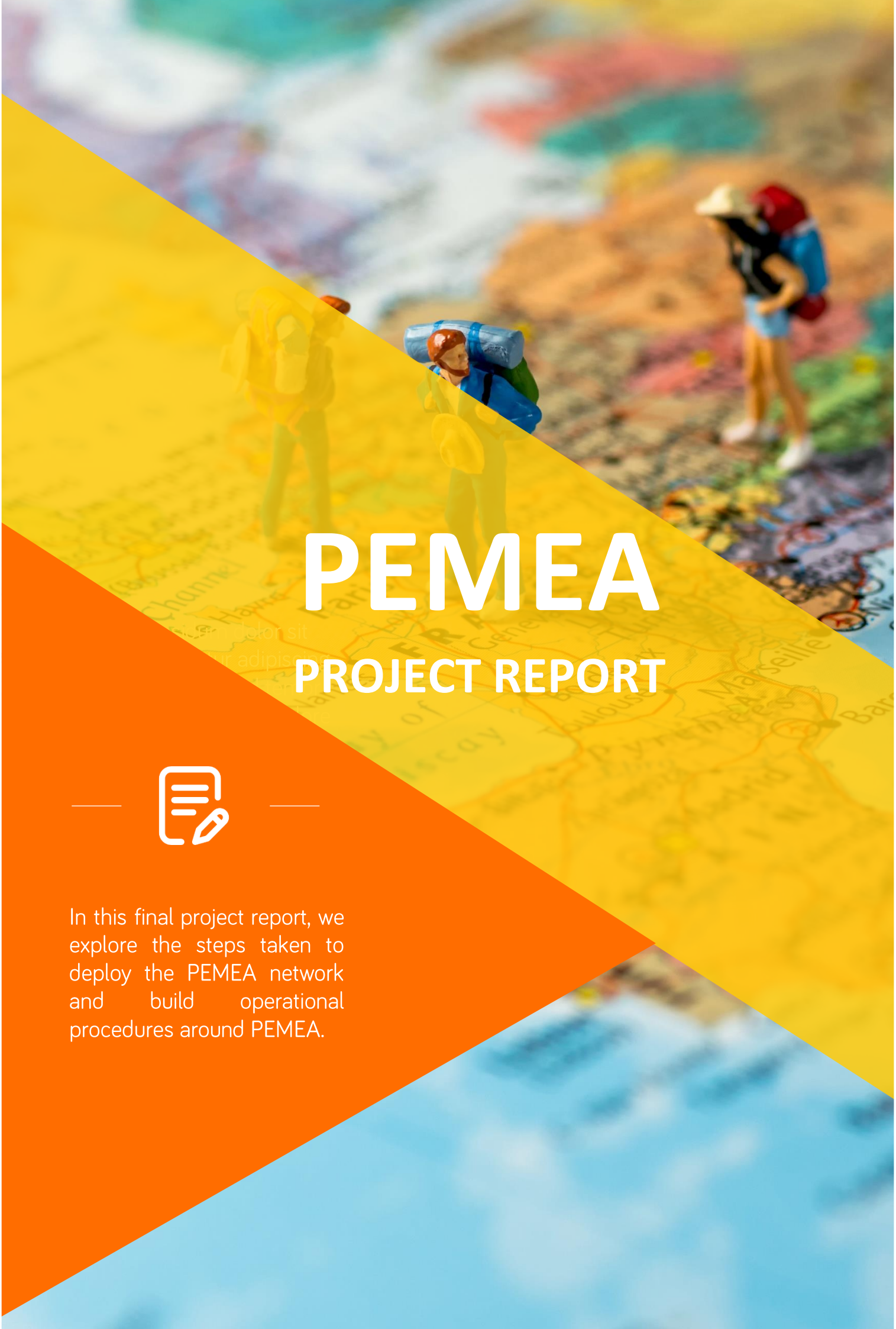

PEMEA

PROJECT REPORT

In this final project report, we explore the steps taken to deploy the PEMEA network and build operational procedures around PEMEA.

PEMEA : Project Report

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Authors that contributed to this document:

This document was written by members of EENA

Authors:

Bertrand Casse - Deveryware

Javier Cabas – Deveryware

Luca Bergonzi – Beta80

Contributors:

Cristina Lumbreras – EENA

Rose Michael – EENA

EENA

European Emergency Number Association

EENA 112

Avenue de la Toison d'Or 79, Brussels, Belgium

T: +32/2.534.97.89

E-mail: info@eena.org

EXECUTIVE SUMMARY

Apps are an increasingly common method of communication and many emergency services can now be accessed through this channel. Previously, emergency Apps could only function within a certain country or region. This created a dangerous situation where people were unable to request help once they crossed a certain border.

The Pan European Emergency Application (PEMEA) is a communication framework introduced to enable emergency Apps to work across borders. All European citizens would then be able to use their local emergency Apps whilst travelling and Public Safety Answering Points (PSAPs) would be able to provide the best service possible to citizens. EENA's PEMEA project aimed to foster the deployment of the PEMEA network, build operational procedures around PEMEA and share information about the architecture across Europe.

The use cases of the project involved testing data communication capabilities and multimedia communication between the App and the most appropriate PSAP. By the end of the project, eight PSAPs and eleven Apps had validated their conformance with the PEMEA standard. The PEMEA network is now ready to connect new Apps and PSAPs in Europe.

This document is accompanied by the *PEMEA GDPR Conformance Statement*[1].

The *PEMEA Project* was launched in two phrases. The first phase project report is available *here*. The second phase of the project began in November 2019.

This document presents the PEMEA project, including use cases, the primary entities and communication interfaces of the PEMEA architecture, conclusions and next steps. Any Apps or PSAPs wishing to connect to the PEMEA network should contact the PEMEA consortium.

[1] *https://eena.org/document/pemea-gdpr-conformance-statement*

1 | OVERVIEW OF PEMEA STANDARD & PROJECT

PEMEA (Pan European Emergency Application) is a communication framework defined by ETSI (TS 103 478) that provides a solution for the interconnection of emergency applications. It specifies the protocols and procedures enabling interoperable implementations of the architecture and provides extension points to enable new communication mechanisms as they evolve[2]. It is designed to enable, control and standardise the multimedia communication between applications (usually http-based Apps working "Over the Top") and 112 emergency systems.

Providers of emergency Apps can be connected to PEMEA to enable their Apps to access the emergency services, not only within a specific geographical territory, but anywhere in Europe where the standard is deployed.

PSAPs can be connected to the PEMEA network to be able to receive additional user information from the Apps, no matter where that App and user are from, and to establish communication through different multimedia channels.

The PEMEA project was organised by EENA. The main objective was to foster the deployment of the PEMEA network and to share information about the PEMEA architecture throughout Europe.

In addition, it also aimed to build operational procedures around PEMEA, including security and data protection aspects, to allow a fast growth of the PEMEA network across Europe after the conclusion of the project.

[2] *ETSI TS 103 487* :
https://www.etsi.org/deliver/etsi_ts/103400_103499/103478/01.02.01_60/ts_103478v010201p.pdf

The project has achieved a successful result. It was focused on Apps and solutions that are already in use: real applications accessing the emergency services provided by real PSAPs across a range of regions and countries throughout Europe.

Today, eight PSAPs in Europe and eleven Apps have already validated their conformance with the PEMEA standard. They are now in the process of connecting to the PEMEA network in a real environment, allowing the roaming of the Apps in the different regions and countries. One or more of the PEMEA communication capabilities (i.e. chat, audio-video and location updates) will be shared.

