

Report of the 2017 CAP Implementation Workshop



Background

The 2017 CAP Implementation Workshop was held 20-21 September in Rome, hosted by the National Fire Corps Academy of Italy, Istituto Superiore Antincendi (ISA). The Workshop was co-sponsored by the International Association of Emergency Managers (IAEM), 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).

The Workshop was a technical meeting intended solely for information sharing among experts. Accordingly, the 72 Workshop participants from 20 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 [Programme](#) lists all of the Workshop agenda topics and links to the presentations;
- The list of [Speakers](#) includes speaker biographies and portraits;
- The list of [Participants](#) gives name, organizational affiliation, and e-mail address of each.

Ancillary Meetings

In the same venue, an all-day [CAP Training Day](#) was held 19 September. Also, a half-day [Workshop on Emergency Data Exchange Language \(EDXL\) Standards](#) was held 22 September.

Report Process

At the Workshop, participants agreed a process for producing this Workshop Report. The Workshop Chair, Eliot Christian, would produce a draft Report in consultation with the participant hosts and co-sponsors (Stefano Marsella and Marcello Marzoli of ISA, Omar Abou-Samra of IFRC, Vanessa Gray of ITU-D, Elysa Jones of OASIS, and Miriam Andrioli of WMO). The draft then would be shared among Workshop participants for a period of two weeks, with

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the Chair making revisions based on comments from participants. Thereafter, the Chair would publish the final Report and link to it from the [2017 CAP Implementation Workshop website](#).

Presentation Summaries by Agenda Item

3.1 [Adopting CAP on nation-wide rescue services: lesson learnt by the Italian case](#)

Marcello Marzoli and Davide Pozzi of Italy's National Fire Corps (CNVVF) gave a presentation focused on adopting CAP in nation-wide rescue services. They said that adopting CAP on nation-wide services is like a 'Fabbrica di San Pietro' (i.e., a never-ending commitment). They explained that CNVVF keeps improving and adapting the interoperability of its systems to satisfy new as well as current needs. They surveyed how CNVVF shares operational data with several other Organizations, typically based on formal agreements. These include many municipal and regional authorities such as: Puglia Region, Sicily Region, Venice Municipality, National Police (Carabinieri), and the Drainage Authority. CNVVF also exchanges CAP alerts with specific control centres established for particular events such as the earthquakes in Amatrice (fall 2016) and Ischia (summer 2017), and the forest fires in the summer of 2017. Fire stations and National Police exchanged 9000 CAP messages per day in the summer investigations regarding crimes against the environment. The presenters noted the exchange of CAP with the Joint Research Centre of the European Commission. They also noted exchange with the Earth Observation Satellite Images Applications Lab (EOSIAL) in Rome for hot-spot detection in real-time, described in agenda item 3.4. They noted as well a common interest in CAP exchange, despite the absence of a formal agreement, with National Civil Protection to improve the management of flash floods and with the Cultural Heritage Authority to improve cultural heritage protection.

3.2 [AccuWeather – Unique Partnerships to Deliver Global Extreme Weather Warnings](#)

Jonathan Porter spoke about the use of CAP within AccuWeather. As background, Jon explained that AccuWeather apps and partner apps reach more than two billion people globally, in over 100 languages. He also noted that Accuweather disseminates publicly available warnings for over 40 countries, many using CAP. From an AccuWeather perspective, he said that CAP facilitates communication with the public on the key questions concerning weather warnings: What is the weather hazard? Where is the hazard occurring? When will the hazard occur? Why does the user need to be aware of the hazard? and, How should they react? Jon also called for further work on developing a best-practices "eventCode list" for CAP. Others noted this request has been made at previous CAP Workshops. The OASIS EM TC report in agenda item 3.24 noted the challenges encountered in responding to this request.

3.3 [CAP and Related Activities in Zimbabwe](#)

Freedom Mukanga delivered a presentation on CAP implementation in Zimbabwe and related activities there. He explained that a CAP jump-start training was conducted in Zimbabwe in 2015 by CAP experts from Tanzania Meteorological Agency. He said Zimbabwe is interested in conducting, with the assistance of the Civil Protection Unit, a National workshop to train and register other alerting authorities. Freedom also talked about other "CAP-related Activities", which he listed as: Early Warning Community Radios, Website, Social Media, Virtual Weather Recording Studio, Short Message Platforms and WhatsApp messaging, Print and Electronic Media.

