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Contact: Ashish Vyas
Ministry of Communications, India
Tel: +91-7428301942
E-mail: ashish.vyas@gov.in

Contact: Saurabh Basu
Centre for Development of Telematics
India
Tel: +91-8506846661
E-mail: sbasu@cdot.in

Contact: Smriti Sachdev
Centre for Development of Telematics
India
Tel: +91-9891508000
E-mail: smriti@cdot.in

Contact: Sandeep Sharma
Centre for Development of Telematics
India
Tel: +91-9034589567
E-mail: sandeeps@cdot.in

Contact: Jinlan Ma
China Telecom
P.R.China
Tel: +8620 38639726
E-mail: majl6@chinatelecom.cn

Abstract: This document is the initial output of draft new Recommendation ITU-T Q.IEM_arch_req "Reference architecture and signalling requirements for interactive emergency messaging through mobile network", resulting from discussion of Q3/11 meeting on 1-10 May 2024.

This document is the initial output of draft new Recommendation ITU-T Q.IEM_arch_req "Reference interface architecture and signalling requirements for interactive emergency messaging through mobile network", resulting from discussion of Q3/11 meeting on 1-10 May 2024.

This document is based on this meeting's discussion and results on the following contribution:

No.	Title	Source	Discussion
SG11-C386	Proposed new work item on " Reference interface architecture and signalling requirements for interactive emergency messaging through mobile network "	Ministry of Communications India, C-DOT India	Accepted with modifications

Table of Contents

1 Scope 3

2 References 3

3 Definitions 3

3.1 Terms defined elsewhere 3

3.2 Terms defined in this Recommendation 4

This Recommendation defines the following terms: 4

4 Abbreviations and acronyms 4

5 Conventions 4

6. Overview 4

7. Requirements for interactive emergency messaging 6

8. Reference architecture for interactive emergency messaging 6

9. Signalling protocol requirements for interactive emergency messaging 6

9.1 Signalling protocol requirements for network originated emergency messaging 6

9.2 Signalling protocol requirements for mobile originated emergency messaging 6

10. Message format for interactive emergency messaging 6

11. Security consideration 6

Recommendation ITU-T Q.IEM_arch_req

"Reference architecture and signalling requirements for interactive emergency messaging through mobile network"

1 Scope

This Recommendation specifies reference architecture and signalling requirements required for interactive emergency messaging through mobile network by addressing many aspects that are crucial in nature but have still not been evolved in the signalling protocols. The scope of this recommendation is as follows:

1） Reference architecture for interactive emergency messaging through mobile network;

2) Signalling requirements for interactive emergency messaging;

3) Interactive emergency message delivery format;

4) Security consideration.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T E.100] Recommendation ITU-T E.100 Supplement 1 (2019), Framework of disaster management for disaster relief systems.

[ITU-T E.108] Recommendation ITU-T E.108 (2016), Requirement for a disaster relief mobile message service.

[ITU-T E.119] Recommendation ITU-T E.119 (2017), Requirement for safety confirmation and broadcast message service for disaster relief.

[3GPP TS 23.041] Technical Specification 3GPP TS 23.041 V13.3.0 (2016), 3rd Generation Partnership Project: Technical Specification Group Core Network and Terminals; Technical realization of Cell Broadcast Service (CBS) (Release 13).

[ETSI TS 103 625] Technical Specification ETSI TS 103 625 V1.2.1 (2012) Emergency Communications (EMTEL): Transporting Handset Location to PSAPs for Emergency Calls - Advanced Mobile Location

[ETSI TS 102 900] Technical Specification ETSITS 102 900 V1.2.1 (2012) Emergency Communications (EMTEL):European Public Warning System (EU-ALERT) using the Cell Broadcast Service

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

TBD

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 Interactive emergency messaging – Providing two-way messaging among targeted group of stakeholders for any emergency or in an ongoing crisis situation.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CB Cell Broadcast

SMS Short Message Service

5 Conventions

In this Recommendation:

The keywords "is required to" indicate a requirement which must be strictly followed and from which no deviation is permitted, if conformance to this Recommendation is to be claimed.