In this project, the PEMEA network elements have been deployed by two providers - Deveryware and Beta 80 - and conducted in two phases:

- Phase I was intended to demonstrate the power of PEMEA regarding its ability to provide citizens access to emergency services anywhere in Europe using their local Apps in roaming.
  In this first phase, the PEMEA network provided the PSAPs with the App information: accurate location and other user information. The first phase was conducted from mid-June 2018 through to the end of April 2019. The project report is available *here*[3].
- Phase II was intended to implement multimedia communication (chat and audio-video), providing the applications with access through these multimedia channels to the emergency services PSAPs across Europe. In this case, the PEMEA network provides the PSAPs with the media servers, allowing the PSAP to communicate with the person needing help. The second phase of the project was conducted from November 2019 to May 2020.

[3] *https://eena.org/wp-content/uploads/Project-Phase-1-report-V1.0-final.pdf*

2 | BRIEF DESCRIPTION OF PEMEA

2.1 | THE NEED FOR CONTROLLED ACCESS FROM APPS TO EMERGENCY SERVICES

Apps are currently one of the most common communication channels used by the citizens, not only to communicate with other people, but also with companies and public organisations.

In the emergency sector, there are currently many emergency applications in use across Europe, allowing fast and intuitive communication between citizens and PSAPs and, in some cases, providing capabilities to improve the accessibility to emergency services for deaf and hard of hearing people.

Apps that could previously only be used by citizens to contact the local emergency services could now be used to contact any PSAP in Europe connected to the PEMEA network through a standardised procedure. Additionally, PEMEA provides the Apps with a single secure and controlled access to the PSAPs.

2.2 | BRIEF TECHNICAL DESCRIPTION

The full PEMEA technical specification is defined in *ETSI TS 103 478*. In this chapter, a summary of the mentioned technical specification is described.

The PEMEA standard architecture identifies the different functional entities of the PEMEA network, their responsibilities, and the necessary interface reference points to support emergency communications. This allow apps to roam anywhere in Europe and potentially around the world.

The architecture defines six primary entities:

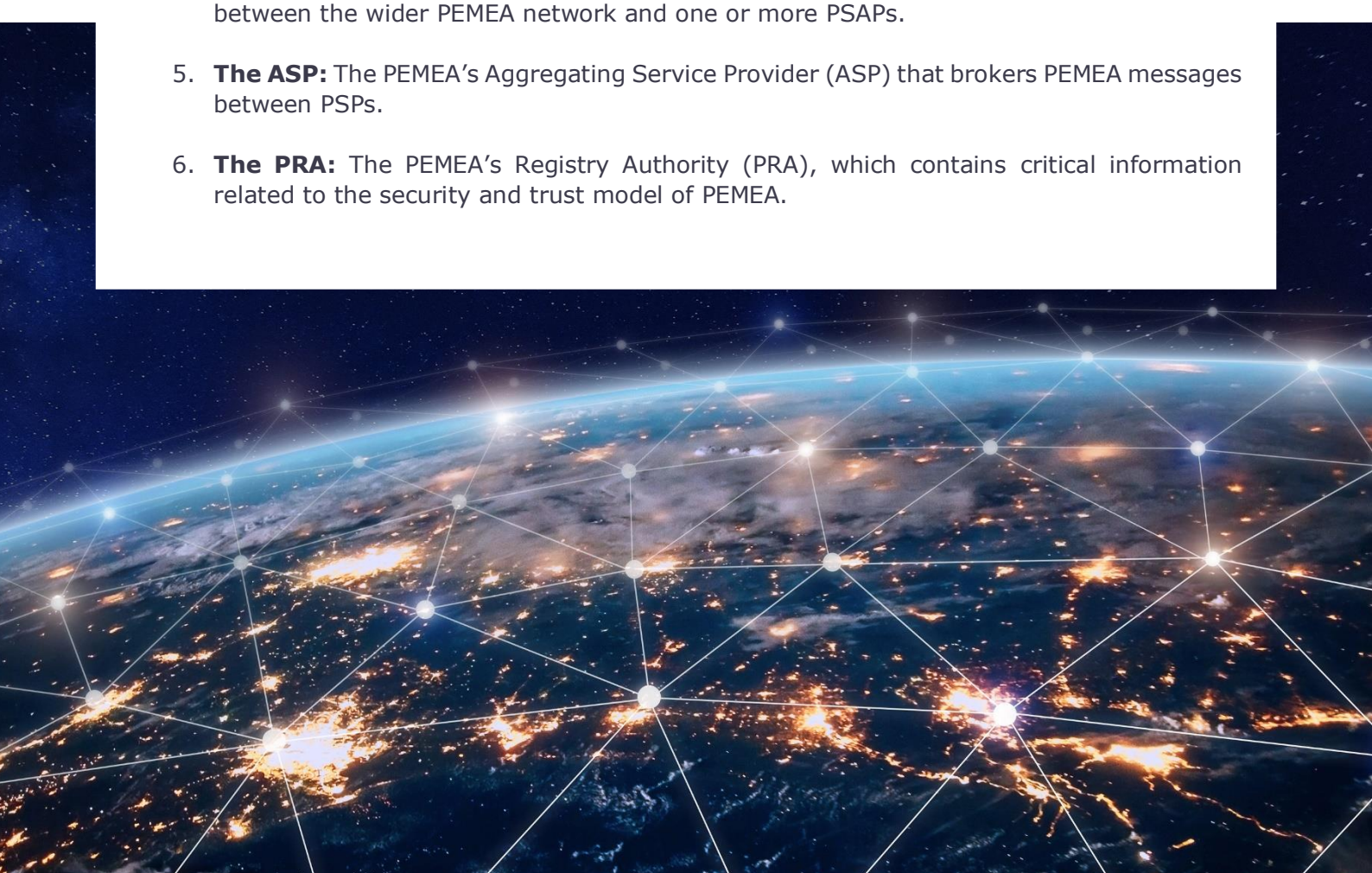
1. **The APP**: The application that runs on the smart device.

2. **The PSAP** system: Where the user's call is handled and where the application data is ultimately sent.

3. **The AP:** The PEMEA's Application Provider entity (AP) is a server that talks to the App and converts its data into PEMEA messages.
4. **The PSP:** The PEMEA's PSAP Service Provider entity (PSP) that provides interconnection between the wider PEMEA network and one or more PSAPs.

5. **The ASP:** The PEMEA's Aggregating Service Provider (ASP) that brokers PEMEA messages between PSPs.

6. **The PRA:** The PEMEA's Registry Authority (PRA), which contains critical information related to the security and trust model of PEMEA.



The architecture also identifies six communication interfaces:

1. **Interface Pa**, between the App and the AP. PEMEA does not define what messages are exchanged or over what protocol, but it does define a minimum set of requirements.

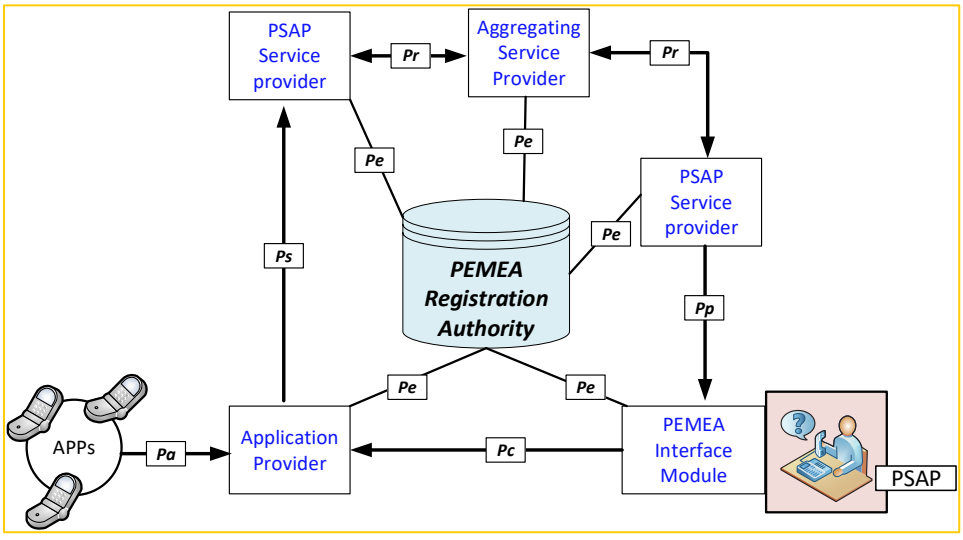
2. **Interface Ps**, between the AP and the PSP. Messages over Ps are always initiated by the AP towards the PSP. This interface is defined and must be adhered to.

