

I_HeERO Project Newsletter: Final Edition

March 2018



Harmonised Pan-European eCall Deployment

eCall saves lives!

More information: www.iheero.eu

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What is eCall

eCall is a 112 emergency call triggered either manually by vehicle occupants or automatically as soon as in-vehicle sensors detect the impact of a serious accident. When activated, eCall establishes a voice connection with the relevant Public Safety Answering Point (PSAP), a public or private emergency call centre operating under public delegation.

Using the voice line, a Minimum Set of Data (MSD) is sent to the PSAP operator. The most important data is the accurate geo-location of the accident scene. Knowing the coordinates of the crash site enables the rescue services to arrive much faster at the accident scene and to treat the victims much quicker. Time saved thus translated into lives saved and less severe injuries.

The I_HeERO Next Generation 112 eCall activity analyses how new technologies can help to improve the eCall experience for the users e.g. with faster data transfer and no voice channel interruption during the transfer.

How eCall works

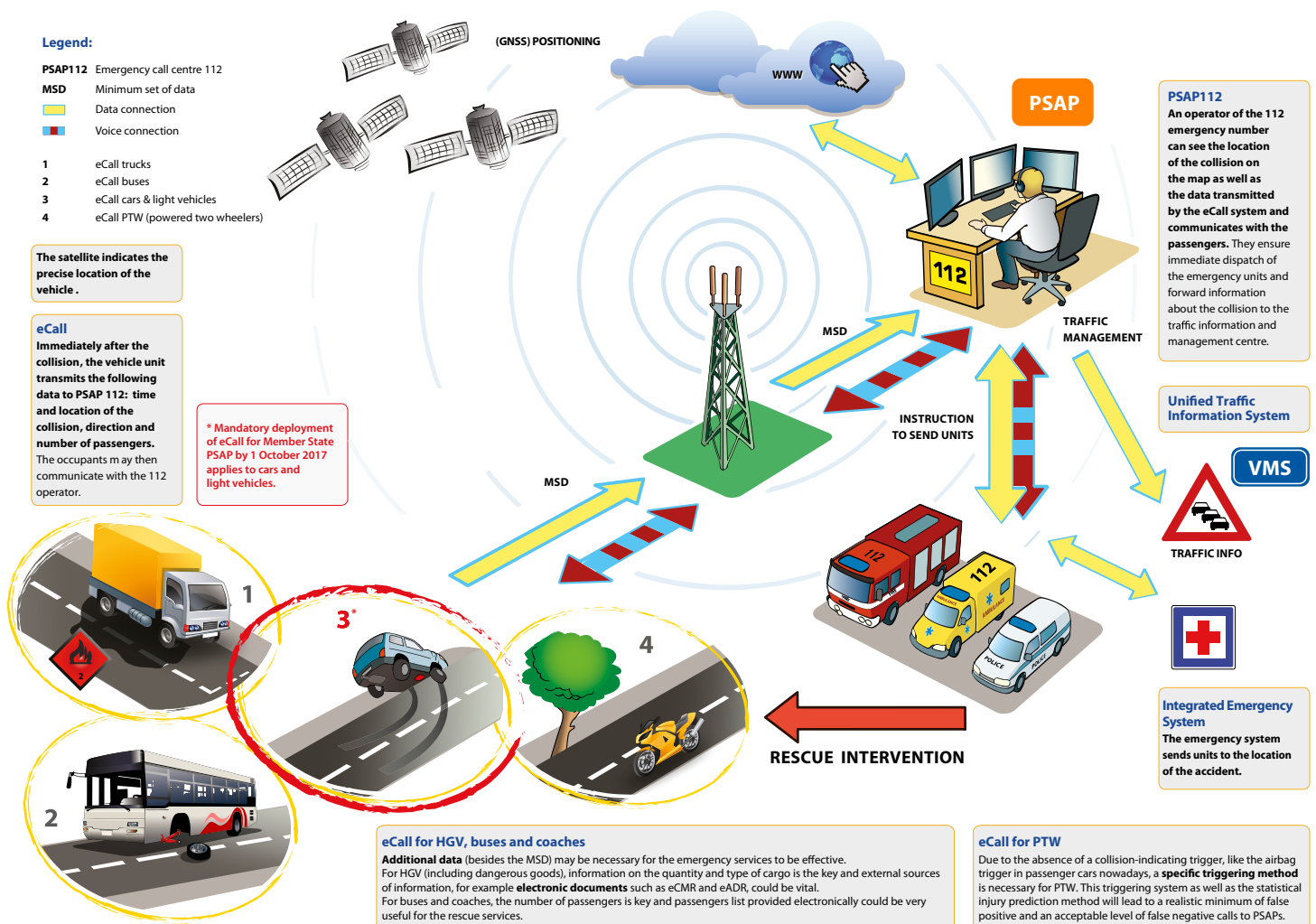


Figure 1: How eCall works

The I_HeERO project

I_HeERO

Deployment pilot project of EU-wide eCall

I_HeERO, (“I” for “Infrastructure”) is aimed at the preparation of the PSAPs in Member States for the deployment of eCall based on 112 as reference implementations.

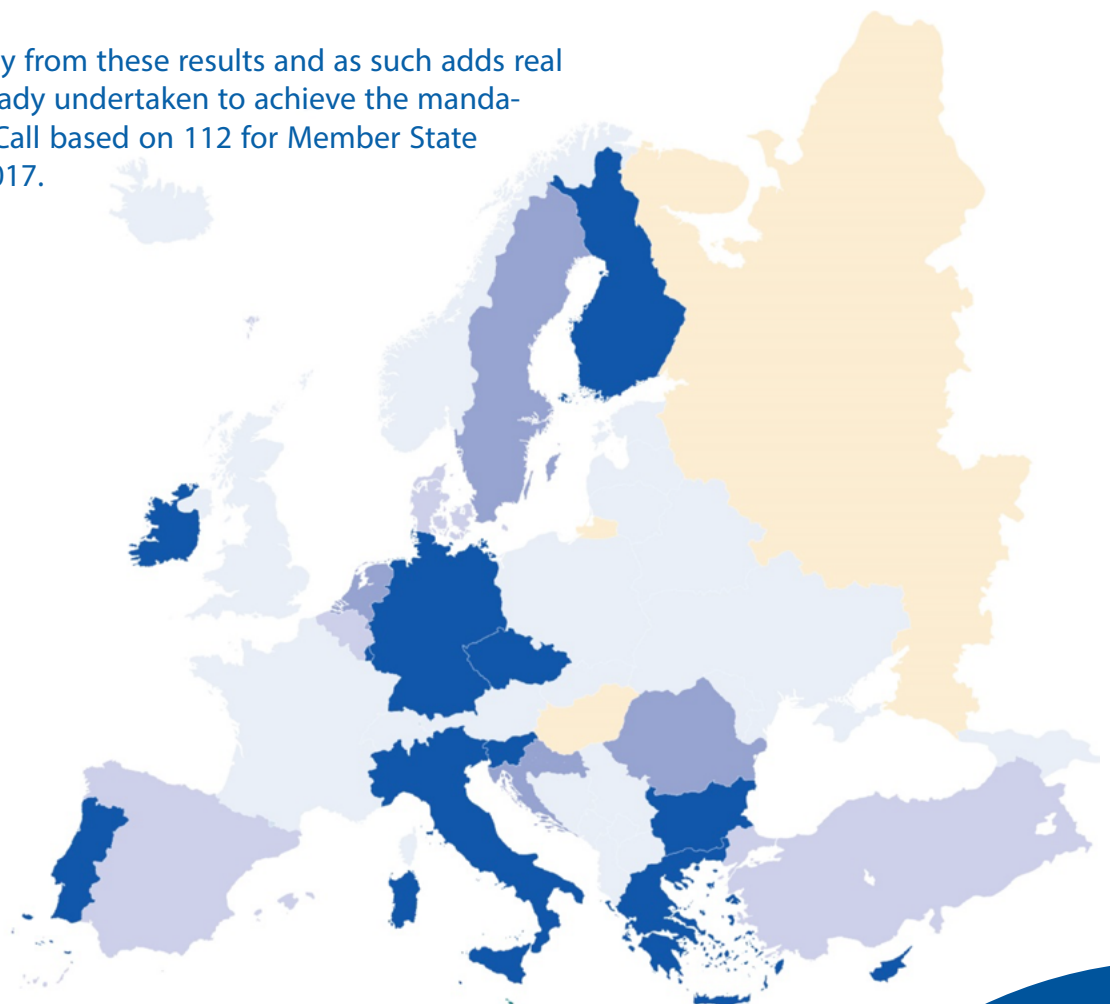
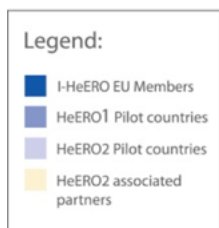
I_HeERO developed a blueprint and implementation plan for beneficiary member site PSAPs on how to upgrade their infrastructure to support eCall as a pan-European project.

I_HeERO consists of studies leading to a number of pilot reference implementation in all activities.

Building further on HeERO and HeERO2

Pre-deployment of eCall started with the EU co-funded projects “HeERO” and “HeERO 2”, i.e. Harmonised eCall European Pilot. In these projects, 14 EU participating Member States and 1 associated country analysed the feasibility and robustness of the eCall service with pilot installations on both the PSAP and vehicle side.

I_HeERO draws directly from these results and as such adds real value to the work already undertaken to achieve the mandatory deployment of eCall based on 112 for Member State PSAPs by 1 October 2017.



Status and way forward from the Project Coordinator



*By Michael Schäfer,
Niedersächsisches Ministerium für Wirtschaft, Arbeit und Verkehr*

Dear Ladies and Gentlemen,

Today I'm very happy to announce the successful completion of the I_HeERO Project within the participating 11 European Member States as well as for the other or associated partners.

Here this project, which started in 2015 and finished at the end of 2017, was not just about the implementation of advanced technical capabilities at the Public Service Answering Points (PSAP), moreover, it is much more complex:

I_HeERO was, with its 6 different activities, each in its diversity and extension a project on its own:

Activity 1, the PSAP upgrade, was fulfilled by almost all Member States at the given date, October 1st 2017. Most have been "eCall-ready" since the end of December 2017.

Activity 2, eCall for Commercial Vehicles, has developed specifications for Heavy Good Vehicles (HGV) and Long-Distance Buses and Coaches. The results are currently being presented in different ways as a European demo tour and the "Busworld Congress" in Belgium.

Activity 3, Powered two-wheeler eCall, (P2W), was a highly complex activity due to the necessary cooperation with political and technical and motor manufacturers' interests coming together. In parallel work has been done together with CEN, defining necessary standards.

Activity 4, Data Integration, focuses on data exchange messages, delivering an eCall to a PSAP with the highest rate of accuracy. Is it possible to use enriched Minimum Sets of Data (MSD) to improve the outcome of an eCall? How can we bring Third-Party System eCall and its MSD to a PSAP?

Activity 5, Next Generation 112 eCall, worked with CEN and ETSI, defining standards for NG112 eCall. A Demo unit is presented by end of October 2017. And, finally, **Activity 6, the Associate Partners Activity**, went up in its amount to almost 100. It allowed free access to HEeERO activities.

