



# GERYON Newsletter

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

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## Welcome Letter

Mr Roberto Maza

Dear Reader,

GERYON has just progressed past the half way mark of its voyage on the development of a technology independent system for emergency networks and services. During the first 17 months of the project, the GERYON consortium has reached a number of milestones, such as the collection of the end-user requirements, system architecture design and development of its components.



Based upon this firm foundation, feasibility studies into some of the GERYON's key functionalities and services were conducted and positive results were obtained. For example, the establishment of interoperability calls between two technologically independent communication networks (i.e. LTE and TETRA) via the GERYON Enhanced Gateway, and direct video calls between a public end-user's Smartphone and a mobile tablet-based control room of the Public Safety Answering Point (PSAP). In order to keep all stakeholders informed about these encouraging outcomes, a number of corresponding videos were produced and uploaded to the GERYON YouTube channel. The consortium has also recently presented live-demos to a wide range of stakeholders at the BAPCO 2013 Exhibition in Manchester (UK).

In the coming months, the GERYON consortium will continue to work at full speed towards the completion of various system components (such as the GERYON Security Gateway and GERYON Media Gateway) and then proceed to integrate them together to form the novel GERYON ecosystem.

Mr Roberto Maza  
GRUPO CYS



## Project News

### GERYON General Meeting

With the aim of providing project updates and enabling smooth collaboration within the project consortium members a project meeting was held at the premises of VIOTECH Communications, Paris, France on 3-4 April 2013. A total of 16 people from all the project partners participated. The 2-day meeting was started by Dr Fidel Liberal presenting the overall project status (e.g. what have been achieved and what can be enhanced by the GERYON consortium). Then, the development progress of major GERYON ecosystem components were fully presented and discussed, including the VPN connections, inter-domain calls, LTE connectivity, GERYON Enhanced Gateway (GEGW), control room, GERYON terminals and GERYON services. This provided a firm foundation upon which the GERYON consortium can prepare a number of real demonstrations for the first audit meeting. In addition, Work Package (WP) leaders also presented the status of each WP, providing a fine-detailed overview of individual WPs accordingly.



**A GERYON team presentation session during the Paris meeting**

### Dissemination activities

During the last 6 months, a number of dissemination activities have been undertaken by the GERYON consortium to ensure that all stakeholders (i.e. the European Commission (EC), researchers, first responders and the general public) are informed regarding the latest status of the project. Details of these dissemination activities are described fully below.

In comparison with the deliverable rush (a total of 9 completed deliverables) before last December, only 1 deliverable (i.e. D3.3) was submitted to the EC by the end of May 2013. Nonetheless, the D3.3 – Procedures for orchestration of emergency communications with GEMS, which is led by the University of

the Basque Country (UPV/EHU), is one of the key documents that describes the proposals for coordinating the user of resources in emergency communications over heterogeneous networks and demonstrates the benefits of the GERYON solution through simulations.

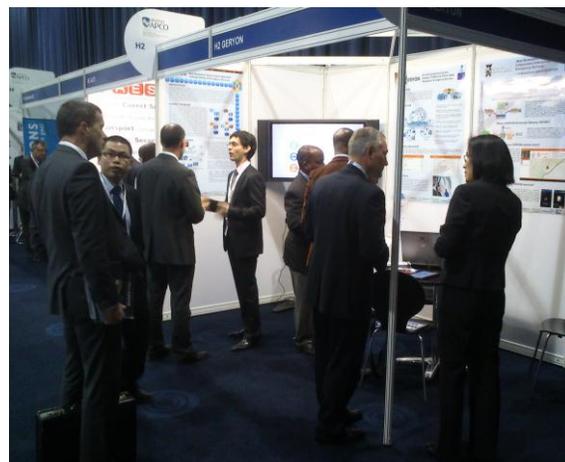
The publication of scientific papers is one of the most important ways to share project results with researchers and provides the cornerstone for future research activities. During the last 6 months, several conference papers and three journal papers were submitted by the project consortium and 5 of them were accepted for publication. In addition, the GERYON consortium also developed and proposed an International workshop on Emergency Telecommunication Systems 2013 (ETS 2013). The ETS 2013 workshop (<http://www.ita13.org/ets>) aims to bring all latest research and development on emergency telecommunication systems together, including the GERYON project, allowing researchers to present their research results and discuss the impact of them. The event will be held on the 12 September 2013 in Wrexham, North Wales in the UK in collaboration with the Fifth International Conference on Internet Technologies & Applications (ITA13) conference.