3. **Interface Pp**, between the PSP and the PSAP. PEMEA does not tightly define this interface.

4. **Interface Pr**, is the roaming interface, nominally between the PSP and an ASP, but may also be between two PSPs. This interface is the only bi-directional interface in PEMEA, that is, PEMEA messages may be initiated in either direction.

5. **The interface Pc,** is described in ETSI TS 103 478. It describes how the AP may advertise additional capabilities to the PSAP and how the PSAP may invoke these, but there are no reference points between the PSAP and the AP shown in the basic architecture. The PSAP invokes these capabilities in the AP by using what are referred to as "Reach-Back" URIs. Since Pr is already used in PEMEA, this document defines the capability invocation reference point between the PSAP and the AP as the PEMEA Capabilities reference point, designated Pc.

6. **The interface Pe,** described in ETSI TS 103 478. It is the interface between the PEMEA entities and the PEMEA registry. In this document, the reference point between the PEMEA entities and the PEMEA registry is referred to as the PEMEA Entity reference point and designated Pe.



A simplified call flow in PEMEA would be as follows:

1. The App sends the "emergency data" to the AP (the PEMEA node acting as access point to the PEMEA network). The emergency data include the user data (telephone number, language, etc.), the accurate location and the multimedia communication capabilities the App has (e.g. location updates during the emergency communication, chat, video, file exchange, etc.)

2. The AP sends the emergency data to the PSP to which is connected (called "originating PSP"). The PSP decides the next routing step in the PEMEA network, depending on the location of the user of the App. The data might be sent to an ASP (typically when the information goes to another country) or it might go to other PSP or even directly to the PSAP in the region where the user is.
   Note: The ASP is normally the access point to the PEMEA branch of each country and is connected to one or more PSP inside the country.

3. The emergency data sent by the App is received by the end PSAP.

4. If the PSAP wants to invoke the establishment of a multimedia channel (i.e. data, voice, chat or video), then it can trigger the creation of the channel to the originating AP and, subsequently, the AP would open it with the App. Several multimedia channels might be invoked in parallel by the PSAP and established during the emergency.

5. The PEMEA network nodes will manage the maintenance of the established channels till the end of the emergency.
6. All the PEMEA network nodes shall confirm that the rest of the entities to which they are connected are previously registered in the PRA. All the messages from non-registered entities shall be rejected.

3 | PEMEA NETWORK OPERATIONAL PROCEDURES

An entity called PEMEA consortium has been created. It is a consortium formed by emergency services organisations and PEMEA network providers. Its objective is to create a "white list" of trusted Apps and PSAPs ensuring the conformance of the PEMEA entities with the ETSI standard, the European PSAPs' requirements and the European regulations in terms of security and data protection.

The PEMEA consortium will be the entity to be contacted by Apps providers and PSAP technology providers to register and obtain the "authorisation" to be connected to the PEMEA network.

To get in contact and be part of the PEMEA Consortium, please access *https://www.pemea.help/* and use the contact information.

In terms of data protection, the document *GDPR Conformance statement*[4] describes how PEMEA conforms to the European General Data Protection Regulation and who is responsible for the access and storage of specific information.

The full operational procedures and guidelines related to the management and deployment of the European PEMEA network will be defined in the upcoming document "PEMEA Operational Procedure - Procedure for connecting Apps, PSAPs and new nodes to the PEMEA network".

The document will define how the Apps Providers, the PEMEA network providers and PSAPs should proceed to be connected and use the PEMEA network in different countries.

[4] *https://eena.org/document/pemea-gdpr-conformance-statement*

4 | PROJECT PARTICIPANTS

The entities involved in the PEMEA project launched by EENA were:

PEMEA network providers:

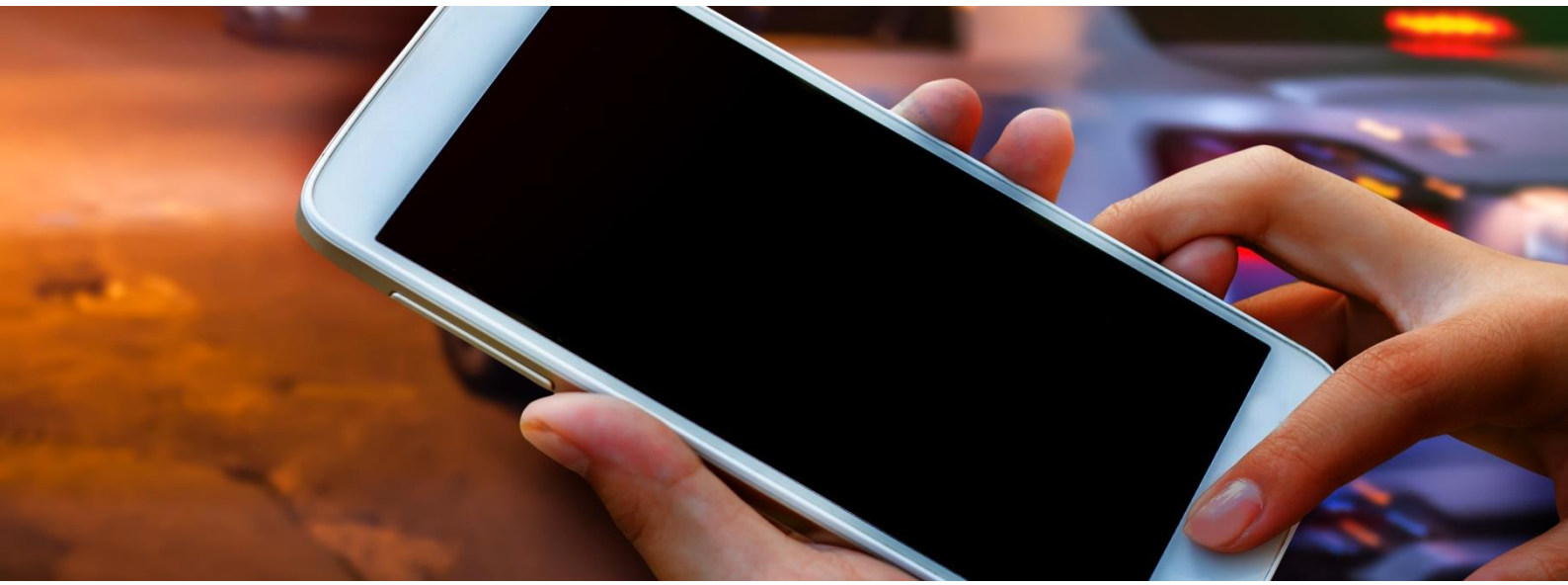
- Deveryware: AP, PSP, ASP, Media Servers
- Beta80: AP, PSP and ASP

Participants in Phase I:

App	Sponsoring PSAP/Country	Technology provider
112 Suomi App	112 Finland (Finnish ERC)	Digia (App and PSAP system)
112 Where Are U App	Italy	Beta 80 (App and PSAP system)
Snapring App	112 Slovenian PSAP	University of Lujbiana (app) and IPKom (PSAP system)
112 SOS Deiak App	112 Basque Country	112 Basque Country (App and PSAP system)
112 App Murcia	112 PSAP Murcia Region	Alterna (App and PSAP system)
112 Omnitor App		Omnitor (App)
mySTART+		Systel (App and PSAP system)
Smart 112 Mobile		Smart 112 (Monaco)

Participants in Phase II:

App	PSAP/Country	Technology provider
Snapring App	112 Slovenia	IPKom
My 112	112 Catalonia, Spain	Telefonica
112 Svisual Extremadura	112 Extremadura, Spain	Cestel
I-Urgence	France	I-Urgence (France)
MyNextbaseConnect		RealRider



5 | USE CASES AND TESTS

The project focused on testing a complete set of use cases, which will allow Apps and PSAPs to get connected. The tests defined during the project focused on the following PEMEA capabilities. Each participant could decide to test one or more capabilities:

- **Data communication capabilities**: Aimed at the transmission from the App to the most appropriate PSAP of:
  - The user identification data: MSISDN, IMSI, IMEI and any other Id that the App may use to identify the user.
  - The user basic information: spoken languages (including sign languages if any), contact details, name, gender, etc. This is called "AP more Info" by the PEMEA standard.
  - The user updated position: this capability is called "Location_Update" by the standard and provides updates of the mobile-based location during the emergency time, typically GNSS or Wi-Fi based.

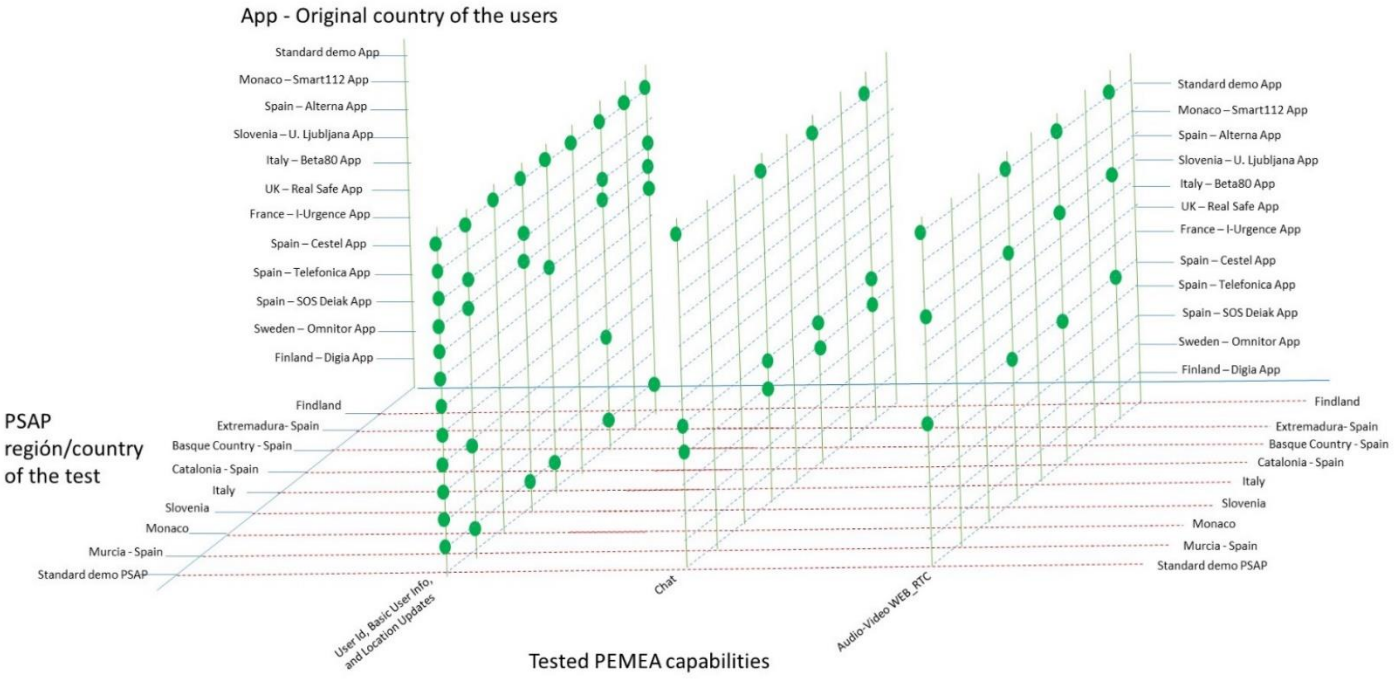
- **Multimedia communication between the App and the most appropriate PSAP**:
  - Chat: this capability is called "IM" (Instant Messaging) by the standard.
  - Web_RTC: this capability is called Audio-Video by the standard.

The tested use cases have been divided considering the following variables:

- The original country of the user and the App: it is used to determine the preferred language of the user (including the sign language used in case of citizens with disabilities).
- The position of the caller: it is used to determine the most appropriate PSAP.
- The PEMEA Capabilities: it determines the communication channel.

A signifcant number of potential combinations have been successfully tested. Apps and PSAPs of different countries have been in contact using different communication channels in roaming. E.g. Use of the Finnish App in Spain, use of the Italian App in Finland, use of all the Spanish Apps in Slovenia, etc.

We have represented these variables in a three dimensions matrix, considering the Apps and PSAPs participating in the project. The successfully tested uses cases have been represented by the dots in the following figure.



Details about the PEMEA architecture used to perform the different test cases and the results of each case can be found in the Annex of the present document.

6 | CONCLUSIONS OF THE PEMEA PROJECT

Emergency Apps have demonstrated their ability to provide citizens with fast and intuitive access to emergency services. Apps provide improved communication channels like chat and audio-video, accurate mobile-based position and tracking during the emergency situation.

Thanks to this project and the available PEMEA infrastructure, eight PSAPs in Europe and eleven Apps have already validated their conformance with the PEMEA standard. They are now ready to connect to the PEMEA network in a live environment, allowing the roaming of the Apps in the different regions and countries.

The PEMEA network is now ready to connect new Apps and PSAPs in Europe. All interested entities can contact the PEMEA consortium to get connected to the network and take advantage of the roaming interoperability.

To get in contact and be part of the PEMEA Consortium, please access *http://www.pemea.help* and find the contact information.

7 | NEXT STEPS

The objective is to allow all European citizens to use their local emergency Apps while travelling outside of their regions and allow all the PSAPs to provide the best service to any European citizen regardless the language they use and the application they prefer.

We encourage Apps and PSAPs to follow the example of the participants in the present project and connect to the PEMEA network. The PEMEA consortium will be reachable to help PSAPs and App providers connect their systems to the PEMEA network

At the time of writing the present document, and in addition to those mentioned in this project, other initiatives to connect to the network are now in process in different countries: Romania, additional regions in Spain, France, etc.

According to the plan that several PSAPs have communicated to the PEMEA consortium, the following countries may have their connection to the PEMEA network ready before the end of 2020:

- Finland
- Italy
- Spain (several regions)
- Romania

8 | ANNEX : TEST CASES

ANNEX CONTENTS

1 | INTRODUCTION

This Annex defines the test cases of the PEMEA Network.