But I_HeERO cannot be described just with regards to contents. Beside the coordination and communication work between the aforementioned activities, there were organizational topics to be addressed, in the background, covered by the Technical Implementation Officer from ERTICO and the subcontracting team. Those included banking procedures, definitions of conformity, clarifications on the budget share and, as a result, the setup of the Consortium agreement. In addition, shared responsibilities for rescue services, in Germany for instance, as well as complicated procurement systems for all partners have proved to be major challenges. The results of I_HeERO deserve a consideration for future, further options. Technical developments are advancing quickly, and should be accompanied and supported by the European Union and its Member States. This important aspect of transport digitalisation is not limited to just road safety, either: it is a topic of key industrial importance for continued competitiveness in the future.

Kind regards and thank you all very much for your contributions!

Michael Schäfer
I_HeERO Project Coordinator



*By Andy Rooke,
ERTICO – ITS Europe I_HeERO Technical Implementing Officer*

The I_HeERO project has been active for three years, and is now fulfilling its contractual obligations over a range of topics which all relate to the delivery of eCall based on 112, in particular the necessary upgrade for the Public Safety Answering Point (PSAP), so that the new eCall-equipped vehicles can be handled correctly after 31st March 2018.

The newsletter will cover the progress of the participating Member States as they prepare for 31st March 2018, when eCall-equipped vehicles will be on the roads of Europe.

In formulating the I_HeERO proposal, the consortium sought to advance the technical capabilities of eCall through a number of initiatives that have reacted to the comments made by members of the European Parliament about the advancement of eCall to other vehicle types, namely the advancement of eCall towards Heavy Goods Vehicles, long distance Coaches and Powered Two Wheeled vehicles. The progress of each will be described by the activity leaders.

Technically, a great deal of work remains to be done concerning the ability for the emergency services and the PSAP to move data between agencies successfully. As the eCall technology matures, there is a greater understanding of what eCall will mean to the emergency services and what technical requirements are needed to ensure that eCall data can be used and moved effectively between emergency services, and between Third Party eCall providers and the PSAP. I_HeERO has made significant progress in standardising this approach, which is now being examined commercially.

The communications industry is by nature a fast-evolving scene, with 4G now equipping vehicles, while mobile networks steadily migrate to 4G. In response to this I_HeERO is working with the standards agencies to develop the next generation of eCall and its capabilities. The project activity tasked with next generation eCall has successfully demonstrated a proof of concept and passed its results to the CEN standardisation body in charge of the development of the next generation of eCall.

In bringing together the partners for the I_HeERO project, lessons learned from both the HeERO and HeERO2 project were applied; one of the key issues and a requirement from the European Commission was to make the products from the projects available to as many entities as possible. In response to this, HeERO2 formed an associate partnership scheme. This has been continued in I_HeERO and the number of partners, both Member State and commercial, continues to increase (now close to 120). The partnership, which is free of charge to all, allows access to I_HeERO activity groups and I_HeERO milestones and upgrade techniques. For the duration of the activity the project has sought to make in-depth information on eCall available to all associate partners. This has been done through twelve webinars that have been staged throughout the term of the project. The subject matter covered every aspect of the development of eCall by the I_HeERO project.

For more information please see the I_HeERO website which can be found here: iheero.eu.

I hope that you enjoy this newsletter and find it interesting and informative. If you require more information please contact the I_HeERO team through the I_HeERO website.

Andy Rooke
I_HeERO Technical Implementing Officer



1. Status

In accordance with the decision of the European Parliament and the Council № 585/2014/EC 15/05/2014, the Ministry of the Interior has taken measures for the temporarily implementation of eCall based on the test environment of the National 112 system. Since October 28th, 2017, the Regional Center 112 (PSAP) Sofia can receive and service eCall calls from the territory of the whole country. The tests performed with Bulgarian IVS devices show localization, direction of movement and MSD.

2. Architecture

The following Figure describes the PSAP eCall architecture from a high-level perspective:

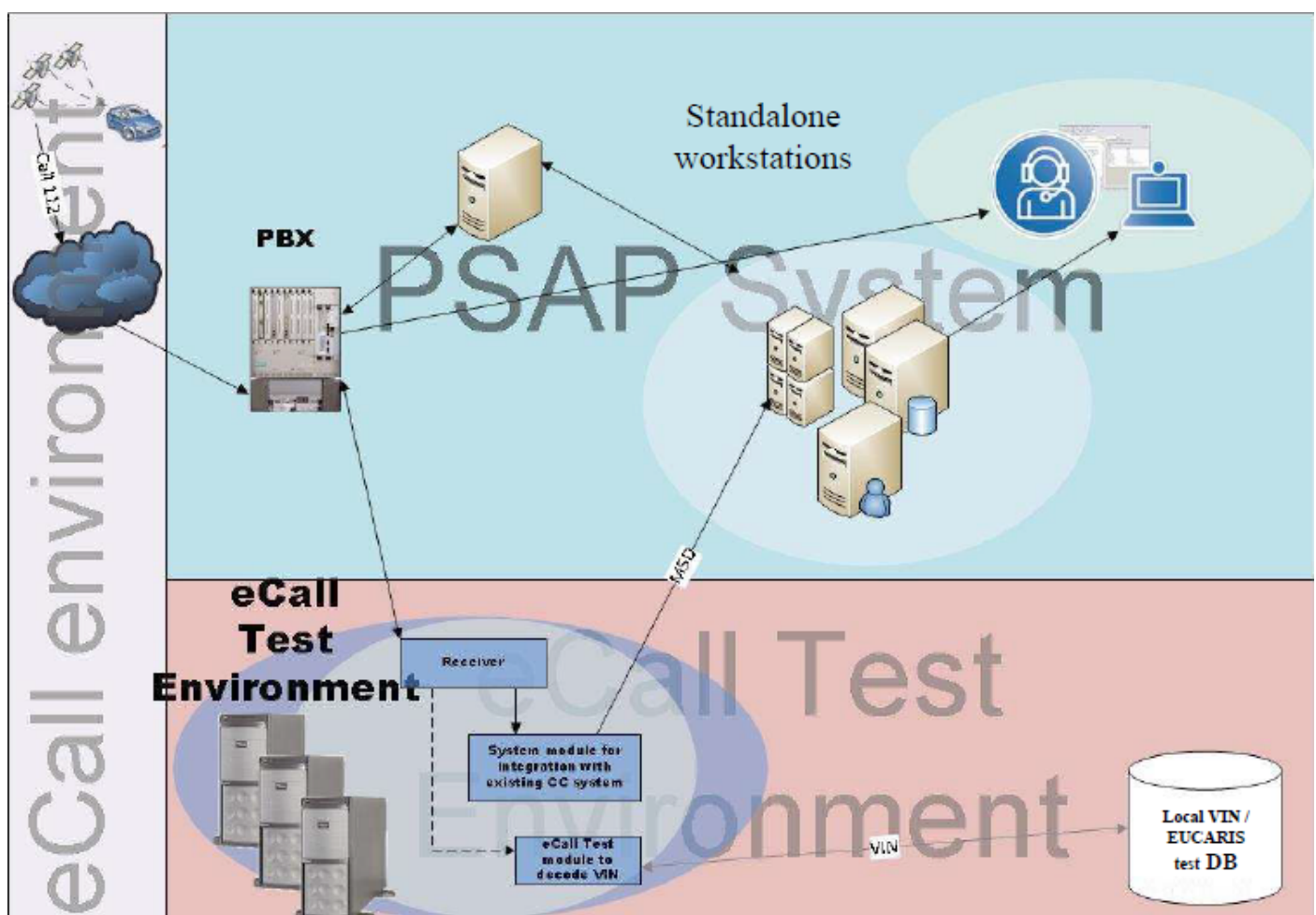


Figure 2: High-level perspective the Bulgarian PSAP eCall architecture

- The three Bulgarian MNOs have already implemented the eCall flag.
- The eCall is received on standalone workstations in a test environment in the Sofia PSAP training centre. The Minimum Set of Data is displayed with active voice channel eCall.
- The received data from local VIN database is visualized on the operator's screen.



3. Problems encountered and overcome

The acceptance of eCall through the Pilot-Embedded HeERO2 service in the testing environment of the National 112 system has the following limitations:

- a) The eCall Acceptance System is not integrated into the production environment, so calls can only be received from standalone workstations in a training environment of the Sofia PSAP;
- b) It must be allocated operators who accept eCalls only, which is statistically relatively uncommon and leads to low-efficiency shifts;
- c) The Ruse PSAP Ruse is not equipped with a reserve eCall system operating in disaster recovery mode.

The above limitations will be overcome after integration of the eCall system in the production 112 system, which was the object of Bulgaria's participation in the I_HeERO project.

The decision on contractor selection for the activities on the Ministry of the Interior's I_HeERO tender and project was appealed to the Commission for Protection of Competition (CPC). The CPC rejected the appeal on October 9th, 2017, and a contract for full implementation and deployment of the eCall service on the territory of Bulgaria was signed on November 24th, 2017. A State of the Art analysis document has been produced, equipment has been ordered and put into production, and the Conformity Assessment has been booked with the supplier.

Member States Update eCall Implementation in Cyprus



By Michalis Michael
Ministry of Transport, Communications and Works

1. Status

Cyprus has finished the upgrade of the Police PSAP in the Police Headquarters in Nicosia. The system was accepted on September 27th, 2017. A backup PSAP and a disaster recovery site were also installed at the Paphos Police District Department Building in order to provide for geo-redundancy. The project was implemented by the consortium of "iKnowHow A.E" and "TEAMNET WORLD PROFESSIONAL SERVICES S.R.L".

During the same period Conformance Tests were carried out successfully by NavCert. The testing continued in November with Suitability for Use, as defined by activity 1.4 of the Project.

All MNO's have been notified about the most suitable eCall-enabled PSAP and a long number was provided so that all eCalls are forwarded to the specific number.

The Ministry of Transport, Communications and Works and the Police tried to raise awareness about eCall by publicizing the conclusion of the PSAP upgrade on social media.

Cyprus also planned to conclude the study on implementing eCall for Heavy Goods and Dangerous Goods Vehicles (eCall HGV and DGV) and the study on Data Integration by the end of 2017, by producing two (2) documents describing the implementation design and process. The documents shall form the basis of implementing both eCall HGV and DGV, and eCall Data Integration on a later stage.

2. Architecture

The upgraded PSAP's architecture is shown below. The upgraded PSAP uses the Police Headquarters' legacy PABX (Alcatel Lucent OmniP-CX) for receiving eCalls and regular emergency calls. An eCall modem (OEACON) is directly connected to the PABX so the MSD is received and then forwarded to the PSAP's Management Software (Teamnet EMER-CONF). The PSAP's Management consists of several modules (CTI, Mapping, Archiving) that run on virtual machines. All virtual machines run on DELL PowerEdge servers in high redundancy mode. Storage is handled by a dedicated storage device (Dell PowerVault) that includes both SAS HDDs in RAID 5 configuration and a back-up tape library.

