

Emergency Alert Systems over Cellular Text Messaging Services in Android Mobile Phones

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ABSTRACT:

Cellular text messaging services are increasingly being relied upon to disseminate critical information during emergencies. Accordingly, a wide range of organizations including colleges and universities now partner with third-party providers that promise to improve physical security by rapidly delivering such messages. In recent days accident happens very common due to heavy traffic and increase in vehicle level and bad drivers, hence it requires a software to inform the service center for instant help to save life of the people. The Most of the people are stressed out and overstrained after accidents even if no one is hurt. Consequently, they may face some difficulty in reporting the accident to the police and civil defense, or they may provide them with inaccurate information about the location of the accident.

Recently, the number of accidents of different types (vehicle accidents, fires, etc.) has been increased. Some of these deaths can be attributed to the long response time required to reach an accident. This is due to the fact that the process of determining the location of an accident made by a communication between a person in the accident or a person near the accident. An emergency personnel as well as sending the nearest emergency service and/or police officers needed for reporting the accident can be quite lengthy. The persons in a given accident may need an urgent treatment and the delay in response time can increase the severity of the accident. Moreover, even if they were able to provide the necessary information it may take them some time to deliver it to a human Counterpart. Hence it will take the police and civil defense more time to reach the accident location in the appropriate time to rescue people. Automatic Crash Detection Systems are those systems that automatically notify emergency centers of vehicle crashes. These systems are commonly equipped with sensors distributed in all directions of the vehicle and used to collect crash severity information. The system then communicates with an emergency dispatcher to assist in determining the appropriate emergency personnel and equipment.

KEYWORDS: Automatic crash Detection, emergency services

INTRODUCTION:

Text messaging allows individuals to transmit short, alphanumeric communications for a wide variety of

applications[1][7][16]. While many of the applications of this service can be considered noncritical, the use of text messaging during emergency events has

proven to be far more utilitarian. The networks are engineered to handle huge amounts of traffic, the sheer number of calls was far greater than the capacity for voice communications in the affected areas. However, voice-based phone services being almost entirely unavailable, SMS messages were still successfully received in even the most congested regions because the control channels responsible for their delivery gets remained. Accordingly, SMS messaging is now viewed by many as a reliable method of communication when all other means appear unavailable. In this paper, we explore the limitations of third-party Emergency Alert Systems (EAS)[3]. In particular, we show that because of the currently deployed cellular infrastructure, such systems will not be able to deliver a high volume of emergency messages in a short period of time.

NETWORK ARCHITECTURE:

A **network architecture** is a blueprint of the complete computer communication network, which provides a framework and technology foundation for designing, building and managing a communication network. It typically has a layered structure. Layering is a modern network design principle which divides the communication tasks into a number of smaller parts, each part accomplishing a particular sub-task and interacting with the other parts in a small number of well-defined ways. Layering allows the parts of a communication to be designed and tested without a combinatorial explosion of cases, keeping each design relatively simple.

If a **network architecture diagram**[11] is open, no single vendor owns the technology and controls its

definition and development. Anyone is free to design hardware and software based on the network architecture. The TCP/IP network architecture, which the Internet is based on, is such a open network architecture and it is adopted as a worldwide network standard and widely deployed in local area network (LAN), wide area network (WAN), small and large enterprises, and last but not the least, the Internet.

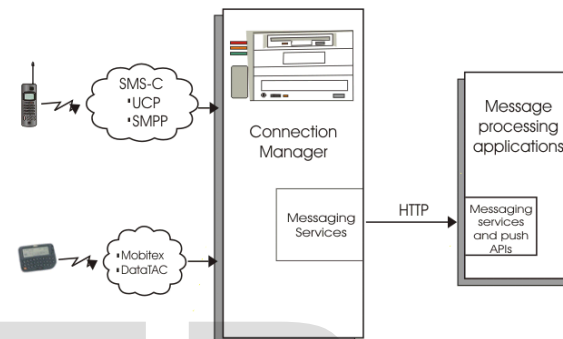


Figure 1: network architecture

GSM Short Message Service:

It can contain up to 140 octets, or 160 char. To allow messages longer than 160 char[2].

