



Security And Interoperability in Next Generation PPDR
Communication Infrastructures



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Dissemination, Exploitation and Standardization Activities Report - Intermediate

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Abstract: Deliverable D8.2 presents the intermediate report on the dissemination, exploitation and standardization activities. The deliverable describes the past, current and planned dissemination activities, provides exploitation plans for each partner and describes the involvement of the consortium in standardization tracks.

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EXECUTIVE SUMMARY

The SALUS project is at its middle point and this deliverable represents an overview of dissemination, exploitation and standardization activities that have occurred since the beginning of the project.

Members of the SALUS consortium have performed the following dissemination activities:

- Issued 15 scientific and technological publications and successfully submitted a book chapter proposal to the first volume of the forthcoming Wiley-ISTE Series on Public Safety Networks. The book chapter is currently in the process of writing;
- Performed 17 promotional activities that targeted not only end-users and industry, but also governmental institutions and regulators;
- Organized the First SALUS conference that attracted over 60 participants;
- Set up the project homepage that attracts over 400 unique visitors per month;
- Set up the End-user advisory board that provides end-user expertise and assistance;
- Established liaison agreements with 4 related PPDR entities (Cognitive Radio Standardization Initiative, Critical Communications Broadband Group, project GERYON and project PPDR-TC);
- Started planning and preparing training activities.

In the next period of the project lifetime the consortium plans the following dissemination activities:

- To organize the Second SALUS conference;
- To organize a public demonstration of the SALUS platform;
- To organize training activities;
- To publish additional scientific and technological papers;
- To prepare additional promotional activities at venues that attract PPDR end-users, industry, regulators, governmental institutions and public.

Partners shall exploit the results of the project by means that are the most appropriate to the mission of their own organizations: by developing cutting-edge products developed inside SALUS, by publishing high-quality papers or by expanding their network of contacts.

Although the project is at its middle point, the standardization activities have already started to emerge. The members of the consortium are actively involved in four standardization tracks (ETSI standardization of Cognitive Radio for Public Safety, 3GPP standardization of Public Safety features, FM49 for identification of spectrum for broadband PPDR and IETF standardization of mobile ad-hoc network routing protocols) to which they shall contribute with SALUS outputs.

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1 INTRODUCTION

The goal of the SALUS project is to design, implement and evaluate the next generation communication network concept for public protection and disaster relief (PPDR) agencies that will be supported by network operators and industry, and that will provide security, privacy, seamless mobility, quality of service and reliability for mission-critical Private Mobile Radio (PMR) voice and broadband data services.

The project is at its middle point and this deliverable presents the past, current and planned activities concerning the dissemination, exploitation, and standardization of knowledge and results that have been generated so far.

Section 2 presents dissemination activities. In part, this section continues and extends the SALUS deliverable D8.1: Dissemination plan [2]. It thus provides an extensive list of already carried out as well as planned dissemination activities that include scientific, technical, promotional, conferential, liaison and training dissemination items.

Section 3 presents the exploitation plans for each partner. With these, partners describe how they plan to exploit SALUS results so that their institutions benefit the most, for instance by marketing their products as in-line with the cutting-edge innovations, by extending their publication records with SALUS-related publications, or by extending their network of contacts.

Section 4 presents the standardization activities. Several beneficiaries participate in standardization bodies and this section overviews the ongoing activities and efforts towards standardizing SALUS results.

Section 5 concludes the deliverable and outlines next steps regarding the dissemination, exploitation and standardization activities.

2 DISSEMINATION

The main goal of the dissemination is the promotion and propagation of knowledge and results that are generated in the project. The overarching idea of all dissemination activities is to raise awareness about the research and technological advancements, promote their use, and thus create value within the targeted audiences. The main objectives of the dissemination are the following:

- To make research results publicly available in order to be evaluated by other researchers;
- To bring project results closer to the market by presenting the research and other technological results at various industrial and end-user events;
- To contribute to regulatory standardization efforts related to SALUS;
- To seek liaisons between SALUS and other related project and efforts;
- To inform interested public about the project progress and its main results.

This part of the document represents the report on the dissemination activities that have been performed so far and an update to the dissemination plan that was given in SALUS deliverable D8.1: Dissemination plan [2].

The section begins by describing the targeted audiences and the means to reach them. This is followed by the description of partner roles in the dissemination process and an overview of the past scientific, technological and promotional dissemination activities. Next, the First SALUS conference is presented, which is followed by the updates regarding the homepage, the end-user advisory board, liaison activities and the remaining means of dissemination. Finally, the section describes the envisaged training activities and the updated version of the dissemination plan.

2.1 Targeted stakeholders and dissemination venues

The results of the SALUS project are interesting to various stakeholders. Most relevant are the following:

- PPDR end-users;
- Telecommunication industry;
- Research institutions;
- Various regulating bodies;
- EU and the general public.

To reach these stakeholders, the members of the consortium shall disseminate the project findings in various dissemination venues. Most relevant are the following:

- Industrial fora (such as the Communications Broadband Group at TETRA & Critical Communications Association at Critical [TCCA/CCBG] or PSCE conference), fairs, exhibitions and end-user events such as Critical Communication World, PMR Expo, Annual Critical Communications World, British Association of Public-Safety Communications Officials [BAPCO], Cambridge Wireless and others;
- Scientific venues such as workshops, conferences and journals. A list of potential venues was presented in D8.1 [2];
- Technology magazines;
- Educational and training institutions;
- Standardization bodies;
- The project homepage and social media accounts.

The following table shows mappings between interested stakeholders and various dissemination venues. The details of dissemination items are provided in the following section.

Table 1 – The mappings between dissemination venues and stakeholders

Venues \ Stakeholders	End-users	Industry	Research	Regulators	Public
Fairs, exhibitions, end-user events	x	x		x	x
Scientific conferences, workshops, journals		x	x		
Technology magazines	x	x			x
Educational and training institutions	x		x		
Standardization bodies		x	x	x	
Homepage, social media	x	x		x	x

2.2 Roles of partners in dissemination activities

This section provides an overall description of partner roles regarding the dissemination activities.

2.2.1 Instituto de Telecomunicações (IT)

As coordinator, IT mainly targets to promote project visibility. During the first reporting period, IT established liaison agreements with other FP7 projects (GERYON, PPDR-TC, CRS-i) and (jointly with Rohill) with the Critical Communications Broadband Group (CCBG), a working group of the TETRA & Critical Communications Association (TCCA). IT has also promoted SALUS during the PSCE-TCCA Workshop, held in Brussels on June 2014, related to “Future of Mobile Communications 2020+” and was a co-organizer of the SALUS 1st conference.

2.2.2 Cassidian (CAS)

Cassidian is a leader in PMR solutions provided to the “blue lights forces” in many countries. The company is in touch with PPDR communication end-users and takes benefit of those contacts to identify their actual needs. These exchanges take place at various fairs where the company actively engages end-users and promotes its products, solutions and future proposals such as the work carried out in SALUS. During the first 18 month of the project, CASSIDIAN established links with other FP7 projects (SECINCORE, EPISECC) and promoted SALUS in several end-user events.

2.2.3 Rohill (ROH)

Rohill is involved in many exhibitions for PMR, TETRA and mission-critical LTE solutions, both generic (like the CCW conferences) and industry specific (like public safety, public transport and oil & gas), for which presentations are provided with reference to the objectives and results of the SALUS project. Examples include the training “TETRA-over-IP” held during every CCW conference, and presentations of user cases like “SETAR Critical Voice and Data on LTE” as presented during CCW2014 in Singapore, during which the SALUS project was introduced as a consortium and its objectives. In addition, partner events are held to present and demonstrate the Rohill solutions, whereby the SALUS project is introduced as the roadmap for future migration to Mission Critical LTE. At least four events are held every year during which the SALUS project is introduced.

2.2.4 Airwave (AW)

Airwave as a national operator of a PPDR network is exploiting its in-depth knowledge of public safety communication requirements and its close links to the PPDR community and related organization to develop three scenarios and use cases. These will act as a framework to help

shape SALUS as it progresses. Airwave's knowledge and experience in testing functionality will also be used in proving the demonstrators developed in SALUS. Airwave will use the knowledge gained from SALUS:

- To brief key spokespersons on the programme in order to discuss the role of SALUS and in particular the Public Protection and Disaster Recovery (PPDR) network;
- Brief Airwave CTO to incorporate process and findings for thought leadership media opportunities (e.g. features) – innovation referencing the Airwave Network;
- In Press releases announcing the results of the project.

2.2.5 Fraunhofer (FhG)

The main contributions of Fraunhofer IOSB in the project are in the field of enterprise and system architecture design. Fraunhofer uses its competences in order to design the enterprise architecture and the system architecture of the SALUS solution as well as to validate the SALUS solution. Fraunhofer IOSB will disseminate the results and new knowledge with regard to Enterprise Architecture Modelling and System Architecture design in international conferences and journals dedicated to the topic of Enterprise Architecture design and System Architecture design.

2.2.6 OneSource (ONE)

OneSource provides diverse contributions to SALUS, which include wearable systems integrating video communications and bio-signals transmission, advanced intrusion detection systems to enhance security and mobile forensics that enable the detection of malicious actions. The progress of these contributions is disseminated in various venues, such as reputed international and national conferences, reputed scientific journals and book chapters. Besides the dissemination of the OneSource components, efforts will also be provided in joint-publications to disseminate the achievements of the project.

2.2.7 University of Ljubljana (UL)

Within the SALUS project, University of Ljubljana contributes in several work packages, but the main contributes pertain to security and privacy aspects, and the definition of generic architecture that acquires, aggregates, transmits and processes sensor data. The findings shall be disseminated in national and international conferences and in reputed scientific journals. Aside to individual dissemination activities, UL shall contribute to publications written collaboratively with other beneficiaries.

2.2.8 University of Twente (UTWENTE)

University of Twente has two focus points for its contribution to the SALUS project: (i) providing seamless mobility for multicast flows, and (ii) providing network-based intrusion detection. The findings in these focus areas will be published in high-quality international conferences and journals and magazines. Knowledge gained will also be used in education at University of Twente.

2.2.9 Kingston University (KU)

KU's main activities within SALUS have focused on the general security of the SALUS architecture with emphasis on the MANETs and also on the operation of the mobile ad-hoc network with the design of its routing protocol. As part of KU dissemination activity, a KU member attended the final demonstration activities for project GERYON. KU has published some research output in a conference, a magazine and a journal paper has been submitted for review.

2.2.10 University of Patras (UPAT)

University of Patras expects to disseminate the results related to seamless and security mobility among heterogeneous networks and PMR services across VANETs. These results will be presented at international conferences and published in scientific journals with high impact factor.

2.2.11 Ubitel (UBITEL)

UBITEL contributes to disseminating activities by providing its competence in the area of information security and indoor positioning. UBITEL is also working towards the indoor localization component for the SALUS platform. As WP8 leader, UBITEL is primary responsible for collecting and storing other partners' dissemination activities.

2.2.12 University of Belgrade (UB)

University of Belgrade is involved in several work packages, contributing mostly in the use cases definition, electro-magnetic (EM) simulation of wireless communication channels in extreme conditions, detection of jamming, and application of sensors. The results of these activities are and will be presented at highly ranked conferences and journals.

2.2.13 Public Safety Communication Europe Forum (PSCE)

PSCE's main contribution is to organize the SALUS conferences and animate the End-User Advisory Board. PSCE also regularly informs its members of the project developments via its website and publications.

