

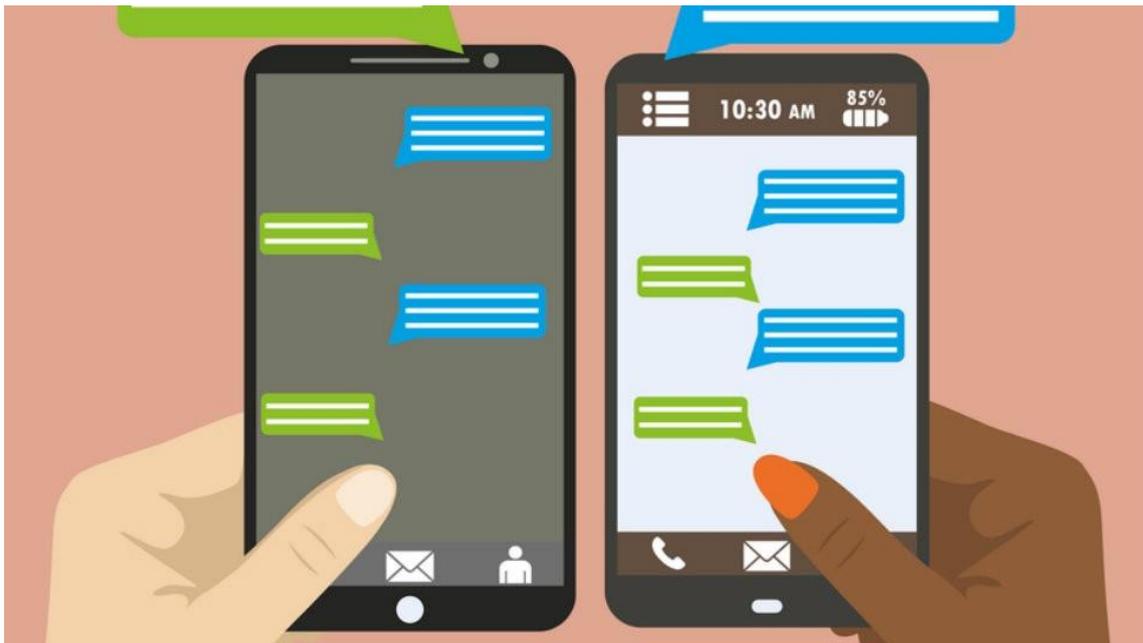


## Implementation of RTT and Total Conversation in Europe



The intention of this document is to provide information about implementations of Real-Time Text (RTT) and Total Conversation (TC) in Europe. Both modalities have been defined by international organisations such as IETF, 3GPP, ETSI and ITU-T.

## Implementation of RTT and Total Conversation in Europe



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Version: 2.0  
Publication date: 1/03/2023  
Status of the document: FINAL

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## EXECUTIVE SUMMARY

### Implementation of Real Time Text (RTT) and Total Conversation (TC) in Europe

Real-Time text (RTT) is text transmitted instantly, character by character, as it is typed. Recipients can immediately read the text while it is being written, without waiting. Total Conversation (TC) is a standard for synchronous communication that uses video, voice and real-time text.

Our focus is to identify and explain how these communication modalities are used in calls made to Emergency Services, for instance:

- Direct calls to Emergency Services
- Calls to Emergency Services via Telecom Relay Services

This document describes several initiatives that will improve accessibility and standardisation, which are in line with recent EU regulation that requires better accessibility, including the implementation of geolocation.



The intention of this document is to provide information about implementations of Real-Time Text (RTT) and Total Conversation (TC) in Europe.



- Definitions of RTT and TC
- RTT and TC protocols
- Examples of usage in North America and Europe
- The use of Over the Top (OTT) apps
- Conclusions and recommendations for further work

# 1 Background

The intention of this document is to provide information about implementations of Real-Time Text (RTT) and Total Conversation (TC) in Europe. Both modalities have been defined by international organisations such as IETF, 3GPP, ETSI and ITU-T.

Our focus is to identify and explain how these communication modalities are used in calls made to Emergency Services, for instance:

- Direct calls to Emergency Services
- Calls to Emergency Services via Telecom Relay Services

For comparison, this document also includes the following information:

- How these modalities (RTT and TC) have been implemented in North America (Canada and the United States).
- Other modalities of communication that use text and video to call 112, but do not follow the standards described by IETF, 3GPP and ITU-T.

There is ongoing work to establish harmonised standards on Emergency Communication in Europe, with a focus on the accessibility requirements defined in Article 4 of Directive (EU) 2019/882<sup>1</sup>. On 14th September 2022, the European Commission made an implementing decision “on a standardization request to the European standardization organizations as regards the accessibility requirements of products and services in support of Directive (EU) 2019/882”.

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<sup>1</sup> Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services (The European Accessibility Act (EAA)).

## 2 Definition of RTT

Real-time text (RTT) is text transmitted instantly, character by character, as it is typed. Recipients can immediately read the text while it is being written, without waiting. It uses IP-based technology on networks that support RTT.