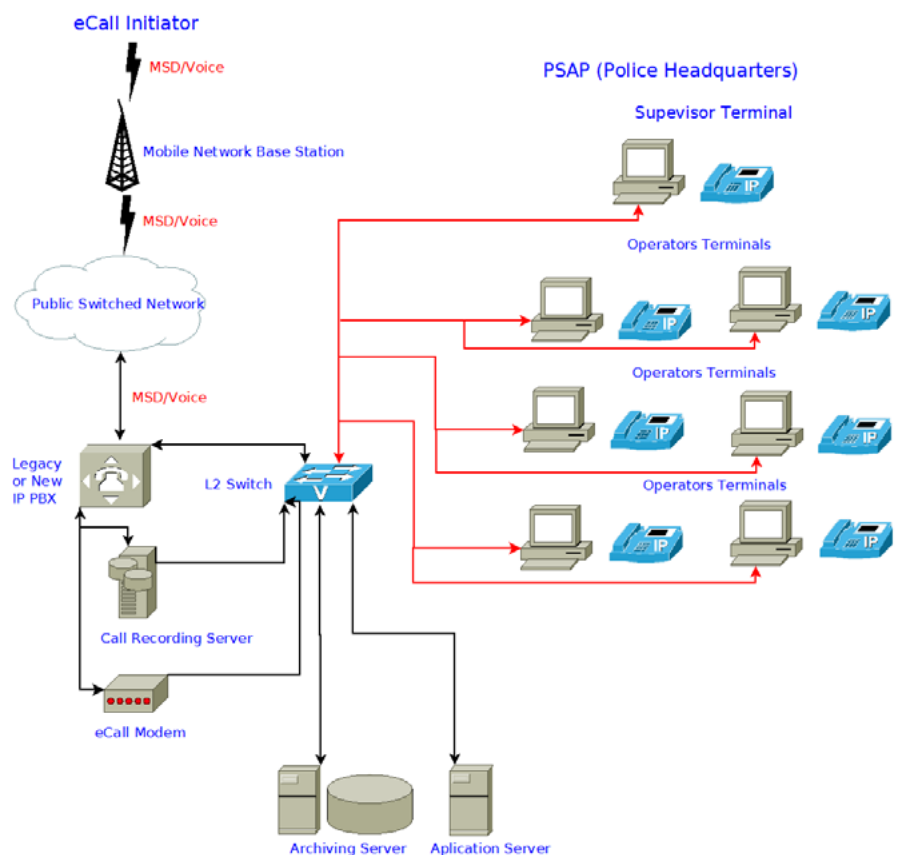


Figure 3: eCall Implementation in Cyprus



The system includes six operator positions that consist of a PC, two screens, an anatomic Headset and an IP phone as backup. It also includes a supervisor position with the same equipment and with two additional large screens for improved situational awareness.

The back-up site has identical equipment but only two operator positions.

3. Problems encountered and overcome

The major problem encountered had to do with public procurement procedures that can greatly delay the procurement process. The only way to overcome public procurement problems is to plan as early as possible the procurement process in order to have sufficient time to handle delays caused by the procedures.

The other major problem encountered was the coordination between the Police and the contractor in view of keeping installation delays to a minimum. Unfortunately, in the case of Cyprus the project was delayed by two months because of coordination issues. The implementation of the project needs to be carefully planned: the contractor needs to identify at an early stage possible bottlenecks in the installation process and take appropriate action towards the Contracting Authority if actions need to be taken by their side. The Contracting Authority also needs to identify any possible bottlenecks and try to resolve them before they become a problem. In case a problem does occur the Contracting Authority needs to take direct actions towards the person responsible for resolving the problem and press for an immediate remedy.



1. Status

Since September 1st, 2017 the eCall flag is mandatory on all mobile networks, based on Decree No. 267 (2017) on emergency calls location. The eCall flag is implemented and tested in all three mobile networks in the Czech Republic.

The technical infrastructure required for eCall, as defined in the European Commission delegated regulation (EU) No. 305/2013, was put in operation on September 27th, 2017. On September 27th, 2017, call routing in PSAP systems was updated to distinguish between eCall and normal mobile emergency calls.

The deadline set in Article 1, paragraph 1 of Decision No 585/2014/EU of the European Parliament and of the Council – “no later than 1 October 2017” – was successfully met.

Three PSAP locations were selected for the first stage of eCall operations – Prague, Ostrava and Plzeň. Every eCall PSAP location handles one third of the territory of the Czech Republic with a backup routing to two other locations.

2. Architecture

The eCall solution in the Czech Republic is integrated into the existing 1st level PSAP 112 infrastructure. Two of three PSAP nodes in Czech Republic, Prague and Olomouc, were equipped with software resources for eCall detection, reception and decoding: eCall PSAP modem (virtual Linux server) and MSD storage server (Oracle RAC Cluster).

Incoming eCalls are delivered from mobile network to the respective PSAP (Prague or Olomouc) based on caller location (origin-dependent routing) with a special network routing code that is derived from the eCall flag. It allows emergency services to distinguish between normal 112 and eCall (manual or automatic) on the public network level as well as in the PSAP call centre technology. On the PSAP side, the eCall is recognized due to this network routing code and immediately routed to the PSAP modem. After the MSD reception, the eCall voice call is distributed to the appropriate PSAP operator together with MSD data. Call Taker Application software is adapted for eCall data visualisation – MSD, decoded VIN and information obtained from the Car Registry.

PSAP communication servers have been updated with new interfaces:

- VIN decoder, National Car Registry and Eucaris network for obtaining additional data about the car;
- Traffic Management Centre System to be able to send basic information about the car accident;
- TPSP (Third Party Service Provider) to allow communication with TPS providers according to standard EN 16102.

The eCall solution is also ready for future reception of HGV optional Additional Data in the 12th octet of MSD.

Member States Update

eCall Implementation in Czech Republic



By Martin Pichl, Zoltan Horvath
Czech Republic Ministry of Transport

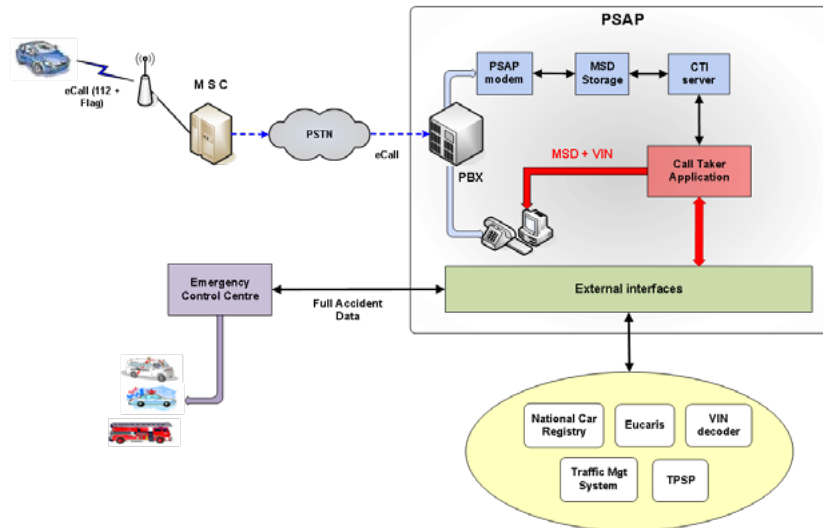


Figure 4: eCall Implementation in the Czech Republic (1)

To ensure high availability of eCall reception both of PSAP modem and MSD Storage, servers works in Hot/Standby mode. It means that the PSAP modem in one node is backed up by a secondary eCall modem from the second PSAP node. The primary database is backed up by means of real time replication.

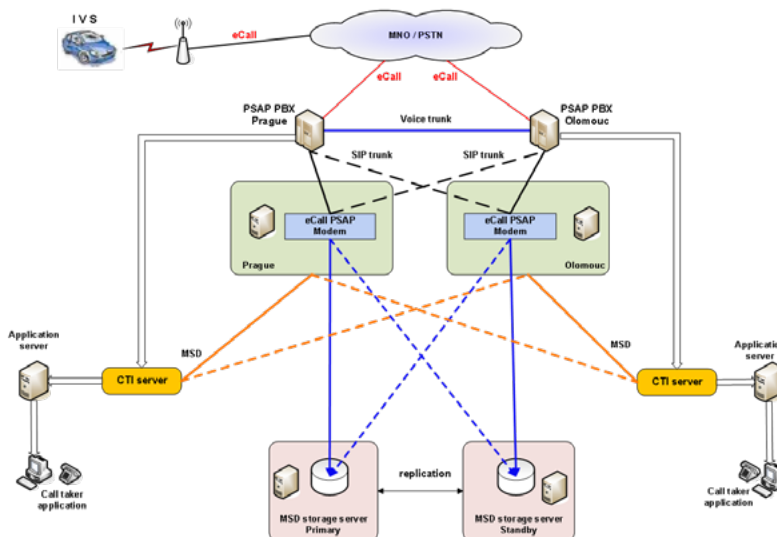


Figure 5: eCall Implementation in the Czech Republic (2)

3. Problems encountered and overcome

False eCalls were observed after the deployment, predominantly on the Vodafone CZ network. As a solution, the "Portugal setup" (see below) was implemented in the network, which led to a significant decrease in false eCalls in the system.

No real eCall case has been handled in the Czech Republic yet.



1. Status

The eCall Infrastructure in the first PSAP in Finland was deployed at the beginning of October 2017. The eCall upgrade was successfully inspected by the I_HeERO Technical Implementation Officer on October 12th. The rollout of the eCall upgrade is currently ongoing and all six PSAPs in Finland have had eCall capability since October 2017. All Mobile Network Operators operating in continental Finland have the eCall flag in operation. The eCall flag has been successfully tested in MNO test laboratory environments as well as in the field with test eCalls (using the 112 emergency number). The eCall implementation part of the Finnish I_HeERO project includes both mandatory conformity tests for the PSAP as well as end-to-end tests covering the whole eCall service chain from In-Vehicle System (IVS) to PSAP. The Conformity Assessment process of the eCall upgrade and the preparations for the final end-to-end tests are currently in progress. The Conformity Assessment has been performed throughout October – November 2017.

2. Architecture

The eCall upgrade to the existing PSAP information system (called ELS) is implemented in all six PSAPs across Finland. The system is duplicated in all PSAPs order to ensure high reliability. When an eCall is launched from an IVS, the MNO network detects the eCall-flag and routes the eCall to a PSAP according to the location of the device. In the PSAP the eCall is then forwarded to the eCall modem which separates the MSD data. A PSSF server transmits the MSD data to a CAD (Computer Aided Dispatch) Cloud. When the operator answers the eCall the PSAP information system picks up the related MSD data from the CAD Cloud. The operator gets the information about the eCall-type and the MSD data to the workstation. Information about road traffic accidents is automatically transmitted to the relevant Traffic Management Centre.