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3.4 [CAP and Satellite-based Fire detection](#)

Giovanni Laneve of Rome University provided a presentation on his research at EOSIAL concerning satellite-based fire detection that generates CAP alerts. CAP alerts are sent from EOSIAL to CNVVF every five and every fifteen minutes. These alerts convey information on hotspots detected by satellite. The smaller detected hotspots within a pixel 4Km-wide, corresponding to a fire over an area of 1-2 hectares. The information is important at a strategic level to feed a quantitative assessment of energy released by large fires and so to improve prioritization of fire-fighting and assets. Studies done over the past 10 years are available at the EOSIAL website, <http://eosial.psm.uniroma1.it/>

3.5 [CAP at the Deutscher Wetterdienst](#)

Eduard Rosert spoke on behalf of the German Weather Service, Deutscher Wetterdienst (DWD), concerning its implementation of CAP. DWD has leveraged CAP for many years and recently added CAP feeds and English warnings to its portfolio. Eduard explained that the "Early Warning System of the DWD" has two distinct components: Warning Status ("abstract data" comprised of structured information/data about potential hazards), and Warning Product (a representation of a warning for a specific audience/purpose such as an image on a website or a CAP Alert). DWD forecasters create and update the Warning Status, but each Warning Product is produced automatically by an "AutoWARN Product Generator". This generation process is based on events from various systems, each of which may be in CAP format or other XML structures. In this way, various DWD warning products can have different content, spatial resolution, informational granularity, language, export formats, update behavior, etc. Eduard stated: that CAP has become the primary exchange format for warnings at the DWD; that most DWD applications that process or display warnings use CAP; and that CAP messages are also used to meet legal requirements for archival of warnings and for verification of the DWD Warning System from a quality assessment and continuous improvement perspective. Eduard also discussed some questions related to CAP-based push notifications and update strategies.

3.6 [CAP implementation and measurement – The role of ITU](#)

Vanessa Gray began by sketching some key aspects of Information and Communications Technology (ICT) worldwide that are especially relevant to emergency telecommunications. She highlighted recent trends in telecommunication/ICT developments, and strong growth in terms of ICT networks and services. The expansion of ICT networks and services and growth in users provides new opportunities in terms of delivering alerting messages to end users but also highlights the importance of partnering with new operators and services providers, including mobile cellular network operators and those delivering social media services. Her presentation focused on ideas to bolster the role of ITU-D in CAP implementation and measurement worldwide. In that regard, she listed four potential areas of concentration:

- Awareness raising & capacity building: Capacity building workshops & training; Emergency telecommunication/disaster risk reduction events; and Guidelines on national emergency telecommunication plans
- Better coordination with ICT community through ITU Membership: Telecommunication/ICT policy makers, regulators, private sector (operators, OTT players)
- ITU Study Group Question 5/2: Utilization of telecommunications/ICTs for disaster preparedness, mitigation and response
- Monitoring progress in CAP implementation

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Vanessa sketched a specific proposal that ITU add a new indicator to its 2025 target for national and local disaster risk reduction strategies. As a draft proposal for indicators on progress to meeting that target, she suggested "Number of countries that have implemented CAP". She posed four related questions: Who should monitor?, What should be monitored?, What should the target be for 2025?, and How could CAP data help track climate change? In response to her suggestion, IFRC and WMO expressed interest in helping craft the indicator.

3.7 CAP Implementation in the Democratic Republic of the Congo
was CANCELLED due to speaker visa problems that prevented his travel to Rome

3.8 CAP in Mexico
was CANCELLED due to the major earthquake in central Mexico on 19 September

3.9 [CAP in National Civil Protection of Italy](#)

Angela Corina explained that the National Service of Civil Protection of Italy aims at safeguarding human life and health, goods, national heritage, human settlements and the environment from all natural or man-made disasters. The organization deals with: Forecasting and Warning; Prevention and Mitigation; Rescue and Assistance; and, Emergency overcoming. The 1998 mud flow disasters in particular increased appreciation of the need for better mapping and warning operations. Since 2004, the Early Warning System of Italy has been managed by 21 regional centres, each responsible for meteo-hydrological alerts in its territory and coordinated by the National Department of Civil Protection. There is also a national warning platform, based on CAP, that provides a single access point to a distributed system for sharing of risk assessments and warnings. Angela emphasized that an early warning system is a social system, synthesized by technology and science, and effective only if the civil society is involved. That is, civil society must be enabled to access, understand, and act upon warning messages.

