WHITE PAPER

Cell Broadcast Emergency Alerts

Find out how one2many delivers governments, local authorities and operators with world-class Cell Broadcast solutions for emergency alerts

Cell Broadcast Emergency Alerts

During emergency situations governments as well as relief and rescue services need to communicate with the people they are trying to protect. These organizations are concerned with how to warn populations in at-risk areas that an emergency may be imminent so that they can take appropriate steps.

The issue is how to transmit that warning to all citizens in the affected area, and how to provide them with meaningful advice that they can put into action. Over recent years, governments worldwide came to the conclusion that current emergency alerts channels such as sirens, radio and TV are no longer sufficient. Authorities need a system that can alert as many people as possible within a given location and provide them with advice and information relevant to where they are.

The mobile phone represents the best channel for relaying this information. Mobile phones are the most ubiquitous communications channel ever and, through text messages, are able to convey the level of detail needed for the public to take action to keep safe.

Cell Broadcast is the most effective method of broadcasting public warning alerts in emergency situations. One message can be sent to millions of devices, instantly, based on subscribers' location to selected telephone cells. Cell Broadcast therefore enables location-specific emergency alerts without the need to register or track devices. As well as being better for privacy than SMS, this also means that visitors from abroad will also receive alerts, in their own language, if an emergency is imminent.

Also unlike SMS text services, Cell Broadcast has its own dedicated broadcast channel and continues to function even when the network is congested as often happens in emergency situations. This makes Cell Broadcast perfectly suited to public warning. In fact, it is the only viable solution today.

Cell Broadcast has therefore garnered much interest from governments across the world for emergency alerts services including EU-Alert (Europe), CMAS/WEA (USA), National Message (Israel), LAT-Alert (Chile) as well as the Earthquake Tsunami Warning System (Japan).

Worldwide PWS initiatives

Over recent years, governments worldwide came to the conclusion that current public warning channels such as sirens, radio and TV are no longer sufficient.

As people carry mobile phones with them wherever they go using the mobile network as an alert channel is an obvious choice. Cell Broadcast has therefore garnered much interest from governments across the world for emergency alerts services including EU-Alert (Europe), CMAS/WEA (USA), National Message (Israel), LAT-Alert (Chile) as well as the Earthquake Tsunami Warning System (Japan).

EU-Alert - Europe

EU-ALERT, the European emergency alerts system is being standardised by Emergency Telecommunications (EMTEL), a committee formed by the European Telecommunications Standards Institute (ETSI). When implemented, the letters EU will be replaced by characters identifying a particular country (e.g. NL-ALERT for the Netherlands and UK-ALERT for the United Kingdom). This allows each country to configure their own system to meet their specific requirements while incorporating it within a common core specification, thereby enabling pan-European interoperability. The Netherlands is the first EU member state to implement EU-Alert and a number of other European countries, like France and Belgium, are currently investigating the possibility of deploying similar services.

Commercial Mobile Alert System (CMAS or WEA) - USA

Following the Warning, Alert, and Response Network (WARN) Act the US is deploying the "Commercial Mobile Alert System" (CMAS), also known as the "Personal Localised Alerting Network" (PLAN) or in short "Wireless Emergency Alerts" (WEA). The emergency alerts system has been overseen by the Federal Communications Commission and allows local, federal and national agencies in the US to transmit alerts from the President, the National Weather Service and emergency service organisations. The alerts are sent to participation mobile operators who then broadcast them to their customers, using Cell Broadcast. The CMAS/WEA system has involved collaboration between the Federal Emergency Management Agency, the Department of Homeland Security Science and Technology Directorate, the Alliance of Telecommunications Industry Solutions and the Telecommunications Industry Association.

'National Message' - Israel

Israel faces a wide range of public safety threats,

from natural disasters to geopolitical violence. Zeev Tzuk Ram Head of the National Emergency Management Authority is on record as saying: "My worst nightmare is that a strong earthquake will catch us unprepared with inability to warn the population and oversee and control the aftermath." The country's geography exacerbates this as it concentrates the majority of the population in just 35 per cent of the country's area, making the population highly vulnerable to disasters. In response to this, the Israeli Home Front Command and the National Emergency Management Authority launched the emergency alerts system. Deployed in conjunction with the country's cellular operators the alert system will use Cell Broadcast technology.in conjunction with the country's cellular operators the alert system will use Cell Broadcast technology.