2.2.14 Alcatel-Lucent International (ALU-I)

Alcatel-Lucent contributes in the SALUS project with its expertise around the LTE technology and its enhancement to support (future) PPDR needs. Alcatel-Lucent promotes the LTE technology and its advances (including the SALUS project related activities) to Ministry of Interiors and related stakeholders worldwide. In the first half of the project ALU-I contributed to the promotion of SALUS within TCCA/CCBG and made a presentation in the 1st SALUS conference.

2.2.15 Emergency Services College (ESC)

ESC will provide training activities associated with the development and use of the secure SALUS platform. Final demonstration of SALUS platform will be organised by ESC at the training area in Finland. ESC will also organize an event for public safety authorities, i.e., (Emergency/fire/rescue/SAR) authorities during final demo.

2.2.16 FIGO (FIGO)

FIGO's main contribution to the SALUS project focuses on the creation of a highly reliable communications platform, combining multiple alternative radio communication technologies, in particular combining public and private LTE, WLAN and ad-hoc networking capabilities. The progress will be disseminated through publications in PPDR related magazines, presentations at innovation workshops and promotion in national PPDR related events such as; the "Hague Security Delta (HSD)" which particularly focuses on innovation for PPDR.

2.3 Scientific and technological publications

This section provides the overview of scientific and technological dissemination activities that have been carried out since the beginning of the project. It is worth noting that the consortium is partly limited in its publication possibilities due to confidentiality restrictions of the project.

To show how published material relates to the project outputs, we present a matrix that relates various SALUS deliverables to publication items. The matrix is given in Table 1. The matrix contains only those deliverables that report scientific results, those that have already been submitted and those that are planned to describe results that have already been published.

Table 2 – The list of already disseminated scientific and technological publications and their relations to SALUS deliverables

Dissemination item	Delierable	D2.1	D2.2	D2.3	D2.4	D3.1	D4.1	D4.2	D4.3	D5.1	D5.2	D5.3	D6.1	D6.2	D6.3	D7.1
Fraunhofer (FhG)																
Wilmuth Müller and Frank Reinert, <i>A Methodology for Development of Enterprise Architecture of PPDR Organisations</i> , International Conference on Software Engineering Research and Practice, 2014.						x										
FIGO (FIGO)																
Frank Brouwer, Column: <i>Taxi</i> , Vakblad Verbinding, January 2015.																
Frank Brouwer, Column: <i>Wolken ver we gen dichtbij</i> , Vakblad Verbinding, August 2014.																
Frank Brouwer, Column: <i>Sotsji</i> , Vakblad Verbinding, March 2014.																
Frank Brouwer, Column: <i>Schengen</i> , Vakblad Verbinding, February 2014.																
Frank Brouwer, Column: <i>Europese kakefonie</i> , Vakblad Verbinding, September 2013.																
OneSource (ONE)																
Konstantia Barbatsalou, Edmundo Monteiro and Paulo Simoes, <i>Mobile Forensics: Evidence Collection and Malicious Activity Identification in PPDR Systems</i> , International Conference in Information Security and Digital Forensics (ISDF 2014), pp. 42-48, Thessaloniki, Greece, 12-14 December 2014.										x	x					
Konstantia Barbatsalou, Bruno Sousa, Edmundo Monteiro and Paulo Simoes, <i>Mobile Forensics for PPDR Communications: How and Why</i> , 10th International Conference on Cyber Warfare and Security (ICWS), 24-25 March 2015, South Africa.										x	x					
University of Twente (UTWENTE)																
Mattijs Jonker, Rick Hofstede, Anna Sperotto, Aiko Pras. Unveiling Flat Traffic on the Internet: An SSH Attack Case Study. Accepted for publication in the 2015 IFIP/IEEE International Symposium on Integrated Network and Service Management (IM'15).											x					
Daniël van der Steeg, Rick Hofstede, Anna Sperotto, Aiko Pras. Real-time DDoS Attack Detection for Cisco IOS using NetFlow. Accepted for publication in the 2015 IFIP/IEEE International Symposium on Integrated Network and Service Management (IM'15).											x					
Olivier van der Toorn, Rick Hofstede, Anna Sperotto, Aiko Pras. A First Look at HTTP(S) Intrusion Detection using NetFlow/IPFIX. Accepted for publication in the 2015 IFIP/IEEE International Symposium on Integrated Network and Service Management (IM'15).											x					
Kingston University (KU)																
Al-Rokabi, Amina, and Christos Politis. <i>SOAP: A cognitive hybrid routing protocol for Mobile Ad-Hoc Networks</i> . IEEE 9th International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM), 2014.													x			
Lasith Yasakethu, Olayinka Adigun and Christos Politis. Towards a Secure Next Generation PPDR Communication: SALUS Approach. .Ee-Forensics Magazine, Vol.03 No.12, 2014.												x				
University of Patras (UPAT)																
George Charalampopoulos and Tasos Dagiuklas. <i>Performance Evaluation of VANETs with Multiple Car Crashes in Different Traffic Conditions</i> , 7th International Working Conference on Performance & Security Modelling and Evaluation of Cooperative Heterogeneous Networks (HET-NETs), Ilkley, United Kingdom, 2013			x					x								
University of Belgrade (UB)																
Olcan, Dragan I., Aleksandra J. Krneta, and Branko M. Kolundzija. <i>Modeling of human bodies for analysis of wireless body area networks in crowds</i> . Antennas and Propagation Society International Symposium (APSURSI), 2014 IEEE. IEEE, 2014.										x						

2.4 Promotional activities

Aside the scientific and technological publications, the consortium aims to promote the project to the interested stakeholders. The list of presentation and promotional activities is given in Table 3. For each dissemination activity, the table lists its leading beneficiary, a short description, the date, the venue and the targeted audience.

Table 3 – A list of activities that were used to promote the project.

Beneficiary	Activity	Date	Venue	Audience
ROH, AW, CAS, PSCE, ALU-I	Project presentation at Critical Communications Broadband Group	8. 10. 2013,	CCBG plenary meeting, London, United Kingdom	End-users, industry
PSCE	Project presentation Public Safety Communication Europe	30. 10. 2013	PSCE annual conference, Bucharest, Romania	End-users, industry
AW	Project promotion in a RadioResource magazine	17. 1. 2014	Online magazine targeted at mission-critical communications	End-users, industry
FIGO	Project promotion at "Dag van de veiligheidsregio" (<i>Safety region's day</i>)	30. 1. 2014	"Dag van de veiligheidsregio", Evoluon, Eindhoven, Netherlands	End-users, government, industry
ROH	Project promotion as part of winning the TETRA Award for "SETAR Critical Voice and Data on LTE" in the category "Best integration of future broadband with TETRA"	21. 2. 2014	TETRA Awards, London	End-users, Industry, Public
UBITEL	Project promotion	22. 4. 2014	The 15th conference of the Open Innovations Association FRUCT, St Petersburg, Russia	Research, industry
ROH	Project promotion	20. 5. 2014	Critical Communications World 2015 in Singapore	End-users, industry
ESC	Project presentation for Public safety researchers	3. 6. 2014	Annual public safety researcher meeting at ESC	Research, end-user, industry
IT, CAS, AW, PSCE	Project promotion and circulation of questionnaire on the needed capabilities/functionalities for the future PPDR communications	26. 6. 2014	PSCE+TCCA Workshop on Future of Mobile Communications 2020+	End-users, government, industry
UBITEL	Project promotion	27. 8. 2014	The 14th International Conference on Next Generation Wired/Wireless Advanced Networks and Systems NEW2AN 2014, St Petersburg, Russia	End-users, industry
IT	Project promotion	23. 9. 2014	ETSI meeting RRS4#16, Mainz, Germany	Regulators, Industry
CAS	Project promotion	1. 10. 2014	Salon des Pompiers, Avignon, France	End-users
UBITEL	Project promotion	6. 10. 2014	The 6th International Congress on Ultra Modern Telecommunications and Control Systems ICUMT, St Petersburg, Russia	Industry
FIGO	Promotion of results related to	9. 10. 2014	Mobile Healthcare, Zeist,	End-users, industry

Beneficiary	Activity	Date	Venue	Audience
	healthcare professionals		Netherlands	
CAS	Project promotion	25. 11. 2014	PMR Expo 2014, Cologne, Germany	End-users, industry
IT, PSCE, CAS, ALU-I	Project promotion and presentation of future trends and demands for PPDR	26. 11. 2014	PSCE conference, Paris	End-user, industry
UL	Project promotion	7. 12. 2014	University Medical Centre Ljubljana	End-users

2.5 The First SALUS Conference

In order to present the results of the SALUS project to the interested stakeholders and to interact with them, the project is set to organize two conferences. The SALUS conferences thus represent an additional dissemination channel by which the project is actively promoted. This section provides a report on the first conference.

2.5.1 Overview

The SALUS conference in Paris, France, was held on November 26th 2014 at the premises of CISCO and was attended by 63 participants including both SALUS project partners and those from outside the SALUS consortium.

The preparation of the conference started in June 2014 and PSCE coordinated the organization process, in close cooperation with the SALUS project coordinator to define the agenda, find and agree on speakers and allocate the tasks.

In organizing the conference, a shortlist of key stakeholders was identified. The invited speakers were as follows (in no specific order):

- Aleš Brabinek, DG Connect, European Commission
- Andrea Lorelli, ETSI
- Dimitris Kanakidis, Project PPDR-TC
- Jeppe Jepsen, Motorola Solutions
- Jérôme Brouet, Alcatel Lucent
- Manfred Blaha, PSCE
- Philippe Devos, Airbus

The promotion of the workshop was done through various media. First, a separate subpage under the SALUS website was created to inform users about the conference and updates. Second, social media and targeted e-mails were used to invite key stakeholders to the workshop.

Figure 1 below shows the e-mail invite sent via *iContact* to a wide network of PSCE contacts. Figure 2 shows the most recent announcements regarding the workshop on the SALUS Facebook page.

As a result of the promotional efforts, 67 potential participants registered online for the conference. Out of the 67 registrations, 63 participated in the workshop. This has been noted as a good turnout for the conference.

In general, a good balance of distribution among stakeholders was achieved between industry, users and researchers. Table 4 shows a breakdown of participants based on their sector.



Forum for Public Safety Communication Europe

Security and interoperability in next generation PPDR communication infrastructures

We would like to invite you to the SALUS 1st Conference which will be held in Paris on November 26, 2014. The Conference will present the industry and standards body vision on end-user needs towards future PPDR systems, including roadmaps for LTE, TETRAPOL and TETRA technologies. For the full program details and registration please follow this [link](#).