RTT can be available in the core network and over the Internet (IP). For example:

- When available in the core network, an individual simply has to activate it in their smartphones in order to use it.
- When available over the internet, an individual will have to download an app or access a web page to use it.

### 2.1 RTT in Europe

RTT in Europe is mainly used by people who are Deaf, DeafBlind and Hard of Hearing (D, DB, HH) in Over The Top (OTT) apps that can be downloaded to smartphones. These apps can be specialised for specific user groups, such as for DeafBlind people.<sup>2</sup>

In addition to apps for smartphones, a few countries also offer web-based applications that are also available for other devices such as tablets and computers.

EN 301 549 is a harmonised standards for Information and Communications Technologies (ICT<sup>3</sup>). It is the Commission's intention that it be revised to include "accessibility requirements for electronic communication services with regards to real-time text (RTT) and Total Conversation (TC) including for number based interpersonal communications services and including when using roaming services. These requirements should also refer to the enablement of these services in the core of the communication networks on which these services are being provided<sup>4</sup>. The goal is that the new harmonised standards be fully implemented by PSAPs in 2027 at the latest, and the belief is that Native RTT will be required.

Chapter 4.1.1 contains further information about the implementation of RTT by Telecom Relay Services.

### 2.2 RTT in North America

The United States is the only country where RTT is currently available natively in the wireless network, whereas in Europe it has been commonly provided over the internet.

Although both the United States and Canada use the North American Numbering Plan the implementation of RTT differs between these countries since each country has its own jurisdiction and oversight. This may cause confusion when consumers cross the borders between the two countries:

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<sup>2</sup> RTT is challenging for DeafBlind people who are Braille users or who use Zoom functionality (very large text). This is because they need to control the speed of the incoming text so that they can read at their own pace. Navigation can be an issue as well since the individual will need to tab between functions and buttons. Specialised apps for DeafBlind are currently available in the United States and in Sweden.

<sup>3</sup> [https://www.etsi.org/deliver/etsi\\_en/301400\\_301499/301459/02.01.01\\_60/en\\_301459v020101p.pdf](https://www.etsi.org/deliver/etsi_en/301400_301499/301459/02.01.01_60/en_301459v020101p.pdf)

<sup>4</sup> [https://docbox.etsi.org/HF/HF/05-CONTRIBUTIONS/2022/HF\(22\)089012\\_Mandate\\_587\\_-\\_SR\\_EAA.pdf](https://docbox.etsi.org/HF/HF/05-CONTRIBUTIONS/2022/HF(22)089012_Mandate_587_-_SR_EAA.pdf)

- The United States has implemented RTT for point-to-point calls and for calls to Emergency Services. Moreover, if the receiving party doesn't have RTT, the call will be connected as TTY.
- Canada hasn't implemented RTT, yet, and the decision so far is that RTT will be implemented for calls to 911 (Emergency Services).

RTT is available in the United States in the core network of wireless providers. It was defined by the Federal Communication Commission (FCC) in 2016 as the technology to replace textphones/TTY<sup>5</sup>.

RTT is activated directly in wireless devices (smartphones) and the feature is available for telephone plans provided by the wireless carriers. Once activated, the caller can dial a number in the national number plan and make a phone call. If the other party has RTT activated, then both parties can text and use audio; however, if the other party has not activated RTT in their device, only audio can be used.

RTT in the United States is backwards compatible with textphones/TTY. If an individual makes a call with RTT to another party that is a TTY, then the call will be converted to TTY by the wireless provider where the call was originated.

To date, the following services are available: point-to-point calls between users, calls to other textphones/TTY or calls to services that use TTY. In the latter two examples, RTT is converted to TTY.

## 2.3 RTT Protocols

Real-time text protocols include Text over Internet Protocol (text over IP, or ToIP), and it has been designed using the following protocols:

- ITU-T T.140
- IETF: RFC 3261 (Session Initiation Protocol, SIP), RFC 4103 (RTP payload for Text Communication), which has been updated with RFC 9071 to support multi-party real-time text calls defined in RTP-Mixer Formatting of Multiparty Real-Time Text.

## 2.4 RTT to Emergency Services

### 2.4.1 RTT calls to 911: Emergency Services in North America

The North American Emergency Number Association (NENA) defines the standard for RTT in Emergency Calls in their document NENA i3 Standard for Next Generation 911<sup>6</sup>.

#### The United States

The Federal Communication Commission (FCC) has established a Disability Advisory Committee (DAC), which provides the FCC with advice and recommendations on a wide variety of disability

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<sup>5</sup> <https://www.fcc.gov/real-time-text>

<sup>6</sup> [https://www.nena.org/page/i3\\_Stage3](https://www.nena.org/page/i3_Stage3)

issues <sup>7</sup>. There are a few reports on the topic of Accessibility to Emergency Services and the use of Real-Time Text (RTT).<sup>8</sup>

## Canada

The Canadian Radio-Television and Telecommunications Commission (CRTC) had defined that RTT will replace textphones (TTY) for emergency calls in Canada<sup>9</sup>. The CRTC has established working groups (Task Identification Forms) with the participation of stakeholders to define RTT to Relay and RTT to 911. These groups are TIF83<sup>10</sup> and TIF89<sup>11</sup>.