Knowledge Exchange for Public Safety Communications

With the aim of informing public safety communication stakeholders, the GERYON project went public at the British APCO (BAPCO) 2013 Exhibition. The GERYON stand included a video presentation, three posters and three live demonstrations.

The video demonstrates the project overview, partners and objectives. While the three posters illustrate the project background, the interoperability solution between TETRA and LTE for next generation emergency services and the main components of the GERYON system. The live demonstrations included a Real-time call/text-message between a smartphone (from the exhibition site, Manchester, UK) to a TETRA terminal (in Bilbao, Spain), Red button service to PSAP (shown on a tablet) with location information and both basic and enhanced GERYON services using mobile phones via IMS such as video call, picture transmission and real-time message exchange. During the exhibition, many people visited the GERYON stand: interesting discussions about the project were formed and ideas on future emergency services were exchanged between the visitors and the GERYON exhibitors (as illustrated in the figure below).



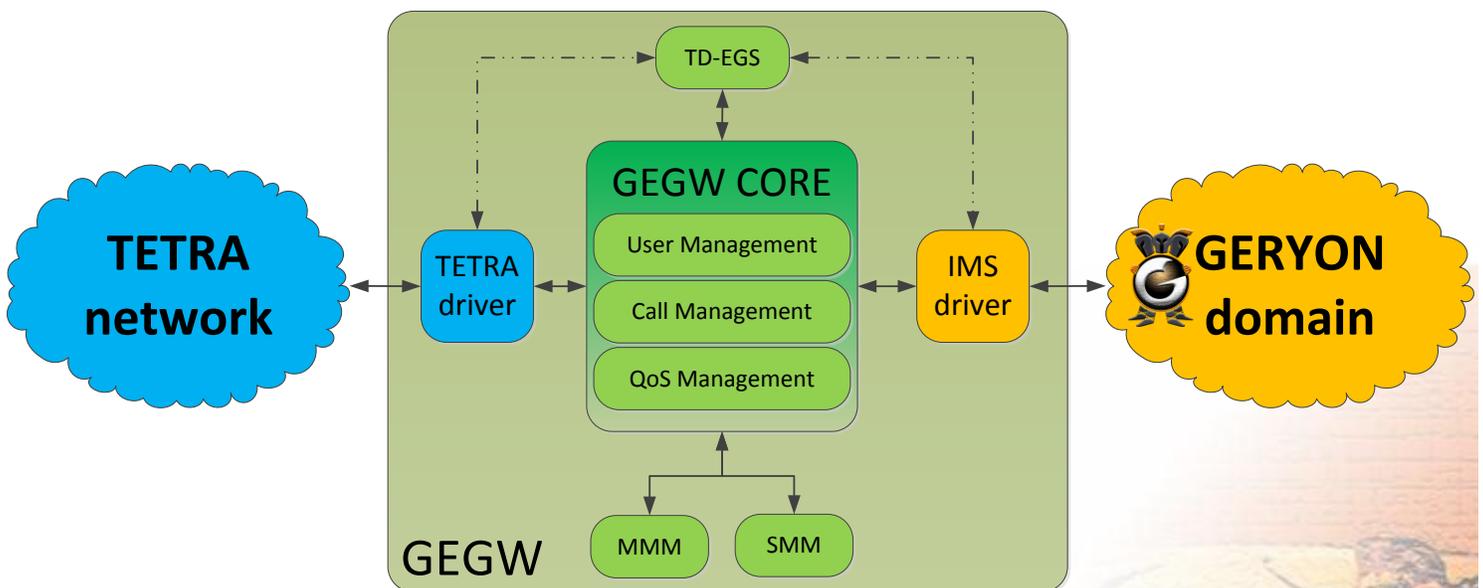
**Exhibitors and visitors of the GERYON stand**

**Technology Insight**

In the last two newsletters, an overview of the GERYON project and the GERYON Enhanced Management System (GEMS) that is the central management system comprising the management logic for all GERYON emergency services were presented to readers. To follow the footprint of the previous two newsletters, the GERYON Enhanced Gateway (GEGW), which is another key component of the GERYON ecosystem, will be fully described in the following section.

