1st Report on Dissemination, Regulation, Standardization, Exploitation & Training – D6.2

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Abstract

In D6.1 deliverable was presented the strategies of OneFIT project to address dissemination, exploitation and training plans, as well as standardization and regulatory approach. The D6.2 document reports the necessary updates of these strategies and the actions taken by the partners in line with them, as well as the obtained results.

Keywords List

OneFIT, Dissemination, Standardisation, Regulation, Conferences, Papers, Posters, Workshops, Web Site

Executive Summary

OneFIT project aims at developing and validating a vision of opportunistic networks that are managed and coordinated with the infrastructure, by advanced cognitive systems. The OneFIT project will validate the concept of opportunistic networks by showing enhanced wireless service provision and extended access capabilities for the Future Internet, through higher resource utilization, lower costs, and management decisions with a larger "green" footprint.

This document presents the report on OneFIT strategy, plans and activities on dissemination, exploitation and impacting standardization and regulatory bodies. The OneFIT project carries out a wide variety of research activities ranging e.g. from architecture, control channel and algorithm development to the validation of the developed concepts on hardware platforms. Moreover, the major building blocks developed in the project are actively promoted to standardization and regulation forums, to allow the introduction of opportunistic networks with cognitive management systems into the real world systems.

The main dissemination activities identified for the OneFIT project include publications in books, journals and conferences, white papers, demonstrations, presentations at concertation and cluster meetings, training, and participation in standardization and regulation. In particular, European Telecommunications Standards Institute (ETSI) has been identified as the major forum for contributions from the OneFIT project. In addition, active participation in various research forums for presenting the project activities and results is carried out to ensure the visibility and impact of the project activities.

More specifically, during 2011, the OneFIT project participants have intensively worked on publishing the outcomes of the project to the community. The project partners achieved sixteen (16) publications in journals (submitted, accepted or published) such as IEEE Network Magazine, IEEE Communications Magazine, IEEE Vehicular Technology Magazine, International Journal of Network Management, Green Engineering Journal, EURASIP, etc, while also three (3) journal papers are under preparation. OneFIT members presented sixteen (16) papers in conferences as Future Network and Mobile Summit, VTC, MONAMI, WPMC, CogArt 2011, and five (5) papers are currently submitted to conferences such as Future Network and Mobile Summit and ICC 2012. Furthermore, members of the consortium participated with six (6) presentations in two concertation and cluster meetings and presented the OneFIT demonstration in three (3) significant events (Future Network and Mobile Summit 2011, ServiceWave 2011 and Bell Lab Open Days 2011). As far as standardization is concerned, the OneFIT consortium has created a Work Item in ETSI RRS for "Feasibility Study on Control Channels for Cognitive Radio Systems" and is leading this Work Item towards its completion by early 2012. Furthermore, OneFIT partners have joined an initiative (Work Item) in 3GPP which is dedicated to the "proximity-based services" on the basis of device-to-device communications as in the concept of Opportunistic Networks. With respect to regulation, the OneFIT partners have been active in contributing and participating to ITU-R WP5A meetings and promoting control channel related topics in the report tentatively called "Cognitive radio systems [(CRS) applications] in the land mobile service". Moreover, OneFIT partners helped to organize the Workshop on Software Defined Radio and Cognitive Radio standardization at the Joint Research Centre in Ispra, Italy in November 2011 and prepared presentations to the Workshop.

The dissemination activities that promote the work of the OneFIT partners will be continued and reinfonced in the forthcoming months.

Revision History

Revision	Date	Author(s)	Description
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V0.7	7.12.2011	ALUD	Document updated with input from ALUD
V0.8	8.12.2011	UPRC	Document updated with input from UPRC
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Contributors

First Name	Last Name	Affiliation	Email
Seiamak	Vahid	CCSR, UNIS	s.vahid@surrey.ac.uk
Klaus	Moessner	CCSR, UNIS	k.moessner@surrey.ac.uk
Marja	Matinmikko	VTT	marja.matinmikko@vtt.fi
Miia	Mustonen	VTT	miia.mustonen@vtt.fi
Panagiotis	Demestichas	UPRC	pdemest@unipi.gr
Yiouli	Kritikou	UPRC	kritikou@unipi.gr
Kostas	Tsagkaris	UPRC	ktsagk@unipi.gr
Vera	Stavroulaki	UPRC	veras@unipi.gr
Evangelia	Tzifa	UPRC	etzifa@unipi.gr
Nikos	Koutsouris	UPRC	nkouts@unipi.gr
Marios	Logothetis	UPRC	mlogothe@unipi.gr
Andreas	Georgakopoulos	UPRC	andgeorg@unipi.gr
Aimilia	Bantouna	UPRC	abantoun@unipi.gr
Louisa-Magdalene	Papadopoulou	UPRC	lpapadop@unipi.gr
Paul	Bender	BnetzA	paul.Bender@bnetza.de
Jens	Gebert	ALUD	Jens.Gebert@alcatel-lucent.com
Milenko	Tosic	LCI	milenko.tosic@lacitadelleing.com
Marcin	Filo	EIT+	marcin.filo@eitplus.pl
Christian	Mouton	NTUK	Christian.mouton@nectech.fr
Benoit	Lécroart	NTUK	Benoit.lecroart@nectech.fr

Markus	Mueck	IMC	Markus.Dominik.Mueck@intel.com
Andreas	Schmidt	IMC	andreas.schmidt@intel.com
Heli	Sarvanko	VTT	Heli.Sarvanko@vtt.fi
Michel	Bourdellès	TCS	Michel.Bourdelles@thalesgroup.com
Stéphane	Pega	TCS	Stephane.Pega@thalesgroup.com

Table of Acronyms

Acronym	Meaning
3G	3rd Generation
3GPP	3rd Generation Partnership Project
4G	4th Generation
ACM	Association for Computing Machinery
ANDSF	Access Network Discovery and Selection Function
AP	Access Point
ARIB	Association of Radio Industries and Businesses
ATIS	Alliance for Telecommunications Industry Solutions
BnetzA	Bundesnetz agentur
BROADNETS	International ICST Conference on Broadband Communications, Networks, and Systems
BS	Base Station
BWA	Broadband Wireless Access
C4MS	Control Channels for the Cooperation of the Cognitive Management Systems
CA	Consortium Agreement
CAPEX	Capital Expenditure
CCR	Cognitive Control Radio
CCSA	China Communications Standards Association
CEN	European Committee for Standardisation
CENELEC	European Committee for Electrotechnical Standardization
CEPT	European Conference of Postal and Telecommunications Administrations
CMON	Cognitive Systems for Managing the Opportunistic Networks
CN	Cognitive Network
COGCLOUD	Workshop on Cognitive Wireless Cloud Networks
CPC	Cognitive Pilot Channel
CPG	Conference Preparatory Group
CPM	Conference Preparatory Meeting
CR	Cognitive Radio
CRS	Cognitive Radio System
CSCI	Cognitive Management Systems for Coordinating the Infrastructure
DG INFSO	Information Society and Media Directorate General
DSA	Dynamic Spectrum Access
DySPAN	IEEE symposia on Dynamic Spectrum Access Networks

EC	European Commission
ECC	Electronic Communications Committee
EDGE	Enhanced Data Rates for GSM Evolution
ETSI	European Telecommunications Standards Institute
EU	European Union
FA	Functional Architecture
FDD	Frequency Division Duplex
FI	Future Internet
FIA	Future Internet Assembly
FM	Frequency Management
FP	Framework Programme
FuNeMoS	Future Networks and Mobile Summit
GA	General Assembly
Globecom	IEEE Global Communications Conference
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
GW	Gateway
HS	Harmonised Standard
HSDPA	High Speed Downlink Packet Access
ICANN	International Conference on Artificial Neural Networks
ICST	Institute for Computer Sciences, Social Informatics and Telecommunications Engineering
ICT	Information and Communication Technologies
ICC	IEEE International Conference on Communications
IEEE	Institute of Electrical and Electronics Engineers
IET	Institution for Engineering and Technology
IMT	International Mobile Telecommunications
IPR	Intellectual Property Right
ISART	International Symposium on Advanced Radio Technologies
ISWCS	International Symposium on Wireless Communication Systems
ITU	International Telecommunications Union
ITU-D	ITU Development
ITU-R	ITU Radiocommunication
ITU-T	ITU Telecommunication
LAN	Local Area Network
LTE	Long Term Evolution

M2MC	Machine to Machine Communications
MAC	Medium Access Control
MAN	Metropolitan Area Network
MoU	Memorandum of Understanding
NDC	National Documentation Center
NPRM	Notice of Proposed Rule Making
OA&M	Operations, Administration and Maintenance
OJEU	Official Journal of the European Union
ON	Opportunistic network
OP	Organizational Partner
OPEX	Operational Expenditure
PAR	Project Authorization Request
PC	Project Coordinator
PCG	Project Co-ordination Group
PHY	Physical Layer
PIMRC	Personal, Indoor, and Mobile Radio Conference
PMT	Project Management Team
QoS	Quality of Service
QMR	Quarterly Management Report
R&D	Research and Development
RA	Regulatory Affairs
RAN	Radio Access Networks
RAS	Radio Access and Spectrum Management
RAT	Radio Access Technology
RF	Radio Frequency
RRM	Radio Resource Management
RRS	Reconfigurable Radio Systems
RSPG	Radio Spectrum Policy Group
R&TTE	Radio Equipment and Telecommunications Terminal Equipment
SA	Services and System Aspects
SCC	Standards Coordinating Committee
SDR	Software Defined Radio
SDRF	Software Defined Radio Forum
SE	Spectrum Engineering
SG	Study Group

SIG	Special Interest Group
SM	Spectrum Manager
TC	Technical Committee
TCAM	Telecommunications Conformity Assessment and Market surveillance
TDD	Time Division Duplex
TLA	Temporary Licensing Agreement
TM	Technical Manager
TMN	Telecommunication Management Network
TO	Technical Organization
TOC	Table of Contents
TR	Technical Report
TS	Technical Specification
TSG	Technical Specification Groups
TTA	Telecommunications Technology Association
TTC	Telecommunications Technology Committee
UE	User Equipment
UHF	Ultra High Frequency
UMTS	Universal Mobile Telecommunications System
UTRA	UMTS Terrestrial Radio Access
VTC	IEEE Vehicular Technology Conference
WCNC	IEEE Wireless Communications and Networking Conference
WG	Working Group
WiFi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access
WINF	Wireless Innovation Forum
WLAN	Wireless LAN
WP	Workpackage/ Working Party of ITU-R
WPL	Workpackage Leader
WRC	World Radiocommunication Conference
WRAN	Wireless Regional Area Network
WWRF	Wireless World Research Forum

Table of Contents

List of Figures

List of Tables

1. Introduction

The OneFIT project [1] aims at developing and validating a vision of opportunistic networks that are managed and coordinated with the infrastructure, by advanced cognitive systems. The OneFIT project will validate the concept of opportunistic networks by showing enhanced wireless service provision and extended access capabilities for the Future Internet, through higher resource utilization, lower costs, and management decisions with a larger "green" footprint.

Opportunistic networks (ONs) are temporary, localised network segments that are created under certain circumstances. Opportunistic networks are assumed to be governed by the operator and can thus be considered as coordinated extensions of the infrastructure network. The concepts of opportunistic networks with cognitive management systems developed in the OneFIT project are envisaged to be important building blocks for the future wireless telecommunication systems. To realize this, it is important that the developed concepts and results are communicated to various forums in the outside world.

This deliverable describes the dissemination and exploitation activities of the OneFIT project including publications in books, journals and conferences, demonstrations, presentations at concertation and cluster meetings, training, and participation in standardization and regulation during 2011 and also the respective planned activities for 2012.

The various dissemination activities envisaged for the OneFIT project ranging from scientific publications to demonstrations and standardization contributions require partly different approaches, because the target audiences and purposes are different. Thus, in order to make a thorough impact, it is important to plan the activities beforehand and have the appropriate strategy of working, depending on the target forum.

The rest of this deliverable is organized as follows. Chapter 2 presents the OneFIT dissemination status and future plans, as far as journals and books, conferences, concertation and clusters, demonstrations, etc, are concerned. Chapter 3 discusses on the planned and achieved training activities. Chapter 4 and Chapter 5 present the standardisation and regulation activities that took place in 2011 and the plans for 2012, respectively. Chapter 6 presents the exploitation plans of the project. Finally, in Chapter 7 the conclusions are given.

2. OneFIT Dissemination Status & Plans

2.1 Dissemination Activities

The dissemination of OneFIT results to the research and standardization communities is one of the key goals of the consortium. To achieve this, OneFIT partners follow a dissemination strategy which encompasses a number of different means, in order to ensure the highest possible impact. The strategy aims, once any relevant intellectual property rights (IPR) issue is secured, to promote the project results and ensure project awareness within the European information and communication technology (ICT) and the global research community. The OneFIT Dissemination Approach, Reporting and Mechanism have already been presented in D6.1 [2], and are also given in the Annex I (Section 9 of this document).

The following sections describe the planned and performed dissemination activities by the OneFIT partners within 2011.

2.1.1 Journal and Book Contributions

2.1.1.1 Planned

OneFIT is continuously targeting to achieve dissemination activities in journals and magazines of all the main editorial houses, namely IEEE, Association for Computing Machinery (ACM), Elsevier, Springer, and Wiley. Such dissemination activities require time (preparation of first versions of submissions, reception of review comments, preparation of revised versions, final outcome). OneFIT also targets the preparation and contribution of special issues in journals and chapters in books. The journals the OneFIT partners are targeting to, are summarized in the following list:

Annals of Telecommunications (Springer)
Communications Magazine (IEEE)
Computers & Electrical Engineering (Elsevier)
Computer Networks Journal (Elsevier)
Journal of Communications (Institution for Engineering and Technology (IET))
Journal of Green Engineering (River Publishers)
Journal of Network and Systems Management (Springer)
International Journal of Communication Networks and Distributed Systems (Wiley)
International Journal of Digital Multimedia Broadcasting (Hindawi)
International Journal of Network Management (Wiley)
Pervasive and Mobile Computing Journal (Elsevier)
Telematics and Informatics (Elsevier)
Transactions on Communications (IEEE)
Transactions on Systems, Man and Cybernetics – Part C (IEEE)
Vehicular Technology Magazine (IEEE)
Wireless Communications and Mobile Computing Journal (Wiley)
Wireless Personal Communications Journal (Springer)

2.1.1.2 Actions done

OneFIT members have the following submissions to Journals and Books (Table 2-1). More publications are currently under preparation, in order to showcase the research done and the results produced within OneFIT.

Table 2-1: OneFIT Journal papers and Book Chapters Submitted/Accepted

Author(s)	Contribution Title	Journal Name	Date
K.Tsagkaris, M.Logothetis, P.Demestichas	Investigation of the QoS Provision Potentials of the Exploitation of Infrastructure-less Segments by	Ad Hoc & Sensor Wireless Networks (AHWSN), Old City Publishing	Accepted

	Composite Wireless Infrastructures		
Dragan Boskovic, Faramak Vakil, Stanisa Dautovic, Milenko Tosic	Greening of Video Streaming to Mobile Devices by Pervasive Wireless CDN	Journal of Green Engineering, River Publishers	Accepted
K. Tsagkaris, A. Bantouna, P. Demestichas	Self-organizing maps for advanced learning in cognitive radio systems	Computers & Electrical Engineering, Elsevier	Submitted (under second review)
A. Georgakopoulos, K. Tsagkaris, V. Stavroulaki, P. Demestichas	Efficient opportunistic network creation in the context of Future Internet	Future Internet Book 2011, Springer	Accepted
K. Tsagkaris, M. Akezidou, A. Galani, P. Demestichas	Evaluation of signalling loads in cognitive network management architecture	International Journal of Network Management, Wiley	Accepted (available online)
K. Tsagkaris, S. Filin, J. Gebert, M. Mueck, P. Vlacheas, G. Athanasiou, V. Stavroulaki, H. Harada	Autonomics in wireless network management: Advances in standards and further challenges	IEEE Network Magazine	Accepted
M. Logothetis, K. Tsagkaris, P. Demestichas	Application and Mobility Aware Integration of Opportunistic Networks with Wireless Infrastructures	Computers & Electrical Engineering Journal	Submitted
V. Stavroulaki, K. Tsagkaris, M. Logothetis, A. Georgakopoulos, P. Demestichas, J. Gebert, M. Filo	Opportunistic Networks: An approach for exploiting cognitive radio networking technologies in the Future Internet	IEEE Vehicular Technology Magazine	Published
V. Stavroulaki, K. Tsagkaris, P. Demestichas, J. Gebert, M. Mueck, A. Schmidt, R. Ferrús, O. Sallent, M. Filo, C. Mouton, L. Rakotoharison	Cognitive Control Channels: From concept to identification of implementation options	IEEE Communications Magazine, Network & Service Management Series	Accepted (Under revision)
K. Tsagkaris, G. Athanasiou, M. Logothetis, Y. Kritikou, D. Karvounas, P. Demestichas	Introducing Energy Awareness in the Cognitive Management of Future Networks	Green Engineering Journal	Accepted
V. Stavroulaki, K. Tsagkaris, M. Logothetis, A. Georgakopoulos, P. Demestichas, J. Gebert, M. Filo	Opportunistic Networks: An approach for exploiting cognitive radio networking technologies in the Future Internet	IEEE Vehicular Technology Magazine	Published
A. Bantouna V. Stavroulaki Y. Kritikou K.Tsagkaris P. Demestichas K. Moessner	An Overview for Learning Mechanisms for Cognitive Systems	EURASIP Journal on Wireless Communications and Networking, Special Issue on “Ten Years of Cognitive Radio: State of the Art and Perspectives"	Accepted for publication
O. Moreno, J. L. González, D. Daroca, A. Lizano, H. López	Vehicle-Pollution Monitoring Testbed Based on Opportunistic Cognitive Networking	IEEE Vehicular Technology Magazine Special issue on Applications of Cognitive Radio Networks	Submitted
D. Karvounas, A. Georgakopoulos,	Resource allocation to femtocells for coordinated capacity expansion of	EURASIP Journal on Wireless Communications and Networking	Submitted

V. Stavroulaki, N. Koutsouris, K. Tsagkaris, P. Demestichas	wireless access infrastructures		
A. Bantouna K. Tsagkaris V. Stavroulaki P. Demestichas	Machine Learning applied to Cognitive Communications	Cognitive Communications: Distributed Artificial Intelligence (DAI), Regulatory Policy & Economics, Implementation. H. Zhang and D. Grace, J. Wiley and Sons.	To be published
A. Bantouna K. Tsagkaris V. Stavroulaki P. Demestichas	Learning Techniques for Context Diagnosis and Prediction in Cognitive Communications	Cognitive Communications: Distributed Artificial Intelligence (DAI), Regulatory Policy & Economics, Implementation. H. Zhang and D. Grace, J. Wiley and Sons.	To be published
A. Georgakopoulos, D. Karvounas, V. Stavroulaki, K. Tsagkaris, M. Tosic, D. Boscovic, P. Demestichas (tentative)	Scheme for Expanding the Capacity of Wireless Access Infrastructures through the Exploitation of Opportunistic Networks (tentative)	Mobile Networks and Applications/ Springer-Verlag	Under preparation
D. Karvounas, A. Georgakopoulos, V. Stavroulaki, N. Koutsouris, K. Tsagkaris, P. Demestichas (tentative)	Resource allocation to femtocells for coordinating capacity expansion of wireless access infrastructures (tentative)	EURASIP Journal on Wireless Communications and Networking (JWCN)	Under preparation
J. Gebert, A. Georgakopoulos, D. Karvounas, V. Stavroulaki, K. Tsagkaris, P. Demestichas (tentative-to be expanded)	Opportunistic Network Management through Cognitive Systems (tentative)	Self-Organization and Green Applications in Cognitive Radio Networks	Under preparation

2.1.2 Conference Contributions (Papers, Presentations, Posters)

2.1.2.1 Planned

The following conferences (Table 2-2) are proposed to be attended either as presenters of an OneFIT paper, or as attendees. Moreover, OneFIT partners will continue identifying important upcoming conferences deadlines for paper submissions (MobiHoc 2013, MobiCom 2013, WPMC 2013, GlobeCom 2013, SECON 2013, etc).