3.10 [Experiences with CAP at the German Aerospace Center \(DLR\)](#)

Benjamin Barth and Monika Friedemann gave a presentation from the perspective of the German Aerospace Center (DLR). Three projects were outlined: Alert4All, PHAROS, and HEIMDALL. Alert4All seeks to improve the effectiveness of alerting systems in the EU and lay a foundation for a pan-European alerting system. PHAROS (the Multi-Hazard Open Platform for Satellite Based Downstream Services) is an open service platform for disaster managers and it has a CAP alerting component to reach citizens. HEIMDALL is a Multi-Hazard Cooperative Management Tool for Data Exchange, Response Planning and Scenario Building. It makes use of CAP and other standards to extend the alerting approach to overall information sharing. The projects used innovative approaches to leverage reusable building blocks, which enable automated translation of alert messages. However, it was found that sometimes building blocks do not cover all possible use cases and manual translation needs to be provided. In this case, it is necessary for the automated system to include multiple languages in one stream. In general, though, the outlook is good for CAP to be a primary component in a future Pan-European warning system.

3.11 [CAP in the Philippines](#)

Lester Kim Lagrimas presented on behalf of the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA). He stated that the main objective of the CAP system at PAGASA is have one application that addresses at the same time both the existing processes and the new CAP alert processes. In its development work, PAGASA has multiple

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partners, including Google Public Alerts, Sahana Software Foundation, and the Philippine Red Cross. Lester Kim noted three works in progress: a restructured CAP alert with polygon, geocode and area description in each area element; implementation of a CAP-enabled Flood Bulletin for river basins in the Philippines; a new CAP product for rainfall warning; and, more inter-agency collaboration.

3.12 (part 1) [CAP in WMO \(policy\)](#)

Miriam Andrioli presented some WMO policy aspects relevant to CAP implementation. She started by noting that WMO has a mandate to assist the National Meteorological and Hydrological Services (NMHSs) of its 191 Members to provide warnings and information of high impact weather and extremes of climate to government authorities and disaster management. The end objective is to aid them in their decision-making processes and so help to protect lives, livelihoods and property. She also explained that the Public Weather Service Delivery Division (PWS/SDD) of the WMO Weather and Disaster Risk Reduction Services Department has an assigned role to help NMHSs develop capacity for impact-based forecasts and warning services, and to establish and improve multiple channels of communication for weather forecasts and warnings. Specific to CAP implementation, Miriam emphasized that PWS/SDD continues to help NMHSs develop the capacity to publish warnings in the CAP standard format.

3.12 (part 2) [WMO Global Multi-hazard Alert System \(GMAS\)](#)

Miriam Andrioli also presented slides prepared by Armstrong Cheng of Hong Kong Observatory. The presentation concerned the WMO Global Multi-hazard Alert System (GMAS) and progress on leveraging the World Weather Information Service (WWIS) and the Severe Weather Information Centre (SWIC) as platforms to disseminate weather warnings in CAP format. The presentation also explained how the WMO Alert Hub prototype could be integrated into GMAS. (This WMO Alert Hub prototype is also discussed under agenda item 3.23, Update on the Filtered Alert Hub.) Miriam noted that HKO plans to Upgrade SWIC to become an online GIS-enable platform that aggregates, displays and shares authoritative warnings and alerts in CAP format, and to enhance WWIS to become a online GIS-enable platform for official weather observations, authoritative forecasts and warnings provided by NMHSs around the world.

