GERYON Newsletter

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

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Contents

Welcome Letter
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Dear Reader,

The fourth newsletter of the GERYON project will provide you with an update of the latest project activities, research results and innovations. GERYON is a 7th Framework Program (FP7) funded project aiming at the design and implementation of novel emergency services to the end-user, which will provide interoperability for incompatible devices and enhance the response time of the first responders at emergency situations.

To accomplish this task, the barrier isolation of emergency communication networks based on Private Mobile Radio (PMR) systems (e.g. TETRA) and next generation general purpose cellular technologies (e.g. LTE) needs to be overcome, by applying novel methods to ensure the unhindered interworking between these networks.

Towards that end, we are very excited to announce that the first video call from an ordinary TETRA terminal located in Spain to a commercial LTE smartphone based in Greece was successfully made earlier this year. To make this call a reality, the partners managed to bring a number of different components together and overcome major technical challenges such as the interoperability of TETRA systems with the IP Multimedia Subsystem (IMS) and the development of a specific IMS client application for 4G smartphones. The accomplishment of this milestone demonstrates a huge amount of research and development effort and the dedication of all project partners. Also, the interoperability between these two completely different and isolated technologies can pave the way towards the desired amalgamation of separate worlds for the provision of ubiquitous emergency communications.

Based upon the success of the initial integration between the TETRA and LTE systems, several other system components (e.g. GERYON Enhanced Management System, GERYON Control room and GERYON Security Gateway) that can provide enhanced emergency services and more complicated interoperability have been developed. At the moment, the project is at its integration phase (i.e. connecting all the system components together) and the GERYON ecosystem will then be fully tested and evaluated.

Helen Theodoropoulou

COSMOTE Mobile Telecommunications S.A.

Project News

GERYON Project Audit Meeting

In order to review the GERYON project progress during the 15-month period, the first Audit meeting was held on 6th June 2013 at the project partner, Itelazpi, premises. In total, 17 people attended the meeting, including the project officer, two reviewers and 13 consortium members. The one-day Audit meeting was packed full with activities, starting with reviewers' briefing and opening words and followed by an overview of the project (including the introduction, current status, future activities and use of resources). Work Package (WP) explanations were scheduled after the overview project review with each WP leader providing detailed descriptions about their achievements, current status and forthcoming plans. A number of demos were also provided by the consortium team to highlight major achievements of the project up to month 15, such as the TETRA to IMS intra domain call via the GERYON Enhanced Gateway and the Control Room. The feedback from reviewers and the project officer was very positive.

The GERYON project reviewers, project officer and consortium members

GERYON General Meeting

With the aim of providing project updates and planning for the next stage of the project, a regular project meeting was held at Glyndwr University, Wrexham, UK on 11 September 2013 in conjunction with the ETS 2013 workshop. A total of 9 people from 5 consortium members participated the meeting. The 1-day meeting was kicked off by Dr Fidel Liberal presenting the outcome of the project audit meeting and overall project status. Then, the development summary of the core GERYON infrastructure (including the GERYON Enhance Management System, terminals and control room) was presented and discussed. This offered a solid overview of where the project was at and the direction that the project should be more focused upon in the coming months.

Dissemination activities

With the purpose of keeping a high visibility for the project, continued efforts were given by the GERYON consortium in various dissemination activities, including deliverables, publications and a workshop. Details of these dissemination activities are described below.

Over the last few months, the GERYON consortium experienced another deliverable peak as 7 deliverables were submitted to the EC on time. D1.3 – Interim progress report 2, describes the comprehensive analysis of the project milestone up to M23, with specific focus upon the activities that were occurred during M16-23. While D3.4 (Development of GEMS and related modules), 4.2 (Design of GERYON reference gateway), 4.3 (Design and development of GEGW modules for TETRA), 4.4 (Integration of GEGW with MGW and SGW), 5.2 (Implementation of emergency communications over GERYON-enabled LTE networks) and 5.4 (Implementation of emergency communications over generic IP networks - Final Report) were mainly focused upon the design, implementation and some levels of integrations on the core GERYON system components (e.g. GEMS, GSGW, GMGW and GEGW).

During the last 6 months, the GERYON consortium has made a huge effort towards scientific publications. In total 6 conference papers were published and 4 conference papers were submitted; also one journal paper was accepted for publications. With the aim of collaborating with other researchers in the emergency communication field and also providing an opportunity to present some initial GERYON results, an International workshop on Emergency Telecommunication Systems 2013 (ETS 2013) was organised by the consortium. The ETS 2013 workshop (http://www.ita13.org/ets) was 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). 7 presentations were given in the workshop by researchers from Europe and North America. Based upon these presentations, interesting discussions on the future emergency telecommunication systems (e.g. Next Generation 9-1-1 and Next Generation 112) were formed between the presenters and audience.

**The GERYON ETS 2013 workshop presentations and discussions**

Technology Insight

In this newsletter, an overview of two GERYON key system components - the GERYON Security Gateway (GSGW) and the GERYON Media Gateway (GMGW) will be presented to readers. Both gateways are designed to provide interoperability support for terminals that utilise different types of media security and codec. Details about these two gateways are described in the following section.