Table 2-2: Forthcoming Conferences of OneFIT Interest

Conference Acronym	Conference Full Name	Paper Submission Date	Conference Date	Location
InfoCom 2013	The 31st Annual IEEE International Conference on Computer Communications	20.07.2012	14-19.04.2013	Turin, Italy
VTC 2013 Spring	2013 IEEE 77th Vehicular Technology Conference	30.09.2012	05. 2013	Dresden, Germany
ICC 2013	The 2013 IEEE International Conference on Communications	16.09.2012	09-13.06.2013	Budapest, Hungary

2.1.2.2 Actions done

The OneFIT partners have already done contributions and have presented their papers to major conferences. More specifically, the OneFIT conference contributions (papers, presentations and posters) that have been made so far are listed in the following table (Table 2-3):

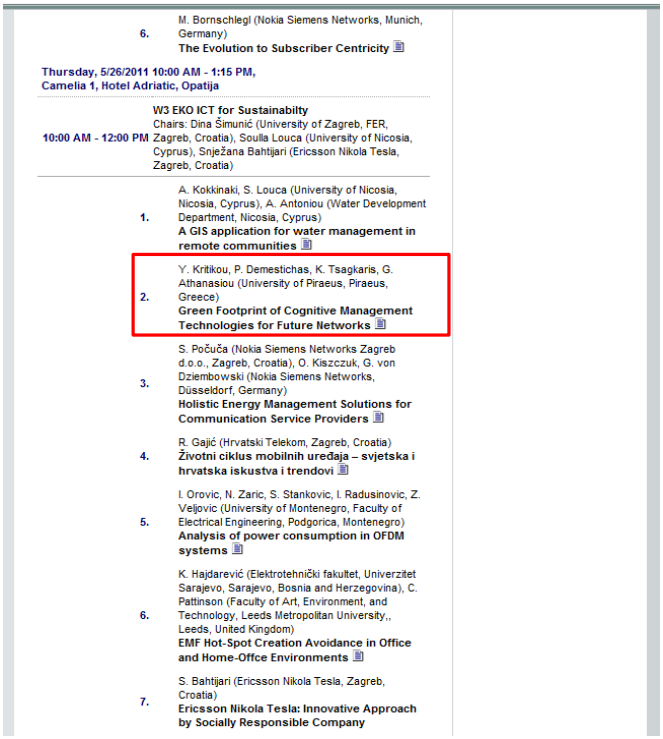
Table 2-3: OneFIT Conference Activities

Author	Presentation Title	Conference Name	Loc.	Date	Ref.
P. Demestichas, K. Tsagkaris, G. Athanasiou, Y. Kritikou	Green Footprint of Cognitive Management Technologies for Future Networks	ECO-ICT FOR ENERGY EFFICIENCY AND SUSTAINABILITY in the context of MIPRO2011	Opatija, Croatia	23-27.05.2011	Paper/ Presentation
A. Georgakopoulos, K. Tsagkaris, V. Stavroulaki, P. Demestichas, K. Moessner, J. Gebert, O. Sallent M. Filo	Opportunistic Networks and Cognitive Management Systems for Efficient Application Provisioning in the Future Internet: An Overview	CrownCom2011	Osaka, Japan	31.05-03.06.2011	Paper/ Presentation
M.Mueck T.Hausstein P.Bender	Digital and Dynamic Certification in the Framework of the novel revised R&TTE Directive in Europe	Crowncom 2011	Osaka, Japan	01-03.06.2011	Paper/Presentation
A. Georgakopoulos, V. Stavroulaki, J. Gebert, O. Moreno, O. Sallent, M. Matinmikko, M. Filo, D. Boskovic, M. Tosic, M. Mueck, C. Mouton	Opportunistic Networks for efficient application provisioning in the Future Internet: Business Scenarios and Technical Challenges	Future Network & Mobile Summit (FNMS) 2011	Warsaw, Poland	15-17.06.2011	Paper/ Poster
A. Georgakopoulos, K. Tsagkaris, V. Stavroulaki, P. Demestichas	Specification and assessment of a fitness function for the creation of opportunistic networks	Future Network & Mobile Summit (FNMS) 2011	Warsaw, Poland	15-17.06.2011	Paper/ Presentation
A. Georgakopoulos, K. Tsagkaris, V. Stavroulaki, P. Demestichas	OneFIT Demonstration Booth	Future Network & Mobile Summit (FNMS) 2011	Warsaw, Poland	15-17.06.2011	Paper/ Presentation
M. Bourdellès, S. Pega	Routing Pattern Selection for opportunistic network management	2011 Wireless Innovation Forum European Conference on Communications Technologies and Software Defined Radio (WinnComm Europe SDR'11)	Brussels, Belgium	22-24.06.2011	Paper/ Presentation
M. Logothetis, K. Tsagkaris, P. Demestichas	Performance evaluation of the suitability of opportunistic networks for the Future Internet	ISCC 2011	Corfu, Greece	28.06-01.07.2011	Paper/ Presentation
J. Gebert, A. Georgakopoulos, V. Stavroulaki, K. Tsagkaris, R. Ferrús, P. Demestichas	Cognitive Control Channels for the Cooperation of Opportunistic and Composite Wireless Networks	EUSIPCO 2011	Barcelona, Spain	29.08-02.09.2011	Paper/ Presentation
M. Logothetis, K. Tsagkaris, P. Demestichas	Performance evaluation of the suitability of Opportunistic Networks in the Wireless World	IEEE 74th Vehicular Technology Conference – VTC2011 Fall	San Francisco, United States	05-08.09.2011	Paper/ Presentation
M. Logothetis, V. Stavroulaki, A. Georgakopoulos, D. Karvounas, N. Koutsouris, K.Tsagkaris, P. Demestichas,	Opportunistic Network Creation Schemes for Capacity Extension in Wireless Access and Backhaul Segments	3rd International ICST Conference on Mobile Networks and Management MONAMI	Aveiro, Portugal	21.-23.09.2011	Paper/ Presentation

M. Tosic, D. Boskovic					
J. Pérez-Romero, O. Sallent, R. Agustí	On the Role of Spectrum Selection to Improve Coverage Extension through Opportunistic Networks	14th International Symposium on Wireless Personal Multimedia Communications (WPMC)	Brest, France	03-06.10.2011	Paper/ Presentation
F. Bouali, O. Sallent, J. Pérez-Romero, R. Agustí	A Framework Based on a Fittingness Factor to Enable Efficient Exploitation of Spectrum Opportunities in Cognitive Radio Networks	14th International Symposium on Wireless Personal Multimedia Communications (WPMC)	Brest, France	03-06.10.2011	Paper/ Presentation This paper received the best student paper award in the conference
H. Sarvanko, M. Mustonen, M. Matinmikko	Modular Decision Flow Approach for Selecting Frequency, Bandwidth and Radio Access Technique for Opportunistic Network	4th International Conference on Cognitive Radio and Advanced Spectrum Management (CogArt 2011)	Barcelona, Spain	26.-29.10.2011	Paper/ Poster
M. Matinmikko, M. Mustonen, T. Rauma, J. Del Ser	Decision-Making System for Obtaining Spectrum Availability Information in Opportunistic Networks	4th International Conference on Cognitive Radio and Advanced Spectrum Management (CogArt 2011)	Barcelona, Spain	26.-29.10.2011	Paper/ Presentation
J. Gebert, A. Georgakopoulos, D. Karvounas, V. Stavroulaki, P. Demestichas	Management of Opportunistic Networks through cognitive functionalities	9th International Conference on Wireless On-demand Network Systems and Services (WONS 2012)	Courmayeur, Italy	09-11.01.2012	Paper/ Presentation

The following figures (Figure 2-1 to Figure 2-10) present screenshots from the events that OneFIT members participated to, highlighting the part of the figure that contains the OneFIT information, accordingly.

ECO-ICT FOR ENERGY EFFICIENCY AND SUSTAINABILITY in the context of MIPRO2011



6. M. Bornschlegl (Nokia Siemens Networks, Munich, Germany)
The Evolution to Subscriber Centricity

Thursday, 5/26/2011 10:00 AM - 1:15 PM,
Camelia 1, Hotel Adriatic, Opatija

W3 EKO ICT for Sustainabilty
10:00 AM - 12:00 PM Chairs: Dina Šimunić (University of Zagreb, FER, Zagreb, Croatia), Soulla Louca (University of Nicosia, Cyprus), Snježana Bahtijari (Ericsson Nikola Tesla, Zagreb, Croatia)

1. A. Kokkinaki, S. Louca (University of Nicosia, Nicosia, Cyprus), A. Antoniou (Water Development Department, Nicosia, Cyprus)
A GIS application for water management in remote communities

2. Y. Kritikou, P. Demestichas, K. Tsagkaris, G. Athanasiou (University of Piraeus, Piraeus, Greece)
Green Footprint of Cognitive Management Technologies for Future Networks

3. S. Počuča (Nokia Siemens Networks Zagreb d.o.o., Zagreb, Croatia), O. Kiszczuk, G. von Dziembowski (Nokia Siemens Networks, Düsseldorf, Germany)
Holistic Energy Management Solutions for Communication Service Providers

4. R. Gajić (Hrvatski Telekom, Zagreb, Croatia)
Životni ciklus mobilnih uređaja – svjetska i hrvatska iskustva i trendovi

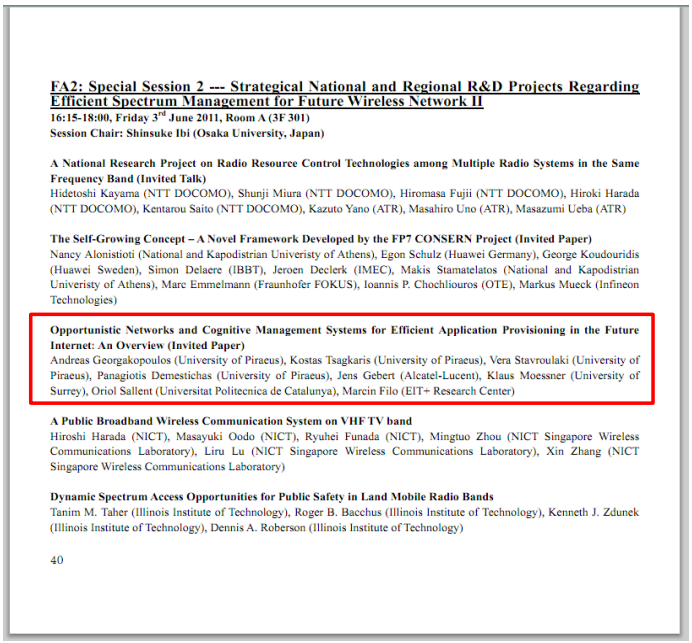
5. I. Orovic, N. Zaric, S. Stankovic, I. Radusinovic, Z. Veljovic (University of Montenegro, Faculty of Electrical Engineering, Podgorica, Montenegro)
Analysis of power consumption in OFDM systems

6. K. Hajdarević (Elektrotehnički fakultet, Univerzitet Sarajevo, Sarajevo, Bosnia and Herzegovina), C. Pattinson (Faculty of Art, Environment, and Technology, Leeds Metropolitan University,, Leeds, United Kingdom)
EMF Hot-Spot Creation Avoidance in Office and Home-Offce Environments

7. S. Bahtijari (Ericsson Nikola Tesla, Zagreb, Croatia)
Ericsson Nikola Tesla: Innovative Approach by Socially Responsible Company

Figure 2-1: OneFIT in ECO-ICT FOR ENERGY EFFICIENCY AND SUSTAINABILITY in the context of MIPRO2011, 23-27 May 2011

CrownCom2011



FA2: Special Session 2 --- Strategical National and Regional R&D Projects Regarding Efficient Spectrum Management for Future Wireless Network II
16:15-18:00, Friday 3rd June 2011, Room A (3F 301)
Session Chair: Shinsuke Ibi (Osaka University, Japan)

A National Research Project on Radio Resource Control Technologies among Multiple Radio Systems in the Same Frequency Band (Invited Talk)
Hidetoshi Kayama (NTT DOCOMO), Shunji Miura (NTT DOCOMO), Hiromasa Fujii (NTT DOCOMO), Hiroki Harada (NTT DOCOMO), Kentarou Saito (NTT DOCOMO), Kazuto Yano (ATR), Masahiro Uno (ATR), Masazumi Ueba (ATR)

The Self-Growing Concept – A Novel Framework Developed by the FP7 CONSERN Project (Invited Paper)
Nancy Alonistioti (National and Kapodistrian Univeristy of Athens), Egon Schulz (Huawei Germany), George Koudouridis (Huawei Sweden), Simon Delaere (IBBT), Jeroen Declerk (IMEC), Makis Stamatelatos (National and Kapodistrian Univeristy of Athens), Marc Emmelmann (Fraunhofer FOKUS), Ioannis P. Chochliouros (OTE), Markus Mueck (Infineon Technologies)

Opportunistic Networks and Cognitive Management Systems for Efficient Application Provisioning in the Future Internet: An Overview (Invited Paper)
Andreas Georgakopoulos (University of Piraeus), Kostas Tsagkaris (University of Piraeus), Vera Stavroulaki (University of Piraeus), Panagiotis Demestichas (University of Piraeus), Jens Gebert (Alcatel-Lucent), Klaus Moessner (University of Surrey), Oriol Sallent (Universitat Politecnica de Catalunya), Marcin Filo (EIT+ Research Center)

A Public Broadband Wireless Communication System on VHF TV band
Hiroshi Harada (NICT), Masayuki Oodo (NICT), Ryuhei Funada (NICT), Mingtuo Zhou (NICT Singapore Wireless Communications Laboratory), Liru Lu (NICT Singapore Wireless Communications Laboratory), Xin Zhang (NICT Singapore Wireless Communications Laboratory)

Dynamic Spectrum Access Opportunities for Public Safety in Land Mobile Radio Bands
Tanim M. Taher (Illinois Institute of Technology), Roger B. Bacchus (Illinois Institute of Technology), Kenneth J. Zdunek (Illinois Institute of Technology), Dennis A. Roberson (Illinois Institute of Technology)

40

Figure 2-2: OneFIT in CrownCom2011, 01-03 June 2011

Future Network and Mobile Summit 2011

09:00 **Session 9d: Call 8 Information Session**
Chair: Andrew Houghton, European Commission, Belgium

10:45
Coffee Break : Coffee Break
11:15

11:15 **Session 10a: Next Generation Architectures**
Chair: Rui Aguiar, Instituto de Telecomunicacoes, Portugal

On the Flexibility of the IEEE 802.11 Technology: Challenges and Directions
Pierluigi Gallo, Università di Palermo, Italy
Specification and Assessment of a Fitness Function for the Creation of Opportunistic Networks
Andreas Georgakopoulos, University of Piraeus Research Center, Greece
FLAVIA: Towards a Generic MAC for 4G Mobile Cellular Networks
Andreas Maeder, NEC Network Laboratories Europe, Germany
IEEE 802.21 and Proxy Mobile IPv6: A Network Controlled Mobility Solution
Fabio Giust, Institute IMDEA Networks, Spain
A Topic-based, Publish-subscribe Architecture for Intermittently Connected 802.15.4 Networks
Nicola Blefari Melazzi, University of Rome Tor Vergata, Italy

11:15 **Workshop 10b: Federation Workshop II – Federation Approaches and Way Forward**
Chair: Antonio Manzalini, Telecom Italia , Italy

UniverSelf – Role and Impact of Autonomics in a Federated Eco-system
Laurent Ciavaglia, Alcatel-Lucent France, France
OneFIT - Control Channels for the Cooperation of Cognitive Management Systems
Marcin Filo, Wroclawskie Centrum Badan EIT+, Poland
ONE - Federation Use Cases
Oscar Gonzalez de Dios, Telefonica I+D, Spain
Panel "Network Federation - Way Forward"

11:15 **Workshop 10c: Technologies for LTE-Advanced: from Theory to Practice II**
Chair: Istvan Zsolt Kovacs, Nokia Siemens Networks, Denmark

Recent Advances in Relaying Technology
Jacek Gora, Nokia Siemens Networks Sp. z o.o., Poland
MU-MIMO in LTE/LTE-A: Performance Analysis
Rizwan Ghaffar, EURECOM, France
Wrap up and Conclusion

13:00
Lunch : Lunch
14:00

14:00 **Plenary Session 11a: Future Internet: Stairway To Heaven?**
Chair: Andrew Houghton, European Commission, Belgium

The vision of Future Internet - ETICS FP7 ICT project
Nicolas Le Sauze, Alcatel-Lucent Bell Labs France, France
The Vision of Future Internet - GEYSERS FP7 ICT project

(a)

16:15

Coffee Break : Coffee Break

16:45

16:45 **Session 4a: EUWB Session**

Chair: Sven Zeisberg, GWT-TUD GmbH, Germany

UWB LDR-LT Platform - An Overview
Manuel PEZZIN, CEA/LETI, MINATEC, France
UWB HDR/VHDR Platform
Kai Dombrowski, TES Electronic Solutions GmbH, Germany
UWB Integrated in Future Mobile Networks
Ana Sierra, Telefónica I+D, Spain
UWB in Daily Life - UWB Application for Public Transport/Cars
Sergio Bovelli, EADS, Germany
UWB in Daily Life - UWB Application in the Home
Pejman HAFEZI, Philips Consumer Lifestyle B.V., Netherlands

16:45 **Session 4b: Emerging PON Solutions**

Chair: Jean-Charles Point, JCP-Consult, France

Evaluation of UHDTV signal transmission in FTTH networks using Next Generation WiMedia UWB
Roberto Llorente, Universidad Politecnica de Valencia, Spain
PROaccess: A Passive-Components-based Reconfigurable WDM-TDM Optical Access Network
Nguyen-Cac Tran, Eindhoven University of Technology, Netherlands
Performance Evaluation of Intensity Modulated and Direct Detected Electrical OFDM signals for Long Reach and Ultra-High Speed Access Networks
Elias Giacoumidis, ATHENS INFORMATION TECHNOLOGY, Greece
Effects of Adaptive Subcarrier Modulation on MAC Operation in OFDMA-PONs
Konstantinos Kanonakis, Athens Information Technology (AIT), Greece
MAC Protocol Design for the Support of DBA in OFDMA-PON Networks
Wansu Lim, University of Hertfordshire, United Kingdom

16:45 **Session 4c: Future Internet - Management**

Chair: Didier Bourse, Alcatel-Lucent, France

Realizing Autonomics for Future Networks
Laurent Ciavaglia, Alcatel-Lucent France, France
Understanding Brain for Future Networks
Antonio Manzalini, Telecom Italia , Italy
Cognitive Management of Procotol Composition Enhanced Future Internet Elements
David Wagner, University of Stuttgart - IKR, Germany
Bootstrapping a Publish/Subscribe Information Centric Network
Christos Tsilopoulos, Athens University of Economics and Business, Greece

16:45 **Poster Session 4d: Future Internet**

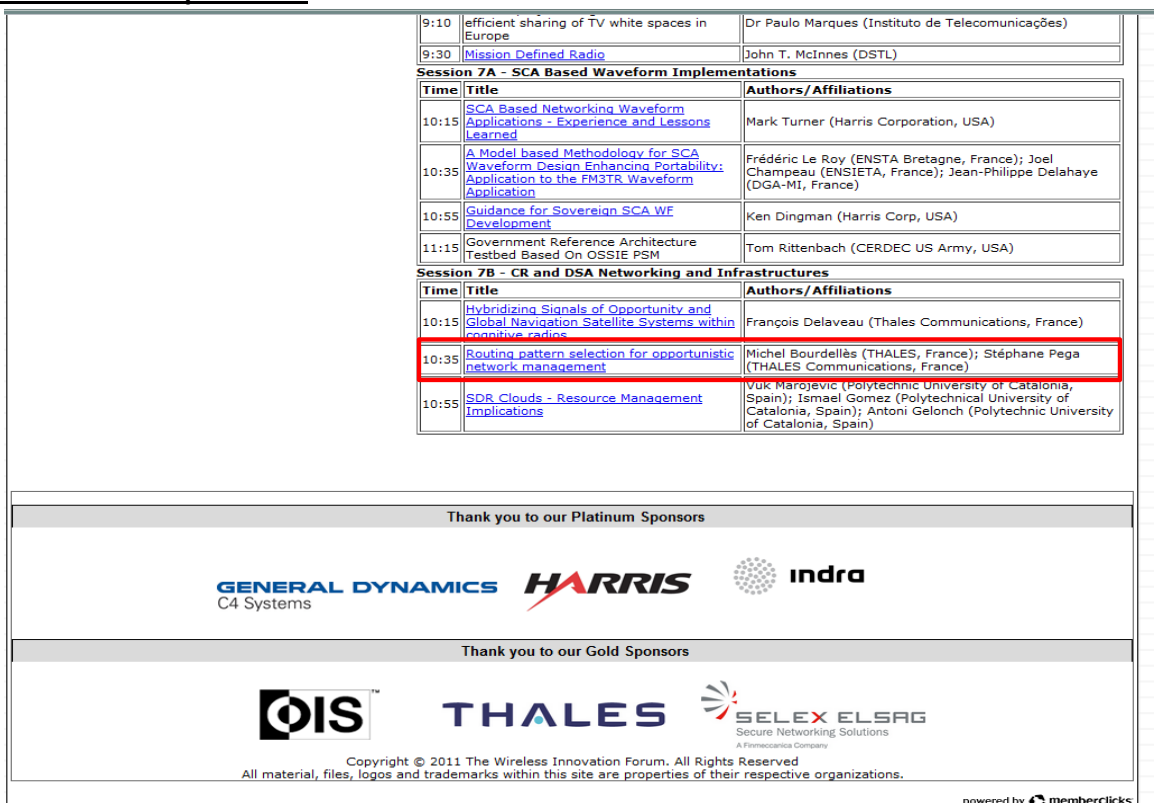
Chair: Slawomir Kuklinski, Warsaw University of Technology, Poland

Opportunistic Networks for Efficient Application Provisioning in the Future Internet: Business Scenarios and Technical Challenges
Panagiotis Demestichas, University of Piraeus Research Center, Greece
Home Network Equipment Virtualization: An Overview on the Architecture Alternatives
Rafael LOPEZ DA SILVA, TELEFÓNICA I+D, Spain
Context Provisioning Middleware with Probabilistic Reasoning Support
Ralf Tönjes, Uni. Appl. Sci. Osnabrück, Germany
A Survey of the Future Internet Business Ecosystems
Laurent Ciavaglia, Alcatel-Lucent France, France

(b)

Figure 2-3: (a), (b) OneFIT in Future Network and Mobile Summit 2011, 15-17.06.2011

WinnComm Europe SDR'11



9:10	efficient sharing of TV white spaces in Europe	Dr Paulo Marques (Instituto de Telecomunicações)
9:30	Mission Defined Radio	John T. McInnes (DSTL)

Session 7A - SCA Based Waveform Implementations

Time	Title	Authors/Affiliations
10:15	SCA Based Networking Waveform Applications - Experience and Lessons Learned	Mark Turner (Harris Corporation, USA)
10:35	A Model based Methodology for SCA Waveform Design Enhancing Portability: Application to the FM3TR Waveform Application	Frédéric Le Roy (ENSTA Bretagne, France); Joel Champeau (ENSIETA, France); Jean-Philippe Delahaye (DGA-MI, France)
10:55	Guidance for Sovereign SCA WF Development	Ken Dingman (Harris Corp, USA)
11:15	Government Reference Architecture Testbed Based On OSSIE PSM	Tom Rittenbach (CERDEC US Army, USA)

Session 7B - CR and DSA Networking and Infrastructures

Time	Title	Authors/Affiliations
10:15	Hybridizing Signals of Opportunity and Global Navigation Satellite Systems within cognitive radios	François Delaveau (Thales Communications, France)
10:35	Routing pattern selection for opportunistic network management	Michel Bourdellès (THALES, France); Stéphane Pega (THALES Communications, France)
10:55	SDR Clouds - Resource Management Implications	Vuk Marojevic (Polytechnic University of Catalonia, Spain); Ismael Gomez (Polytechnical University of Catalonia, Spain); Antoni Gelonch (Polytechnic University of Catalonia, Spain)

