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Emergency Communications (EMTEL); Lightweight Messaging Protocol for Emergency Service Accessibility (LMPE)

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Reference

RTS/EMTEL-00077

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location, SSL/TLS certificates

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Foreword

This Technical Specification (TS) has been produced by ETSI Special Committee Emergency Communications (EMTEL).

Modal verbs terminology

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Executive summary

Lightweight Messaging Protocol for Emergency Service accessibility (LMPE) extends a SIP SIMPLE-based messaging service with session mode and facilities to redirect or transfer a chat. The mechanisms introduced in the present document differ from existing solutions like Message Session Relay Protocol (MSRP) in a sense that no media plane is required. This reduces the functionality to chat, but requires less deployment effort and complexity (e.g. no intermediate services or relays in case of firewalls or NAT), especially in a roaming use case. In addition, to further reduce complexity, the identification of a user is carried out via a device identifier only, such as a mobile phone number as with comparable chat services. In summary, it simplifies the implementation and thus can be used in simple mobile applications or even smart IoT devices and chatbots, that, for example, send or respond to messages automatically.

The referred baseline specification (ETSI TS 103 479 [1]) already defines page mode messaging suitable for a single message exchange or a series of short messages similar to paging or SMS on a mobile device. Routing and mapping mechanisms (defined in ETSI TS 103 479 [1]) to determine the adequate control room, are based on location information. Therefore, a single message exchange is not practicable as caller location may change and lead to messages being routed to a different control room. The present document defines specific message types to group messages into sessions with routing and mapping only required at setup time. In addition, the same principles are used to support supplementary services like chat redirect and transfer. Each mechanism is transparent to ETSI TS 103 479 [1] core services and requires only minor modifications to the Public Safety Answering Points (PSAP) interface.

Introduction

Emergency communications services are primarily voice-only, along with a marginal share of data and multimedia used by Public Safety Answering Points (PSAPs). Improving access to emergency services for citizens, especially for the deaf and hard of hearing, requires PSAPs and people in need to handle new modes of communications such as text. Messenger services are widespread and well-known to the public. The present document defines extensions to support a comparable messenger service to access emergency control rooms by leveraging the new architecture introduced in ETSI TS 103 479 [1]. The main purpose of such extensions is to enable a simplified chat session mode combined with means to redirect or transfer a chat session. Furthermore, the present document allows a lightweight implementation of a messenger application for emergency chat or bot services. The fact that besides a signalling plane, no further media sessions are required, supports a straight integration with firewalls or, in general, network security technologies.

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1 Scope

The present document describes a lightweight session-based emergency chat protocol that extends the base messaging functionality as defined in ETSI TS 103 479 [1]. The messaging service is based only on methods of the SIP signalling plane and interworks with Border Control Function (BCF), Emergency Service Routing Proxy (ESRP), Emergency Call Routing Function (ECRF), Public Safety Answering Point (PSAP), the Location Information Server (LIS). It is important to emphasize that this feature is an alternative to MSRP, real-time text or, in general, total conversation and not a replacement.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found in the [ETSI docbox](#).

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The following referenced documents are necessary for the application of the present document.

- [1] [ETSI TS 103 479](#): "Emergency Communications (EMTEL); Core elements for network independent access to emergency services".
- [2] [IETF RFC 2046 \(November 1996\)](#): "Multipurpose Internet Mail Extensions (MIME) Part Two: MediaTypes", Freed N. and Borenstein, N.
- [3] [IETF RFC 3261 \(June 2002\)](#): "SIP: Session Initiation Protocol", Rosenberg, J., Schulzrinne, H., Camarillo, G., Johnston, A., Peterson, J., Sparks, R., Handley, M. and Schooler, E.
- [4] [IETF RFC 3325 \(November 2002\)](#): "Private Extensions to the Session Initiation Protocol (SIP) for Asserted Identity Within Trusted Networks", Jennings, C., Peterson, J. and Watson, M.
- [5] [IETF RFC 3326 \(December 2002\)](#): "The Reason Header Field for the Session Initiation Protocol (SIP)", Oran, D. and Camarillo, G.
- [6] [IETF RFC 3428 \(December 2002\)](#): "Session Initiation Protocol (SIP) Extension for Instant Messaging", Campbell, B., Rosenberg, J., Schulzrinne, H., Huitema, C. and Gurle, D.
- [7] [IETF RFC 3841 \(August 2004\)](#): "Caller Preferences for the Session Initiation Protocol (SIP)", Rosenberg, J., Schulzrinne, H. and Kyzivat, P.
- [8] [IETF RFC 4119 \(December 2005\)](#): "A Presence-Based GEOPRIV Location Object Format", Peterson, J.
- [9] [IETF RFC 7044 \(February 2014\)](#): "An Extension to the Session Initiation Protocol (SIP) for Request History Information", Barnes, M.
- [10] [IETF RFC 4412 \(February 2006\)](#): "Communications Resource Priority for the Session Initiation Protocol (SIP)", Schulzrinne, H. and Polk, J.
- [11] [IETF RFC 8866 \(January 2021\)](#): "SDP: Session Description Protocol", Begen, A., Kyzivat, P., Perkins, C., and Handley, M.
- [12] [IETF RFC 5031 \(January 2008\)](#): "A Uniform Resource Name (URN) for Emergency and Other Well-Known Services", Schulzrinne, H.