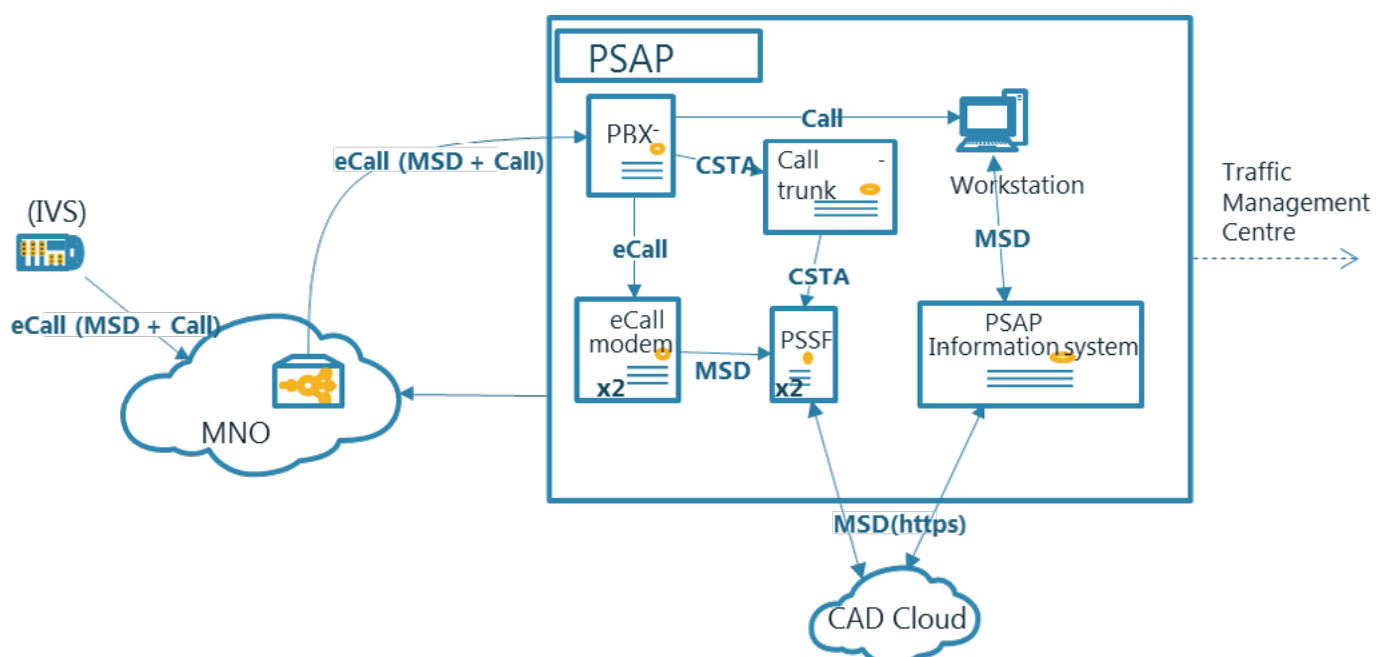


Figure 6: eCall Implementation in Finland



*By Seija Miettinen
Ministry of Transport and Communications*

3. Problems encountered and overcome

The existing information system used by PSAPs (ELS) in Finland will be replaced by a new information system (ERICA) in the near future. In the course of the I_HeERO project the first version of the eCall functionality for the new ERICA information system was developed. However, during 2017 it became clear that the commissioning of the new PSAP ERICA information system as a whole would be delayed and that it would not be ready by October 1st, 2017. Therefore, the Emergency Response Centre Administration decided to implement eCall in the existing ELS system as a temporary solution until the new system can be deployed.



1. Status

At the time of writing, more than 90 % of the German PSAPs have provided a status report on their eCall readiness. The analysis of this feedback showed that around 75% of them have completed their eCall upgrade in September 2017, which is a great result based on the preconditions in Germany. The missing 25% will have finished their eCall upgrade by December 2017. There will be a variety of upgrade infrastructure solutions from “totally integrated” to “temporary solution” depending on the existing technology and the future development plans.

2. Architecture

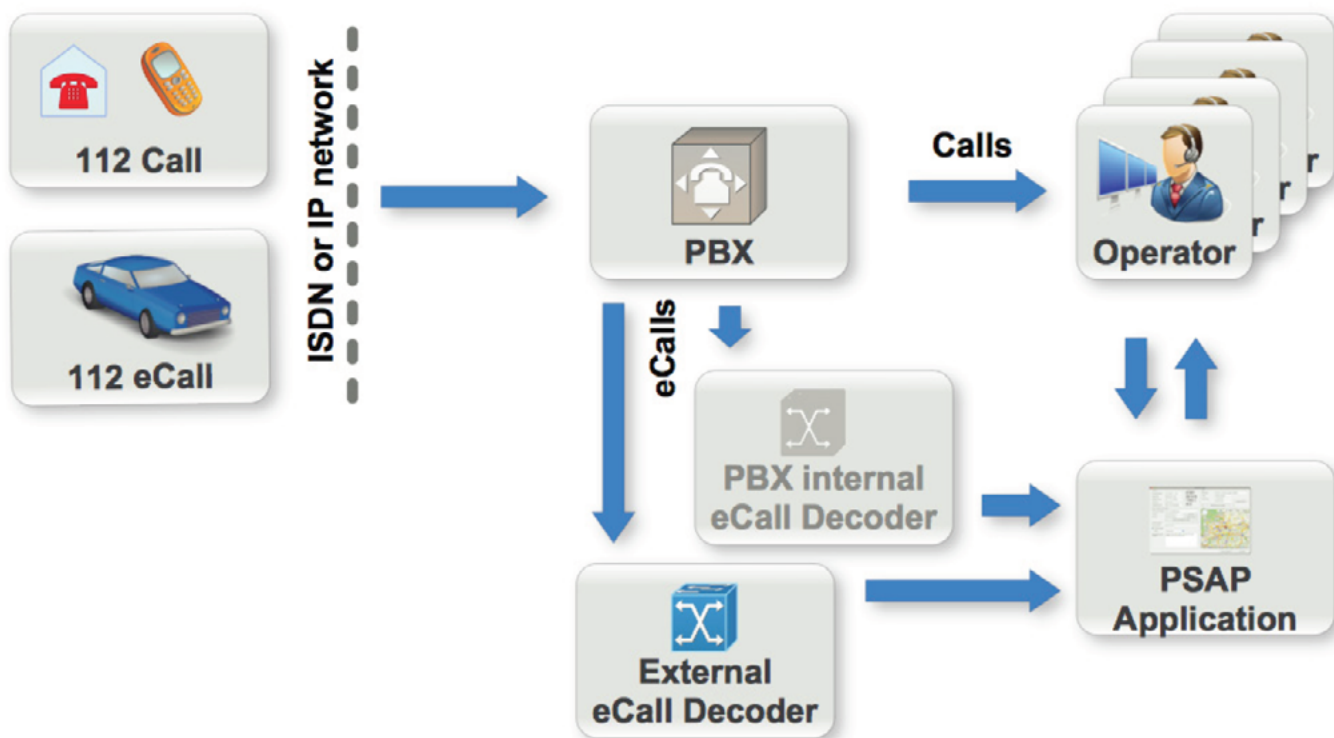


Figure 7: eCall Implementation in Germany

3. Problems encountered and overcome

The interaction of individual components presents a greater challenge, since a large number of combinations of PBXs and application control software are found in German PSAPs. The manufacturers were under considerable pressure to install several similar but non-identical interfaces in their products in time for deployment. These combinations also required partial proprietary customizations. Due to these issues, smaller temporary solutions have been created in order to buy more time to handle the existing individual problems.

1. Status

The Greek PSAP has been updated according to the latest releases of the eCall standards. After this step was finalised, wide field tests were planned and conducted which included more than 2500 eCalls. The field tests took place between May 17th and July 3rd, 2017 in three different regions of Greece: Attica, Thessaly and Epirus.

The following figures illustrate the locations of established eCalls in the corresponding heat map of each region.

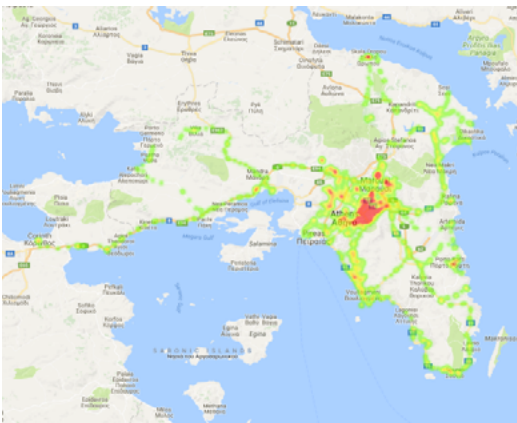


Figure 8: Heatmap of locations of established eCalls in Attica

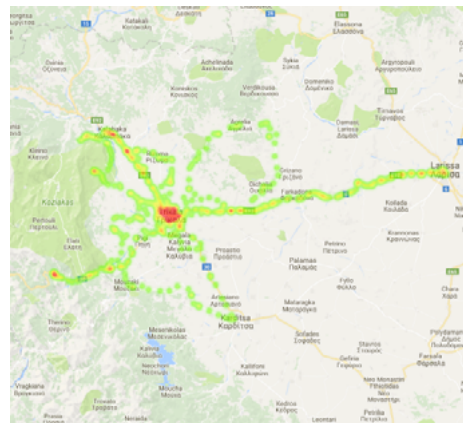


Figure 9: Heatmap of locations of established eCalls in Thessaly

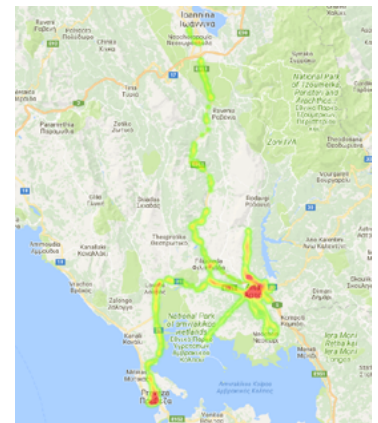


Figure 10: Heatmap of locations of established eCalls in Epirus

For the field tests two IVSs were used to trigger eCalls to 112, which were rerouted to the Greek eCall PSAP, located in Athens, Greece, where they were handled by the eCall operators. Drivers of vehicles equipped with the IVSs were instructed to follow specific routes in each region. The co-driver of each vehicle was responsible for initiating the eCalls and communicating with the PSAP operator. For every ten eCalls from each vehicle, the operator was performing a new MSD request and a call-back to the IVS.

For the evaluation, data was logged from the PSAP, IVS and MNOs. The Key Performance Indicators proposed by the project were calculated and were all found to be of high-quality. For example, KPI_1 "Success rate of completed eCall using 112" was 98.81% while KPI_2 "Success rate of call-backs" was 100%.

2. Architecture

The architecture of the Greek eCall PSAP is shown below.