3.12 (part 3) [CAP in WMO \(technical\)](#)

Federico Galati explained that WMO is committed in 'Help in saving lives' through on-line alerting systems. The main strategy of WMO would be to nominate focal points for CAP in each member country, and to help them move from data to products users-centered service. He spoke about technical challenges confronting WMO Members as they engage in CAP implementation. In some WMO Member cases, the alerting authority cannot host their CAP alerts. He showed where and how WMO is going to introduce CAP alerts on Web portals gradually over the course of the coming years hosted in Hong-Kong observatory. He explained what are the WMO Web requirements if we want to have an authoritative official WMO Alert Hub including the technical approach advised by the W3C named 'Open Data Standards'. In this context a WMO Web governance procedure is being drafted. He also talked about some issues surrounding use of Social Media in an emergency alerting context which is mainly targeted to situational awareness, request for assistance and recovery efforts. There are many examples of using Social Media as an input to situation awareness, and some of these

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highlight the very real risk of promulgating mis-information. He ended up his presentation by showing a table of WMO members using social media for alerting messages, besides or in addition to, CAP, and by playing a WMO video titled: [Why the World Needs Meteorologists](#).

3.13 [Can CAP help persons with disabilities calling for rescue or receiving public alerts?](#)

Stefano Marsella gave a presentation discussing how persons with disabilities calling for rescue or receiving public alerts can benefit from incorporation of CAP into the emergency number ("112") system. He noted that European Regulation requires Member States to ensure that access for disabled end-users to emergency services is equivalent to that enjoyed by other end-users. However, the reality at present is that such access is not equivalent. In that regard, Stefano described the "Next Generation 112" (NG112) initiative, designed to enable citizens to reach an authority by calls using VoIP, text messaging, instant messaging, real-time text, pictures and videos. NG112 enables the delivery of calls, messages and data to the appropriate emergency answering point and makes calling easier. Stefano advocates the adoption of CAP in NG112, thereby improving calling and enhancing alerting of people in an emergency.

3.14 [CAP-based Alerting System via Commercial Radio](#)

Franco Impellizzeri and Massimo Cristaldi started by presenting the system known as GECoS (Gestione Emergenze e Comunicazione Sicilia), a command and control room focused on the needs of a Regional Civil Protection Authority. GECoS realizes the idea of a shared, virtual web 2.0 based control room for 390+Municipalities, prefectures and 600+Volunteer Organizations in Sicily, and it has been operational for one year. In GECoS, alerts in CAP format flow into the system from citizens and others, by means of an app or thanks to the external CAP feeds. Then, CAP alerts are dispatched to other actors (such as Municipalities or prefectures) as appropriate. Massimo also described a device marketed by his company, Jixel-RADIO, which is designed to be inserted in the audio chain leading to radio broadcast of an emergency alert. He illustrated how a CAP feed from GECoS would interface with the radio device to help disseminate the alerts to people listening to FM radio broadcasts.

3.15 [China's National Early Warning Release System](#)

Cao Zhiyu described China's National Early Warning Release System (NEWRS) operated by the NEWRS Center. Established in 2015, the Center studies and formulates relevant policies and technical standards in addition to operating NEWRS. NEWRS (accessible at <http://www.12379.cn>) is a very large scale, CAP-based system that provides the overall mechanisms for relevant departments throughout China to disseminate and publicize early warnings and related information for all types of hazards. Cao described six features of the system design:

1. all-media release of early warning, wide coverage of early warning dissemination network
2. rapid release of the designated area via entire network
3. barrier-free sharing of early warning across departments
4. dedicated channel for local messenger
5. real-time feedback of release effect, and
6. warning release security assurance

He also showed how NEWRS will connect with GMAS (described in agenda item 3.12 part 2).

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3.16 [Cloud Services and CAP-based Alerting](#)

Jed Sundwall presented on Cloud Services and CAP-based Alerting from the perspective of Amazon Web Services, the leading cloud services provider worldwide. He began by characterizing cloud computing as "The on-demand delivery of IT resources over public or private networks with zero up-front costs, no long-term contracts, and pay-as-you-go pricing." He noted some advantages of loose-coupling in system design: systems can scale bigger, they are more fault tolerant, they have fewer dependencies, and they allow developers to innovate faster. Jed also explained that loose coupling is often achieved through messaging among system components, typically with message queuing or publish-subscribe (pub-sub). He then related these design concepts to specific AWS services, such as the Simple Notification Service (SNS). Here we can also note that the Filtered Alert Hub technology described in agenda item 3.23, Update on the Filtered Alert Hub, is using AWS much as Jed described.