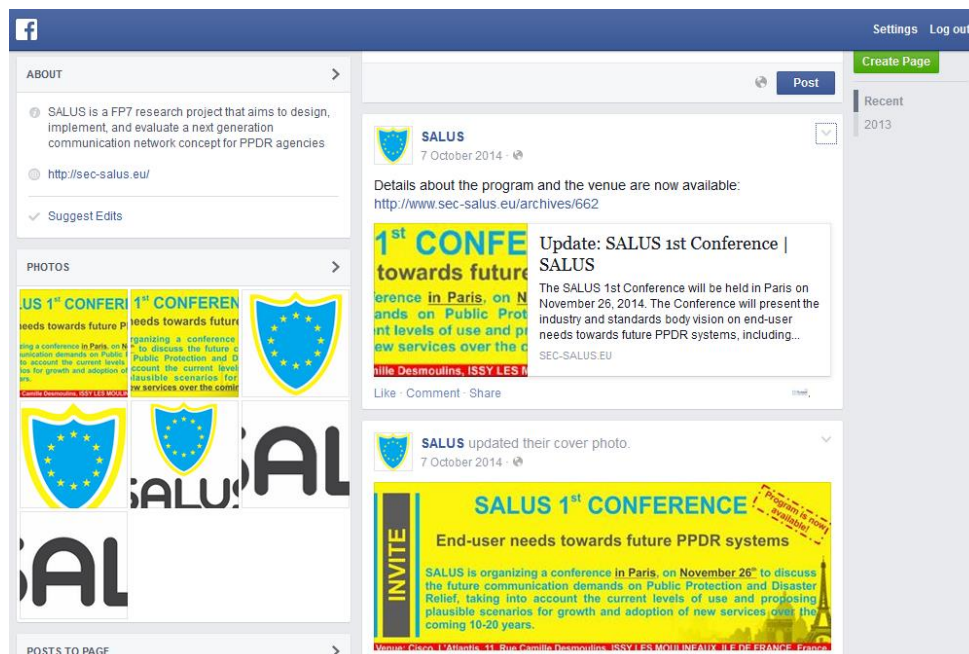
Conference details

- Name: SALUS 1st Conference (co-located with the PSCE Conference);
- Date: 26th November (afternoon);
- Venue: Cisco, L'Atlantis, 11, Rue Camille Desmoulins, ISSY LES MOULINEAUX, ILE DE FRANCE, France;
- Cost: Free (please note, however, that participation on PSCE conference 25/26 (morning) is subject to a fee, see details on the registration form);
- Registration: available [here](#). Please fill it in and send it to adm@psc-europe.eu;
- Program: available [here](#).

Accommodation

Participants are suggested to book their hotel room as soon as possible. Some

Figure 1 – Invitations sent via iContact



The screenshot shows the SALUS Facebook page interface. The left sidebar contains the 'ABOUT' section, which states: 'SALUS is a FP7 research project that aims to design, implement, and evaluate a next generation communication network concept for PPDR agencies' and provides the URL 'http://sec-salus.eu/'. Below this is the 'PHOTOS' section, displaying several images related to the conference, including the SALUS logo and a banner for the '1st CONFERENCE towards future PPDR systems'. The main content area shows two posts from October 7, 2014. The first post is titled 'Update: SALUS 1st Conference | SALUS' and provides details about the conference in Paris on November 26, 2014, including the venue (Cisco, L'Atlantis) and the topics to be discussed (end-user needs, future PPDR systems, roadmaps for LTE, TETRAPOL, and TETRA). The second post is titled 'SALUS updated their cover photo.' and shows a new cover photo for the SALUS page, which is a yellow banner with the text 'SALUS 1st CONFERENCE End-user needs towards future PPDR systems' and an 'INVITE' button.

Figure 2 – Latest posts on the SALUS Facebook page regarding SALUS 1st Conference

Table 4 – Number of participants at SALUS 1st Conference based on sector

Sector	#
Industry	32
Users	8
Research	21
Organization	2
Total	63

2.5.2 Schedule and sessions

The final agenda of the conference is available in the Annex 1. In preparing the agenda, a conscious decision was made not to focus on presenting the work packages of the project and their deliverables, but instead to structure the event in such a way that participants would be able to learn and contribute to current hot topics for PPDR organisations. Therefore, each presentation explained, for example, why TETRA or TETRAPOL technologies still offer viable solutions and what the new formalities to be deployed are, when they could become operational and how it could affect work with LTE.

The workshop was opened by SALUS project coordinator Hugo Marques, who gave a brief introduction to the SALUS project and the agenda of the conference. The scenarios and use cases of SALUS were observed in some detail, as were the end goals of the project.

The first presentation was delivered by Manfred Blaha (PSCE). He focused on the PPDR requirements for crisis and disaster management. He emphasized that voice communications for PPDR are currently running fine, but more data is necessary to improve communications tools. In the modern world everything depends on data. The right data must come at the right time and be available at the right place. The speaker also highlighted the need for a harmonized and dedicated spectrum for PPDR.

The next presentation was given by Philippe Devos (Airbus). The topic of his speech was the activities of the WG System Architecture from the Critical Communication Broadband Group (CCBG). The TETRA & Critical Communications Association (TCCA) WG System Architecture from Critical Communication Broadband Group analyses spectrum, current requirements, system architecture, as well as strategic cases. The WG has frequently met the user representatives to discuss the future of communications. As such, the WG acts as a forum between industries and users to provide inputs for 3GPP and ETSI Standardisation groups.

Dimitris Kanakidis (Project PPDR-TC) was next to take the floor. He elaborated on a possible roadmap for the future of PPDR communication systems and introduced the PPDR-TC (Public Protection and Disaster Relief – Transformation Center) project. The project aims to define PPDR reference usage scenarios and identify service requirements and future needs in the European context. It will seek to gather data on European PPDR facts and figures and develop validation tools for future PPDR. The end goal of the project is to provide a road map towards full satisfaction of future PPDR requirements and to develop recommendations for PPDR standards for decision-makers.

The following speaker was Jérôme Brouet (Alcatel-Lucent). His presentation highlighted the role of LTE in future PPDR systems. An important positive aspect of LTE is the speed at which information can be transmitted. While it can take TETRA technologies up to fourteen minutes to transmit a high resolution picture, LTE can do the same job in not more than two seconds. According to the speaker, LTE can lead to improved operational effectiveness and safety for citizens and for PPDR users.

During the conference Philippe Devos (Airbus) delivered two presentations. His second speech focused on the future of TETRAPOL. His key point was that, with the modernization of current networks, TETRAPOL is evolving toward a common PMR Broadband Standard. The modernization and evolution of current technologies will bring benefits both in the short-term and long-term.

Jeppe Jepsen (Motorola Solutions) took the floor next to discuss the future of TETRA or TETRA-enhanced services. One of the largest problems in public safety today is that, even though all public safety organisations rely on private mobile radio for critical voice communications and believe that data is mission critical, when this data is most necessary, it is oftentimes not available. The speaker suggested that, in order to be prepared for future communication challenges, TETRA and LTE technologies should be unified into a single service.

Next, Andrea Lorelli (ETSI) delivered a presentation on the synergies between PPDR/civil PMR, military and commercial domains. This is the focus of the ETSI Technical Committee, which works on defining use cases, requirements, architectures and interfaces for exploiting synergies among commercial, civil security and military domains.

The final presentation of the SALUS conference was delivered by Aleš Brabinek (European Commission, DG CONNECT). He presented the results of the European Commission's study on the use of commercial mobile networks and equipment for "mission-critical" high-speed broadband communications in the sectors of PPDR, Transport and Utilities. The goal of the study was to explore the potential role that commercial MNO networks could play in ensuring the provision of "mission-critical" high-speed broadband communications in the sectors of PPDR, transport and utilities in Europe. The study found that European society depends a lot on mission-critical services and that these services in turn require wireless broadband support, which is also the most required by PPDR services.

2.5.3 After the conference

Following the successful conference, all presentations were uploaded to the SALUS website (Figure 3). Both PSCE and the project website were updated with relevant news items about the success of the conference. Messages were also posted on social media channels. New contacts gained during the conference will be added to the contact list in order to ensure continuous interactive dialogue in further stages of the SALUS project.

First SALUS conference

The First Conference of the SALUS project was held on 26th November in Paris, France, as part of the autumn conference of Public Safety Communications Europe (PSCE).

Entitled "End-User Needs Towards Future PPDR Systems", the SALUS Conference discussed in length the future communication demands from the public protection and disaster relief sector in order to achieve their missions. The aims and purpose of SALUS project was presented at the beginning of the Conference by SALUS project coordinator Hugo Marques. Subsequently, a series of speakers took the floor to present various roadmaps for the future of PPDR communications presenting the potential role of LTE and the evolution of TETRAPOL and TETRA technologies. Due to a wide range of participants, the Conference attendees also gained vital insight into the viewpoints of the industry, standards bodies, researchers and end-users.

The Conference was attended by over 60 people, each of which represented a unique and interesting angle on PPDR communications. The presentation material with the list of speakers is available below.

1. [Project SALUS](#), Hugo MARQUES, SALUS, IT
2. [PPDR's Requirements for crisis and disaster management](#), Manfred BLAHA, PSCE
3. [Activities of the WG System Architecture from the Critical Communications Broadband Group \(TCCA\)](#), Philippe DEVOS, Airbus
4. [Building the Roadmap for future PPDR communication systems evolution](#), Dimitris KANAKIDIS, Project PPDR-TC
5. [Role of LTE in the future PPDR systems](#), Jérôme BROUET, Alcatel Lucent
6. [The future of TETRAPOL or TETRAPOL enhanced services](#), Philippe DEVOS, Airbus
7. [The future of TETRA or TETRA enhanced services](#), Jeppe JEPSEN, Motorola Solutions
8. [Synergies between PPDR/civil PMR, military and commercial domains](#), Andrea LORELLI, ETSI
9. [Results of the Commission Study on the use of commercial mobile networks and equipment for "mission-critical" high-speed broadband communications in the sectors of PPDR, Transport and Utilities](#), Ales BRABINEK, DG Connect, European Commission

Figure 3 – Conference presentations uploaded on the SALUS website

Table 5 provides the list of participants for the 1st SALUS Conference.

Table 5 – List of participants

Last name	First name	Affiliation	Country
AGARD	Philippe	ALCATEL-LUCENT International	France
BABATUNDE	Kassim	HW Communications	UK
BENOIT	Guillaume	EUTELSAT	France
BERIOLI	Mateo	ETSI	Germany
BIVAS	Philippe	CEDRALIS	France
BLAHA	Manfred	Ministry of Interior	Austria
BONNAMOUR	Marie-Christine	PSCE	Belgium
BOUTRY	Philippe	Airbus D&S	France
BOUWERS	Bert	Rohill	The Netherlands
BRABÍNEK	Aleš	EC-DG Connect	Belgium
BROUET	Jérôme	Alcatel-Lucent	France
BROUWER	Frank	Figo	The Netherlands

Last name	First name	Affiliation	Country
CHENARD	Bruno	EC-DG Enterprise & Industry	Belgium
CLAEYS	Laurence	iMinds	Belgium
CORDEIRO	Luis	OneSource	Portugal
DELPRATO	Uberto	IES	Italy
DEVOS	Philippe	Airbus D&S	France
FERRÚS	Ramon	Universitat Politècnica de Catalunya	Spain
FISCHER	Gerhard	Frequentis	Austria
GALIOTOS	Panagiotis	University of Patras	Greece
GAWECKI	Wojtek	ESRI	USA
GOJMERAC	Ivan	AIT	Austria
GUSTAVSEN	Morten	UMS	Norway
HEIJENK	Geert	University of Twente	The Netherlands
HELLAND	Tor	KoKom	Norway
JELENC	David	University of Ljubljana	Slovenia
JEPSEN	Jeppe	Motorola Solutions	Belgium
JUNTTILA	Kari	Emergency Services College	Finland
KÄMPPI	Pasi	Laurea University of Applied Sciences	Finland
KANAKIDIS	Dimitris	Exus	Greece
KOLUNDZIJA	Branko	University of Belgrade	Serbia
LADAS	Alexandros	Kingston University London	UK
LALLET	Arthur	Airbus D&S	France
LEGRAND	Arnaud	Alcatel-Lucent	France
LINKE	Harold	HITEC	Luxembourg
LORELLI	Andrea	ETSI	France
LUND	David	HW Communications	UK
MALAINA	Fidel Liberal	Universidad del País Vasco	Spain
MARCUSSON	Håkan	Civil Contingencies Agency	Sweden
MARQUES	Hugo	Instituto de Telecomunicações	Portugal
MEIJERINK	Bernd	University of Twente	The Netherlands
MEZDREIJA	Zane	PSCE	Belgium
MODŁAWSKA	Joanna	ITTI	Poland
MÜLLER	Wilmuth	Fraunhofer	Germany
MYHRE	Geir	National Police Computing & Material Service	Norway
NEUBAUER	Georg	AIT	Austria
NOWAK	Andrea	AIT	Austria
NYANYO	Andy	Airwave Solutions	UK
PEREIRA	Luis	IT	Portugal

Last name	First name	Affiliation	Country
PERRET	Evelyne	ALCATEL-LUCENT	France
PETROV	Vitaly	UBITEL	Russia
PIEMONT	Philippe	Motorola Solutions	France
PIVOT	Eric	HubOne	France
REINERT	Frank	Fraunhofer	Germany
RIEMER	Gerrit Jan	Adam Opel AG/OnStar	Germany
ROBERTSON	Dave	Inmarsat	UK
SCHWABACH	Helmut	AIT	Austria
SOUSA	Bruno	OneSource	Portugal
TIKANMÄKI	Ilkka	Laurea University of Applied Sciences	Finland
WEERASINGHE	Nuwan	Kingston University London	UK
WICKSON	Peter	Airwave	UK
WILKEN	Rolf-Dieter	German Commission on Civil Protection	Germany

2.6 Project homepage and social media updates

To interface with the public, a homepage and two social media outlets have been set up. These dissemination channels have been described in deliverable D8.1 [2] and this section provides an overview of updates and modifications that have occurred since then.

