



**Project PHYLAWS (Id 317562)
PHYSical LAYER Wireless Security**

Deliverable D1.9: Standardization planning report

FP7 Collaborative Projects, Networks of Excellence, Coordination and Support Actions in Collaborative Projects, Research for the benefit of Specific Groups (in particular SMEs)

Version V1 - Date 31 / 01 / 2013

Contractual Date of Delivery: January 31, 2013

Actual Date of Delivery: January 31, 2013

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Work Package: WP1

Dissemination level: PU

Version: V1

Abstract: This deliverable provides the plan for the standardization activities of the PHYLAWS project, as anticipated at month 3. It covers the partners' intentions in terms of participation to standardization bodies and to regulatory administrations.

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Executive Summary

Deliverable D1.9 is the first among three reports dedicated to standardization activities of PHYLAWS. It provides the detailed plan for these activities as viewed at a very early stage of the project. The activities here described are:

- Contributions to standardization groups
- Contributions to regulatory actions (ITU, CEPT, etc.)
- Dedicated dissemination towards regulators and frequency administrations

Authors and Document History

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Project Summary

Wireless communications have become a universal way to access information for nearly every human around the world. This domination also presents major risks to society, owing to the widely recognized leaks and unsafe technologies in the current wireless networks. Basically all of the security today relies on bit level cryptographic techniques and associated protocols at various levels of the data processing stack, but these solutions have drawbacks and they are often not sufficiently secure. This difficulty is a major retarder to the progress of the digital society. In the recent years therefore, new approaches have been investigated in order to exploit security opportunities offered by the handling signals operating at the physical layer level. These works have been based on a fundamental analysis of the notion of security in the context of information theory. In a more concrete manner, the potential leaks and possible ways to avoid them have also started to be seriously addressed. The objective of the PHYLAWS project is to elaborate on this knowledge basis in order to develop focused and synthetic ways to benefit from wireless physical layer opportunities in order to enhance the security of wireless communications in an affordable, flexible and efficient manner. Efficient here means simple to implement, requiring easily developed and easily validated algorithms, but it also means techniques that will consume less resources, let that be in terms of energy (especially at the terminal level) and in terms of data consumption overhead (i.e. acting on the overall net spectral efficiency). The project outputs will thus benefit to a variety of existing and future standards for a large set of needs.

This objective will be reached through a suitably sized consortium combining an excellent academic expertise in order to address information theory fundamentals, to design optimal codes, to design furtive signal wave forms and versatile radio access protocols; a major research centre for the development and test of several competing techniques; a SME involvement perfectly aligned with the application targets; and a strong industrial involvement highly motivated by security in wireless networks as a manufacturer, as an end-user and as a provider of wireless communication services. The complementary skills inside the consortium will ensure both innovation and impact towards industrial applications, and they will assess validation of the commercial goals and validation of the society use relevance.

The project will benefit from recommendations and advices by an international Advisory Board, constituted of very high level personalities from governmental bodies, standardization bodies or academia. This Board will be one of the cornerstones of the project, based on the recognition that excellent technical developments and demonstrations will not be enough to ensure their wide spreading. Clearly, the project impact will largely benefit from a proper vision, aided by the AB, in order to penetrate standards and existing systems and ensure support from the major stakeholders.

Ultimately, PHYLAWS will facilitate the penetration of wireless technologies in the personal and professional sphere, by guaranteeing a more efficient safe access to the digital world through the future internet. This achievement will strongly impact the lives of citizens and will very much contribute to trustworthy ICT in the following years.

Administrative and contract references

[PHYLAWS_GA-A] PHYLAWS Grant Agreement, referenced 317562 version date 2012-07-03, part A

[PHYLAWS_GA-WP] PHYLAWS Grant Agreement, referenced 317562 version date 2012-07-03, Work Plan

[PHYLAWS_GA-DOW] PHYLAWS Grant Agreement, referenced 317562 version date 2012-07-03, Description of Work (part B of the Grant Agreement).

[PHYLAWS_D.1.1] PHYLAWS Management plan

Other references

[RAS_WD1.0] Research Project Collaboration in the area of Radio Access and Spectrum - Working document version 1.0. – January 2013, edited by Paulo Marques and Ronald Raulefs

Acronyms and Abbreviations

3GPP	3rd Generation Partnership Project
AB	Advisory Board
CEPT	European Conference of Postal and Telecommunications Administrations
CR	Cognitive Radio
DoW	Description of Work
EC	European Commission
EDA	European Defense Agency
ETSI	European Telecommunications Standards Institute
FP7	7 th Framework Programme
GCF	Global certification Forum
ICT	Information and Communication Technologies
IEEE	Institute of Electrical and Electronics Engineers
IET	Institution of Engineering and Technology
IP	Integrating Project
ISO/IEC	International Organization for Standardization / Information Security Standard
ITU	International Telecommunication Union
LSTI	LTE/SAE trial initiative
NGMN	New Generation of Mobile Network
NoE	Network of Excellence
OMG	Object Management Group
PHYSEC	PHYSical SECurity
PO	Project Officer
QUANT	Quantitative
SDR	Software Defined Radio
SME	Small and Medium Enterprise
STREP	Small and medium-scale focused research project
TBD	To Be Defined
WP	Work Package
WRC	World Radio Conference (2018)
Y1	Year 1
Y2	Year 2
Y3	Year 3

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1 Introduction

This deliverable D1.9 “Standardization planning report” is intended to describe the plan of activities regarding the Standardization activities carried out by the PHYLAWS project over the 36 months of its duration (WP1, task 1.3).

