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Emergency Communications (EMTEL);
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implementation guidelines

Reference

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Foreword

This Technical Report (TR) has been produced by ETSI Special Committee Emergency Communications (EMTEL).

Modal verbs terminology

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Introduction

The present document contains recommendations and guidelines on the implementation of Total Conversation for emergency service access and provision. Total Conversation enables conversation in real-time text, video and audio. Subsets are also considered including the combination of real-time text and audio that forms the text telephony service.

Total Conversation services and terminals are deployed in some European countries, and have been adopted by people with disabilities who, for example, need video for sign language, or real-time text for a text based conversation or as complement to a voice conversation. The use of Total Conversation for Emergency Communications would enable and/or improve access to emergency services by people with disabilities. However the few deployments of Total Conversation for Emergency Communications that exist, are implemented in different ways in different countries, and are not implemented according to the latest development of ETSI, IETF and 3GPP standards for Emergency Communications. This non-harmonized deployment means that there are no interoperable solutions for emergency service access across the EU countries, which is contrary to EU policy.

The present document is intended to assist ETSI SC EMTEL to coordinate with other standards bodies and relevant stakeholders so that the recommendations of ETSI TS 101 470 [i.2] and ETSI TR 103 170 [i.3] can be implemented. It can also be used to assess if Total Conversation requirements are fulfilled by other necessary standards, and to ensure that there are no contradictions.

1 Scope

The present document:

- Assesses the support of Total Conversation for emergency communications by existing specifications, in particular those from 3GPP and IETF.
- Identifies any changes that might be needed to those specifications to support Total Conversation for emergency communications.
- Provides guidance for developers and PSAPs planning to implement Total Conversation for emergency communications, and for users of the Total Conversation service.

The present document covers emergency calls with the full media set of Total Conversation as well as subsets of the media, except voice calls in which no assisting service is needed.

Although the focus of the present document is Total Conversation for emergency communications, no Total Conversation user can be expected to use Total Conversation only for contacting emergency services. Therefore and where applicable, some aspects of use of Total Conversation for non-emergency communications are also covered.

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 reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

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

Not applicable.

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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] EENA NG1-1-2 Long Term Definition.

[i.2] ETSI TS 101 470: "Emergency Communications (EMTEL); Total Conversation Access to Emergency Services".

[i.3] ETSI TR 103 170: "Emergency Communications (EMTEL); Total Conversation Access to Emergency Services".

[i.4] ETSI TR 102 180: "Emergency Communications (EMTEL); Basis of requirements for communication of individuals with authorities/organizations in case of distress (emergency call handling)".

[i.5] ETSI ES 202 975: "Human Factors (HF); Requirements for relay services".

[i.6] ETSI TS 122 173: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services; Stage 1 (3GPP TS 22.173)".

[i.7] ETSI TS 126 114: "Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS); Multimedia telephony; Media handling and interaction (3GPP TS 26.114)".

[i.8] ETSI TS 123 167:"Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS) emergency sessions (3GPP TS 23.167)".

[i.9] ETSI TS 122 101: "Universal Mobile Telecommunications System (UMTS); LTE; Service aspects; Service principles (3GPP TS 22.101)".

[i.10] ETSI TS 122 228: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Service requirements for the Internet Protocol (IP) multimedia core network subsystem (IMS); Stage 1 (3GPP TS 22.228)".

[i.11] IETF RFC 6881: "Best Current Practice for Communications Services in Support of Emergency Calling (BCP 181)".

[i.12] IETF RFC 4596: "Guidelines for Usage of the Session Initiation Protocol (SIP) Caller Preferences Extension".

[i.13] IETF RFC 3841: "Caller Preferences for the Session Initiation Protocol (SIP)".

[i.14] IETF RFC 6443: "Framework for Emergency Calling Using Internet Multimedia".

[i.15] IETF RFC 4190: "Framework for Supporting Emergency Telecommunications Service (ETS) in IP Telephony".

[i.16] IETF RFC 3261: "Session Initiation Protocol".

[i.17] Recommendation ITU-T F.742: "Service description and requirements for videotelephony services over IP networks".

[i.18] Recommendation ITU-T F.703: "Multimedia Conversational Services".

[i.19] Recommendation ITU-T V.18: "Operational and interworking requirements for DCEs operating in the text telephone mode".

[i.20] ETSI TS 122 071: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Services (LCS); Service description (3GPP TS 22.071)".

[i.21] ETSI TS 123 271: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Functional stage 2 description of Location Services (LCS) (3GPP TS 23.271)".

[i.22] ETSI TS 124 229: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP) (3GPP TS 24.229)".

[i.23] IETF RFC 4353: "A Framework for Conferencing with the Session Initiation Protocol (SIP)".

[i.24] Directive 2002/22/EC of the European Parliament and the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

[i.25] ETSI TS 133 106: "Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Lawful interception requirements (3GPP TS 33.106)".

