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WHITE PAPER

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CELL BROADCAST FOR WARNING AND PUBLIC NOTIFICATION

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The recent fires in Australia demonstrated the unpredictability of crisis situations that can change very rapidly and in unforeseen directions. Fires are caused by a mix of fuel, heat and oxygen. They can change direction rapidly and overwhelm the ability of safety officials to warn citizens in its path of the dangers, and advise them on what to do. If using a cell broadcast notification system, emergency officials can notify approximately 80% of people in a specific area within the first two minutes.

It has long been recognized that there is a need for a public warning system that can be implemented quickly, target specific locations, and has the ability to inform the public or first responders about complex events, ongoing efforts and recommended action plans. A mass, scalable, free texting system would be ideal for this.

Several studies all over the world are now pointing towards 'cell broadcast' as one part of a solution to this demanding problem.

The Evolution of Cell Broadcast

Back in 1990, mobile phone developers, looking for a competitive edge to pagers, decided to include two new systems into the infrastructure of the GSM mobile phone:

The first system, referred to as Short Message Service (SMS), quickly became popular with young people and has now become a mainstream feature used by most mobile phone consumers to relay short messages in an efficient manner. In order to deliver a mass, targeted SMS message, you need to know the phone number of everyone who is actually in a specific area at a given time. This is not as easy as it looks and takes a lot of network resources to locate a user. When you try to locate tens of millions of users, the load becomes bad enough to crash the network. Experience shows that despite its many proper uses, SMS is a very poor match for large scale mass warning of the public in emergency situations where the system may be fully overloaded, resulting in unsent or delayed messages by hours or even days.

The other, less known, system built into GSM that closely resembles one way message paging, is called "Cell Broadcast", or on some phones it may be called "Area Information" or "Local Information". This bearer is a downlink only direction that does not need to communicate with each terminal individually. To send out a broadcast message, the authorized entity simply asks each base station to stream the text of the message, and all the phones attached to that base station receive it at the same time. There is no signaling to each mobile, no data base to interrogate. This system is indefinitely scalable, even when all systems are jammed with load caused by phone use or SMS.

Important benefits of cell broadcast include:

- About 80% of the world's phones have cell broadcast installed in them;
- It works even if the networks are fully overloaded (as they are in emergencies);

- It is natively and passively geo specific without any data base or location system, even roamers and people passing through are included. You can inform people if they should evacuate, or if they are safer to stay in their present location;
- It is difficult to spoof and less likely to be abused by spammers or cyber terrorists.

Cell Broadcast Emerges as a Valuable Emergency Notification Tool

Disaster preparedness and recovery cost countries around the globe billions of dollars annually. In a recent two and a half year study comparing public warning systems, the University of Delft concluded that cell broadcast was the most valuable tool for emergency warnings. The results from the study were so encouraging that the Netherlands announced that it will build a cell broadcast system for public use and have it fully operational by 2010.

Implementing Cell Broadcast

It is one thing to identify an obscure bearer service, but another to turn it into a really useful practical tool for the emergency manager. This has required the design of some sophisticated pieces of middleware, capable of authenticating messages, applying trust protocols and prioritizing them for delivery.

A British team from Cardiff, Wales, working for Cellcast Technologies, LLC, has been working with governments all over the world to develop a comprehensive broker solution, called the CellCast Aggregator Gateway™ that includes a user-friendly interface and all the needed middleware to manage systems capable of initiating and delivering cell broadcast communications.

The process of sending a mass cell broadcast message is simple. The message sender (for example, a police officer at an incident handling center) uses a map and mouse to draw 'polygon' around an area of interest for targeted notifications. He then types a text message notification/alert appropriate for the situation. The CellCast Aggregator Gateway™ equipment takes care of all the protocols and technical connectivity matters.

Cell broadcast is a new, effective tool for emergency alerts and public notification. Now is the time for stakeholders to negotiate the terms for cell broadcast connectivity. The technology is available today. We must all prepare today to protect tomorrow.

ABOUT CELLCAST TECHNOLOGIES: With headquarters in the United States, CellCast Technologies has long been committed to making the delivery of emergency messages "personal" with their browser based EAGLE™ messaging front-end, their Trust Protocol Consulting services and their innovative Aggregator/Gateway (AG) Broker technology necessary for the deployment of geo-targeted cell broadcast notifications and alerts. The author of this white paper is Mark Wood. Mark Wood is the Chief Technology Officer of CellCast Technologies, LLC. Among his many international contributions to the industry, he authored *Disaster Communications*; the crisis communication book used by the International Aid workers for training, and is leading cell broadcast harmonization efforts for the United Nations.
