

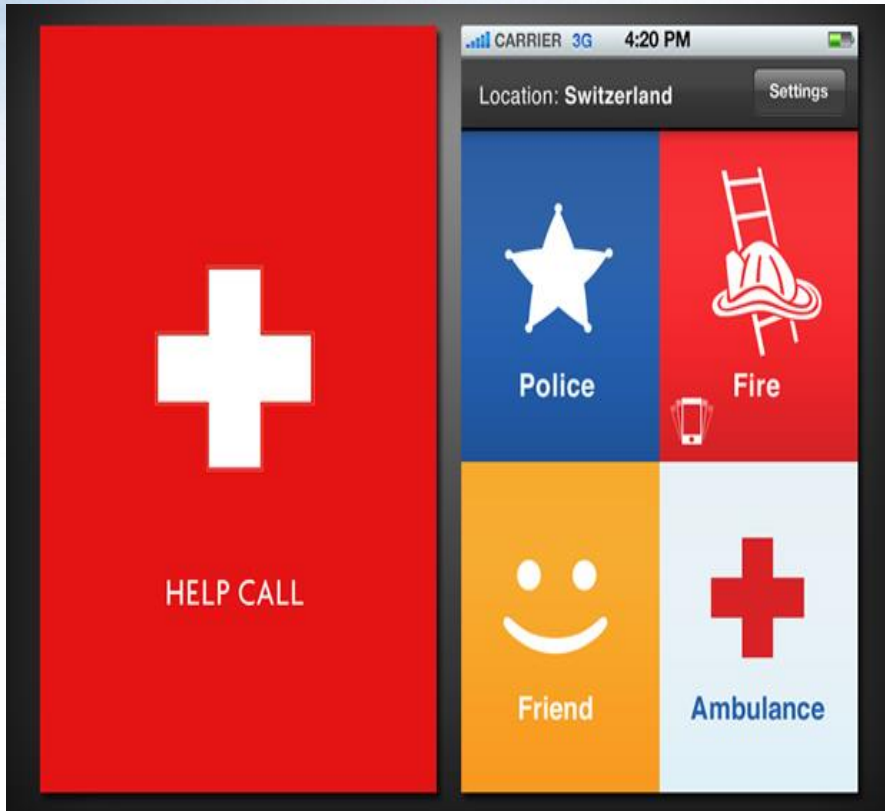
Next Generation Emergency Services: The EMYNOS Project