[i.26] ETSI ES 201 158 (V1.2.1): "Telecommunications security; Lawful Interception (LI); Requirements for network functions".

[i.27] ETSI TS 123 237: "Digital cellular telecommunications system (Phase 2+);Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS) Service Continuity; Stage 2 (3GPP TS 23.237)".

[i.28] IETF RFC 5631: "Session Initiation Protocol (SIP) Session Mobility".

[i.29] IETF RFC 5589: "Session Initiation Protocol (SIP) Call Control - Transfer".

[i.30] IETF RFC 4579: "Session Initiation Protocol (SIP) Call Control - Conferencing for User Agents".

[i.31] IETF RFC 3515: "The Session Initiation Protocol (SIP) Refer Method".

[i.32] IETF RFC 3725: "Best Current Practices for Third Party Call Control (3pcc) in the Session Initiation Protocol (SIP)".

[i.33] IETF RFC 5646: "Tags for Identifying Languages".

[i.34] ETSI TS 122 226: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Global text telephony (GTT); Stage 1 (3GPP TS 22.226)".

[i.35] ETSI TS 123 226: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Global text telephony (GTT); Stage 2 (3GPP TS 23.226)".

[i.36] ETSI TS 129 332: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Media Gateway Control Function (MGCF) - IM Media Gateway; Mn interface".

[i.37] Errata 1203 to IETF RFC 4103: "RTP Payload for Text Conversation".

NOTE: Available at https://www.rfc-editor.org/errata_search.php?rfc=4103.

[i.38] IETF Draft: "Additional Data Related to an Emergency Call, draft-ietf-ecrit-additional-data-37".

[i.39] IETF RFC 4566: "SDP: Session Description Protocol".

[i.40] IETF Draft: "Negotiating Human Language in Real-Time Communications, draft-ietf-slim-negotiating-human-language-00".

[i.41] IETF RFC 3264: "An Offer/Answer Model with the Session Description Protocol (SDP)".

[i.42] IETF RFC 6157: "IPv6 Transition in the Session Initiation Protocol (SIP)".

[i.43] IETF RFC 7090: "Public Safety Answering Point (PSAP) Callback".

[i.44] IETF RFC 6189: "ZRTP: Media Path Key Agreement for Secure RTP".

[i.45] GSMA IR.92: "IMS Profile for Voice and SMS".

[i.46] GSMA IR.94: "IMS Profile for Conversational Video Service".

[i.47] IETF RFC 3840: "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)".

[i.48] EENA 3.5.4.1: "Transnational Emergency Calls version 1.0".

[i.49] IETF RFC 5012: "Requirements for Emergency Context Resolution with Internet Technologies".

[i.50] IETF RFC 5764: "Datagram Transport Layer Security (DTLS) Extension to Establish Keys for the Secure Real-time Transport Protocol (SRTP)".

[i.51] IETF RFC 6497: "BCP 47 Extension T - Transformed Content".

[i.52] ETSI TS 127 007: "Technical Specification Group Core Network and Terminals; AT command set for User Equipment (UE)".

[i.53] ETSI ES 203 178: "Functional architecture to support European requirements on emergency caller location determination and transport".

[i.54] IETF Draft: "A Routing Request Extension for the HELD Protocol, draft-ietf-ecrit-held-routing".

[i.55] ETSI draft ETSI ES 203 283: "Protocol specifications for emergency service caller location determination and transport".

[i.56] BoR(15)135: "Update of the report on equivalent access and choice for disabled end-users". BEREC, 2015. Retrieved 29 November 2015.

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[i.57] RERC-TA "Real-time text interoperability; status and field trial", Gallaudet University 2015, Retrieved 8 December 2015.

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[i.58] ETSI TR 102 974: "Human Factors (HF); Telecommunications relay services".

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[i.61] EMYNOS, nExt generation eMergencY CommuNicatiOnS, Horizon 2020 project under grant agreement no 663762. Retrieved 06 January 2016.

NOTE: Available at http://www.emynos.eu.

[i.62] ETSI NG112 Emergency Communications Plugtest.

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[i.65] Recommendation ITU-T H.264: "Advanced video coding for generic audiovisual services".

[i.66] Recommendation ITU-T G.711 (11/1988): "Pulse code modulation (PCM) of voice frequencies".

[i.67] Recommendation ITU-T G.722 (09/2012): "7 kHz audio-coding within 64 kbit/s".

[i.68] Recommendation ITU-T T.140 (02/2000): "Protocol for multimedia application text conversation - Addendum 1".

[i.69] IETF RFC 4103 (2005): "RTP Payload for Text Conversation", G. Hellstrom and P. Jones.

[i.70] FCC EAAC: "Emergency Access Advisory Commmittee (EAAC) Report on TTY Transition". March 2013, retrieved January 05, 2016.