2.6.1 Homepage

The homepage¹ represents the main interface by which the interested public can obtain information about the SALUS project. The homepage was put on-line on 1st October 2013 (M2) and has since then attracted several thousand visits. Figure 4 shows a screen capture of the homepage.

The structure of the homepage was given in [2] and has not substantially changed since then. However, the following subpages were added:

- Subpage **Events**² that lists the SALUS organized events and points to subpages with additional details for each event entry;
- An example of such detailed entry is the **First SALUS conference**³ subpage that provides information and presentation material from the first SALUS conference;
- Subpage **Liaison activities**⁴ shows information about projects and initiatives with which SALUS liaises;
- As part of the **Project SALUS** section, a subpage **Deliverables**⁵ was added that lists the SALUS deliverables. Once the deliverables have been approved by the European Commission (EC), this subpage will allow visitors to download deliverables whose dissemination level is public.

Aside to above additions, the homepage is regularly updated with project news relevant to the public, such as the news regarding the organization of the First SALUS conference and similar.

¹ <http://sec-salus.eu>

² <http://www.sec-salus.eu/events>

³ <http://www.sec-salus.eu/events/first-salus-conference>

⁴ <http://www.sec-salus.eu/liaison-activities>

⁵ <http://www.sec-salus.eu/salus/deliverables>



SALUS GOAL

Design, implement and evaluate a next generation communication network concept for Public Protection and Disaster Relief (PPDR) agencies, supported by network operators and industry, which will provide security, privacy, seamless mobility, QoS and reliability support for mission-critical PMR voice and broadband data services.

First Conference of SALUS Project Successfully Held

Posted on [December 9, 2014](#)

The First Conference of the SALUS project was held on 26th November in Paris, France, as part of the autumn conference of Public Safety Communications Europe (PSCE).

Entitled "End-User Needs Towards Future PPDR Systems", the SALUS Conference discussed in length the future communication demands from the public protection and disaster relief sector in order to achieve their missions. The aims and purpose of SALUS project was presented at the beginning of the Conference by SALUS project coordinator Hugo Marques. Subsequently, a series of speakers took the floor to present various roadmaps for the future of PPDR communications presenting the potential role of LTE and the evolution of TETRAPOL and TETRA technologies. Due to a wide range of participants, the Conference attendees also gained vital insight into the viewpoints of the industry, standards bodies, researchers and end-users.

The Conference was attended by over 60 people, each of which represented a unique and interesting angle on PPDR communications. The list of speakers and the presented material can be obtained [here](#).

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- [Update: SALUS 1st Conference](#)

Archives

- [December 2014](#)
- [November 2014](#)
- [October 2014](#)
- [June 2014](#)
- [May 2014](#)
- [January 2014](#)
- [December 2013](#)

Figure 4 – Screen capture of the SALUS homepage

On average, the homepage attracts a bit over 400 unique visitors per month that generate a bit over 1200 visits. The terms unique visitors and visits correspond to the number of different IP addresses that have accessed the page and the number of times each visitor visited the page (i.e. visitors that have not visited site in the previous 60 minutes). Thus on average, each visitor visits the homepage three times per month. The following figure shows the number of unique visitors and visits from 1st October 2013 till the 16th February 2015. (The data for the February 2015 is thus incomplete.)

The peak in both number of unique visitors and visits in July 2014 corresponds to the public announcement of the SALUS conference on the homepage of PSCE homepage⁶.

A more detailed and interactive overview of SALUS homepage visits can be accessed online⁷. However, the statistics dashboard is password protected: use **salusstats** for username and password to log-in and access the dashboard.

⁶ <http://www.psc-europe.eu/index.php?id=426>

⁷ <https://www.sec-salus.eu/awstats/awstats.pl?config=sec-salus.eu>

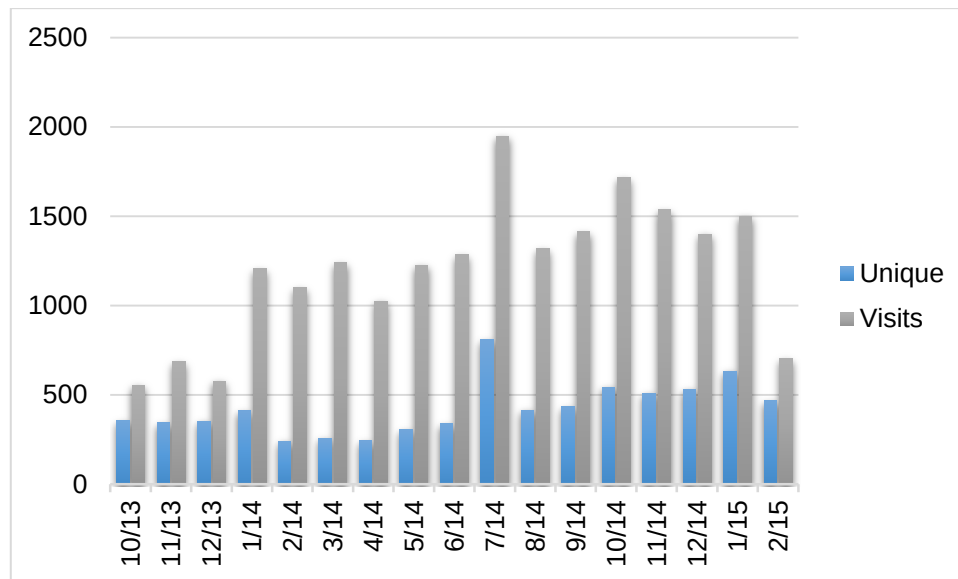


Figure 5 – Homepage visits statistics

2.6.2 Social media accounts

As an extension of the homepage and as means to promote the content of the homepage, two social network accounts have been set up, one on LinkedIn⁸ and the other on Facebook⁹. While the homepage registers a solid number of visits, the social media accounts have not been so successful. At the moment of writing this report, the Facebook page has 37 followers (>likes<), while the LinkedIn group has 27 members.

2.7 End-User Advisory Board meetings

2.7.1 Setting up the End-User Advisory Board

The End-User Advisory Board (E-UAB) is composed of internal members, three being end-users representatives and of external members. Its role is to provide assistance in the project. The duties of the Members of the Advisory Board will mainly include answering questionnaires, providing feedback, reviewing documents and attending yearly board meetings. Their contributions will be focused on some specific work packages dealing with use cases, use case development and requirements, benefits from business cases, use case validation and best practices.

Table 6 – Internal members of the E-UAB

Members	Country	Represents
PSCE (Chair)	Belgium	European Public Safety users
CAS	France	Large Industry, Manufacturer
AW	United Kingdom	Operator
FIGO	Netherlands	The Dutch police
ALU-I	France	Large Industry, Manufacturer
ESC	Finland	End-user, represents public safety agencies in Finland

After a call for interest by PSCE, launched at the end of last year, the following end-users have been appointed as External Members of the Advisory Board:

⁸ <https://www.linkedin.com/groups/SALUS-Security-interoperability-in-next-7429420>

⁹ <https://www.facebook.com/sec.salus.eu>

- Mr. Constantin-Lucian Baicu, head of PMR department, Radio Division, Special Telecommunications Service in Romania;
- Mr. Geir Myhre, senior engineer at Norwegian Police Shared Services;
- Ms. Kristina Bram, strategist at Swedish Civil Contingencies Agency.

Table 7 – External members of the EU-AB

Members	Country	Represents
Special Telecommunications Service (STS)	Romania	Public agency for special communications operating 112
Swedish Civil Contingencies Agency (MSB)	Sweden	Civil Protection Agency
Police Shared Services	Norway	Police

2.7.2 Meetings of the End-User Advisory Board

The EUAB was internally kicked-off at the Second General Assembly organized in Karlsruhe on January 15, 2014. Its main purpose was to agree on working methods and its first task was to identify possible consultations or required inputs from the EU-AB. It was considered essential to provide a clear picture of the SALUS activities as well as an overview of (planned activities for the first upcoming 12 months. The first contribution of the EU-AB external members concerned the end-user scenario (WP2) and providing answers to the questionnaires for SALUS deliverables D2.3 and D2.4. The three external end-users members were invited to take part to the First SALUS Conference held in Paris on 26th November which was immediately followed by a EUAB meeting. At this occasion, the list of deliverables presented in Table 8, was presented and explained.

Table 8 – List of SALUS deliverables of relevance to the E-UAB

Deliverable		Dissemination level	Delivery date
D2.3	SALUS PPDR use cases – Final	PU	M16 updated
D2.4	User Requirements Definition - Final	PU	M16 updated
D3.2	Enterprise and System Architecture – Intermediate	PU	M21
D3.3	Enterprise and System Architecture - Final	PU	M36
D4.3	Business analysis - Intermediate	PU	M18
D4.4	Inventory of PPDR organizations – Final NOTE: Even though we could not sent this deliverable to the external E-UAB members, their organizations can still be contacted for inventory purposes	Restreint UE	M24
D4.5	Spectrum requirements	PU	M24
D4.6	Business analysis - Final	PU	M27
D4.8	Frequencies allocations proposals	PU	M30
D4.9	TCO and migration roadmap	PU	M30
D6.2	PMR-over-LTE services definition –Intermediate	PU	M16
D6.5	PMR-over-LTE services definition – Final	PU	M28
D7.1	SALUS PPDR platform – Intermediate	PU	M18
D7.2	SALUS use cases validation– Intermediate	PU	M21
D7.3	SALUS PPDR platform – Final	PU	M33
D7.4	SALUS use cases validation – Final	PU	M33

2.8 Liaison activities

The consortium has established liaison activities with four PPDR related entities: the Critical Communications Broadband Group, the Cognitive Radio Standardization Initiative and two EU funded projects: GERYON and PPDR-TC.