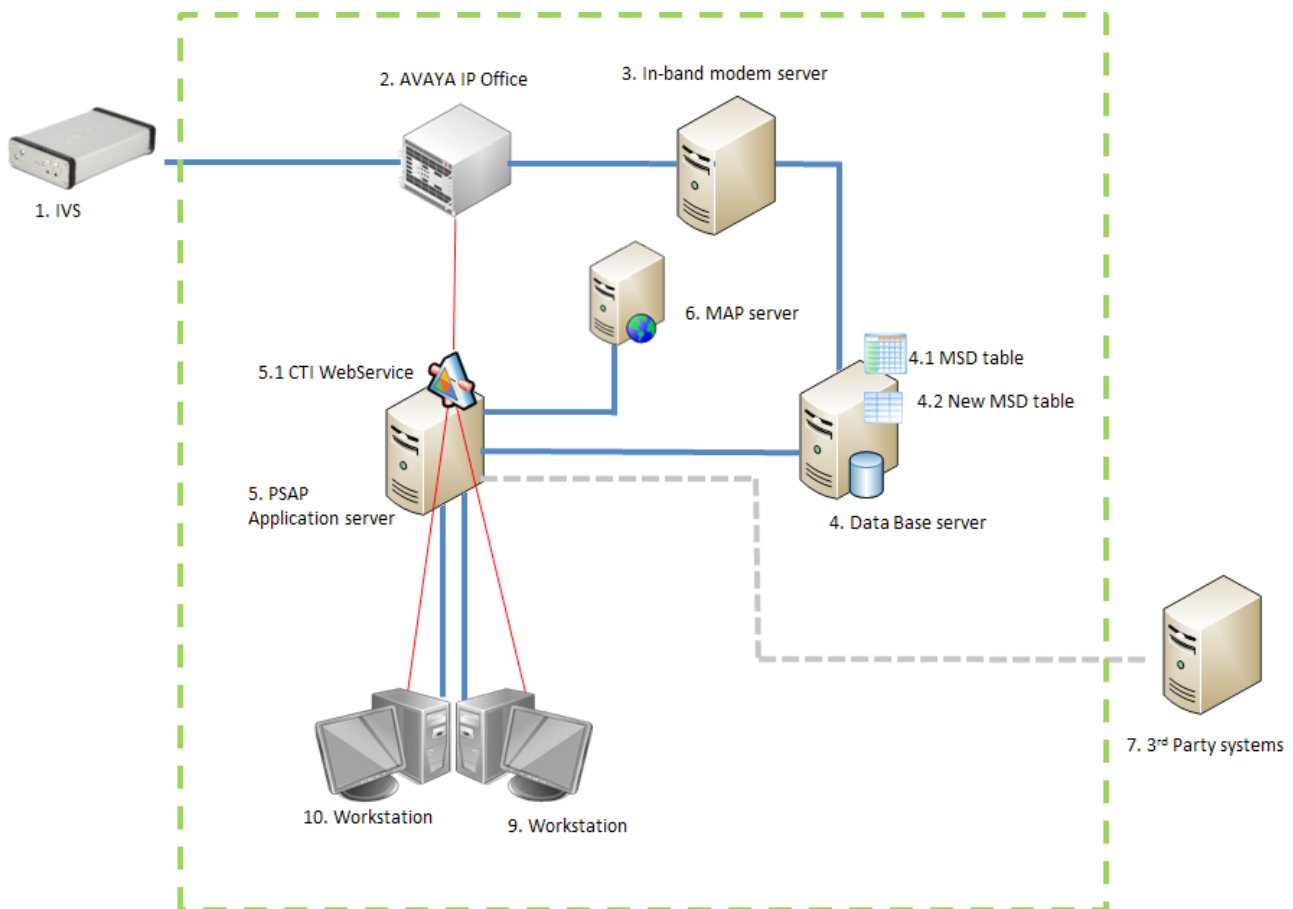


Figure 11: Architecture of the Greek eCall Public Service Answering Point

3. Problems encountered and overcome

The main problem encountered is that there is no Greek organisation accredited to assess the eCall PSAPs conformity with the specifications of the "Intelligent Transportation Systems – eSafety - eCall ECall end to end conformance testing" standard (EN 16454:2015). A restricted tender is under way to select an accredited organisation, but this takes some more time as a foreign entity is sought.



1. Status

The planned upgrade of the Varese PSAP is complete. Now Varese is a stage 1 PSAP able to receive and manage incoming eCalls, possibly acting as a single entry point for eCalls generated everywhere in Italy. The upgrade includes the ability to cope with both eCall standards: 2011 and 2015. In addition, the PSAP is ready to process the MSD extended data used for the management of Heavy Goods Vehicles.

It is also possible to communicate the MSD between different PSAPs and/or Emergency Response Officers by the use of a standardized “contact record” common for all the Emergency institutions in Italy.

The eCall discriminator detection capability is not available nationwide for the moment. Only two areas and a single MNO are ready to discriminate the eCall flag.

A specific inter-ministerial technical commission is being instituted to follow the deployment of eCall at a national level.

2. Architecture

In Italy a two level 112 model is in use, as shown below.

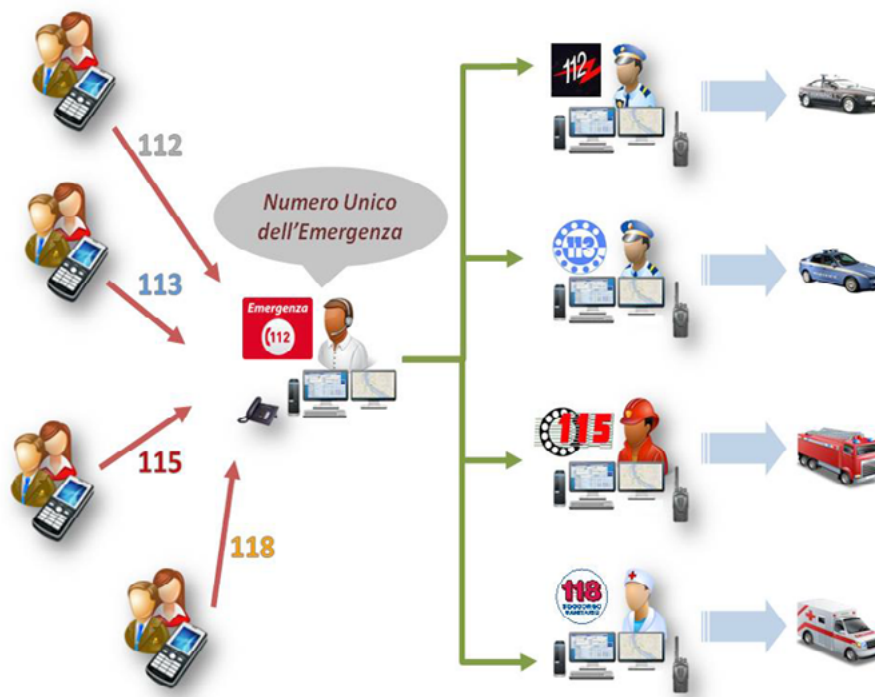


Figure 12: Two-level 112 model in use in Italy



At a stage1 PSAP, “Civilian” Call Takers are tasked with receiving all types of emergency calls and dispatching them to the specific stage2 PSAP (ERO).

The Italian eCall general architecture has been based on this existing two-level model.

The eCalls are received directly only at the stage1 PSAP(s) and then forwarded to the stage2 both as phone call (if available) and as a “contact record” including the complete MSD.

This means that only stage1 PSAPs are equipped with the specific in-band eCall modem and decoding software. At the stage2, the incoming data is already translated in a XML message.

The schematic below is a simplified representation of the architecture showing only a single stage2 PSAP (ERO).

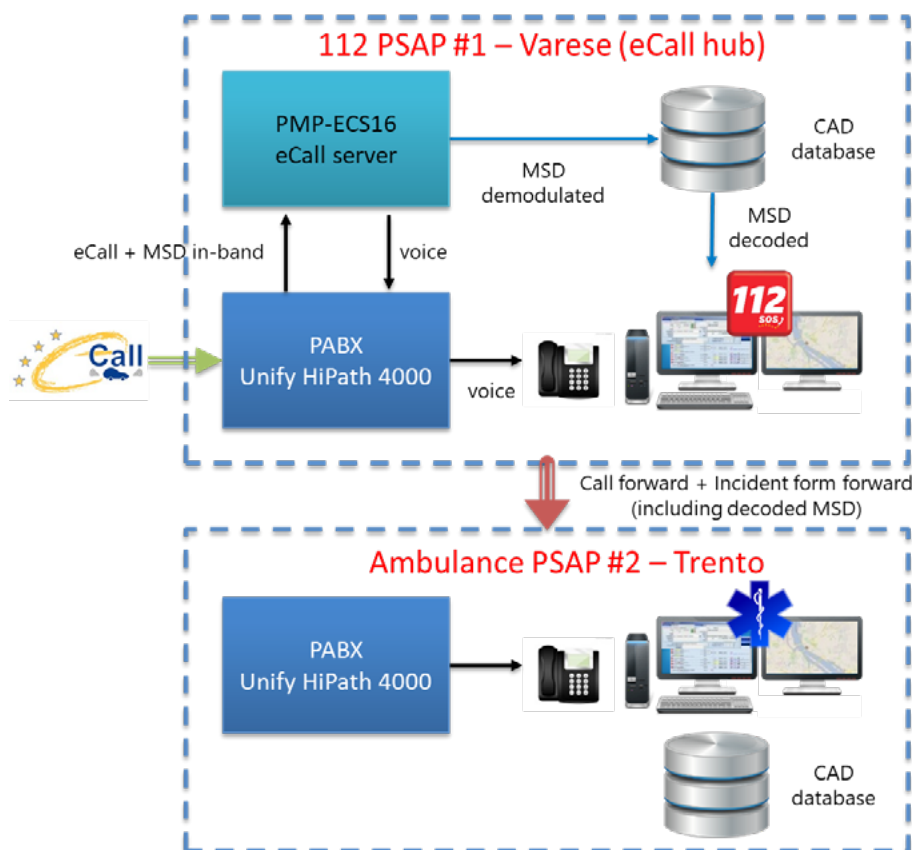


Figure 13: Simplified representation of the Italian eCall architecture showing a single stage 2 PSAP

3. Problems encountered and overcome

In Italy, at present, no “Competent Authority” for eCall has not been yet defined. Project partners are working with a specific inter-ministerial commission to solve the situation.



1. Status

The National Stage-1 Filtering PSAP – the ECAS (Emergency Call Answering Service) has been upgraded to be eCall-capable. eCalls can be received, decoded and then presented to an ECAS call handling agent.

The eCall modems, received data and associated voice calls have been fully integrated with the live ECAS call handling platform. All agents can receive and handle eCalls as well as normal Emergency calls. eCalls present to the ECAS stage-1 Call handling agents in the same manner and using the exact same interface as normal Emergency calls with the addition of the eCall data and location display.

The Solution has been fully tested using Gradient eCall Simulator devices including calls from mobile simulator devices installed in a test vehicle.

All functionality works as expected including data refresh and call back of the IVS Simulator device. No issues were encountered during testing.

Live eCalls (if any were to occur) are currently routed as for normal Emergency calls to the ECAS, and the Irish mobile network operators are in the process of implementing specific routing for eCalls using the agreed routing numbers in order to specifically identify both manual and automatic eCalls when presenting these calls to the ECAS.

The “fake eCalls” issue and proposed solutions has been highlighted to the mobile network operators and the conditional routing of eCalls based on combinations of the emergency call type flags is being reviewed by the mobile network operators with a view to implementing the solution.

ECAS Call handling processes for receipt and onward connection of eCalls have been developed and reviewed. Call handling agent training is underway.



Figure 14: Gradient eCall Simulator device

2. Architecture

The ECAS is using the Gradient eCall modem server which has been deployed at both ECAS “Switch sites”. This modem server has been fully integrated with the existing ECAS call handling platform used for all emergency calls. The ECAS call handling platform is based on the Oasis for Emergency Services product from Volt Delta International.