- [13] [IETF RFC 5621 \(September 2009\)](#): "Message Body Handling in the Session Initiation Protocol (SIP)", Camarillo, G.
- [14] [IETF RFC 6442 \(December 2011\)](#): "Location Conveyance for the Session Initiation Protocol", Polk, J., Rosen, B. and Peterson, J.
- [15] [IETF RFC 6881 \(March 2013\)](#): "Best Current Practice for Communications Services in Support of Emergency Calling", Rosen, B. and Polk, J.
- [16] [IETF RFC 7135 \(May 2014\)](#): "Registering a SIP Resource Priority Header Field Namespace for Local Emergency Communications", Polk, J.
- [17] [IETF RFC 8446 \(August 2018\)](#): "The Transport Layer Security (TLS) Protocol Version 1.3", Rescorla, E.
- [18] [W3C® Recommendation 19 July 2022](#): "Decentralized Identifiers (DIDs) v1.0 Core architecture, data model and representations".
- [19] [IETF RFC 8224 \(February 2018\)](#): "Authenticated Identity Management in the Session Initiation Protocol (SIP)", Peterson J., Jennings C., Rescorla E. and Wendt C.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents may be useful in implementing an ETSI deliverable or add to the reader's understanding, but are not required for conformance to the present document.

- [i.1] [EENA, Version 1.1, March 2013](#): "Next Generation 112 - Long Term Definition".
- [i.2] [EENA Version 1.05, March 2016](#): "Public Safety Digital Transformation - The Internet of Things (IoT) and Emergency Services".
- [i.3] [W3C® Recommendation 15 May 2025](#): "Verifiable Credentials Data Model 2.0".

3 Definition of terms, symbols and abbreviations

3.1 Terms

Void.

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AP	Application Provider
APP	APPlication
ASP	Application Service Provider
BCF	Border Control Function

BGP	Border Gateway Protocol
CA	Certificate Authority
CAP	Common Alerting Protocol
CERT	Computer Emergency Response Team
CR	Carriage Return
CTI	Centre for Testing & Interoperability (ETSI)
DHE	Diffie Hellman Exchange
DID	Decentralized Identifier
DLT	Distributed Ledger Technology
ECDHE	Elliptic Curve Diffie-Hellman Ephemeral
ECDSA	Elliptic Curve Digital Signature Algorithm
ECRF	Emergency Call Routing Function
ESInet	Emergency Services IP network
ESRF	Emergency Service Routing Function
ESRP	Emergency Service Routing Proxy
ETSI	European Telecommunications Standards Institute
FG	Forest Guide
GCM	Galois/Counter Mode
GIS	Geographic Information System
HELD	HTTP Enabled Location Delivery
HTTP	Hypertext Transfer Protocol
ID	IDentity
IETF	Internet Engineering Task Force
IM	Instant Messaging
IoT	Internet of Things
IP	Internet Protocol
IT	Information Technology
JSON	JavaScript® Object Notation
LF	Line Feed
LIS	Location Information Server
LMPE	Lightweight Messaging Protocol for Emergency service accessibility
LOST	Location to Service Translation
LTD	Long-Term Definition
MIME	Multipurpose Internet Mail Extensions
MSD	Minimum Set of Data
MSRP	Message Session Relay Protocol
NAT	Network Address Translation
OS	Operating System
OTA	Over The Air
P-A-I	P-Asserted-Identity
PIDF	Presence Information Data Format
PIDF-LO	Presence Information Data Format - Location Object
PNNS	Protocol Naming and Numbering Service
PSAP	Public Safety Answering Point
RCS	Rich Communication Services
RFC	Request For Comment
RSA	Rivest Shamir Adleman
SIP	Session Initiation Protocol
SMS	Short Message Service
TCP	Transmission Control Protocol
TLS	Transport Layer Security
TS	(ETSI) Technical Specification
UDP	User Datagram Protocol
URI	Uniform Resource Identifier
URN	Uniform Resource Name
VSP	Voice Service Provider
WGS84	World Geodetic System 1984