2.8.1 Cognitive Radio Standardization Initiative

Cognitive Radio Standardization Initiative (CRS-i) is a “FP7 Coordination and Support action with the main objective to facilitate the exploitation of results from Cognitive Radio and Dynamic Spectrum Access research projects by strengthening their impact on standardization”. SALUS and CRS-I have established a liaison agreement that will exploit the mutual interest in the area of standardization of cognitive radio (CR) and dynamic spectrum access technologies. Both projects will coordinate efforts to contribute in the definition of use cases and potential system requirements, implementation obstacles and regulatory implications related to synergies between civil security and commercial domains.

2.8.2 Critical Communications Broadband Group

Critical Communications Broadband Group (CCBG) is a working group of the TETRA & Critical Communications Association (TCCA) with the main aim to enable all mission-critical and business critical users to access their information systems, intranet and internet at broadband speeds using their professional mobile devices wherever they are and whenever they have the need. This broadband capability should meet the specific needs of the user in the same way that critical voice and narrowband data services are currently delivered by technologies such as TETRA, TETRAPOL, P25 and others. SALUS has established collaboration and cooperation activities with TCCA CCBG towards a fruitful and mutually beneficial collaborative working environment. The scope of this collaboration is the development of critical broadband user requirements, standards and promotion. SALUS partners Airwave, Alcatel-Lucent, Cassidian, and Rohill are active members of CCBG and act as the project liaison interfaces.

2.8.3 Project GERYON

GERYON was a 30 month small-to-medium scale focused research project funded by the European Commission under the 7th Framework programme that ended on May 2014. GERYON proposed an innovative emergency inter-networking system capable of connecting existing first responder communication systems and enabling the integration of next generation mobile networks by defining technology independent standardized interfaces and autonomic configuration and adaptation techniques under the umbrella of IMS. Therefore, GERYON aimed to unify common technical and operational logic of first responder communications networks in a technology independent manner. This unification was able to offload interconnection gateways from duplicated technology dependent details by providing a neutral interconnection interface. The proposed GERYON system intended to ensure seamless operation regardless the access technology and take advantage of coverage and responsiveness of existing PMRs and broadband data services of 4G networks. SALUS representatives from Airwave Solutions and Kingston University participated in the UK GERYON Day on 13 May 2014 at Plymouth University in the UK, and GERYON Project Coordinator attended the SALUS 1st Conference on 26 November 2014 at Paris, France. During the mutual coexistence of the two projects SALUS was able to retrieve the key technological achievements made by GERYON as well as impression for future evolution of PPDR communications.

2.8.4 Project PPDR-TC

Public Protection and Disaster Relief – Transformation Center (PPDR-TC) project is a 30 month small-to-medium scale focused research project funded by the European Commission under the 7th Framework programme that aims to provide the foundation for the evolution of mission critical communications. The project focuses on specifying an interoperable, secure and resilient voice and data communications architecture, tailored specifically for the needs of the PPDR community. PPDR-TC addresses both mission critical and non-mission critical situations in an integrated and uniform way. The goal of the project is to enable ubiquitous secure

communications over dedicated and commercial networks, investigate and propose optimal scenarios to merge commercial broadband infrastructure with current PPDR systems.

Noting the mutual interest in the evolution of PPDR mission-critical communications, the SALUS and PPDR-TC projects have agreed to establish a Liaison Agreement that establishes that some classified information produced by any of the projects when conducting their own activities may be shared. The Project Coordinator from PPDR-TC project was an invited speaker in the SALUS 1st Conference on “End-user needs towards future PPDR systems” that took place in Paris on November 26th, 2014.

2.9 Other dissemination means

This section presents the remaining dissemination means that have not been covered in previous sections.

2.9.1 Press releases

Since the beginning of the project, two press releases have been issued. One¹⁰ just after the project kick-off meeting that took place in Aveiro, Portugal on 20th of September 2013, and the other¹¹ just after the PSCE Conference in Bucharest, Romania on 30th October 2013.

2.9.2 Newsletter

Visitors of the SALUS homepage may subscribe to the SALUS newsletter and periodically receive emails featuring recently published items. This feature, however, has not been fully utilized. So far it contains only 8 subscribers and only one newsletter has been sent out inviting subscribers to register to the first SALUS conference.

2.9.3 Other publications

The Public Safety Communications Europe (PSCE) regularly issues a newsletter that covers EU activities in the field of crisis communications. The developments and progress made in the SALUS project are regularly mentioned in these newsletters.

2.10 Training activities

SALUS consortium shall provide training activities associated with the development and use of the secure SALUS platform. Stakeholders that could be interested in learning about activities associated with the development and use of the secure SALUS platform and that could put this new knowledge into practice will benefit from specific events designed to inform the PPDR operators and users in the selected sectors.

These activities have not taken place yet but are envisaged to happen before the end of the project. Such events for specialists are crucial to guarantee the success of the implementation of knowledge learned throughout the project. The estimated audience shall be between 10 and 20 participants per meeting and a total of approximately 2 seminars will be organized depending on the interest shown by the industry.

In particular, related to SALUS result reporting, ESC will organize an event for public safety authorities, i.e. (emergency/fire/rescue/SAR) authorities in conjunction with final demonstration in Finland at ESC premises.

An additional seminar will be organized by PSCE and/or CAS in other EU member country in conjunction with some other event before end of the project.

¹⁰ <http://www.sec-salus.eu/archives/479>

¹¹ <http://www.sec-salus.eu/archives/499>

2.11 Dissemination plan update

The preliminary version of the dissemination plan was provided in SALUS deliverable D8.1: Dissemination plan [2] on month 4. Since then the project has progressed and some dissemination plans have changed. This section provides an update to the dissemination plan from deliverable D8.1. As with past dissemination activities, this section also presents separate plans for SALUS events, for scientific and technological publications and for promotional activities.

2.11.1 Planned SALUS events

Table 9 shows the planned SALUS events that will take place before the end of the project. Note that the venues and the dates are still tentative.

Table 9 – Planned SALUS events

Event	Date	Venue	Audience
The Second SALUS Conference	June 2016	Finland, Europe	End-users, industry, public
Demonstration of the SALUS platform	June 2016	Finland, Europe	End-users, industry, public
Training activities	Not yet defined	Not yet defined	End-users, industry

2.11.2 Planned promotional activities

Table 10 shows the updated plan for promotional activities.

Table 10 – Planned promotional activities

Beneficiary	Activity	Date	Venue	Audience
IT	SALUS promotion	30 Mar - 3 Apr 2015	ETSI meeting RRS#29+WGs meeting, Aveiro, Portugal	Regulation bodies, industry
IT		1-5 Jun 2015	ETSI meeting RRS#30+WGs meeting, Seoul, Korea – (depending on support)	
IT		7-11 Sep 2015	ETSI meeting RRS#31+WGs meeting, Sophia Antipolis, France	
IT		2-27 Nov 2015	World Radiocommunication Conference 2015, Geneva, Switzerland	Regulation bodies, government and industry
FIGO	SALUS promotion (WP6 results)	5 Mar 2015	TEC4SE congress, Enschede, Netherlands	End-users, government, industry
CAS	SALUS promotion	24-26 Nov 2015	PMRExpo 24th to 26th November 2015 Koelnmesse, Germany	Industry, public safety authorities (police, fire, rescue services) and also public transport, energy industry, energy suppliers, municipal enterprises and industry
UBITEL	SALUS Promotion	6-8 Oct 2015	The 7th International Congress on Ultra-	Industry, academia

			Modern Telecommunications and Control Systems ICUMT, Brno, Czech Republic	
ALU-I, ROH	SALUS Promotion	May 2015	Critical Communication World	End-users, Industry
AW	SALUS promotion	Mar to Nov 2015	17th Annual Critical Communications World 2015 B-APCO 2015 Cambridge Wireless	End-Users Government bodies
ALL / IT	SALUS promotion by means of entry for TETRA Awards in the category "Best integration of future broadband with TETRA"	Feb 2016	TETRA Awards 2016 in London	End-user, Industry, Press
ESC	SALUS promotion	May 2015	PSRG meeting Skopje	End-user, operators (PPDR)
ESC	SALUS result publication event for public safety authorities in Finland	Jun 2016	ESC	End-users

2.11.3 Planned scientific and technological publications

Table 11 shows the updated plan for scientific and technological publications. Like Table 2, it also maps deliverables to expected publications. Similarly, it should be noted that the matrix contains only those deliverables that are planned to describe scientific and technological solutions.

2.11.3.1 Highlighted joint publication: book chapter

In order to disseminate the overall SALUS vision, a book chapter has been proposed and accepted for publication in the first volume of the forthcoming Wiley-ISTE Series on Public Safety Networks (Edited by Daniel Câmara and Navid Nikaein).

This book chapter, co-authored by several SALUS partners (ONE, IT, AW, ALU-I, FhG, PSCE, CAS, ROH, UPAT, KU, UL and UB), is currently under preparation for final submission. It will provide an overview of SALUS vision and technical approach, focusing on the following topics:

- Security aspects linked to emergency communications;
- The Open Safety and Security Architecture Framework;
- Attack risk analysis;
- Use cases definition and evaluation;
- Present state of the art on security for emergency networks and the studied extensions, in the context of the SALUS project.

The joint publication also addresses a limitation of past publications: partners have mainly been publishing in isolation. For the second half of the project, the partners shall aim to produce joint publications and the book chapter provides a good step in this direction, as depicted in Table 11.

Table 11 – Planned scientific and technological publications

Dissemination item	D2.1	D2.2	D2.3	D2.4	D3.1	D3.2	D3.3	D4.1	D4.2	D4.3	D4.4	D4.5	D4.6	D4.7	D4.8	D4.9	D5.1	D5.2	D5.3	D6.1	D6.2	D6.3	D6.4	D6.5	D6.6	D7.1	D7.2	D7.3	D7.4
Instituto de Telecomunicações (IT)																													
An SCI-indexed journal paper, tentative title: Seamless handover on PPDR dual radios – LTE, TETRA and IEEE 802.21																	x	x		x	x								
Fraunhofer (FhG)																													
An Enterprise Architecture of PPDR Organizations						x																							
Methodology and Tooling for Developing Enterprise Architecture of PPDR Organisations					x																								
System Architecture of PPDR Network						x																							
OneSource (ONE)																													
In addition to additional joint papers, with other SALUS partners, ONE intends to prepare at least two additional research papers focused on the SALUS mechanisms for mobile forensics and intrusion detection systems. ONE also intends to publish at least one paper describing the wearable communications platform it is developing for SALUS																	x	x											
University of Ljubljana (UL)																													
An SCI-indexed journal paper, tentative title: Survey of privacy architectures and technologies for PPDR communication networks			x	x		x	x										x	x	x										
A conference paper, tentative title: Generic privacy architecture for PPDR communication networks (in collaboration with WP5 partners)			x	x		x	x											x	x							x		x	
University of Twente (UTWENTE)																													
A conference paper, tentative title: Seamless mobility for multicast flows in IPv6 networks																				x		x				x			
An SCI-indexed journal paper on seamless and secure handovers for multicast traffic in highly resilient IPv6 networks																							x		x			x	
A dissertation on Mobility and security in IPv6-based PPDR networks																				x		x	x		x				
Kingston University (KU)																													
Journal Paper titled: Integrating Peer-to-Peer Functionalities and Routing in Mobile Ad-hoc Networks																						x			x				
IETF Draft titled: ChaMeLeon version 2 (CMLv2): A Multipath Hybrid Routing Protocol																						x			x				
University of Patras (UPAT)																													
An SCI-indexed journal paper, tentative title: Seamless handover on PPDR dual radios – LTE, TETRA and IEEE 802.21																	x	x	x	x	x								

Dissemination item	D2.1	D2.2	D2.3	D2.4	D3.1	D3.2	D3.3	D4.1	D4.2	D4.3	D4.4	D4.5	D4.6	D4.7	D4.8	D4.9	D5.1	D5.2	D5.3	D6.1	D6.2	D6.3	D6.4	D6.5	D6.6	D7.1	D7.2	D7.3	D7.4
Conference Paper, tentative title V2I in Highways: The use of RSUs to enhance service delivery in emergency scenarios. Extension of the paper to SCI-indexed journal	x	x	x	x	x	x	x																			x		x	
Conference Paper, tentative title: Performance Evaluation of secure mobility across heterogeneous networks																	x	x		x	x								
University of Belgrade (UB)																													
Veljovic, J. Miroslav, Olcan, Dragan I., and Branko M. Kolundzija. <i>Full Wave simulation of propagation in human crowds</i> . IEEE Antennas and Propagation Society International Symposium (AP-S/URSI), 2015.																		x											

3 EXPLOITATION

3.1 Exploitation opportunities

SALUS project covers the full techno-economic scope regarding development and deployment of the next generation PPDR networks by focusing on the integration with / migration to 4G (LTE) and Wi-Fi wireless communications developments targeting three critical scenarios 1) city security, 2) disaster recovery, and 3) temporary protection.