**GEGW Overview**

GEGW is specified as the GERYON enabler for non-IMS compatible emergency organisations that utilise traditional Professional Mobile Radio (PMR) based technologies (e.g. TERTRA or TETRAPOL) to communicate each other. As a result, this new reference gateway will provide the interconnection between existing first responder’s PMR networks and the novel IMS-based GERYON emergency inter-networking architecture. Unlike traditional “Technology A”/ “Technology B” gateways (i.e. the gateways ONLY handle the interconnection between technology A and B), the GEGW will take the advantage of standardised IMS procedures to get connected with the GERYON IMS domain and it will only be required to re-engineer the technology dependent part (e.g. TETRA). An overall architecture of the GEGW is illustrated in the figure below. In order to provide a seamless interconnection between first responder’s PMR networks and the GERYON emergency services architecture, the GEGW utilises the following elements: the Core module, the Security Management Module (SMM), the Multimedia Management Module (MMM), the IMS driver, the technology dependent driver (TETRA is chosen for demonstration purpose) and the Technology Dependent – Enhanced GERYON Services (TD-EGS) module.



**GEGW overall architecture**

The Core module is the most important entity of the GEGW as it handles all functionalities that must be supported by the gateway in a technology agnostic way. These functions include user, call and Quality of Service (QoS) management. The user management function manages all users' identity and profile along with authentication and authorisation information regarding their access to services and their communication abilities; the call management function is responsible for managing calls between users from two different networks (e.g. between IMS and TETRA); the QoS management function is a high-level functional element that refers to the "intelligence" of the network concerning QoS; it retrieves user-related configuration, access permissions and network feedback in order to assign required QoS levels to a communication session.

The MMM is responsible for managing the Media flows of the GEGW. It will be implemented with a number of standard protocols for real-time multimedia traffics (e.g. Real-time Transport Protocol (RTP) and Secured RTP (SRTP)) based upon the RFC 3550 and RFC 3711. The module adapts the traffic according to the requirements of both the source and destination end devices. It will support multiple calls simultaneously by allowing mixed RTP traffic coming from different individual users.

The SMM is implemented for two purposes: managing the security within the gateway and ensuring the data that goes through the gateway is protected. For its internal duty, the SMM performs the authentication of all modules within the GEGW and confirms their legitimacy. Regarding real-time multimedia data, the SMM utilises its built-in security mechanisms to guarantee the confidentiality and integrity of the data is protected.

The IMS driver is responsible for connecting the Gateway main core with GEMS. As a result, the GEGW will be implemented with several functionalities to interoperate with GERYON IMS domain, such as specific identity/addressing mapping, call management mechanisms, media formatting, secure procedures for both signalling and data planes, etc. It makes possible for PMR users to act as IMS users for all purposes and it also allows the PMR users behave in the way as a Mobile Virtual Emergency Operator (MVEO).

The TETRA driver is designed to allow the interoperability between the TETRA network and the GERYON IMS architecture. The interface of the TETRA network is implemented by TELTRONIC's NEBULA which is the only 100% IP based TETRA system at the moment. Therefore, the TETRA driver must use NEBULA procedures in order to connect to the TETRA infrastructure. In this way, the operation of the TETRA driver will not affect any of existing TETRA network procedures and communications; also the TETRA driver will be able to provide a pure IP connection to the core of GEGW.

The TD-EGS is specified as the GERYON enabler for emergency organisations endowed with IMS-based network infrastructures for emergency communications. Although these organisations will be able to establish basic IMS communications with GERYON IMS domain, specific support for some PMR-grade functionalities will probably differ between different deployments. Those PMR-grade functionalities include local resource allocation, pre-emption capabilities and local location based services. Thus, TD-EGS will be in charge of mapping the intra-organisation procedures to GERYON IMS domain compliant ones.