Task 1.3. is organized in relation to the main aspects of these activities:

- Contributions to standardization working groups (IEEE, ETSI).
- Contributions to regulatory actions (ITU, CEPT, etc.).
- Contribution to industrial initiatives (3GPP, LSTI etc.).

Task 1.3 includes dedicated dissemination actions towards regulators and frequency administrations in order to prepare these contributions.

Note that general dissemination activities are not part of this report, being covered by another dedicated tasks (WP.1 Task 1.2, see [PHYLAWS_D.1.1]).

Nevertheless, dissemination will support in some sense standardization activities, by providing written material for presentations of Phylaws intents and outputs, which will be dedicated to standardization bodies, to regulatory administrations, etc.

Note that standardization activities, to be efficient, need to be sustained by project outputs and project results (even partial). Thus standardization activities should grow up along the project duration, and will especially increase at the mid and at the end of the project.

In practice,

- Year 1 should be mainly dedicated to standardization preparation, through contacts, publications, etc.
- Year 2 will be dedicated to active standardization initiatives towards standardizations bodies, regulation administrations and industrial groups.
- Year 3 is expected to finalize Phylaws standardization contributions, and to initiate future standardization actions relevant to security of wireless networks.

2 Aims and processing of standardization activities within PHYLAWS

The key objectives of PHYLAWS include the response to this challenge by considering a large variety of existing and future wireless networks : PHYLAWS focus is on highly efficient security techniques, low overhead then better use of the spectrum resource and power reduction.

It is thus a major objective for the PHYLAWS consortium to contribute to existing and to new standards through the main results that will be achieved along the project, especially

- For partner Celeno company, as designer of secure WiFi components;
- For partner VTT, as a research laboratory that is very close to 3G/4G devices manufacturers;
- For partner TCS, as a European leader of secure communications and as a manufacturer and user of transmission networks.

Some quantitative goals relevant to standardization have been defined in the DoW and are recalled below:

Objective	Indicator	Nature
Standardization dissemination	Number of proposal to standardization groups : ≥ 3	QUANT

Table 1: Standardization performance indicators

The process will be the following:

During the project, and at each stage of it, partners will identify

- results and outputs that may be proposed to standardization bodies
- suitable target standardization bodies for these potential proposals
- results and outputs that may be proposed to regulatory administrations
- suitable target administrations for these potential proposals

A check-up will occur on standardization opportunities at each meeting among partners. In addition, standardization opportunities will be submitted to our advisory board and the task will take benefit from its advices.

From this consolidated action plan, the partners, helped by the coordinator, will introduce and promote their standardization proposals and regulation proposals in suitable target bodies, administrations and industrial groups when opportunities occur.

The standardization report will be upgraded regularly and EC will be informed of these evolutions. In addition (see [PHYLAWS_D.1.1]), revised editions of the standardization report will be provided at month 18 and at month 36.

At the end of the project, the partners will identify

- final results/outputs that could be standardized in the next years after the project's termination,
- final results/outputs that could be included in regulatory contributions,

and partners will report these results and the relevant actions in the final revision of the standardization report D.1.11, delivered at month 36, (see [PHYLAWS_D.1.1]).

3 Concrete actions being prepared

More concretely, significant achievements of the project will be evaluated and contributions will be written towards the committee(s) and groups that are potentially interested in these achievements. The tables hereafter provide the initial identification of targeted bodies and administrations.

3.1 Towards standardization bodies

Acronym	organization	Event Date	Event Place	involved Partners	Remarks
IEEE 802.11	Institute of Electrical and Electronics Engineers WLAN Working groups	TBD 2013 2014 2015	http://www.ieee802.org/11/ Geneva (July), Dallas (Nov) Los Angeles (January)	CEL, + aid of TCS	CEL is well implanted in IEEE std groups for WiFi
WNG SC	Wireless Next Gen Standing Committee Plenary sessions	etc.	Included in 802.11 sessions 4 times a year. Twice a year, limited slots		Suited for initializing proposals to standardization Need preparation, suited for presentation of results.
ISO/IEC	International Organization for Standardization/ Information Security Standard	TBD 2014 2015	http://www.iso.org/iso/fr/home/standards_development/resource_s-for-technical-work/iso_iec_directives_and_iso_supplement.htm	VTT, aid of TCS	VTT will initiate contacts with security community Potential links with computers networks security thanks to Dr Mueller (member of AB)
EDA	European Defense Agency	TBD 2014 2015	Brussels http://www.eda.europa.eu/	TCS	TCS is implied in EDA project Corasma relevant to cognitive radios
ETSI Security cluster	European Telecommunications Standards Institute	TBD 2014 2015	http://www.etsi.org/ http://www.etsi.org/index.php/technologies-clusters/clusters/security	TCS, VTT Aid of CEL	Dr Cadzow is a key member of ETSI for security standardization