4 General

4.1 Overview

Per ETSI TS 103 479 [1], emergency communications are routed by the ESRF to the ESRP via a BCF. Depending on national PSAP models the ESRP may then forward directly to the appropriate PSAP as explained in NG112 LTD [i.1]. The same mechanism applies to instant messaging in a non-session mode. The present document defines extensions to interfaces and introduces an Application (APP) interface to support a session-based chat application.

NOTE: The term APP refers to either a mobile application or a backend service acting on its behalf.

Figure 1 illustrates a high level functional architecture, where specific Application Provider (AP) services are used to manage the application (AP BE) or to interconnect with an ESInet (SIP PROXY). Chat messages addressed to a public emergency service SIP URI or service URN are forwarded to a BCF and routed within the ESInet utilizing a geodetic location determined by the mobile application (typically via sensor fusion).

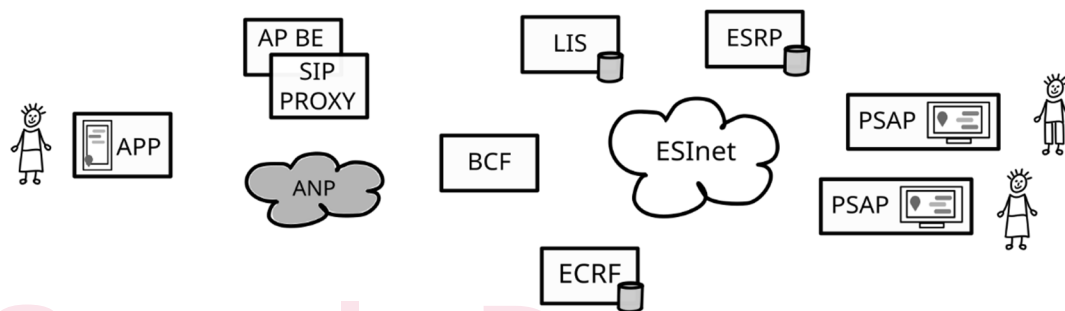


Figure 1: High level functional architecture

The present document specifies only the signalling interface between APP, PSAP, and other core services required to setup a session-based chat. The following architecture introduces functional elements that comprise an IP only environment. Such elements provide security measures (BCF), emergency call routing (ESRP), mapping PSAP boundaries to SIP URIs (ECRF), a mobile Application (APP), and chat processing equipment (PSAP).

4.2 Architecture

The definition of core elements and interfaces supporting a Lightweight Messaging Protocol for Emergency service accessibility (LMPE) is based on the core concept introduced in ETSI TS 103 479 [1]. LMPE utilizes IP technology and requires public and private managed, and routed IP networks. The present document introduces new interfaces between the functional elements APP and PSAP (dashed-line boxes in Figure 2), and refers to functional elements with their internal and external interfaces as defined in ETSI TS 103 479 [1], listed below:

- Border Control Function (BCF);
- Emergency Call Routing Function (ECRF);
- Chat Application (APP);
- Public Safety Answering Point (PSAP);
- Emergency Services Routing Proxy (ESRP); and
- Location Information Service (LIS).

