Report of the 2016 CAP Implementation Workshop

Background

The 2016 CAP Implementation Workshop, 23-24 August in Bangkok, was hosted by the Asian Institute of Technology (AIT) and the Sahana Software Foundation. The Workshop was co-sponsored by the International Federation of Red Cross and Red Crescent Societies (IFRC), the International Telecommunication Union (ITU), the OASIS standards organization, and the World Meteorological Organization (WMO).

This was a technical meeting intended solely for information sharing among experts. Accordingly, the 81 Workshop participants from 17 countries represented themselves; they did not formally represent any organizations with which they were affiliated.

The following other documents may be also of interest:

- The list of links to the Presentations includes speaker biographies and portraits;
- The list of Participants gives name, organizational affiliation, and e-mail address of each;
- The Information Note for Participants has information on the AIT venue and travel matters.

Report Process

At the Workshop, participants agreed the following process for producing a Workshop Report. The Workshop Chair, Eliot Christian, is to consult with the hosts and co-sponsors (Manzul Hazarika of AIT, Nuwan Waidyanatha of Sahana, Omar Abou-Samra of IFRC, Elysa Jones of OASIS, and Samuel Muchemi of WMO) and produce a draft Report. The draft will be shared among Workshop participants for a period of one month, with the Chair making revisions based on comments from participants. Thereafter, the Chair will post the final Report publicly on the 2016 CAP Implementation Workshop web site.

Presentation Notes

Sahana Alerting and Messaging Broker: Lessons Learned - Nuwan Waidyanatha made a presentation to discuss lessons learned regarding the Sahana Alerting and Messaging Broker (SAMBRO) and the "CAP on a Map" initiative that has the goal to improve emergency management "Situational-Awareness" in a country. He summarized the situation in the three countries targeted by the recent initiative: Maldives, Myanmar, and Philippines. Nuwan also presented several findings of interest, which point that further work is needed to implement impact-based alerting and engaged collaboration is needed to implement an initiative involving multiple agencies.

Universal App Program Progress Report - Omar Abou-Samra of the IFRC Global Disaster Preparedness Center (GDPC) presented an update on the Universal App Program of the GDCP. The Program encompasses the First Aid App and the Multi-Hazard App, available for iOS and Android devices, that provide content localized to that country's language/culture and images. He said the Program now has First Aid App in 80 countries (36 languages), and Hazard App in 20 countries (7 languages). Omar explained that Hazards App has a strong preference for delivering CAP alerts. He also emphasized that IFRC has an extensive investment in its Public Education and Public Awareness (PAPE) key messages. The app includes 'What Now' messaging giving guidance on immediate actions for people affected by the hazard event.

Omar introduced "Red Cross Notifications", a new feature of Hazards App that provides authorized RC/RC National Society partners a tool for issuing CAP alerts. These alerts are posted to country-level CAP alert feeds as well as being sent to all Hazards App subscribers who have elected to monitor the area being alerted.

New Zealand Red Cross Case Study and Mosul Dam Preparedness Campaign - Omar presented the case of the New Zealand Red Cross, which is incorporating Hazard App into its core business while deepening partnerships with Government and Private sector partners. He noted that New Zealand has one national CAP alert feed in operation, GNS Science, which posts CAP alerts for earthquake and volcano events. Two others are in development: one for New Zealand MetService and one for New Zealand Transport Agency.

Omar also described the possibility of a failure of the Mosul Dam in Iraq, which would be a disaster of epic scale. He reported that if the Mosul dam catastrophically fails, a tsunami like wave would course down the river from Mosul to Baghdad. An estimated 10 million people in the Tigris Valley are at risk and hundreds of thousands of people could be killed. Such a catastrophe is certain to greatly overwhelm disaster response capacities, and the situation is further complicated because many at risk are in ISIS controlled areas. GDPC has partnered with Iraqi Red Crescent Society and UNDP to develop and launch a Mosul Dam Flash Flood Awareness Campaign. This campaign helps deliver the Public Awareness and Public Education Key Messages: what to do before, during and after a flash flood caused by a Mosul Dam failure. It is using Mass Media (TV, Radio), Social Media (Facebook, WhatsAp), and the Hazards App.

Open Source Alerting with CAP: Unattended Emergency Broadcasting - Rob Hopkins presented on "OpenBroadcaster", an open source suite of tools he created for unattended messaging of CAP alerts over broadcast radio and TV, streaming, and digital signage. He opened with a 5 minute video, available at https://vimeo.com/158372379 Used extensively

throughout Canada, OpenBroadcaster provides an important community service, especially for isolated regions. Multilingual alerting in different dialects is a challenge, along with training, innovation and technology development. Future opportunities include mobile applications and new media that could leverage the CAP-enabled alerting infrastructure. Participants noted that the technology described may have a useful intersection with RANET (Radio and Internet for the Communication of Hydro-Meteorological and Climate Related Information).

