIS Open Standard. Elysa is chair of the OASIS Emergency Management Technical Committee (EMTC) and Jacob is chair of the EMTC CAP Subcommittee. Both presenters work in support of enhancing emergency alerting systems globally, which is crucial for effective disaster response. The presentation included an overview and status of the full suite of specifications from the EMTC, including: Emergency Data Exchange Language Distribution Element, Tracking of Emergency Patients, Hospital Availability, Resource Messaging, Tracking of Emergency Clients; and, Situation Reporting. They emphasized recent EMTC development of a comprehensive OASIS Event Terms List note, and the ongoing mapping of mobile alerting practices across countries. They noted that ongoing collaborative efforts require significant engagement from committee members and stakeholders in order to achieve robust standards. The presenters noted there are regular meetings of the EMTC and its subcommittees to discuss and develop standards. One of these was hosted in the Leuven venue following the first day of the CAP Implementation Workshop.