## Partner Spotlight

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

### The National Centre for Scientific Research (NCSR) DEMOKRITOS



The National Centre for Scientific Research (NCSR) DEMOKRITOS is the biggest research centre in applied sciences and engineering in Greece and it is a self-governing research organisation under the supervision of the Greek Government. With more than 800 staff members, NCSR consists of eight Institutes spanning a broad range of activities and of divisions responsible for administrative and technical support. It is the home of the Greek National Host and a major node in the Greek National Research and Technology Network (GR-Net). NCSR participates in the project through the Institute of Informatics and Telecommunications (IIT) that comprises 15 senior researchers, 6 postdoctoral fellows and 12 PhD Students. IIT has a leading experience in the telecommunication and informatics areas relevant for the project, such as Next Generation, media-oriented network architectures based on technology convergence, IP Multimedia Subsystem (IMS) and IMS-based management of multimedia services, and Virtualisation Environments Secure Networking. The following are some of latest EU funded competitive research and development projects, in which the IIT has participated: LIAISONFP6/ IST(IP), ENTHRONE-I and II-FP6/IST(IP), UNITEIST/ FP6, ADAMANTIUM-ICT/FP7, HURRICANE-ICT/FP7, ALICANTE-ICT/FP7(IP) and PERSEUS SEC/FP7(DEMONSTRATION).

NCSR's Role in the GERYON project: NCSR undertakes the leadership of WP3 and coordinate the design and development of GEMS. In addition to participating to the system definition/specification phase, NCSR focuses upon the implementation of the TAMS and its sub-modules (RCM, TMM, SMM, ESMM) on an existing experimental IMS platform. NCSR also contributes to the implementation of GEMS Media and Security Gateways and actively participate in the integration and trials phase.

#### Short profile of the staff members



Dr. Anastasios Kourtis received his BS degree in Physics in 1978 and his PhD degree in Telecommunications in 1984, from the University of Athens. Since 1986 he is a member of the research staff at the Institute of Informatics and Telecommunications of the Greek National Centre for Scientific Research "Demokritos". Currently he is a Research Director. His technical and research activities have been in the area of digital modulation techniques, spread spectrum systems, multimedia applications, Quality of Service (Perceived and Network), broadband wireless networks, interactive digital terrestrial TV (DVB-T/T2), satellite communications (DVB-S/S2-RCS) and networks convergence. He has participated

in a number of EU-funded research and development projects: ESPRIT (FCPN, OFSES), ACTS (CRABS, WATT), IST/FP5 (WIN, MAMBO, SOQUET, REPOSIT), IST/FP6 (ATHENA, IMOSAN, ENTHRONE-I, ENTHRONE-II, UNITE) and ICT/FP7 (ADAMANTIUM, HURRICANE). He is the author of several papers on telecommunications, broadband wireless networks and digital interactive TV. He has been Project Manager of ATHENA, IMOSAN-FP6/IST and ADAMANTIUM-ICT/FP7, and Technical Manager of REPOSIT-FP5/IST projects.



Dr. Harilaos Koumaras was born in Athens, Greece in 1980. He received his BSc degree in Physics in 2002 from the University of Athens, Physics Department, his MSc in Electronic Automation and Information Systems in 2004, being scholar of the non-profit organization Alexander S Onassis, from the University of Athens, Computer Science Department and his PhD in 2007 at Computer Science from the University of Athens, Computer Science Department, having granted the four-year scholarship of National Centre of Scientific Research "Demokritos". He has received twice the Greek State Foundations (IKY) scholarship during the academic years 2000-01 and 2003-04. He has also granted with honors the classical piano

and harmony degrees from the classical music department of Attiko Conservatory. Since 2004 he is a principal lecturer at the Business College of Athens (BCA) teaching modules related to Information Technology and Mathematics and Logic. From 2009, he has been elected as the Head of the Computer Science Department of BCA and Course leader of the respective franchised course of London Metropolitan University. He also joined the Digital Communications Lab at the National Centre of Scientific Research "Demokritos" in 2003 and since then he has participated in numerous EU-funded and national funded projects with presentations and publications at international conferences, scientific journals and book chapters. His research interests include objective/subjective evaluation of the perceived quality of multimedia services, video quality and picture quality evaluation, video traffic modeling, digital terrestrial television and video compression techniques. Currently, he is the author or co-author of more than 53 scientific papers in international journals, technical books and book chapters, numbering 130 non-self citations. He is an editorial board member of the Telecommunications Systems Journal and a reviewer of the IEEE Network magazine, the EURASIP Journal of Applied Signal Processing, the IEEE Transactions on image processing and the IEEE Transactions on Broadcasting. Dr. Koumaras is a member of IEEE, SPIE, NGS and ECPMA.