**PSCE Conference
28 – 29 November 2017
Presenter: Y. Rebahi
Fraunhofer Fokus**

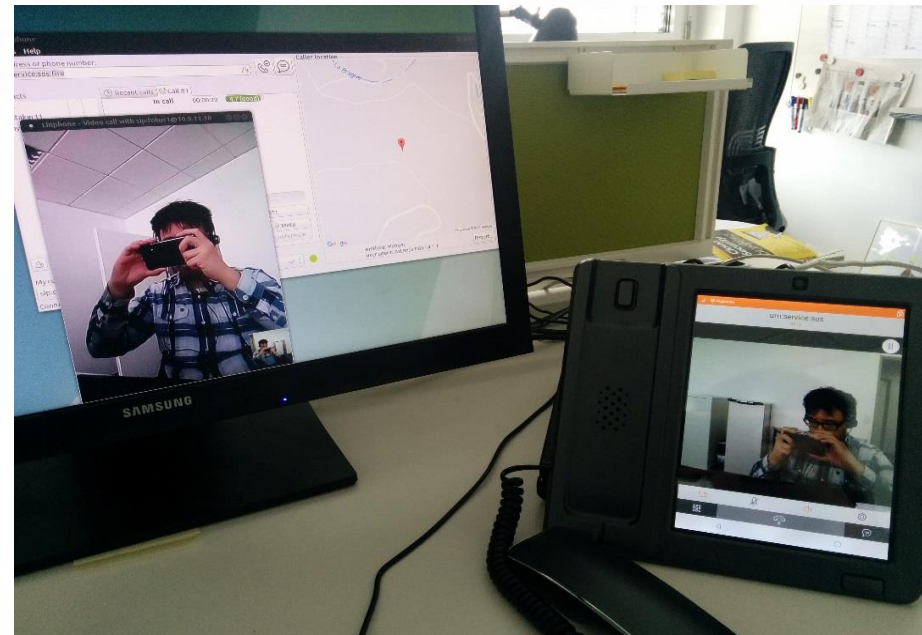
Outline

- Problem statement
- The EMYNOS project
- Project achievements

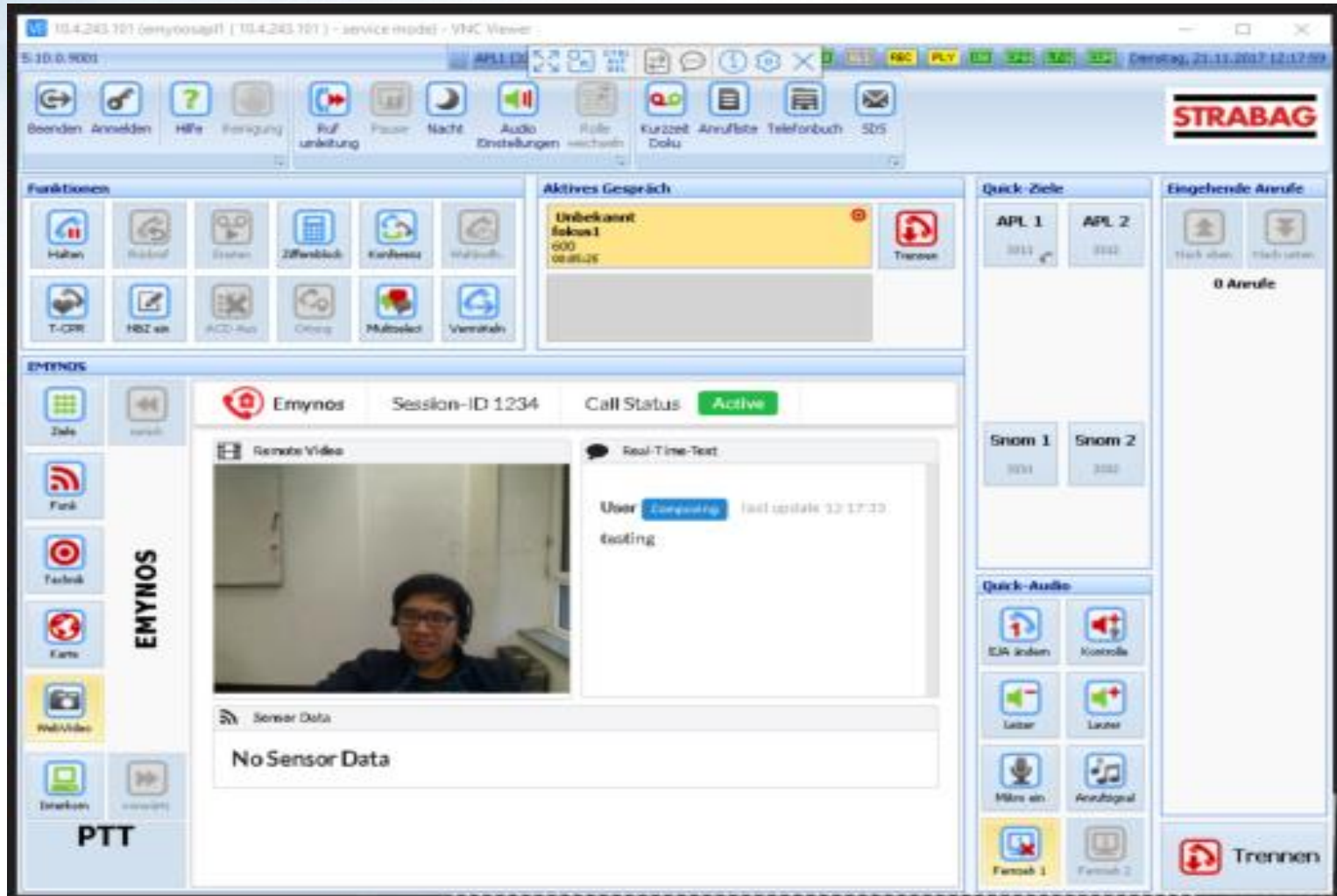
Expectations: Citizens



9-1-1
Call if you can,
text if you can't.



Expectations: End Users



Expectations: End Users

10.4.243.101 (emynosapl1 (10.4.243.101) - service mode) - VNC Viewer

5.10.0.9001 APL1 (3311) nicht eingeloggt Defaultrolle VMS CCI ELS REC PLY DB CFB LTG CDR Dienstag, 21.11.2017 12:19:09

Beenden Anmelden Hilfe Reinigung Ruf umleitung Pause Nacht Audio Einstellungen Rolle wechseln Kurzzeit Anrufliste Telefonbuch SDS

STRABAG

Funktionen

- Halten
- Rückruf
- Starten
- Ziffernblock
- Konferenz
- Wahlwdh.
- T-CPR
- NBZ ein
- ACD Aus
- Ortung
- Multiselect
- Vermitteln

Aktives Gespräch

Unbekannt
fokus1
600
00:06:38

Trennen

Quick-Ziele

APL 1 3311	APL 2 3312
Snom 1 3331	Snom 2 3332

Eingehende Anrufe

0 Anrufe

map

- Ziele
- Funk
- Technik
- Karte
- WebVideo
- Interkom

PTT

N47.083857° E15.414964°

Current Emergency Systems: Challenges



*No Standard underlying technology
No Unified platform*



No Multimedia (e.g. Video, Photos, Text)



No Advanced features: such as accurate caller location



More and more calls are from mobile phones

EMYNOS: Overview

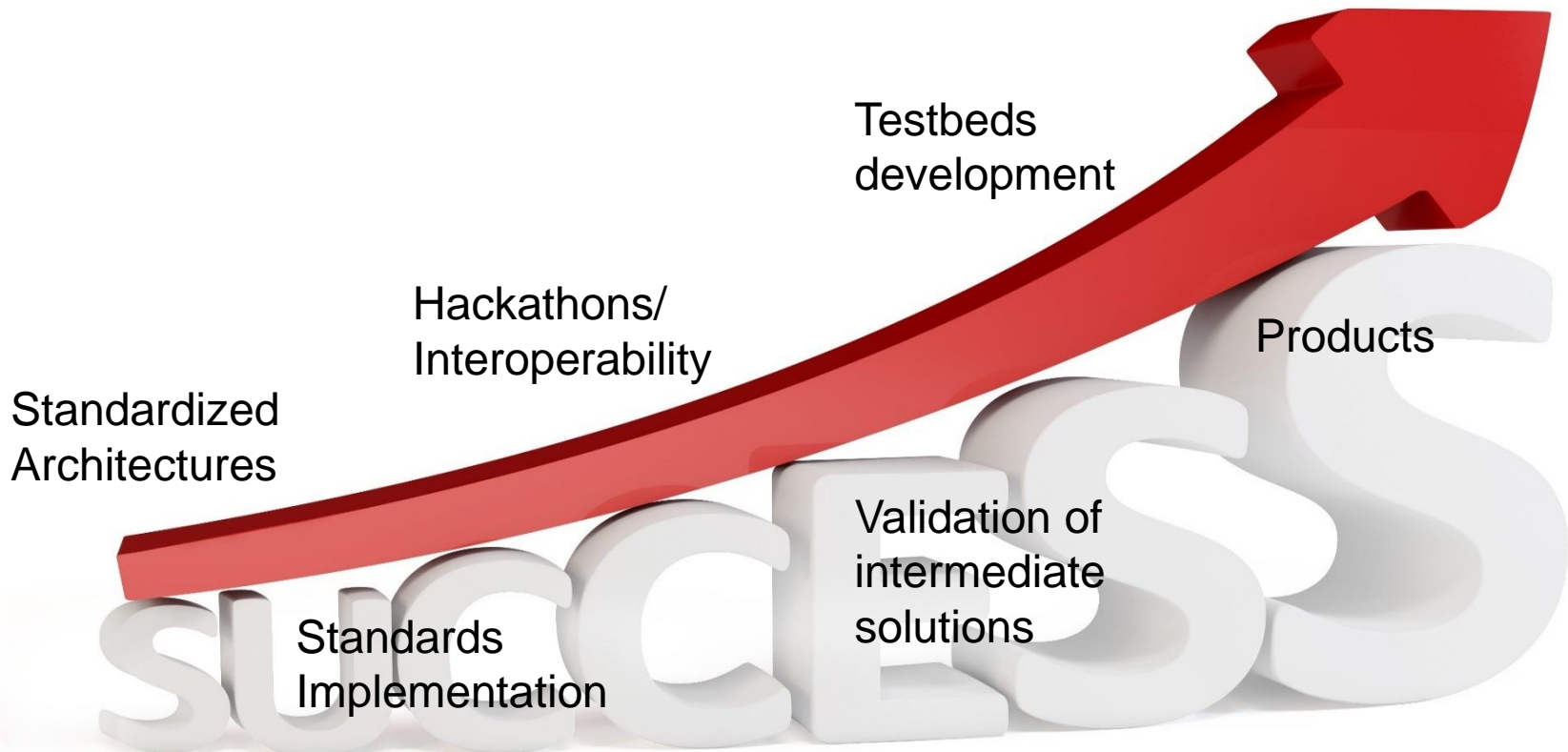
- **EMYNOS:** nExt generation eMergencY commuNicatiOnS
- **EMYNOS** is a European project submitted to/ accepted in the call (H2020, Secure societies – Protecting freedom and security of Europe and its citizens)
- Website: <http://www.emynos.eu/>
- Project started: September 2015
- **Duration:** 30 months