The keywords "is recommended" indicate a requirement which is recommended but which is not absolutely required. Thus, this requirement need not be present to claim conformance.

The keywords "can optionally" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option, and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with this Recommendation.

6. Overview

Today in the era of rapid technology development, it is essential that technology is to be utilized effectively for the betterment of people and facilitate them to take informed decision. In past few decades, the telecom has played a crucial role for providing emergency information, mobile terminal being the key receiver because people always carry it with them and the penetration ratio of telecom is higher than that of any other communication medium.

The speed and accuracy of conveying information is crucial for the protection of people to give them sufficient time for preparation in emergency or an ongoing crisis situation. Currently, SMS based or CB based telecom technologies are in use for dissemination of information especially in emergency situation. CB based technology is widely used technology as it is a network congestion independent broadcast messaging service that holds an upper hand in low latency dissemination which enables it to reach a large number of people in near real-time and thereby saving lives and livelihoods. Figure 6.1 shows the block diagram of CB technology.

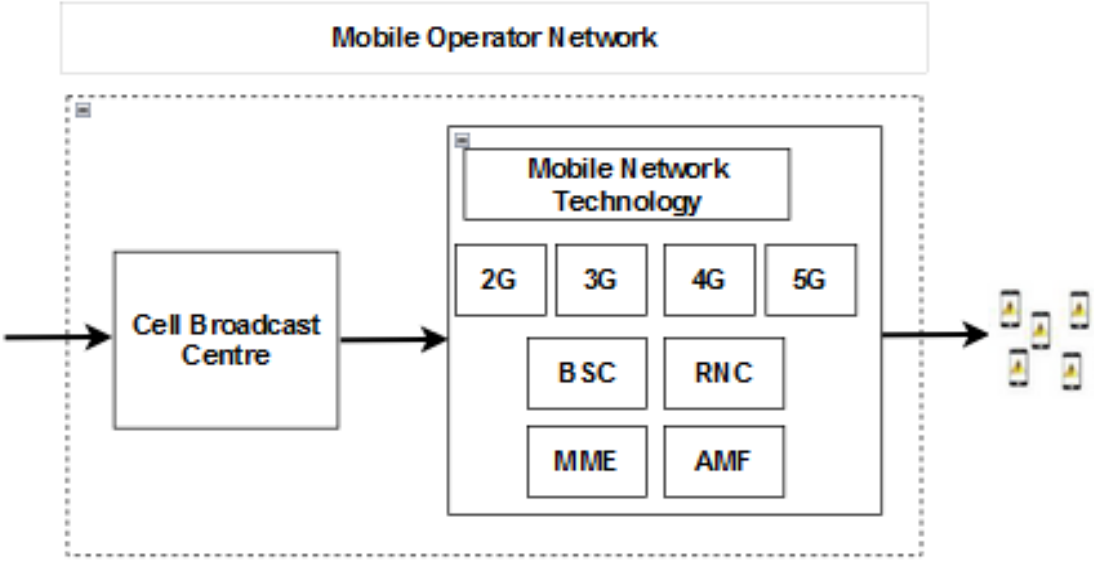

Figure 6.1

However, there is no provision in CB for collecting information on the acknowledgement of message delivery to mobile handsets and it is not supportive for image and video transmission to provide effective alerting, especially for disabled or illiterate population. Further, there does not exist any provision to have a closed group communication.

Apart from CB technology, there are some other emergency technologies used for their distinct purposes such as emergency call facility (Dial 112), SMS based disaster message dissemination, Public safety network but all these have their own limitations.

Figure 6.2 shows the exiting emergency telecommunications technologies available and their limitations and overall challenges.