Christos Sakkas was born in Athens, Greece in 1989. He has received his undergraduate degree from Computer Science Department of the Athens University of Economics and Business. At the beginning of 2013 he joined Media Networks Laboratory at the National Center of Scientific Research "Demokritos". Currently he is working as a software engineer. His current research interests include Cloud Services, Mobile Streaming Services, IMS, VoIP management, Video Surveillance, Face Recognition and web/mobile applications.



## ITELAZPI



ITELAZPI is a public network operator wholly owned by the Basque Government, which provides communication services to the different public administrations in the Basque Country. To go about this task, it has a public infrastructure of over 240 communication locations at key points in the region.

This public infrastructure, managed and operated by Itelazpi, is the basis for the services offered to its client entities.

ITELAZPI was created in September 2003, by Decree of the Basque Government, whose mission and main objectives are:

- To provide broadcasting services (radio and TV) to Basque Public Television (EITB)
- Public communication infrastructure management, offering housing services to third party operators and agencies.
- To provide TETRA Voice and Data services to Basque Public Administrations and mission critical agencies in the Basque Country.
- Broadband Internet deployment to rural areas via a Wimax network.
- To provide consultancy services to other public institutions on communication matters.

As a public company ITELAZPI aims at the provision of broadcasting and public communications services and the management of public telecommunications infrastructure, using cutting-edge technology, service quality and protection of the environment, clearly reflected in our corporate values: Focusing on customers and society, Providing services with the latest technology, Staffed by highly-skilled professionals, Focusing on results and efficiency, Protecting the natural environment, People as the core of the business, Excellence and innovation.

Role in the project. Based on this experience, the main ITELAZPI contributions will be focused on Specification and system design (leader of WP2) and on the Integration, Field Trials and Evaluation of the systems and components (WP6). As a TETRA service operator, and fully aware of different mission critical and emergency users' current requirements, ITELAZPI will lead the definition of emergency services and interoperability from user requirements points of view. Likewise, ITELAZPI will support the specification and settings of emergency communications in IMS, LTE and TETRA. Finally, ITELAZPI will also assume a leading role in the final trials and technical evaluation of interoperability, carrying out life trials and pilots with current emergency users, in order to provide enhanced capabilities as well as added value services in daily communications in the Land Mobile Radio business.

### Short profile of the staff members



Naiara Goia is a senior Account Manager with over 10 years' experience in the Telecommunications sector across different countries in Europe (France, Sweden, Spain). For the last nine years she has worked for the Basque Government leading on the procurement and deployment of large-scale technology solutions within the public sector. Currently she is the TETRA Customer Manager and is responsible for leading on the definition of the business model, the strategic objectives and the design and commercialization of TETRA services for mission critical users and government agencies in the Basque Country. Naiara holds an

MsC in Telecommunications Engineering from the UPV/EHU and an MBA in Marketing and Management. She is also trained under the EFQM Excellence Model for Advanced Management.



Amaia Bizkarguenaga, TETRA Customer Engineer. Amaia works as a TETRA engineer at ITELAZPI, assisting and supporting the TETRA services design and marketing process. She graduated in Telecommunications Engineering in 2005 from the UPV/EHU. Previously Amaia worked as a lecturer at the Department of Electronics and Telecommunications of Mondragon University, particularly in the area of Digital Signal Processing and Wireless Communications. She cooperated on several R&D projects related to emerging digital video broadcasting (DVB) standards and wireless, and other communication systems.

Ricardo Lizundia works since 2004 at Itelazpi, currently as TETRA Service Manager. This organization is responsible of the telecommunications services of the Basque Government. At Itelazpi he is in charge of the TETRA network operations and maintenance, assuring the service delivery and availability to its customers. He also collaborated in the rural broadband WiMAX project promoted by the Basque Government. Holding a degree in telecommunications, Ricardo has a wide experience as a communications project manager. Previously he worked at the cable operator Euskaltel, in the customer engineering area, coordinating the deployment of private voice and data networking corporate networks. His scope of technical knowledge includes mainly data switching and routing systems, radio transmission networks, as well as Internet security aspects.



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