## 2.4.2 RTT calls to Emergency Services in Europe

### 2.4.2.1 Direct communication to the PSAP based on RTT

In Europe, the following documents issued by IETF and ETSI are used as guidelines:

- IETF RFC 6881 - Best Current Practice for Communications Services in Support of Emergency Calling <sup>12</sup>
- ETSI TS 101 470 - Emergency Communications (EMTEL); Total Conversation Access to Emergency Services <sup>13</sup>
- ETSI TS 103 479 - Emergency Communications (EMTEL); Core elements for network independent access to emergency services <sup>14</sup>

### 2.4.2.2 Indirect communication via Telecom Relay Services

RTT has been mainly implemented as Over the Top (OTT) apps and web applications by several Telecom Relay Services. These apps are used to make general calls as well as emergency calls via relay services.

Normally, the call is handled as follows:

- A deaf person calls the Relay Service, and the Relay Service makes a voice call to the Emergency Services.
- Some apps have a special button in the dialer panel that allows users to call directly to the relay service by clicking on it.
- The call is routed to the Relay Service either as a priority call or as a regular call.
- Currently, geolocation is usually not sent to the relay service. This means that the relay service operator must ask the users where they are calling from and identify the location before contacting the PSAP.
- If the call is interrupted or dropped, there is often administrative procedures defining how the call should be re-established.

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<sup>7</sup> <https://www.fcc.gov/disability-advisory-committee>

<sup>8</sup> Relevant DAC reports that are available in the FCC web page: Recommendation of the FCC Disability Advisory Committee on the Report Prepared by the Real-Time Text Deployment in Wireline Networks Working Group (February 24, 2022), Recommendation of the FCC Disability Advisory Committee Prepared by the Pandemic Communication Access Working Group, Concerns and Lessons Learned regarding Communication Access for People with Disabilities During the Pandemic (September 9, 2021).

<sup>9</sup> Latest update on this topic: <https://crtc.gc.ca/eng/archive/2021/2021-199.htm>

<sup>10</sup> <https://crtc.gc.ca/cisc/eng/cisf3e4c.htm>

<sup>11</sup> <https://crtc.gc.ca/cisc/eng/cisf3fe.htm>

<sup>12</sup> <https://datatracker.ietf.org/doc/html/rfc6881>

<sup>13</sup> [https://docbox.etsi.org/EMTEL/Open/emtel-00055v103\\_ts%20101%20470\\_stable%20draft.pdf](https://docbox.etsi.org/EMTEL/Open/emtel-00055v103_ts%20101%20470_stable%20draft.pdf)

<sup>14</sup> [https://www.etsi.org/deliver/etsi\\_ts/103400\\_103499/103479/01.01.01\\_60/ts\\_103479v010101p.pdf](https://www.etsi.org/deliver/etsi_ts/103400_103499/103479/01.01.01_60/ts_103479v010101p.pdf)

In countries where Telecom Relay Services are available, the deaf community prefers to use the same app they use to make telephone calls when they make an emergency call. As long as the call is local, this represents no problem. However, there are clear issues if the relay service is not located in the same region or country when an emergency call is made. Roaming issues become a huge problem as well.

Another disadvantage in this call scenario is that there is a lack of standardisation and/or recommendations that define the interaction between TRS and PSAPs. This may cause delays, for example in identifying or validating location information. To date, there is only very limited reference to standards and protocols that describe the interaction between Telecom Relay Service and Emergency Services in Europe.<sup>15</sup>

Recent regulation containing more specific rules related to accessibility for people with disabilities, including the specification of “functional equivalency requirements”, are very important in order to safeguard accessibility to emergency services. One important example is the delegated regulation supplementing Article 109 of the European Electronic Communication Code (directive 2018/1972) <sup>16</sup>, for instance:

- In many countries, access to Emergency Services is only provided via Relay Services and direct calls to 112 are not available.
- According to new legislation, geolocation should be available during calls to Emergency Services. It is important for Relay Services to evaluate the impact of this requirements to their services and operations.

### 2.4.3 Other Text Modalities

The simple definition of RTT is “text which is typed, sent and received character by character”. Currently, many text-based solutions to contact emergency services available in Europe are not harmonised according to the above definition. Chapter 4 contains examples of service implementations in Europe.

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<sup>15</sup>Example of reference document: Emergency Communication from Third-Party Service Providers (<https://eena.org/knowledge-hub/documents/emergency-communications-from-third-party-service-providers/>)

<sup>16</sup>[https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13183-Emergency-communications-improving-access-through-the-single-European-emergency-number-112\\_en](https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13183-Emergency-communications-improving-access-through-the-single-European-emergency-number-112_en)

## 3 Definition of Total Conversation

Total Conversation (TC) is a standard for synchronous communication that uses video, voice and real-time text. It was defined in ITU-T recommendation F.703 of 2000 (Multimedia Conversation Services)<sup>17</sup>. The simultaneous use of video, voice and real-time text allows callers to use the most suitable modalities of communication during a call.