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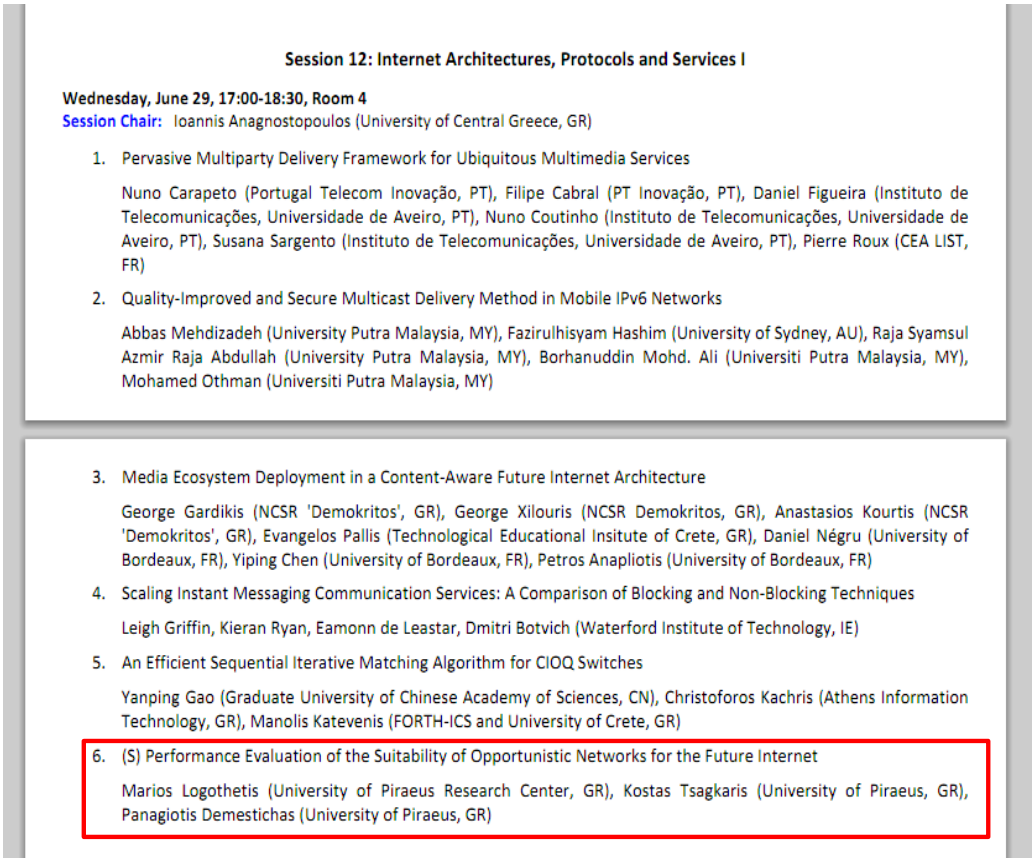
Figure 2-4: OneFIT in WinnComm Europe SDR'11, 22-24 June 2011

ISCC 2011



Session 12: Internet Architectures, Protocols and Services I

Wednesday, June 29, 17:00-18:30, Room 4
Session Chair: Ioannis Anagnostopoulos (University of Central Greece, GR)

1. Pervasive Multiparty Delivery Framework for Ubiquitous Multimedia Services

   Nuno Carapeto (Portugal Telecom Inovação, PT), Filipe Cabral (PT Inovação, PT), Daniel Figueira (Instituto de Telecomunicações, Universidade de Aveiro, PT), Nuno Coutinho (Instituto de Telecomunicações, Universidade de Aveiro, PT), Susana Sargento (Instituto de Telecomunicações, Universidade de Aveiro, PT), Pierre Roux (CEA LIST, FR)

2. Quality-Improved and Secure Multicast Delivery Method in Mobile IPv6 Networks

   Abbas Mehdizadeh (University Putra Malaysia, MY), Fazirulhisyam Hashim (University of Sydney, AU), Raja Syamsul Azmir Raja Abdullah (University Putra Malaysia, MY), Borhanuddin Mohd. Ali (Universiti Putra Malaysia, MY), Mohamed Othman (Universiti Putra Malaysia, MY)

3. Media Ecosystem Deployment in a Content-Aware Future Internet Architecture

   George Gardikis (NCSR 'Demokritos', GR), George Xilouris (NCSR Demokritos, GR), Anastasios Kourtis (NCSR 'Demokritos', GR), Evangelos Pallis (Technological Educational Insitute of Crete, GR), Daniel Négru (University of Bordeaux, FR), Yiping Chen (University of Bordeaux, FR), Petros Anapliotis (University of Bordeaux, FR)

4. Scaling Instant Messaging Communication Services: A Comparison of Blocking and Non-Blocking Techniques

   Leigh Griffin, Kieran Ryan, Eamonn de Leastar, Dmitri Botvich (Waterford Institute of Technology, IE)

5. An Efficient Sequential Iterative Matching Algorithm for CIOQ Switches

   Yanping Gao (Graduate University of Chinese Academy of Sciences, CN), Christoforos Kachris (Athens Information Technology, GR), Manolis Katevenis (FORTH-ICS and University of Crete, GR)

6. (S) Performance Evaluation of the Suitability of Opportunistic Networks for the Future Internet

   Marios Logothetis (University of Piraeus Research Center, GR), Kostas Tsagkaris (University of Piraeus, GR), Panagiotis Demestichas (University of Piraeus, GR)

Figure 2-5: OneFIT in ISCC 2011, 28 June – 01 July 2011

EUSIPCO 2011

SS-17: Special Session on "Secure biometrics"

Room: J
Chairs: Paulo Lobato Correia (Instituto Superior Tecnico - Universidade Tecnica Lisboa & Instituto de Telecomunicacoes, Portugal), Luis Ducla Soares (I.S.C.T.E. / I.T. - Lisbon, Portugal)

16:20 ***Applications of Coding and Information Theory in Biometrics***
Han Vinck (University of Duisburg-Essen, Germany)

16:40 ***Non-Cooperative Iris Recognition: Issues and Trends***
Hugo Proença (University of Beira Interior & IT-Instituto de Telecomunicações, Portugal)

17:00 ***Mixing Fingerprints for Template Security and Privacy***
Arun A. Ross (West Virginia University, USA); Asem Othman (West Virginia University, USA)

17:20 ***Secure Multi-Spectral Hand Recognition System***
Mauricio Ramalho (Instituto de Telecomunicações, Portugal); Sanchit Singh (IT, IST, Portugal); Paulo Lobato Correia (Instituto Superior Tecnico - Universidade Tecnica Lisboa & Instituto de Telecomunicacoes, Portugal); Luis Ducla Soares (I.S.C.T.E. / I.T. - Lisbon, Portugal)

17:40 ***ECG Based Biometric for Doubly Secure Authentication***
Sairul Safie (University of Strathclyde, United Kingdom); John J Soraghan (University of Strathclyde, United Kingdom); Lykourgos Petropoulakis (University of Strathclyde, United Kingdom)

SS-18: Special Session on "Technical enablers and platforms for cognitive radio"

Room: H2
Chair: Faouzi Bader (CTTC & Centre Tecnologic de Telecomunicacions de Catalunya, Spain)

16:20 ***Iterative Signal Processing for Mitigation of Wideband ADC Nonidealities in Cognitive Radio Receiver***
Markus Allén (Tampere University of Technology, Finland); Jaakko Marttila (Tampere University of Technology, Finland); Mikko Valkama (Tampere University of Technology, Finland)

16:40 ***Residual Cognitive Network Interference Due to Primary User Miss-Detection***
He Bo (Shandong University, P.R. China); Andrea Giorgetti (University of Bologna, Italy); Marco Chiani (University of Bologna, Italy)

17:00 ***Cognitive Control Channels for the Cooperation of Opportunistic and Composite Wireless Networks***
Jens Gebert (Alcatel-Lucent Bell Labs, Germany); Andreas Georgakopoulos (University of Piraeus, Greece); Vera Stavroulaki (University of Piraeus, Greece); Kostas Tsagkaris (University of Piraeus, Greece); Ramon Ferrús (Universitat Politècnica de Catalunya, Spain); Panagiotis Demestichas (University of Piraeus, Greece)

17:20 ***Software Architecture Design for a Dynamic Spectrum Allocation-enabled Cognitive Radio Testbed***
Oscar Tonelli (Aalborg University, Denmark); Gilberto Berardinelli (Aalborg University, Denmark); Andrea F. Cattoni (Aalborg University, Denmark); Troels B. Sørensen (Aalborg University, Denmark); Preben Mogensen (Nokia Siemens Networks, Aalborg, Denmark)

17:40 ***Interference Source Localization and Transmit Power Estimation Under Log-Normal Shadowing***
Natalia Miliou (University of Athens, Greece); Aris Moustakas (University of Athens, Greece); Andreas Polydoros (University of Athens, Greece)

Figure 2-6: OneFIT in EUSIPCO 2011, 29 August – 02 September 2011

VTC Fall 2011

8 September 2011 15:50-17:10 Franciscan A

9A: Ad-Hoc and Sensor Networks Applications

1 **North Atlantic Inflight Internet Connectivity via Airborne Mesh Networking**
Daniel Medina, Felix Hoffmann, Francesco Rossetto, German Aerospace Center (DLR); Carl-Herbert Rokitansky, University of Salzburg, Austria

2 **A Hybrid Mesh, Ad Hoc, and Sensor Network for Forest Fire Management**
Ali El Masri, Troyes University of Technology; Ahmad Sardouk, Lyes Khoukhi, Leila Merghem-Boulahia, Dominique Gaiti, UTT; Rana Rahim-Amoud, LaSTRe, Azm research center, Lebanese University

3 **Feasibility of Safety Applications based on Intra-Car Wireless Sensor Networks: A Case Study**
Jiun-Ren Lin, Carnegie Mellon University; Timothy Talty, General Motors Corporation; Ozan Tonguz, Carnegie Mellon University

4 **Performance evaluation of the suitability of Opportunistic Networks in the Wireless World**
Marios Logothetis, Kostas Tsagkaris, Panagiotis Demestichas, University of Piraeus

8 September 2011 15:50-17:10 Golden Gate 2

9D: Indoor and NLOS Positioning

1 **Indoor Positioning Using Femtocells**
Varun Khaitan, Peerapol Tinnakornsrisuphap, Mehmet Yavuz, Qualcomm

2 **Advantage of non-periodic Leaky Coaxial Cable Structures for Indoor Positioning**
Julia-Maria Engelbrecht, Ralf Collmann, University of Applied Sciences, HTW Dresden; Ulrich Birkel, University of Applied Sciences Giessen; Mark Weber, University of Applied Sciences Gießen-Friedberg

3 **Toward the Deployment of an Ultra-Wideband Localization Test Bed**
Alexander Feldman, Haute Ecole dIngenierie et de Gestion du Canton de Vaud; Alexander Bahr, EPFL; James Colli-Vignarelli, EPFL-STI; Stephan Robert, HEIG-VD; Catherine Dehollain, EPFL-STI; Alcherio Martinoli, Ecole Polytechnique Federale de Lausanne

4 **An Improved Reference Selection Method in Linear Least Squares Localization for LOS and NLOS**
ShiXun Wu, Jiping Li, Shouyin Liu, Huazhong Normal University

8 September 2011 15:50-17:10 Golden Gate 3

9E: Equalization and Detection

1 **Analytical Evaluation of Iterative Packet Combining and Multipacket Detection Schemes for SC-FDE**
Francisco Ganhão, Rui Dinis, Luis Bernardo, Universidade Nova de Lisboa

2 **Sparse FIR Equalization: A New Design Framework**
Ahmad Gomaa, Naofal Al-Dhahir, University of Texas at Dallas

3 **Turbo Equalization for Receivers with Unreliable Buffer Memory**
Jan Geldmacher, Klaus Hueske, Jürgen Götze, TU Dortmund University;

4 **A Simplified Hard Decision Feedback Equalizer for Single Carrier Modulation with Cyclic Prefix**
Chao Dong, Jiaru Lin, Kai Niu, Zhiqiang He, Zhisong Bie, Beijing University of Posts and Telecommunications

8 September 2011 15:50-17:10 Golden Gate 4

9F: Vehicular Electronics and Telematics

1 **Automatic Vehicle Parallel Parking Design using Fifth Degree Polynomial Path Planning**
Mehrdad Simkani, University of Michigan-Flint; Mehrdad Zadeh, Kettering University; Shuwen Zhang, University of Michigan-Flint

2 **Implementaion and Evaluation of Data Management Methods for Vehicle Control Systems**
Masahiro Yamada, Nagoya University; Kenya Sato, Doshisha University; Hiroaki Takada, Nagoya University

3 **Real-Time Video-Based Lane Tracing System with the Sliding Focus Window**
Wally Chen, National Taiwan University; Leon Jian, Maction Technologies, Inc; Sy-Yen Kuo, National Taiwan University

4 **Wireless Power Transmission for Autonomous Sensors in Removable Vehicle Seats**
Joan Albesa, Universitat Politècnica de Catalunya; Thomas Jäger, Albert-Ludwigs-Universität Freiburg; Leonhard Reindl, University of Freiburg; Manel Gasulla, Universitat Politècnica de Catalunya

8 September 2011 15:50-17:10 Golden Gate 7

9H: MIMO II

1 **Analysis of an Iterative Layered Space Time Receiver with Imperfect Feedback**
Li Li, Andre Neubauer, Muenster University of Applied Sciences; Andreas Czylwik, University of Duisburg-Essen

2 **Capacity Balancing for Multiuser MIMO Cognitive Radio Network**
Zhilan Xiong, Chaohua Gong, Alcatel-Lucent Shanghai Bell; Kanapathippillai Cumanan, Sangarapillai Lambotharan, Loughborough University

3 **Multiple-Symbol Differential Sphere Decoding Aided Amplify-and-Forward Differential Space-Time Modulation**
Chao Xu, Cong Liu, Soon Xin (Michael) Ng, Lajos Hanzo, University of Southampton

4 **A Simple Approach of Gaussian Approximation for Channel Capacity in Multiple-antenna Systems**
Qian Rongrong, Yuan Qi, Tao Peng, Wenbo Wang, Beijing University of Posts and Telecommunications

Figure 2-7: OneFIT in VTC Fall 2011, 5-8 September 2011

MONAMI 2011

Friday 23 September 2011

9:00am - 9:30am	**Best Paper Awards Ceremony**
9:30am - 10:30am	**Technical Session** (Chair: *Ramón Agüero*, University of Cantabria)
Future Research Directions I	**Opportunistic Network Creation Schemes for Capacity Extension in Wireless Access and Backhaul Segments** *Marios Logothetis, Vera Stavroulaki, Andreas Georgakopoulos, Dimitrios Karvounas, Nikos Koutsouris, Kostas Tsagkaris, Panagiotis Demestichas* (University of Piraeus, Greece), *Milenko Tosic, Dragan Boskovic* (La Citadelle Inzenjering, Serbia)
	Key Function Interfacing for the MEDIEVAL Project Video-Enhancing Architecture *Daniel Corujo* (Instituto de Telecomunicações, University of Aveiro, Portugal), *Carlos J. Bernardos* (Universidad Carlos III de Madrid, Spain), *Telemaco Melia* (Alcatel-Lucent, France), *Michelle Wetterwald* (Mobile Communications Dept., EURECOM, France), *Leonardo Badia* (Consorzio Ferrara Ricerche, Italy), *Rui L. Aguiar* (Instituto de Telecomunicações, University of Aveiro, Portugal)
10:30am - 11:00am	**Coffee Break**
11:00am - 12:00am	**Technical Session** (Chair: *Kostas Pentikousis*, Huawei Technologies)
Future Research Directions II	**OConS: Towards Open Connectivity Services in the Future Internet** *Ramón Agüero* (University of Cantabria, Spain), *Luisa Caeiro, Luis M. Correia, Lucio S. Ferreira* (Technical University of Lisbon, Portugal), *Marta Garcia-Arranz* (University of Cantabria, Spain), *Lucian Suciu* (Orange-Labs, France), *Andreas Timm-Giel* (Hamburg University of Technology, Germany)
	Coordination of Self-Organizing Network Mechanisms, Framework and Enablers *Laurent Ciavaglia* (Alcatel-Lucent, France), *Zwi Altman* (France Telecom, France), *Eleni Patouni, Alexandros Kaloxylos, Nancy Alonistioti* (University of Athens, Greece), *Kostas Tsagkaris, Panagiotis Vlacheas, Panagiotis Demestichas* (University of Piraeus Research Centre, Greece)
	Coordinating IT and Network Virtualisation to Provide Infrastructure as a Service: A GEYSERS Approach for the Future Internet *Sergi Figuerola, Joan Antoni Garcia-Espin, Jordi Ferrer, Ester Lopez* (Distributed Applications and Networks Area, i2CAT Foundation, Spain), *Eduard Escalona, Reza Nejabati, Shuping Peng, Dimitra Simeonidou* (University of Essex, United Kindgom)
12:00am - 13:00pm	**Invited Talk:** The Random Walk down Venture Capital Land *Dr. Luís Campos*, CEO PDM Group, Portugal
13:00pm - 14:30pm	**Lunch Break**
14:30pm - 16:30pm	**MONAMI SmaRT Workshop** (Chair: *Andreas Timm-Giel*, Hamburg University of

Figure 2-8: OneFIT in MONAMI 2011, 21-23 September 2011

WPMC 2011

A2: Cognitive radio I

Chair: Milica Pejanovic-Djurisic (University of Montenegro & Centre for Telecommunications, Montenegro)

Temporal Secondary Access Opportunities for WLAN in Radar Bands
Miurel Tercero (KTH, Sweden); Ki Won Sung (Royal Institute of Technology (KTH), Sweden); Jens Zander (Royal Institute of Technology (KTH), Sweden)

Received Signal Interpolation for Context Discovery in Cognitive Radio
Liliana Bolea (Universidad Politecnica de Catalunya, Spain); Jordi Pérez-Romero (Universitat Politècnica de Catalunya (UPC), Spain); Ramon Agustí (Universitat Politècnica de Catalunya, Spain)

On the Performance of Calibration Techniques for Cognitive Radio Systems
Boris Kouassi (University of Nice Sophia Antipolis, France); Irfan Ghauri (Intel Mobile Communications, France); Bassem Zayen (Eurecom, France); Luc Deneire (University of Nice & University of Aalborg, France)

A New Algorithm for Joint Sensing and Power Allocation in Multiuser Cognitive Radio Networks
S. Eman Mahmoodi (Iran University of Science and Technology, Iran); Saeid Balaneshin Kordan (Iran University of Science and Technology, Iran); Bahman Abolhassani (Iran University of Science and Technology, Iran)

A Framework Based on a Fittingness Factor to Enable Efficient Exploitation of Spectrum Opportunities in Cognitive Radio Networks
Faouzi Bouali (Universitat Politècnica de Catalunya, Spain); Oriol Sallent (Universitat Politècnica de Catalunya, Spain); Jordi Pérez-Romero (Universitat Politècnica de Catalunya (UPC), Spain); Ramon Agustí (Universitat Politècnica de Catalunya, Spain)

A3: Multihop networks

Chair: Ajey Kumar (Federal University of Campina Grande & Indian Institute of Technology Roorkee, India, Brazil)

An Adaptive Routing Algorithm for Mobile Delay Tolerant Networks
Jingwei Miao (INSA LYON, France); Omar Hasan (INSA Lyon, France); Sonia Ben Mokhtar (Centre National de Recherche Scientifique (LIRIS CNRS), France); Lionel Brunie (LIRIS INSA de Lyon, France)

Computationally effective TDMA scheduling algorithm for delay-sensitive multi-hop wireless networks
Juha Huovinen (University of Oulu, Finland); Juha-Pekka Makela (University of Oulu, Finland); Jari Iinatti (University of Oulu, Finland)

Cooperative performance bounds of Wireless Local Area Networks
Rasool Sadeghi (University of Aveiro & Instituto de Telecomunicações, Portugal); João Paulo Barraca (University of Aveiro & Instituto de Telecomunicações, Portugal); Rui L Aguiar (University of Aveiro & Instituto de Telecomunicações, Portugal)

09:45 - 10:30

P1: Poster Session 1

Zero-Forcing Spatial Interweave with Greedy Scheduling
Jarkko Kaleva (University of Oulu, Finland); Petri Komulainen (University of Oulu, Finland); Markku Juntti (University of Oulu, Finland)

Improving LTE/EPC signaling for sporadic data with a control-plane based transmission procedure
Izuru Sato (Fujitsu Labs. LTD., Japan); Ahmed Bouabdallah (Institut Telecom - Telecom Bretagne, France); Xavier Lagrange (Institut Telecom - Telecom Bretagne, France)

Adaptive Watermark Power Control for Capacity Optimized MC-CDMA System
Seba Maity (CEMK, Kolaghat, India); Jaya Sil (Bengal Engineering and Sc. University, India); Santi Prasad Maity (Bengal Engineering & Science University, Shibpur, India); Claude Delpha (Universite Paris Sud, France)

TVWS Opportunities and Regulation:-Empowering Rural India
Tanuja Dhope (University of Zagreb, India); Dina Simunic (University of Zagreb, Croatia); Ramjee Prasad (Aalborg University, Denmark)

Deep Underwater Compatible Wi-Fi Antenna Development
Hector Fabian Guarnizo Mendez (LabSTICC/IFREMER, France); François Le Pennec (Lab-STICC/MOM - Telecom Bretagne/Dpt MO & Telecom Bretagne, France); Christian Gac (IFREMER, France); Christian Person (Lab-STICC/MOM UMR CNRS, France)

Motion-compensated Refinement based Distributed Video Coding for Wireless Video Sensor Network
Jinhong Di (Beijing University of Posts and Telecommunications, P.R. China); Aidong Men (Beijing University of Posts and Telecommunications, P.R. China); Bo Yang (Beijing University of Posts and Telecommunications, P.R. China); Zeyang Yang (Beijing Uninversity of Posts and Telecommunication, P.R. China); Manman Fan (Beijing University of Posts and Telecommunications, P.R. China)

A heuristic approach for solving the virtual topology design problem in next generation networks
Nihed Bahria El Asghar (Supcom, Tunisia); Ben Fredj Awatef (Supcom, Tunisia); Mounir Frikha (High School of Communication in Tunis, Tunisia); Sami Tabbane (Sup Telecom, Tunisia)

Analysis of Cellular System Using Coordinated Base Stations with Nonuniform and Flexible Cells
Tetsuki Taniguchi (University of Electro-Communications, Japan); Nobuo Nakajima (The University of Electro-Communications, Japan); Yoshio Karasawa (The University of Electro-Communications, Japan)

Linear Cooperation for Spectrum Sensing over Correlated Log-Normal Shadow Fading Channels
Vahid Jamali (K. N. Toosi University of Technology, Iran); Soheil Salari (University of Ontario Institute of Technology, Canada); Nima Reisi (KN-Toosi University of Technology, Iran); Jean Pierre Cances (University of Limoges, France); Mahmoud Ahmadian (K.N. Toosi University of Technology, Iran)

Energy Detection and Eigenvalue Based Detection: An Experimental Study Using GNU Radio
Pedro Alvarez (Aalborg University, Denmark); Nuno Pratas (Center for TeleInFrastructure (CTIF), Aalborg University & Instituto de Telecomunicações, Instituto Superior Técnico, Denmark); António J. Rodrigues (IT / Instituto Superior Técnico, Portugal); Neeli Rashmi Prasad (Center for TeleInFrastructure (CTIF), Denmark); Ramjee Prasad (Aalborg University, Denmark)