3.17 [IFRC 'What Now' Service in Collaboration with Google](#)

Omar Abou-Samra gave a presentation on the new 'What Now' service being developed by the International Federation of Red Cross and Red Crescent Societies (IFRC) in partnership with Google. He explained that the service is a data feed of actionable and contextualized messages on how to prepare and respond to local hazards, designed specifically to complement CAP messages. For example, he showed these 'What Now' messages for a Typhoon Alert:

- 1. Prepare to evacuate, and know when and where to evacuate**
- 2. Turn off utilities and gas tanks. Unplug small appliances**
- 3. Never try to drive through flood waters. Turn around and go the other way**

(He also played a short video, available [here](#).) Omar said that the messages are based on IFRC Public Awareness and Public Education messaging--a compilation of evidence-based, concise, actionable information for disaster risk reduction that is customizable to fit local hazards, culture, and context. He also noted: the target audiences of the service are individuals and households; the service intends to cover 20 hazards, 6 urgency levels; and 78 languages; and the service should eventually be available in 192+ countries. He said the "What Now" service is available in API form for any network platform utilizing CAP and public alerts.

3.18 [Met Norway and CAP](#)

Gjermund Haugen and Helen Korsmo co-presented on CAP in Norway. The Met Norway implementation of CAP started in 2015 based on perceived advantages including: CAP is a standard format supporting distribution to many channels; CAP is supported by WMO, MeteoAlarm, AccuWeather and Google, and CAP aligns with impact-based forecasting, which is recommended by WMO. In 2016, Met Norway began issuing CAP alerts for certain warnings and publishing an RSS-feed at the external API. These alerts were produced in parallel with the existing warnings, since not all systems and users could start consuming CAP immediately. Also in 2016, a collaboration began with the Norwegian Water Resources and Energy Directorate (NVE) on CAP alerts carrying forecasts of floods, landslides, and snow avalanches. The presentation also focused on their weather website, "yr.no", maintained as a collaboration between MET Norway and the Norwegian Broadcasting Company, NRK. This site is considered a great success, and it ranks as the fifth largest weather web site in the world. The presenters provided a list of various discussions/questions about CAP usage (see slide 13).

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For instance, it is suggested to define aviation warnings such as icing, turbulence or ash volume. It was also noted that Met Norway has suggested CAP to become a native format in the most common Norwegian crisis management tool, and that Met Norway is investigating use of the Filtered Alert Hub technology for local and regional authorities.

3.19 [Météo France and the WINTDO \(What I Need to Do\) Toolkit](#)

Michael Claudon provided information about Météo France work on CAP and its new CAP-based WINTDO (What I need to Do) Toolkit. He began by noting that the MeteoFactory® CAP facility marketed by Météo France International (MFI) is now producing CAP compliant with both version 1.1 and 1.2 and it has a new prototype interface for the defined areas in a CAP alert. The primary implementation use case is centered on South African Weather Service and there are two others in progress: Indonesia BMKG and Luxembourg MeteoLux. Michael then focused on the WINTDO (What I need to Do) Toolkit. He explained that this open source toolkit is intended to facilitate simple and quick integration of CAP-based alerting into mobile applications.

3.20 [Promotion of Public Awareness on Natural Water Disasters including Floods](#)

Alireza Salamat and Mohammad Hajrasouliha presented on Iran's National Flood Prediction and Alerting Systems, which have close ties with regional and national monitoring systems for meteorological data. Among stakeholders dealing with flood management, tasks and responsibilities are categorized at three stages: "before issuing pre-information", "from Pre-information to the end of the flood" and "after flood". A set of 100 flood management actions are classified into five groups: Prediction, monitoring and early warning; River engineering; Water and wastewater facilities; Resources Management; Coordination and crisis management. The entire process in Iran involves collaboration between different ministries and organizations including the Ministry of Energy, Iran Meteorological Organization, and Crisis Management Organization, among others. A video was played demonstrating the action taken in response to water flow forecasts and flood to deplete a major dam reservoir of water and sediments.

