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Community Broadcasting Association of Australia

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re: Community Radio Code Review Australia- Emergency Alerting

Hello:

RadioRob here, checking in from Canada's Arctic. I recently saw this review and an item about emergency alerting. I have over 25 years experience as a broadcaster and developer of open source software technologies used throughout the Canadian broadcast sector, operating from my home in Tagish, Yukon. I am very passionate about community radio and its continued relevance for providing timely and local information to remote rural communities.¹

Executive Summary

Australia already has a functional Common Alerting Protocol (CAP-AU-STD) alert feed presently used on Smartphones that is unused for FM radio and available for authorities to be able to provide unattended emergency alerting to the community radio sector and distribute government Public Service Announcements (PSA).

CAP is the global standard for emergency alerting, a published technical specification x.1303 administered by the International Telecommunications Union (ITU) supported by Eliot Christian's annual CAP Implementation workshop² Canada has its own CAP profile CAP-CP that expands on the ability to contain French language accent characters. Australia also has its own CAP-AU-STD profile to incorporate local event-related terminology, and area-references, relevant to the Australian community.

Indigenous Language and multicultural alerts are crucial to non-English speakers.

Do it yourself (DIY) technical capacity and skills already available in Australia to expand coverage to FM community radio using existing alerting network infrastructure.

Open source broadcast user base in Australia: radio stations, coders, funders, commercial operators

Raspberry Pi(s) are powerful low cost computers that run open source alerting software

¹ Rob Hopkins Bio <https://openbroadcaster.com/rob-hopkins>

² CAP Implementation Workshop <https://preparecenter.org/call-to-action-on-emergency-alerting/>

History of Alerting in Canada

There have been many national emergency alerting systems proposed over the years, reinvented many times, until the Common Alerting Protocol became more standardized. In 1992 the resources rich province of Alberta, built their own province wide alerting system.

Alert Ready is the national public alerting system in Canada. Pelmorex³ manages the central technical infrastructure of the Alert Ready system⁴. Alert Ready is used by authorized public safety officials to send emergency alerts for an imminent threat to life. These alerts are sent to TV, radio and wireless devices. Authorized users may send an emergency message which is aggregated into a XML feed for broadcasters to monitor via redundant TCP/IP socket connections or over “C” Band Satellite.

CRTC and Mandatory Alerting

The Canadian Radio-television and Telecommunications Commission (CRTC) is Canada’s regulatory agency for broadcasting and telecommunications. CRTC announced that all broadcast stations in Canada must carry emergency alerts for the National Public Alerting System (NPAS) a country wide initiative to provide complete coverage. There would be no cost for the alert feed provided by Alert Ready, but the cost of the equipment and labour was handled by the station operator. CRTC policy holds that if it is a licenced transmitter, then it must be part of public alerting. No exceptions.

Deadline to participate was March 31 2015 for all commercial radio and TV, and for community stations and indigenous broadcasters by March 31 2016. Those were busy times.⁵

Open Source Alerting

In 2013 I was involved in a pilot project with the Yukon Government – Emergency Measures Organization, using my commercial FM radio station to evaluate off grid satellite reception and relay of Alert Ready CAP messages with commercially available off the shelf products (manufactured in US). This was the third installation at the time and the first to receive a Pelmorex generated CAP message in northern Canada by satellite.

I realized that the equipment, technology and resources needed for a small rural station to participate would be financially out of reach and very difficult to finance. I was able to secure some “innovation” funding to mentor and hire some local coders to include CAP alerting into our open source broadcast automation systems releasing a standalone alert player for other stations and experimenters to use.