Table 2: Main standardization bodies of interest for Phylaws

3.2 Towards regulatory administrations

Acronym	organization	Event Date	Event Place see also http://www.itu.int/en/events/Pages/Calendar-Events.aspx http://www.itu.int/en/ITU-T/focusgroups/Pages/default.aspx http://www.cept.org/ecc/groups-list	involved Partners	Remarks
ITU-T	International Telecommunication Union-Telecommunication Standardization Bureau	TBD 2013 2014 2015	Geneva, yearly or twice a year. FG: Focus Groups SG: Standardization Groups WP13 (Future network) WP17 (security) WP3 (Economic and policy issues)	TCS	Existing FG M2M could be addressed To be explored: proposal of a new FG dedicated to Physsec. Related to WP 17.
IUT-R	International Telecommunication Union-Radiocommunications	TBD 2013 2014 2015	Geneva, yearly or twice a year WP 5D (IMT systems) WP 1B (Spectrum management methodologies and economic strategies) WP 1C (Spectrum Monitoring)	TCS	TCS is regular actor of ITU-R working parties (especially WP 1C) and working groups
CEPT WRC 2015 WRC 2018	European Conference of Postal and Telecommunications Administrations World Radio Conference	TBD 2015	http://www.cept.org/ecc/groups-list FM 22 : Monitoring and Enforcement CPG : Conference Preparatory Groups. During WRC 2015 subject proposal for WRC 2018	TCS	TCS is usually implied in the French preparation of WRCs WRC 2015 subject list is closed WRC 2015 propose subject for WRC 2018.

Table 3: Main regulatory administration of interest for Phylaws

3.3 Towards industrial initiatives

Global Industry Initiatives (i.e. 3GPP, GCF, LSTI) will be monitored such as the following

Acronym	organization	Event Date	Event Place	involved Partners	Remarks
3GPP	3rd Generation Partnership Project	TBD 2014 2015	http://www.3gpp.org	All	GSM upgrades for M2M UMTS/UTRA LTE and LTE-A
WFA	WiFi Alliance	TBD 2014 2015	http://www.wi-fi.org/	CEL and other	Celena point of contact in WFA
NGMN LSTI	New Generation of Mobile Network LTE/SAE trial initiative	TBD 2014 2015	http://www.ngmn.org/news/partnernews/newssingle0/article/lte-sae-trial-initiative-lsti-186.html http://www.3gpp.org/That-s-a-Wrap-LSTI-job-complete	All	Standardization dedicated to LTE and LTE-A
GCF	Global certification Forum	TBD 2014 2015	http://www.globalcertificationforum.org/WebSite/public/home.aspx	All	
OMG	Object Management Group	TBD 2014 2015	http://www.omg.org/	All	Dedicated to SDR, CR, Cloud Computing

Table 4: Main industrial initiatives of interest for Phylaws

Among these industrial initiatives, 3GPP and LTSI and WFA will be particularly monitored :

- 3GPP and LTSI are major industrial initiatives dedicated to LTE and LTE-A, and are thus natural “target” for implantation of Phylaws demonstrated concepts and utilities. VTT and TCS, being partners most involved in WP6 (dedicated to LTE security upgrades), will be the point of contact in 3GPP and LTSI.
- WFA (WiFi Alliance) WFA is a very good entry point into regulatory bodies such as FCC and ETSI, and WFA has a very active Spectrum and Regulatory working group. WiFi certification is the de-facto standard for actual 802.11 implementations. Celeno, being highly involved in WiFi evolutions, will be the point of contact in WFA.

3.4 Within clustering activities

PHYLAWS will address standardization issues at the convergence between physical layer and higher layer aspects. Many other projects and initiatives are concerned by PHYLAWS results more or less closely and standardization efforts may be joined. Likewise, it is important for PHYLAWS to be quite aware of the standardization progress carried out in related projects, dealing with future standards for wireless networks. Clustering is also an excellent way to promote PHYLAWS results easily for standardization.

Therefore, it is considered to take part in liaising and clustering activities, particularly with the most relevant FP7 European projects

- Relevant to the RAS Cluster (Radio Access Spectrum), see [RAS_WD1.0]
- Relevant to the Future internet cluster.

Further clustering/liaising actions towards these projects will be decided in the course of Y1.

4 Conclusion

This document contains the initial views of the consortium on the standardization activities planned over the 3 years of Phylaws' duration. It will be upgraded along the project duration, and an intermediate release (deliverable D.1.10) will be provided at month 18, giving details about already achieved and projected standardization actions, and at the end of the project (deliverable D.1.11 Month 36), which will recover all standardization actions during the project and mention the best opportunities and perspectives for the years following the end of the project.