Deaf people can use video for sign language and write text in during a conversation, for instance instead of finger-spelling the name of a medicine, foreign names, etc. DeafBlind people can use video to sign to the other party and receive all communication in text and read it either on the screen or in a braille device connected to the smartphone or computer.

TC is currently only available on Over the Top (OTT) apps for smartphones, computers and other devices and via the Web.

### 3.1 Total Conversation in the United States

Total Conversation is used in the United States by most Video Relay Services providers (VRS), which are regulated and financed by the FCC. Although these services follow the definition of Total Conversation, the terminology is currently not widely used in the United States. The standards used are documented in the SIP Forum VRS US Providers Profile<sup>18</sup>.

TC is provided as Over the Top (OTT) and are commonly used to make and receive calls via VVRS.

These apps do not use phone numbers available in the National Numbering Plan, but instead they use numbers made available by the FCC, which is called the iTRS Database, or Internet-Based Telecommunication Relay Services Numbering<sup>19</sup>.

### 3.2 Total Conversation in Europe

Total Conversation in Europe is used in a similar way as in the United States: It is used by many Video Relay Services. TC is available in several European countries, but it is not fully standardised.

### 3.3 Total Conversation Protocols

The SIP Forum VRS US Providers Profile in the US provides extended details and requirements that are used in the United States. Other examples of Protocols used by Total Conversation are:

- Session Initiation Protocol (SIP) for call handling according to RFC 3261<sup>20</sup>
- T.140 with RFC 4103 for RTT
- Video Codecs H.264 and VP 8
- Audio Codecs G.711, G.722 and other protocols commonly used in VoIP calls.

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<sup>17</sup> ITU-T F.703: <https://www.itu.int/rec/T-REC-F.703/>

<sup>18</sup> <https://www.fcc.gov/files/sip-forum-vrs-us-providers-profile-twg-61>

<sup>19</sup> <https://www.federalregister.gov/documents/2011/09/27/2011-23824/internet-based-telecommunications-relay-service-numbering>

<sup>20</sup> <https://www.ietf.org/rfc/rfc3261.txt>

## 3.4 Total Conversation to Emergency Services

### 3.4.1 TC calls to 911: Emergency Services in North America

TC is not available for direct calls to 911 in North America.

In the United States and Canada, callers that want to use TC must make their calls to 911 via a Video Relay Service (VRS). These calls are connected to the VRS, and the sign language interpreter makes a call 911 using voice.

### 3.4.2 TC calls to Emergency Services in Europe

#### 3.4.2.1 Direct communications

The European Project REACH112 is the only blueprint in Europe that attempts to define how TC can be used to make direct calls to Emergency Services.

#### REACH112: Pilot Project 2009-2012

Responding to All Citizens needing Help (REACH) aimed at piloting Total Conversation in Emergency Services was widely tested during the REACH112 project. The project was a landmark in testing and verifying the benefits of Total Conversation in emergency calls, and according to EENA:

“REACH112 had been a blueprint for the extension of IP-based communications, Total Conversation and emergency services in the EU. It provided guidance for the improvements of communication between all citizens – in particular those with disabilities – as well as the accessibility and call handling of all EU emergency services.

This project was co-funded by the European Commission within the ICT Policy Support Programme (Grant Agreement Number: 238940).”<sup>21</sup>

To our knowledge, there are no countries in Europe that offer direct calls using TC as defined in REACH112 or that use the protocols defined under point 3.3.

#### 3.4.2.2 Via a Third-Party Provider

In few countries such as France and Lithuania, people who are Deaf, DeafBlind and Hard of Hearing and use video may call a special number or click on a dedicated button in the app to access a video interpreter or specialised call takers who will work as intermediators to the Emergency Services. Video, chat, and voice are normally available in those calls.

Where Video Relay Services (VRS) are widely available 24/7, individuals are able to call the Emergency Services via a video interpreter. To date, only a few countries such as Germany, Sweden and the United Kingdom offer 24/7 access to Emergency Services via VRS.

The calling process is similar to the one for RTT calls via TRS to Emergency Services.

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<sup>21</sup> <https://eena.org/our-work/eu-projects/reach-112/>

## 4 Example of implementations

This chapter describes additional information about services where RTT and TC have been implemented in Europe, including experience from Call Agents in Telecom Relay Services when they handle Emergency calls. As reference, the experience by two Emergency Services when handling these calls in the Netherlands was also included.

### 4.1 Over the Top (OTT) apps used for Communication

#### 4.1.1 OTT RTT in Telecom Relay Services

The implementation of Relay Services and RTT differs widely in Europe. Whereas RTT is mandatory in several countries by national telecom regulators, other countries have set up video-based interpreting services as a complement for their interpretation services.

This means in practice that RTT has been deployed in many European countries, but it is required in the national legislation only in a few countries, for instance:

- 1) Examples of countries that require that RTT in their legislation as part of their procurement requirements are for example France, Germany, The Netherlands, and Sweden.
- 2) Examples of countries where RTT has been rolled out in TRS, although it is not required by law are parts of Belgium (Flanders), Denmark, Finland, Norway, and Switzerland.