SALUS addresses key research challenges that include enterprise architectures, economic and business analysis, and a number of technical aspects, such as QoS, resilience, inter-systems handover (secure, seamless and fast), enhanced security, privacy mechanisms in heterogeneous network infrastructure, multicast broadband PPDR services; and specific items ranging from spectrum availability to body area networks for in-field staff operations support.

The outcome of the project will enhance interoperability in the next generation PPDR networks, promoting modernization and standardization in the EU, encouraging investments in competitive access networks with innovative techno-economic solutions. Indeed, technological and economical aspects are equally important to offer an effective solution for PPDR users in terms of cost of operations and to create as well a sustainable business for PPDR operators and the industry.

Although SALUS project is not a development project, demonstrating some of the advanced mechanisms developed during the project time-frame, using equipment from the industry (and some advances in the standardisation) for both legacy and broadband PPDR access networks and for different scenarios validated by the end-user community will lead to clear exploitation plans from the different partners (new products, new research, ...) and will drive roadmap for the commercial evolution towards future PPDR systems.

3.2 Individual exploitation plans

This section provides the individual exploitation plans for every partner.

3.2.1 Instituto de Telecomunicações (IT)

The knowledge currently being gathered in the scope of SALUS will be exploited by the liaison activities between IT and the top Portuguese Universities, with the potential to contribute/shape curriculums or foster new courses, and also attract new Ph.D. students and PostDocs. IT plans to use the gathered knowledge, including on-going work and the tools currently being developed (security services, VoIP services and QoS applications), in training actions for the industry and involvement in new national and international research challenges. The research team involved in the project is also expected to transfer to the industry, through consultancy actions or other methods, their deep knowledge in design, analysis and implementation techniques envisioned for future PPDR communication systems.

3.2.2 Cassidian (CAS)

CASSIDIAN is an industry with an important customer installed bases. Our mission and objective is to create and provide the best equipment and the best solutions for our customers in a win-win economical attitude.

The results of SALUS project, knowledge, demonstrators, will be considered while analyzing new perspectives with our customers. On a technical perspective, SALUS potential innovations or technical solutions may be useful for our R&D. On the financial way, potentially new Total Cost of Ownership considerations may influence our customer relationship. The contacts established along the project duration with various partners from the industry and the university may also play a role during our future exploitation of SALUS project.

3.2.3 Rohill (ROH)

Rohill considers SALUS as a strategic project to further develop and share our Critical Voice and Data Protocol (CVDP) for PMR-over-LTE applications with other SALUS partners. CVDP is the interim solution for delivering mission-critical voice, text, status, positioning, photo and video over LTE until standards become available. Our vision is to migrate CVDP into a future standards-based solution, while maintaining compatibility with the CVDP open specification in our CVDP Relay and Gateway solution.

3.2.4 Airwave (AW)

Airwave shall exploit the results from SALUS in the following ways:

- In our communications, we will explain/highlight that by participating in SALUS, Airwave is using its public safety knowledge and expertise to influence the direction of public safety communications of the future whilst at the same time working with other industry leaders and academic experts in this vital area of communications.
- Thought leadership discussion innovation: Airwave will by feeding in our customers' requirements and operational scenarios will shape future technology and innovation.
- Airwave will use the work of SALUS in working with academia and research institutions across Europe.

3.2.5 Fraunhofer (FhG)

Within the SALUS project, Fraunhofer increases its current knowledge in the area of communication networks, building up re-usable expertise. Fraunhofer will use the SALUS developed PPDR specific enterprise architecture framework and related tools in further projects in the security domain. This will allow for large scale enterprise application integration efforts and thus enable such projects. Fraunhofer will also use the results of SALUS in research projects on control centres in the security domain.

3.2.6 OneSource (ONE)

The outcome of the SALUS project will allow OneSource to advance its expertise in field of PPDR, allowing it to reinforce its portfolio of consultancy, product development and platform management services for telecommunications providers and the PDDR industry.

OneSource also plans to exploit the SALUS results in application areas outside the specific scope of PPDR, where some of the specific functionalities targeted by the SALUS project will also become valuable. Such application areas include, for instance, corporate communication platforms, specialized workforce management applications and collaborative tools specifically designed for mobile devices.

Specific examples of how OneSource intends to exploit the outcomes of SALUS include:

- Development and commercialization of advanced wearable communications systems for first responders. A partnership has already been established with a company in Ireland for joint development of such a system, targeting live video communications for first responders and other specialized application fields, and the first prototypes are currently under preparation.
- Development and commercialization of solutions integrating biosensors into the previously mentioned wearable communications platform. Negotiations are currently under way with two companies specialized in medical sensors, in order to establish a viable joint business model.

Integration of the security and mobile forensics features to be developed in the SALUS project into other application fields, such as mobile communications in general (e.g. mobile terminals with enhanced security for supporting sensitive enterprise applications).

3.2.7 University of Ljubljana (UL)

University of Ljubljana will exploit the project outcomes by focusing on the following:

- By advancing its research in the area of lightweight security and privacy (sensors and other weak Internet of Things (IoT) devices alike), as well as in the area of mobile devices. The objectives of these are good Ph.D. dissertations and high-quality publications;
- By using the results in further initiatives with SALUS partners in market oriented efforts and research projects in line with SALUS IPR agreement. The aim of these is the transfer of results into practice.

3.2.8 University of Twente (UTWENTE)

University of Twente will use the outcomes of the project to advance its expertise in two main fields, highly resilient IPv6-based mobile networks, and network-based intrusion detection. The outcomes will be used in two different ways. The outcomes of the project will be used for further research works resulting in dissertations, one in each of the two main fields. Further, the results will be used to strengthen the education in Computer Science and Networking (Telematics) at the University of Twente. To this end, new final projects will be issued and supervised, and results from the project will be integrated in courses, most likely in Master courses on Mobile & Wireless Networking and on Network Security.

3.2.9 Kingston University (KU)

Kingston University will use the outcomes of the project to strengthen its research profile with regards to emergency and secured communication. The outcomes of the project will greatly influence and create new research directions for research and PhD candidates. Some academic programmes taught within the faculty relating to communications will also benefit from the outcomes of SALUS project; these will be incorporated as demonstration activities and also reflect in the teaching materials. KU will also utilize the outcomes of SALUS project to improve the performance of its MANET routing protocol and enhance it with security.

3.2.10 University of Patras (UPAT)

UPAT expects to exploit SALUS results to the Greek Civil Protection Agency as well as to the Authorities that are responsible for the Emergency Handling (e.g. Police, Fire brigade). Furthermore, UPAT also foresees to expand its research activities in IP based mobility management. Through its participation at SALUS, UPAT aims to work towards the media independent handover (MIH) security extensions in order to provide confidentiality and integrity of handover signalling and how MIH can be interworked with pre-authentication process and mobility management protocols so that authentication latency is reduced. UPAT foresees to exploit SALUS to IETF WG. UPAT expects to explore SALUS results to its graduate programs at both MSc and PhD level.

3.2.11 Ubitel (UBITEL)

UBITEL will use the outcomes of the project to advance its expertise in localization systems design and integration as well as to the design of next generation security and public safety ICT systems. The results of the project will be used to adjust the company products with respect to the end-users and customer needs as well as existing regulations.

3.2.12 University of Belgrade (UB)

UB will use research throughout the project to advance its codes for electromagnetic simulation, applying them to real-life examples and complex scenarios which are in the focus of SALUS project. The final results will enhance UB expertise in electromagnetic wave propagation in challenging setups, physical layer jamming using strong electromagnetic field, and wireless sensor networks (i.e., wireless body area networks). Indirectly these outcomes will be beneficiary for the spin-off companies which started from UB.

3.2.13 Public Safety Communication Europe Forum (PSCE)

PSCE is a forum gathering experts from end-users, industry and research organizations specialized in public safety communications and communication systems. Therefore, PSCE intends to promote the SALUS approach towards its members and contribute to any further step for the preparation and implementation of next generation PPDR networks. PSCE will relay all the outcomes and potential developments to its members.

3.2.14 Alcatel-Lucent International (ALU-I)

Alcatel-Lucent develops and sells solutions to PPDR organization worldwide. Through the SALUS project and the detailed integration activities of the LTE component with other sub-systems systems and applications, Alcatel-Lucent will gain additional expertise and knowledge that will translate into better prioritization of future public safety related features to be developed in Alcatel-Lucent LTE portfolio and solid guidelines for integration of PPDR specific applications and sub-systems for deployment of future PPDR projects.

Alcatel-Lucent may also showcase (with partner consent) selected applications / sub-system developed within SALUS as part of marketing activities in its government lab.

3.2.15 Emergency Services College (ESC)

ESC has two main activities: First, education and training of all emergency and rescue personnel from first responder/firemen to fire officers in Finland. Education also includes topics on wireless communications for operative field activities including usage on voice and data. Knowledge gained through SALUS activities provides a good basis for explaining future development of communication methods. Second, the ESC research and development services department gains additional ICT knowledge and expertise from SALUS, generating a base for development of usage of new technologies in the ESC communications network.

3.2.16 FIGO (FIGO)

Within the SALUS project, FIGO improves and extends its knowledge and experience in multi-radio communication solutions for PPDR. Within this scope, QoS is one of the main focus area's that can certainly improve the FIGO product line. It is the intention to exploit the SALUS QoS results by integration key improvements into the FIGO products targeting PPDR and other customers in safety and security. It is the intention to further improve the SALUS approach either through co-operational or internal projects along the lines of wireless sensor technology, as integral part of the overall solution.

4 STANDARDIZATION ACTIVITIES

In this section, a brief summary of SALUS standardization activities as well as description of further standardization plans is presented. Within the list of standardization institutions, SALUS is primarily contributing to European Telecommunications Standards Institute (ETSI) due to its key role in forming the shape of next generation PPDR platforms and service.

When compared to the list of other dissemination activities, the list of standardization contributions is shorter. Three reasons contribute to this fact. First, the standardization process normally takes much longer than the dissemination in a form of a research paper or a presentation. Second, academic institutions and the majority of SMEs do not have technical possibilities to actively contribute to the standardization process directly. And third, the work on the project is still ongoing, which means that it is still premature for several solutions to be standardized.