Sum Mutual Information of Block-faded MIMO MAC with LMMSE Channel Estimation for Packet Transmission
Emiliano Dall'Anese (University of Minnesota, USA); Silvano Pupolin (University of Padua, Italy); Antonio Assalini (University of Padua, Italy)

Go Green with Distributed Beamforming
Nico Prananta (Osaka City University, Japan); Shinsuke Hara (Osaka City University, Japan); Yoshitaka Hara (Mitsubishi Electric Corporation, Japan)

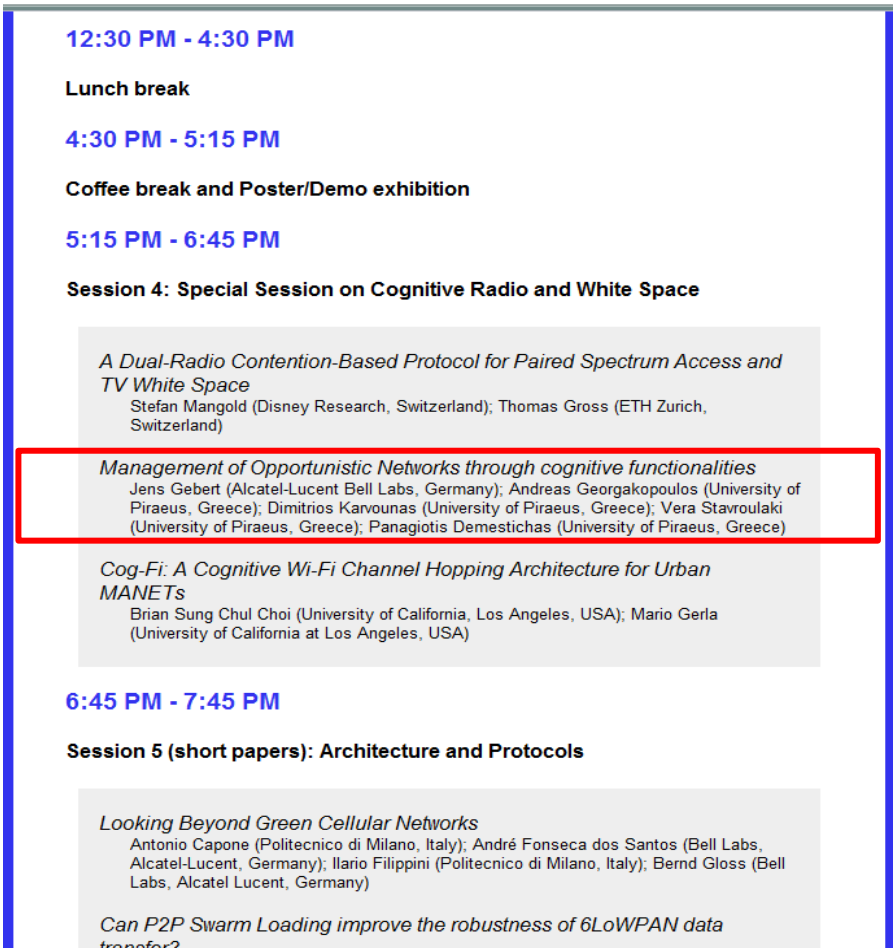
On the Role of Spectrum Selection to Improve Coverage Extension through Opportunistic Networks
Jordi Pérez-Romero (Universitat Politècnica de Catalunya (UPC), Spain); Oriol Sallent (Universitat Politècnica de Catalunya, Spain); Ramon Agustí (Universitat Politècnica de Catalunya, Spain)

A Prototype BAN For Medical and Healthcare Monitoring Based on High Band UWB
Huan-Bang Li (National Institute of Information and Communications Technology, Japan); Kiyoshi Hamaguchi (NICT, Japan)

Feature Selection Strategy for Classification of Single-Trial EEG Elicited by Motor Imagery
Swati Prasad (Aalborg University, Denmark); Zheng-Hua Tan (Aalborg University, Denmark); Ramjee Prasad (Aalborg University, Denmark); Alvaro Rodrigo Cabrera (Aalborg University, Denmark); Ying Gu (Aalborg University, Denmark); Kim Dremstrup (Aalborg University, Denmark)

Figure 2-9: OneFIT in WPMC2011, 03-07 October 2011

WONS 2012



12:30 PM - 4:30 PM

Lunch break

4:30 PM - 5:15 PM

Coffee break and Poster/Demo exhibition

5:15 PM - 6:45 PM

Session 4: Special Session on Cognitive Radio and White Space

A Dual-Radio Contention-Based Protocol for Paired Spectrum Access and TV White Space
Stefan Mangold (Disney Research, Switzerland); Thomas Gross (ETH Zurich, Switzerland)

Management of Opportunistic Networks through cognitive functionalities
Jens Gebert (Alcatel-Lucent Bell Labs, Germany); Andreas Georgakopoulos (University of Piraeus, Greece); Dimitrios Karvounas (University of Piraeus, Greece); Vera Stavroulaki (University of Piraeus, Greece); Panagiotis Demestichas (University of Piraeus, Greece)

Cog-Fi: A Cognitive Wi-Fi Channel Hopping Architecture for Urban MANETs
Brian Sung Chul Choi (University of California, Los Angeles, USA); Mario Gerla (University of California at Los Angeles, USA)

6:45 PM - 7:45 PM

Session 5 (short papers): Architecture and Protocols

Looking Beyond Green Cellular Networks
Antonio Capone (Politecnico di Milano, Italy); André Fonseca dos Santos (Bell Labs, Alcatel-Lucent, Germany); Ilario Filippini (Politecnico di Milano, Italy); Bernd Gloss (Bell Labs, Alcatel Lucent, Germany)

Can P2P Swarm Loading improve the robustness of 6LoWPAN data

Figure 2-10: OneFIT in WONS 2012, 09-11.01.2012

Moreover, the OneFIT members have submitted papers to conferences presented in Table 2-4:

Table 2-4: OneFIT Conference Papers Submitted to Significant Events

Authors	Presentation Title	Conference Name	Location	Date	Ref.
H. Lee S. Vahid V. Stavroulaki K. Moessner	Impacts of Dynamic Spectrum Aggregation approaches on Spectrum Utilization and Fragmentation in Cognitive Radio Networks	IEEE International Conference on Communications - Cognitive Radio and Networks Symposium (ICC 2012)	Ottawa, Canada	10-15.06.2012	Paper/ Submitted
D. Karvounas, A. Georgakopoulos, V. Stavroulaki, N. Koutsouris, K. Tsagkaris, P. Demestichas (tentative)	Opportunistic capacity extension of wireless access infrastructure by exploiting femtocells	IEEE International Conference on Communications (ICC 2012)	Ottawa, Canada	10-15.06.2012	Paper/ Submitted
D. Karvounas, A. Georgakopoulos, N. Koutsouris, K. Tsagkaris, V. Stavroulaki, P. Demestichas	Femtocell-based capacity extension of wireless access infrastructures	Future Networks & Mobile Summit 2012	Berlin, Germany	04-06.07.2012	Paper (Submitted)
A. Georgakopoulos, D. Karvounas, V. Stavroulaki, M. Tosic, D. Boscovic,	Cognitive cloud-oriented wireless networks for the Future Internet	IEEE Wireless Communications and Networking Conference (WCNC 2012)	Paris, France	01-04.04.2012	Paper (Submitted)

J. Gebert, W. Koenig, P. Demestichas					
D. Boscovic M. Tosic	Context aware algorithm for reconfiguration of wireless mesh network nodes	19th Annual IEEE International Conference and Workshops on the Engineering of Computer Based Systems (ECBS)	Novi Sad, Serbia,	11-13.04.2012	Paper (Submitted)

2.1.3 Publication/Contribution to White Papers

2.1.3.1 Planned

OneFIT partners plan to develop white papers, in order to showcase the results of the project.

2.1.3.2 Actions done

There has not been development of any white papers yet, as the member of the consortium focused on other dissemination opportunities. Yet, in the future, there will be white papers written by the OneFIT members.

2.1.4 Presentations in Concertation and Clusters Meetings

2.1.4.1 Planned

OneFIT members plan to attend and contribute to all to the three concertation and clusters meetings that will take place during 2011.

2.1.4.2 Actions done

OneFIT members participated to the following cluster and concertation meetings:

Table 2-5: OneFIT Contributions to Concertation and Clusters Meetings

Author	Presentation Title	Concertation/ Cluster	Location	Date	Ref.
P. Demestichas, J. Gebert, A. Georgakopoulos, V. Stavroulaki	Information and Execution Automation between the Service and Network planes – The OneFIT Perspective	Future Networks 7th FP7 Concertation	Brussels, Belgium	10-11.02.2011	Presentation
K. Tsagkaris, M. Goldhamer, M. Mueck	Working with ETSI: ISG or Technical Committees	Future Networks 7th FP7 Concertation (Plenary Meeting)	Brussels, Belgium	10-11.02.2011	Presentation
K. Tsagkaris, P. Demestichas	E3 Impact on Standards–	Future Networks 7th FP7 Concertation (Plenary Meeting)	Brussels, Belgium	10-11.02.2011	Presentation
P. Demestichas, J. Gebert, K. Tsagkaris, V. Stavroulaki, A. Georgakopoulos Y. Kritikou	Overview of Green Footprint of the OneFIT Technologies–	Future Networks 7th FP7 Concertation (RAS Cluster Meeting)	Brussels, Belgium	10-11.02.2011	Presentation
O. Sallent (presented by P. Demestichas)	Achievement: Spectrum opportunity identification & selection	Future Internet (FI) Cluster meeting	Brussels, Belgium	6.10.2011	Presentation
M. Tosic, D. Boscovic, A. Georgakopoulos, P. Demestichas	Management of the Cloud: Opportunistic resource aggregation in the backhaul	Future Internet Cluster Meeting	Brussels, Belgium	06.10.2011	Presentation

The following figures (Figure 3-4, Figure 3-5, and Figure 3-6) present screenshots from the events that OneFIT members participated to, highlighting the part of the figure that contains the OneFIT information, accordingly.

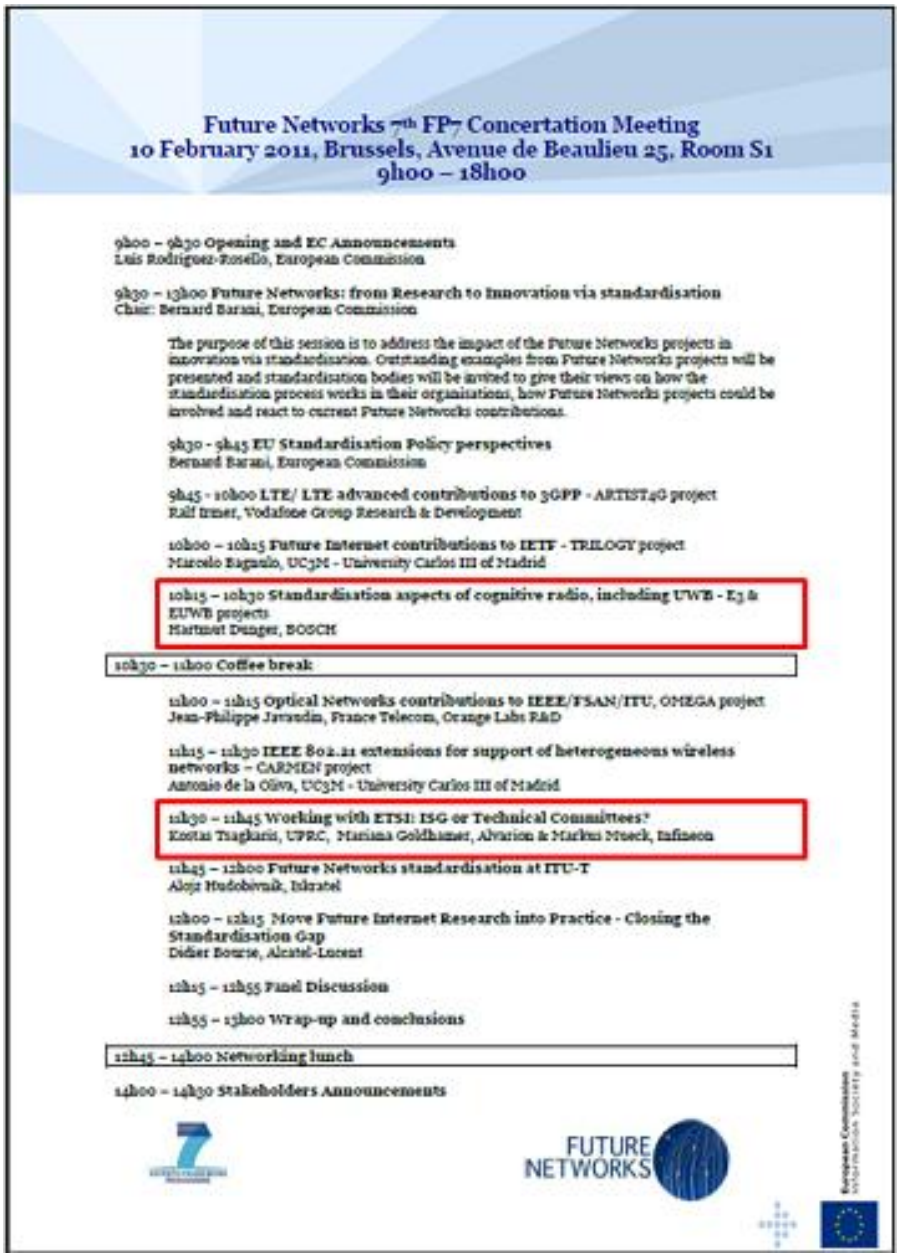


Figure 2-11: OneFIT Presentations in the Future Networks 7th FP7 Concertation

Figure 2-12: OneFIT Presentation in the RAS Cluster Meeting in the Future Networks 7th FP7 Concertation

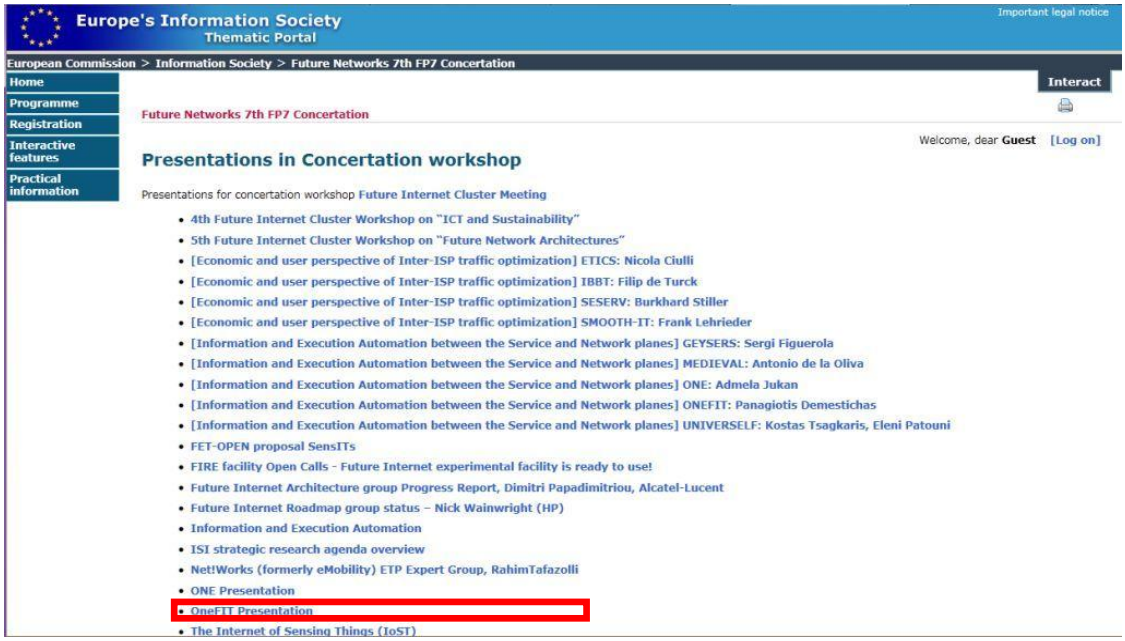
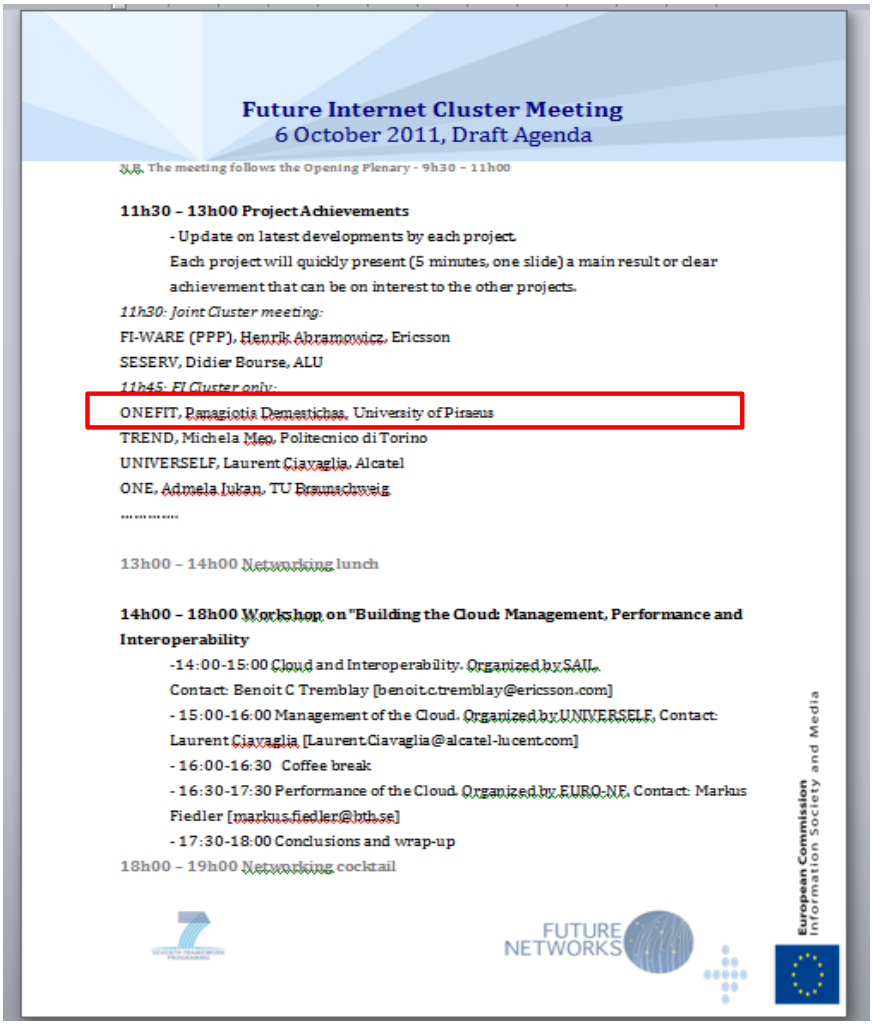


Figure 2-13: OneFIT Presentation in the Concertation Workshop in the Future Networks 7th FP7 Concertation



Future Internet Cluster Meeting
6 October 2011, Draft Agenda

N.B. The meeting follows the Opening Plenary - 9h30 – 11h00

11h30 – 13h00 Project Achievements

- Update on latest developments by each project.
Each project will quickly present (5 minutes, one slide) a main result or clear achievement that can be on interest to the other projects.