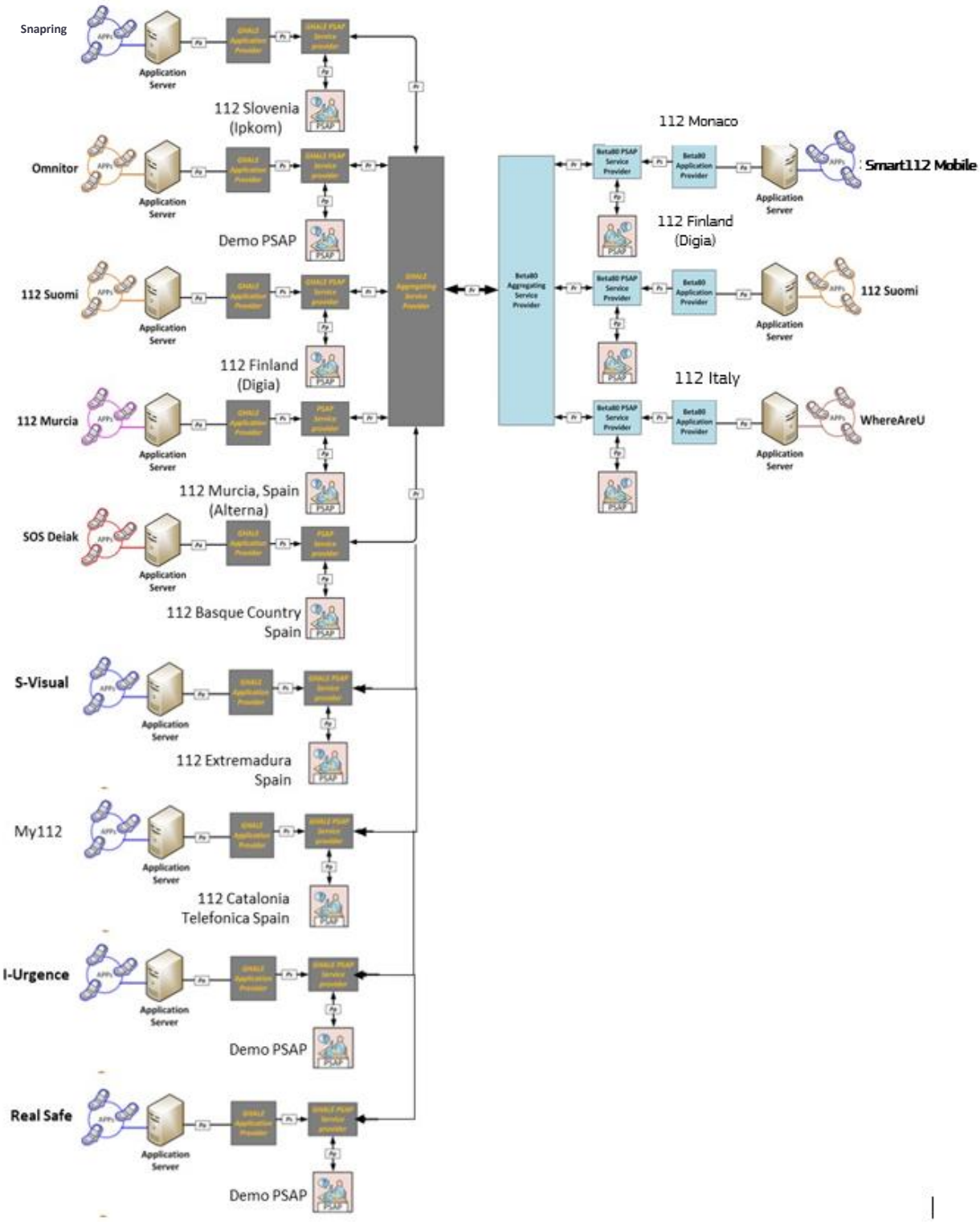
2 | TEST ENVIRONMENT CONFIGURATION

In this project, two PEMEA providers implemented the necessary PEMEA network infrastructure to perform the tests cases: Deveryware (France) and Beta80 (Italy).

The following PEMEA network configuration was implemented:

- Each AP is connected to a single PSP.
- Some PSPs have direct connection to a PSAP and some do not.
- Just one ASP has been deployed per PEMEA provider. The two ASPs are connected together and each ASP has one or more PSPs.

The following figure shows the schema of the used network configuration. On the left, the components provided by Deveryware are represented (media servers are not included in the picture) and on the right, the components provided by Beta80.


Snapring
Application Server
112 Slovenia (Ipkom)
Omnitor
Application Server
Demo PSAP
112 Suomi
Application Server
112 Finland (Digia)
112 Murcia
Application Server
112 Murcia, Spain (Alterna)
SOS Deiak
Application Server
112 Basque Country Spain
S-Visual
Application Server
112 Extremadura Spain
My112
Application Server
112 Catalonia Telefonica Spain
I-Urgence
Application Server
Demo PSAP
Real Safe
Application Server
Demo PSAP
112 Monaco
Application Server
Smart112 Mobile
112 Finland (Digia)
Application Server
112 Suomi
112 Italy
Application Server
WhereAreU

3 | SOFTWARE PROVIDED PER PARTICIPANT

Software Provider	Type of software component	Emergency service organisation
Digia	Suomi App	112 PSAP, Finland
Digia	112 Finish PSAP	112 PSAP, Finland
University of Ljubiana	Snapring	112 PSAP, Slovenia
IPkom	112 Slovenia PSAP	112 PSAP, Slovenia
Beta80	WhereAreU App	112 PSAP, Italy
Beta80	Italian PSAPs	112 PSAP, Italy
Basque Country 112 PSAP	SOS Deiak App	112 PSAP, Basque Country, Spain
Basque Country 112 PSAP	PSAP	112 PSAP, Basque Country, Spain
Alterna	App	112 PSAP, Murcia Region, Spain
Alterna	112 Murcia PSAP	112 PSAP, Murcia Region, Spain
Cestel	S-Visual App	112 PSAP, Extremadura Region, Spain
Cestel	112 Extremadura PSAP	112 PSAP, Extremadura Region, Spain
Telefonica	My112 App	112 PSAP, Catalonia Region, Spain
Telefonica	PSAP	112 PSAP, Catalonia Region, Spain
I-Urgence	App	112 PSAP, SDIS-6 Region, France
Smart112	Smart112 App	112 PSAP, Monaco
Omnitor	App	112 PSAP, Sweden
Real Rider	MyNextbaseConnect app	PEMEA consortium
Deveryware	Demo App	PEMEA consortium
Deveryware	PSAP Interface Module	PEMEA consortium

4 | TYPE OF TEST CASES

The participants were free to decide the use cases they wanted to test, in conformance with the ETSI PEMEA standard.

One or more of the following sets of test cases have been tested per software component, in the context of each of the phases of the PEMEA project.

Different colours of text are used in the following chapters to differentiate the type of test case

PEMEA project Phase 1:

- Routing of emergency data from the App to the PSAP. App in the o-PSP local region.
- Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP local region.
- Invocation of Location Update capability from the PSAP module to the AP transmission of the updated Location

PEMEA project Phase 2:

All the uses cases of PEMEA project phase 1 and

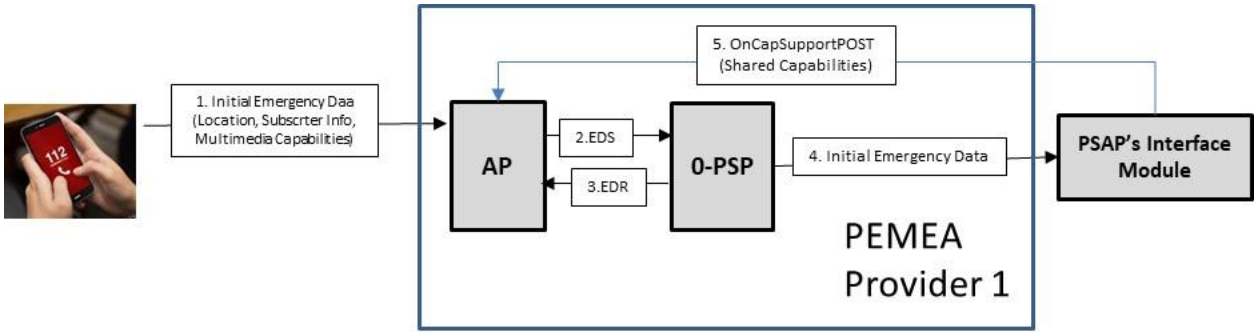
- Invocation of Instant Messaging capability from the PSAP module to the AP and exchange of text messages

Additional uses cases out of the initial scope:

- Invocation of Audio-Video capability from the PSAP module to the AP and establishment of Audio-Video conference

5 | DESCRIPTION OF THE SEQUENCES PER TEST CASE

a) Routing of emergency data from the App to the PSAP. App in the o-PSP local region



1. The App sends the initial emergency data to the AP including the user location, the user information, and the multimedia capabilities it has, using the Pa interface.