Filtered Alert Hub - Eliot Christian explained that an alert hub simplifies access to copies of alerts by aggregating CAP alerts from many different feeds into one URL. When operated on a cloud infrastructure, such an alert hub offers high levels of responsiveness, availability, reliability, authenticity, and security. To maximize alerting speed, an alert hub typically also allows alerts to be pushed immediately to the hub from alert sources, and from the hub to subscribers. These characteristics are shared by the "Filtered Alert Hub", now in prototype. This free facility on the Internet will be useful to get alerts filtered by location or other alert content. For example, one can filter just those CAP alert feeds that are in the Register of Alerting Authorities maintained by WMO, thereby being functionally equivalent to the "WMO Alert Hub". One can also filter just highest priority alerts for "broadcast intrusive" applications such as the IFRC Hazards App now being implemented in countries worldwide.

CAP-abilities of Modern Weather Radar Networks - Andre Weipert of Selex ES GmbH of Germany, presented CAP-enabled meteorological services and situational awareness using weather radar networks. He explained that a remote sensing technology such as weather radar has inherent advantages compared to numerical weather prediction. He also emphasized that it is not a big challenge to implement CAP when quality controlled weather radar data is available. As examples, his presentation showed complete CAP messages for: a Severe Thunderstorm Warning, a Sand Storm Alert, and a Wind Shear Alert at Frankfurt Airport. Andre noted that MET services ought to be aligned with interoperability frameworks and international standards of other disciplines, including aeronautical, meteorological and geospatial standards. Here the work of the WMO Commission for Aeronautical Meteorology is especially relevant.

ADPC Experiences in End-to-End Early Warning Systems - Atiq Ahmed of the Asian Disaster Preparedness Center (ADPC) gave a presentation on their experiences in the region on strengthening "End-to-End Early Warning Systems", which includes promoting the CAP standard. Among his many points, Atig noted the value of CAP for leveraging multiple, redundant dissemination modes for alerting and that these include traditional technologies as well as emerging technologies. He envisions a great scope for applying CAP in work among the multi-stakeholder platforms and in collaborative environments, and thereby to greatly improve multi-hazard warning systems for communities everywhere.

Common Alerting Protocol (CAP) in WMO - Samuel Muchemi of WMO presented on the role of WMO in enabling its Members to adopt the CAP standard. He explained how WMO is focusing on its Public-Private Partnership approach that will help WMO Members engage with private companies that are CAP players. He also described how WMO is supporting training in CAP through its CAP Jump-Start initiative, as well as supporting efforts to develop the WMO Alert Hub.

MeteoAlarm CAP Topics - The focus of the presentation by Guido Schratzer was on the import into MeteoAlarm of alert messages in the CAP format. In the Meteoalarm context, the challenge is to harmonize among 33 Partners and Guido notes there are implementation

differences due to the open nature of the CAP standard. He noted there are different ways to specify the type of event (which has been noted in CAP Workshops for several years). He also noted that using geocodes enables different ways to specify the alerting area location. Guido provided a link to an open source library of tools he developed for importing CAP alerts.

Questions of specific CAP usage - Elysa Jones, Chair of the OASIS Emergency Management Technical Committee (EM TC) led a discussion on "Questions of Specific CAP Usage". Here it was noted again that CAP implementors need to converge on a common scheme for coding the type of event (e.g, tornado, tsunami, typhoon). Attendees were encouraged to provide their preference for and usage of multiple info blocks to the Committee as they deliberate their relevance and usage. Attendees were also pointed to the current draft CAP Practices Guide that will be released later this year.

Update from OASIS Emergency Management Technical Committee - Elysa also made a presentation on activities of the OASIS EM TC. She dwelt especially on the family of OASIS Emergency Data Exchange Language (EDXL) Standards. Elysa also mentioned that Mark Wood is compiling a guide to the current status of Cell Broadcast in countries worldwide.

