GERYON Newsletter

Next Generation Technology Independent Interoperability of Emergency Services
http://www.sec-geryon.eu

Issue: No.2

November 2012

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SEVENTH FRAMEWORK PROGRAMME

Welcome Letter

Dr. Harilaos Koumaras

Dear Reader,

Welcome to the second newsletter of the GERYON project, which has a scope to provide you information about the GERYON related activities and our exciting research journey. GERYON project is funded under the seventh Framework Program (FP7) for research in the security field. However, the innovations of the GERYON project are not limited in the security field only but include telecommunications as well.

The GERYON project has introduced significant innovations in the field of the IP Multimedia Subsystem (IMS), especially in the architectural design for the provision of unified services across multi IMS domains. The use of a hierarchical IMS structure, with the GERYON IMS domain holding the central role for the user management and the service provision, introduces innovative ways of the IMS exploitations towards novel business opportunities beyond the existing marketing plans of the IMS. Moreover, the conjunction of the IMS with the respective GERYON Gateway and the TETRA system, introduces novel emergency services to the end-user, which will enhance the response time of the first responders to emergency situations. The GERYON team works towards the interoperability of the two systems (i.e. TETRA and 4G), creating a totally new market and novel services, which will enhance the daily life of all European citizens, especially when they face an emergency situation. At the top of the GERYON prototype an interactive control room will be demonstrated, which will offer the operator monitoring capabilities of first responders geo-positions and the citizen in danger. The operator will be in the position to initiate a host of media services between the citizen and the first responder, independently of the terminal type (i.e. TETRA or Mobile). GERYON bridges the technological differences among the different terminal types, providing the European citizen with a homogeneous and coherent emergency service.

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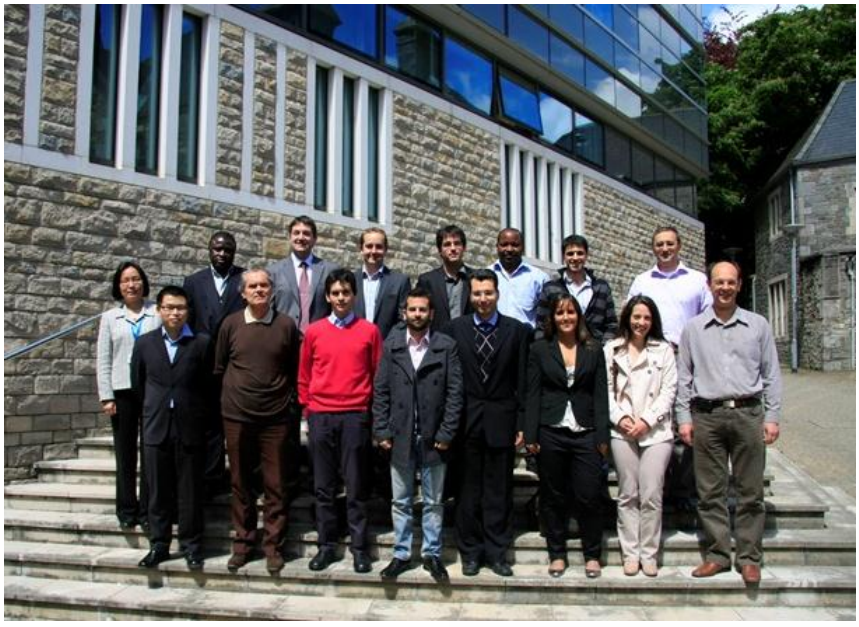
Project News

GERYON General Meetings

With the purpose of updating the status of the project, ensuring a good level of project progress and enhancing the collaboration between partners, two regular meetings were organised by the GERYON consortium since the publication of the last newsletter. They were held at University of Plymouth, Plymouth, UK, on 16-17 May, 2012 and the National Centre for Scientific Research (NCSR) Demokritos, Athens, Greece, on 25-26 October, 2012 respectively. A total of 16 members across 7 project partners attended the Plymouth meeting. During the meeting, end user's requirements for the GERYON system were presented, analysed and discussed; also, a number of use cases were proposed with the aim of demonstrating the capabilities of the GERYON system from various stakeholder perspectives. Based upon the firm foundation which was laid down during the Plymouth meeting, a comprehensive and robust GERYON system architecture was presented and discussed in the Athens meeting four months later. In additional, the design and functionality of each component of the GERYON architecture were demonstrated by the associated partners. By the end of the meeting, the road map of the project was updated and all project partners were satisfied with the outcome and ready for the next phase of the challenges.