11h30: Joint Cluster meeting:

FI-WARE (PPP), Henrik Abramowicz, Ericsson
SESERV, Didier Bourse, ALU
11h45: FI Cluster only:
ONEFIT, Panagiotis Demestichas, University of Piraeus
TREND, Michela Meo, Politecnico di Torino
UNIVERSELF, Laurent Ciavaglia, Alcatel
ONE, Admela Jukan, TU Braunschweig
……

13h00 – 14h00 Networking lunch

14h00 – 18h00 Workshop on "Building the Cloud: Management, Performance and Interoperability

-14:00-15:00 Cloud and Interoperability. Organized by SAIL.
Contact: Benoit C Tremblay [benoit.c.tremblay@ericsson.com]
- 15:00-16:00 Management of the Cloud. Organized by UNIVERSELF. Contact: Laurent Ciavaglia [Laurent.Ciavaglia@alcatel-lucent.com]
- 16:00-16:30 Coffee break
- 16:30-17:30 Performance of the Cloud. Organized by EURO-NF. Contact: Markus Fiedler [markus.fiedler@bth.se]
- 17:30-18:00 Conclusions and wrap-up

18h00 – 19h00 Networking cocktail

FUTURE NETWORKS

European Commission Information Society and Media

(a)

(b)

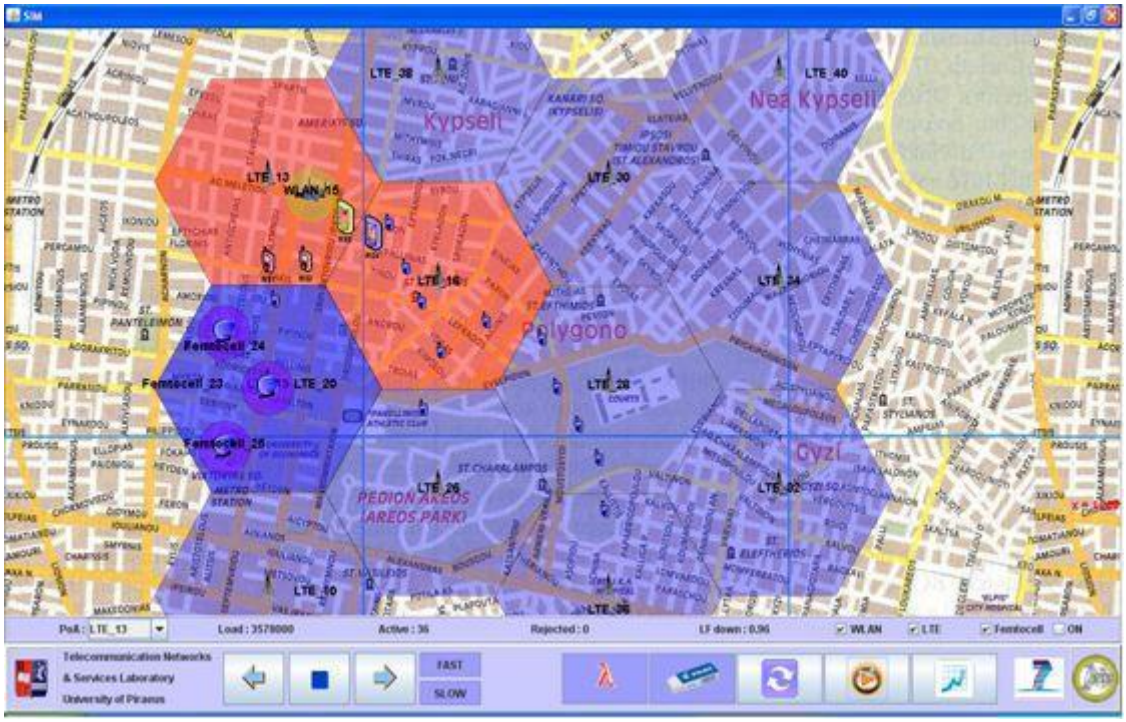
Figure 2-14: (a), (b) OneFIT Presentation in the Future Internet Cluster Meeting

2.1.5 Organization of Demonstrations

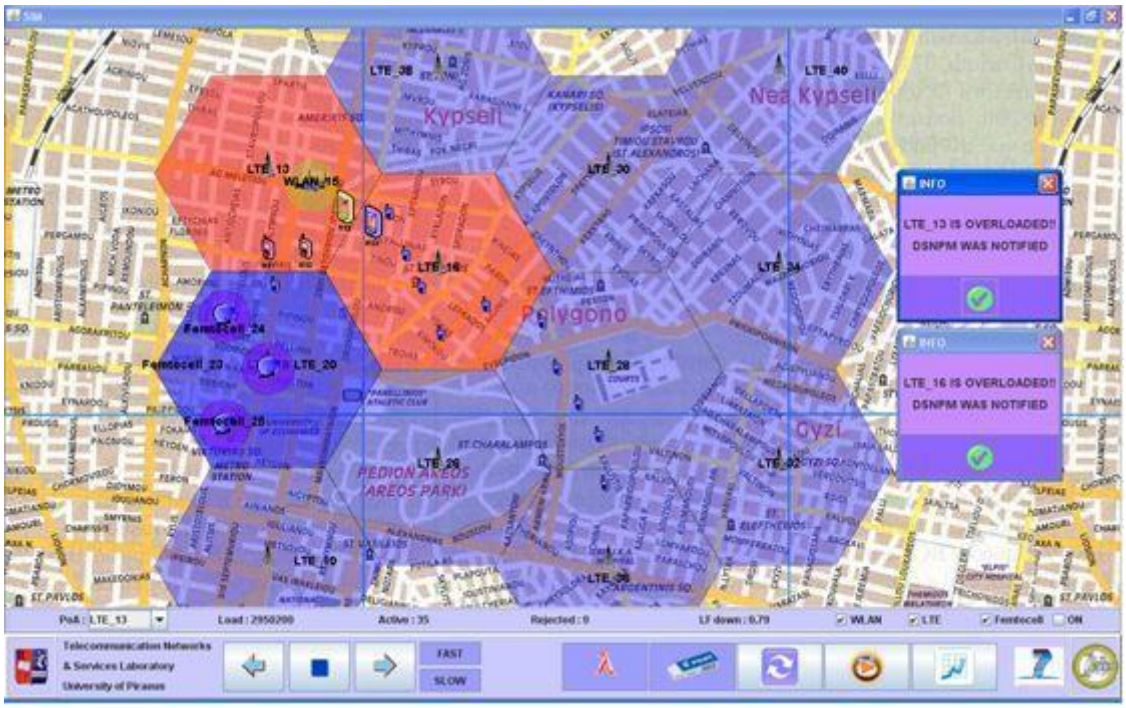
2.1.5.1 Future Network and Mobile Summit 2011

During the 20th Future Networks and Mobile Summit in Warsaw, Poland from 15 to 17 June 2011, OneFIT members staffed a demonstration booth in order to show the featured platform. The main aim of the platform is to address issues regarding the opportunistic coverage extension and the opportunistic capacity extension. In other words, it provides an initial validation of the ON paradigm to the Future Internet Architectures and Scenarios.

The main concept of the opportunistic capacity extension through the use of a maximum flow algorithm scenario is to show how nodes/ terminals are capable of forming an ON in an ad-hoc manner in the case where one or more Macro Base Stations (BSs) experience congestion issues, hence users can be re-routed to alternate infrastructure elements. The benefits of the opportunistic capacity extension through the use of a maximum flow algorithm concept are that service provisioning remains possible in an acceptable QoS even when a BS experiences congestion issues. Moreover, during the demonstration was shown that as soon as congestion is resolved in the problematic BSs and traffic is re-routed to neighboring, alternate BSs, the BSs that acquired the traffic did not become congested themselves. As a result, an ON is formed in order to support the operator's infrastructure without shifting the problem from one BS to another. Screenshots (a), (b), (c) of the following figure illustrate exactly what happens when an infrastructure experiences problems due to congestion. Specifically, in (a) congested areas are shown in red hexagons. In (b) Cognitive Management Systems as described in OneFIT (i.e., Cognitive management System for the Coordination of the Infrastructure –CSCI) and the Dynamic Self-Organizing Network Planning and Management (DSONPM) are notified about the problem in order to trigger and implement the solution via the Cognitive system for the Management of the Opportunistic Network (CMON). In (c) the final situation following the establishment of routes (red lines) that connect terminals of the previously congested area to alternate BSs is depicted. The congested area is relieved without at the same time shifting the problem to another area.


Kypseli
Nea Kypseli
Polygono
Cyzi
PEDION AREOS
(AREOS PARK)
Femtocell_24
Femtocell_23
Femtocell_25
LTE_13
WLAN_15
LTE_16
LTE_20
LTE_26
LTE_28
LTE_30
LTE_38
LTE_40
LTE_24
LTE_02
LTE_10
Load : 3578000
Active : 36
Rejected : 0
LF down : 0,96
WLAN
LTE
FemtocellS
ON
Telecommunication Networks
& Services Laboratory
University of Piraeus
FAST
SLOW

(a)


INFO
LTE_13 IS OVERLOADED!!
DSNPM WAS NOTIFIED
INFO
LTE_16 IS OVERLOADED!!
DSNPM WAS NOTIFIED
Kypseli
Nea Kypseli
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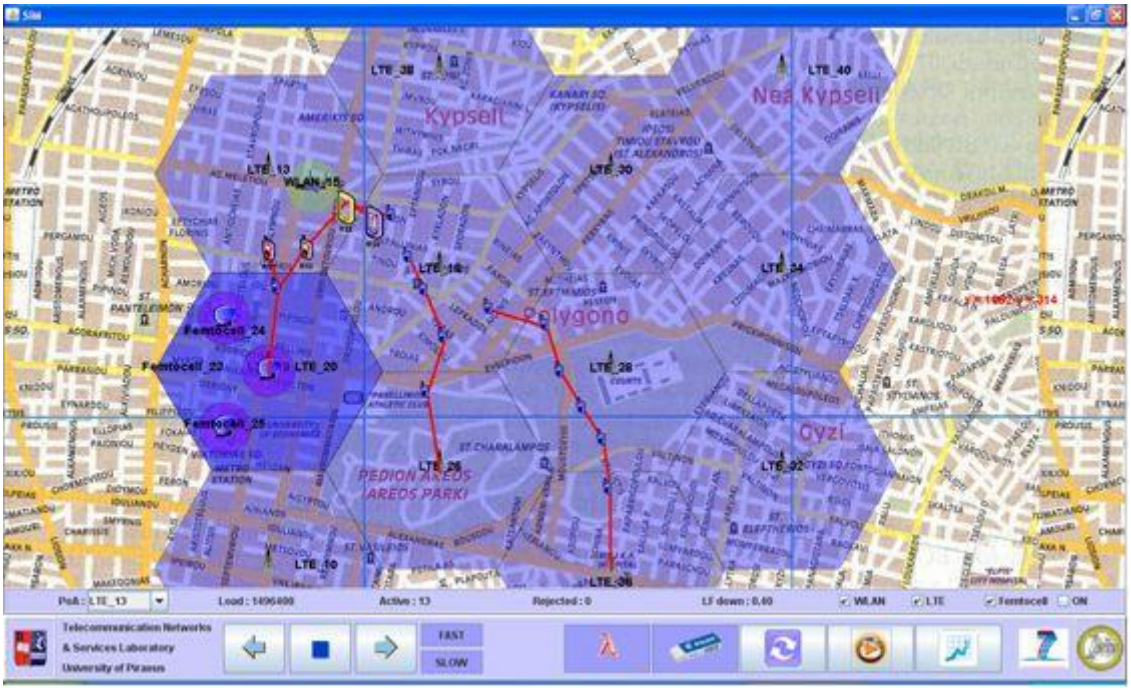
Cyzi
PEDION AREOS
(AREOS PARK)
Femtocell_24
Femtocell_23
Femtocell_25
LTE_13
WLAN_15
LTE_16
LTE_20
LTE_26
LTE_28
LTE_30
LTE_38
LTE_40
LTE_24
LTE_02
LTE_10
Load : 2950200
Active : 35
Rejected : 0
LF down : 0,79
WLAN
LTE
FemtocellS
ON
Telecommunication Networks
& Services Laboratory
University of Piraeus
FAST
SLOW

(b)



(c)

Figure 2-15: Opportunistic capacity extension scenario (a) Congested areas are shown in red (b) Cognitive Management Systems and DSONPM are informed about the problem in order to trigger the solution (c) Final situation following the establishment of routes (red lines) that connect terminals of the previously congested area to alternate BSs –Congested area is relieved

Furthermore, in the Future Networks and Mobile Summit in Warsaw, Poland, previously evolved scenarios regarding the opportunistic coverage extension and the opportunistic capacity extension through femtocells were demonstrated as well. Specifically, the main concept of the opportunistic coverage extension scenario is to show how nodes/ terminals are capable of forming an ON in the case of a Macro Base Station (BS) failure, in order to gain access to another, distant infrastructure element, or while the terminals are in motion, they enter into a blind spot which is not covered by the operator's infrastructure, thus, an ON is needed in order to ensure that the out of infrastructure coverage nodes gain access to the infrastructure again. The benefits of the opportunistic coverage extension concept are that service provisioning remains possible even when the infrastructure cannot directly support the node/ terminal. As a result, an ON is formed in order to support the opera'or's infrastructure.

Finally, the opportunistic capacity extension through femtocells scenario handles congestion issues via the introduction of the DSONPM entity. According to this scenario, when an infrastructure element experiences overloading conditions, the DSONPM agent is notified in order to redistribute load to ONs (such as femtocells, which are present in the area). To that respect, QoS is benefited as overloading is resolved and traffic is re-assigned to non-congested ONs.

Also, the opportunistic capacity extension through femtocells scenario handles congestion issues via the introduction of the DSONPM entity. According to this scenario, when an infrastructure element experiences overloading conditions, the DSONPM agent is notified in order to redistribute load to ONs (such as femtocells, which are present in the area). To that respect, QoS is benefited as overloading is resolved and traffic is re-assigned to non-congested ONs.

2.1.5.2 Service Wave 2011 in the context of Future Internet Week

During the ServiceWave 2011 event which was held in Poznan, Poland in conjunction with the Future Internet Week, October 2011, an enhanced version of the demonstration platform was presented by adding some extra functionality to the opportunistic capacity extension scenarios. Specifically, actual

terminals were used as a proof-of-concept in order to show the selection of the network, before and after the utilization of the algorithms. The communication between the main platform and the terminals relies on JADE (Java Agent Development Framework) and the utilization of wireless (Wi-Fi) links. In addition, release messages for the opportunistic network were introduced as part of the termination phase of an ON.

The scenarios are supported by the demonstrated platform and are subject to further development. Further progress and detailed planning related to demonstrations will be reported as the project progresses. Specifically, regarding the capacity extension through femtocells scenario, a new algorithm has been introduced (the Dynamic Resource Allocation –DRA algorithm) which takes into account the acquisition of users and the energy consumption of each femtocell in order to provide the capacity extension of the network solution. To that respect, future demonstrations are expected to feature enhanced versions of the platform which at the same time will be aligned with the overall OneFIT scenarios and system architecture work and will also be in close linkage to the system definition.

2.1.5.3 Bell Labs Open Days 2011

Results of the OneFIT Research made inside Alcatel-Lucent's Bell Labs Germany has been presented during the Bell Labs Open Days 2011. The presentation included posters, a demonstration of the simulations of opportunistic networking and a demonstration of the prototype where different devices have been connected dynamically and spectrum selection was made based on information from the Dynamic Spectrum Manager and from live spectrum sensing data.

BELL LABS
OPEN DAY STUTTGART

MOBILE NETWORK GOES CLOUD

CLOUD-MANAGED OPERATOR-GOVERNED OPPORTUNISTIC WIRELESS NETWORKS

Introduction

- Network operators need to find mechanisms to enhance the performance of their networks in an efficient way to:
  - offer a better experience to users
  - reach previously unreachable users
  - provide a new span of attractive services to the users, increase average revenue per user (ARPU) and overall revenue
- Service providers can benefit by providing:
  - localized services such as advertising, ad-hoc social networks
  - closed-group services such as VPN
  - traffic aggregation
- End users can benefit from
  - capacity and coverage extension
  - additional services such as localized services
  - home networking: interconnecting all devices in a household

The Vision:

To design, develop and validate the concept of applying opportunistic networks and respective cognitive management systems for efficient application/service/content provisioning in the future Internet.

Opportunistic networks are operator-governed (through resources, policies, and information/knowledge) and can be coordinated extensions of the infrastructure for a particular time interval.

The Research Work:

Candidate node discovery, spectrum opportunity identification, opportunistic network suitability determination, opportunistic network creation, maintenance and release, control channels for the cooperation of cognitive management systems (C4MS) requirements: information definition, signaling flows, protocols (packet structures, exchange).

The Solution:

Cognitive systems for the management of opportunistic networks (CMONs), including functions for coordination with Cloud-based infrastructure.

The Innovation:

- In state-of-the-art ad-hoc networking, no guidance is provided by the infrastructure.
- With infrastructure-governed opportunistic networking, Cloud-based infrastructure provides
  - additional context information
  - recommendations such as when to create an opportunistic network and which spectrum to use
  - security and trust

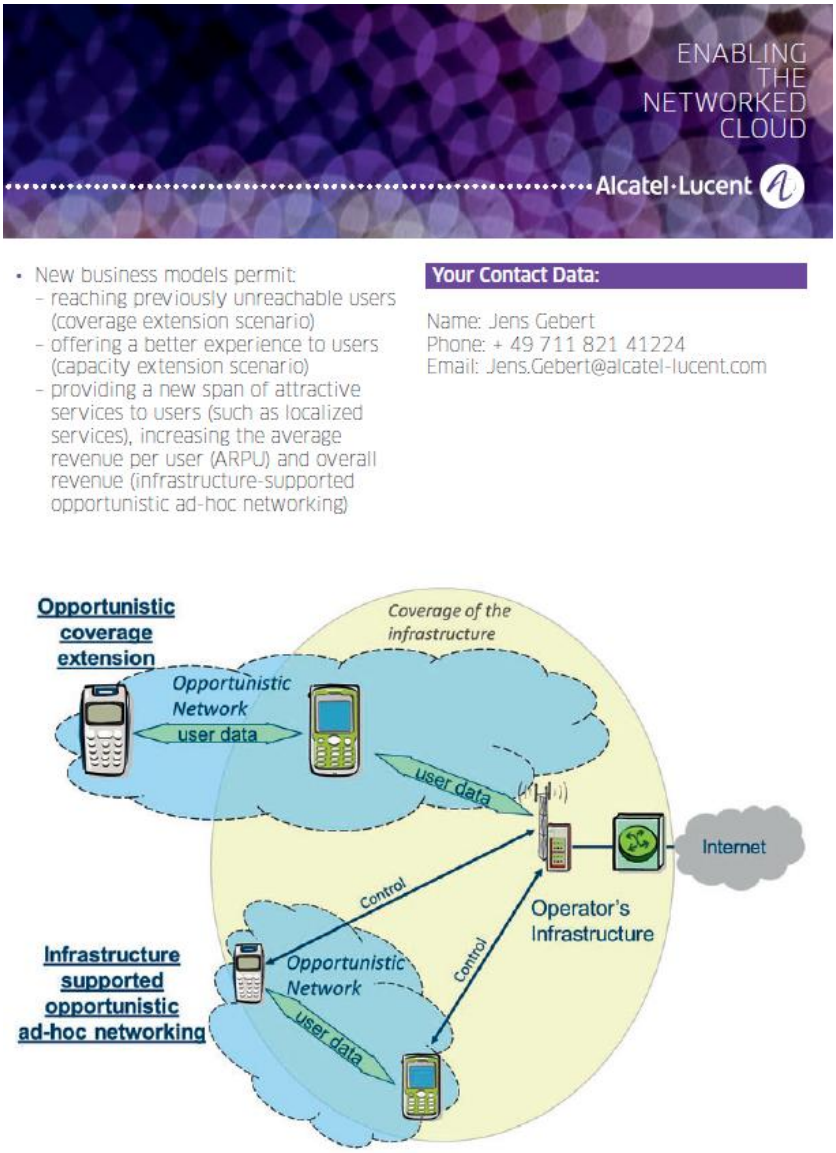


Figure 2-16: Operator governed opportunistic networks presentation and demonstration during the Bell Labs Open Days 2012

2.1.6 OneFIT Referencing and Vision Propagation

OneFIT PMT is analysing the project impact and the worldwide propagation of the vision. Three sources have been identified so far:

- References to OneFIT in articles, forum reports…;
- References to OneFIT papers/authors in papers (e.g. IEEE papers…);
- Consultation and access to OneFIT web site.

It is expected that the OneFIT public website is referenced by:

- OneFIT partners portals;
- Research projects linked to OneFIT;
- Portals addressing reconfigurability, software-defined radio (SDR), CR themes.

2.1.6.1 OneFIT Public and Private Websites

The OneFIT website contains a public part that is accessible to all web users and always provides current information on the progress of the project to external community, and a private part dedicated to the OneFIT consortium partners and only accessible using specific credentials.

2.1.6.1.1 OneFIT Public Website

The project web site (http://www.ict-onefit.eu/) has been launched in July 10th 2010. It displays the project goals, approach, achievements, dissemination documents, public deliverables, press releases, partners' news, and all late-breaking progress and information to be easily and widely publicized. Sections are also addressing training, interviews, workshops, and symposium.

The references to the site by other websites are monitored. The management platform of OneFIT and the different tools (Reporter, Reflectors, etc) are accessible from the OneFIT website front page (Partners log in). The different OneFIT web-based tools are developed by UPRC. The project management platform and tools have been successfully adopted and used by the consortium members. The OneFIT public website front page is depicted in Figure 2-17.

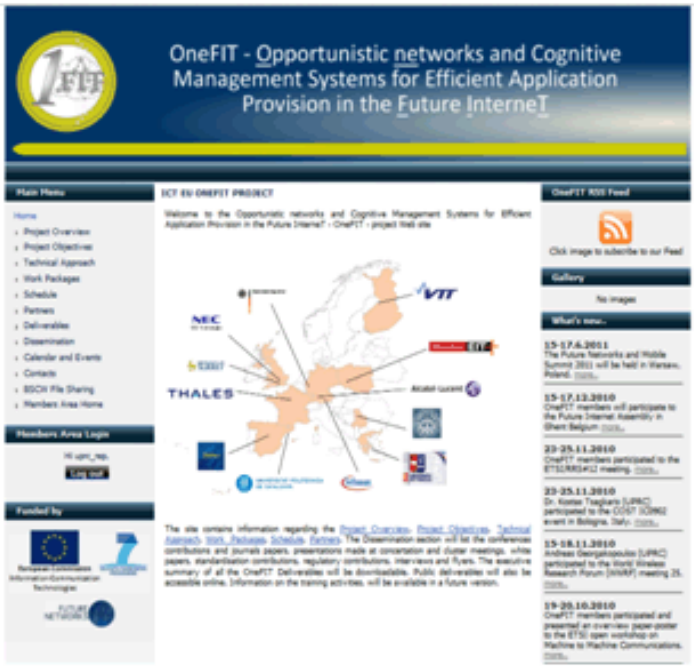


Figure 2-17: OneFIT Public Website – Home Page

Access to the Private Section dedicated to the consortium partners is available from the public website through a secure connection, each Partner being identified by unique username and password.

2.1.6.1.2 OneFIT Private Website

The OneFIT private platform, restricted to the consortium partners, is available from the public website or directly at http://tns.ds.unipi.gr/bscw. It has been on-line since July 10th 2010. As displayed in Figure 2-18, the home page provides access to a series of 6 folders (may evolve in the future) each containing data relating to the overall project management and operation. From this menu each user can browse and upload/download information. In order to maintain a coherent structure only the coordinator can decide to add or delete main folders.

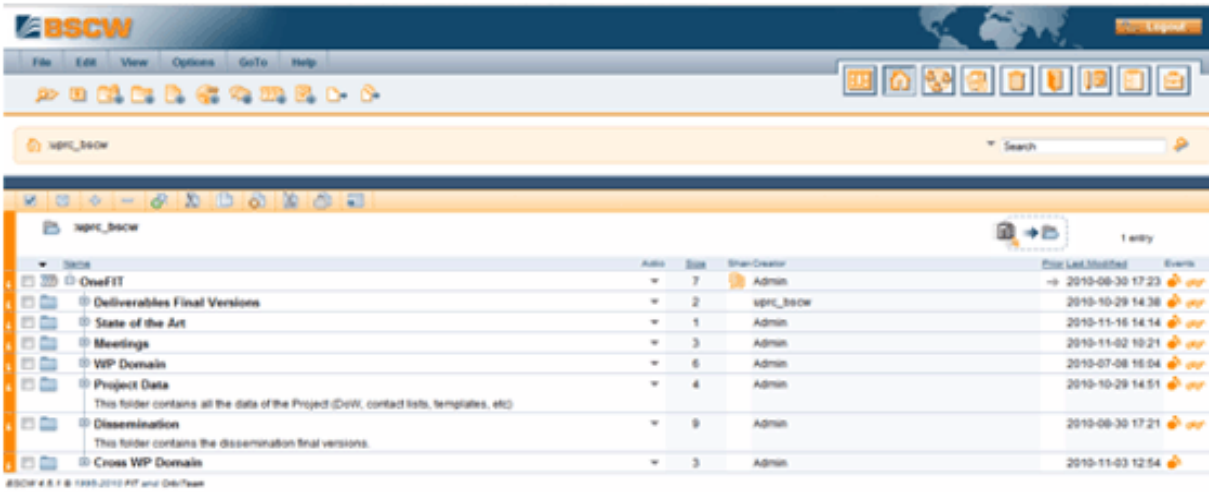


Figure 2-18: OneFIT Information Management Platform – Front Page in BSCW

The calendar feature is a tool used in OneFIT to provide an overall view of the events and meetings taking place during the life of the project. Thanks to the shared calendar, each user can have visibility on the project activity and include relevant events.
The following folders were created in the Private Part of the Management Platform, in order to satisfy the needs of the overall project and the different WPs:

- Project data: Includes the information regarding the overall project,

WPs Domains: Include all data connected to WPs:

- Cross-WP Domain: Includes Cross-WP related information,
- Dissemination: Includes all published dissemination,;
- Deliverables Final Versions: Includes the final versions of all the deliverables submitted to the EC;
- State of the Art: Contains the state of the art information in the project field;
- Meetings: Includes information on each meeting held for the OneFIT partners (agenda, presentations, minutes, etc).