#### 4.1.2 OTT RTT to Emergency Services in The Netherlands

RTT to 112 has been regulated in the Netherlands since 2014, at the same time as textphones (TTYs) were switched off from the network. The D, DB, HH communities use the same Over the Top (OTT) apps as they use when making phone calls via the relay service.

Callers initiated their calls by either dialing 112 on their apps, or selecting a predefined contact in their app. This is how calls are made:

- A Deaf person makes a call to 112 in their app.
- The call is identified in the platform of the Relay Service as being a RTT call to 112. It is then connected directly to the 112 Primary PSAP.
- Geolocation is available to the call taker so that they can connect the call to the nearest PSAP based on it.
- The call taker receives the call in a separate application and handles it . They will work as intermediary for the secondary PSAP, for instance a local ambulance or fire brigade, if needed. Voice is not used, although the sound is available and the call taker can hear the surroundings.
- If a call is interrupted, the PSAP will make a call back. If the call back is not answered, the PSAP will send an ambulance to the emergency location.

Currently the service supplier in the Netherlands is finalising the integration of RTT into the core 112 network, and further into the same queue as voice calls.

Other recent changes that were implemented are:

- Inbound RTT calls are connected to a call taker that is available. A special application is automatically started, and the call taker can handle RTT and voice from the same workstation.
- Geolocation information for the app is available in the same application used by voice calls.

Experience from the service:

- An average of 40 RTT calls are handled every month, excluding test calls.
- The handling of RTT calls is included in the training for the PSAP call takers. They are taught how to (technically) answer a TC-call and how to communicate with people who are D, DB or HH. Periodic training consists of a "training on the job" and on a regular basis by answering test calls.
- Currently, RTT calls are only handled using text. The voice path that is available during all calls is mainly used to hear any background noise which can sometimes support the conversation. However, the 112 agent only communicates through RTT.
- Observations and notes provided by the Dutch Police:
  - The 112 agents are taught to adapt their language to the communication and culture of the Deaf community. Callers are born deaf, which means that their sentence structure may differ from that of hearing people.
  - The 112 agents use pre-set text blocks, for example "who do you want to speak to?", etc.
  - At the end of a typed sentence, the agent types the letter "X" which indicates turn-taking. At the end of a call, the letters "XQ" are used to mark that it is the end of the conversation.

#### 4.1.3 Austria – DEC112 app

- The Austrian emergency services have offered text-based access to its emergency services since 2019. The OTT app DEC112 is based on ETSI standards<sup>22</sup> as it is integrated into the next generation core network<sup>23</sup>.
- To date, 5231 devices have registered for the service, and 942 calls to the emergency services have been made. The service receives an average of 10 calls per month.
- For training and quality-of-services purposes, the app uses the same process and call flow as the app used for the general public (Emergency Call app "Rettung"). Further support to staff is provided by a detailed description of the process with pictures in the service internal knowledge database. In addition, the app is also content of a CDE (Continuing Dispatch Education).
- Most emergency communications initiated using the DEC112 app are text based only. Not all calls reported are strictly emergency calls, but a number of people use it to get in touch with the Austrian Public Health Service (telephone number 1450) and other healthcare advice, for instance on COVID-19.

#### 4.1.4 112 app in the Netherlands

- The Netherlands has launched a 112 specialised app for text-based communication to emergency services. It is seen as a complement to the RTT over-the-top app that is widely used by the deaf community.
- The 112 app connects to the Stage 2 PSAP directly, and it can be used by all citizens in the Netherlands that have downloaded the app, hearing or non-hearing. The app passes

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<sup>22</sup> TS 103 479 and TS 103 698

<sup>23</sup> <https://www.dec112.at/en/>

on geolocation and can be used for direct communication with secondary PSAPs using voice and/or chat<sup>24</sup>.

#### 4.1.5 Interoperability of OTT apps – PEMEA

The goal of PEMEA architecture is to establish a network environment that enables EU citizens to access emergency services across the borders with their local apps. When the PEMEA network is available, a user will be able to access emergency services with their local apps when roaming, and the right app information (caller location, caller language, ICE contacts, etc.) to the local PSAP.<sup>25</sup>

PEMEA RTT is an adaptation of its chat function that conforms to the standard ITU-T T.140 but not to the protocols defined under 2.3. It is further described in the following documents:

- ETSI TS 103 525-3 V1.2.2 (2022-07)<sup>26</sup>
- PEMEA's adaptation is described in a technical document available in the PEMEA homepage.<sup>27</sup>

#### 4.1.6 OTT apps in Spain

Spain has a variety of apps that use different standards to communicate directly with Emergency Services or via the Video Relay Services. Spain has 19 regional governments, each with their own 112 setup. We have listed some examples of apps available in Spain:

- CESTEL is PEMEA compliant and it allows RTT-based chat and video communication to Emergency Services via the Video Relay Services. The app is called **SVISUAL** (in Google Play: <https://play.google.com/store/apps/details?id=com.CESTEL.FCNSEMobileAppDroid&hl=es&gl=US>)
- The telecom operator Telefonica has developed the emergency app **My112** which sends geolocation and pre-set messages to a local PSAP. The app can also send emergency notification to pre-selected contacts, and it is available for iOS and Android.<sup>28</sup>
- My local 112 is an app available in the Basque Country which is also PEMEA compliant. The app allows the user to select the emergency type (police, fire, accident, ambulance). During registration, the user may add medical and other personal information as well.<sup>29</sup>
- National Police have an app called AlertCops (<https://play.google.com/store/apps/details?id=com.alertcops4.app&hl=es&gl=US>) allowing for text-based comms with Police PSAPs.