Voice switches, ACD functionality, and associated databases are located in 2 fully redundant “Equipment centres” and any call can be seamlessly handled via either equipment centre. Call handling agents use a Call

Member States Update

eCall Implementation in Ireland



By Tracy Hall
Department of Communication Energy and Natural Resources

handling workstation client which has been specifically designed for handling Emergency calls including a fully integrated VoIP client.

The eCall data has been fully incorporated into the existing ECAS Caller location system and is associated with all other caller location information including Cell location and Operator-initiated manual location searches.

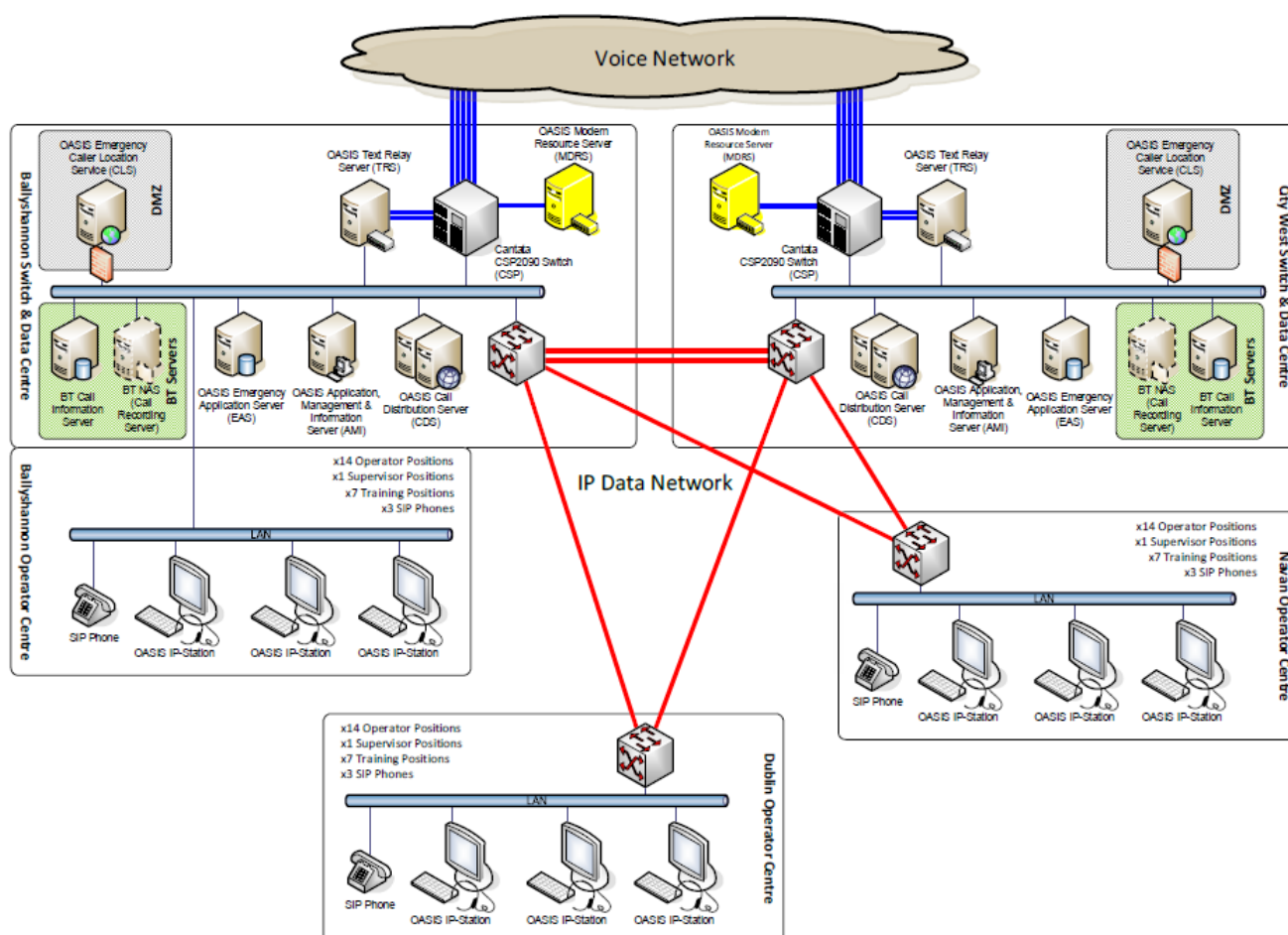


Figure 15: eCall Implementation in Ireland

The Operation of eCall for ECAS is as follows:

1. eCall is received over existing interconnects from the Mobile network operator and is specifically identified as an eCall using the chosen call routing digits included by the mobile network operator based on the presence of the eCall Discriminator flags on the mobile call (manual or automatic).
2. The ECAS Switch/ACD system identifies this as an eCall and routes the call over SIP to the Gradient eCall Modem Server.
3. The eCall modem server answers the IVS system, performs the handshake, and receives the eCall Data. The eCall data is stored in the ECAS Caller Location System Database by the Gradient eCall server.

Member States Update

eCall Implementation in Ireland



By Tracy Hall
Department of Communication Energy and Natural Resources

4. Once the data Transmission has completed (or times out after 20 seconds) the Gradient eCall server returns the call to the ECAS ACD.
5. On Return of the call the ACD immediately presents the call to the longest idle ECAS call handling agent using the same queue and priority as all other emergency calls. If no call handling agents are available the normal queue messages are played on the voice call.
6. Once presented to a call handling agent on an ECAS workstation, the call is identified as an eCall and the workstation retrieves the eCall data and location from the Caller Location system and presents this information to the ECAS call handling agent.

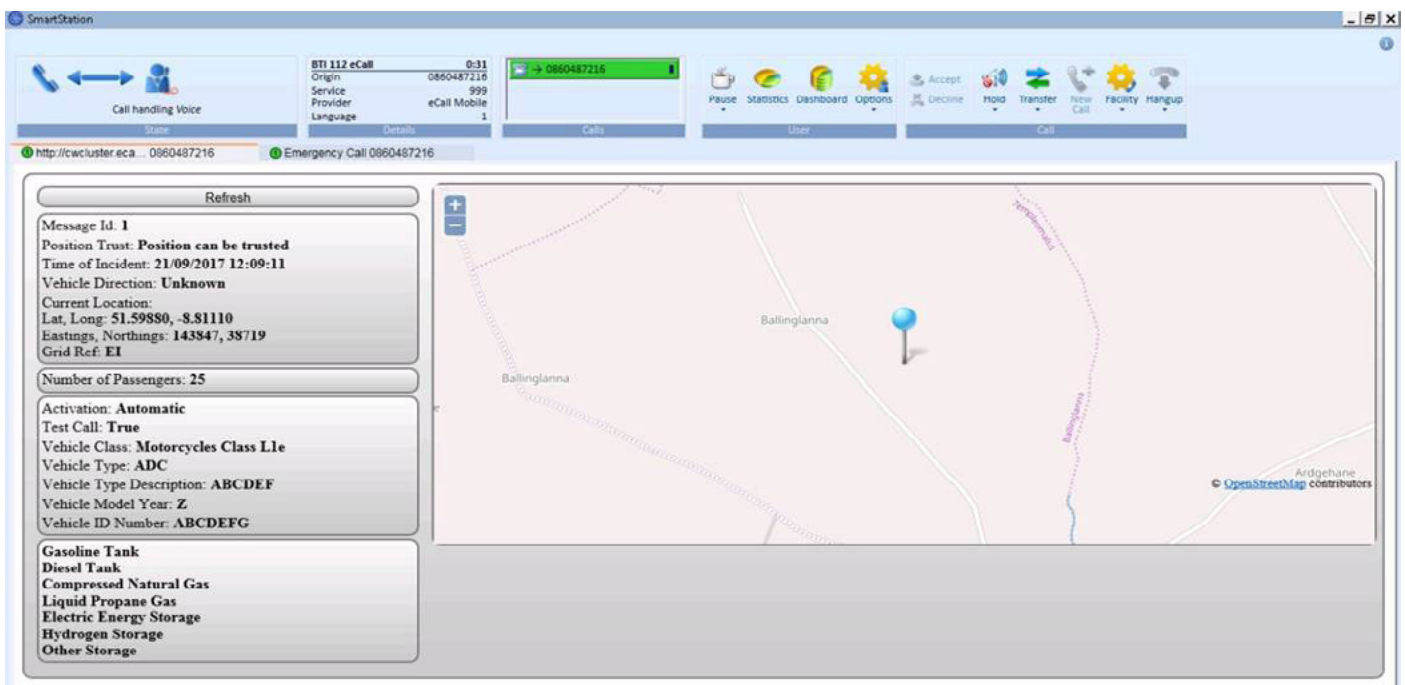


Figure 16: Information presented to Emergency Call Answering Service handling agent

All normal call control functions are available to the ECAS call handling agent who can speak to the eCall caller (vehicle occupants), control call state, and once identified connect the call to the requested Stage-2 Emergency Service. If no service is identified, ECAS procedure is to connect eCalls to the National Ambulance Service.

All eCall data is available to the Emergency Services using an enhanced version of the ECAS Emergency Services Interface. This is an XML based interface made available by the ECAS which the Emergency Services can use to automatically retrieve caller location information from the ECAS. The Emergency Services call-taking and CAD systems connect to the ECAS interface and can automatically retrieve all call data which now includes the eCall MSD.

eCall data can also be passed verbally from the ECAS call handling agent to the emergency services call taker on request as all information is also presented to the ECAS Call handling agent.



The ECAS call handling agent can also re-query the IVS using the “Refresh” button available on the eCall page. This has the effect of returning the call to the eCall Modem server which switches the call back to data mode for the re-transmission.

3. Problems encountered and overcome

No Significant issues were encountered during the ECAS implementation.

Specific routing for Automatic and Manual eCalls based on the eCall discriminator flag is still a work in progress and as a result during testing the Test eCalls from the Simulator devices were passed to the ECAS as Normal Emergency Calls.

CLI matching rules were used during testing to identify calls from the Simulator devices as eCalls.



1. Status

Luxembourg has one single 112 centre (PSAP) that is responsible for all emergency calls in the country. The 112 centre is located in the city of Luxembourg. The Luxembourg Administration des Services de Secours (ASS) is responsible for the operation of the 112 centre.

After testing eCall with an eCall test server and an eCall test PSAP solution in the HeERO2 project Luxembourg has renewed the complete PSAP software. This new PSAP software also implements the eCall functionality for the Luxembourg PSAP. The solution was purchased in September 2015, the update of the PSAP software started in the beginning of 2016 and was finished in early 2017. The complete eCall functionality was implemented and ready for testing by mid-2017.

Luxembourg successfully completed the eCall conformity assessment in August 2017, becoming the first EU Member State to declare itself ready to implement eCall. This assessment was carried under the supervision of NavCert GbmH, leader of the conformity assessment activities in the I_HeERO project.

In addition to the implementation of the Europe-wide standard eCall, Luxembourg participated in the CEN TC 278 WG 15 (Intelligent transport systems - eCall) standardisation group to standardise the exchange of data between neighbouring PSAPs in order to be able to handle cross-border eCalls, to standardise the data exchange with dangerous goods tracking databases in order to reduce the risks in accidents with dangerous goods, and to support the standardisation of the Next Generation 112 eCall.