2.1.7 OneFIT Plans for Interactions with other Forums and Institutes

Worldwide forums and institutes which OneFIT will technically interact with, in order to propagate its vision, results and recommendations, are identified as:

- Wireless Innovation Forum (WInF),
- Wireless World Research Forum (WWRF),
- Cost Actions.

2.1.7.1 The Wireless Innovation Forum (WINF, aka SDR-Forum)

Established in 1996, the Wireless Innovation Forum™ (WINF) is an non-profit “mutual benefit corporation” dedicated driving technology innovation in commercial, civil, and defense communications around the world. Forum members bring a broad base of experience in Software Defined Radio (SDR), Cognitive Radio (CR) and Dynamic Spectrum Access (DSA) technologies in diverse markets and at all levels of the wireless value chain to address emerging wireless communications requirements through enhanced value, reduced total life cost of ownership, and accelerated deployment of standardized families of products, technologies, and services. The Forum acts as the premier venue for its members to collaborate to achieve these objectives, providing opportunities to network with customers, partners and competitors, educate decision makers,

develop and expand markets and advance relevant technologies. It was previously known as SDR Forum.
OneFIT is planning to collaborate with the WINF. Information provided by OneFIT consortium members correspond to data part of public project deliverables (PU deliverables, according to EC contract) and OneFIT dissemination (publication, standardization contributions, training material).
Infineon participated to the SDR'10 Technical Conference on 30-Nov-2010 to 3-Dec-2010 in Washington, USA. In particular, Infineon gave a tutorial and a paper presentation of the current European Telecommunications Standards Institute Reconfigurable Radio Systems (ETSI RRS) status including information related to cognitive control channels as currently studied in the framework of ETSI RRS. The level of interest was huge and the comments received were encouraging to further pursue this working direction.

2.1.7.2 WWRF

WWRF is a global organization, which was founded in August 2001 [3]. Members of the forum are manufacturers, network operators/service providers, research and development (R&D) centres, universities, small and medium enterprises. The forum will (1) identify and scope research issues relevant to future mobile and wireless communications, including pre-regulatory impact assessments and (2) invite world-wide participation, open to all actors. The forum provides a global platform for discussion of results, exchange of views to initiate global cooperation towards systems beyond third generation (3G).
Specific WG6 (Cognitive Wireless Networks and Systems) meetings are held during each WWRF meeting. Also, a WG6 website has been established for supporting and promoting the work. The WWRF WG6 is clearly an appropriate platform to develop and maintain the worldwide coherent system vision of the "cognitive wireless networks and systems" area.
OneFIT has contributed to the WWRF meeting 26, in Doha, Qatar (Table 2-6 and Figure 2-19) and also participated to the WWRF meeting 27, in Dusseldorf, Germany. The OneFIT members are planning to contribute to future WWRF meetings.

Table 2-6: OneFIT Participation to WWRF meetings

Author	Title	Conference Name	Loc.	Date	Ref.
A. Georgakopoulos, K. Tsagkaris, V. Stavroulaki, P. Demestichas	Opportunistic Network Creation for Efficient Application Provisioning in the Wireless Future Internet	Wireless World Research Forum #26	Doha, Qatar	11-13.04.2011	Paper/ Presentation

Session 4: WG6- Cognitive Networks and Systems for a Wireless Future Internet

2:00 - 3:30 pm, Monday, April 11th, 2011 Chair: Prof. Panagiotis Demestichas of University of Piraeus, Greece	
Introduction to the meeting "Cognitive Networks and Systems for a Wireless Future Internet"	Panagiotis Demestichas, University of Piraeus, Greece, Alessandro Trogolo, TILAB, Italy Andreas Georgakopoulos, University of Piraeus, Greece
Opportunistic Network Creation for Efficient Application Provisioning in the Wireless Future Internet	Andreas Georgakopoulos, Kostas Tsagkaris, Vera Stavroulaki, Panagiotis Demestichas, University of Piraeus, Greece
Large Scale Architecture for the Future Internet of Things	Nidal Nasser, Lutful Karim, University of Guelph, Canada

Figure 2-19: OneFIT in Wireless World Research Forum 26, 11 – 13 April 2011

2.1.7.3 COST Actions

Two COST Actions have been launched in the field of cognitive radio systems. The following paragraphs elaborate on the two actions and underline OneFIT partners' activities within these actions.

2.1.7.3.1 COST Action IC0902

The main objective of the COST Action IC0902 "Cognitive Radio and Networking for Cooperative Coexistence of Heterogeneous Wireless Networks" [4] is to integrate the cognitive concept across all layers of communication systems, resulting in the definition of a European platform for cognitive radio and networks. The action proposes coordinated research in the field of cognitive radio and networks. The cognitive concept applies to coexistence between heterogeneous wireless networks that share the electromagnetic spectrum for maximum efficiency in resource management. Several efforts are currently in place in European research centers and consortia to introduce cognitive mechanisms at different layers of the communications protocol stack. This action goes beyond the above trend by integrating the cognitive concept across all layers of system architecture, in view of joint optimization of link adaptation based on spectrum sensing, resource allocation, and selection between multiple networks, including underlay technologies.
OneFIT mainly contributes to the WG4 "Definition of mechanisms for intersystem coexistence and cooperation", which is led by the project's coordinator, Prof. P. Demestichas.
Table 2-7 depicts the activities within COST Action IC0902:

Table 2-7: OneFIT Participation to COST Action IC0902 Activities

Author	Contribution Title	Event Name	Location	Date	Ref
V. Malbasa, D. Boskovic, M. Tosic	Predictions for Opportunistic Multi-Path Routing in Wireless Mesh Networks	COST Action IC0902: Cognitive Radio and Networking for Cooperative Coexistence of Heterogeneous Wireless Networks SIG 2: Learning and Artificial Intelligence	Barcelona, Spain	06-07.10.2011	Paper/ Presentation
V. Stavroulaki, K.Tsagkaris, A. Georgakopoulos, P. Demestichas, R. Ferrús, M. Filo	Control Channels for the Cooperation of Cognitive Management Systems in Opportunistic and Composite Wireless Networks	COST Action IC0902 Cognitive Radio and Networking for Cooperative Coexistence of Heterogeneous Wireless Networks WG4: Definition of mechanisms for intersystem coexistence and cooperation	Barcelona, Spain	05-07.10.2011	Presentation

IC 0902. SIG2/SIG4 Session 2/1, Friday 7 October, h 15:45-17:15

Room BETA

Chair: *Nicola Baldo, CTTC-Spain.*

15:45 16:00: - "Learning and Artificial Intelligence Predictions for Opportunistic Multi-Path Routing in Wireless Mesh Networks," **by** [1]Vuk Malbaša, [1]Dragan Bošković, [1]Milenko Tošić, [2]Dragan Bošković. [1]*La Citadelle Inženjering-Serbia,* [2]*Faculty of Technical Sciences of UNS-Serbia*

16:00 16:15: - "On the Performance of Reinforcement Learning for Dynamic Channel Selection," **by** Irene Macaluso, Barış Özgül, Luiz DaSilva,. *CTVR, Trinity College Dublin-Ireland.*

16:15-16:30 **Coffee Break**

16:30 16:45: - "A Supervised Learning Approach to Cognitive Access Point Selection" **by** Biljana Bojovic. *Centre Tecnologic de Telecomunicacions de Catalunya, CTTC-Spain.*

16:45 17:00: - "A Bayesian Network approach to Cognitive Call Admission Control for VoIP in WLANs," **by** [1,2]Giorgio Quer, [3]Nicola Baldo, and [1]Michele Zorzi. [1]*University of Padova-Italy,* [2]*University of California San Diego-USA,* [3]*CTTC-Spain*

17:00 17:15: - "Positioning Estimates Generated from the Finger Printing Method Compared with Coverage Area Estimates in Indoor Environments and their extension to cognitive networks," **by** [1]George Agapiou, [2]Stelios Agapiou. [1]*Hellenic Telecommunications Organization (OTE) S.A-Greece,* [2]*National and Kapodistrian University of Athens-Greece.*

Figure 2-20: OneFIT in COST IC0902, SIG2, 06-07 October 2011

Friday, October 7:

CTTC Center, Castelldefels

Workshop Technical Sessions Programme, and IC 0902 MC Meeting

8:15- **Registration**

Plenary session

Room AUDITORI

9:00- 9:30 "**Award-Winning" REM Demonstrator at DySPAN 2011, Based on a Heterogeneous Sensing Platform**," by Berna Sayrac, *France-Telecom, France.*

IC 0902. WG4 Session 1, Friday 7 October, h. 9:45-10:45

Room AUDITORI

Chair: *Panagiotis Demestichas, University of Piraeus-Greece, and Oliver Holand , King's College London-UK.*

9:45 10:00: - "Coexistence issues in multi-system Cognitive Radios," **by** Oscar Tonelli, Gilberto Berardinelli, Fernando M. L. Tavares, Andrea F. Cattoni (*Aalborg University-Denmark*) and Luiz A. DaSilva (*CTVR, Trinity College Dublin-Ireland).*

10:00 10:15: - "Joint Spectrum Sensing and Multi-dimension Cognitive Database Mechanisms in Cognitive Radio Networks," **by** Qixun Zhang, Zhiyong Feng, Yizhe Li and Ping Zhang. *University of Posts and Telecommunications (BUPT), Beijing.*

10:15 10:30: - "CLAROS: A Geo-location database for white spaces in the UHF band," **by** [1]Elena García-Couto, [2]Rubén Nocelo, [2]Verónica Santalla, [1]Carlos Mosquera. [1]*Gradiant- Spain,* [2]*Universidad de Vigo, Spain*

10:30 10:45: - "Control Channels for the Cooperation of Cognitive Management Systems in Opportunistic and Composite Wireless Networks," **by** [1]Vera Stavroulaki, [1]Kostas Tsagkaris, [1]Andreas Georgakopoulos, [1]Panagiotis Demestichas, [2]Ramon Ferrús, [3]Marcin Filo. [1]*University of Piraeus-Greece,* [2]*Universitat Politècnica de Catalunya-Spain,* [3]*EIT+ Research Center-Poland.*

Figure 2-21: OneFIT in COST IC0902, WG4, 05-07 October 2011

2.1.7.3.2 COST Action IC0905

Another four year long COST Action was started in 2010 to complement IC0902. The COST Action IC0905 "Techno-Economic Regulatory Framework for Radio spectrum Access for Cognitive Radio/Software Defined Radio – TERRA" was established to consider techno-economical and regulatory aspects of software defined radio (SDR) and cognitive radio systems (CRS) [5]. The goal of the TERRA is to develop a comprehensive techno-economic regulatory framework for radio spectrum access rules for CRS/SDR, catering for envisaged CRS/SDR deployment scenarios, fostering the development of wireless industries, and serving consumer interests in general. In particular, the goal is to help European regulators in forming the regulatory framework for CRS.

The work is carried out in four Working Groups (WG):

- WG1 Deployment Scenarios
- WG2 CR/SDR co-existence studies
- WG3 Economic aspects of CR/SDR regulation
- WG4 Impact assessment of CR/SDR regulation

WG1 aims at developing and selecting plausible deployment scenarios for CR/SDR, based on results from a range of technological R&D activities. WG2 is doing research into coexistence and developing technically feasible regulatory options pertaining to CR/SDR under these deployment scenarios. WG3 is carrying out research into economic implications/benefits of regulatory options under these deployment scenarios. WG4 focuses on overall impact assessment and study of the benefits to society of developed regulatory options.

OneFIT project participates in COST TERRA by e.g. obtaining knowledge and providing contributions to the WG meetings. In particular, several members of the OneFIT project consortium are also Management Committee members of COST TERRA and participate actively there.

Table 2-8 presents the contributions of OneFIT members to COST Action IC0905.

Table 2-8: OneFIT Participation to COST Action IC0905 Activities

Author	Contribution Title	Event Name	Location	Date	Ref
M. Mustonen, M. Matinmikko, P. Demestichas, J. Gebert, M. Filo, O. Sallent, M. Mueck, K. Moessner, D. Boskovic	Scenarios for Opportunistic Networks from OneFIT Project	COST Action IC0905 WG1&WG2 meeting	Brussels, Belgium	30-31.08. 2010	Document
M. Matinmikko	Scenarios for Opportunistic Networks from OneFIT Project	COST Action IC0905 WG1&WG2 meeting	Brussels, Belgium	30-31.08. 2010	Presentation

3. Training Activities

During and after the course of the OneFIT project, partners and consortium as a whole, aim at organizing series of internal and external trainings. The idea of the internal trainings is to facilitate knowledge exchange between the OneFIT partners so that collaboration within the project is streamlined. The purpose of the external trainings is to raise the ICT community awareness about the OneFIT technologies so that its results become visible, acknowledged and used in practice.

3.1 Internal Training Activities

Internal trainings will be held among OneFIT project partners. These trainings are aiming at knowledge exchange between consortium partners. The trainings will take a form of tutorials on relevant technology enablers and their implementation and usage for different use cases that will be organized as dedicated workshops.
With these internal workshops, the OneFIT partners will get opportunity to expand their knowledge and practical experience in relevant fields so that they will be able to use new technologies and concepts for further development of the OneFIT system.

3.1.1 Planned

Internal workshops are planned to be organized during plenary meetings covering different topics relevant for the course of the project. These workshops will allow some partners to gain additional knowledge in different fields that are critical to further execution of the OneFIT project.
The need for these internal workshops will be identified in the course of the project. This form of training is especially critical for the technology transfer between different work packages. Partners hosting these events will have possibility to present their platforms (hardware, software) which they plan to use for the OneFIT system development and testing. Interested partners will receive detailed platform trainings and optionally demo kits and prototypes of presented platforms.

3.1.2 Actions done

Internal Training Activities at the Second OneFIT Meeting:
The first internal training took place during the second OneFIT meeting in Munich in October 2010, hosted by Infineon. The training activity took form of a one day hands-on session which allowed interested partners to receive detailed training on Infineon XMM 6160 HSPA Smart Modem Solution. Partners who signed temporary licensing agreement (TLA) received demo kits for further experimenting.

3.2 External Training Activities

Public trainings, seminars and workshops will enable better understanding of the OneFIT system outside of the consortium and trigger further development of algorithms and protocols for opportunistic networking and cognitive management. During and after the course of the OneFIT project, the consortium will organize:

- Academic seminars/courses - The academic partners could include some of the OneFIT aspects in their academic program;
- Public workshops - Presentation of the OneFIT project achievements, key features and training of interested individuals and organizations outside of the consortium;
- Remote learning - By publishing the materials (presentations/tutorials) on the OneFIT official web page, project achievements will be brought closer to ICT community.

OneFIT consortium actively participates in:

- International mobile communication conferences - OneFIT will pursue the presentation of public tutorials and trainings at the Future Network and Mobile Summit, DySPAN, WINF Technical Conferences, etc.;
- Joined workshops - Common workshops that provide venues for interactive exchange of ideas.

By familiarizing the ICT community with the OneFIT project achievements consortium will ensure that this project is recognized and referenced to by future projects in this field. If broader ICT community is trained and capable of using the OneFIT system this may trigger faster standardisation of protocols, architectures and interfaces presented by the project.

3.2.1 Planned

OneFIT Workshop in the context of MobiHoc 2012:
In order to maximise dissemination and impact of the project, OneFIT is planning to organize a workshop in the context of Mobihoc 2012. The workshop is envisioned to present the OneFIT project achievements, key features and demonstrate its results.
Future Networks and Mobile Summit (FuNeMS) 2012:
OneFIT is planning to co-organize a workshop during Future Networks and Mobile Summit (FuNeMS) 2012. The workshop will be the continuation of the Federation workshop that was realised in the context of FuNeMS 2011, co-organised by OneFIT, UniverSelf and ONE Projects. The workshop will consist of the following sections:

- Architecture
- Algorithms
- Panel and Demos

Workshop proposal for FuNeMS 2012 has been already prepared and submitted.

3.2.2 Actions done

Future Network and Mobile Summit 2011 Demonstration
The OneFIT work has been demonstrated in the context of Future Network and Mobile Summit 2011, as detailed in Section 2.1.5.1.
Future Internet Week – ServiceWave 2011
The results and achievements of the OneFIT project have been presented during the ServiceWave 2011 organized by the Future Internet Week that took place in Poznan, Poland on October 24-28 2011, as presented in Section 2.1.5.2**.**
Bell Labs Open Days 2011
Results of the OneFIT Research made inside Alcatel-Lucent's Bell Labs Germany have been presented during the Bell Labs Open Days 2011. The event was organized by Alcatel-Lucent in December 2011 in Stuttgart, Germany, as presented in Section 2.1.5.3.

4. OneFIT Standardization Plans

This section elaborates on the OneFIT standardisation plans and commitments.

4.1 Overall Plan Towards Standardization of OneFIT Outcomes

As described in [6], it is an essential element of the OneFIT strategy to influence most relevant standardization by impacting with OneFIT consortium proposals. In this context, the intention is to concentrate on standards with a focus on cognitive radio/networks and architecture aspects as well as convergence and interworking of heterogeneous wireless systems. Further standards have been identified that will be monitored closely. It is also a stated goal of OneFIT not to focus on standards of a single region only, but to ensure the coverage of the most relevant standardisation bodies across the globe, in particular ETSI and IEEE.

The standardization strategy will be updated during the development phase continuously reflecting any changes and expert review. Steps to come to an OneFIT standardization strategy:

- Investigation of available standards and identification of “white spots”, i.e, opportunities for contributions to standardization bodies;
- Specification of standardization objectives, with special focus on standards based interoperability and adoption through open source quality and best-of-breed implementations;
- Prioritization of standardization areas, standardization bodies and standards;
- Formulation of strategy considering impact, feasibility, costs and effort, performance, openness, interfaces, regulations, innovation, risks, existing standards applicability, tailoring standards, development of new standards;
- Identification of project stakeholders. Dissemination and discussion of objectives and strategy with these stakeholders;
- Alignment of strategy and formulation of implementation plan according to expert advises (including e.g. resources, action and communication plan, documentation, continuous review);
- Identification of key people within the relevant standardization bodies to lobby for support for concepts and contributions;
- Execution of standardization strategy and implementation plan. Continuous review and alignment.

4.2 Relevant Standard Bodies

4.2.1 ETSI RRS

As the result of the selection process described in previous section, the OneFIT consortium has selected ETSI Technical Committee RRS as initial target for the standardization of the project’s outcomes, while monitoring the progress and roadmaps of other potential targets, namely IEEE P1900.4 and 3GPP.Figure 4-1 illustrates the relationship of relevant standards to the OneFIT system vision.

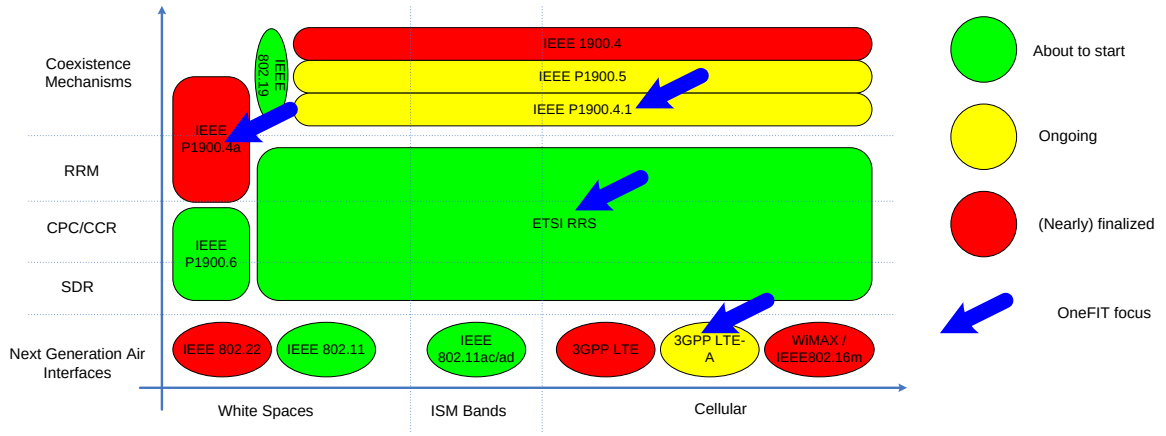


Figure 4-1: OneFIT Standardization Overview

The ETSI RRS focuses on technologies such as SDR and CR whose systems exploit the capabilities of reconfigurable radios and networks for self-adaptation to a dynamically-changing environment with the aim of improving supply chain, equipment and spectrum utilization. ETSI RRS has four active working groups: WG1 System Aspects, WG2 Equipment Architecture, WG3 Cognitive Management and Control and WG4 Public Safety.
The reasons for selecting RRS are the following:

1. Technical relevance: in particular, for control channels, the concepts of CPC/CCR elaborated in FP7 E3 project and then in ETSI RRS are considered good ground for the development of the control channels required by the management of opportunistic networks (C4MS);
2. Established influence as a key to success: historically OneFIT partners have played an important role in RRS by shaping the specific scope of relevant groups, especially in WG3 and in WG1, by taking a lead position and providing technical inputs;
3. Good alignment of RRS' and OneFIT's roadmaps: RRS has started as a standard-making entity in May 2010 (previously it was limited to feasibility studies and technical reports, not standards) and is building their work programme at the time when OneFIT is setting the ground of its technology, creating opportunities for one with the other's outcomes.