#### 4.1.7 OTT apps in Germany

The Emergency Services in Germany can be reached using the following OTT apps:

Nora<sup>30</sup>

- Nora is the official emergency call app of the German federal states.
- This app lets you contact the police, fire brigade and rescue service quickly and easily in an emergency. Anywhere in Germany.

<sup>24</sup> <https://www.politie.nl/nieuws/2022/januari/12/lancering-112nl-app.html>

<sup>25</sup> <https://eena.org/pan-european-mobile-emergency-apps-project-pemea/>

<sup>26</sup> [https://www.etsi.org/deliver/etsi\\_ts/103500\\_103599/10352503/01.02.02\\_60/ts\\_10352503v010202p.pdf](https://www.etsi.org/deliver/etsi_ts/103500_103599/10352503/01.02.02_60/ts_10352503v010202p.pdf)

<sup>27</sup> <https://pemea.help/wp-content/uploads/2021/09/Real-Time-Text-for-PEMEA-consortium-1.0d.pdf>

<sup>28</sup> <https://www.orientatech.es/en/my112>

<sup>29</sup> <https://play.google.com/store/apps/details?id=com.gvdi.euskarri.app112&hl=es&gl=US>

<sup>30</sup> <https://www.nora-notruf.de/en-en>

- nora uses the geolocation function of your mobile device to communicate your exact location to the responsible emergency control centre. This enables responders to find you more easily, even if you don't know exactly where you are.

Tess<sup>31</sup>

- Tess Relay Services is the national relay service in Germany. OTT apps can be downloaded.
- If possible, Tess technical platform identifies the geo location of the caller. In case the geo location is not transmitted (e.g., caller not using apps etc.) or the emergency takes place somewhere else, the interpreter identifies the emergency's address during the conversation with the caller. Either information is then used to connect to the correct PSAP.

#### 4.1.8 OTT app in Romania

Romania is currently implementing NG112. When the new service is put into operation, the Romanians will be able to call 112 with text using the new citizen app, Apel 112. The app is PEMEA compliant and has implemented the PEMEA RTT standard.

This is how the service will work:

- Citizens will be able to call using Over the Top (OTT) apps on Android or iPhone.
- The goal is that anyone will be able to use it and registration will not be required. However, registered users could make a call from their phones to 112, and the PSAP would then send a link to a HTML5 webRTC-based page with text and video capability.

#### 4.1.9 Direct calls to Emergency Services in France

The emergency service in France has a different calling number for the deaf community. The service for the deaf community is called Urgence 114<sup>32</sup>, and it can be accessed as follows:

- SMS or fax to the number 114
- iOS and Android app for text/voice and video.

It is necessary to register and use the service's app to make text/voice or video calls to 114.

#### 4.1.10 SMS to 112

SMS is an established communication modality that is available in several countries to offer accessibility for people who are D, DB and HH. Further information about how SMS is used, registration requirements, and other related topics is available in the EENA Annual Publication Public Service Answering Points – 2021 Global Edition.<sup>33</sup>

Note also that whereas a number of countries such as Belgium, the Netherlands and Sweden have implemented SMS to 112, other countries such as Switzerland have implemented SMS via the Relay Service, which then makes a voice call to 112.

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<sup>31</sup> <https://www.tess-kom.de> Tess uses a technical platform that conforms to standards for RTT and for Total Conversation as specified in points 2.3 and 3.3 respectively.

<sup>32</sup> <https://www.info.urgence114.fr>

<sup>33</sup> <https://eena.org/knowledge-hub/documents/>

## 4.2 Experience of Norwegian Text Relay Services' interaction with PSAPs

It is important to note that in 2022, the Norwegian Telecom Regulator (NKOM) was the first regulator in Europe to decide that RTT will be rolled out in the wireless network as Native RTT<sup>34</sup>.

However, at this stage, people who are D, DB and HH call a special emergency number (1412). They use the same app or web application that is provided by Telenor to connect to the Text Relay Service, or the TC app provided by NAV (the Norwegian Labour and Welfare Administration) to connect to the Norwegian Remote Video Interpreter<sup>35</sup>.

Call to 1412 are received by the Norwegian Text Relay Service, which is responsible for handling the calls and connecting them to the Emergency Services.