*SMS concatenation

Typically an SMS can contain up to 160 characters. It is possible however to combine several single SMS into one long SMS containing up to 765 characters. This method is called SMS concatenation. As such a concatenated SMS is what is usually referred to as long SMS

*SMS compression

The compression mechanism in this paper has been researched plainly in mobile phone that uses Android operating system. The aim of this proposal is to optimize the maximum character capacity of SMS body. Every character in SMS is mostly encoded in 7 bit and the maximum capacity of one SMS is only 1120 bit. It requires additional memory space in compressed data to save arithmetic coding probability table for decompressing the compressed-data

Two type of GSM SMS

Cell broadcast service

Cell Broadcast (CB)[4] is a mobile technology that allows messages (currently of up to 15 pages of up to 93 characters) to be broadcast to all mobile handsets and similar devices within a designated geographical area. The broadcast range can be varied, from a single cell to the entire network. It designed for simultaneous delivery of messages to multiple users in a specified area. Whereas the Short Message Service (SMS) is a one-to-one and one-to-a-few service, Cell Broadcast is one-to-many geographically focused service.

Point-to-point service

In telecommunications, a **point-to-point** connection refers to a communication connection between two nodes or endpoints. An example is a telephone call, in which one telephone is connected with one other, and what is said by one caller can only be heard by the other. This is contrasted with a point-to-multipoint or broadcast communication topology, in which many nodes can receive information transmitted by one

node. Other examples of point-to-point communications links are leased lines, microwave relay links, and two way radio. Examples of point-to-multipoint communications systems are radio and television broadcasting.

SMS Architecture:

The realization of SMS implies the inclusion of several additional elements in the network architecture (GSM, GPRS, or UMTS)[2][11].

The two additional network elements in the architecture are the SMS center and the Email gateway. In addition, an element called the short message entity, usually in the form of a software application in a mobile device, is necessary for the handling of messages (sending, reception, storage, etc.). The SMS center, Email gateway, and the message entity are presented in the following sections.

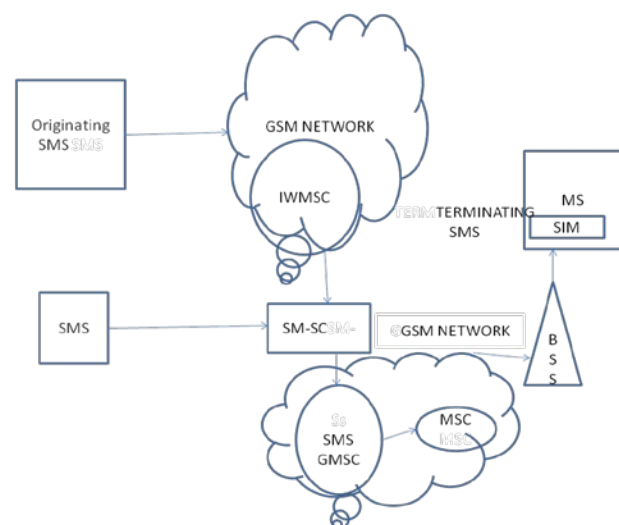


Figure 2: SMS Architecture:

SMS GMSC: SMS Gateway MSC

IWMSC: Interworking MSC

SM-SC: Short Message Service Centre

MSC: Mobile switching centre

BSS: Base Station System

SIM: Subscriber Identity Module

MS: Mobile Station

SMS Hierarchy Protocol:

It provides services to transfer TPDU's and delivery reports for SMS TL. Generate SM-RL SMI for every short message.