2. The AP packages the data up into an emergencyDataSend (EDS) message and sends this to the local PSP (o-PSP) via the Ps interface.

3. The o-PSP is in charge of routing the information to the proper PSAP based on the user location. Each o-PSP has the connected ASP and local PSAPs areas mapped in its database. When receiving the EDS message, it compares the location provided in the EDS with the loaded areas and, if the location provided aligns with one of the areas, the o-PSP will answer back with the EDR indicating a successful result and the identity of the next node in the PEMEA network chain. If not, the o-PSP will answer back with an error.

4. If the location provided in the EDS aligns with the area of one of the local PSAPs, then the PSP sends the emergency data to that local PSAP via Pp interface.
   If the location provided does not align with the area one of the local PSAPs then the EDS is forwarded to the ASP connected to the PSP via the Pr interface. This scenario is described in the next chapter in this document.

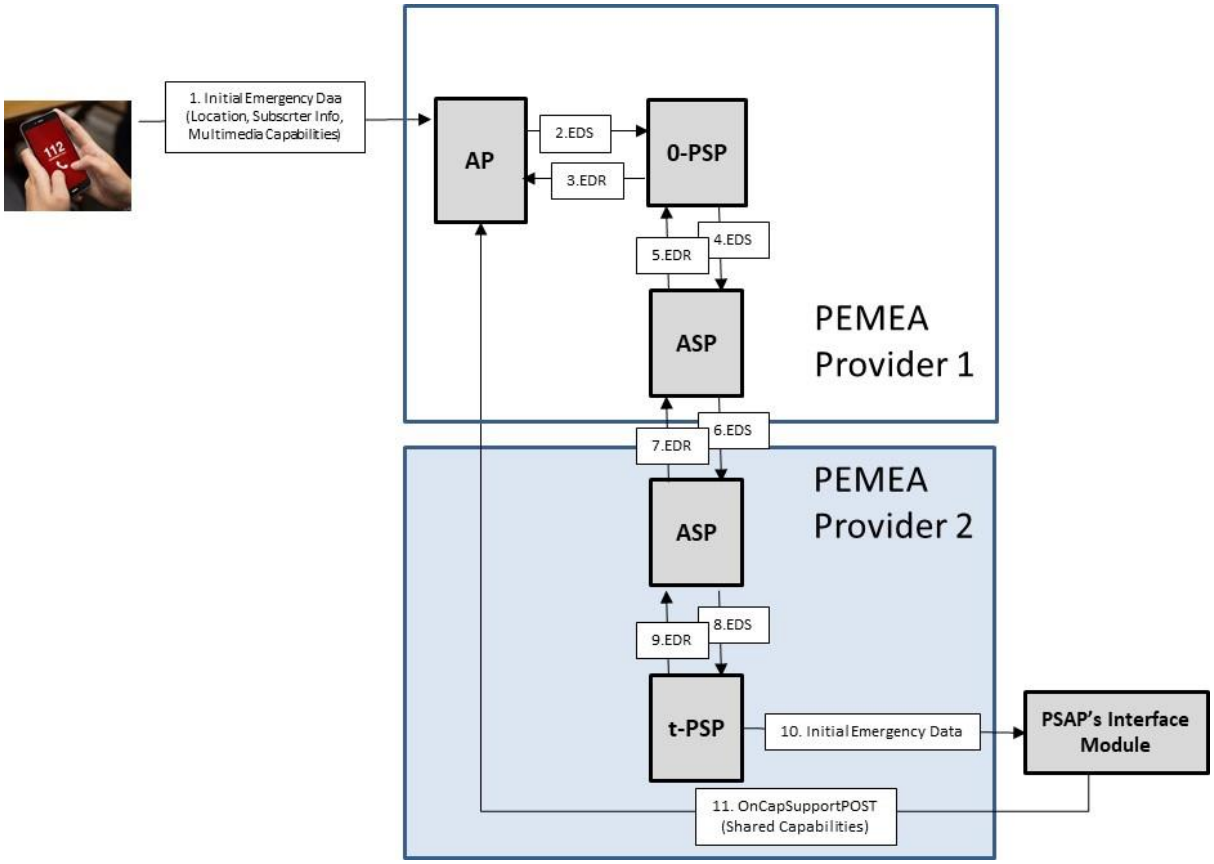
5. When the new emergency data notification arrives at the PSAP, it will read the communication capabilities proffered by the App. Based on that, it will compare against the subset of capabilities that it supports, will create the App-PSAP shared-set of capabilities and will send an onCapSupportPost message including the shared capabilities to the AP via

the Pc interface, so that the AP can get prepared to receive additional signalling messages from the PSAP.

6. From that point, the PSAP would be able to read/retrieve (*) the content of the emergency data notification (user location, user info, etc.) and invoke the management of multimedia channels with the App.

   (*) Note: the emergency information is conveyed in IETF Additional-Data structures, with a general preference to information being conveyed by value. However, it may not be legal in some jurisdictions to send private caller information (contained in the SubscriberData structure) to any entity but the receiving PSAP or PSP. In this case, SubscriberData shall be sent by reference and only provided to a validated PSAP or PSP querying for the information.

b) Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP local region.



1. The App sends the initial emergency data to the AP including the user location and the multimedia capabilities it has, using the Pa interface.

2. The AP packages the data up into an emergencyDataSend (EDS) message and sends this to the local PSP (o-PSP) via the Ps interface.

3. The o-PSP is in charge of routing the information to the next PEMEA node based on the user location. Each o-PSP is connected to an ASP and local PSAP areas mapped in its database. When receiving the EDS message, it compares the location provided in the EDS with the loaded areas and, if the location provided aligns with one of the areas, the o-PSP will answer back with the EDR indicating a successful result and the identity of the next hop. If not, the o-PSP will answer back with an error.

4. If the location provided does not align with the area of a local PSAP and aligns with the area of one ASP, then it passes the EDS on to the ASP for on routing via the Pr interface.
   If the location provided in the EDS aligns with the area of a local PSAP, then the PSP sends the emergency data to that local PSAP via Pp interface. This scenario is described in the previous chapter of this document.

5. The ASP is in charge of the routing of the information to the next PEMEA node, either PSP or ASP, based on the location provided in the EDS. The ASPs are interconnected, with each ASP knowing its local PSPs areas. When receiving the EDS message, it compares the location provided in the EDS with the loaded areas and, if the location provided aligns with one of the areas, the ASP answers back with the EDR indicating a successful result. If not, the ASP will answer back with an error message. If an error is returned, then the PSP that sent the EDS forward must respond directly to the AP with an onErrorPost message indicating the cause of the error.

6. If the location provided aligns with an area associated with the connected ASP, then it passes the EDS on to the ASP via the Pr interface.

7. The receiving ASP compares the location provided in the EDS with the PSP (t-PSP) loaded areas and, if the location provided aligns with one of the areas, the ASP will answer back with the EDR indicating a successful result. If not, the ASP returns an error. If an error is returned, then the ASP that sent the EDS forward must respond directly to the AP with an onErrorPost message indicating the cause of the error.