Partners

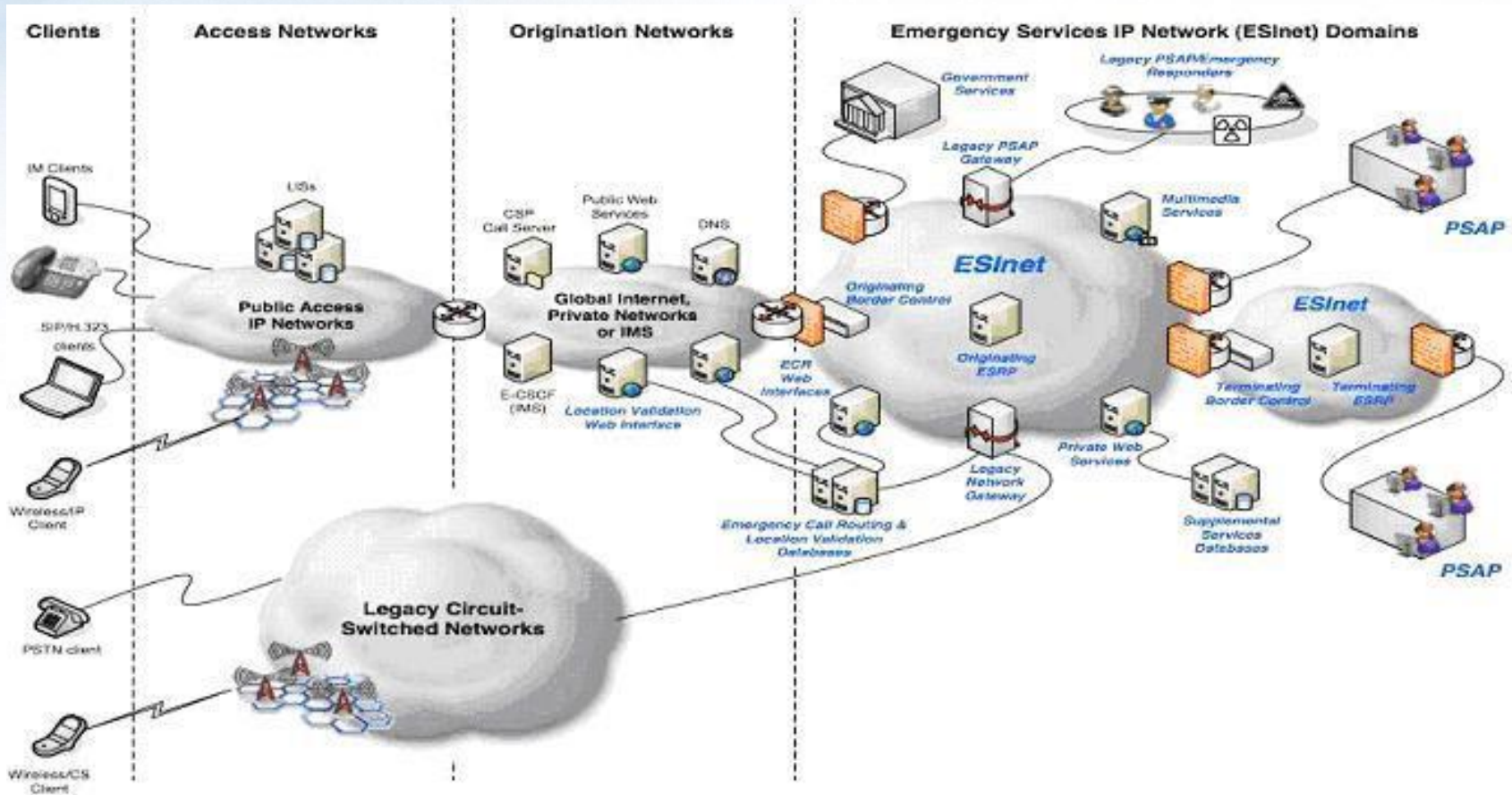
Participant No	Participant organisation name	Short name	Country
1 (Coordinator)	Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V.	Fraunhofer	Germany
2	Turksat	Turksat	Turkey
3 (Tech. Management)	Technological Educational Institute of Crete	TEIC	Greece
4	Navcert	Navcert	Germany
5	Public Safety Communication Europe	PSCE	Belgium
6	The Special Telecommunications Service	STS	Romania
7	Voztelecom	Voz	Spain
8	Harpo Sp. Z o.o.	Harpo	Poland
9	Hellenic Open University	HOU	Greece
10	Österreichisches Rotes Kreuz	ARC	Austria
11	MCS Data Labs	MCS	Germany
Research Institutes, 2 Operators, 2 End Users, 2 Universities, 4 SMEs,			