4.2.2 3GPP

3GPP stand for "3rd Generation Partnership". It unites 6 key telecom standards bodies of Asia, Europe and USA. 3GPP was created at the end of 1998, with the aim of building from the GSM standards a 3rd Generation of wireless network system. Following the development of wireless technologies as W-CDMA, HDPA and LTE and its associated core network, 3GPP has defined in its Release 10, the main technologies that are recognised by the ITU as part of the IMT-Advanced Technologies.
Research on device to device communication over LTE and LTE-Advanced have been performed in the recent years by EU founded projects [15][16]. The Qualcomm company has developed the FlashLinq™ technologies aiming to use the direct device to device communication for realising proximity-based services [17]. In June 2011 (SA Plenary meeting in Bratislava), QUALCOMM proposed, to the System Architecture group of 3GPP (SA), to start a new study on proximity-based services using direct communication between devices. The study item was not accepted as proposed by QUALCOMM, but at the following meeting in September 2011 (SA Plenary meeting in Fukuoka), the study item was significantly amended as to focus more on the intended services rather than on the technology. The revision of the study item proposal did not contain any restriction to communication in the licensed bands anymore and operator control of device-to-device communication was added. The core focus was now on proximal devices discovery. This new version was supported by several major telecom operators (Telecom Italia, NTT Docomo, AT&T, etc …) and

manufacturers (NEC, Motorola), and eventually accepted [17]. The main use cases targeted are initially classified in 3 categories: Commercial/social use, Network offloading and Public Safety. During the SA meeting of November 2011, about 40 contributions were presented. 40 companies were also participating to the discussion, showing a clear and growing interest for this topic in the standardization field.
As viewed from the 3GPP work programme, the expectation on the proximity-based services using device to device communication is currently to define the use case and the service requirements. The completion date for this study is planned for September 2012. Further to this, it is expected that a full definition of the system architecture and protocols for this feature will be defined in the 2013-2014 timeframe.

4.3 Actions done

4.3.1 Actions towards ETSI RRS

As of December 2010, the actions of the partners have been focussed on ETSI RRS with great success

A. OneFIT has introduced the operator-governed opportunistic networks as a possible use case for the technology to be standardized in RRS;

B. OneFIT has proposed a new work item in WG3 on a “Feasibility Study on Control Channels for Cognitive Radio Systems” which was approved by ETSI RRS in November 2010. OneFIT made major contributions to this work item as well as towards other work items, e.g. related to use cases and architecture.

C. Currently the Work Item has been identified as a stable draft and it is expected to be finalised in February 2012.

For information see http://www.etsi.org/website/technologies/RRS.aspx
OneFIT members participated in the ETSI/RRS#16 that took place in Ispra, Italy, 21-25 November 2011. Contributions were made in the context of the "ETSI TR102.684: Feasibility Study on Control Channels for Cognitive Radio Systems". Also, the activity report of the OneFIT project was presented.

Table 4-1 contains the list of all the documents prepared and presented by OneFIT partners in support of the above actions.

Table 4-1：OneFIT Standardization Contributions towards ETSI RRS

Author	Contribution Title	Event Name	Location	Date	Ref
V. Stavroulaki	Reporting of Activities in the OneFIT project: Overview of Functional Architecture	ETSI RRS #13 Meeting	Maison Alforts, France	08-10.02.2011	Presentation
Alcatel-Lucent Deutschland AG,NEC Technologies (UK) LTD,DAC-UPC,UPRC,EIT+	RRSWG3(11)0011r1 Contribution to Draft ETSI TR 102 684	RRS1-RRS3-Conf call	Phone conf.	21.4.2011	Approved Change Request
EIT+, Alcatel-Lucent, UPRC, IMC	RRSWG3(11)0017 CR Network Management based CCC	RRS1-RRS3-Conf call	Phone conf.	4.5.2011	Approved Change Request
EIT+, Alcatel-Lucent, UPRC, IMC	RRSWG3(11)0030r1 Bluetooth based implementation option	RRS1-RRS3-Conf call	Phone conf.	23.09.2011	Approved Change Request
V. Stavroulaki	Participation to the	ETSI	Sophia-	05-	

	meeting	RRS1-RRS3/ ETSI RRS#15 Meeting	Antipolis, France	07.09.2011	
K. Tsagkaris OneFIT Partners	AFI(11)0029 Reporting of activities of the OneFIT project to the AFI WI#3 branch: Autonomicity-enabled Ad-Hoc, Mesh and Sensor Network architectures	ETSI AFI ISG	Sophia-Antipolis, France	27-30.09.2011	Presentation
EIT+, Alcatel-Lucent, UPRC, IMC	RRSWG3(11)0036 WiMedia UWB based implementation option	RRS1-RRS3-Conf call	Phone conf.	24.10.2011	Approved Change Request
ALUD	RRSWG3(11)0040 Control Channel to access geo-location database for retrieving information on available white spaces	RRS1-RRS3-Joint Meeting	Ispra, Italy	21-23. 11.2011	Approved Change Request
ALUD	RRSWG3(11)0041, 41r1 Location Tracking by Proxy	RRS1-RRS3-Joint Meeting	Ispra, Italy	21-23. 11.2011	Approved Change Request
EIT+, UPRC	RRSWG3(11)0042 Overall assessment of implementation options for Control Channels	RRS1-RRS3-Joint Meeting	Ispra, Italy	21-23. 11.2011	Presentation
ALUD	RRSWG3(11)0045 CR for section 7.1.5 IETF PAWS based approach	RRS1-RRS3-Joint Meeting	Ispra, Italy	21-23. 11.2011	Approved Change Request
UPRC, ALUD	RRS(11)0171 Reporting of Activities in the OneFIT project	RRS Plenary	Ispra, Italy	24-25. 11.2011	Presented

4.3.2 Actions towards 3GPP

OneFIT members contributed to the discussion for the definition of the Study Item, ensuring that the key options of OneFIT, that is the RAT-independancy and the operator's control, were included in the scope of the SI.

Then, at the first SA1 meeting dealing with the SI, some partners contributed to the collection of use cases and requirements by submitting a number of documents.

These documents were directly accepted or "noted" as needing to be merged with other proposals in order to prepare a selection process in next SA1 meeting (February 2012).

Table 4-2: OneFIT Standardization Contributions towards 3GPP

Author	Contribution Title	Event Name	Location	Date	Ref
NEC Technologies (UK)	Use cases for Proximity-based Services study	TSG-SA1 Meeting #56	San Francisco, CA (US)	14-18..2011	S1-113148
IMC	Enabling Proximity	TSG-SA1	San	14-	

	services in a LTE network under operator control	Meeting #56	Francisco, CA (US)	18.11.2011	
IMC	Enabling Proximity services with inter-RAT capabilities	TSG-SA1 Meeting #56	San Francisco, CA (US)	14-18.11.2011	
IMC	Use Case: Proximity Services Enabled MTC scenarios	TSG-SA1 Meeting #56	San Francisco, CA (US)	14-18.11.2011	
IMC	Range extension scenarios for Proximity services	TSG-SA1 Meeting #56	San Francisco, CA (US)	14-18.11.2011	

4.4 Next Steps

The consortium will continue contributing to the ETSI RRS and more specifically on the Work Item on Control Channels for Cognitive Radio Systems that is expected to be finalised in February 2012 meeting.

Furthermore, OneFIT intends to be active in the design of the multi-year RRS roadmap, initiated at RRS#12 meeting, in order to pave the way for the future results as mentioned above

As far as 3GPP is concerned, partners will continue contributing to the Use Case and requirements capture phase for the “proximity-based services” SI and consider how to feed the following phase of a proper “Work Item” for device-to-device communication.

5. OneFIT Regulatory Plans

5.1 Relevant Regulatory Bodies

The creation and maintenance of opportunistic networks is determined by regulatory aspects and may have regulatory implications. Targets will be European wide initiatives and national initiatives. Work and outcomes will be used to inform the regulation authorities about the technological options and aim to lead to the rules for a more dynamic and flexible allocation of spectrum resources, as well as to corresponding rules towards certification and licensing of (opportunistically behaving) equipment. Also, OneFIT targets will be European regulation authorities (i.e., one of which is a consortium member) but also wider initiatives in EU and international bodies like International Telecommunication Union (ITU).

Partners from the OneFIT consortium have previously participated in spectrum regulatory frameworks e.g. European Conference of Postal and Telecommunications Administrations (CEPT) and ITU Radiocommunication sector (ITU-R). This will assist to build the necessary links between the spectrum regulatory domain and the OneFIT project ensuring that the latest regulatory information influencing the OneFIT system is available for the project.

- Specific exploitation steps are: Information about and proposals how dynamic spectrum access may impact service providers and network operators will be fed into Working group Frequency Management (WG-FM) and WG – Spectrum Engineering (WG-SE), respectively.
- OneFIT will propose solutions and enablers for dynamic spectrum access, and provide contributions to relevant regulatory bodies (CEPT, ITU-R, etc.).

It has to be noted that ITU is considered by OneFIT as both standardization body (the ITU Standardization (ITU-T) is responsible for the standardization of telecommunications) and regulatory body (with ITU-R, overall regulatory work). OneFIT will report plans and contributions to ITU under "Regulation".
The OneFIT consortium includes the German regulator Bundesnetzagentur (BNetzA) working on and facilitating this envisaged exploitation. In terms of regulatory activities, OneFIT intends to help shape the regulatory framework for cognitive enabled equipment and distributed decision-making systems. OneFIT will achieve this by raising awareness within the relevant regulatory bodies and by feeding relevant project results into the discussions within these.

5.2 Opportunities

This section lists possible opportunities for contributions regarding the OneFIT regulation activities.

5.2.1 Opportunities within ITU-R

The next World Radiocommunication Conference (WRC) of ITU-R in 2012 will consider regulatory measures and their relevance, in order to enable the introduction of SDR and CRS (agenda item 1.19). The preparatory work for this agenda item has been done ITU-R Working Party (WP) 1B "Spectrum management methodologies and economic strategies". As the first step, ITU-R WP 1B developed the definitions for CRS and SDR in September 2009. The official ITU definition for CRS is [7] "*a radio system employing technology that allows the system to obtain knowledge of its operational and geographical environment, established policies and its internal state; to dynamically and autonomously adjust its operational parameters and protocols according to its obtained knowledge in order to achieve predefined objectives; and to learn from the results obtained.*" As a second step ITU-R WP 1B finalized the Conference Preparatory Meeting (CPM) text in June 2011. The outcome of WRC-12 will be considered in the OneFIT project.

Starting point for technical studies conducted in ITU-R on CRS have been questions posed by Radio Assembly (RA) in 2007 [8]. Two Working Parties in ITU-R have been active in preparing technical reports on cognitive radio systems: ITU-R WP 5D ”IMT Systems” and ITU-R WP 5A ”Land mobile service excluding IMT; amateur and amateur-satellite service”. IMT refers to International Mobile Telecommunication. For the preparation towards WRC-12 ITU-R WP 5D finalized an ITU-R report ”Cognitive radio systems specific for IMT systems” in October 2011. The purpose of the report is on the impact of adding cognitive radio capabilities to existing IMT systems, identifying IMT specific issues related to CRS, and analysing the benefits, challenges and impacts of CRS in IMT systems. The focus of the report is on intra-operator scenario.
The main responsibility of the technical work regarding the WRC-12 agenda item A1.19 has been assigned to ITU-R WP 5A. For this purpose ITU-R WP 5A developed an ITU-R report ”Introduction to cognitive radio systems in the land mobile service” which was finalized in November 2011. The report provides a brief overview of CRS including an introduction of the technical features and capabilities of CRS, potential benefits, challenges and the deployment scenarios envisaged for CRS. ITU-R WP5A is continuing its work on the CRS and developing a new report tentatively called “Cognitive radio systems [(CRS) applications] in the land mobile service” which contains items that were not found mature enough to be included in the first report on CRS due to the time pressure posed by approaching WRC-12. This second report on CRS will include aspects such as existing and emerging systems employing cognitive capabilities, use cases and potential applications of CRS, a detailed description of the operational techniques of CRS, coexistence both with existing radio systems and between CRSs, technical solutions to enable coexistence and the impact of CRS to the spectrum use. The OneFIT partners have been active in contributing and participating to ITU-R WP5A meetings and promoting control channel related topics in the second report.
Furthermore, national regulators around the world are currently starting discussions related to the definition and work organization of a post-IMT-Advanced initiative. The German regulator BNetzA organized for example a first *ITU Correspondence Group* meeting in Mainz, Germany on 21-Dec-2010. Infineon participated and drove the discussions with a vision on the future evolution of radio standards in 10-years time-frame. The work of OneFIT, in particular related to opportunistic networks and cognitive control channel, is expected to play a key role.

5.2.2 Opportunities within CEPT ECC

OneFIT members are considering options on a possible OneFIT – CEPT regulatory implementation plan. The Groups identified for potential interaction are regulatory affairs (RA), FM, SE and conference preparatory group (CPG).
CEPT ECC Working Group RA has developed a first draft European Communications Committee (ECC) Report on “consideration of the regulatory mechanisms needed to facilitate the introduction of cognitive radio systems (CRS) in the ‘white spaces’ of the frequency band 470-790 MHz”. The Report will focus on different regulatory models for the management of CR databases.
CEPT ECC Working Group SE 43 is investigating the use of cognitive radio systems in the TV white spaces. The outcome of these investigations will be reported in the ECC repo“t "Technical and operational requirements for the operation of cognitive radio systems in t“e "white spa”es" of the frequency band 470-790 ”Hz". The report is mainly band specific, considering sharing scenarios and national deployment scenarios of systems or services to be protected. However, some of the issues may be applicable for other frequency bands.
CEPT ECC WG FM monitors and investigates the CR technological and characteristics development and studies how to regulate the spectrum requirements of such technologies. The working group will receive information by monitoring e.g. the European Union research projects and ETSI. The work was initiated by sending a liaison statement to ETSI in attempt to receive information on which use case scenarios are anticipated to become real first and in which time frame. By doing so, CEPT ECC WG FM wishes to gain knowledge of foreseen CRS characteristics, to the purpose of these cognitive features, to the foreseen applications and services, and to assess possible impacts on spectrum use

and spectrum management. OneFit could influence the group via ETSI RRS as well as by being one of the European projects to be monitored by WG FM.
The preparatory work for the WRC-12 agenda item 1.19 at the European level was done in CEPT ECC CPG PT A. The current draft CEPT Brief includes as an annex, an example for a possible Resolution ITU-R [CR“] "Studies on the implementation and use of cognitive radio systems (C”S)" was annexed to the Brief. It contains a proposal for an ITU-R Resolution which could be adopted by RA-12 to give guidance to ITU-R study groups for studies on the implementation and use of CRS. Follow-up of the scheme relating to this possible Resolution will be taken care of by CPG PTE, which was called to life by CPG12-6. In addition, PTA developed a new preliminary draft ECP echoing the long-settled preliminary CEPT positions in the Brief. A multi country proposal of some CEPT CPG members (including Germany) sent the proposal for an ITU-R Resolution in response to the AI 1.19 in June 2010 to the ITU-R WP 1B.

5.2.3 Opportunities within EC

In February 2010, the Radio Spectrum Policy Group (RSPG) of European Commission (EC) published a first report on cognitive technologies [9]. The report had the objective of informing policy makers in Europe as early as possible of the discussions and challenges raised by these technologies. The use of cognitive radio technologies is seen as an enabler providing more efficient spectrum sharing and providing more dynamic access to spectrum. The report also highlighted that the use of so-called ‘white spaces’ in the UHF band might be one of the first applications of CR. In November RSPG published a draft RSPG Opinion on Cognitive Technologies which is currently under public consultation which includes views on Regulatory implications, Cognitive Functionalities like Sensing, Cognitive Pilot Channel, Database and RSPG recommends concerning CR. OneFit will follow the progress of the RSPG Opinion and contribute to the development as found suitable. In particular which requirements might be relevant to be included in a Harmonised Standard which has to be developed by ETSI.
Within the current process for the revision of the Radio and Telecommunications Terminal Equipment (R&TTE) Directive, Telecommunications Conformity Assessment and Market surveillance (TCAM) intents to use the opportunity to identify regulatory challenges raised by Software Defined Radio (SDR) and consider realistic solutions to them from a variety of points of view in the revised Version ob the R&TTE. Issues addressed included the definition of the subject of conformity assessment, dynamic marking, DoC (Declaration of Conformity) and information requirements for products, security features against inappropriate downloads, allocation of responsibilities for non compliance and enforcement. OneFit will follow the progress of the TCAM and contribute to the development as found suitable. In particular which requirements might be relevant to be included in a harmonised standard which has to be developed by ETSI.
The European Commission (EC) organized a Workshop on Software Defined Radio and Cognitive Radio standardization at the Joint Research Centre in Ispra, Italy on November 17-18, 2011. The purpose of this workshop was to identify the main steps needed to drive the development and use of SDR and CR technologies in Europe, including the elements of a future standardization mandate as well as related regulatory and certification issues, and to define a roadmap to that purpose. BNetzA together with other OneFIT partners (e.g. Intel, Alcatel Lucent) helped to organize the Workshop and prepared presentations to the Workshop (see Table 5.-2) .
The outcome of the Workshop is that the EC will issue a common standardization mandate, including SDR and CR requests, collectively named Reconfigurable Radio System (RRS), for civil security/military and commercial applications:

- A specific request in the commercial area, addressing at least use of TV White Spaces or opportunistic spectrum access.
- In the civil security/military area, a programming phase followed by a standardization phase
- Exploring possible synergies in medium/long term

For the Commercial domain the General aim is:

- To allow CR Devices to comply with EU and national legislation on the placing on the market and the use of radio equipment
- To ensure that implementation of RRS technologies does not create barriers to the Single Market
- To ensure that standardization of RRS happens timely in Europe in order to lead or keep pace with global developments

Specific objectives for a standardization mandate are:

- To develop harmonised standards in order to enable the deployment and use of cognitive radio devices (CRDs) dependent upon information obtained from geo-location databases (GLDB), covering at least use by CRDs of TV White Spaces. The standard should include:
  - The parameters and other information to be exchanged between a CRD and a GLDB
  - The procedures for such information exchange, including security and reliability aspects
  - Discovery and access to GLDBs
  - *An early draft should be available in order to be proposed to early experimentations in Europe*
  - *Actual HSs timing: to be determined*
- To develop other European standards covering:
  - The information to be exchanged between GLDBs
  - In the area of Software Defined Radio:
  - Standards for verification of compliance and secure software update
  - Version logs
- This EC Mandate is a major achievement to serve as base for the development of Harmonized Standards to be used for conformance declaration with the essential requirements of the R&TTE Directive

5.2.4 Summary of the Regulatory Contribution Opportunities

The summary of the ITU-R, CEPT ECC and EC regulatory contribution opportunities for OneFIT project together with the timeplan for the year 2012 is given in Table 5-1.

Table 5-1: Summary and Timeplan for OneFIT Opportunities for Regulation Contributions

Event Name	Location	Date	Description of opportunity
ITU-R Radiocommunication Assembly	Geneva	16-20.01. 2012	Possible adoption of PROPOSED draft ITU-R Resolution on Studies on the implementation and use of cognitive radio systems (CRS)
World Radiocommunication Conference 2012 (WRC-12)	Geneva	23.01 -17.02. 2012	Adoption of a global position concerning Agenda item 1.19 SDR/CR
2nd Public CEPT workshop on cognitive radio and software defined radio.	To be confirmed	May 2012 (to be confirmed)	Presentation of OneFIT activities.
WP5A	Geneva, Switzerland	22.05-01.062012	Contributions on control channels to draft ITU-R report on cognitive radio systems in the land

			mobile service.
WP5A	Geneva, Switzerland	05-16.11.2012	Contributions on control channels to draft ITU-R report on cognitive radio systems in the land mobile service.

5.3 Actions done

The actions that have been made are introduced in Table 5-2.

Table 5-2: OneFIT Regulatory Contributions

Author	Contribution Title	Event Name	Location	Date	Ref
BNetzA	Supporting of the work of the FM Corresponding group for Cognitive Radio Systems	CEPT WG FM	Luxemburg	31.01-02.02.2011	Document
BNetzA	Paul Bender was nominated by CEPT as CEPT Coordinator for Agenda Item 1.19(Cognitive Radio/ Software defined Radio)	CPM (Conference preparatory meeting for WRC 12) Meeting	Geneva, Switzerland	14-25.02.2011	Participation. Agenda Item 1.19 CEPT Coordinator
BNetzA	Proposal for ITU-R Resolution for Cognitive Radio.	CPG PTA meeting	Copenhagen, Denmark	29-31.03.2011	Proposal
BNetzA M. Kurt, R. Liebler, P. Bender	Keynote Speech at DySPAN 2011. Presented by Rainer Liebler	DySPAN	Aachen, Germany	04.05.2011	"Cornerstones of a forward-looking regulatory framework – How to foster investment and innovation"
ETSI TC RRS Chairman OneFIT members M. Mueck, P. Bender, J. Gebert	ETSI WI "Use Cases for Dynamic Declaration of Conformity Dynamic Declaration of Conformity".	ETSI TC-RRS	Aachen Germany	11-12.05.2011	This technical report will define RRS Use Cases related to the introduction of mechanisms to enable the dynamic declaration of conformity with the essential requirements. In particular, this work is tailored to the potential needs of the future version of the R&TTE Directive, which is currently in preparation.
BNetzA	The work of the FM Corresponding group for Cognitive Radio Systems	CEPT WG FM meeting	Miesbach, Germany	16-20.05.2011	Participation and support of the work
Germany (Federal Republic of), Finland, Sweden, Portugal, Netherlands (Kingdom of the), Italy	PROPOSED draft ITU-R Resolution on Studies on the implementation and use of cognitive radio systems (CRS) In Relation to WRC-12 agenda item 1.19	ITU-R WP 1B meeting	Geneva, Switzerland	25.05-01.06.2011	Proposal for an ITU-R Resolution for CRS This document is the base for a proposal to ITU-R WP1B meeting in June 2011, to call for a development of an ITU-R Resolution to provide a

					framework in order to facilitate studies on the technical and operational consideration related to the implementation of CRS technologies in the radio communication services.
BNetzA		CPM (Conference preparatory meeting for WRC 12) Meeting	Oxford, UK	27.05-01.06.2011	Participation
BNETZA		ITU-R WP1B Meeting	Geneva, Switzerland	06-13.06.2011	Participation
BNETZA	Review and contributions to the content of draft ITU-R Report "Cognitive Radio Systems in the Land Mobile Service" [CRS.LMS]	ITU-R WP5A meeting	Geneva, Switzerland	13-24.6.2011	Review and contributions
M. Mustonen M. Matinmikko P. Bender OneFIT Partners	Draft ITU-R Report "First Report on Cognitive Radio Systems in the Land Mobile Service" [CRS.LMS]			09.2011	Review of the draft report
M. Mustonen M. Matinmikko P. Bender OneFIT Partners	Draft ITU-R Report "Cognitive Radio Systems in the Land Mobile Service" [CRS.LMS]			09.2011	Review of the draft report
BNetzA	Support of the work of FM Corresponding group for Cognitive Radio Systems	CEPT WG FM	Lille	17-21.10.2011	Participation and support of the work
BNetzA	Proposal for a ITU-R Resolution for Cognitive	CPG PTE meeting	Copenhagen, Denmark	03.-04.10.2011	Document/ proposal
BNetzA	CEPT position (CEPT Brief) with respect to WRC 12 concerning SDR and CRs	CPG PTA meeting	Copenhagen, Denmark	05-07.10.2011	Further development of the document
BNetzA	Proposal for a ITU-R Resolution for Cognitive	CPG-8 meeting	Bucharest, Romania	01-04.11.2011	Updated proposal/ accepted
P.Bender	A View on the Regulatory context of SDR and Cognitive Radio	European Commission Workshop on Software Defined Radio and Cognitive Radio standardization	Ispra, Italy	17-18.11.2011	Submitted
ETSI TC RRS Chairman plus OneFIT members (M. Mueck, P. Bender, J. Gebert)	Building Standards For SDR and CRS by ETSI TC RRS	European Commission Workshop on Software Defined Radio and Cognitive Radio standardization	Ispra, Italy	17-18.11.2011	Submitted

6. OneFIT Exploitation Plans

The exploitation strategy or exploitation plan will be elaborated and updated during lifetime of the project aiming at the commercial exploitation of the OneFIT project results on a global scale. The exploitation plan integrates individual and joint exploitation plans. OneFIT exploitation of results will be addressed within following contexts:

- Identification of exploitable outcomes;
- Mechanisms to identify and secure IPR;
- Exploitation monitoring.