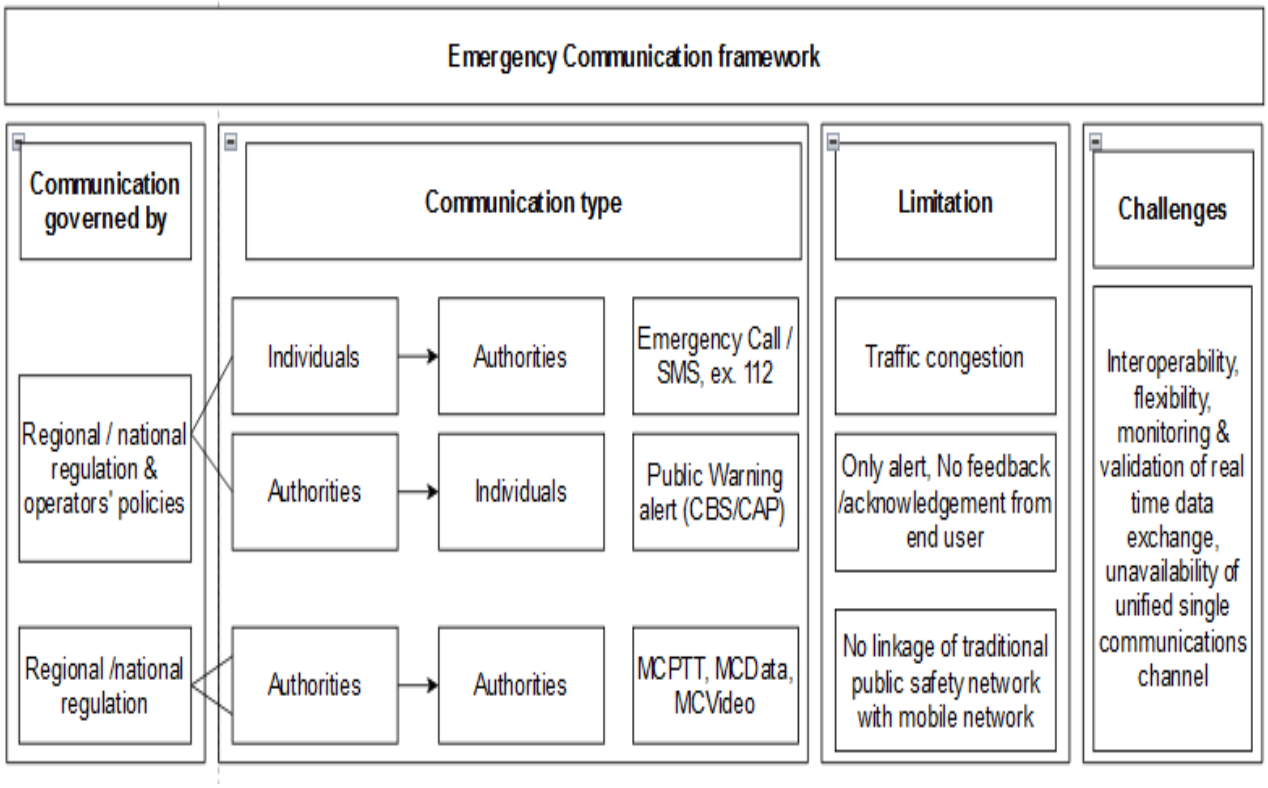

Figure 6.2

The most of components of existing emergency messaging framework is in silos and have issue of interoperability among them due to which many crucial aspects of emergency messaging are missing in the signalling protocols.

Hence, there is a need to converge and define reference interface architecture and signalling requirements required for interactive emergency messaging through mobile network which addresses crucial aspects of emergency messaging at signaling level.

7. Requirements for interactive emergency messaging

- Interoperable interfaces with existing protocols.
- Interactive emergency messaging either through specific code or emergency number.
- Support of emergency messaging including but not limited to Emergency alert, Alert acknowledgement, Alert Coverage Feedback, Request for assistance from UE, Response to assistance, Fetch UE location, Event basis alert to UE, Close group messaging, Convey the 'SAFE' status, Convey on ground situation, etc. with support of Image and video services.

TBD

8. Reference architecture for interactive emergency messaging

TBD

9. Signalling protocol requirements for interactive emergency messaging

9.1 Signalling protocol requirements for network originated emergency messaging

9.2 Signalling protocol requirements for mobile originated emergency messaging

TBD

10. Message format for interactive emergency messaging

TBD

11. Security consideration

TBD

[Note: detailed features will be added and refined.]

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