Pictographs in Alerting: Survey Session - Lutz Fromberger led a session that involved active participation from the Workshop attendees on the topic of using pictographs to communicate emergency information and recommended actions. Everyone was invited to blindly choose one of the prepared emergency scenarios with recommended response actions and to draw a pictographic representation of it. These pictographs were then exchanged with another person, and each then took on the role of a reviewer, whose task was to understand the pictograph. Each was asked to rate their difficulty in drawing and in understanding the pictograph. The work will be reported though the site at https://www.sahanafoundation.org/pictographs

CAP for Emergency Management in Italy and Europe - Marcello Marzoli, a fire captain from Italy, presented on CAP for Emergency Management in Italy and Europe. He explained that the Italian National Fire Corps has an operational information exchange based on CAP. This involves National Control Centers plus eighteen regional centers and one hundred provincial centers exchanging information daily, which includes about 2,500 CAP messages. Their system includes sophisticated rules for filtering in support of effective information distribution that is reliable, redundant, scalable, configurable, and sustainable. In their experience, the key to broad uptake was to focus on the practical advantages CAP interoperability brings to each role and to show that it really does work. In this, the best way to convince was to provide ‘working’ use cases which involve colleagues, partners and professionals they trust. Now, uptake of the CAP-enabled approach is spreading broadly not only in Italy but in Europe as well. For instance, Portugal embed CAP into its National emergency management system; the Prefecture of Paris issued an European bid for a new Emergency Control Centre including CAP for data exchange; the implementation project for eCall is considering CAP; and the Government of France launched SAIP, a smartphone app for public alerting in large crises, which will use CAP in its next version.

Implementing CAP-AU - Simon Moffat of Emergency Management Australia presented about CAP implementation in Australia, under the title of "CAP-AU" which refers to the Australian Profile of the CAP standard. He explained that, in Australia, the main players in Emergency Management are the eight State / Territory Governments. They manage first responders (Police, Fire Brigades, Ambulance, Rescue, Health, etc.) and control most functions essential

for effective crisis prevention, preparedness, response and recovery. The 562 Local Governments provide supporting Emergency Services, while the National (Federal) Government is responsible for National Disaster Management Policy. The top five natural hazards in Australia are Bushfires, Floods, Severe Storms, Earthquakes, and Cyclones. Australia has been for some years using CAP operationally across the country. In 2012 CAP-AU was implemented to address local variances in language and to specify certain country-specific codes. Emergency Management Australia promotes CAP-AU as part of the Australian Government's Open Data agenda. Simon emphasized the advantage that the using of CAP alerts is "always on"--, i.e., it is used for routine alerting as well as major disasters. He also said his agency is focusing on consumers as a way to increase demand for CAP-AU, in their role of facilitating the flow of information rather than controlling it.

CAP Implementation in Taiwan - Mei-Chun "Betty" Kuo of Taiwan's National Science and Technology Center for Disaster Reduction (NCDR) presented on the implementation of CAP in Taiwan. NCDR operates a national alerting system based on CAP, in collaboration with the Executive Office of Disaster Management, the National Fire Agency, various Government Departments, and the National Communications Commission. CAP alerts are issued for typhoon, extreme rain, earthquake, tsunami, debris flow, reservoir discharge, flood, high water, highway closure, high speed rail service interruption, train interruption, and call off work and school. Their CAP news feeds have had 320 million views, with the rate in 2015 at five times more than in 2014. She noted that Taiwan's CAP validator is called "CAP Maker". She also said that Taiwan's Cell Broadcast service components should be complete in 2017, and already Taiwan's five major telecommunication companies have sent alerts to the public.

MASA and SAMBRO in the Maldives - Umar Fikry presented at the Workshop a progress report for the Maldives on implementing the Sahana situational awareness tools. He explained that the Maldives is a very disperse small island nation with a population of 400,000. The Maldives National Disaster Management Center (NDMC) was the principal implementer of SAMBRO, working in partnership with the Maldives Meteorological Services (MMS). Umar said that SAMBRO Server has been installed, alert templates have been entered, and key staff have been trained. He noted that data entry of the 500+ focal points is not complete, but he predicted that the system would be officially launched in October. Thereafter, NDMC plans to engage with other agencies such as the fire and rescue services to implement CAP.

CAP on a MAP: Improving Institutional Responsiveness to Coastal Hazards through Multi-Agency Situational Awareness - Tun Lyn Kiaw, of the Myanmar Department of Meteorology and Hydrology (DMH), presented at the Workshop a progress report on implementing the Sahana situational awareness tools in Myanmar. DMH is the lead agency for the CAP implementation project based on SAMBRO. He explained that there are issues with the way DMH sends alert messages to other government agencies as well as to television broadcasters and the public. These messages are sent out via their Web site, by Fax and voice phone, as well as by radio (FM and SSB), among other means. The main issue is that these methods require manual steps that take too much time and cannot be done in parallel, with the result that messages may not reach communities in time to be useful. Also, warning messages are mostly in "text" format and the availability of hazard and risk maps is very limited. When completed, he believes SAMBRO will be very useful as the alerting system will be: Easy to understand; Easy to define the area according to hazard/risk levels; and, Easy to send alert to different users all at once. Because the system will save time in the warning and bulletin

dissemination, alerts and warnings can be received in near real time, which will help reduce risk. (The Myanmar DMH CAP feed will be http://www.dmhwarning.gov.mm/eden/cap/public.rss)