6.1 Identification of Exploitable Outcomes

The exploitation plan aims to clearly identify exploitable project results and classify them according to their commercial potential, as a first step towards the exploitation of the project results. The consortium will consider the following aspects:

- Identification of the scientific and technical knowledge, products and services (deliverables) of the project susceptible to be exploited and classification of these according to their commercial potential, while foreseeing potential barriers for the exploitation;
- New or renew products, processes or services comparing with the existing products or services in the actual market;
- Relevance of the expected technological innovation (sectorial, national and international newness);
- Technical and economic advantages or improvements considering the actual market;
- Expected final development (prototypes, demonstration cases) for each project results (product, services and processes);
- Expected barriers for the exploitation and knowledge transfer;
- The assessment, at a high-level of the expected impact of the knowledge and technology generated and the factors that would influence their exploitation (such as standardization, regulatory aspects, etc) as well as the wide deployment of OneFIT;

Aside from the consortium exploitation plan, every partner will identify the projects' results relevant to their business and to their individual final exploitation.

6.2 Partner Exploitation Plans

6.2.1 Commercial Exploitation Plans

Specific exploitation strategies differ for the various partners in the OneFIT project, since different markets/segments are addressed. In the sequel, the specific exploitation strategies of the industrial partners are commented in further detail:

Alcatel-Lucent Deutschland AG. Alcatel-Lucent is a major vendor of the mobile infrastructure and network business: radio access network and mobile core network equipment, access points (also femtocell related) and gateways. Alcatel-Lucent has with its Bell Labs one of the largest research, technology and innovation organizations focused on communications. OneFIT will be used to exploit the capabilities of flexible multi-standard base stations to support cognitive network approaches and opportunistic networks e.g. by possibly providing CSCI functionality and supporting the C4MS. OneFIT will be used to open the possibility to address new market segments beyond the classical carrier business in the future, e.g. to use the concepts and technologies for the design of CR equipment for local-area applications like cognitive femtocells. Further on, Alcatel-Lucent will contribute to the dissemination of OneFIT results through publications to journals and conferences as well as with standardization activities in European and international standardization bodies.

Intel Mobile Communications GmbH. Intel Mobile Communications GmbH is actively exploiting OneFIT results for driving standardization, mainly ETSI RRS and 3GPP, in alignment to the company's long-term plans for innovative products. In particular, the introduction of Cognitive Control Channel is seen as an important evolution step in the wireless world and driving standards in this direction is of key interest to Intel. Here, a highly efficient linkage and cooperation with OneFIT has been established. Also, IMC will exploit the OneFIT results in the framework of future integration of a multitude of heterogeneous radio standards onto a single platform, including the mechanisms ensuring an efficient inter-operation of the various wireless standards. Here, the set-up of Opportunistic Networks and exchange of control information via Cognitive Control Channels is key. Indeed, IMC will focus on advanced Multi-Comm features in the future, in particular related to an efficient (possibly joint) exploitation of all available data-pipes. In this context, decision making in the mobile terminal will become increasingly relevant. Obviously, such decision making entities require adequate context information and here the solution of the OneFIT project will be considered for our product implementation plans. In a nutshell, the OneFIT solution is in perfect alignment to IMC's vision related to the evolution of the smart phone market and will help IMC to maintain its lead role.

NEC Technologies (UK) Limited. NEC Technologies (UK) (NTUK) expects to re-use and exploit some of the outcomes of the OneFIT project to build and offer innovative solutions to the telecommunication operator market. Typically, implementing cognitive network concepts like e.g. C4MS in its products range will help NTUK to support the establishment and maintenance of opportunistic networks. Cognitive radio concept is a key opportunity and technical challenge for the telecommunication industry. As one of the major player in this industry, NEC provides all equipments for telecommunication networks: terminals, femtocell access points and gateways, radio access and core network equipments. It is expected that the work in OneFIT will feed in all or part of these various product roadmaps in the 2015-20 timeframe. Finally, NTUK will feed relevant standardization bodies and global industry initiatives (such as ETSI RRS, 3GPP) with all relevant outcomes of OneFIT.

Telefonica Investigacion Y Desarrollo SA. Telefónica I+D is a company 100% owned by the Telefónica group. Its main mission in the group is to develop R&D for business units of the rest of companies of the group, mainly the network operator. Therefore, the results of this project will be exploited both internally and externally. Internally, Telefónica I+D aims to improve several of its in-house radio access network evaluation tools, adding functionalities to address the impact of opportunistic networks and cognitive systems over coverage, routing and congestion-solving. Security procedures are also an important line of work, and a new range of security issues appears when opportunistic networks are tackled. Finally, the provision of policy-based services will probably open new spans of application development. Externally, Telefónica will profit from the development of novel services and products that will generate new revenue streams. Additionally, Telefónica will take advantage from standardisation activities undertaken by OneFIT project, when new opportunistic interfaces and cognitive systems could be deployed in real environments.

Thales Communications & Security S.A. (TCS) will exploit the results of the OneFIT project in order to improve the ad-hoc based products, in particular Wimax ad-hoc specific modes used in the Private Mobile Radios networks. These studies will help to improve the quality of service (QoS) of the communication flows by the instance of opportunistic networks as defined in the OneFIT project. Further on, TCS will contribute to the dissemination of OneFIT results on dedicated conferences as WinnComm'11, on which the TCS work already done in OneFit has been presented.

As described in section 6.4 ,a patent resulted from the TCS work done within Onefit on the multi-flow route co-determination.

6.2.2 Regulatory Exploitation Plans

Bundesnetzagentur (BNetzA) will exploit the results of the OneFIT project together with other project results to create a common and strong European position to drive regulation bodies towards advanced regulatory and spectrum management practices, and to influence standardization bodies to adopt cognitive radio systems features in their discussions and standardization processes. BNetzA is interested in a global approach and is therefore very active at ITU and 3GPP.
BNetzA supports also a flexible regulatory approach for SDR/CR to be developed under the planned revision of the R&TTE directive in order to allow fast innovation of flexible radio systems while ensuring at the same time the efficient use of spectrum. The focus will be, among others, the development of harmonised standard for SDR and CR. A significant event concerning this matter was the EC Workshop on Software Defined Radio and Cognitive Radio standardization at the Joint Research Centre in ISPRA, Italy on November 17 and 18, 2011(for details see Section 5.2.3) .The outcome of the Workshop, the EC standardization mandate for SDR and CR is a major achievement to serve as basefor the development of Harmonized Standards to be used for conformance declaration with the essential requirements of the R&TTE Directive

6.2.3 Research Exploitation Plans

Research institutions involved in OneFIT play prime roles as providers of advanced technology solutions to industrial players. Hence, generation of industrially relevant results and IPR in the commercially promising area of cognitive radio and networks for future heterogeneous communication systems is the most important motivation for their involvement in OneFIT. Detailed exploitation plans of EIT+ and VTT are provided in the following.

Wroclawskie Centrum Badan EIT+ Sp z o.o. As a highly dynamic and innovative research institute, EIT+ seeks to apply the results of its research in industrially relevant contexts. Hence, within the framework of OneFIT, EIT+ will aim at generating IPR that will be usable to European firms and will strengthen the European position in this field. Furthermore, the results of this project will further fuel R&D activities at EIT+ in the direction of developing solutions for efficient interconnection of dynamic opportunistic networks to infrastructure networks. Foremost, solutions for C4MS will be sought. EIT+ will also contribute to the OneFIT dissemination activities through IPR generation and presentations in conferences and publications in relevant journals.
VTT Technical Research Centre of Finland. In OneFIT project VTT will extend its previous research on opportunistic communications to build the C4MS framework. The increased competence of VTT's personnel will be used in future research and development work to benefit European communication and electronics industry via new customer projects related to opportunistic communications. European projects are important for VTT to establish connections to academia and industry to create partnerships. The results created in the project will be disseminated via publications and intellectual property right (IPR) and in the best situation they can lead to new spin-off companies.

6.2.4 Academic Exploitation Plans

Academic partners will exploit their findings in any way that will help to expand their knowledge base and enable them to bring the forefront of technological development into their syllabuses to educate future engineers and computer scientists for the European workforce. Furthermore, by being involved in such advanced research, the institutions will ensure that they stay competitive for future research initiatives. Participation and contribution to a successful OneFIT project will help stimulate spin-off projects with industry partners. The exploitation plans from the academic partners can be summarized as follows:

- Enhance teaching scope and quality by introducing new findings and technologies into the curriculum;

- Present project results to students and university staff in seminars and tutorials;
- Use the project results/learning to make adjustments to their current research directions;
- Position for better cooperation with industrial partners;
- Supervision of PhD theses on areas related to the OneFIT project.

6.3 Mechanisms to Identify and Secure IPR

A methodology for appropriate management of the knowledge generated in the project is needed. The management of knowledge encompasses its use (exploitation and further research) and dissemination (including training). A plan for the use and dissemination of knowledge will be provided and periodically updated internally (every 12 months) describing the innovation related activities (dissemination, exploitation, IPR, etc.) undertaken during the preceding period and those planned for the next 12 months period. A final plan for the use and dissemination of foreground will be delivered at the end of the project.

IPR protection strategy will be according to the interest of the partners and stated in consortium agreement (CA). Background and foreground, pre-existing know-how and knowledge developed in the project for project execution and use are regulated in the CA. The CA is signed by the partners. An active policy of protecting intellectual property will be adopted where applicable. Considering the number of potential applications, advanced IPR strategies can be adopted:

- A new company, composed by all partners (spin-off), which would own the intellectual property concerned and exploit it jointly,
- One or more groups of patents or other IPRs protection means relating to a given technology which could be freely used or cross-licensed among themselves or jointly licensed to third parties according to the default regime for joint ownership foreseen in the FP7 programme.

Main working hypothesis of the Consortium are:

- **Confidentiality**: during the term of the project and beyond (in general several years, but the exact duration to be agreed in the CA), the contractors shall treat as confidential any information, which is designated as property by the disclosing contractors. The same obligations will be imposed on their employees and suppliers;
- **Publication**: during project run-time, any proposed publication or communication by one of the parties (or projects), regarding the media is required to be submitted for the prior written consent of the other contractors;
- **Background (Pre-existing know-how)**: each contractor is and remains the sole owner of its intellectual property and its background. The contractors are identifying and listing the background over which they may grant access rights for the project. The contractors agree that the access rights to the background needed for carrying out their own work under the project shall be granted on a royalty-free basis. Use of existing patents and copyrights by the other partners in the project is secured within the CA.

6.4 Patent

Table 6-2: OneFIT Patent Regulatory Contributions

Author	Patent Title	Location	Submission Date	Ref	Extension expected
M Bourdellès, S.Pega	Procédé pour optimiser les capacités d'un réseau de télécommunications de type ad-hoc	France	07.04.2011	67419	Yes

6.5 Exploitation Monitoring

The exploitation monitoring plan involves:

- Assessment of future feasibility of the solutions developed in the project in the respective marketplaces;
- Technology implementation plan developed for the future commercial deployment of the project results;
- Publications of OneFIT results in international peer-reviewed journals, magazines and book chapters. The editorship of book chapters related to the project research;
- Items have been investigated and are used as a means to externalize OneFIT related work and to document the advances with respect to the current state of art;
- Presentation of results and participation in selected high quality conferences, workshops and summits. In addition, organisation of workshops (and/or special sessions) in large international wireless communication conferences will be exploited;
- Interaction with worldwide research groups, forums and institutes. The OneFIT consortium interacts with worldwide forums and institutes for dissemination of project results as well as cross-fertilization of ideas and concepts;

7. Conclusion and Perspectives

The goal of the OneFIT project is to develop and validate the vision of opportunistic networks that are managed and coordinated with the infrastructure, by advanced cognitive systems. To realize the expected gains of opportunistic networks in terms of enhanced wireless service provision and extended access capabilities for the Future Internet, through higher resource utilization, lower costs, and management decisions with a larger “green” footprint, a wide range of dissemination activities have been identified.

This deliverable has collected the major dissemination activities envisaged for the OneFIT project together with the results produced during 2011. Dissemination activities include publications in books, journals and conferences, white papers, demonstrations, presentations at concertation and cluster meetings, training, and participation in standardization and regulation. A large number of dissemination activities have already been carried out during 2011, including publications, standardization contributions, regulatory contributions, training activities, and presentations in various international forums. On the one hand, inputs to standardization and regulation forums are a sign of practical applicability of the OneFIT project results. On the other hand, an important complementary goal is continue producing high quality scientific results, published in the most prestigious international conferences and journals.

During the forthcoming and last year of the project, the development of powerful demonstrations and proofs-of-concept will allow an even better dissemination of the OneFIT results, building confidence in the concepts and technologies developed by the project.

8. References

[1] ICT OneFIT Project, www.ict-OneFIT.eu/

[2] OneFIT D6.1 "Strategy on Dissemination, Regulation, Standardization, Exploitation, Training", December 2010

[3] Wireless World Research Forum (WWRF), http://www.wireless-world-research.org/

[4] Cost Action IC0902, http://newyork.ing.uniroma1.it/IC0902/

[5] COST Action IC0905, www.cost-terra.org

[6] OneFIT Technical Annex, July 2010

[7] ITU-R Report SM.2152 "Definitions of Software Defined Radio (SDR) and Cognitive Radio System (CRS)", September 2009.

[8] Question ITU-R 241-1/5. 2007. Cognitive radio systems in the mobile service.

[9] Radio Spectrum Policy Group of European Commission Report on "Cognitive Technologies", RSPG10-306, February 2010. Available online: http://www.ictregulationtoolkit.org/en/Publication.3902.html

[10] 3rd Generation Partnership Project (3GPP), http://www.3gpp.org/

[11] European Telecommunications Standard Institute (ETSI), http://www.etsi.org/

[12] Institute of Electrical and Electronics Engineers (IEEE), www.ieee.org

[13] International Telecommunication Union (ITU), http://www.itu.int/home/

[14] European Conference of Postal and Telecommunications Administration (CEPT), http://www.cept.org

[15] Innovative concepts in Peer-to-Peer and network coding, D1.3, Winner+ "http://projects.celtic-initiative.org/winner+"

[16] OneFIT functional and system architecture D2.2

[17] Toward Proximity-aware Internetworking, IEEE wireless Communications, December 2010

[18] 3GPP Study Item for 3GPP Rel-12 on "Proximity-based Services", 3GPP TSG SA Plenary Meeting #53, SP-110638

9. Annex I – Dissemination approach, reporting & mechanism

9.1 Dissemination Approach

Specifically, the dissemination efforts will include the following activities:

- Publications of high quality project results in international peer reviewed journals, magazines and book chapters: Submission and publication of the technological concepts and results achieved by OneFIT, in selected international journals and magazines as well as special issues related to cognitive radio research areas. The editorship of book chapters related to the project research items will be also exploited as a means to externalize OneFIT work and to document the advances of the state-of-the-art achieved by OneFIT;
- Contributions and participation at international conferences, workshops and summits: This dissemination activity concerns the coordinated preparation, submission and presentation of papers in selected highly recognized international conferences and workshops (including Institute of Electrical and Electronic Engineers (IEEE) events such as International Conference on Communications (ICC), Global Communications Conference (GLOBECOM), Vehicular Technology Conference (VTC). In addition, the organization of special sessions in large international mobile communications conferences and workshops will be exploited, fostering the promotion of project work and investigating the positioning of the project achievements in relation to new business opportunities and technological trends;
- Organization of OneFIT workshops: To facilitate targeted dissemination of project results and to ensure high visibility of the OneFIT work within the 7th Framework Programme (FP7). This concerns both the organization of OneFIT public workshops as well as joined workshops. Such common workshops provide venues for interactive exchange of ideas;
- Organization of training events: OneFIT project will organize training events and seminars tailored to facilitate the technology training of individuals within the partner organizations. Likewise, OneFIT will pursue the presentation of public tutorials at large international mobile communications conferences including the Future Networks Mobile Summit, Dynamic Spectrum Access Networks (DySPAN), Wireless Innovation Forum (WInF) Technical Conferences, etc. Such events may also involve the presentation of public available whitepapers and the distribution of suitable dissemination material (i.e. OneFIT CDs, leaflets) to the audience;
- Participation and contributions to EC Concertation and Cluster Meetings: OneFIT partners will actively participate and contribute to Concertation and Cluster meetings, fostering the aggregation of the project work in the unified framework of related European projects;
- Interactions with worldwide forums and institutes: OneFIT will organize interactions with worldwide forums and institutes for the effective dissemination of the project results and the cross-fertilization of ideas and concepts;
- OneFIT online presence: OneFIT will provide a web portal for public dissemination of project information and results. This will include information about the project structure, vision, challenges and objectives as well as all dissemination material.

In line with its obligations regarding dissemination of results and achievements, the PC ensures that all public documents, including, but not restricted to, the following material: Video material covering experiments, demonstrations and trials, animations of "real-time" simulation results, presentations, promotional material (leaflets, posters, press releases, etc.) generated by the project are duly collected in a dissemination package which is associated with the periodic reports. The project

undertakes to establish a website supported by the project partners, to provide a unified view of the project; a snapshot thereof will be included in the dissemination package.

The OneFIT project web site [1] (http://www.ict-onefit.eu/) has been launched at the very early stage of the project (July 2010). It displays the project goals, approach, achievements, dissemination documents, public deliverables, press releases, partners' news, and all late-breaking progress and information to be easily and widely publicized. Sections are also addressing training, interviews, workshops, symposia, etc. The references to the site by other websites are monitored. The management platform of OneFIT and the different tools (Reporter, Reflectors, Wiki…) are accessible from the OneFIT website front page (Partners Log in). The OneFIT project management platform and tools are fully and successfully adopted and used by the overall consortium.
The access to the private section dedicated to the OneFIT consortium partners is available from the public website through a secure connection, each OneFIT partner being identified by unique username and password. The public website also includes specific pages for describing the OneFIT consortium partners (organizations, profiles, key researchers).
OneFIT is building on a specific top-down (PMT), and bottom-up (WP participants) iterative loop. Right from the beginning of the project, the PMT has initiated the OneFIT dissemination opportunities file to collect all dissemination targets for the full project. The next sections present the "Dissemination Reporting", the "Dissemination Mechanism" and the "Dissemination Activities" within OneFIT.

9.2 Dissemination Reporting

The OneFIT dissemination is reported in OneFIT quarterly management reports (QMR) and related deliverables according to the following themes:

- Publication of papers within journals and book chapters;
- Contribution to conferences and events: Papers, presentations, posters, participation to panels;
- Publication and contribution to white papers;
- Publication of specifications;
- (Co-)organisation of workshops;
- Contributions to EC Concertation and Cluster meetings;
- Organization of demonstrations;
- Diffusion of press releases;
- Interviews of OneFIT participants;
- Development of multimedia illustration and related showcase.

The OneFIT standardization/regulatory contributions are reported in OneFIT QMRs and related deliverables according to the following themes:

- Contributions to standardization bodies;
- Contributions to regulatory bodies;
- Contributions to fora.

Reporting OneFIT contributions (only OneFIT co-authors and contribution fully acknowledging OneFIT) and OneFIT related contributions (not only OneFIT co-authors and/or contribution partly acknowledging OneFIT). Dissemination not acknowledging OneFIT, even if including OneFIT co-authors, is not counted as OneFIT dissemination.

9.3 Dissemination Mechanism

The PMT members are identifying from a top-down perspective what may be the candidate targets for OneFIT dissemination and the most appropriate WP to contribute to. The opportunities are analysed within the PMT, then the writing decisions are brought by the WP leader to the WP, defining jointly with the OneFIT WP participants the best co-authorships. The bottom-up component contributing to the OneFIT dissemination approach includes expression from WP participants having identified dissemination targets and potentially initiated specific dissemination, referencing the OneFIT project. This source of opportunities is of high interest and is directly feeding the OneFIT dissemination opportunities file, keeping in mind that the dissemination opportunities use to repeat on a regular yearly basis. The OneFIT dissemination opportunities file is up-dated on a regular basis (twice a month) and stored on the management platform.

No party shall have the right to publish or allow the publishing of any data which constitutes foreground, background or confidential Information of another party, even where such data is amalgamated with such first party's foreground, background or other information, document or material. Any such publication without such other party's written agreement justifies, in addition to any other available remedies, objection to the publication by the party concerned.

A copy of any proposed publication, but at least a draft of such contribution that is sufficiently elaborated to allow the other parties for a substantive assessment whether objections should be raised as described below in connection with or relating to the project shall be sent to the co-ordinator and by the coordinator to the parties at the earliest time possible. Any of the parties may object to the publication within fifteen (15) days after receipt of a copy of the proposed publication on any of the following grounds: (i) that they consider that the protection of the objecting party's foreground would be adversely affected by the proposed publication, (ii) that the proposed publication includes the confidential information of the objecting party, or (iii) the publication of such information would be contrary to the commercial interests of the objecting party. The proposed publication shall not take place until the expiry of the above period of fifteen (15) days. In the absence of any objection within the above mentioned period, it is deemed that the parties agree to the proposed publication. Following the end of the above mentioned period, the coordinator shall inform the parties whether or not any objection has been received.

In the event that an objection is raised on any of the above defined grounds within the above period of fifteen (15) days, the party proposing the publication and the party objecting shall seek in good faith to agree a solution on a timely basis whereby such objection is resolved. Parties cannot be quoted without prior agreement of the related parties in occasions different from technical-scientific ones and, in any case, with advertising aims.