GERYON Gateways

Different emergency organisations may utilise various security controls and codecs to secure and en/decode their real time multimedia communication. Therefore, incompatibility issues can occur when they try to communicate with each other using different security mechanisms and/or media codecs, resulting in unsuccessful calls even for life-threatening situations. In GERYON, the GSGW and GMGW are designed to provide interoperability support for those who encounter compatibility issues: the GSGW is responsible for cross-ciphering support while the GMGW is countable for transcoding needs.

A simplified GERYON system architecture is illustrated in the following figure. As mentioned in the second newsletter, GERYON Enhanced Management System (GEMS) is the central management system that manages all the devices within the GERYON ecosystem. During a call setup, the GEMS invokes the GSGW and GMGW for their cross-ciphering and transcoding supports respectively when terminals have media compatibility issues (i.e. mismatched security controls and/or different media codecs). The GSGW and GMGW are largely designed in three main parts in order to assist any incompatible terminals: the signalling, media and management segments. For the signalling plane, its main responsibility is to securely establish signalling communication with GEMS to set up a seamless media plane cross-ciphering/transcoding processes. The media plane is responsible for identifying incoming media flows and performing the cross-ciphering/transcoding on the media. The Management segment controls both the media and signal plane interfaces and also provides resource management, error control, performance monitoring and accountability functionalities.
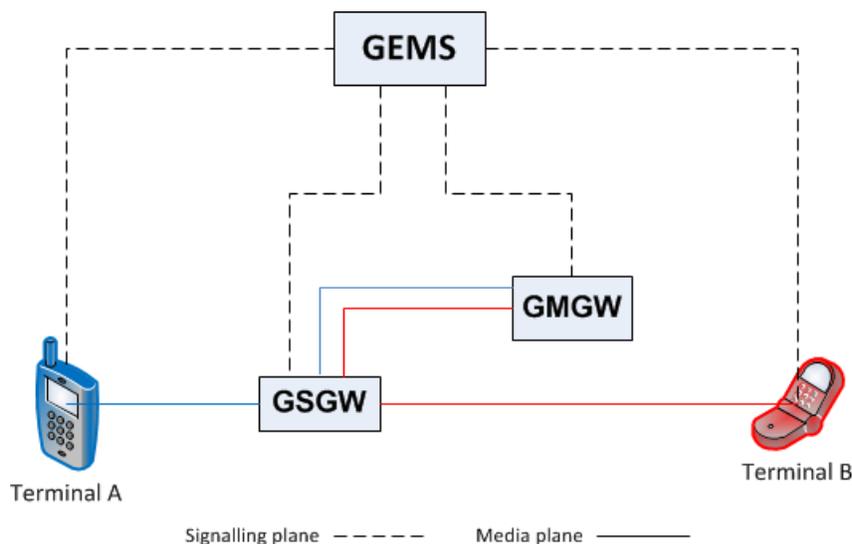

A generic GERYON ecosystem architecture

The Signalling Controller of the GSGW and GMGW is mainly responsible for establishing secured communication with the GERYON Enhanced Management System (GEMS), including mutual authentication, key establishment and security association setup. The Signalling Controller is also in charge of configuring the security associations for the setup of media transmissions between GSGW/GMGW and a terminal. When ciphering assistance and media codec help is requested, the Signalling Controller selects an appropriate set of crypto suite and key management solutions of the GSGW and media codecs of the GMGW to set up both the incoming and outgoing calling legs.

Media Controller is the interface of GSGW/GMGW to any media transmissions. Upon receiving the media traffic, Media Controller will apply a predefined set of security control policy of the GSGW or media codec policy of GMGW to perform cross-ciphering and/or transcoding. Once the ciphering and/or transcoding process is completed, Media Controller will send the modified media to the appointed receiver. Details of the whole process will then be stored in an Audit Log for the purpose of accounting.

Management Controller is the primary controller of GSGW and GMGW that regulates the system and liaises between components. Apart from overseeing the entire cross-ciphering and transcoding processes, it is also responsible for managing the ciphering capability of GSGW and the media codec capability of the GMGW, both of which need to be regularly updated to provide appropriate media assistance for any newly developed terminals.

A scenario that the GSGW and GMGW are both required in a call session is illustrated in the following figure. In this scenario, both terminals do not share common security set or same codec and therefore the GSGW is utilised for cross-ciphering and the GMGW is required for media transcoding. Assume terminal A starts to send media, the media will flow in the following manner: GSGW decrypts the media by utilising security set A and securely sends the decrypted data to GMGW for transcoding; GMGW decodes the media by using codec X and encodes the media by employing codec Y; then the media is securely sent back to the GSGW where the media is encrypted by security set B and then transmitted to terminal B.
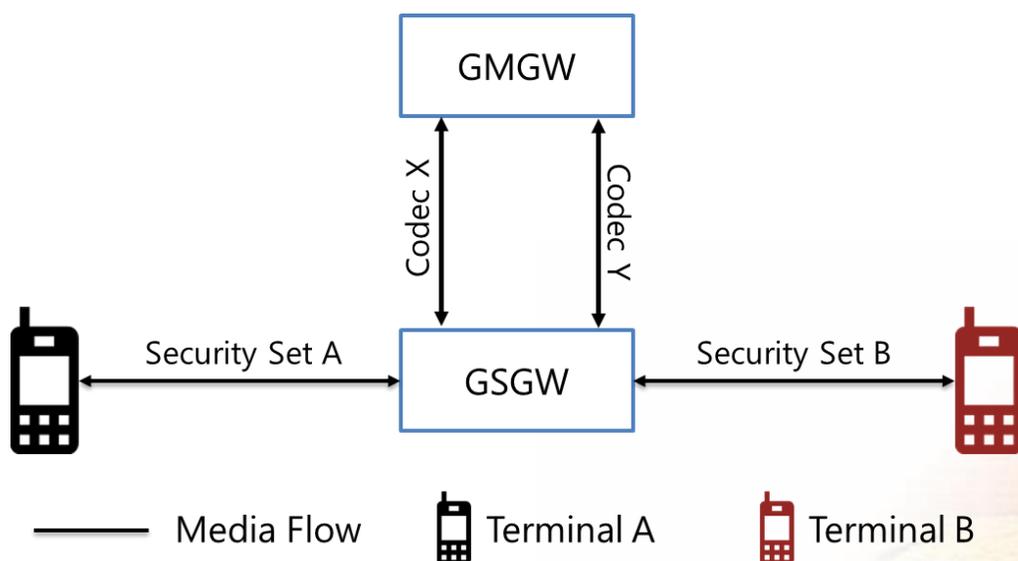
Cross-ciphering and transcoding of the GSGW and GMGW

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, partner VIOTECH Communications will be introduced.

VIOTECH Communications

VIOTECH Communications, headquartered in Versailles (France), develops, produces and markets advanced solutions for multimedia applications, which meet the expectations of people in terms of communications, information and security. The company spends a comparably high percentage of its turnover on Research and Development, and in doing so provides the means to employ specialists for its main field of activity. The focus of the activity is on developing "digital media"-related applications, particularly based on ISO/MPEG, IETF and ITU-T standards.

VIOTECH provides solutions that enable audiovisual and multimedia transmission over digital networks, including IP multicasting over WLAN and Intranets inside homes and companies. At the core of their work, new communication architectures and protocols supporting multimedia and mobility over the Internet, together with intelligent Internet services, are essential as well as human-computer (user awareness) & P2P interaction and personalization capabilities. Numerously awarded in fairs across the globe (CES'13, CeBIT'13), their solutions blend in people's entertainment and privacy expectations with providers' next generation services within the booming Digital Home Market:

- Enhanced Linux-based Home Gateway;
- IMS-based Media Center applications;
- VoIP embedded softwares;
- In-home and extended-home solutions.

Their further research and development activity has been focusing on investigating the design and implementation of next generation middleware so as to meet the requirements of emerging distributed applications. The company sets itself as a leading contributor to the European Union's Information Society Technology programme (EU IST), as well as various national French (ANR, RNRT) programmes. Within FP7 & Eureka Eurostars, VIOTECH Communications aims at integrating and implementing the multiple projects' results the company has been actively involved in (ADAMANTIUM, MULTI@HOME, ALICANTE, DELTA, W3TV) in its existing and future product families, for new commercial applications either through its OEM and System-integrator, other strategic partners or through the many channels and direct sales worldwide.

Within the GERYON project, VIOTECH is participating in the general architecture definition, IMS set-up, design and implementation of MGW, project solution integration and test, dissemination of the project results.

Short profile of the staff members

Mamadou SIDIBE received his Ph.D. from the University of Versailles-Saint-Quentin, France, in 2010 in the field of network QoS and QoE monitoring systems. Form 2004 to 2008, he worked as Associate Researcher at the CNRS-PRISM laboratory and participated in several European collaborative projects (ENTHRONE 1 & 2, ATHENA, IMOSAN). He joined VIOTECH Communications as R&D Engineer in 2008, bringing his expertise and experience to several collaborative projects (ADAMANTIUM, MULTI@HOME, GERYON).

Olimpiu NEGRU received his BS degree in Electrical Engineering from the University of Cluj (Romania) in 1969 and his PhD degree in Computer Science from the University of Timisoara (Romania) in 1982. In 1984, he joined MATRA where he was involved in R&D projects focusing on imaging and audio/video processing such as MPEG-1/MPEG-2/MPEG-4 encoding/decoding/transcoding/multiplexing. From 1997 to 2009, he led the participation in the IST programme at THOMSON BROADCAST & MULTIMEDIA within the Multimedia & Digital Systems Unit, coordinating numerous IP and STREP projects. In 2010, he joined VIOTECH Communications as Head of the Collaborative Projects Department.

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