ONEMI 'LAT-Alert' - Chile

Following the devastating earthquake and tsunami of 2012, the Government of Chile recognised the need to implement a comprehensive alert and notification system to warn its citizens in the event

of future disasters. President Sebastian Pineda initiated a review into the available options. This review concluded that a multi-channel alert and notification system was desirable. Cell Broadcast was chosen as the primary alert technology to be augmented with notifications over analogue and digital TV broadcast, radio, sirens and the Internet. Following the President's order the Chilean Sub Secretary of Telecommunications (SUBTEL) issued in an official tender for deployment of Chile's next generation emergency alert and notification system in early 2011. The deployment is now underway.

Earthquake and Tsunami Warning System (ETWS) - Japan

NTT Docomo, one of Japan's leading operators, has offered the Area Mail Disaster Service since November 2007. This Cell Broadcast services delivers warnings for impending earthquakes and tsunamis. Users on the NTT Docomo network are provided with handsets that have a specific configuration menu that allows them to chose whether to receive earthquake and/or tsunami warnings or not. The menu also allows users to select the volume and duration of the ringtone dedicated to emergency messages. The Earthquake and Tsunami Warning System (ETWS) has been standardized in 3GPP (a global telecommunications standardisation institute). Other tsunami and earthquake prone countries are looking to deploy similar solutions in the future.

Cell Broadcast at a glance

Cell Broadcast is a robust and proven technology. It distributes text messages and binary content to Cell Broadcast-enabled handsets specific to their location and within a matter of seconds.

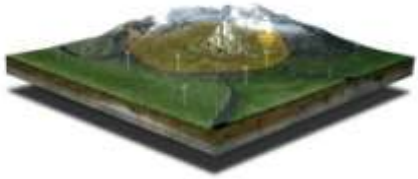
Ideal for emergency alerts and other time-sensitive services, Cell Broadcast also enables revenue-generating services that rely on location, such as mobile advertising and dynamic tariffing.

With Cell Broadcast it is possible to send a text message to:

- millions of subscribers
- in near real-time
- with location specific information
- including visitors from other countries
- in their desired language
- without being affected by network congestion.

Cell broadcast explained

In addition to the below, please watch the video on one2many's website to understand the fundamental principles and applications.



To the end user, Cell Broadcast resembles SMS very closely, but in terms of implementation it is far more practical. The technology works on a one-to-many basis, so that one message can be sent to many millions of devices, instantly. Messages are broadcast to all phones connected to the network in the target area, making it a truly location-specific service.

As the broadcaster has no way of knowing who receives the message, Cell Broadcast is anonymous and does not require any mobile subscribers to register. Cell Broadcast has been included in all major standards including GSM, CDMA, UMTS(3G) and LTE, so is already available to deploy on the majority of networks.

Importantly, Cell Broadcast utilizes dedicated network signalling, different from voice and data capacity and is therefore not affected by network congestion, making it ideal for emergency alerts.

SMS versus Cell Broadcast

Short Message Service (SMS)	*Characteristic*	*Cell Broadcast (CELL BROADCAST)*
Messages sent **point-to-point**	Transmission type	Messages sent **point-to-area**
Required. Requires specific phone numbers to be known	Mobile Number dependency	**Independent.** Does not require phone numbers to be known
No. Only pre-registered numbers will be notified; message will be received regardless of actual location	Location based targeting	**Yes.** All phones within a targeted geographical area (cells) will be notified.
Static messages will be sent to pre-registered numbers.	Message type	**Location specific.** Tailored messages can be sent to different areas.
Direct. Users can receive messages and respond directly to the sender via SMS.	Bi-directionality	**Indirect.** The message should contain a URL or number to reply.
Subject to network congestion. Delivery is queued. Congestion can occur	Congestion and delay	CELL BROADCAST is **always available**.
140-160 characters. Longer 'concatenated'	Message length	**93 characters.** Longer 'multiple page'