The path to Go

NG112



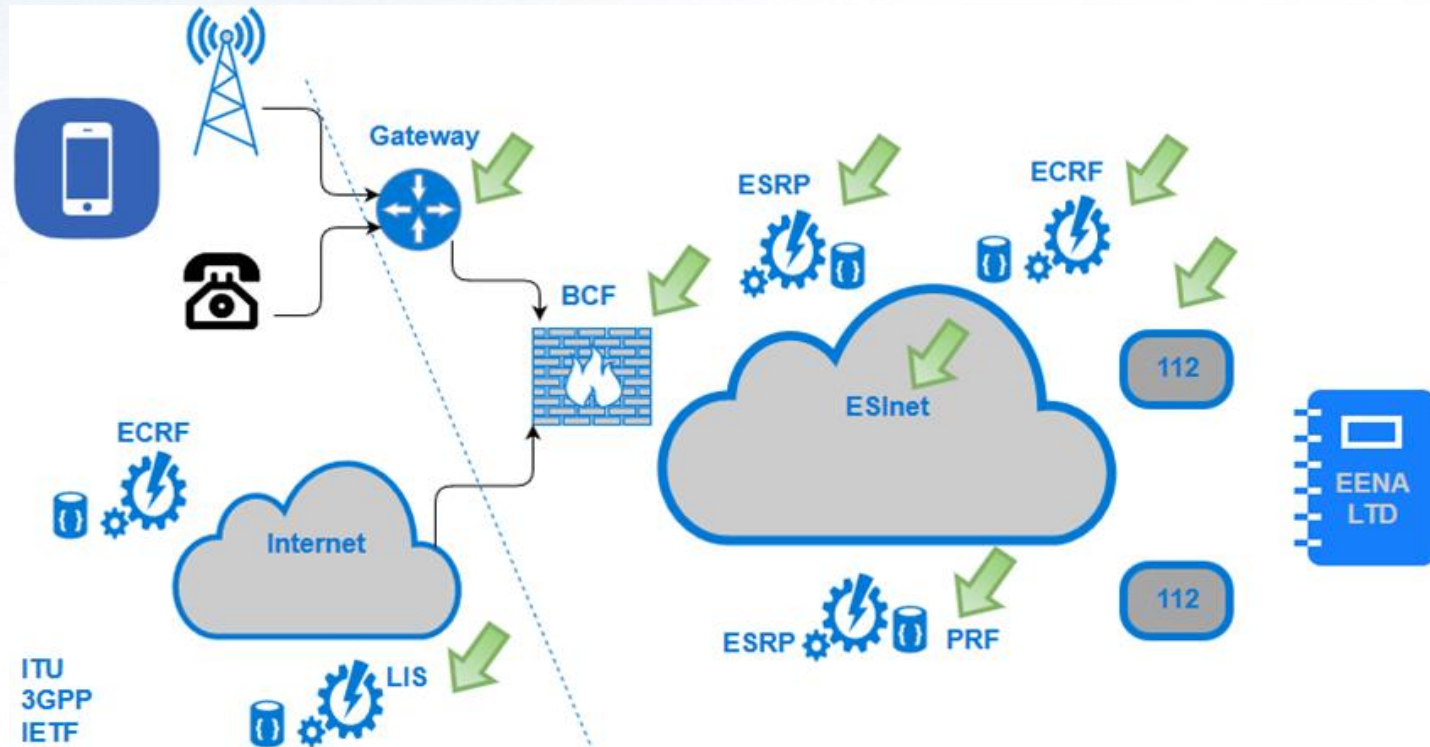
Vision



NG112 LTD Vision

Vision

- Open standards

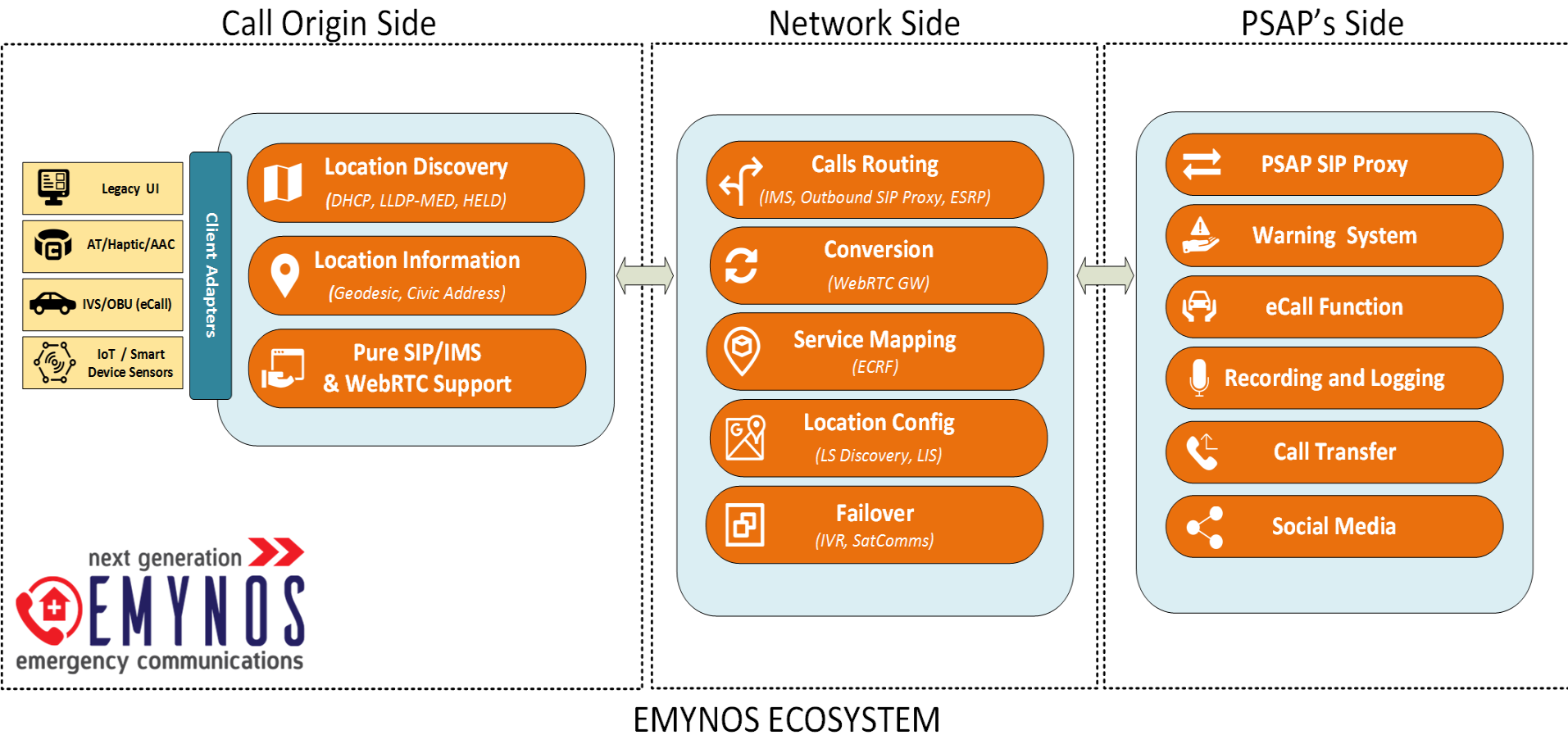


NG112 LTD Vision

EMYNOS Objectives

- **Design and develop a common Next Generation emergency management platform that:**
 - addresses the limitations of today's Emergency Systems
 - can manage both extreme emergency situations such as natural disasters and terrorist attacks as well as usual emergency situations (such as calls to ambulance and police)
 - Is standardized
 - Full support of new communication and information technologies (mobile devices, photos, video, GPS, WebRTC, etc)