The alerting workflow in Canada for TTS (Text to Speech) is designed in such a way that if an alert is issued with an attachment, then the audio attachment is played, switching to the built in TTS if corrupted or missing. Open source CAP alert players operating in production environments use a couple of enhanced ways to play alerts. Some broadcasters use AWS POLLY⁶ neural machine learning voices in their systems which speak out the text from CAP alerts in a more natural human sounding manner. There is support for Australian dialects. POLLY is relatively inexpensive, at around \$4.00 USD per million characters for thousands of hours of spoken alerts. If something is broken with POLLY, then the alert player automatically falls back to onboard TTS to relay broadcast intrusive messages in both official languages, English and French. In some remote communities, we have the ability to receive and decode CAP alerts to include one of the many indigenous languages still spoken in the far north.

³ Pelmorex <https://www.pelmorex.com/>

⁴ Alert Ready <https://www.alertready.ca/>

⁵ CRTC Mandatory Alerting <https://crtc.gc.ca/archive/2014/2014-444>

⁶ POLLY AWS <https://aws.amazon.com/polly/>

POLLY AWS Neural Machine learning Languages			
Language variants	Language code	Name/ID	Gender
English (Australian)	en-AU	Nicole	Female
		Olivia	Female
		Russell	Male

Comparison Canada to United States EAS (Emergency Alert Systems)

US Model uses proprietary certified hardware capable of supporting legacy systems from 40 years ago to be able to receive emergency messages from over 170 alert sources in the US and in some cases originate and **transmit** alerts.

Canada's system is 100% end to end digital delivery with CAP messages issued from a single alert source. Broadcasters must relay alerts (at least once) in both official languages and are required to only **receive** CAP alerts, not issue them.

Reporting and Testing

Canada has an annual reporting survey issued by CRTC each November. There are optional reports can be submitted to Alert Ready how the tests were received during semiannual tests (May and November).

US takes approx 20 hours a year for stations to provide required EAS reports to Gov. US EAS has extensive, scheduled testing with RWT (required weekly tests) and RMT (required monthly tests)

CRTC enforcement of non-compliant stations

Every year, stations must complete DCS (Mandatory online reporting to CRTC) with questions, including a specific section about emergency alerting. Stations cannot answer "no", to any of these questions as they will be put on a non-compliance list, which, if not addressed, will cause licensing issues upon renewals, resulting in short term duration licenses (or none at all). For stations that continue to be non-compliant, CRTC issues orders that stations must record and play a self-shaming script, informing their radio audience they are non-compliant, and to provide playlogs and logger recordings when these play. Stations are already non-compliant keeping proper logger tapes, so it just piles up.

Successes

What was really helpful in all this, was a consolidated Common Look and Field Guidance document (CLFG).⁷ Public Safety Canada provided this as a blue print and technical road map to create our solution. It was so detailed and complete that we did not have to ask a single question creating an open source CAP alerting application for Radio and TV.

Open Source community

Broadcast engineering groups and technical conferences

CRTC allowed some degree of innovation

⁷ CLFG <https://www.publicsafety.gc.ca/mrgnc-prprdnss/npas/clf-en>

Pelmorex provided “arms length” advice and encouragement to develop open source

Challenges

Providing support to multiple stations with different systems. Every station is different how they are setup, what type of hardware they use and the the way(s) they inject the alert ⁸ into the broadcast chain. In emergency broadcasting there was no “one size fits all” solution (that was affordable).

There was zero funding available, from conventional funders and resources to the community and indigenous radio sector for “Emergency Alerting Equipment and Services”.

How do stations use open source alerting in Canada?

- DIY using open source software on recycled computers or run in a virtual machine.
- Off the shelf hardware including hardened fanless computers and low cost Raspberry Pi.
- Install onto existing hardware. Why buy another when there is a rack full in a data centre?
- Emergency alerting as a service (EaaS) with partners providing GEO targeted on demand CAP audio streams for stations area.

Compensation

I’m often asked. How do you make money with Open Source? Short answer, it’s a digital resume, something to give out as an example. If you like what I do, come see me and I can help. Sometimes I get some follow up for providing advanced training and, increasingly, small sponsorships from patrons to keep us in toques and poutine.