Short Message Service (SMS)	*Characteristic*	*Cell Broadcast (CELL BROADCAST)*
messages are supported.		messages are supported.
Poor authenticity. The source of the message cannot be verified.	Security	**Good security.** Only the mobile operator can broadcast messages.
No barring.	Service barring	**Yes.** Users can turn off CELL BROADCAST reception or a specific channel.
By default. When phone is turned on messages can be received.	Reception	**Requires action.** CELL BROADCAST needs to be turned on in order to receive messages.
Yes. Senders can request delivery confirmation.	Delivery confirmation	**No.** Confirmation of delivery to the handset is not available, however actual broadcast in the network is.
No repetition rate.	Repetition rate	**Yes.** Can be repeated between 2 seconds and 32 minutes.
No. Identical to all receivers.	Language selection	**Yes.** Messages can be broadcasted in subscriber's preferred language
Yes.	Message storage	**Handset dependant.**

Standardization

Through its involvement in numerous standardization bodies, one2many is active in driving uptake of Cell Broadcast as a global service and enhancing the applications that Cell Broadcast enables.

ETSI

The European Telecommunications Standards Institute (ETSI) produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies.

ETSI is officially recognized by the European Union as a European Standards Organization.

EMTEL

Within the European Telecommunications Standards Institute ETSI a special committee has been formed: Emergency Telecommunications (EMTEL) which addresses a broad spectrum of aspects related to the provisioning of telecommunications services in emergency situations. The following standards have been developed in EMTEL for PWS:

- ETSI TS 102 182, Requirements for communications from authorities/organizations to individuals, groups or the general public during emergencies

- ETSI TS 102 900, EU-Alert using the Cell Broadcast Service
- ETSI TR 102 850, Analyses of Mobile Device Functionality for PWS
- ETSI TR 102 444, Analysis of the SMS and CBS for Emergency Messaging applications

ATIS

ATIS develops standards and solutions addressing a wide range of industry issues in a manner that allocates and coordinates industry resources and produces the greatest return for communications companies in the North American region.

ATIS is accredited by the American National Standards Institute (ANSI).

ATIS has, jointly with TIA, developed standards, based upon three Reports and Orders issued by the Federal Communications commission (FCC) in regards to the Commercial Mobile Alert System (CMAS). To the general public CMAS is known as "Wireless Emergency Alerts" (or WEA).

- J-STD-100, Mobile Device Behaviour Specification
- J-STD-101, Federal Alert Gateway to CMSP Gateway Interface Specification
- J-STD-102, Federal Alert Gateway to CMSP Gateway Interface Test Specification

CMAS is a technology independent service. ATIS and TIA have recognized that the only viable technology for CBS would be the Cell Broadcast Service. Therefore ATIS has developed standards for the CMSP Gateway, which is basically a protocol convertor between the technology independent Federal Alert Gateway to CMSP Gateway Interface and the CMSP GW to CBC interface.

- ATIS-0700006, CMAS via GSM-UMTS CBS
- ATIS-0700007, Implementation Guidelines and Best Practices for CBS
- ATIS-0700008, CBE to CBC Interface Specification
- ATIS-0700010, CMAS via EPC PWS Specification

The FCC has mandated the support of CMAS messages in the English language. ATIS is developing standards for the support for messages in the Spanish language.

3GPP

Standards organizations, such as ETSI and ATIS, and others in Japan, Korea, etc. have formed a partnership programme to jointly develop global standards: 3GPP (Third Generation Partnership Programme). The following standards have been developed in 3GPP for PWS:

- 3GPP TR 22 968, Study for requirements for a PWS service
- 3GPP TS 22 268, PWS Requirements
- 3GPP TS 23 041, Technical realization of Cell Broadcast Service (CBS)
- 3GPP TS 48 049, Base Station Controller - Cell Broadcast Centre (BSC-CBC) interface specification
- 3GPP TS 25 419, UTRAN Iu-BC Interface: Service Area Broadcast Protocol
- 3GPP TS 23 401, General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access
- 3GPP TS 29 168, Cell Broadcast Centre interfaces with the Evolved Packet Core

TIA

The Telecommunications Industry Association (TIA) is the leading trade association representing the global information and communications

technology (ICT) industries through standards development, government affairs, and certification for CDMA networks.

TIA is accredited by ANSI.

TIA has developed CMAS standards, jointly with ATIS.