 - Integrates mechanisms giving accurate user/device position (civic address, geodetic location)
 - Special focus on disabled persons

EMYNOS Blocks



Project Implementation



- Build a NG112 Testbed
- Implement various standardized technologies
- Evaluate and validate them in concrete scenarios

- Finalize the Testbed
- Integration with end users systems





Achievements and Innovations

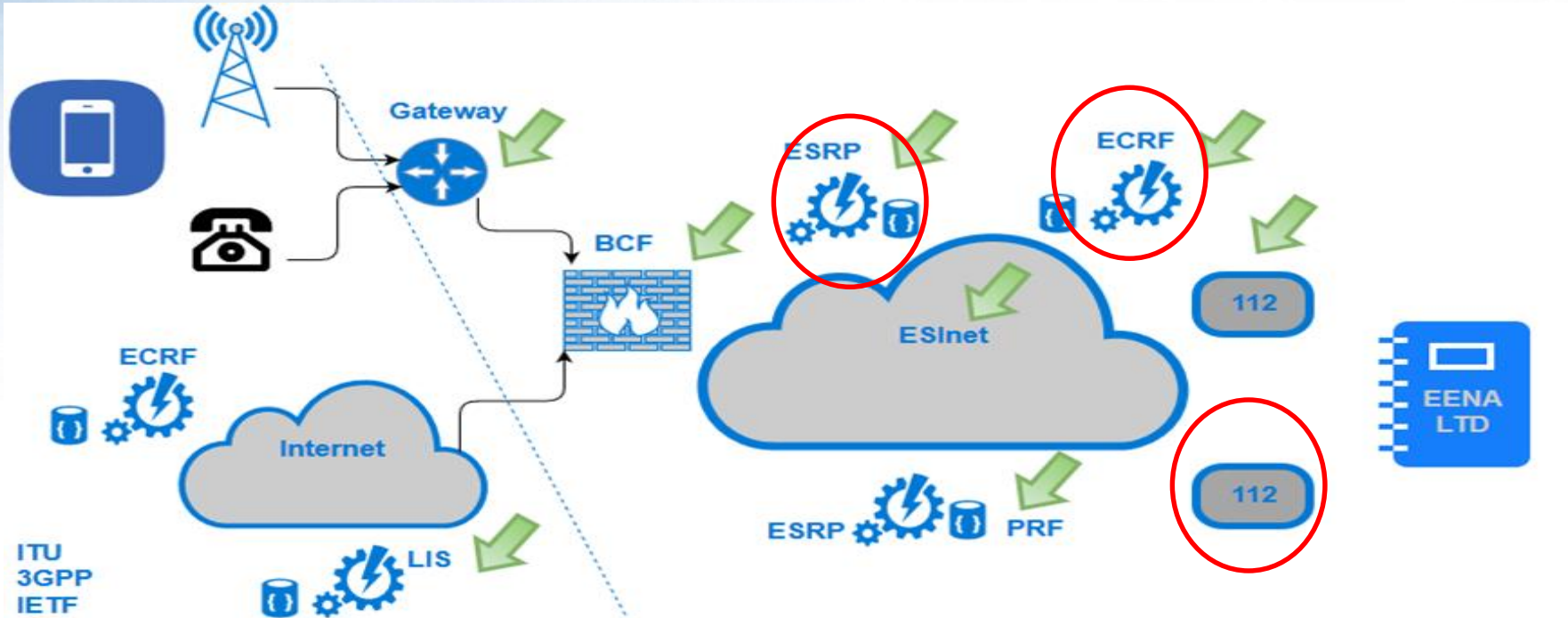
Project Implementation

- Implementation based on standards
 - EENA LTD vision
 - European Commission Vision (Mandate M493)
 - Pure SIP and IMS
- Implementation validation through interoperability
 - Participation to both first and second ETSI NG112 plugtests