3.21 [The Apulia Region 'SINAPSI' System and the European FP7 'C2SENSE' Project](#)

Marianna Cavone gave a presentation on two sub-topics: an existing system and a research project. The existing system is known as "SINAPSI" (Integrated System for Analysis, Provision, Surveillance and Information). The SINAPSI goals are: Support to the decision making process; Ability to coordinate actions during emergency phases; Availability of "intelligent" data; Integrating content from different sources into a single stream of information in the field of Civil Protection; Development and realization of a modern information system of the Regional Civil Protection for the planning, monitoring and emergency management (NetRisk); and Development and realization of a navigation service and observation system updated with real time data (NetAnalysis). The research project, C2-SENSE, is funded through the European Framework Programme 7. It concerns CAP message exchange between the fire department and the Operating Room of Civil Protection, known as SOIR. The project involves use of "CITADEL" which is designed for "Empowering Citizens to Transform European Public Administrations". Its pilot was a realistic "Flood Scenario in Italy", intended to help asses to what extent the developed technologies are generic and applicable in a real life setting.

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3.22 [Mobile Pictographs for Alerting](#)

Lutz Frommberger of Sahana Software Foundation presented ongoing research concerned with the use of symbols in communicating emergency alerts. The research was framed as this question: “How do we design symbols, workflows and technology to communicate disaster information through pictographs such that it can be used by linguistically challenged populations?” The major findings he presented, based on literature review and field work in Sri Lanka and the Philippines, are in six areas:

- Local Design: Pictographs must be designed locally with target audiences to address cultural differences
- User-centered Symbolology: Usual recommendations for icon design might not hold for illiterates due to deficiencies in abstraction and categorization
- Level of abstraction: Choosing level of abstraction is crucial due to different cultural background and experiences
- Time and Numbers: Abstract concepts like time and numbers must be handled with care – important, but hard to communicate clearly
- Response actions: Usually not considered, but crucial part of the information
- Limited success: Evaluations do not show required comprehension rates, even with professionals

Among his conclusions is that representation of response actions must be researched further.

3.23 [Update on Filtered Alert Hub](#)

Eliot Christian presented on the topic of CAP "alert hubs", giving an update on the "Filtered Alert Hub" technology specifically (see <http://alert-hub.org>). An alert hub simplifies access to copies of alerts by aggregating alerts from many different feeds into one URL. The Filtered Alert Hub is free and open source software that filters available CAP alerts by city or country, and any other alert content. The Filtered Alert Hub technology also supports the "WMO Alert Hub" prototype, the main technology supporting GMAS which is now being realized in WMO. GMAS was presented in agenda item 3.12, as noted above.

3.24 [Update on OASIS EM TC Work](#)

Elysa Jones spoke on behalf of the [OASIS Emergency Management Technical Committee \(EM TC\)](#). She responded to a request from previous CAP Workshops and again this year regarding an international CAP “Event” Term List. She showed the proposed structured resulting from the CAP Subcommittee’s work responding to this request. She spoke to the challenges in developing and maintaining such a list without input from the broader CAP community. Three specific example questions were given. Elysa invited all Workshop participants to sit in on the OASIS EMTC call-in meeting to be held in a conference room across the hall at 6pm to discuss the next steps. During that meeting, the decision was made to open a discussion list on the OASIS forum to seek consensus from implementers on those questions and invite all CAP implementers to comment. Elysa next presented on the family of OASIS Emergency Data Exchange Language (EDXL) Standards. She invited attendees to join the half-day EDXL Workshop scheduled for Friday 22 September to learn more

Offers to Host the 2019 CAP Implementation Workshop

The Workshop participants were invited to put forward suggestions regarding who might host a CAP Implementation Workshop in 2019, given that Hong Kong Observatory is hosting the

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2018 CAP Implementation Workshop in Hong Kong. The tentative plan is that each of these will be in the September-November period. ITU-D is looking into hosting the 2019 CAP Implementation Workshop at ITU offices in Geneva, Switzerland. Also, Rob Hopkins joined the meeting remotely and gave [this presentation](#) offering to host the 2019 Workshop in Whitehorse, Canada. It appears the cost for a four-day trip is comparable between Whitehorse and Geneva, for instance. Although the air fare is typically higher, lodging and other expenses ("per diem") are half as much.