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3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Many of the definitions have been copied from ETSI TS 101 470 [i.2]. If there are any discrepancies between the definitions that follow and those in ETSI TS 101 470 [i.2], then the definitions that follow apply to the present document.

additional data: additional call related information provided by various entities in the path of the call in accordance with the data structures and mechanisms described in Draft IETF Additional Data Related to an Emergency Call [i.38]

address: identifier of the destination of a call containing only numbers, or a wider range of characters depending on the rules established by the application service provider

application service provider: organization or entity that, via a serving network, provides application-layer services, which may include voice, video and text communication

assisting services: services invoked during a call, assisting the Total Conversation user or the call-taker with specific tasks in the call

NOTE: Such tasks can for example be language translations, relay service or expert advice.

call-taker: agent at the PSAP that accepts calls and may dispatch emergency help

NOTE: Sometimes the functions of call taking and dispatching are handled by different groups of people, but these divisions of labour are not generally visible to the caller and thus do not concern us here (definition is copied from IETF RFC 5012 [i.49])

Emergency Services IP network (ESInet): Internet Protocol (IP) based communications network dedicated for public safety use

NOTE: An ESInet delivers emergency requests and corresponding data to emergency services providers and facilitates communication between emergency service providers and other supporting entities. An ESInet is typically deployed to support a set of PSAPs and other public safety agencies on a geographic basis. A given PSAP, or other appropriate entity, may connect to one or more ESInets. ESInets may be interconnected to facilitate emergency event handling and other related interactions (from EENA NG112 LTD [i.1]).

home environment: environment responsible for overall provision and control of the Personal Service Environment containing personalized information defining how subscribed services are provided and presented towards the user

NOTE: Each subscriber of the Home Environment has her own Personal Service Environment. The Personal Service Environment is defined in terms of one or more User Profiles.

IETF SIP: session control environment for calls, using the IETF RFC 3261 [i.16] and related protocols in the IP networks

NOTE 1: The above refers to an environment outside the scope of IMS.

NOTE 2: In ETSI TS 101 470 [i.2], the term "basic SIP" is used.

IP Multimedia Subsystem (IMS): standardized architectural framework for delivering Internet Protocol (IP) multimedia services, as described in ETSI TS 122 228 [i.10]

modalities: methods for human expression and perception of communication

NOTE: Examples are written, signed and spoken languages, pictures, gestures, etc.

multi-party call / conference: real-time communication session with more than two participants where media sent from participants are distributed for presentation among the participants in the call

NG112: next generation 112 emergency services provided via the Emergency Services IP network (ESInet)

non-Total Conversation emergency session: voice-only IP based emergency session that is not a Total Conversation session

Public Safety Answering Point (PSAP): physical location where emergency calls are received under the responsibility of a public authority

Real Time TexT (RTT): form of text conversation in point to point situations or in multipoint conferencing where the text being entered is displayed in such a way that the communication is perceived by the user as being continuous

relay node: functional entity providing a conference bridge to multiple parties, including and not limited to the Total Conversation user and the relay service, engaged in a total conversation session

NOTE: In the context of Total Conversation emergency session, the PSAP is also considered as a party using the relay Node.

relay service: telecommunications service that enables users of different modes of communication e.g. text, sign, speech, to interact by providing conversion between the modes of communication, normally by a human operator

NOTE: A type of assisting service (definition from ETSI ES 202 975 [i.5]).

serving network: entity that provides the user with access to the services of the home environment

Total Conversation: audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, Real-Time Text and voice between users in two or more locations

NOTE: Definition from Recommendation ITU-T F.703 [i.18].

Total Conversation emergency service: emergency service capable of handling total conversation emergency sessions

Total Conversation terminal: user terminal capable of being used for total conversation

Total Conversation user: individual taking advantage of the total conversation service

UICC: physically secure device, a Universal Integrated Circuit Card (or 'smart card'), that can be inserted and removed from the terminal

NOTE: It may contain one or more applications. One of the applications may be a USIM.

user profile: set of information necessary to provide a user with a consistent, personalized service environment, irrespective of the user's location or the terminal used (within the limitations of the terminal and the serving network)

3.2 Abbreviations

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

3GPP	3rd Generation Partnership Project
3PCC	3rd Party Call Control
AMR	Adaptive Multi Rate
AT command	ATtention Command
AVP	Audio Video Profile
AVPF	Audio Video Profile with Feedback
BOM	Byte Order Mark
CEPT	European Conference of Postal and Telecommunications Administrations
CN	Core Network
CS	Circuit Switched
CSG	Closed Subscriber Group
DTLS	Datagram Transport Layer Security
DTMF	Dual Tone Multi Frequency
EC	European Commission
ECC	Electronic Communication Committee (of the CEPT)
ECRIT	Emergency Context Resolution with Internet Technologies
EENA	European Emergency Number Association
ESInet	Emergency Services IP Network
ESRP	Emergency Service Routing Proxy
GSMA	GSM Association