2. Architecture

The new Luxembourg PSAP solution is based on a virtualized integrated emergency control system. The system was provided by Swissphone Systems. It is a modern central system for the acceptance of operations, scheduling, alerting and operation tracking. It provides interfaces to all important secondary systems (e.g. rescue points). The system integrates the complete eCall functionality. The user interface of the integrated emergency control system (ECS) is shown in the figure below.

Member States Update

eCall Implementation in Luxembourg



By Harold Linke
Ministère de l'Intérieur, Administration des Services de Secours



Figure 17: User interface of the Luxembourg integrated emergency control system

1. Three screens for the integrated emergency control system
2. One screen for office service (e.g. Microsoft Office, FireFox, etc.)
3. One Touchscreen for Phone and Radio
4. Headset for Phone and Radio
5. Interface for keyboard and mouse

The system is a stretched VMWare Cluster over two datacentres:

- +/- 25 virtual servers
- Replicated HA Storage and backup
- Redundant PRI for:
 - 112 calls
 - Dedicated DDIs for e-calls
 - QSIG with PBX police for call forwarding
- E-Call specific features:
- Dedicated DDIs for e-Call
 - Automatic e-Call
 - Manual e-Call
- 2 separate GIS systems for e-Call Map
 - Own offline OSM server
 - Transparent MSD data transfer to ECS
- Callback functionality and reload of MSD
- VIN polling via EUCARIS is under development.

3. Problems encountered and overcome

No problems encountered during the implementation and testing.



1. Status

Implementation of the eCall “flag” in Portuguese mobile networks – Completed Task

All of the three MNO’s (MEO, NOS, Vodafone) operating in Portugal have implemented the eCall flag in the second half of 2015.

Creation of the routing mechanisms to deliver eCall to the Portuguese PSAPs – Completed Task

The mechanisms for routing eCalls to the most appropriate PSAPs were implemented in 2016.

Two PSAP’s enabled for eCall – Completed Task

Portugal has implemented a completely new PSAP in the North of the country (112CONOR) and has also upgraded an existing PSAP in the South (112COSUL).

After this new deployment, the country will have a structure based on only 2 PSAPs for the whole mainland and 2 PSAPs in the Autonomous Regions of Madeira (112COMDR) and the Azores (112COAZR). During this complex operation the existing 11 regional PSAPs were shut down and merged into both centres (112CONOR and 112COSUL)

In normal operation 112CONOR (based in Porto) will answer standard 112 calls and eCalls generated in the North of Portugal, while 112COSUL (based in Lisbon) will answer standard 112 calls and eCalls coming from the southern part of Portugal. For continuous availability these two PSAP work in a redundancy failover regime, switching between each other upon failure or abnormal termination of one of them.

The standard 112 calls generated in the Azores are answered in 112COAZR while eCalls generated in the same Autonomous Region are routed to 112CONOR (Porto). The same approach was applied to the Autonomous Region of Madeira: this means that standard 112 calls generated in the archipelago of Madeira are answered in 112COMDR, while the eCalls generated in this same Autonomous Region are routed to 112COSUL (Lisbon).

The only PSAP’s in Portugal that are eCall-enabled are the 112CONOR and 112COSUL.

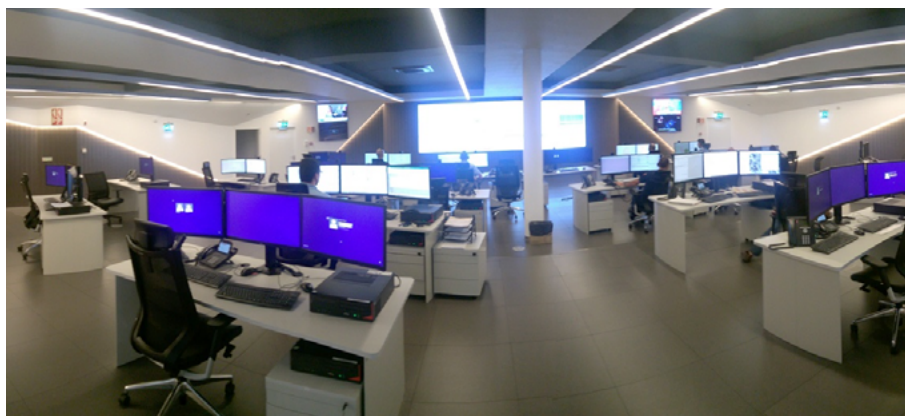


Figure 18: 112 CONOR in Porto

Member States Update

eCall Implementation in Portugal



By Vitor Judicibus
Ministry of Internal Administration

End-to end Testing Activity – Completed Task

The testing strategy of the Portuguese PSAPs was translated in the testing and validation of the eCall system in Portugal in order to:

- validate technological and functional properties;
- evaluate performances of the system to detect possible weaknesses or problems due to complex infrastructural conditions.

The implemented testing has covered the whole service chain from the eCall IVS up to the PSAP. The tests took place in urban and rural areas, roads and highways.

The testing tools were designed to also support the Conformity Assessment (based on the information available today).

One of the I_HeERO Portuguese Consortium partners (IEP- Instituto Eletrotécnico Português) involved in the e2e testing phase activity is also the responsible entity for the eCall Conformity Assessment of the PSAPs.

Field Tests	Number	MSD Present	VIN Decoded	Voice Established
Automatic Calls	208	99,49%	98,99%	98,99%
Manual Calls	195	100,00%	100,00%	100,00%
Total Calls	403	99,74%	99,48%	99,48%

Figure 19: Summary of results

Portugal ready for eCall – Completed Task

Portugal implemented eCall on September 28th, 2017. Since then, Portugal has been able to receive, process and dispatch eCalls generated throughout the national territory.

The 3rd I_HeERO workshop on “Portugal ready for eCall” took place in Lisbon on October 10th, 2017, in order to deepen the I_HeERO project and officially announce that Portugal was ready for eCall. The event was attended by more than 110 participants from private and public sectors engaged in road safety, third-party service providers, motorway concessionaries, police and other stakeholders.

Conformity Assessment – Ongoing Task

The Conformity Assessment of the Portuguese PSAPs started in early November 2017. The tests have been performed in mainland Portugal and in the Autonomous Regions of Madeira and the Azores.

As the Portuguese PSAPs already incorporate equipment that is fully compliant with eCall standards (EN16454), the eCall conformity assessment of the Portuguese PSAPs (CONor and COSul) only entails the execution of the field tests, in the scope of the “Suitability for Use”.

While it is not expected that the approval of the new CEN standard for the Conformity Assessment of the PSAP's can be approved and published by the end of 2017, the Ministry of Internal Administration will use for this purpose the reference documents developed in the scope of I_HeERO, based on the standard EN 16454.

Member States Update eCall Implementation in Portugal



By Vitor Judicibus
Ministry of Internal Administration

2. Architecture

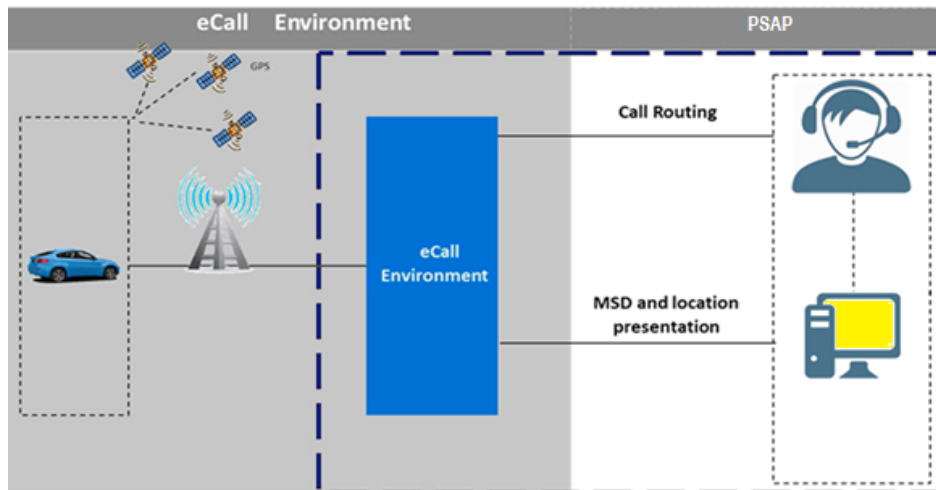


Figure 20: Generic architecture of eCall in Portugal

The PSAP side includes:

- the 112 eCall router, which is the component responsible for handling the communications with the IVS;
- the I/Calltaker, which is the 112 application used by the operator;
- the I/CAD, which is the command and control dispatcher application.

All eCalls are routed to the most appropriate 112 PSAP (112COSUL or 112CONOR) and when the eCall MSD is received and the voice connection is established, the eCall case is handled according to existing 112 call protocols. Before taking the decision to route the eCalls to the 112 number the entire eCall chain was tested, including generation of eCall (IVS), GSM transmissions, reception and eCall handling at PSAP and integration with higher level applications.

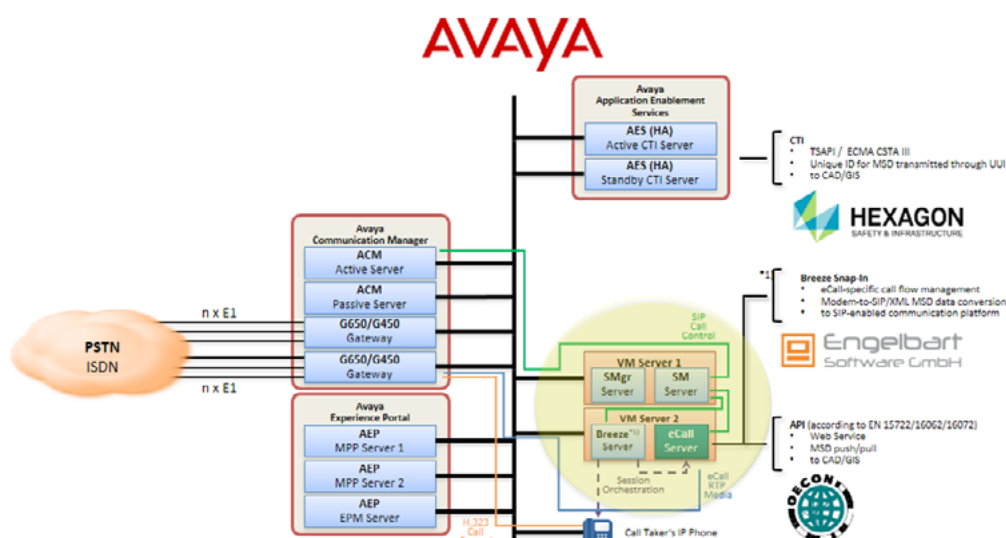


Figure 21: eCall core solution implemented in Portugal



The picture above shows the Integration of an OECON eCall Modem and the Snap-In from Engelbart with AVAYA Aura. The eCall infrastructure of the Portuguese 112 is fully integrated with the 112 call taking and dispatching application I/CAD (Hexagon).

3. Problems encountered and overcome

EUCARIS

The Portuguese public authority acting as the National Contact Point for EUCARIS is the Institute of Registration and Notary Affairs – IRN (Instituto dos Registos e Notariado) which exercises the Ministry of Justice's powers, under the supervision and guidance of the respective Minister.