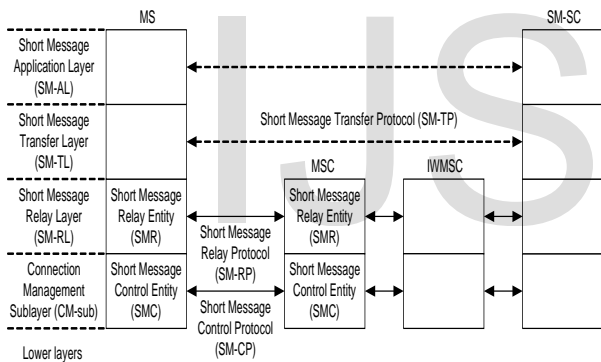
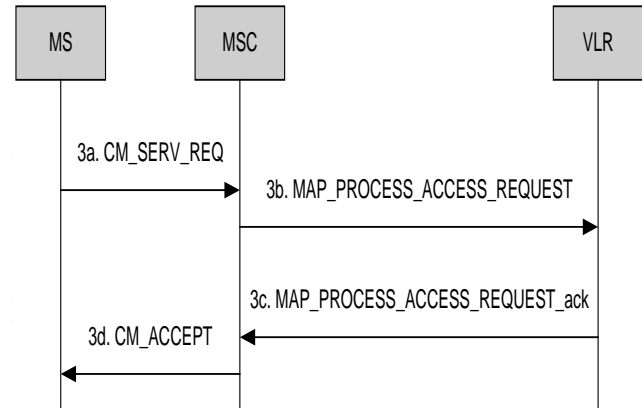


Figure 3:SMS Hierarchy Protocol:

message to a network provider, for delivery to the messaging services. The messaging services use an HTTP post operation to forward the message to an application or servlet which uses the IBM Lotus Mobile Connect Messaging Services and Push APIs.

Mobile Originated SMS messages are received by the test set after being transmitted over the air by the mobile station. The test set displays much of the content of these messages on the front panel, makes them available for query via GPIB, or when using the HTTP

interface, acts as the SMSC and routes the message to a receiving entity.



the accident location. People cannot explain the appropriate location type of the accident to the service. The affected person cannot contact the person soon due some technical problems in calling them by a call. The person may not be able to explain about the situation due to mental imbalance caused by the accident, they cannot be directly applied in countries like Jordan because everyone should replace his vehicle by a new vehicle equipped with such a system or install the system in his vehicle, which could be too expensive. Also it is not security to display information about the accident location. It's very difficult to access by the person who was not aware of technical aspects.

Disadvantages:

- People cannot explain the appropriate location type of the accident to the service.
- The affected person cannot contact the person soon due some technical problems in calling them by a call.

The person may not be able to explain about the situation due to mental imbalance caused by the accident during emergency. However, large scale

Security systems are rare, such a techniques are considered.

PROPOSED SYSTEM:

The affected person can just send a message to the service center from their mobile. The message is sent by the affected person is by a software installed in mobile which doesn't require the user not even to type the message. Then the message will be received by the service center using GSM modem.

Using the mobile number and tower location they identify accident location using latitude and longitude. Then they inform the type of the accident and appropriate location to the nearby service (police & fire). This will reduce the time required for the police and the emergency personnel to reach the accident location.

The idea will make the location identification automatic using the latitude and longitude hence will be more precise and take less time. Hence it will take the police and civil defense more time to reach the accident location in the appropriate time to rescue people.

Advantage:

- It is reduce the death during the time of accident since it can inform about the accident faster.
- Software requirement is very less, hence it can be easily implemented.
- Since there is a no need of conversation in call it reduces the confusion and helpful to the user to report the accident without any tension.
- Even the affected person can inform about the accident using the proposed system.

- This system can be easily accessed by any people who were not much aware about the technical aspects.
- Can be implemented by all since its costs less.

CONCLUSION:

Cellular networks are becoming the primary means of communication during emergencies. To detect this problem emergency alert text messaging can send to the particular services and find the specific area where the accident occurs through GSM Modem[8].

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