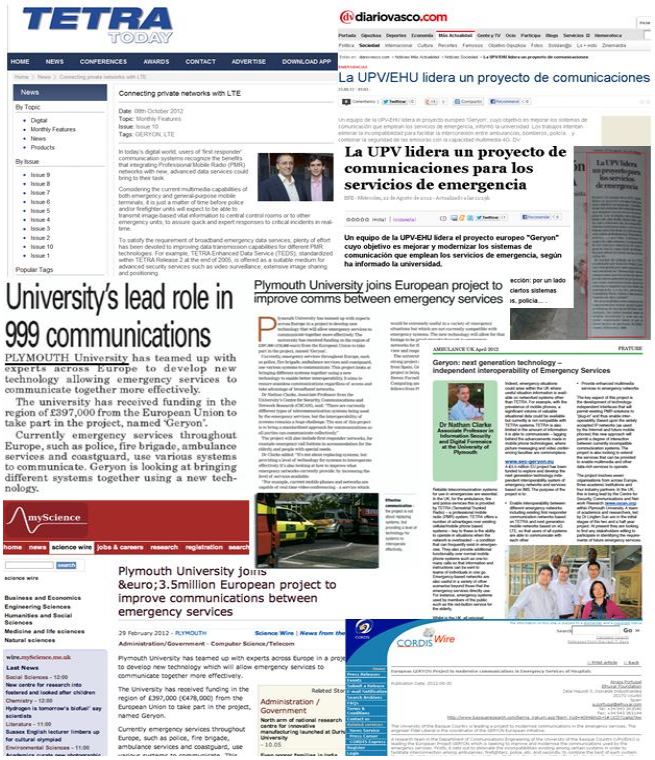
A GERYON team photo during the Plymouth meeting

Deliverable submissions

During the past 6 months, a total of 9 project deliverables were successful submitted to the European Commission sensitivity board for reviewing. These 9 deliverables were: D1.2, D2.1, D2.2, D3.1, D3.2, D4.1, D5.1, D5.3 and D7.2. D1.2 – Interim progress report 1, was led by the University of the Basque

Country (UPV/EHU) describing a comprehensive analysis of the status of the project up to M8. D2.1 – Emergency Communications: Current state and Users' requirements, and D2.2 – Overall system architecture and technical specifications were organised by partner Itelazpi: D2.1 covers the state of the art of the emergency communication and users' requirement for the GERYON system; based upon the information presented in D2.1. D2.2 demonstrates the specification of the entire GERYON system regarding its architecture, technologies, nodes, modules and interfaces. The NCSR Demokritos was in charge of work for the D3.1 – IMS infrastructure for emergency communications and D3.2 Design of GEMS and related modules: D3.1 describes the overall deployment of the IMS infrastructure based upon which the GERYON system will be built; while D3.2 provides an overall system and specifications description of GEMS (i.e. the central management module of the GERYON system) and various interfaces between GEMS and other system components. D4.1- Intermediate report on GEGW development was provided by partner Group CYS covering the development status of the GEGW until M12. Cosmote was the main contributor for D5.1 – Design of TD-EGS for Advanced Emergency Communications over LTE, which presents the preliminary results of the LTE test bed network deployment and provides a description of the TD-EGS for the LTE part of the GERYON system. Finally, D5.3 – Implementation of emergency communications over generic IP networks – Intermediate Report and D7.2 – Intermediate Report on Dissemination, Standardisation and Exploitation of project results were led by partner University of Plymouth; these two intermediate reports summarise the activities which were carried out about the aforementioned areas until M12.

Dissemination activities



A selection of screen shots of the GERYON dissemination activities

Dissemination is essential to the success of a project through making relevant stakeholders aware of the existence and purpose of a project. In order to present the GERYON project to a broad range of stakeholders, including researchers, the general public, first responders and market vendors of systems, various channels of dissemination have been utilised.