Cautions

Overuse of Alert Ready

This needs to be thought out and carefully used only in special situations, so the public doesn’t get “Alert Fatigue” or worse, like the false nuclear alert that went out close to the Pickering, Ontario nuclear reactor on a Sunday morning,⁹ and people simply ignored the alert as “another annoying dud”. Typically, in smaller markets, there might be 2 – 3 alerts issued in a year (or none at all).

There is some criticism using Alert Ready for province wide alerts for missing children (at 2:00 AM) for a huge geographic area the size of Western Australia.

Nova Scotia Shooter

Not using the Alert Ready system to alert people during Canada’s worse Mass shooting in Nova Scotia, leaving 22 dead. Radio and TV Alerting was totally available, but Twitter was used instead, and in the middle of the night!¹⁰

Pacific Northwest Flooding

Last year’s atmospheric river flooding of the Lower Mainland was the worst natural disaster in Canadian history. The BC government did not issue a single CAP alert (dormant since 2018), and instead went door to door.

8 Example Methods to inject alerts <https://support.openbroadcaster.com/obplayer/>

9 False Nuclear Alert <https://globalnews.ca/false-nuclear-alarm-pickering/>

10 Nova Scotia Shooter https://en.wikipedia.org//2020_Nova_Scotia_attacks

Improvements

A large part of making the system more effective is about federal and provincial officials working together to establish better guidelines regarding the use of the Alert Ready system as public expectations continue to evolve and increase.

Getting small items fixed in the Canadian alert system with the Government of Canada and Industry requires more efficiencies moving issues forward.

Educating the public about alerts and what action to actually take when there is one. Silly as it seems at first, there is a need to educate. If a fire alarm happens at a movie theatre, everyone heads to the exits? Or do they? If there is severe weather advisory, what action do they take?

AU Community Radio

We have had input from local community broadcasters in Australia, assisting our North America broadcasters, including the sharing of new features, along with some cool virtualisation. No shortage of skilled talent to support your industry. TY. Call out to CMTO.¹¹ Over the past couple of winters they put on some really engaging educational webinars that are top notch.

CA Community Radio

We have three community radio umbrella groups In Canada; two French speaking and one English, but nothing in the way of a national indigenous broadcasting group. Combined these organizations represent less than half of the estimated 350 licenced stations. Many smaller stations do not have technical engineers or budgets and are in need of assistance with tech support, sustainability and direction in capacity building.

Future Challenges for AU and CA regulators

Alert boxes with out of date software not installed/maintained properly

Station's alert boxes exposed to public access/no firewalls. No cyber security policy

End users "unwilling and unable" to provide updates and security or replace end of life equipment.

Some alert boxes; three, five sometimes ten years with out updates or testing

Mechanism for security framework to enable stations to report cyber breaches

Automated polling and status reporting. Heartbeats back from stations with confirmation the alerts actually played. *Easy to do with open source and a few lines of code.*

Closing

Thank-you for allowing me to comment on this important matter. I will be following further policy changes for Emergency Alerting in Australia to keep up with the expectations of the public in order to ensure greater consistency in the use of alerting system(s) nationally.

Good luck with your emergency alerting initiatives and community radio review.