It was expected that Portugal could start exchanging data under the Prüm Decision on cooperation in investigations and legal action ((2008/615/JHA)), and the Directive on Cross-Border Exchange of Information on traffic offences ((2011/82/EU) before the end of 2016, but according to the information provided, the process of implementation of EUCARIS is currently at a very advanced stage, but has not yet been completed. Thus, in view of this scenario, integration with EUCARIS in the Portuguese I_HeERO project will not be viable.

More info: <https://www.eucaris.net/2750/workshop-portugal/>

Given the above it was not feasible to establish a direct or indirect (through the IRN) connection between the PSAPs and EUCARIS, so the Consortium decided to use a VIN decoder as a temporary contingency measure. This means using a small piece of software with a database that can translate the Vehicle Identification number to a set of relevant data about the vehicle.

The referred decoder will be developed under the scope of I_HeERO and will stay in place until all the constraints that hinder the connection to EUCARIS are sorted out.

Ghost eCalls generated by mobile handsets

In 2015 one of the first actions in the scope of the I_HeERO Project in Portugal was the implementation of the eCall flag by all MNOs.

During the tests, the Portuguese Consortium found that some misconfigured mobile handsets mimicked an eCall when calling 112, causing normal emergency calls to be identified by the mobile networks as eCalls, which does not comply with the standard (ETSI 3GPP TS 24.008).

These mobile terminals provided erroneous values in the Emergency Category of Emergency Setup messages in the Mobile Radio Interface.

In practice, this means that when someone calls 112 asking for help, using a misconfigured handset like the ones described above, they will generate a false eCall (referred to as "ghost calls").

Since the number of ghost calls was very high (more than 2000/day) the Portuguese authorities couldn't route the eCalls to the 112 number infrastructure until a solution was found.

Member States Update eCall Implementation in Portugal



*By Vitor Judicibus
Ministry of Internal Administration*

To overcome this issue the Portuguese Consortium analysed the situation and developed a solution that has been adopted by all MNOs in Portugal. In this solution the software in the core network should analyse all the elements of the emergency category, and not only the elements corresponding to manual eCall and automatic eCall.

The so-called “Portuguese solution” was shared with other EU countries during the 16th EEIP (European eCall Implementation Platform) meeting in Brussels on September 15th, 2017, and during an EENA webinar “the eCall flag issue” on September 26th, 2017.

This was the biggest issue for the implementation of eCall in Portugal.

Simultaneity of 112.PT Project and the I_HeERO Project

The 112.PT project and the I_HeERO project running simultaneously brought an additional workload to the Portuguese team that worked on both projects.

To overcome this issue and handle these two projects that on the one hand have some areas of overlap but on the other hand have different timelines, singularities and distinct issues, the project team had to perform extra work with a continuous analysis of the evolution of both projects and a permanent revision of the critical path of these two important endeavours.



1. Status

PSAP conformity assessment

The existing eCall configuration was extended with the second, geographically separated eCall Node. In the first phase, it will be used for the Heavy Goods Vehicles demonstration project. Later on, both eCall Nodes will share eCall traffic and will provide geographic redundancy.

eCall for Heavy Goods Vehicles, long-distance Buses and Coaches:

The special application for transport of unexploded ordnance was developed and for this reason MSD was extended with some optional information indicating HGV transport. Receiving the eCall with extended MSD, the operator in the 112 PSAP is signalled that eCall is received from the vehicle loaded with unexploded ordnance. Exploiting information from MSD, the application allows the operator to make an immediate query for the consignment note from the database. Detailed information on the dangerous goods carried by the vehicle involved in the accident is then displayed on the operator's screen.

The application was demonstrated during the I_HeERO HGV roadshow event in Ljubljana on October 16th, 2017. In the near future there are plans to equip the trucks for transport of unexploded ordnance with IVSs and to deploy the application into regular use when unexploded ordnance is to be transported.

Next Generation 112

The prototype of NG 112 eCall PSAP gateway has been developed. The NG 112 PSAP gateway allows existing Slovenian PSAPs to be upgraded to receive NG 112 eCall calls from packet-based LTE networks. The prototype was developed in compliance with the applicable requirements for traditional pan-European eCall and the new RFC 8147 IETF standard for Next Generation pan-European eCall. Some interoperability tests were performed with SIP client application for NG IVS of Ficosa. The call was successfully established and MSD transferred over SIP protocol.

2. Architecture

The picture below presents the final eCall infrastructure architecture as planned for introduction by the end of the year 2017. There are two eCall Nodes in operation providing eCall gateway functionality, arranged in geo-redundancy configuration. The first one is situated in Ljubljana, the second one in Maribor. Both are installed in the premises of national operator Telekom Slovenije. Each of the locations is provided in redundant configuration (high availability). In case of a disaster situation at one of the locations (e.g. fire), the second one takes over all eCall traffic.

All eCall traffic is routed by MNOs to the eCall Nodes. During the normal operational regime, the network distributes the eCall traffic evenly among both locations. The eCall nodes extract and decode MSD and re-route voice calls and data to the most appropriate PSAP where they are coupled again and presented to the operator's screen. The voice calls are rerouted via the network, while the data (decoded MSD) is conveyed over a separate data interface.

The eCall traffic is routed through the network between MNOs and eCall Node locations as VoIP traffic with

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eCall Implementation in Slovenia



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a minimum number of TDM/VoIP conversions on gateways (typically one), in order to ensure the lowest possibility of MSD being impaired.

The solution is scalable and when the number of eCalls increases, the capacity of eCall Nodes will be easily extended (no additional hardware needed).

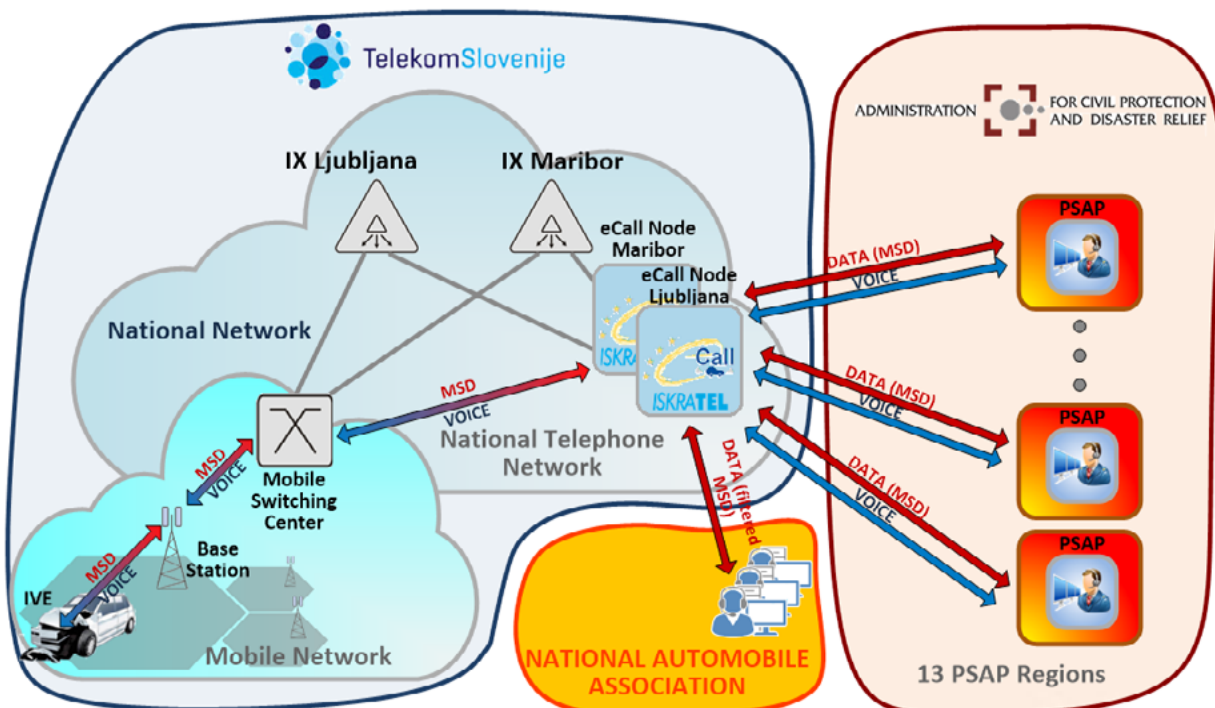


Figure 22: Final eCall infrastructure architecture in Slovenia

3. Problems encountered and overcome

Following the next-generation 112 eCall demo it seems that there is a lack of next-generation IVS. There is no such equipment available so far, not even prototypes that could trigger NG 112 eCall over the LTE network. If the equipment is not found in time, the demonstration project will be realised by means of SIP simulator. In this case the NG 112 eCall mechanisms will be tested only in the SIP (IMS) environment. IMS routing, MSD transfer and receipt at an existing 112 PSAP will be included.

What are Associated Partners?

All EU Member States are obliged to upgrade their PSAP for eCall in order to comply with the EU legislation. All interested parties, Member States and commercial organisations, that are not partners of the I_HeERO project are “Associated Partner”.

Associated Partners have access to a wide variety of “Reference implementations of eCall based on 112”. Member States will receive valuable information toward the PSAP upgrade and commercial organisations involved in eCall are allowed to test equipment or answer technical questions.

I_HeERO Project materials are made available through a document web portal.

How to become Associated Partner

Interested parties are requested to send an email to the I_HeERO Technical Implementation Officer, Andy Rooke – ERTICO – ITS Europe: a.rooke@mail.ertico.com. Clearly explain your motivation and how you plan to contribute to the I_HeERO project. I_HeERO Consortium Partners must agree with your applications. The I_HeERO Steering Committee approves the applications.

Associated Partners Webinars

Associated Partners receive an invitation to the Associated Partners webinars organised by the I_HeERO project on a monthly basis. These webinars tackle various issues related to I_HeERO. Past webinars dealt with topics such as Architecture and costs for PSAP, and IVS and PSAP demonstration.

Glossary

- ERA-GLONASS: Russian automated emergency response system, similar to eCall
- ECAS: Emergency Call Answering Service
- EUCARIS: EUROpean CAR and driving licence Information System
- GIS: Geographic Information System
- HeERO: Harmonised eCall EurOpean pilot
- HGV: Heavy Goods Vehicle
- I_HeERO: Infrastructure – Harmonised Pan-European eCall Deployment
- IVS: In-Vehicle System
- KPI: Key Performance Indicator
- MNO: Mobile Network Operator
- MSD: Minimum Set of Data
- NG112 eCall: Next Generation 112 eCall
- PSAP: Public Safety Answering Point
- PTW: Powered Two Wheeled
- TIO: Technical Implementation Officer
- TMC: Traffic Management Center
- VIN: Vehicle Identification Number

Participants

Consortium

Project leader: German State of Lower Saxony, under the authority of the German Ministry of Transport BMVI

Technical Implementation in all aspects: ERTICO – ITS Europe

The project operates in 11 EU Member States (Bulgaria, Cyprus, Czech Republic, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Portugal and Slovenia), including close to 100 commercial partners and Associated Partners.

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More information: www.iheero.eu

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