Cell Broadcast in CDMA is standardized in:

- IS-824, Generic Broadcast Teleservice Transport Capability - Network Perspective
- TIA-637-A, Short Message Service (SMS) for Wideband Spread Spectrum Systems
- TSB-58I, Administration of Parameter Value Assignments for CDMA2000 Spread Spectrum Standards
  Support, specifically for CMAS has been specified in:
- TIA-1149-1, CMAS over CDMA Systems

EENA

EENA, the European Emergency Number Association, is dedicated to promoting high-quality emergency services reached by the number 112 throughout the EU. EENA serves as a discussion platform for emergency services, public authorities, decision makers, associations and solution providers in view of improving emergency response in accordance with citizens' requirements. EENA is also promoting the establishment of an efficient system for alerting citizens about imminent or developing emergencies.

Cell Broadcast Forum

The Cell Broadcast Forum (CBF) is a non-profit Industry Association that supports the world standard for cell broadcast wireless information and telephony services on digital mobile phones and other wireless terminals.

The primary goal of the Cell Broadcast Forum is to bring together companies from all segments of the wireless industry value chain to ensure product interoperability and growth of the wireless market.

Cell Broadcast Forum members represent the global handset market, carriers that together serve more than 100 million customers, leading infrastructure providers, software developers and other organisations providing solutions to the wireless industry.

The members of the Forum, by means of their voluntary participation in and contributions to working groups form the basis for the Forum's activities

One of the publications of the CB Forum is the Handset Requirements Specification. This document specifies how CB could be implemented on a mobile phone to give the subscriber a consistent user experience and to make the best use of the technology. This document can be downloaded from the CB Forum's website, and, for your convenience, can also be downloaded here.

CHORIST (EU)

The CHORIST project is a 3-year project (June 2006 - July 2009), funded by the European Commission, which addresses Environmental Risk Management in relation to natural hazards and industrial accidents.

CHORIST has proposed solutions to increase rapidity and effectiveness of interventions following a major natural and/or industrial disaster

in order to enhance citizens' safety and communications between rescue actors.

one2many is a member of CHORIST

CHORIST Approach

one2many participated in sub-project SP3. CHORIST SP3 demonstrated that Cell Broadcast (CB), DAB, DVB and siren technologies can be used to alert citizens more effectively. More particularly, CHORIST developed and implemented user interfacing, and performed trials in Elancourt and Barcelona with CB/DAB/DVB/sirens warning messaging, which has not yet been done anywhere in the world.

The project is now finished and results are available on the CHORIST website.

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one2many - 15 Years of Cell Broadcast leadership

one2many is the pioneer behind Cell Broadcast. Having built the world's first Cell Broadcast Centre in 1996, it can claim to have the most mature Cell Broadcast solutions on the market. Formerly a part of Acision (previously known as LogicaCMG Telecom Products), one2many was established as an independent business in 2007.

With the spin-off one2many instantly became the world's market leader in Cell Broadcast with experience in excess of 80 installations, at 50 customers in more than 30 countries on all continents. Based on 15 years' experience, one2many's technology leads the market for high availability, performance and interoperability.

one2many has close relationships with all network infrastructure companies, major SIM vendors, leading handset manufacturers and industry standards organisations, and has a unique combination of both theoretical background and practical field experience in Cell Broadcast. The company has the most extensive BSC, RNC, MSC and GAN driver library in the market, ensuring that it can deliver Cell Broadcast to any operator on any network standard.

Profitable from day one, the company's strong financial base allows it to continue to innovate and excel in Cell Broadcast. one2many has its headquarters in The Netherlands and supported by offices around the world.

Cell broadcast timeline

Mission statement

"one2many strives to lead in the innovation, development and manufacture of the telecommunications industry's most advanced cell broadcast system; enabling our customers to utilize the full potential of CBS technology, resulting in greater customer satisfaction, higher revenues and a safer world."

Key facts

- **Built world's first CBC at D2-Mannesmann (Vodafone DE)**
- **More than 15 years of CB experience**
- **The most mature and premier CBS product in the market**
- **The most experienced and respected CBC vendor**
- **The most extensive BSC / RNC driver libraries in the market.**
- **Is the global CBC market leader**
- **Market leader in CBC for public warning (geo-redundancy) and dynamic tariffing.**
- **Most stable product due to design paradigms like high availability, performance and interoperability / open standards.**
- **Leading Cell Broadcast authority; actively involved in standardization committees like ETSI, 3GPP, EMTEL, EENA, Cell Broadcast Forum, CHORIST, and ATIS / TIA.**
- **Unique combination of both theoretical background and practical field experience in CB public warning.**