Interoperability RTT tests: EMYNOS
Linphone vs. Omnitor device

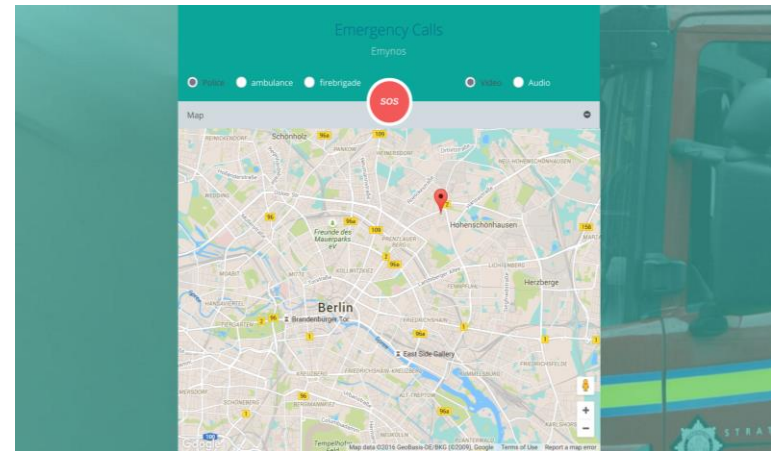
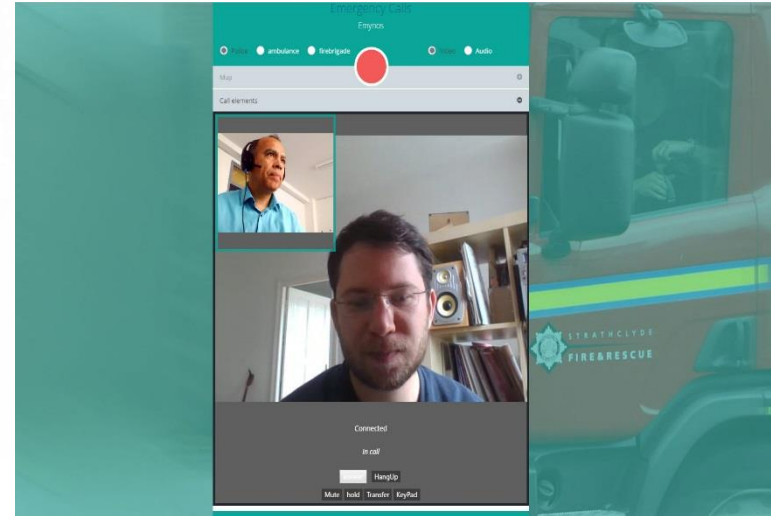
Towards an Open ESInet



ESInet components being implemented (ESRP, ECRF, IVR, PBX extended to support location and sensor data)

PEMEA: The Balance

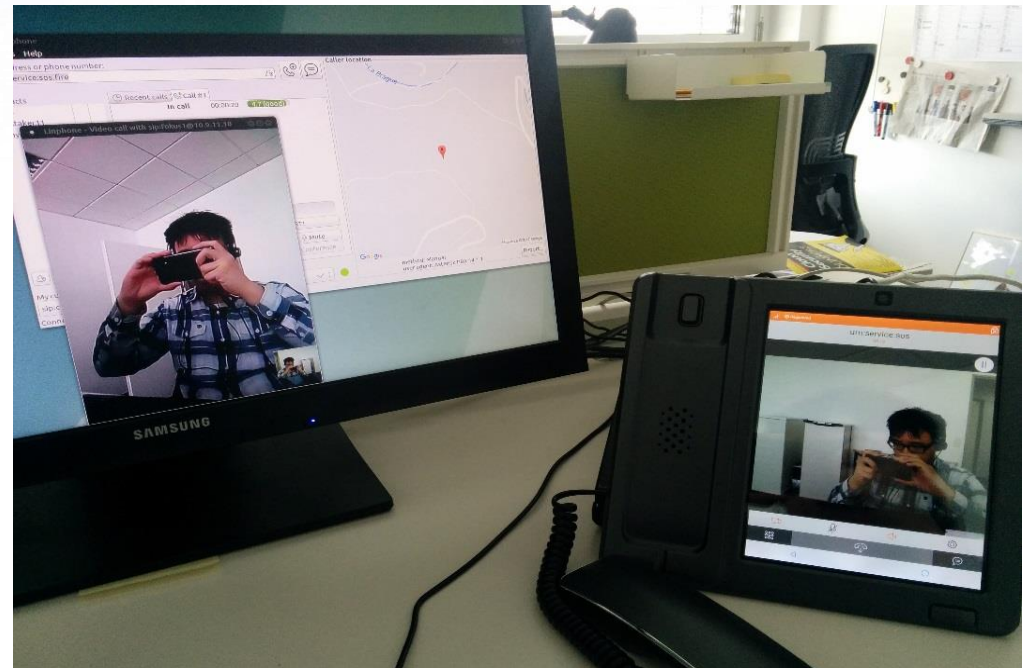
- EMYNOS proposes a PEMEA combining WebRTC and SIP
 - No architectural changes are needed on the EENA LTD vision
 - Easy interoperability



Various Deployment possibilities

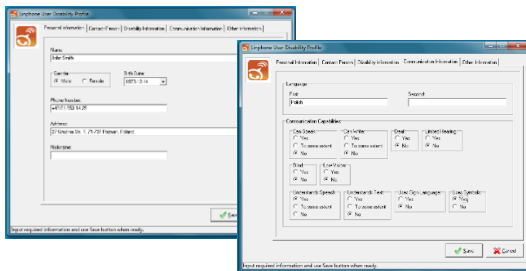
Ability for making emergency calls from mobile phones, desktops, and IP hardphones (*covering residential and enterprises*)

- Emergency call made from an IP hardphone
- Call taker can answer calls with features: audio, video, and Real Time Text