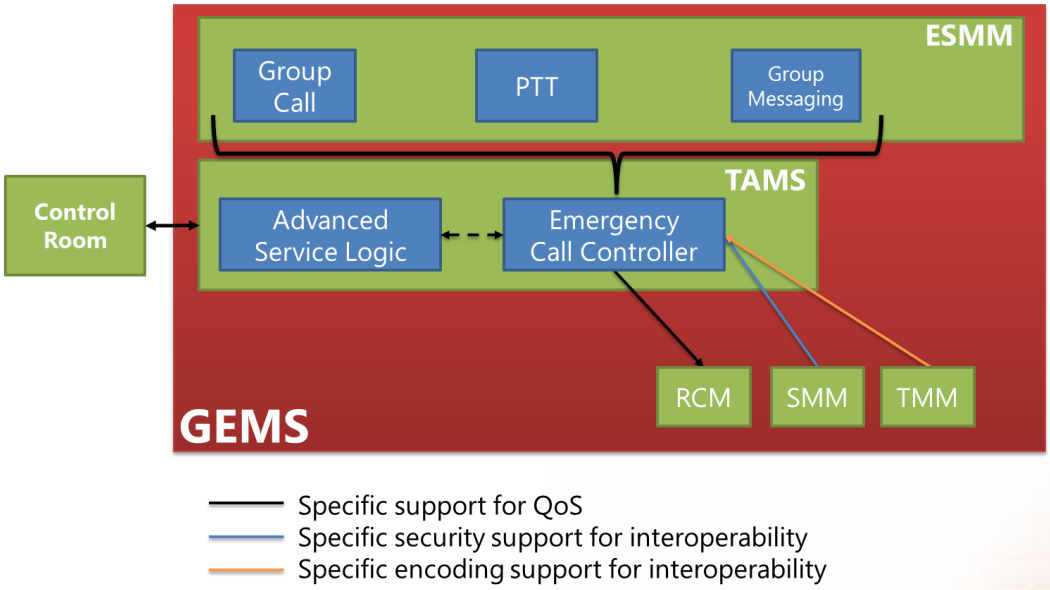
Many dissemination approaches have been utilised during the first 12-month of the project by the GERYON consortium. A fruitful set of results have been achieved, including: 4 press releases, 12 published articles, 10 scientific papers,2 industrial workshop presentations, 1 leaflet, 2 interviews, creation of the project website, and 1 video. In order to keep the dissemination of GERYON as high as possible throughout the remaining period of the project, the whole consortium will continuously utilise the existing methods to performance more activities.

Technology Insight

In the 1st newsletter, an overview of the GERYON project was presented, providing the reader with the reason why the project was proposed and the objectives that the GERYON system aims to achieve. In the following series of the newsletters, a number of core components of the GERYON system will be introduced to provide an insight of the GERYON system. In this newsletter, the GERYON Enhanced Management System (GEMS) will be fully described.

GEMS Overview

GEMS is the central management system of the GERYON architecture and it is responsible for the management logic for all GERYON emergency services. In order to ensure the technology independence, GEMS will be built on top of the GERYON standardized IMS domain, using existing IMS interfaces and protocol messages. It provides the basic set of emergency services which are supported by legacy PMR systems, such as Group Call, Pre-emptive priority Call, Push-to-talk and enhanced location-based services. GEMS interacts with the heterogeneous resource management functions associated to the different radio systems involved in the communication to assure dependable emergency communications. Apart from its main management operations, GEMS is also responsible for deploying configuration and adaptation capabilities (e.g. innovative codec selection) in order to grant current and future interoperability between different emergency technologies. GEMS utilises a number of key components to provide the aforementioned functionalities. These components are fully described in the following section.



GEMS overall architecture

The **Technology Agnostic Management System** (TAMS) is the main management module of GEMS. From the standpoint of SIP dialogs TAMS acts as an intermediate endpoint in all the emergency

communications, and it implements the signalling bridges between the incoming leg (i.e. the caller) and outgoing leg (i.e. the callee). By default, TAMS utilises its Session Logic, where it proactively reassures the compatibility of the different endpoints at media level in terms of codecs, security mechanism and Quality of Service (QoS). In order to process all possibly simultaneous session establishment requests, TAMS implements a priority-based input queue for incoming requests. In this way, the session requests are processed in order of priority.

The **Transcoding/multimedia Management Module** (TMM) of GEMS is in charge of the interface between the corresponding GEMS modules and the GERYON Media Gateway (GMGW) in order to perform the control of the media codecs that can be added to the session establishment procedure for reassuring the media level compatibility and reconfigure the session when media codec support is required.

The **Security Management Module** (SMM) of GEMS is responsible for the interface between the corresponding GEMS modules and the GERYON Security Gateway (GSGW) in order to obtain and configure security mechanism parameter of a session by adding additional security options. When TAMS detects an incompatibility between the ciphering characteristics of the terminals, who are participating in a session, it will communicate with SMM to initiate the cross-ciphering process through GSGW, sending to it instructions and the required security information.

