

The Home All-Hazards Alarm

Next Generation of the Home Fire Alarm

A Life-Saving Opportunity

Home fire alarms save lives, but they only warn about one kind of hazard: a fire.



Wouldn't it be great to have in our homes an "all-hazards alarm" that sounds a warning for any life-critical threats we want to know about: not only a fire but a flood, a tornado, lightning, an earthquake, a tsunami, a chemical spill, an active shooter, ... ?

Throughout the world, such a "home all-hazards alarm" is becoming quite feasible. Soon these devices could be available in stores, maybe for just \$20 or so more than today's home fire alarms.

This wonderful new life-saving opportunity is enabled by two worldwide trends in emergency alerting: cellular phone services using the Cell Broadcast standard, and alerting authorities using the Common Alerting Protocol (CAP) standard.

The Cell Broadcast Standard



Cell Broadcast is a standard message delivery service over cellular phone systems. When used in public alerting, a warning message goes to each cellular base station (cell tower) in the alerting area. That base station then sends the warning to the cell phones.

A cell broadcast warning goes to all cell phones in range, whether or not the phone owner subscribes to the particular cellular service. The station sends the warning immediately as a broadcast, which is much faster and more reliable than calling perhaps thousands of phones, one by one. For these reasons, cell broadcast is ideal for severe emergencies, when cellular message traffic is often heavy and the cellular network itself may have been degraded by the emergency.

For several years already, alerting authorities in the U.S. have been using cell broadcast to send CAP-based alerts. Known as "Wireless Emergency Alerts", these life-critical warnings could be picked up by every home all-hazards alarm in the alerting area. The alarm would then beep or speak the warning, customized to the resident's preferences in terms of the particular warning message. Even if residents have personal cell phones, the alarm could be useful

because their cell phones might be out of battery, set to silent, or in a coat pocket in a closet.

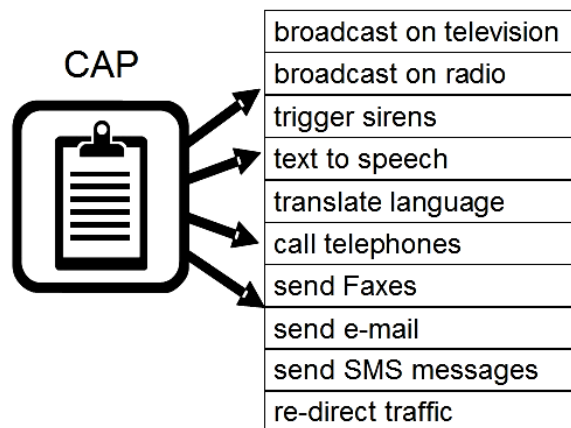
Many other countries have already implemented, or soon will implement, this kind of public warning, combining the reach and reliability of Cell Broadcast with the simplicity and broad adoption of the Common Alerting Protocol standard.

The Common Alerting Protocol Standard

Historically, emergency alert messages have been mostly just text, composed like a news story without much, if any, structured data. This kind of free-form text message makes sense for in-person communication, but it prevents fast and efficient processing. The information in emergency messages varied widely across hazard types, and across countries and languages as well. Without a worldwide emergency messaging standard, all-hazards public alerting was impossible to achieve.

The Common Alerting Protocol (CAP) standard is exactly the single standard format needed to carry essential information when alerting about any kind of emergency. Because CAP makes processing much easier, the U.S. National Weather Service responded when users asked for CAP to become their primary alert format for weather. Users of alerts across other natural and man-made hazard types found the same thing: it is much easier to use emergency alerts in the CAP standard format.

Now that we have the CAP standard, effective and efficient alerting systems promise great benefits for very modest investments. With CAP-based alerting, an alert sender activates multiple warning systems with a single trigger--reducing cost and complexity when employing a range of warning mechanisms (cell broadcast, sirens, pagers, electronic highway signs, e-mail, web sites, etc).



CAP is not a complex standard to implement. Alerting authorities typically implement CAP as an add-on feature to their current alerting processes. They publish a copy of the alert, in CAP format, on their own Internet news feed. Users of alerts then monitor that Internet news feed so they can automatically disseminate critical warnings to online users in the alerting area.

Australia, Brazil, Canada, China, Colombia, Germany, Indonesia, Mexico, New Zealand, Philippines, South Africa, the United States of America, and some Caribbean islands already publish CAP news feeds. Across Europe, CAP weather alerts are produced in 35 languages and will be publicly available as news feeds soon. Many other countries are implementing CAP right now as well. Given the accelerating spread of CAP-based alerting, there is now a need to aggregate CAP news feeds for simplified access.