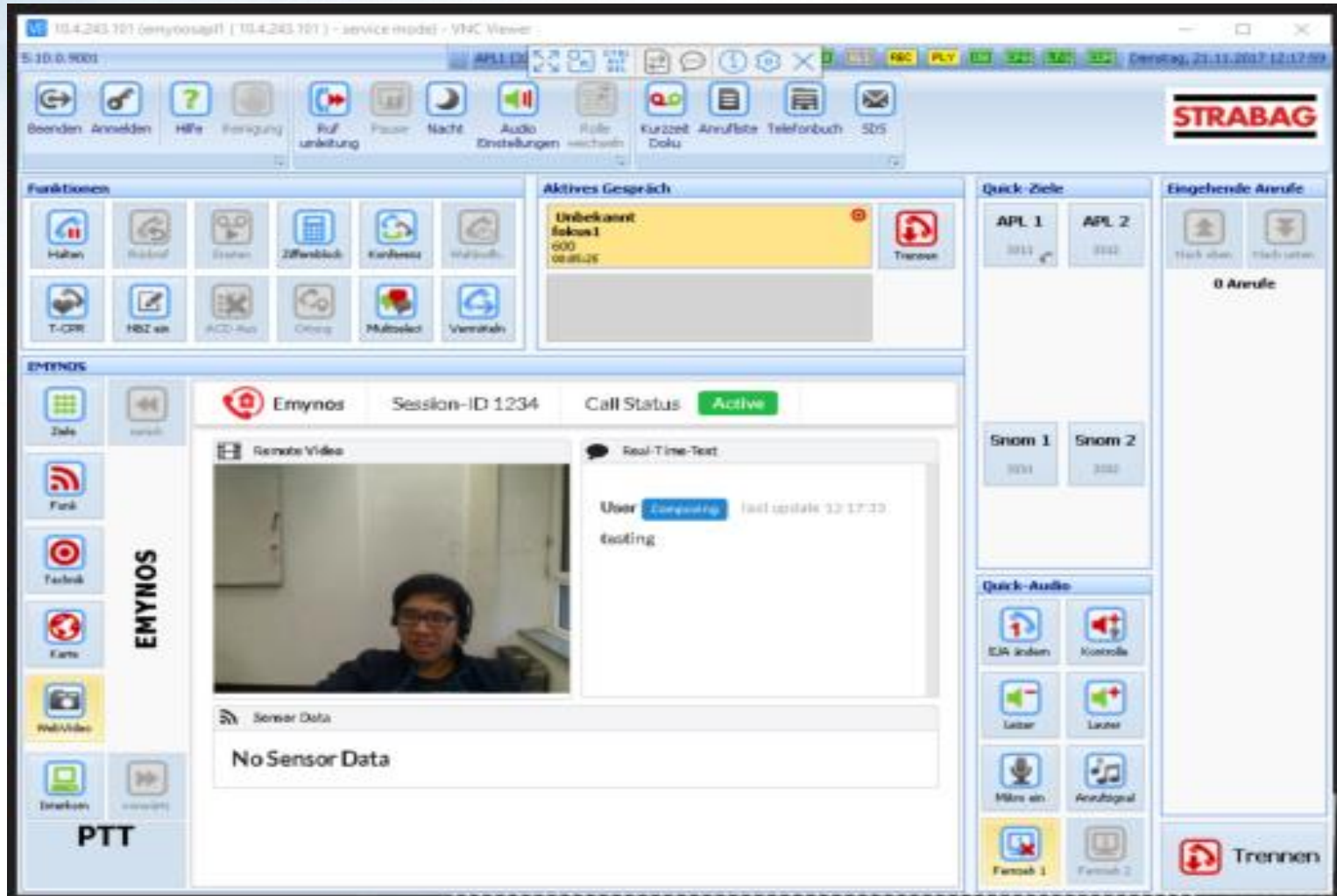


Accessibility for persons with special needs

- Development of API providing EMYNOS framework functionality for Assistive Technology developers
- Providing customized solutions for persons with different types of disabilities:
 - Blind and low vision,
 - Deaf and hard of hearing,
 - Users unable to operate standard ICT devices.
- Disability profile info sent to PSAP



Integration With Legacy Systems



Integration With Legacy Systems

The screenshot displays a VNC Viewer window titled "10.4.243.101 (emynosapl1 (10.4.243.101) - service mode) - VNC Viewer". The interface is a legacy emergency communication system for STRABAG, running on a Windows operating system. The top status bar shows the date and time: "Dienstag, 21.11.2017 12:19:09".

The interface is divided into several sections:

- Top Menu Bar:** Contains icons for "Beenden", "Anmelden", "Hilfe", "Reinigung", "Ruf umleitung", "Pause", "Nacht", "Audio Einstellungen", "Rolle wechseln", "Kurzzeit Doku", "Anrufliste", "Telefonbuch", and "SDS".
- Funktionen (Functions):** A grid of icons for "Halten", "Rückruf", "Starten", "Zifferblock", "Konferenz", "Wahlwdh.", "T-CPR", "NBZ ein", "ACD Aus", "Ortung", "Multiselect", and "Vermitteln".
- Aktives Gespräch (Active Conversation):** Shows a call from "Unbekannt fokus1" (600) at 00:06:38, with a "Trennen" (End Call) button.
- Quick-Ziele (Quick Targets):** Lists "APL 1" (3311) and "APL 2" (3312), "Snom 1" (3331), and "Snom 2" (3332).
- Eingehende Anrufe (Incoming Calls):** Shows "0 Anrufe" (0 Calls) with "Nach oben" and "Nach unten" navigation buttons.
- Quick-Audio:** Includes controls for "E/A ändern", "Kontrolle", "Leiser", "Lauter", "Mikro ein", "Anrufsignal", "Fernseh 1", and "Fernseh 2".
- map:** A central map view showing a street grid in Lend, Austria, with a red location marker. The map includes a "Ziele" (Targets) list, "Funk" (Radio) icon, "Technik" (Technical) icon, "Karte" (Map) icon, "WebVideo" icon, and "Interkom" (Intercom) icon. The "PTT" (Push-to-Talk) button is also visible.