Common Alerting Protocol in the Philippines - Resly George Amador presented at the Workshop the Philippines project report on implementing the Sahana situational awareness tools. Resly works for PAGASA, the Philippine Atmospheric Geophysical Astronomical Services Administration, which is the "authoritative" voice in providing warnings to the public. PAGASA worked with Google to implement CAP and launched a CAP alert feed in 2014. This was followed in 2015 with PAGASA leading a "CAP on a MAP" project to introduce the SAMBRO system (a working copy in pre-operational status is at http://sambro.meteopilipinas.gov.ph/). CAP alerts for some types of hazards are already implemented and more are planned, including Thunderstorms Warning and Rainfall Warning. PAGASA also plans to enhance inter-agency collaboration with the Office of Civil Defense, the Philippines Red Cross, Philippines Volcanology and Seismology (PHILVOLCS), and the Department of Social Welfare and Development (DSWD).

CAP Implementation in Thailand National Disaster Warning Center - Rear Adminral Song Ekmahachai explained that Thailand uses a wide range of methods to disseminate alerts. These include: SMS to more than 20 million mobile phones, Fax, E-mail, Television, Government Radio Station, Government Information Network, News services, Warning Towers, Warning Boxes, Local Government's Relay stations, small towers, special radios, Call Center 192, Smart Phone server unlimited licenses (IOS & Android), and Web EOC. CAP is apparently supported in the "Alert Manager" software shown in an NDWC screen shot.

CAP Implementation in Thai Meteorological Department - Kesaraporn Techapichetvanich of the Thai Meteorological Department (TMD) presented on CAP Implementation by that agency. She explained that TMD supports a range of channels for alerting: Websites, a Mobile app, Television, Radio, Call center, Social media (e.g., Facebook), and an Application Programming Interface (API). TMD has implemented CAP for two hazard categories: Meteorology (Met) & Geophysical (Geo). A system for generating, validating, and publishing CAP alert feeds has been implemented. In collaboration with Google, TMD expects to launch the CAP system and add the CAP feed URL to the TMD entry in the WMO Register of Alerting Authorities. Future plans include: applying CAP to more hazard types, including English language alerts, and integrating CAP into "Thai weather", the TMD mobile app availbale on iOS and Android.

Emergency Alerting in Canada - Lawrence Sham of Environment Canada presented on its nation-wide, multi-hazard CAP implementation. He noted that CAP was first implemented as a pilot in 2011 and today approximately 150,000 CAP messages are produced annually and distributed to partners for the purposes of public alerting. Much of the public alerting in Canada is handled by the National Alert Aggregation and Dissemination System (NAADS), operated by a commercial company, Pelmorex. Lawrence explained that alerting clients such as broadcasters (TV and radio), and their vendors are also organized into a collaboration known as "Alert Ready" and the Broadcaster group has their own Common Look and Feel guidelines. He further explained that Canada defines a special class of Emergency Alerts that are to be broadcast immediately due to the high urgency, severity, and certainty of the emergency. These alerts are identified by a CAP parameter named "layer:SOREM:1.0:Broadcast_Immediately" that has its value set to "yes". Lawrence also mentioned that Canada is working on its implementation of Cell Broadcast.

CAP in Mexico - Mario Ruiz of Mexico gave a presentation about Mexico's National Alert System, now being implemented. First, he described the earthquake early warning system designed by Centro de Instrumentacion y Regsitro Simico (CIRES) A.C. The system has been in place since 1991, obtaining seismic data from 98 accelerometers installed in seven States. In 2008 this system began using CAP and is now able to warn 25 million people. A Presidential instruction in May 2013 established a mandate to "Create and operate the National Warning System, which will provide information in real time to increase the security of Mexicans in situations of imminent danger." Now, Mexico's Federal Institute for Telecommunications (IFT) has the lead role for CAP implementation and that includes law, policy and regulations. In this effort, IFT is supported by CIRES, the National Meteorological Service within the National Commission or Water (CONAGUA-SMN), and other organizations.