The Relay Service has been handling these calls for many years, and previously textphones (TTY) were used. This is their experience with the service:

- In 2021 there were 19 emergency calls, and in 2022 there were 15 calls.
- Although there is a special emergency number, often callers use the regular relay service when they make an emergency call. For instance, in 2021 10 of the 19 calls made were placed to the relay service number, and in 2022, 10 out of the 15 calls.
- Location information is not available, so the agents have to ask where the caller is. If the caller is not sure, the agent calls the Primary PSAP in the capital Oslo for location identification.
- The voice channel is always open, even if the caller is not using their voice to speak. This is to get an idea about what is going on in the background.

## 4.3 Experience of the Swedish Emergency Service

### 4.3.1 Calls to 112 via the Relay Service

Currently all RTT and TC calls are connected via the Relay Services, and SMS are made directly to 112.

Call volume in 2021:

- 307 calls were made via the Text Relay Service (418 calls in 2020). Callers used RTT on OTT apps or web application.
- 485 calls were made via the Video Relay Services (428, in 2020). Callers used TC on OTT apps or web application.
- 796 SMS calls were made (864 in 2020). Callers have to be pre-registered and only D, DB, HH and people with speech impairment are allowed to make SMS calls.

Of the above calls:

- 33 were related to health issues (62 in 2020)
- 4 were made by people who needed rescue (1 in 2020)
- 0 to the police (0 in 2020)
- Other reasons: 65 (58 in 2020)

<sup>34</sup> <https://www.nkom.no/aktuelt/norge-forst-ute-i-europa-med-ny-tjeneste>

<sup>35</sup> About NAV Remote Interpreter Service (Information in Norwegian):

<https://www.nav.no/no/person/hjelpemidler/hjelpemidler-og-tilrettelegging/tolketjenesten/skjermtolk>

- 684 were test calls or not emergency calls (743 in 2020)

Additional experience:

- Geolocation is not available. This is done via interview with the caller (either via the Relay Service or direct if it is a SMS).
- All calls using RTT and TC are relayed via a Telecom Relay Service. This means that these calls are only voice, whereas the Relay Service will use either RTT or TC to communicate with the caller.
- When calls are made via the video relay services using TC, and video is available, the interpreter may give additional information to the call taker about the environment. For instance, the caller may show with the camera if there is fire.
- SMS calls taken an average of 21-23 minutes. Besides, consumer organisations (D, DB, HH) would like to have other options to call 112.
- Registration is required to send a SMS, but user organisations are very negative to it.

### 4.3.2 RTT and TC calls to 112 in Sweden

Even if RTT is an accessibility requirement by the government, there have been public requirements that text is available for any caller, for instance in situations when voice cannot be used due to a threat, and that also video can be used as a complement to the call, for example, to show a fire.

#### Past Experience

Sweden took part in the REACH112 project (point 3.4.2 above). This is a summary of the service's experience during the project:

- The average length was 6-7 minutes.
- Call Takers experienced that RTT was helpful when a road or street were written instead of finger-spelling using sign language.
- Video communication was established as a 3-party call with the caller, interpreter, and Call Taker. However, Call Takers were unwilling to activate their camera.

In 2016-17, the 112 organisation made a pilot project during which callers could send a picture to 112. It was very useful when callers did not speak fluent Swedish so that the call taker could better understand what was happening or to send a picture with a street name in Swedish.

#### Viability Study: Implementation of Direct RTT and TC Calls to 112 in Sweden

The Swedish 112 Emergency Service is currently conducting a pre-study to analyse the viability of implementing direct RTT and TC calls to 112. The following main questions are being discussed:

1. Call Recording: when and how to save TC/video calls:
  - From a legal perspective, it is also important to understand the integrity principals – are there other people shown on a recorded video? How is GDPR to be applied?
  - From a technical perspective, how much data space would it be required? In Sweden, for example, voice calls concerning medical data are saved for 10 years.
2. Process: How to handle calls and how to engage stage 2 PSAPs

- The process for handling calls must be defined. For instance: If the Primary PSAP takes TC and RTT calls, how will the communication with the stage 2 PSAP be? Would the PSAP need to stay on the call to intermediate with the stage 2?
- In Sweden, the interpretation of the EECC states that the stage 2 PSAPs also need to comply with RTT requirements, and calls to stage 2 PSAPs would then be transferred to them. This is based on the following paragraphs under Article 2, Definitions<sup>36</sup>:
  - §37: 'most appropriate PSAP' means a PSAP established by responsible authorities to cover emergency communications from a certain area or for emergency communications of a certain type
  - §38 'emergency communication' means communication by means of interpersonal communications services
  - §39 'emergency service' means a service, recognised as such by the Member State, that provides immediate and rapid assistance in situations where there is, in particular, a direct risk to life or limb, to individual or public health or safety, to private or public property, or to the environment, in accordance with national law.

### 3. Call Back

- What are the requirements for call back? The Swedish 112 service would like to have more clarity in the EU requirements.

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<sup>36</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L1972>

## 5 Conclusions and recommendation for further work

### 5.1 Conclusions

The US has defined that RTT uses RFC4103 protocol, with corresponding documentation and information defined by the Federal Communication Commission and NENA, as presented above. In Europe however, there is currently no technical specifications for how RTT should be implemented. The consequence is clear: in Europe there are several apps available that use different text and/or video protocols.