8. The ASP passes the EDS to the t-PSP serving the location provided via the Pr interface.

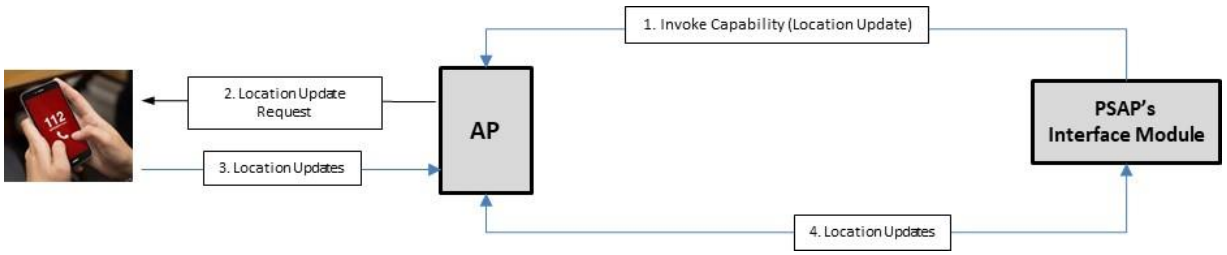
9. The t-PSP is in charge of routing the information to the proper PSAP based on the user location. Each t-PSP has the connected local PSAPs areas mapped in its database. When receiving the EDS message, it compares the location provided in the EDS with the loaded areas and, if the location provided aligns with one of the areas, the t-PSP will answer back with the EDR indicating a successful result. If not, the t-PSP will send an error. If an error is returned, then the ASP that sent the EDS forward must respond directly to the AP with an onErrorPost message indicating the cause of the error.

If the location provided in the EDS aligns with the area one of the local PSAPs, then the PSP sends the Emergency data to that local PSAP via Pp interface.

10. When the new emergency data notification arrives at the PSAP, it will retrieve the communication capabilities proffered by the App. Based on that, it will compare against the subset of capabilities that it supports, will create the App-PSAP shared-set of capabilities and will send an onCapSupportPost message including the shared capabilities to the AP via the Pc interface, so that the AP can get prepared to receive additional signalling messages from the PSAP.
11. From that point, the PSAP would be able to read/retrieve (*) the content of the emergency data notification (user location, user info, etc.) and invoke the management of multimedia channels with the App.

    (*) Note: emergency information is conveyed in IETF Additional-Data structures, with a general preference to information being conveyed by value. However, it may not be legal in some jurisdictions to send private caller information (contained in the SubscriberData structure) to any entity but the receiving PSAP or PSP. In this case SubscriberData shall be sent by reference and only provided to a validated PSAP or PSP querying for the information.

c) Invocation of Location Update capability from the PSAP module to the AP and transmission of information.



1. Following the sending of the onCapSupportPost message to the AP, the PSAP may request the user/subscriber information and/or location updates from the AP.

2. The AP sends the request of Location Updates to the App.

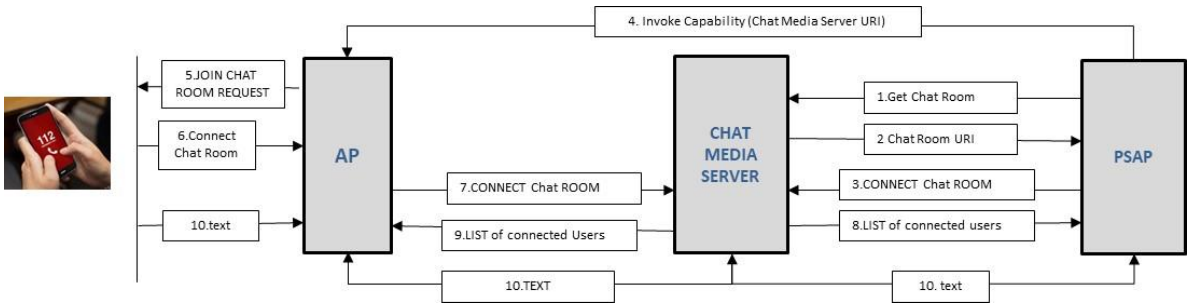
3. During the time of the emergency, the App will periodically send location updates to the AP.

4. During the time of the emergency, the PSAP will periodically request the location updates to the AP.

d) Invocation of Instant Messaging capability from the PSAP module to the AP and exchange of text messages

Following the sending of the onCapSupportPost message to the AP, the PSAP may invoke the Instant Message (IM) capability. This results in a chat room being created that allows the PSAP call taker and App user to communicate using instant messaging.

The following figure shows a simplified sequence of the messages that would be orchestrated:

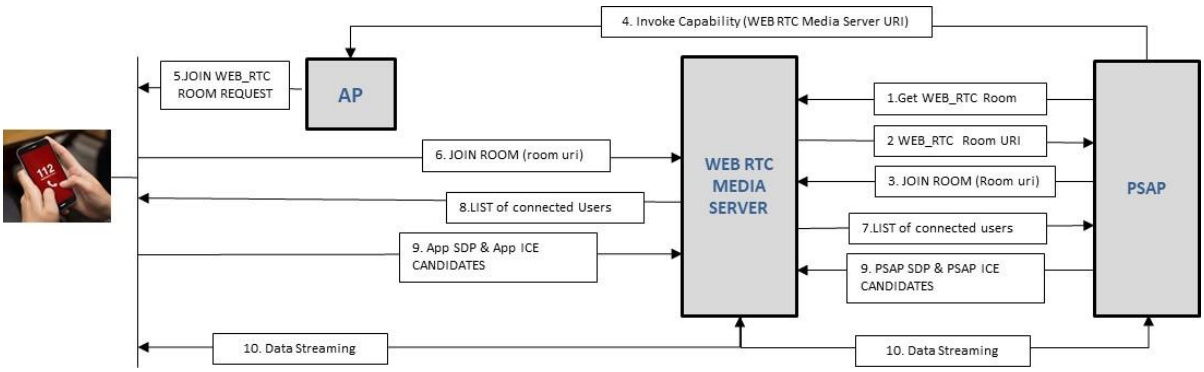


1. PSAP contacts the IM server and requests a new Chat room.
2. The server creates a new room and returns the URI to the PSAP.
3. The PSAP joins the room.
4. The PSAP invokes the IM capability in the AP, passing the room URI.
5. The AP then notifies the App of the Chat room.
6. The App requests the AP to join the Chat room.
7. The AP joins the Chat Room.
8. The PSAP receives the list of connected users to the call.
9. The AP receives the list of connected users to the call. It may also inform the App.
10. The parties can exchange messages following the same path App-AP-Media Server-PSAP.

e) Invocation of Audio-Video capability from the PSAP module to the AP and establishment of the Audio-Video conference

Following the sending of the onCapSupportPost message to the AP, the PSAP may invoke an Audio_Video capability. In this case, a WebRTC media server is engaged to process the data streams.

The following pictures shows a simplified sequence of the messages that would be orchestrated:



1. PSAP contacts the Web_RTC server and requests a new WEB_RTC room.
2. The server creates a new room and returns the URI to the PSAP.
3. The PSAP joins the room.
4. The PSAP invokes the Audio_Video capability in the AP, passing the room URI.
5. The AP then notifies the App of the WebRTC room.
6. The App joins to the WebRTC room.
7. The PSAP receives the list of connected users to the call.
8. The App receives the list of connected users to the call.
9. The parties share the SDP and ICE candidates following the standard formats.
10. The media Server establishes the data channel and the parties exchange the data streaming. When the emergency session is over, the URI of the WEB_RTC room is made invalid.