Robert G. Hopkins - Radio and Telecommunications Enthusiast

¹¹ Community Media Training Organisation <https://cmt.org.au/>

Appendices

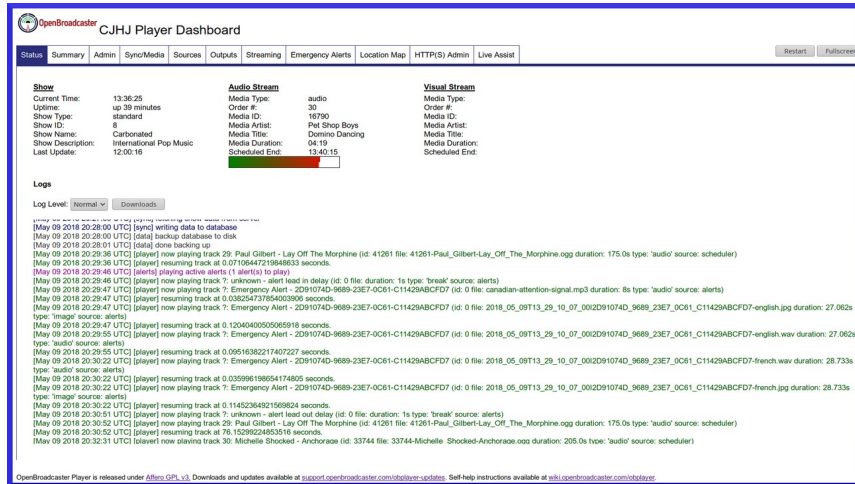


Figure 1: CAP Alert during playback

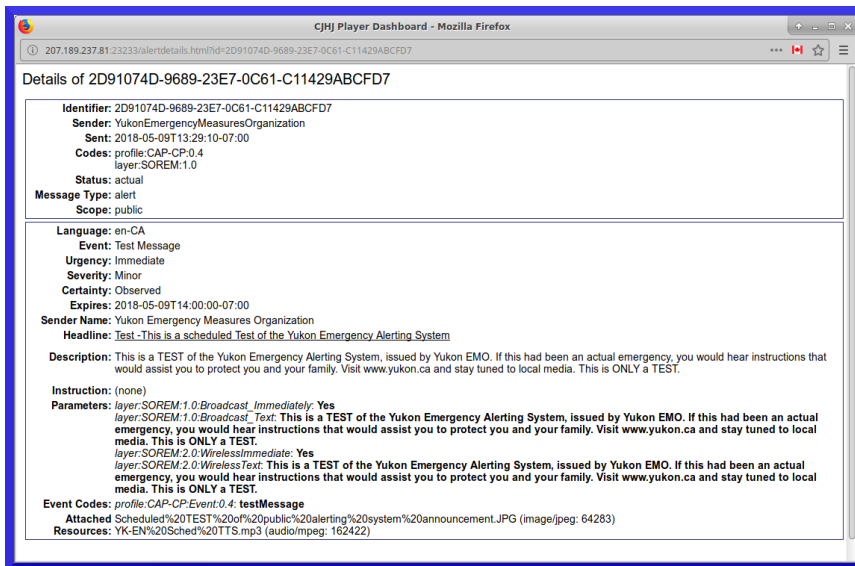


Figure 2: CAP Alert Formatted Message

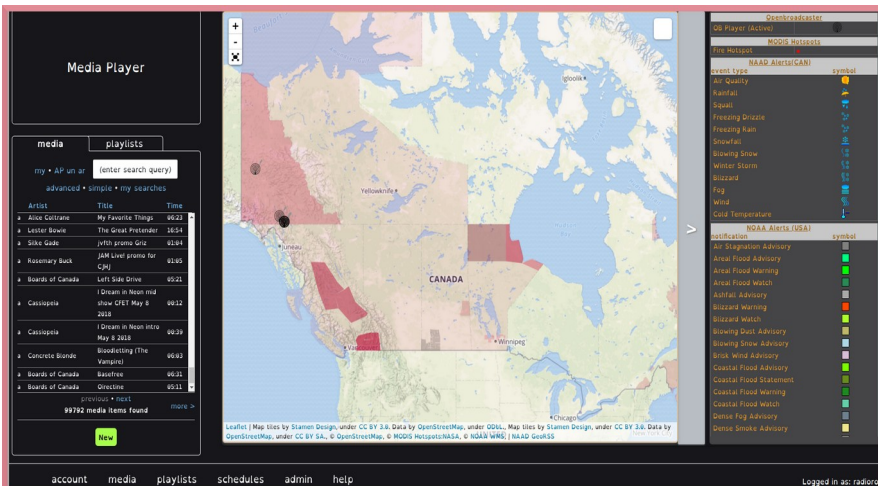


Figure 3: Alert Players reporting and showing Polygons on Map