The bottom of the map shows coordinates: "N47.083857° E15.414964°".

Next Generation eCall

EMYNOSeCall

- Based on the current eCall concept with an **enhanced concept** (e.g. by integration of video functionalities, real-time text messaging, ...)
- **Introduction of SIP-based eCall**
 - SIP based eCall removes limitations of current eCall system
 - Data is transmitted in parallel to voice call
 - Exchange of larger amounts of data

The screenshot displays the 'eCall Development Server' interface. At the top, the browser address bar shows 'https://emynos01.comloc.net/emynosrv/video/index'. The page has a navigation menu with 'Calls', 'Dispatch', 'Video', 'Tests', 'Phones', 'Users', 'Groups', and 'Configuration'. The 'Video' tab is active, showing a video call in progress with two participants. Below the video, a form displays call details:

- Registration State: **Registered**
- Connection State: **Connected**
- Session State: **Accepted**

Buttons for 'Hang Up' and 'Request MSD' are visible. The form includes fields for Position (48.30036 11.61738), Position N-1 (48.30064 11.61710), and Position N-2 (48.30091 11.61655). It also features fuel type selection (Gasoline, Diesel, CN Gas, LP Gas, Electric, Hydro, Other) and vehicle information (ID/Format Version: 1, Vehicle Type: passengerVehicleClassM1, VIN: WMIVDSVDSYA123456, Event Time (UTC): 2017-03-23 07:40:32, Vehicle Direction: 14, Number of Passengers: 2, Optional Additional Data: 3c73656e736f72733e0a2c). Realtime Sensor Data is updated at 08:55:28. A map at the bottom shows the location with a red pin on a street grid.

Open Source

Although the EMYNOS implementation has been targeting NG112 (Next-Generation Emergency Services in Europe), this implementation can also be used in the context of NG911 (North America. For more details, we refer to the specifications documents EENA NG112 LTD and NENA i3 architecture.

Components

Linphone

The VoIP software [Linphone](#) is extended in the context of EMYNOS as follows:

- Initiating emergency calls with audio/ video/ real-time text
- Supporting emergency URNs
- Supporting several location configuration protocols (DHCP, HELD, LLDP-MED)
- Accepting emergency calls and visualizing location information

Related Links:

- » [Download Extended Linphone](#)
- » [Clone Extended Linphone \(Desktop\)](#)
- » [Clone Extended Linphone \(Android\)](#)
- » [Clone Extended Linphone](#)
- » [Belle-Sip](#)

Interactive Voice Response system (IVR)

The IVR is used, for instance, in case all the call takers are busy. It is based on the Asterisk VoIP software. Here, the emergency call is forwarded to an IVR system where an audio file will be played and an Instant Message (with necessary information to be used by the caller) will be sent to the caller's VoIP client.

Open Source

The screenshot shows a web browser window with the address bar displaying "emynos | Open Source" and "https://www.emynos.eu/en/emynos/opensource". The page content includes a title "Emergency Support for the IP Multimedia Subsystem (IMS)" in green, followed by a paragraph explaining that IMS is a key enabler for rich multimedia services, standardized by 3GPP (IMS Release 6) using SIP. It mentions that IMS is supported by 3GPP, ETSI TISPAN, and 3GPP2/LTE. A bulleted list describes three layers: Transport or Access, Control, and Service or Application. The text continues to discuss the objective of 3GPP to enhance IMS with emergency services, listing documents like 3GPP TS 22.101, 23.167, and 24.229. It also describes the architecture of emergency services support, mentioning the Emergency C-SCF (E-CSCF) and the Location Retrieval Function (LRF). A "Related Links" section contains a link to "Emergency Support for IMS". At the bottom, a message states "More components and functionalities will be published soon." The Windows taskbar at the bottom shows the search bar, task view, and various application icons, with the system tray displaying the time as 12:59 PM on 11/28/2017.

Emergency Support for the IP Multimedia Subsystem (IMS)

The IP Multimedia Subsystem (or shortly IMS) is the key enabler in the mobile world for providing rich multimedia services to the end-users. It was standardized by the Third Generation Partnership Project (3GPP) (IMS Release 6) and uses the IETF standard (SIP) for session management. Although originally designed for mobile networks, IMS has been considered as a core component for NGN fixed networks. This vision is supported by the standardization bodies 3GPP, ETSI TISPAN and 3GPP2/LTE. The IMS architecture specifies three layers,

- Transport or Access layer: responsible for media processing and interaction with end systems
- Control (or IMS) layer: responsible for registration and SIP signaling routing
- Service or Application layer: hosting the call control applications and Value Added Services (VAS)

The objective of 3GPP was also to develop the necessary elements to enhance IMS with the support of emergency services while using as much as possible the protocols specified by IETF. The 3GPP work about emergency services was decomposed into several stages and described in corresponding documents: 3GPP TS 22.101 (for the requirements), 3GPP TS 23.167 (for the architecture), and 3GPP TS 24.229 (for the protocols and interfaces). For more details, we refer to these documents.

The architecture of the emergency services support for IMS is depicted in the figure above. Two main components were added to the IMS framework: (1) the Emergency C-SCF (E-CSCF) which is the entity in charge of routing the emergency requests to the appropriate PSAPs, and the Location Retrieval Function (LRF) which is in charge of retrieving the location information of the user's terminal that has initiated an IMS emergency session. For more details, we refer to the 3GPP document TS 23.167.

Related Links:

- » [Emergency Support for IMS](#)

More components and functionalities will be published soon.



World Class Standards

Certificate of Participation

awarded to

Fraunhofer Fokus

*for their attendance at the 2nd NG112 Emergency Communications
Plugtests event*

Sophia-Antipolis, France, 6th - 10th March 2017

10 March 2017

*The issuance of the present document
does not imply any form of certification by ETSI*

**Thank You
Questions?**

Jørgen Friis
ETSI Chief Service Officer