A Source for Official CAP Alerts Worldwide

The aggregation of alerts across many news feeds is facilitated with an Internet "Alert Hub" and Google was the first to offer this as a free service worldwide. But, not all alert news feeds are official sources so a new Official Alerts Hub is being developed to provide copies of alerts issued by official sources worldwide.

The status of an alerting authority as official is managed through the international [Register of Alerting Authorities](#) (shown below). This Register is maintained by the World Meteorological Organization, a treaty-level organization that is part of the United Nations.



Public Weather Services established this register of information about alerting authorities as identified by Members. For questions, please contact us. Select a country to get started.

Alerting authorities by WMO Member or Organization
To monitor updates to this Register, subscribe to the RSS or ATOM news feed.

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|--|---|---------------------------------------|---|--|
| <input type="checkbox"/> Afghanistan | <input type="checkbox"/> Albania | <input type="checkbox"/> Algeria | <input type="checkbox"/> Angola | <input type="checkbox"/> Anguilla |
| <input type="checkbox"/> Antigua and Barbuda | <input type="checkbox"/> Argentina | <input type="checkbox"/> Armenia | <input type="checkbox"/> Australia | <input type="checkbox"/> Austria |
| <input type="checkbox"/> Azerbaijan | <input type="checkbox"/> Bahamas | <input type="checkbox"/> Bahrain | <input type="checkbox"/> Bangladesh | <input type="checkbox"/> Barbados |
| <input type="checkbox"/> Belarus | <input type="checkbox"/> Belgium | <input type="checkbox"/> Belize | <input type="checkbox"/> Benin | <input type="checkbox"/> Bhutan |
| <input type="checkbox"/> Bolivia | <input type="checkbox"/> Bosnia and Herzegovina | <input type="checkbox"/> Botswana | <input type="checkbox"/> Brazil | <input type="checkbox"/> British Caribbean Territories |
| <input type="checkbox"/> Brunei Darussalam | <input type="checkbox"/> Bulgaria | <input type="checkbox"/> Burkina Faso | <input type="checkbox"/> Burundi | <input type="checkbox"/> Cambodia |
| <input type="checkbox"/> Cameroon | <input type="checkbox"/> Canada | <input type="checkbox"/> Cape Verde | <input type="checkbox"/> Cayman Islands | <input type="checkbox"/> Central African |

Implemented on an Internet cloud infrastructure, the Official Alerts Hub will be highly reliable, highly available, and fast enough that an alert can reach online users within two seconds. This speed is crucial for immediate threats such as earthquakes, tsunami, and tornadoes where seconds can mean the difference between warnings that are life-saving and warnings that arrive too late.

Because the Official Alerts Hub will be largely independent of local network services, robust

alerting will continue even if local services are weak or become overwhelmed. This off-loading of demand can be especially crucial for events in least-developed countries.

The Official Alerts Hub will be secured against cyber attack, will assure that alerts are from authenticated sources, and will allow receivers to verify that alerts are the same as what was sent. The Official Alerts Hub will also support analytic capabilities to help alert publishers optimize the dissemination of alerts as the emergency unfolds.

The Makings of a Home All-Hazards Alarm

Only a very small percentage of emergency alerts worldwide include any particular home within the alerting area at a given time. Even among those alerts intended for that specific area, perhaps 99% or more are not life-critical and so would not be broadcast to the home all-hazards alarm.

For a cell broadcast that would trigger a home all-hazards alarm, typical criteria are when people need to act immediately or within the next hour in response to an extraordinary or significant threat that is already observed or likely to occur

As a device, the home all-hazards alarm is basically a home fire alarm with some cell phone parts added: an antenna and cellular module to receive cell broadcast signals, a simple processor to analyze and handle the warning message, and a speaker to sound the warning. There is no need for other cell phone parts such as a GPS, a display, a camera, a flash, or a battery (the home fire alarm already provides power). As noted above, cell broadcast reception does not need a subscription so there is no need for a SIM card.

The home all-hazards alarm should provide a way for the home resident to set user preferences--options such as the preferred language and what levels of warnings should trigger the alarm. Depending on local law and policies, the reception of public warnings would likely have opt-in and opt-out choices that a user can set in the home alarm. Also, the all-hazards warnings should have optional distinctive sounds to avoid confusion with the usual home fire alarm sound. A resident might be able to set such preferences using option switches provided on the home alarm. Or, the home alarm might support Bluetooth or some other means for setting these kinds of options.

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