The **Resource Coordination Module** (RCM) is in charge of orchestrating the resources allocated to different GERYON users and services in each network in order to ensure reliability and quality levels equivalent to those in traditional PMRs. In order to fit this purpose, RCM receives SIP session modification messages from TD-EGS modules corresponding to different networks (IMS enabled or non-IMS enabled communicated via GEGW) and stores this information in a database. The information can be cell identifications, users, priorities, capacity/performance estimates, session drops, etc. When the RCM detects if there is a resource deficiency, it will alert TAMS, which deals the situation accordingly.

The **Enhanced Services Management Module** (ESMM) handles all the service specific operations (e.g. push-to-talk functionalities, location management and voice/video group call/multiparty operations) by utilising existing IMS interfaces. This functionality can be operated in a pure IMS context, so the basic emergency capabilities can be provided. Additionally, if all the involved networks are GERYON-compatible, TD-EGS provided capabilities will be used to support enhanced services such as location-based decision making.

The **GERYON Control Room** is aimed at providing an efficient interface for GERYON PSAPs, so they are able to easily receive/initiate emergency calls, process these calls and perform required actions, control and manage the set of emergency sessions currently being processed in the system, etc. The GERYON Control Room will be a GEMS independent sub-module, which will be used to control and monitor the full functionality of GERYON. It will be available to the user via an easy to learn intuitive graphical user interface. This ensures reliable and high-quality call-taking and processing in emergency situations.

Partner Spotlight

The Partner Spotlight section introduces project partners of the GERYON consortium in more details: the background of their organisations, their experiences and expertise, the role they play, and staff members from each partner. In this issue, partners GRUPO CYS and COSMOTE will be introduced.

GRUPO CYS

GRUPO CYS was created by private initiative in Spain in 1985. Since then, GRUPO CYS has become a global integrator of communications solutions recognized by many operators, public agencies and equipment manufacturers worldwide. The main activity of GRUPO CYS along 25 years of existence has been the engineering, planning, installation, tuning and maintenance of Cellular networks including TACS, ETACS, CDMA, GSM, DCS, TDMA, TETRA, TETRAPOL, NMT, AMPS, POCSAG, MPT1327, PCS, LMDS and UMTS.

Regarding PMRs GRUPO CYS has been responsible for:

- Installation and integral maintenance of the Technical Management/Tactics centers and Control centers of the TETRAPOL network of the Spanish Ministry of the Interior (Home Office) for INDRA
- Maintenance of the Sirdee (TETRAPOL) Network for the Spanish Ministry of the Interior (Home Office) through Telefonica from 2001.
- Installation and Integral Maintenance of the TETRA network of the Bilbao Airport from 2008.
- Installation and Maintenance of the TETRA network for Itelazpi (Public Society of the Basque Government) comprising more than 130 TETRA's Base Stations.

Role in the project: The main activities of CYS can be split into three major lines. In WP2, CYS will provide its long experience as system integrator to the specification of the GERYON architecture (T2.3, T2.4 and T2.5). CYS will head WP4, leading the design (T4.2) and development (T4.4) of the GEGW which will allow the interconnection of TETRA networks with IMS systems. As well, CYS will have an important participation in the integration and trials (WP6) where they will lead the evaluation of technical interoperability (T6.2). Finally, CYS will provide its commercial standpoint and will contribute to the Business Plan.

Short profile of the staff members

Roberto Maza received his MSC degree in Telecommunications Engineering from the University of Cantabria. He joined CYS in 1998. Since then he has taken active part in the deployment of GSM, UMTS, TETRA and TETRAPOL networks. He has been in charge of the engineering, design and implementation in several projects as the project manager. He is also an expert in software tools for the analysis of radio networks.

Marcos Lequerica received his MSC degree in Telecommunications Engineering from the Polythecnic University of Madrid in 1990. He joined Grupo CYS in 1993 where he has been responsible for the Radio-electric Division and managed several R&D regarding different radio technologies planning, coverage analysis and deployment specially TETRA and TETRAPOL.

Jonathan Gonzalez received his MSC degree in Telecommunications Engineering from the University of the Basque Country in 2009. He has joined Grupo CYS in 2012, working since then in the GERYON team as designer and developer of the Geryon Gateway. Previously, he has also worked in several R+D projects, including FP7 ones and in projects in the area of train communications systems. His main area of expertise include programming languages and wireless communications systems.

Aaron Rodriguez received his MSC degree in Telecommunications Engineering from the University of the Basque Country in 2010. He has joined Grupo CYS in the scope of GERYON project, designing and developing the GERYON gateway. Before that, he has been working on mobile communications networks area, designing, planning and optimizing 2G and 3G networks. His area of interest includes electronics, programming language and telecommunications systems.

