Emergency Alert Service (EAS)

Requirements & Capabilities for Wireless Platforms

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Technology Basics for Today's Wireless Platforms

- **Point-to-point SMS services would be quickly overloaded without narrow requirements.**
- **Point-to-multipoint services not fully specified, deployed or enabled.**
  - Wireless today is fundamentally a point-to-point architecture.
  - Wireless platforms in US lack many capabilities for likely EAS
    - **full requirements TBD**
  - Changes to user devices would require multi-year replacement as new devices come out
  - Infrastructure changes needed to specify, design and deploy

Full Requirements are TBD; this significantly impacts possibilities and timelines for future solutions.

Undefined Requirements Include:

- Audience **– point-to-point or point-to-multipoint**
- Message Format of Content Delivered **(e.g. voice, text, video)**
- Mandatory or Optional **– to carrier, to subscriber**
- # of Messages **– expected # of messages/month**
- Message Authority **– Presidential/Gubernatorial or lower**
- Message Length – **maximum length may dictate technology**
- Delivery/performance parameters **– Speed, %age of pop, best effort; delivery and/or receipt confirmation**
- Geographic targeting, resolution **– Cell Tower or market area**
- Priority/precedence w/ other services **– Call Interrupt, multiple messages**
- Future **- services, technologies, messages**
- Methodology & Funding

SMS-based Interim EAS

- **Capability exists today across all platforms with limitations also across all platforms.**
  - SMS-based EAS is not scalable. It cannot be enlarged to become a full throttle solution.
  - Limitation to length of messages
  - Likely latency in message delivery
  - Must be opt-in by users
  - Must be for highest level of alerts only – presidential and gubernatorial only.

Approaches to Longer-term EAS wireless solutions

Standards Development Process

- **Standards developed around a service description – this is the importance of a stable, well-defined requirements document.**
- **CMRS Standards bodies**
  - 3GPP for GSM, 3GPP2 for CDMA
  - WiMAX is 802.16_ & WiMAX Forum for “Profiles”
  - WiFi is 802.11_ & WiFi Forum
  - iDEN has AMTA (EWA) standard for CALEA
- **“Quick” Government - Industry standards – need 18 months after requirements document is completed and stable.**

Approaches to Longer-term EAS wireless solutions

Pre-consensus Alternative

- **This is the WPS model**
- **Technology features agreed to by a government-industry working group by consensus**
- **Agreed upon technology features then put into the appropriate standards for each wireless technology**

Cell Broadcast Overview

- **Cell broadcast is a method of sending one short text messages to all idle mobiles in a cell site:**
  - Efficient; same broadcast message can be received by many mobiles.
  - Granularity may be technology dependent; MSC, paging area or cell sector
  - Non-impacted users may receive alerts in addition to impacted users
  - Roamers are reached as easily as home subscribers within cell-site coverage area
- **Issues**
  - Cell Broadcast is not generally available
  - Cell Broadcast is not provided for in the standard for analog or iDEN
  - Cell Broadcast can only be received while mobile is idle
  - Cell Broadcast impacts significantly battery life
  - Cell Broadcast is not acknowledged by the MS; no confirmation
  - Cell Broadcast message length is limited.

Cell Broadcast on CDMA

- **Not *implemented* in most network equipment nor in most CDMA handset devices in use today and sold in the US.**
  - **CDMA Network Equipment:**
    - **There are *voluntary* CB specifications in the CDMA standard; many operators choose not to implement**
    - **Vendors would need to develop other software to support the CB specs in the standard.**
      - For Motorola Network equipment: Cell Broadcast is a purchasable feature on the EMX-V, the MSS-C and the MR. It is an embedded feature on the CDMA RAN.
      - Hodgepodge implementation due to IOS between different switches and RAN vendors
      - Motorola has no knowledge of what other vendors offer.
  - **CDMA Standard Limits Length of CB message**
    - **~45 words @ 4.75 char/word. This is approximately ≅15-18 seconds of speech vs. 2 min. for most alerts**

Cell Broadcast on CDMA ... continued

- CDMA Handset Devices
  - Motorola CDMA handsets are not enabled to receive CB messages today.
    - **The handsets cannot be enabled over-the-air.**
    - **Every handset that is capable of receiving CB messages would have to be touched to add refreshed software.**
  - Development is required to support CB capability

- Impact to Handset battery life depends on how often the CB message is sent from the network to the mobile. (The mobile constantly monitors and "wakes up" on a pre-set schedule.) Battery life improvement will be an significant development effort in evolution of any EAS solution.
  - 50% reduction with shortest slot cycle (lower delay)
  - 25% impact for 2.5 second slot cycle
  - 12.5% for 5 second slot cycle (higher delay)

Cell Broadcast on GSM

- **Most Motorola GSM handsets sold in US are not capable or able to receive CB messages.**
  - Most if not all handset devices have capability in the hardware but require software up-grade
  - Every handset must be touched to re-fresh software and not all handsets could be re-flashed. Some handsets would have to be replaced.
  - Over-the-air software up-grade is not an option.

- **In most GSM handsets the US carrier has flexed off Cell Broadcast feature.**
  - Carriers use the handset memory for other features & services.
  - A primary reason CB is not enabled is the impact to battery drain (20%- 50% battery life reduction)
  - European carriers may have treated this issue differently than US carriers; different markets; different capabilities implemented

- **There is no Motorola GSM network equipment in US carrier networks today.**

Cell Broadcast on iDEN

- iDEN does not have a cell broadcast capability
  - Technology does not support GSM-like cell broadcast
  - Requires extensive revisions to:
    - **Air Interface**
    - **Infrastructure**
    - **Replacement/New Handsets**

EAS Solution Roadmap

Now:

- **Amber Alert SMS-type service available today**
- **Important to recognize limitations but it is a start**
  - Only fraction of US carriers offer Amber Alert; most small carriers do not
  - Carrier and end-user voluntary opt-in service
  - Capacity limited, no performance guarantees

Longer Term:

- **Define service requirements; let marketplace create solutions**
- **Recommend a flexible approach for which technology is used to provide wireless EAS.**
  - Different air interfaces could benefit from different approaches.