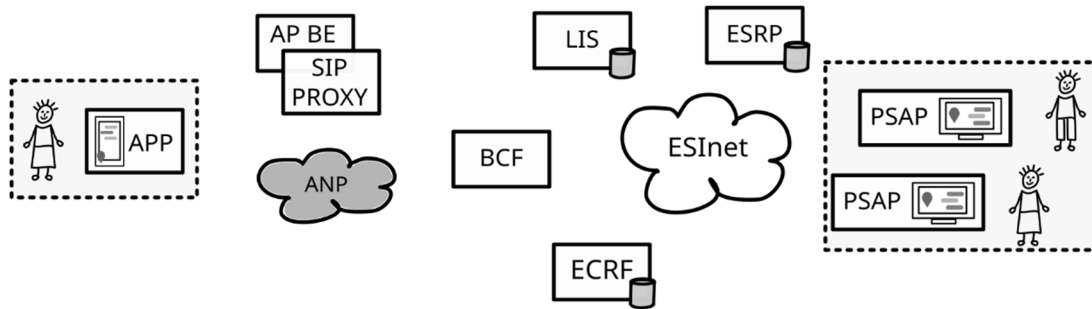


Figure 2: Core elements

4.3 Mandatory Interfaces

Mandatory interfaces are either referenced (ETSI TS 103 479 [1]), or introduced by the present document to define simple chat capabilities of an APP and ESInet core elements. Figure 3 shows the following mandatory interfaces:

- **SIP-1, SIP-2:** Interface between APP, BCF, ESRP and PSAP elements that defines SIP transport and signalling capabilities.
- **LOST-1, LOST-2:** Interface between ESRP and ECRF elements that defines LoST signalling capabilities.
- **HELD-1, HELD-2:** Interface between ESRP or PSAP and LIS elements that defines location dereference and HELD signalling capabilities.
- **IM-2:** APP and PSAP chat handling capabilities to support instant messaging.

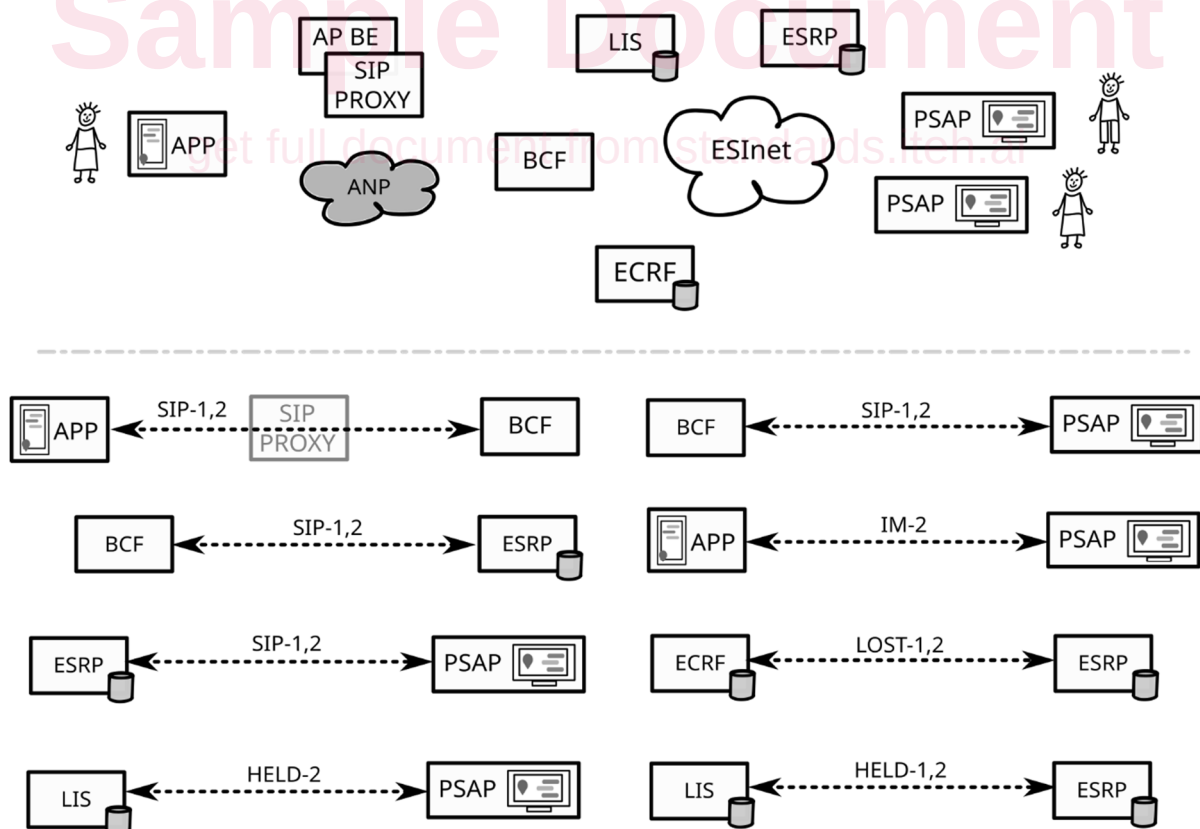


Figure 3: Considered mandatory interfaces