Fernando Perez de Eulate received his MSC degree in Telecommunications Engineering from the University of the Basque Country in 1992. Since 1999 he is the director of the department of Technology and Systems where he is leading different projects of wireless communications including the design, development, production and integration of wireless devices. He is also in charge of projects of software engineering and research in radiofrequency and microwaves.

COSMOTE Mobile Telecommunications S.A.

COSMOTE Mobile Telecommunications S.A. was commercially launched in April 98, entering the market five years after its two competitors and within a short period of time (2001) COSMOTE succeeded in becoming the leading provider of mobile telecommunications services in Greece. Today COSMOTE' s customer base reaches 7.8 millions in Greece that is almost half of the Greek market share. COSMOTE has also managed to establish itself as one of the biggest mobile operators in SE Europe through the successful course of its subsidiaries: AMC in Albania, GLOBUL in Bulgaria and COSMOTE Romania, with a subscriber base of about 12.6 millions (Q3/12). Its extended presence is mostly due to GERMANOS, the most successful telecommunications retail chain in SE Europe that is today the backbone of the Group's commercial network (excluding Albania).

Until recently COSMOTE has deployed and maintains nationwide GSM/GPRS/EDGE/UMTS/ HSPA/HSPA+ mobile networks and offers 3G femtocell services. On 15/Nov/12, by registering one more first, COSMOTE breaks ground in Greece with the commercial launch of its 4G LTE (Long Term Evolution) mobile broadband, initially available in Athens and Thessaloniki through 4G tablets and USB sticks, while the gradual development of the network in more Greek cities is ongoing.

COSMOTE's role in GERYON is multifold: At first stages COSMOTE's focused on the identification of the users' and system requirements regarding the emergency communications that shall be fulfilled as well as the expected challenges from a mobile operator's perspective. COSMOTE is the leader of the deployment of LTE emergency communications, allowing the convergence of PMR with commercial mobile services. COSMOTE will actively contribute to the GERYON system deployment as well as the trials' conduction and assessment. Finally, COSMOTE will participate in the project dissemination, results' exploitation and standardization activities.

Short profile of the staff members

Dr. George Lyberopoulos received the Electrical Engineers Diploma from the Democritus University of Thrace, in 1989 and Dr.-Ing. in Electrical Engineering from the National Technical University of Athens, in 1994. Joined COSMOTE in 1999 as Project/ Technical manager for all the major projects, e.g. GPRS, 3G, WiMAX, IMS, Femtocells, LTE incl. tenders (specifications/ evaluation), technical trials, network design & rollout phases. Today he holds the position of Network Evolution Deputy Director. Since 1989, he has been involved in several EU and national research projects and is author of over 35 scientific papers.

Helen Theodoropoulou, graduate of the Physics Dept. of the National University of Athens also holds a M.Sc. in Radioelectrology and Electronics. Since 1994 she has worked with two Greek Mobile Operators. She joined COSMOTE in 1998 with fields of responsibility in the areas of radio network planning, wireless broadband access and broadcasting technologies while she has been assigned the co-ordination of technology trials and special projects. Since Sept. 2009 she has been assigned the R&D Projects Section, regarding EU and National funded technology projects.

Ioanna Mesogiti holds a Diploma in Electrical & Computer Engineering from the National Technical University of Athens (NTUA) (2002) and an M.B.A. degree from Athens University of Economics and Business (AUEB) and NTUA (2003). During 2001–2002 she worked as a research associate in NCSR Demokritos, while during 2003-2005 she was employed as software engineer in Siemens S.A. In 2005 she joined COSMOTE participating in novel technology trials and special projects and since 2009 she works in the R&D Projects Section as Senior Engineer, participating in EU and National funded projects.

Dr. Konstantinos Filis holds a Ph.D. degree from Southern Methodist University, Dallas, Texas, an MSEE degree from Purdue University, W. Lafayette, Indiana and a BSEE degree from Ohio University, Athens, Ohio. From 1993-1995 he worked as a Telecommunications Engineer in INTRACOM SA. From 1995-1996 he held the position of Assistant Researcher in NCSR DEMOKRITOS. Since 1996 he is an OTE employee detached to COSMOTE since its establishment. He has contributed in several projects of the Radio, Core and O&M Divisions of COSMOTE. Currently he serves as a Senior Research Engineer. Dr. Filis has authored several scientific papers in the area of mobile communications.

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