That may change, as pointed out under point 2.4.2, since the European Commission's goal is to standardise the accessibility requirements for electronic communication services with regards to real-time text (RTT) and Total Conversation (TC).

Currently there are several differences between how services are accessed, and how RTT and TC are used in Europe:

- Several countries use RTT according to RFC4103, including interoperable apps and open standards. Some countries do it based on their national regulation, while others do not regulate it at all and leave the decision to the market.
- Other countries use RTT, but not according to RFC 4103. This may cause compatibility and roaming issues in the future.
- There are also differences in calling patterns: Some countries provide specialised 112 apps to be used, whereas other countries allow the deaf community to use the apps they currently use to make phone calls via Telecom Relay Services. There are advantages and disadvantages in both alternatives.
- There is no functional equivalency in Europe: Accessibility to emergency services by people who are Deaf, DeafBlind and Hard of Hearing is improving very, very slowly. To date the number of calls to emergency services by these communities is still extremely low.
- Geolocation is generally not available yet for callers who are Deaf, DeafBlind and Hard of Hearing and use an app to make a phone call.

### 5.2 Recommendations

This document describes several initiatives that will improve accessibility and standardisation, which are in line with recent EU regulation that requires better accessibility, including the implementation of geolocation. However, the effort should be coordinated.

The European Accessibility Act defines that PSAPs should also handle Total Conversation. As an interim solution, the Netherlands can be an example of good practice: RTT calls are made directly to 112 but Total Conversation calls are directed via the Video Relay Services, so that calls that need a sign language interpreter can be accommodated.

A number of areas may need to have further harmonisation, such as:

- RTT and TC should be standardised within the EU so that roaming, and service provisioning can work.
- If Native RTT is implemented in the EU, accessibility and geolocation will increase tremendously.

- Video is necessary for those who use sign language. Currently these calls are connected via a Video Relay Service. However, to guarantee functional equivalency, calls should be connected to 112 first, and then an interpreter should be connected to the call if necessary.
- Calls to 112 via a Third-Party Provider, for instance a Telecom Relay Service, should be further described and a common process within the EU, including roaming and connection of interpreters, should be defined.

## 6 References

The list below contains additional references to the ones already listed in the footnotes.

### 6.1 Additional NENA documentation

Calls via IP Relay and Video Relay:

[https://www.nena.org/general/custom.asp?page=Video\\_IP\\_911Relay](https://www.nena.org/general/custom.asp?page=Video_IP_911Relay)

PSAP Readiness for Real-Time Text (RTT) Information Document:

<https://www.nena.org/page/RTT?&hhsearchterms=%22rtt%22>

### 6.2 Other references

Wikipedia: [https://en.wikipedia.org/wiki/Real-time\\_text](https://en.wikipedia.org/wiki/Real-time_text)

Federal Communication Commission about Telecom Relay Services and RTT:

<https://www.fcc.gov/consumers/guides/real-time-text-improving-accessible-telecommunications>

<https://www.federalregister.gov/documents/2011/09/27/2011-23824/internet-based-telecommunications-relay-service-numbering>

Apple: Native RTT

<https://support.apple.com/en-us/HT207033>

Zetterström, E. (2011). Mobile Total Conversation – Communication for All, Everywhere. In: Campos, P., Graham, N., Jorge, J., Nunes, N., Palanque, P., Winckler, M. (eds) Human-Computer Interaction – INTERACT 2011. INTERACT 2011. Lecture Notes in Computer Science, vol 6949. Springer, Berlin, Heidelberg. [https://doi.org/10.1007/978-3-642-23768-3\\_32](https://doi.org/10.1007/978-3-642-23768-3_32)  
(<https://rdcu.be/cZxAs>)

## 6.3 Table of Acronyms

<b>Acronym</b>	<b>Description</b>
<b>RTT</b>	Real-Time Text
<b>EAA</b>	European Accessibility Act
<b>TC</b>	Total Conversation
<b>IETF</b>	Internet Engineering Task Force
<b>3GPP</b>	3 <sup>rd</sup> Generation Partnership Project
<b>ITU-T</b>	ITU Telecommunication Standardisation Sector
<b>IP</b>	Internet Protocol
<b>OTT</b>	Over The Top
<b>ICT</b>	Information and Communications Technologies
<b>PSAP</b>	Public Safety Answering Point
<b>TTY</b>	TeleTYpe
<b>FCC</b>	Federal Communication Commission
<b>ToIP</b>	Text over Internet Protocol
<b>DAC</b>	Disability Advisory Committee
<b>NENA</b>	North American Emergency Number Association
<b>CRTC</b>	Canadian Radio-Television and Telecommunications Commission
<b>ETSI</b>	European Telecommunications Standards Institute
<b>TC EMTEL</b>	Technical Committee Emergency Telecommunications
<b>TRS</b>	Telecom Relay Services
<b>ITRS</b>	Internet-based Telecommunication Relay Services
<b>SIP</b>	Session Initiation Protocol
<b>VRS</b>	Video Relay Service