IPAWS Evolution - Scott Shoup, Chief Data Officer of the United States Federal Emergency Management Agency (FEMA) presented on the CAP-based Integrated Public Alert and Warning System (IPAWS). He opened with a FEMA background video about IPAWS, available at https://www.fema.gov/media-library/assets/videos/77356 Scott explained that IPAWS evolved out of a 1951 Cold War public warning system over radio. In 1963, this was expanded for use during peacetime at state and local levels and became the Emergency Broadcast System (EBS). In 1997, EBS was further refined to become the Emergency Alert System (EAS), jointly coordinated by the U.S. Federal Communications Commission (FCC), FEMA and the U.S. National Weather Service (NWS). In 2006, EAS was encompassed by IPAWS, a CAP-enabled system that provides an increased capability to alert and warn communities of all hazards impacting public safety. IPAWS today aggregates more than 700 CAP alert sources throughout the country and delivers alerts as: CAP; as EAS messages over TV, Radio, Cable, and Satellite; and as Wireless Emergency Alerts carried via cell broadcast to mobile telephones.

Survey of Other CAP Implementations - Eliot Christian presented a survey of other CAP implementations now underway or newly launched. In the Americas, he identified 18 countries/territories as having CAP operational or soon-to-be: 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, and US Virgin Islands. In Europe, the Middle East, and Africa, Eliot noted 21 countries having CAP operational or an in-progress CAP Implementation: Botswana, Burundi, France, Germany, Ireland, Israel, Italy, Kenya, Kuwait, Malawi, Mauritius, Nigeria, Norway, Rwanda, Serbia, South Africa, Sweden, Tanzania, Togo, United Kingdom, and Zimbabwe. In the Asia-Pacific region, he listed an additional 20 countries/territories with operational or in-progress CAP implementations: 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, and Vanuatu.

Eliot highlighted the CAP implementation in China. Their National Early Warning Release System (NEWRS) gathers all hazards information nationwide from emergency command sectors and disseminates the information to the public and emergency management personnel throughout China. This is the world's most extensive CAP-enabled warning system--comprised of 1 national, 31 provincial, 343 municipal, and 2015 county centers. He noted that a NEWRS presentation earlier this year at WMO in Geneva, included this 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."

Eliot also noted a variety of CAP systems that are operated by Non-Governmental Organizations and by Commercial organizations. These include the well-known Google Public Alerts and the IFRC Hazards App. There is also a range of CAP-enabled products/services in the area of commercial weather alerting, including AccuWeather, MeteoFrance Vigilance, MeteoFrance International MeteoFactory, and The Weather Company. He noted several systems based on sensors that emit CAP alerts, including the Earth Networks system for lightning detection, the Earthquake Building Damage Assessment system, and in-home fire and air quality monitors that become all-hazard alarms by monitoring CAP alert sources. He also listed several other interesting CAP-enabled systems: sighting of bombers in Syria, hate group monitoring, Neighborhood Watch, Microsoft CityNext, the Federation for Internet Alerts, and the RSOE Emergency and Disaster Information Service. He ended with a note on Pinkerton's corporate risk management. Active in over 100 countries and servicing 80 of the world's 100 largest companies, all of Pinkerton's alerting is CAP-enabled.

Offers to Host the Next CAP Implementation Workshop

The participants were asked to put forward suggestions regarding who might host the next CAP Implementation Workshop. The Fire Corps Academy of Italy, Istituto Superiore Antincendi (ISA) was suggested. Subsequent to the Workshop, Eliot received from Stefano Marsella an e-mail offering to host a 2017 CAP Implementation Workshop at ISA in Rome. Also, Hong Kong Observatory (HKO), a WMO Center, offered to host a 2018 CAP Implementation Workshop in Hong Kong. The tentative plan is that each of these will be in the September-November period.

Sahana Training Session

A training session associated with the CAP Implementation Workshop was conducted at the AIT Conference Center on 22 August. This was related to Sahana Software Foundation teaming with the AIT's Geoinformatics Centre to execute a project funded by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). The project objective was to provide "Situational Awareness" freeware and procedures to three participating countries from the region: Maldives, Myanmar, and the Philippines. Situational Awareness in this context helps disaster managers to be aware of and map every significant emergency incident or risk in the country, and to share such information across multiple agencies with disparate information systems. CAP-enabled Sahana tools for this purpose (common operating picture, warning, and first-response) were the focus of the training session. Participants were exposed to these principles through a series of hands-on exercises and interactive group discussions, as well as an introduction to CAP and procedures for a CAP implementation.

OASIS EM TC Meeting

The OASIS EM TC held its one hour scheduled meeting by conference call initiated from the CAP Implementation Workshop venue, starting at 7:30am on 24 August. Three Workshop participants attended as observers with one member calling in from the United States. The deliberation regarding multiple info blocks will continue in the CAP subcommittee. We discussed the need for an international list of events and decided this could be part of the CAP Practices Guide and published later this year.