4.1 SALUS effort towards standardization of Cognitive Radio for Public Safety

4.1.1 Scope of the standardization work

On November 2011 the European Commission issued mandate M/512 - "Standardisation Mandate to CEN, CENELEC and ETSI for Reconfigurable Radio Systems" [1]. M/512 includes three main objectives, as depicted in Table 12:

Table 12 – The three main objectives from EC M/512

Objective	Domain	Objective Description
Objective A	Commercial	Targets the deployment and operation of cognitive radio systems (CRSs) including white space devices (WSD) and devices under Licensed Shared Access regime, dependent for their use of radio spectrum on information obtained from geo-location databases (GLDB).
Objective B	Civil Security and Military Applications	Targets the standardization of suitable SDR architecture(s) (SCA-based for the military domain). The ideal situation would be a single architecture fulfilling the requirements of both domains.
Objective C	Commercial, Civil Security and Military Applications	Explores potential areas of synergy among commercial, civil security and military applications

While Objective B is still pending, Objectives A and C have been accepted by ETSI in 2013. SALUS is only focused on Objective C of EC Mandate M/512 which is defined as follows:

Objective C: to explore potential areas of synergy among commercial, civil security and military applications. These include the following:

- Architectures and interfaces for dynamic use of spectrum resources among commercial, civil security and/or military domains for disaster relief. This objective will require collaboration with spectrum regulatory organizations.
- Reconfigurable mobile device architecture for commercial and civil security applications.
- Other potential synergies to be identified.

Three phases are identified by the Objective C of EC Mandate M/512, as depicted in Table 13.

Table 13 – The EC M/512 phases, adapted from [1]

C1	Phase 1 - Feasibility study	This phase will explore potential synergies across the commercial, civil security and military domains in the medium/long term (5-15 years in the future) as described in Objective C.
C2	Phase 2 - Proposal of a Work Programme	This phase involves the development of a comprehensive work programme addressing one or more tasks identified in Objective C. This phase may also include the identification of user requirements and a risk analysis.
C3	Phase 3 - Execution of the Work Programme	Depending on the definition of the work programme from Phase 1, this phase will deliver one or more standardization deliverables related to: a) Definition of the network interfaces and architectures for dynamic use of spectrum resources among commercial, civil security and/or military domains for disaster relief. b) Definition of the architecture and interfaces for reconfigurable mobile devices for commercial and civil security applications. c) Other potential synergies to be identified.

4.1.2 SALUS involvement

SALUS, in liaison with the CRS-i¹² project are currently involved in the preparation of the ETSI Technical Report (ETSI TR 103 217) on Phase 1 – Feasibility Study. SALUS contribution will mainly target suitable business models, extrapolated from SALUS Deliverables 4.3 (Business analysis - Intermediate) and 4.6 (Business analysis - Intermediate) that could potentiate synergies among commercial, civil security and military applications.

Since this initiative is expected to gather feedback from major stakeholders, SALUS and CRS-i have jointly proposed and contributed to the development of the ETSI RRS WG4 *Questionnaire on Exploitation of Inter-Domain Synergies*, see Annex 2.

Within the M1-M18, SALUS has participated in the ETSI RRS WG4 meetings, as depicted in Table 14.

Table 14 – SALUS RRS WG4 meeting attendance

Date	Meeting	Reference	Meeting work item(s)
27-May-2014	RRS4-Phone Call	15459	Contributions on DTR/RRS-04010 (TR 103 217): «Inter-domains synergies»
24-Jun-2014	RRS4#15	15502	Contributions on DTR/RRS-04010 (TR 103 217): «Inter-domains synergies» Liaison Statements with stakeholders (possibly FM49, NATO, EDA, Cassidian/Airbus Space and Defense, Rohde&Schwarz, Selex, Thales, UIC, TC TETRA)
29-Jul-2014	RRS4-Conf Call	15748	Contributions on DTR/RRS-04010 (TR 103 217): «Inter-domains synergies» Analysis of the FM49 document, “On the Future Architecture of Mission Critical Mobile Broadband PPDR Networks” Discussion on the procedures to collect feedback from stakeholders – Questionnaire is proposed.

¹² www.ict-crsi.eu

Date	Meeting	Reference	Meeting work item(s)
15-Sep-2014	RRS4-Conf Call	15749	Contributions on DTR/RRS-04010 (TR 103 217): «Inter-domains synergies» Questionnaire set-up «Exploitation of Inter-Domain Synergies»
23-Sep-2014	RRS4#16	15557	Contributions on DTR/RRS-04010 (TR 103 217): «Inter-domains synergies» PPDR/civil PMR Access to spectrum resources of Commercial and/or Military Systems – use of Filter Bank Multi-Carrier solution Questionnaire discussion and approval «Exploitation of Inter-Domain Synergies»
03/04-Dec-2014	ETSI workshop on Reconfigurable Radio Systems - Status and novel Standards	---	(Amongst others) To discuss about the potentialities of reconfigurable radio systems for the achievement of synergies between commercial, civil security and defence domain.

4.1.3 Roadmap for the next period

SALUS will continue to actively participate in ETSI towards finalizing the TR 103 217 document. Currently, the conclusion of Phase 1, based on the feedback received through the questionnaires, is that the study should wait for the outcome of the ITU World Radiocommunication Conference (WRC) 2015 and then resume the interviews and questionnaires for the feasibility for synergies. If phase 2 is to be then approved, SALUS will contribute to the delivery of a work programme addressing the tasks identified in EC M/512 Objective C. This will include continued collaboration with the CRS-i project and eventually new projects that may share similar goals.

4.2 SALUS effort towards standardization of 3GPP Public Safety features

4.2.1 Scope of Standardization Work

3GPP is defining and specifying since the 3GPP Release 12, specific features to enhance LTE to support Public Safety grade (mission critical) features. The features include:

- Group Communications System Enabler (GCSE): support of massive group communication;
- Proximity Service (ProSe): direct communications between terminals;
- Isolated E-UTRAN operations (IOPS): fallback mode for the base station;
- Mission Critical Push to Talk (MCPTT).

The scope of the 3GPP for these items covers architecture, detailed protocols, and security. While 3GPP Release 12 is being almost finalised, significant works still remains to be done, especially on ProSe, IOPS and MCPTT. This work is starting in the frame of the Release 13 (completion planned for Q1 2016).

Also a new work group (SA6) has recently been created and kick-started early 2015. The objective of this group is to define and maintain technical specification for application layer functional elements and interfaces supporting critical communications.

4.2.2 SALUS involvement

Several members of the SALUS project are regular members of the 3GPP meetings and working groups (SA1, SA2, SA6, RAN, CT, etc) where public safety features are discussed and defined. These groups meet regularly, each 4 to 6 weeks (the calendar can be found on the 3GPP web site).

4.2.3 Roadmap for the next period

Part of the work on security (WP5) and on PMR services over LTE (WP6) could potentially form inputs to the Public Safety 3GPP related features.

4.3 SALUS effort towards standardization of ad-hoc routing protocols

4.3.1 Scope of Standardization Work

The Internet Engineering Task Force (IETF) is a large open international community of network designers, operators, vendors and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any individual who is interested and wants to acquire knowledge on various fields or wants to contribute. The IETF Mission Statement is documented in RFC 3935 [3]. The actual technical work of the IETF is done in working groups. Each working group is organized by topic into several areas, such as routing, security, transport, etc. Most of the work effort is handled via mailing lists. The IETF holds meeting 3 times per year. The specific working group within IETF, which is considered potential recipient for SALUS results, is the IETF Mobile Ad-hoc Network (MANET) working group (WG). The IETF MANET working group (WG) is responsible for standardization of IP routing protocols for both static and dynamic topologies within MANETs. The routing functionality has to consider increased dynamics because of node mobility and other changing network attributes. MANET WG recommends lightweight routing approaches suited for diverse hardware and environments.

In SALUS scenarios, the deployment of MANET is most useful at times when existing communication infrastructures are partially or wholly destroyed. Hence, the routing solutions for the MANET should support hybrid MANET-Mesh infrastructures for communication with other IP based communication system such as those deployed in PPDR situations. The IETF MANET WG aims to develop two standard tracks of routing protocol; proactive and reactive routing protocols and eventually a convergence of the proactive and reactive approaches will be the hybrid routing protocol. The MANET WG will also address requirements and issues in the realm of security in IP routing for the purpose of MANETs as described above. The IAB and IESG are responsible for the management and organization of the standardization process on behalf of the Internet community. Internet-drafts are reviewed and commented upon by interested parties. If popular enough, they are then submitted to the IESG who recommends whether the document can be published as a Request For Comments (RFC). Both the Internet-draft and the RFC are available for review and comments at the IETF internet-draft and RFC directories respectively. The RFC containing a protocol specification may then gain several maturity levels to be considered as an internet standard which is described as a "STD" series RFC. The specifications which are targeted to be internet standards follow the standard track through the maturity levels of an internet "Proposed Standard", "Draft Standard", and "Standard". Even with a status of Internet Standard, the specifications may undergo modifications introduced through experience and new requirements.

4.3.2 SALUS involvement

For the purpose of SALUS, Kingston University intends to submit a multipath hybrid routing protocol called ChaMeLeon version 2 (CMLv2). In this draft, we present the concept of providing routing solutions with multipath routes in consideration. This is an update to our initial hybrid routing protocol ChaMeLeon (CML) [4]. According to the process described above, the proposed mechanism will be documented as recommended in IETF. The document will then be submitted as an internet-draft to the MANET WG where comments and reviews would take place.

4.3.3 Roadmap for the next period

It is planned that this contribution will be done by the next IETF meeting, which is scheduled for March 22-27, 2015 in Dallas, TX, USA.

4.4 SALUS effort towards regulation of spectrum for broadband PPDR

4.4.1 Scope of Standardization Work

Within the European Communications Committee (ECC) of the European Postal and Telecommunications Administrations (CEPT), the FM 49 group is tasked to identify radio spectrum for broadband PPDR applications and deployment in preparation for upcoming ITU World Radiocommunication Conference (WRC) in November 2015. The group started in 2011 and agreed end 2013 to work on two main options for broadband PPDR spectrum in 400-470 MHz range and in 694-790 MHz range. Each option includes a subset of different sub-options for which coexistence studies with services in adjacent bands are being done. The work in this group is mainly driven by regulators and industries but end-users are also key contributors.

4.4.2 SALUS involvement

Several members of the SALUS project are regular members of the FM49 meetings being involved in discussions and contribution for the identification of spectrum for broadband PPDR. This involvement allows to collect information on the status of a key aspect for the SALUS project but also contributes to technical studies.

4.4.3 Roadmap for the next period

Part of the work on spectrum (WP4) could potentially form inputs to FM49. The calendar of the next meeting is the following:

- FM49#19 – 23 and 24 2015 April in Oslo;
- FM49#19bis – 11 May 2015 (Web meeting).

5 CONCLUSION AND NEXT STEPS

This deliverable presents the past, ongoing and planned activities regarding dissemination, exploitation and standardization. The project has been quite active on several fronts: be it publishing scientific or technological papers, actively promoting the project at industrial and end-user events, organizing end-user meetings and conferences, and establishing liaisons with other relevant PPDR entities. In the dissemination part, this deliverable represents an extension of deliverable D8.1 [2].

Similarly, the deliverable has shown that the work in SALUS will be exploited by partners in order to gain economic, scientific, educational and networking gains. While the standardization activities are not as numerous as dissemination activities, the impact of SALUS results is beginning to emerge.