6 | TEST LISTS & RESULTS

The following table lists all the testing done during the different phases of the project. The tests are described through the following fields:

- **Test id**: Unique identifier of the test.
- **App provider**: It includes the name of the provider of the App and, in some cases, the name of the App.
- **PEMEA Provider 1**: It includes the name of the PEMEA provider 1 as described in chapter **Error! Reference source not found.** and the PEMEA network elements that are provided.
- **PEMEA Provider 2**: It includes the name of the PEMEA provider 2 as described in chapter **Error! Reference source not found.** and the PEMEA network elements that are provided.
- **PSAP Providers**: It includes the name of the PSAP system providers.
- **Test Case**: It includes the name of the test case as described in Chapter **Error! Reference source not found.**.
- **Test result**: It includes the result of the test. OK means that the behaviour is compliant with the PEMEA standard specification.

Test ID	App Provider	Location of App User	PEMEA provider 1	PEMEA provider 2	PSAP Providers	Test case	Test Result
PEMEA project Phase 1							
1	Digia – Suomi App	Murca, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Alterna** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
2	Digia – Suomi App	Basque Country, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**112 Basque Country** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
3	Digia – Suomi App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
4	Digia – Suomi App	Italy	**Deveryware** providing AP, o-PSP, and ASP	**Beta80** providing ASP and t-PSP	**Beta80** providing the PSAP systems	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
5	Digia – Suomi App	Italy	**Beta80** providing AP, o-PSP, and ASP	**Beta80** providing ASP and t-PSP	**Beta80** providing the PSAP systems	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK

6	Digia – Suomi App	Murca, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Alterna** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
7	Digia – Suomi App	Basque Country, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**112 Basque Country** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
8	Digia – Suomi App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
9	SOS Deiak. 112 Basque Country	Murca, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Alterna** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
10	SOS Deiak. 112 Basque Country	Finland	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Digia** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK

11	SOS Deiak. 112 Basque Country	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
12	SOS Deiak. 112 Basque Country	Italy	**Deveryware** providing AP, o-PSP, and ASP	**Beta80** providing ASP and t-PSP	**Beta80** providing the PSAP systems	Routing of emergency data from the App to the PSAP. App in the o-PSP local region	OK
13	SOS Deiak. 112 Basque Country	Murca, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Alterna** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
14	SOS Deiak. 112 Basque Country	Finland, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Digia** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
15	SOS Deiak. 112 Basque Country	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
16	Alterna – 112 App	Basque Country, Spain	**Deveryware** providing AP,	**Deveryware** providing ASP and t-PSP	**112 PSAP Basque country** providing the	Routing of emergency data from the App to	OK

			the o-PSP and ASP		PSAP systems and **Deveryware** adding the PEMEA Interface module	the PSAP. App roaming out of the o-PSP areas	
17	Alterna – 112 App	Finland	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Digia** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
18	Alterna – 112 App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
19	Alterna – 112 App	Italy	**Deveryware** providing AP, o-PSP, and ASP	**Beta80** providing ASP and t-PSP	**Beta80** providing the PSAP systems	Routing of emergency data from the App to the PSAP. App in the o-PSP local region	OK
20	Alterna – 112 App	Basque Country, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**112 PSAP Basque country** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
21	Alterna – 112 App	Finland, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Digia** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmissio	OK

						n of information	
22	Alterna – 112 App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmissio n of information	OK
23	UL – 5G Spin 112 App Slovenia	Basque Country, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**112 PSAP Basque country** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
24	UL – 5G Spin 112 App Slovenia	Finland	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Digia** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
25	UL – 5G Spin 112 App Slovenia	Slovenia	**Deveryware** providing AP, the o-PSP		**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App in the o-PSP areas	OK
26	UL – 5G Spin 112 App Slovenia	Murcia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Alterna** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App in the o-PSP areas	OK

27	UL – 5G Spin 112 App Slovenia	Basque Country, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**112 PSAP Basque country** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
28	UL – 5G Spin 112 App Slovenia	Finland, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Digia** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
29	UL – 5G Spin 112 App Slovenia	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
30	UL – 5G Spin 112 App Slovenia	Murcia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Alterna** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
31	Smart 112 App	Sofia Antipolis	**Beta80** providing AP and the o-PSP		**Beta80** providing the PSAP systems	Routing of emergency data from the App to the PSAP. App in the o-PSP areas	OK

32	Omnitor 112 App	Sofia Antipolis	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
33	Omnitor 112 App	Sofia Antipolis	**Deveryware** providing AP, the o-PSP and ASP	**Beta80** providing ASP and t-PSP	**Beta80** providing the PSAP systems	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
34	Beta80 App	Madrid	**Beta80** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
35	Beta80 App	Finland	**Beta80** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Digia** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
36	Beta80 App	Finland	**Beta80** providing AP, the o-PSP and ASP	**Beta80** providing ASP and t-PSP	**Digia** providing the PSAP systems	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
PEMEA project Phase 2							
37	Cestel – SVISUAL App	Catalonia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA	Routing of emergency data from the App to the PSAP. App roaming out	OK

					Interface module	of the o-PSP areas	
38	Cestel – SVISUAL App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
39	Cestel – SVISUAL App	Madrid, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
40	Cestel – SVISUAL App	Catalonia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
41	Cestel – SVISUAL App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
42	Cestel – SVISUAL App	Madrid, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK

43	Cestel – SVISUAL App	Catalonia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
44	Cestel – SVISUAL App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
45	Cestel – SVISUAL App	Madrid, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
47	Cestel – SVISUAL App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Audio_Video capability from the PSAP module to the AP and establishment of the conference	OK
48	Cestel – SVISUAL App	Madrid, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Invocation of Audio_Video capability from the PSAP module to the AP and establishment of the conference	OK

49	I-UrgenceApp	Madrid	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Routing of emergency data from the App to the PSAP. App out of the o-PSP local region	Pending
50	MyNextbase Connect app	Madrid	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Deveryware** providing the PSAP Interface module	Routing of emergency data from the App to the PSAP. App out of the o-PSP local region	OK
51	My112 App Telefonica	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Cestel** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App out of the o-PSP local region	OK
52	My112 App Telefonica	Murcia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Alterna** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App out of the o-PSP local region	OK
53	My112 App Telefonica	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Cestel** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
54	My112 App Telefonica	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Cestel** providing the PSAP systems and **Deveryware** adding the PEMEA	Invocation of IM capability from the PSAP module to the AP and exchange of	OK

					Interface module	text messages	
55	My112 App Telefonica	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
56	My112 App Telefonica	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
57	DW demo App	Madrid, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
58	DW demo App	Madrid, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
59	UL – Snapring App	Catalonia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK

60	UL – Snapring App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
61	UL – Snapring App	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Cestel** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Routing of emergency data from the App to the PSAP. App roaming out of the o-PSP areas	OK
62	UL – Snapring App	Catalonia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
63	UL – Snapring App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK
64	UL – Snapring App	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Cestel** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Location Update capability from the PSAP module to the AP and transmission of information	OK

65	UL – Snapring App	Catalonia, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Telefonica** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
66	UL – Snapring App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
67	UL – Snapring App	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Cestel** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of IM capability from the PSAP module to the AP and exchange of text messages	OK
68	UL – Snapring App	Slovenia	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**IPKom** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Audio_Video capability from the PSAP module to the AP and establishment of the conference	OK
69	UL – Snapring App	Extremadura, Spain	**Deveryware** providing AP, the o-PSP and ASP	**Deveryware** providing ASP and t-PSP	**Cestel** providing the PSAP systems and **Deveryware** adding the PEMEA Interface module	Invocation of Audio_Video capability from the PSAP module to the AP and establishment of the conference	OK