This deliverable represents an intermediate report. The final report on the dissemination, exploitation and standardization activities will be provided in deliverable D8.3: Dissemination, exploitation, standardization – Final on month 36 (August 2016).

6 BIBLIOGRAPHY

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ACRONYMS

ALU-I	Alcatel-Lucent International SAS
AW	Airwave Solutions Ltd
BAPCO	British Association of Public-Safety Communications Officials
CAS	Cassidian SAS
CCBG	Critical Communications Broadband Group
CEPT	European Postal and Telecommunications Administrations
ECC	European Communications Committee
ESC	Pelastusopisto, Emergency Services College
E-UAB	End-Users Advisory Board
FhG	Fraunhofer-Gesellschaft Zur Foerderung der Angewandten Forschung E.V
GA	General Assembly
IT	Instituto de Telecomunicações
ITU	International Telecommunication Union
KU	Kingston University Higher Education Corporation
MIH	Media independent hand-over
ONE	One Source Consultoria Informatica Lda
PMR	Private Mobile Radio
PSCE	Public Safety Communication Europe Forum AISBL
ROH	Rohill Technologies BV
UB	Elektrotehnički Fakultet Univerzitet u Beogradu
UBITEL	Ubitel CO LTD
UL	Univerza v Ljubljani
UPAT	University of Patras
UTWENTE	Universiteit Twente
xAB	Exploitation Advisory Board
TCCA	TETRA & Critical Communications Association
WRC	ITU World Radiocommunication Conference

ANNEX 1 – SALUS 1ST CONFERENCE AGENDA



SECURITY AND INTEROPERABILITY IN NEXT GENERATION PPDR COMMUNICATION INFRASTRUCTURES

SALUS First Conference **“End-User Needs Towards Future PPDR Systems”**

The SALUS 1st Conference was held on November 26, 2014, as part of the autumn conference of Public Safety Communications Europe (PSCE).

Entitled “End-User Needs Towards Future PPDR Systems”, the SALUS Conference discussed in length the future communication demands on public protection and disaster relief. During the Conference, a series of speakers took the floor to present various roadmaps for the future of PPDR communications. The potential role that LTE, TETRAPOL and TETRA technologies could play in the future was also discussed.

The full agenda of the Conference is available below:

Wednesday, 26th November 2014

12:45 – 12:55	Presentation of SALUS <i>Hugo MARQUES</i>
12:55 – 13:15	Presentation of PSCE on user needs <i>Manfred BLAHA, PSCE</i>
13:15 – 13:35	Presentation on the activities of the WG System Architecture from the Critical Communications Broadband Group (TCCA) <i>Philippe DEVOS, Airbus</i>
13:35 – 13:55	Building the Roadmap for future PPDR communication systems evolution <i>Dimitris KANAKIDIS, Project PPDR-TC</i>
13:55 – 14:25	Role of LTE in the future PPDR systems <i>Jérôme BROUET, Alcatel Lucent</i>
14:25 – 14:55	The future of TETRAPOL or TETRAPOL enhanced services <i>Philippe DEVOS, Airbus</i>
14:55 – 15:15	Coffee Break

- 15:15 – 15:45 The future of TETRA or TETRA enhanced services
Jeppe JEPSEN, Motorola Solutions
- 15:45 – 16:15 Synergies between PPDR / civil PMR, military and commercial domains
Andrea LORELLI, ETSI
- 16:15 – 16:45 Results of the Commission Study on the use of commercial mobile
networks and equipment for “mission-critical” high-speed broadband
communications in the sectors of PPDR, Transport and Utilities
Ales BRABINEK, DG Connect, European Commission
- 16:45 – 17:00 Conclusions and closing of the Conference

ANNEX 2 – ETSI RRS QUESTIONNAIRE: EXPLOITATION OF INTER-DOMAIN SYNERGIES



European Telecommunications Standards Institute

ETSI RRS Questionnaire: Exploitation of Inter-Domain Synergies

Contact details of organization answering to this questionnaire
By 28-Nov-2014, please return document to: andrea.lorelli@etsi.org

Organization: _____

Contact Name: _____

Position: _____
(within company)

Address: _____
(street)

(Postal code, city) _____ (Country) _____

E-mail address: _____ Telephone: _____

Key Business related to (please indicate all that apply):

- ☐ Commercial Wireless Broadband
 - ☐ Mobile Network Operator
 - ☐ Infrastructure Manufacturer
 - ☐ Mobile Equipment Manufacturer
 - ☐ Chipset Manufacturer
 - ☐ Other: _____
- ☐ Public Safety Wireless
 - ☐ Mobile Network Operator
 - ☐ Infrastructure Manufacturer
 - ☐ Mobile Equipment Manufacturer
 - ☐ Chipset Manufacturer
 - ☐ Other: _____
- ☐ Military Wireless
 - ☐ Military Organization
 - ☐ Infrastructure Manufacturer
 - ☐ Mobile Equipment Manufacturer
 - ☐ Chipset Manufacturer
 - ☐ Other: _____
- ☐ Regulation Administration
- ☐ Other: _____

Introduction

EC Mandate M/512 [1] was issued to CEN, CENELEC and ETSI with a focus on **Reconfigurable Radio Systems**. It was accepted (Objectives A&C) by ETSI in 2013. While Objective B of the mandate is still pending, the ETSI Reconfigurable Radio Systems (RRS) Technical Body has considerably progressed on developing standards in accordance to Objective A of the mandate. The present Questionnaire addresses Objective C of EC Mandate M/512 which is defined as follows:

Objective C: to explore potential areas of synergy among commercial, civil security and military applications. These include the following:

- Architectures and interfaces for dynamic use of spectrum resources among commercial, civil security and/or military domains for disaster relief. This objective will require collaboration with spectrum regulatory organizations.
- Reconfigurable mobile device architecture for commercial and civil security applications.
- Other potential synergies to be identified.

Furthermore, 3 phases are identified by the mandate:

Within Objective C:

C1) Phase 1- Feasibility study

This phase will explore potential synergies across the commercial, civil security and military domains in the medium/long term (5-15 years in the future) as described in Objective C.

C2) Phase 2 - Proposal of a Work Programme

This phase involves the development of a comprehensive work programme addressing one or more tasks identified in Objective C. This phase may also include the identification of user requirements and a risk analysis.

C3) Phase 3 - Execution of the Work Programme

Depending on the definition of the work programme from Phase 1, this phase will deliver one or more standardization deliverables related to:

- a) Definition of the network interfaces and architectures for dynamic use of spectrum resources among commercial, civil security and/or military domains for disaster relief.
- b) Definition of the architecture and interfaces for reconfigurable mobile devices for commercial and civil security applications.
- c) Other potential synergies to be identified.

ETSI TC RRS is currently preparing the Phase 1 – Feasibility Study report as ETSI TR 103 217.

In order to provide a comprehensive view on the potential for exploiting Inter-Domain Synergies, all major stakeholders are invited to complete this questionnaire and to send it to Mr. Andrea Lorelli (andrea.lorelli@etsi.org) **before 28-Nov-2014**. The outcome will be presented during the ETSI Workshop on Reconfigurable Radio Systems on 3-4-December-2014 in Sophia Antipolis, France and will be included in ETSI TR 103 217.

[1] EC Mandate M/512, available at <http://www.etsi.org/images/files/ECMandates/m512.pdf>

Question 1: Clarity of the scope of EC Mandate M/512, Objective C.

Is the wording of EC Mandate M/512, Objective C clear to your organization? Are the intended processes (including 3 Phases) and the final objectives sufficiently outlined and explained?

- ☐ EC Mandate M/512, Objective C processes and objectives are clear
- ☐ EC Mandate M/512, Objective C processes and objectives are somehow clear
- ☐ EC Mandate M/512, Objective C processes and objectives are unclear

Comments:

Question 2: Exploitation of Synergies – the right way forward ?

In the opinion of your organization, is the exploitation of synergies the right way forward for the future evolution of commercial, public safety and military wireless communications?

- ☐ YES, exploitation of synergies is the right way forward
- ☐ YES, exploitation of synergies for specific cases (e.g., synergies between specific domains, etc.) should be envisaged – in parallel, commercial, public safety and military wireless communication systems should evolve independently. Those specific cases are for example:

- ☐ NO, commercial, public safety and military wireless communication systems should evolve independently
- ☐ NO, instead of exploitation of synergies, another way forward should be taken:

Comments:

Question 3: Timeliness

Does your organization believe that now is the right time to develop a feasibility study and subsequently standards enabling the exploitation of inter-domain synergies?

- ☐ The time is right to develop standards on exploiting synergies
- ☐ It is too early we should wait until
 - ☐ after WRC-15
 - ☐ a specific date: _____
 - ☐ a specific event: _____
 - ☐ a specific evolution of technology is achieved, namely: _____

Comments:

Question 4: Feasibility Challenges

In the opinion of your organization, the main challenges on the exploitation of synergies in terms of

- **technical challenges,**
- **political/regulation challenges and**
- **commercial/business model challenges**

relate to:

- ☐ Main feasibility challenges are technical challenges
 - ☐ Interoperability issues between various systems
 - ☐ Technology is not yet ready, namely : _____
 - ☐ QoS guarantees
 - ☐ Security/Safety challenges
- ☐ Main feasibility challenges are political challenges, namely: _____
- ☐ Main feasibility challenges are regulatory challenges
 - ☐ Regulation framework is not ready
 - ☐ Other: _____
- ☐ Main feasibility challenges are commercial/business model challenges
 - ☐ Business model of exploitation of synergies (e.g., sharing) is unclear
 - ☐ Return on Investment is unclear
 - ☐ Liability issues are unclear
 - ☐ Other: _____

Comments:

Question 5: Key opportunities.

In the opinion of your organization, the key opportunities (technical & commercial) for enabling the exploitation of synergies lay mainly in:

- ☐ Exploitation of synergies among Commercial/Public Safety systems
- ☐ Exploitation of synergies among Commercial/Military systems
- ☐ Exploitation of synergies among Public Safety/Military systems
- ☐ Exploitation of synergies among Commercial/Public Safety/Military systems

Comments:

Question 6: Key challenges.

In the opinion of your organization, the key challenges (technical & commercial) in the exploitation of synergies lay mainly in

- ☐ Exploitation of synergies among Commercial/Public Safety systems
- ☐ Exploitation of synergies among Commercial/Military systems
- ☐ Exploitation of synergies among Public Safety/Military systems
- ☐ Exploitation of synergies among Commercial/Public Safety/Military systems

Comments:

Question 7: Key services/applications.

In the opinion of your organization, which novel key services and applications will be enabled by the exploitation of synergies?

- ☐ Which additional services may be available to Commercial systems by exploiting synergies with Public Safety systems?

- ☐ Which additional services may be available to Commercial systems by exploiting synergies with Military systems?

- ☐ Which additional services may be available to Public Safety systems by exploiting synergies with Commercial systems?

- ☐ Which additional services may be available to Public Safety systems by exploiting synergies with Military systems?

- ☐ Which additional services may be available to Military systems by exploiting synergies with Commercial systems?

- ☐ Which additional services may be available to Military systems by exploiting synergies with Public Safety systems?

Comments:



Question 8: Is your organization planning to contribute?

Is your organization interested in getting involved in the ETSI process of developing standards related to exploitation of synergies?

- ☐ YES
- ☐ It is under discussion
- ☐ NO
- ☐ I do not know

Comments:

Question 9: Further comments ?

Does your organization have any comments on the way forward? Is the current process suitable or should it be changes?

Comments:
