

# FIREweek 2010

future internet research and innovation / barcelona, spain 30 june - 1 july 2010



## Brokerage Event Catalogue



Organizers

## PROFILES

---

<b>Wisebed: Wireless Sensor Networks Testbeds</b>	<b>4</b>
Josep Díaz	
UPC	5

---

<b>LAWA (Longitudinal Analytics of Web Archive data)</b>	<b>6</b>
Dr. Marc Spaniol	
Max-Planck-Institut für Informatik, Saarbücken, Germany	8

---

<b>PERIMETER - User-centric paradigm for seamless mobility in future internet</b>	<b>9</b>
Fikret Sivrikaya	
Technische Universität Berlin / DAI-Labor	10
Martin Dobler, Jens Schumacher	
Vorarlberg University of Applied Sciences	11
Eileen Dillon	
Waterford Institute of Technology	12
María Pérez Ortega	
GFI Informatica	13

---

<b>Wireless Sensor Network Testeds (WISEBED)</b>	<b>14</b>
Prof. Dr. Torsten Braun	
Universität Bern	16
Maick Danckwardt	
Universität zu Lübeck	17

---

<b>PARADISO 2</b>	<b>18</b>
Roland Burger	
Club of Rome	20

---

<b>Experimental UpdateLess Evolutive Routing (EULER)</b>	<b>21</b>
Papadimitriou Dimitri	
Alcatel-Lucent Bell	22
David Coudert	

<b>INRIA</b>	<b>23</b>
<b>Davide Careglio</b>	
<b>Universitat Politècnica de Catalunya (UPC)</b>	<b>24</b>
-----	
<b>CREW</b>	<b>25</b>
<b>Ingrid Moerman</b>	
<b>IBBT</b>	<b>27</b>
-----	
<b>VITAL++ Embedding P2P Technology in Next Generation Networks: A New Communication Paradigm &amp; Experimentation Infrastructure</b>	<b>29</b>
<b>Spyros Denazis</b>	
<b>University of Patras</b>	<b>31</b>
-----	
<b>Self-NET: Self- management of cognitive future internet elements</b>	<b>33</b>
<b>Nancy Alonistioti, Apostolos Kousaridas</b>	
<b>National and Kapodistrian University of Athens</b>	<b>35</b>
-----	
<b>MyFIRE - MULTIDISCIPLINARY NETWORKING OF RESEARCH COMMUNITIES IN FIRE</b>	<b>36</b>
<b>Le Gall Franck &amp; Baumberger Marianne</b>	
<b>inno TSD</b>	<b>38</b>
<b>Alessandro Santiago dos Santos</b>	
<b>Instituto de Pesquisas Tecnológicas do Estado de São Paulo</b>	<b>39</b>
<b>PAVENTHAN Arumugam</b>	
<b>ERNET India</b>	<b>40</b>
<b>Jørgen Friis</b>	
<b>ETSI (European Telecommunication Standards Institute)</b>	<b>41</b>
<b>James Stewart</b>	
<b>University of Edinburgh</b>	<b>42</b>
-----	
<b>N4C Networking for Communications Challenged Communities: Architecture, Test Beds and Innovative Alliances</b>	<b>43</b>
<b>Maria Udén</b>	
<b>Luleå University of Technology (Luleå tekniska universitet) Sweden</b>	<b>44</b>

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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Wisebed: Wireless Sensor Networks Testbeds

### Project Description

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The aim of this project is to provide a multi-level infrastructure of interconnected testbeds of largescale wireless sensor networks for research purposes, pursuing an interdisciplinary approach that integrates the aspects of hardware, software, algorithms, and data. This will demonstrate how heterogeneous small-scale devices and testbeds can be brought together to form well-organized, large-scale structures, rather than just some large network; it will allow research not only at a much larger scale, but also in different quality, due to heterogeneous structure and the ability to deal with dynamic scenarios, both in membership and location.

For the interdisciplinary area of wireless sensor networks, establishing the foundations of distributed, interconnected testbeds for an integrated approach to hardware, software, algorithms, and data will allow a new quality of practical and theoretical collaboration, possibly marking a turning point from individual, hand-tailored solutions to large-scale, integrated ones. For this end, we will engage in implementing recent theoretical results on algorithms, mechanisms and protocols and transform them into software.

We will apply the resulting code to the scrutiny of large-scale simulations and experiments, from which we expect to obtain valuable feedback and derive further requirements, orientations and inputs for the long-term research. We intend to make these distributed laboratories available to the European scientific community, so that other research groups will take advantage of the federated infrastructure. Overall, this means pushing the new paradigm of distributed, self-organizing structures to a different level.

### Project Partners

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UPC	Spain
UNIGE	Switzerland
UNIBE	Switzerland
RATCI	Greece
UNIDE	Neetherlands
UZL	Germany
UBERLIN	Germany
ULANCASTER	England

## Contact Details

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**Name**

Josep Díaz

**Organisation**

UPC

**Job Position**

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## Partner Expertise

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Large networks, algorithms for communication, stochastic processes

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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LAWA (Longitudinal Analytics of Web Archive data)

### Project Description

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#### Project Overview

To support innovative Future Internet applications, we need a deep understanding of Internet content characteristics (size, distribution, form, structure, evolution, dynamic). The LAWA project on Longitudinal Analytics of Web Archive data will build an Internet-based experimental testbed for large-scale data analytics. Its focus is on developing a sustainable infra-structure, scalable methods, and easily usable software tools for aggregating, querying, and analyzing heterogeneous data at Internet scale. Particular emphasis will be given to longitudinal data analysis along the time dimension for Web data that has been crawled over extended time periods.

#### Research Description

LAWA will federate distributed FIRE facilities with the rich Web repository of the European Archive, to create a Virtual Web Observatory and use Web data analytics as a use case study to validate our design. The outcome of our work will enable Internet-scale analysis of data, and bring the content aspect of the Internet on the roadmap of Future Internet Research. In four work packages we will extend the open-source Hadoop software by novel methods for wide-area data access, distributed storage and indexing, scalable data aggregation and data analysis along the time dimension, and automatic classification of Web contents.

#### Target Users and Benefits

LAWA adds value to the FIRE community by offering access to very large datasets, with advanced methods and open-source tools for intelligent analysis. This enables research on the Future Internet with regard to the challenge of content explosion. A Virtual Web Observatory will be created, to support data-intensive experimentation with Web content analytics. A demonstrator is planned which will allow citizens at large to interactively browse, search, and explore born-digital content along the time dimension.

#### Key Objectives

- Web-Scale Data Provisioning  
Methods for large-scale on-demand crawling services that can be used for research purposes, and will optimize Web-content storage for processing.
- Distributed Access to Large-Scale Data Sets  
Smart distribution of data across a wide-area network, coping with low-bandwidth high-latency Internet connections, and developing new techniques for distributed indexing across heterogeneous data stores.
- Web Analytics  
Algorithms and software for systematically aggregating, querying, mining, and analyzing statistical patterns, cross-data dependencies, and temporal patterns and trends, in order to reveal latent knowledge in Web data.

- Virtual Web Observatory  
Services for measuring, mining, and classifying Web-scale data forming the basis of the Virtual Web Observatory (VWO). The VWO will enable experiments-driven research on large-scale Web contents.

## Project Partners

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MAX PLANCK GESELLSCHAFT ZUR FOERDERUNG DER WISSENSCHAFTEN E.V.	Germany
THE HEBREW UNIVERSITY OF JERUSALEM	Israel
STICHTING EUROPEAN ARCHIVE	Netherlands
HUNGARIAN ACADEMY OF SCIENCES	Hungary
HANZO ARCHIVES LIMITED	Great Britain
UNIVERSITY OF PATRAS	Greece

## Contact Details

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### Name

Dr. Marc Spaniol

### Organisation

Max-Planck-Institut für Informatik, Saarbücken, Germany

### Job Position

Post Doctoral Researcher and Deputy Project Coordinator

### Website

<http://www.mpi-inf.mpg.de/~mspaniol/>

## Partner Expertise

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Dr. Marc Spaniol has received a doctorate in computer science from RWTH Aachen University and is now a post doctoral researcher at the Max-Planck-Institut für Informatik (MPI-INF). Within LAWA he serves as deputy project coordinator. His research interests and publications are in the area in the field of Web data quality, temporal Web mining and knowledge evolution. Research in the scope of LAWA aims to bridge the models, algorithmic methods, and architectural paradigms of the three fields of database systems, information retrieval, and data mining. He works in the area of Web archiving and mining, large-scale data processing as well distributed data management. In Web archiving and mining research aims at the creation of high-quality archival strategies, so that the interpretability of contents for later retrieval and analysis is ensured. This goes along with work in large-scale data processing. Here, he investigates information extraction techniques to textual and semi-structured Web sources (e.g., Wikipedia). Finally, in the field of distributed data management studies he studies handling of Web archival data in a distributed and self-organizing way.



## FIRE Week 2010 Brokerage Event Profile

### Project Title

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PERIMETER - User-centric paradigm for seamless mobility in future internet

### Project Description

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PERIMETER's main objective is to establish a new paradigm of user-centricity for advanced networking. In contrast to network-centric approaches, user-centric strategies could achieve true seamless mobility. Putting the user at the centre rather than the operator enables the user to control his or her identity, preferences and credentials, and so seamless mobility is streamlined, enabling mobile users to be "Always Best Connected" in multiple-access multiple-operator networks of the Future Internet.

For that, PERIMETER will develop and implement protocols designed to cope with increased scale, complexity, mobility and requirements for privacy, security, resilience and transparency of the Future Internet. These include appropriate mechanisms for network selection based on Quality of Experience; innovative implementation of "Distributed A3M" protocols for Fast Authentication, Authorisation and Accounting based on privacy-preserving digital identity models. All these mechanisms will be designed to be independent from the underlying networking technology and service provider, so that fast, inter-technology handovers will be possible.

PERIMETER will also develop and implement middleware that support generic Quality of Experience models, signalling and content adaptation, and exemplary extension applications and services for user-centric seamless mobility. The paradigms of user-centric seamless mobility, middleware components and its integrated applications and services will be tested in two large-scale interconnected testbeds on real users, in three cycles of increasingly complex scenarios. The results will be used for assessment of user centricity.

The realization of user-centric paradigm will revolutionise mobile communications. It will impact seamless mobility, issues of security and privacy, standards and future research, and it will maintain Europe's leading position in the race to define and develop the network and service infrastructures of the Future Internet.

### Project Partners

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Technische Universität Berlin / Germany  
DAI-Labor

Vorarlberg University of  
Applied Sciences Austria

Waterford Institute of  
Technology Ireland

GFI Informatica Spain

## Contact Details

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### Name

Fikret Sivrikaya

### Organisation

Technische Universität Berlin / DAI-Labor

### Job Position

Senior Researcher

### Website

[www.dai-labor.de](http://www.dai-labor.de)

## Partner Expertise

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The Distributed Artificial Intelligence Laboratory (DAI-Labor) within Technical University of Berlin (TUB) employs over 100 researchers, post-docs, graduate students, and tech support staff. Since its inception in 1992 the DAI-Labor at TUB has become a bridge between research and industry in the areas of agent technologies, wireless communications, network and mobility management, autonomous security, data mining, and services/applications of these fields. Research at DAI-Labor is being conducted within five Competence Centres (CCs):

- Agent Core Technologies (ACT)
- Network and Mobility (NEMO)
- Information Retrieval and Machine Learning (IRML)
- Next Generation Services (NGS)
- Security (SEC)

The DAI-Labor key competency in the context of ICT-PERIMETER project is “Network & Mobility”, which conducts research in the areas of new network architectures, mobility and QoS support and resource management in multi-technology, multi-operator environments, self-organising & self-managing networks, and autonomous communications. The group maintains a complex state-of-the-art „Beyond-3G” testbed, which was built jointly with the support of Cisco, Sun, Deutsche Telekom and other companies, and supports research on novel access technologies and QoE-enabled telecommunication services. The testbed constantly incorporates new and emerging technologies and provides the basic infrastructure for ongoing and future research projects.

Within the PERIMETER project, DAI-Labor/TUB focuses on the design and development of the core middleware component for making network access and mobility decisions based on application requirements, user preferences, network measurements, and context information. Moreover, the „Beyond-3G” testbed at TUB forms one leg of the federated PERIMETER testbed, which is connected to the other leg at Waterford Institute of Technology in Ireland. Leading the test and assessment work package in the project, TUB hosts the heterogeneous network access part of the federated testbed and will employ living lab methodologies in the last phase of the 3-phase project development and testing cycle.

DAI-Labor at TUB has been involved in many large scale projects at national and European levels, including OBAN, Daidalos, BIB3R, ScaleNet, and StrokeNet. TUB is also one of the leading partners in the upcoming EU-ICT project ULOOP (User-centric Wireless Local Loop), scheduled to start in September 2010.

## Contact Details

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### Name

Martin Dobler, Jens Schumacher

### Organisation

Vorarlberg University of Applied Sciences

### Job position

Research Assistant, Lecturer

### Website

[www.fhv.at](http://www.fhv.at)

## Partner Expertise

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The University of Applied Science Vorarlberg has a proven track record in creating solutions with over 100 companies and organisations worldwide and in acquiring extensive funding and grants. The FHV cooperates with Industry in pre-competitive and competitive research in order to come up with innovative solutions in the area of applied research. As a university of applied sciences the University of Applied Science Vorarlberg is focused on working together with business and industry, namely learning from each other to what is possible in the research laboratory and in the real-work context. In its joint ventures with business and industry, the University has channelled its resources into three strategic areas: Micro technology; User-centred technologies; Product and process engineering. The University has gladly provided solutions for SMEs as well as for world-class companies.

FHV is currently involved in three large-scale testbeds related projects:

**CoreLabs (EP# 35065)**, with the objective to establishing a coordinated European programme of Co-Creative Living Labs for a New European Innovation Infrastructure.”

**Tell-Me (EP#610175)**, aiming at providing a “turnkey“ solution for the configuration, implementation and maintenance of Living Labs at national and international level.

**Living Lab Vorarlberg**, is a basic research study for supporting the sustainability of products in the development and utilisation phase by applying the Living Lab approach.

## Contact Details

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**Name**

Eileen Dillon

**Organisation**

Waterford Institute of Technology

**Job position**

Research Assistant

**Website**

[www.wit.ie](http://www.wit.ie)

## Partner Expertise

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The Telecommunications Software & Systems Group (TSSG) is a research centre within the WIT, and the group can rightly claim its place as Ireland's largest communications software research centre. Since its foundation in 1996, the TSSG has grown to 115 active staff and students, two-thirds of which are professional researchers. From its outset, the TSSG has carried out research in communications, including topics such as mobility, security, autonomies, software development tools, pervasive computing and networked multimedia. The TSSG is the "Irish National IPv6 Centre" and is responsible for driving IPv6 related Research & Innovation activities in Ireland.

In IST FP5, the TSSG was project manager of ALBATROSS, FLEXWORK and OPIUM. OPIUM is directly related to the PERIMETER concept in that through the project innovative software and services for mobile devices were designed, developed, and successfully trialled in a Pan-European OSA-Parlay Testbed, eventually used in an ETSI Parlay Interoperability Event. In IST FP6, the TSSG were prime contactors on the Daidalos, DBE, SEINIT, ENABLE and CoreLabs projects, and coordinators and project managers of the SecurIST project. On these, the TSSG was WP leader in the testbed, field trials and validation & verification tasks. The ENABLE project is directly relates to PERIMETER, as the TSSG are WP leaders in integration & validation, and are looking to validate enhancements of Mobile IPv6 to enable offering of transparent terminal mobility in large operational networks including multiple administrative domains and heterogeneous access technologies.

## Contact Details

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### Name

María Pérez Ortega

### Organisation

GFI Informatica

### Job position

Programme Manager

### Website

[www.gfi.es](http://www.gfi.es)

## Partner Expertise

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GFI Informática forms part of the GFI International Group, a multinational services company in the field of the Information Technologies. In Spain, GFI Informática operates in Alicante, Barcelona, Bilbao, Madrid, Pamplona, San Sebastián, Seville, Valencia, Valladolid and Vitoria, and counts with more than 1200 professionals. GFI Informática has presence in all the sectors of the market, collaborating with clients like Telephone Group, Vodafone, Madrid Box, Iberia, Community of Madrid, Basque Government, Caser, RENFE, Grupo Repsol, Bank of Spain, etc.

GFI Informática provides global solutions to their clients in all related to Information Systems, Consultancy, Design and Conception, Development and Implementation, as well as in Evolutionary and Corrective Maintenance and the Support to Systems and Applications in Production. Our consultants and projects development staff have a wide experience in processes improvement, content management, distributed systems, I\*Net architectures, integration and tests, focused towards "mission critical" applications. GFI Informática provides a complete range of services and solutions (especially on all the BEA Systems Platform), guaranteed by certification ISO 9001.

More recently, and in order to exploit very specialized market branches, GFI participates in companies like AST (biometrics systems) or SAVAC (sanitary information systems).

As technical and managerial partner, GFI has been involved in European projects since 1998 contributing with its effort and knowledge to their innovative solutions. Hypermedia, IRMA, TerreGov, PIM, Pallianet and currently Demos@Work, U@MareNostrum and FIT4Green are good examples of GFI's experience in this European environment, being coordinators and/or technical leaders of several of them.

In PERIMETER, GFI participate in all aspects of the project, with special attention to management of as the coordinator as well as the leverage their experience in SOA for telecom in applications and services in converging networks (WP4), integration (WP5) and testing (WP7, 9)

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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Wireless Sensor Network Testbeds (WISEBED)

### Project Description

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The aim of WISEBED is to provide an infrastructure of interconnected test beds of large-scale wireless sensor networks for research and experimentation purposes. The Wisebed experimentation infrastructure

- interconnects different test beds across Europe and forms a federation of distributed test laboratories.
- interconnects the wireless sensor network testbeds with the Internet and especially with other test beds from FIRE in order to provide a virtual laboratory to enable testing and benchmarking in a controlled way.
- allows researchers to use the experimentation facilities remotely, thus reducing the need for a local, private test bed and, more importantly, reducing the cost for research.
- integrates simulated and physical sensor nodes to support large-scale sensor network experiments.
- interconnects heterogeneous and previously incompatible sensor nodes among each other. Thus a user is able to set up a testbed with nodes equipped with different sensors, memory sizes and energy supplies.
- enables virtual topologies on top of the physical topology of the local testbeds to give a specialized testbed to the users hand.
- supports code independence by using different hardware available across the various testbeds. Several testbeds even include mobile sensor nodes and outdoor deployments.
- provides services for allowing algorithms and applications to be tested in large-scale environments.
- provides a repository of algorithms, mechanisms and protocols (Wiselib library) that can be directly used in future applications and experiments as reference for benchmarking purposes.
- has developed a sophisticated testbed management system including federated authentication and authorization using single sign-on, allocation and reservation of testbeds and sensor nodes, deployment of experiment software, and experiment monitoring. The testbed management system can be adapted to other wired/wireless testbed architectures.
- collects traces of data from the physical environment and derive models of real-life situations and scenarios. These scenarios will be used to evaluate the performance of algorithms and systems and draw conclusions on their operation and how it can be improved.

Wisebed will make the distributed laboratory available to the European research community. The software to use the testbed or to integrate an own testbed in the WISEBED facility will be available in a ready to run packet including documentation and tutorials.

## Project Partners

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Universität zu Lübeck	Germany
TU Braunschweig	Germany
FU Berlin	Germany
TU Delft	Netherlands
Universitat Politecnica de Catalunya	Spain
Research Academic Computer Technology Institute	Greece
Lancaster University	United Kingdom
Université de Genève	Switzerland
Universität Bern	Switzerland

## Contact Details

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### Name

Prof. Dr. Torsten Braun

### Organisation

Universität Bern

### Job position

Professor in Computer Science

### Website

[www.iam.unibe.ch/~rvs](http://www.iam.unibe.ch/~rvs)

## Partner Expertise

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Universität Bern has strong experiences in the areas of

- network management
- network security
- wireless sensor networks
- wireless mesh networks
- mobile ad-hoc networks
- energy-efficient protocols for wireless sensor/mesh networks
- network virtualization, and
- Internet-based experimentation facilities.

Universität Bern has developed Wisebed's testbed management system "Testbed Management Architecture for Wireless Sensor Network Testbeds" (TARWIS).

Access control is ensured by a distributed, federated authentication and authorization system based on Shibboleth, which compatible to the eduGAIN service provided by GÉANT.

A graphical user interface has been developed allowing users to schedule, execute, monitor, and analyse distributed wireless sensor network experiments. Several services are accessible via an iPhone application.

Universität Bern is operating an in-door wireless sensor/mesh network testbed.

Moreover, Universität Bern is participating in the European GpENI activity, an infrastructure project within the GENI program in the US. There, the GpENI (Great Plains Environment for Network Innovation) network testbed is being extended to Europe.

Universität Bern is member of COST Actions IC0804 (Energy efficiency in large scale distributed systems) and IC0906 (Wireless Networking for Moving Objects).



## Contact Details

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### Name

Maick Danckwardt

### Organisation

Universität zu Lübeck

### Job position

PhD student at the Institute of Telematics

### Website

<http://www.itm.uni-luebeck.de/users/danckwardt/>

## Partner Expertise

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The Institute of Telematics (ITM) is active in the research field of protocols, algorithms, and applications for communication in Networks and Distributed Systems. One major topic is the experimental research with our wireless network simulator SHAWN and our sensor node testbed projects FleGSens, WISEBED, Real-World G-Lab and FRONTS. On the other hand the ITM has experience in communication infrastructures for health care systems and distributed car to car networks.

ITM is the coordinator of the WISEBED project. We specified a set of APIs for the sub-components of the WISEBED management system and developed a so called federator to be able to interconnect the different testbed instances among each other. Using this federator the different testbeds look like one testbed laboratory for the end user. Furthermore, we focus on a tunnelling technique for wireless sensor nodes called "virtual links". With this virtual links we are able to interconnect nodes that are not in communication range, consist of incompatible radio interfaces or even physical nodes with simulated ones. The user application running on the nodes can not tell if a message was received via the radio interface or if it was injected via a virtual link. This technique is one of the key components to establish a federated heterogeneous sensor network testbed.

The WISEBED testbed located at University of Lübeck consist of 200 sensor nodes of three different hardware types and includes mobile and solar powered outdoor nodes.

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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PARADISO 2

### Project Description

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Wouldn't it paradoxical that, to a large extent, the "Future Internet" is explored today without exploring what the future of our societies might be...

If it is today well acknowledged that the world has profoundly changed during the last decades, it has to be acknowledged too that the world will probably profoundly change in the next decades in order to avoid major risks of breakdown.

Industrialized, emerging and developing countries will therefore need to agree, sooner or later, on an alternative way forward based on a true sustainable development, more sustainable economic and financial models, more equally shared resources. What is at stake if of course, ultimately, the wellbeing of all citizens of the world, to be measured by new indexes going beyond GDP.

Therefore, designing the Internet of the future is not only a question of technological developments, of user-centric approaches, of socio-economics issues. And even if it is not easy to predict the future, it doesn't mean we can't prepare for it.

The PARADISO project, defined in early 2007 and selected at ICT Call 1, has already advocated and explored this probable paradigm shift in global societal developments through the "PARADISO reference document". It thus appeared quite visionary and timely when the present economic and financial crisis expanded during the year 2008, which is probably one of the reasons of the significant project impact.

The PARADISO2 project, selected at ICT Call 4, will build on the assets and achievements of the PARADISO project and will be:

- more focused: while "PARADISO1" was encompassing the ICT sector at large, PARADISO2 will specifically focus on the Future Internet,
- more concrete: the two facets of the problem ("how should societies evolve" and "which FI can be suited to these societies") will be further explored, including functional and technological specification of the envisioned Future Internet, and recommendations concerning research to be developed in the framework of FP8.

The PARADISO2 project counts on the involvement of a multidisciplinary high-level expert panel composed of around 25 representatives of leading institutions, companies, research institutes, and NGOs from Europe and all over the world.

## **Project Partners**

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Sigma Orionis (coordinator)	France
Club of Rome	Italy

## Contact Details

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**Name**

Roland Burger

**Organisation**

Club of Rome

**Job position**

Member of the Board, Italian chapter of the Club of Rome

**Website**

[www.clubofrome.it](http://www.clubofrome.it)

## Partner Expertise

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Born in 1969, Italy. Studied Economics and Information Technology at the Catholic University in Milan. Degree in Business Japanese from Bocconi University/JETRO, Milan. Member of the Club of Rome think tank and project leader on ICT & Sustainable Development. Organizer of the Digital World Conference series together with UNESCO and Club of Rome towards the World Summit on the Information Society in Tunis (WSIS 2003/2005). Organized presentation of the \$100 Laptop in Tunis in November 2005 together with Prof. Nicholas Negroponte of MIT Media Lab and the presentation to International Government Representatives. Fellow of the Digital Vision Laboratory, Stanford University. Member of the American Association for the Advancement of Science AAAS, ACM. Member of the Council of the Club of Rome Aurelio PECCEI Foundation, Rome.

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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Experimental UpdateLess Evolutive Routing (EULER)

### Project Description

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The EULER project will develop new models and tools to extensively analyse the Internet topology, to accurately and reliably measure its properties, and to precisely characterize its evolution. These models, that will better reflect the dynamics and the evolution of the network together with its policy, will be used to derive useful properties and metrics for designing routing schemes and provide relevant experimental scenarios. The present project will also develop appropriate tools to evaluate the performance of the proposed routing schemes on large-scale topologies (of order of 10.000 nodes or even more).

The focus of this research project is the introduction of new routing schemes that i) produce routing paths whose stretch is bounded and independent of the network size, and ii) store corresponding entries in routing tables whose memory size is sub-linear in the number of nodes based on the exploitation of unique properties of the Internet topology. These properties offer the possibility to design a routing scheme using a metric space that would significantly reduce the amount of routing updates required to timely maintain non-local but consistent knowledge about the topology.

Prototype of the designed routing protocols as well as their functional validation and performance evaluation on the iLab-T experimental facility and/or other FIRE experimental facilities such as PlanetLab/OneLab will be performed. These experiments will allow validating the proposed routing schemes under realistic running conditions.

### Project Partners

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Alcatel-Lucent Bell	Belgium
Institut National de Recherche en Informatique et Automatique (INRIA)	France
Interdisciplinair Instituut voor BreedBand Technologie (IBBT)	Belgium
Universite Pierre Marie Curie (UPMC)	France
Universite Catholique de Louvain (UCL)	Belgium
Research Academic Computer Technology Institute (RACTI)	Greece
Universitat Politecnica de Catalunya (UPC)	Spain

## Contact Details

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**Name**

Papadimitriou Dimitri

**Organisation**

Alcatel-Lucent Bell

**Job position**

Principal Research Engineer

**Website**

## Partner Expertise

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Alcatel-Lucent Bell (ALB) has achieved a wide and in-depth expertise in routing research domain including distributed routing algorithmic, routing system architecture, routing scheme design, traffic engineering and routing protocols. ALB is also experience in Internet topology modelling, analysis, and mining, as well as performance modelling and performance analysis of distributed routing algorithms and systems.

ALB is also active in various standardization bodies of direct interest to the EULER project such as the Internet Research Task Force (IRTF) and Internet Engineering Task Force (IETF) where it is actively involved in IP routing, IP/MPLS and MPLS-TE efforts as well as various Routing and Internet Area activities.

ALB has been prime contractor of many European IST projects such as FP7 EIFFEL, ECODE, and TA2, FP6 MUSE and MUSE2, FP5 ATRIUM, GIANT and TEQUILLA, as well as Eureka projects such as ITEA TBONES, CELTIC TIGER and RUBENS. Alcatel-Lucent is also involved in ETP (NEM, NESSI, and e-Mobility) and NoE (CONTENT).

## Contact Details

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### Name

David Coudert

### Organisation

INRIA

### Job position

Senior Research Scientist

### Website

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## Partner Expertise

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The EULER project involves participants from 3 INRIA project-teams, namely:

o) MASCOTTE (a joint team with University of Nice Sophia and CNRS) develop methods, tools and software for efficient use of telecommunication networks. This involves a high level research in the fields of simulation, algorithms and discrete mathematics. MASCOTTE has developed industrial collaborations with various partners such as France Telecom and Alcatel-Lucent for the design and optimization of telecommunication networks. For example it has participated in the CRC CORSO with Orange Labs (2003-2008) and is currently involved in a contract with Alcatel-Lucent-Bell on dynamic compact routing. MASCOTTE has also been involved in various R&D projects funded by the EU: FET CRESCCO 2003-2006, RTN ARACNE, IST FET AEOLUS, and COST 293 GRAAL.

o) GANG (a joint team with CNRS and University Paris Diderot) focuses on algorithm design for large-scale networks using structural properties of these networks. Application domains include the development of optimized protocols for large dynamic networks such as mobile networks or overlay networks over Internet such as peer-to-peer applications, and the navigability of social networks. GANG tools come from recent advances in the field of graph algorithms both in centralized and distributed settings. In particular, this includes graph decomposition and geometric properties (such as low doubling dimension, low dimension embedding, etc.). It was involved in EU action COST 295 DYNAMO.

o) CEPAGE (a joint team with CNRS and University of Bordeaux) members have strong skills in the techniques dedicated to graphs decomposition, searchability properties in large networks and data mining. CEPAGE is specialized in algorithms of compact routing, economic broadcast and perpetual exploration of networks. CEPAGE's main contributions are the study of models allowing dynamicity and errors. It was involved in EU action COST 295 DYNAMO.

## Contact Details

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### Name

Davide Careglio

### Organisation

Universitat Politècnica de Catalunya (UPC)

### Job position

Associate professor

### Website

<http://people.ac.upc.edu/careglio>

## Partner Expertise

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The EULER project involves participants from a Joint Research Unit (JRU) belonging to two different universities: Universitat Politècnica de Catalunya (UPC) and Universitat de Girona (UdG).

UPC is a public university devoted to high level education and research excellence in engineering. The participation of the UPC in the EULER project will be carried out by the Advanced Broadband Communications Centre (CCABA: <http://www.ccaba.upc.edu>), which integrates several UPC research groups with interests in complementary communications fields.

CCABA has participated in many projects of the different European Framework Programs (FPs). Within the 6th FP, we participated in the Integrated Projects EuQoS and NOBEL (phases I and II), and in the e-Photon/ONe, E-NEXT and CONTENT Networks of Excellence. Concerning the 7th FP, we are involved in IP STRONGEST, STREP DICONET and NoE BONE projects. We were also active in the COST actions (COST 263, 266 and 291) and currently we are participating in COST IC0703 (Data Traffic Monitoring and Analysis – TMA: theory, techniques, tools and applications for the future networks) and COST IC0804 (Energy efficiency in large scale distributed systems).

CCABA members focus on the development of methods and tools for traffic monitoring, characterization, and analysis, on the design of algorithm and protocols for traffic engineering, traffic management, distributed control plane, and packet scheduling, and on the experimentation of field-trial prototypes.



## FIRE Week 2010 Brokerage Event Profile

### Project Title

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CREW

### Project Description

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The main target of CREW is to establish an open federated test platform, which facilitates experimentally- driven research on advanced spectrum sensing, cognitive radio and cognitive networking strategies in view of horizontal and vertical spectrum sharing in licensed and unlicensed bands.

The CREW platform incorporates 4 individual wireless testbeds (heterogeneous ISM @ IBBT-Gent, heterogeneous licensed @ TCD-Dublin, cellular @ TUD-Dresden, wireless sensor @ TUB-Berlin) augmented with SoA cognitive sensing platforms from IMEC (Belgium) and TCF (France).

CREW will physically and virtually federate components by linking together software and hardware entities from different partners using a standardized API, realizing advanced cognitive sensing functionality. In addition, the CREW federation will establish a benchmarking framework, enabling experiments under controlled and reproducible test conditions and providing methodologies for automated performance analysis, allowing a fair comparison between different cognitive concepts or between subsequent developments. Data sets created under benchmarked conditions according to a common data structure enable the emulation of CREW components in other experimental or simulation environments.

The basic CREW federation will be operational at the end of the first year for external use. Through two open calls (at month 12 and month 24) external experimenters will be attracted for using the CREW platform, leading to an open and demand-driven expansion of the federation and its usage.

Along with the federation activities, a strong interaction with the FIRE coordination and support actions will be realized, hereby ensuring maximal compliance of the CREW platform to the overall vision of the FIRE facilities.

Finally, the CREW project will implement a sustainability business model for exploitation of the federated testbed from year 4 on and beyond the project.

## Project Partners

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Interdisciplinary Institute for Broadband Technology VZW (IBBT)	Belgium
Interuniversity Microelectronics Center VZW (IMEC)	Belgium
Trinity College Dublin (TCD)	Ireland
Technische Universität Berlin (TUB)	Germany
Technische Universität Dresden (TUD)	Germany
THALES Communications France (TCF)	France
EADS	Germany

## Contact Details

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### Name

Ingrid Moerman

### Organisation

IBBT

### Job position

Group leader Mobile & Wireless networks – coordinator of CREW

### Website

[www.ibbt.be](http://www.ibbt.be)

## Partner Expertise

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The IBBT (Interdisciplinary Institute for Broadband Technology [www.ibbt.be](http://www.ibbt.be)) is an interdisciplinary research institute for ICT innovation in Flanders, Belgium. It has been established in 2004 by the Flemish government as a Strategic Research Centre in view of the emerging e-society. It has today over 600 researchers dealing with the technological, economic, legal and social dimensions of the development and exploitation of broadband services. The IBBT-IBCN (INTEC Broadband Communication Networks) research group, where Ingrid Moerman belongs to, counts around 120 members, specialised in various technology aspects of both fixed and wireless networks, the related services and supporting software and the techno-economic evaluation of the future internet. The expertise on mobile and wireless networking covers the following research areas:

- Wireless sensor networks
- Cooperative and cognitive networks
- Wireless access
- Self-organizing distribute networks

In the broad range of research domains mentioned above, the IBCN group combines theoretical top-down research and development with validation, experimentation and proof-of-concept. As such, the group has developed the following set of competences across its research domains:

- Design and development of innovative protocols and algorithms and network architectures.
- Network-level simulation and validation
- IBCN's competence of validation, experimentation and proof-of-concept is guaranteed through an extensive set of prototyping, emulation, and testbed evaluation & exploitation technologies and practices.

IBBT iLab.t provides extended test facilities for evaluating the technical feasibility of ICT innovation (more info: see <http://ilabt.ibbt.be/>). Lab.t contains an extensive set of user devices, network technologies, and advanced testing and measurement equipment, and has adequate network connectivity. The floor space covers around 500m<sup>2</sup>, with currently approx. 80 racks, or 3300 units, which is about 2/3 of the maximum capacity. There are 550+ Linux nodes, and various technologies like IP, Ethernet, xDSL and coax access are used. In addition to a wired testbed, iLab.t includes a significant wireless testbed, Virtual Wall emulation facilities, an operational GRID network, file-based production, video testing and physical layer facilities.

The iLab.t Wireless Lab is an extensive wireless mesh and sensor network infrastructure installed at IBBT office premises. It consists of 400 IEEE 802.11 wireless mesh network nodes and 200

sensor nodes, supporting a mix of sensor platforms. Its unique features include power control and measurement, and environmental emulation on all nodes. Easy deployment of specific software (protocols, middleware components ...) is available. The iLab.t Wireless Lab allows for easy and flexible testing of functionality and performance, of stress, interference and scalability, and log of the sensor and WLAN nodes' events.

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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VITAL++

Embedding P2P Technology in Next Generation Networks: A New Communication Paradigm & Experimentation Infrastructure

### Project Description

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Emerging types of applications, rich in user-created or provider-created content, enabled by P2P technology, with high demands for network resources are rapidly changing the landscape of network requirements and operations creating new challenges in network and service management, configuration, deployment, protocols etc. P2P is primarily a technology that fosters self-deployment and self-organisation, thus, reducing operational costs, while it achieves optimised resource utilisation for the deployed applications and services. In contrast, IMS as a control plane technology primarily addresses issues of heterogeneity of access technologies, addressing schemes, AAA, security and mobility management.

VITAL++ major objective is to combine and experiment with the best of the two worlds, namely, IMS-like control plane functionality and P2P technology giving rise into a new communication paradigm that will bring a wide range of benefits. The key to achieving this objective is to put this paradigm under strenuous experimentation, carried out under realistic network conditions using popular applications. To this end, VITAL++ is putting together a pan-European testbed comprised of existing geographically distributed test sites integrated by IMS technology. This will be thoroughly tested by reference content applications and services that use P2P technology as a means for their distribution and achieving satisfactory QoS levels through network resource optimisation algorithms rather than non-scalable QoS reservation operations.

**VITAL++ mainly aspires at defining and illustrating a new communication paradigm** that will demonstrate how content-based applications and services, highly heterogeneous in terms of user functions and distributed in the network, can be enrolled in the frame designated by the operations of traditional telecommunication networks and thus be made widely available to the users with proper Quality of Service, security and adequate privacy. VITAL++ will use the IMS technology to introduce its paradigm, targeting at the following technological objectives:

Define methods for binding P2P technology applications with the user oriented concepts of call setup and administration of the NGN networks.

- Define methods for binding the QoS mechanisms of NGN networks with the highly distributed nature of the P2P applications and their mechanisms for discovering and managing various types of content.
- Define mechanisms for secure content delivery.
- Integrate within the P2P applications the framework of user identification and authentication.

- Designate a generic frame of P2P integration with NGN networks that will include:
  - Perception of P2P services.
  - Terminal issues and user operations (e.g. mobility management).
  - Business models for P2P exploitation in NGN networks.
- Building on the VITAL++ platform, create a prototype network environment that will integrate P2P applications and perform extensive experimentation on the new communication paradigm through appropriate trial scenarios.
- Demonstrate a number of P2P application trials involving real time content like video, audio and multimedia.
- Use the technological knowledge of the project for contributions to standardisation bodies, scientific magazines, conferences and related events.

## **Project Partners**

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University of Patras	Greece
Telefonica I+D	Spain
Fraunhofer Fokus	Germany
Rundfunk Berlin-Brandenburg	Germany
Blue Chip Technologies S.A	Greece
Centre for Technological Research of Crete	Greece
Waterford Institute of Technology	Ireland
Telekom Austria TA AG	Austria
Voiceglobe Belgium Sprl.	Belgium

## Contact Details

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### Name

Spyros Denazis

### Organisation

University of Patras

### Job position

Assistant Professor

### Website

<http://www.wcl.ece.upatras.gr/network-architecture>

## Partner Expertise

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Network Architectures and Management Group (NAMaG) is led by Assistant Professor Spyros Denazis in collaboration with Prof. Odysseas Koufopavlou and is currently comprised of 10 Phd students, 1 postdoc, 3 research fellows and one network administrator. The research work that has been carried out by our group during the last 4-5 years resulted in innovative concepts followed by their implementations that can be exploited in the context of Future Internet, Content Distribution, Identity Management and Large scale experimentation.

In this document we focus and elaborate on our work on Content distribution, in particular in the areas of content distribution our work focuses on the areas of live streaming and video on demand by means of Peer-to-Peer systems. This work has been mainly carried out in the Vital++ project ([www.ict-vitalpp.eu](http://www.ict-vitalpp.eu)) although it started well before this project. The result of this research activity has led us to this conclusion: “building content distribution systems through P2P requires a holistic approach according to which the scheduler should be co-designed with the P2P overlay for optimal content distribution”. Having this in mind we have designed and built a locality aware (mesh) overlay that organizes the peers in such a way that the neighbors in the overlay are also physically close to each other in the underlying network. Taking this into account, our scheduler has been designed so as it exploits this feature (locality) of the overlay resulting in considerable reductions in the setup time and increased adaptability and robustness in dynamic network conditions (congestion) and peer behavior (churn). We note here that our overlay is self-organised and self-adaptable due to our distributed algorithms that we have designed and built in our system.

Furthermore, our work is not just theoretic and simulation based but we have built a P2P engine (P2P client) that implements our P2P architecture (overlay and scheduler) and we have initially tested it in some VITAL++ scenarios. The P2P engine has been integrated in the VITAL++ client that is comprised of an IMS client and the P2P engine. We are about to engage ourselves in a large scale experimentation that involves real users from the university campus in order to face real conditions and refine our P2P engine.

Part of our expertise stems from our involvement in VITAL++ which is coordinated by our group and aims at integrating NGN functionality and operations with P2P technology. To this end, we have contributed to the overall VITAL++ architecture that allows NGNs to use P2P in such a way that a number of criteria are met, with most prominent being authentication of peers, DRM, and QoS. Based on our experience in working with VITAL++ it is evident that in future networks, content distribution could take advantage of P2P mechanisms by exploiting idle resources in the operator’s network thus greatly reducing the cost of content delivery.

The research and experimentation is carried out using our testbed which is an IMS system extended with some additional architectural components as specified by VITAL++ architecture,

namely, Content Index subarchitecture and Overlay Management sub-architecture. This testbed is currently connected with the PASIPHAE audiovisual platform Technological Educational Institute in Crete allowing us access to a larger user group and geographical area in order to carry out experimentation planned in VITAL++. It is also connected with the IMS platforms of Telefonica, Fraunhofer Fokus in Berlin and Telekom Austria in order to run multimedia experimentation in collaboration with RBB a broadcaster in Berlin.

Currently, we are researching mechanisms that will facilitate cooperation between the overlay and the underlying network for increasing efficiency of content distribution. In addition, having realized that different architectures of P2P overlays (structured, unstructured etc) are suitable for different application domains, we are designing our P2P engine as a modular architecture that allows third parties to plug-and-play their own overlays, schedulers etc in order to dynamically built P2P engines customized for specific application domains. Finally, we are enhancing the features of our P2P technology with real time measurements and statistics using a scalable sampling technique that will allow our P2P algorithms and schedulers to use more accurate estimates which will greatly improve their efficiency.



## FIRE Week 2010 Brokerage Event Profile

### Project Title

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Self-NET: Self- management of cognitive future internet elements

### Project Description

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Self-NET shall engineer the Future Internet based on cognitive behaviour with a high degree of autonomy, by proposing the operation of self-managed Future Internet elements around a novel hierarchical feedback-control cycle. The Self-NET concepts are based on a hierarchical Distributed Cognitive cycle for System & Network Management (DC-SNM) which aims at facilitating the promotion of distributed management. The management approach encompasses a hierarchical distribution of cognitive cycles, breaking down the execution and decision making levels to (autonomic) network elements, network domain types and up to the service provider realm in order to address management, dynamic organisation and (re)configuration of future internet elements.

### Research Description

Self-NET key outcome is the specification, engineering and experimentation on network elements high autonomy in order to allow distributed management, fast decisions, and continuous local optimization. The overall design is based on the paradigms of self-awareness, self-management/self-governance, self-organisation and self-optimisation and on the hierarchical Distributed Cognitive cycle for System & Network Management (DC-SNM). The DC-SNM model is the reference model for Autonomic Internet Elements' functionality and behaviour. An Autonomic Element may be a network element (e.g., router, server, base station), a network management system, or any software element that lies at the service layer. The major phases of the DC-SNM follow the Generic Cognitive Cycle (Monitoring-Decision making-Execute) steps but are reiterated in order to perform similar steps in networking or domain layer abstractions, thus virtualising the notion of the autonomic internet elements (encompassing also internet clusters, network neighbourhoods, communities etc.). In this way a knowledge plane can be accommodated throughout the internet enabling cognitive operations and behaviour (e.g., cognitive management, cognitive ARQ operations, cognitive IP component functions, cognitive routing).

Self-NET has designed an OSGi based cognitive framework for the engineering of the future Internet Self-management systems. Mechanisms for situation awareness building (locally, compartment view) and for the decision making engine (Fault and Optimization opportunities identification, configuration action selection) have been proposed. Feedback-based learning algorithms for the refinement of the policy rules of the decision making engine and inference engines have been also designed. Furthermore, the Self-NET management ontology and the respective policy rules that guide network nodes operation have been issued. Based on the above mechanisms that constitute the functionalities of the network element cognitive manager (NECM) and the network domain cognitive manager (NDCM), specific control and execution capabilities have been extended, designed and tested (dynamic protocol composition framework, mobility management framework, forwarding and routing in wireless mesh networks, and wireless networks coverage and capacity optimisation).

## Target Users and Benefits

The Self-NET vision for the future Internet is to enable the management and service integration of a multitude of heterogeneous standards, building on self-management and cognitive principles and accommodating several operators, network types, and complex service and application environments. Various fixed and wireless/mobile systems and interfaces have been considered for the architectural specification and for the performance evaluation of the proposed mechanisms for the instantiation of self-management concepts (e.g., 3GPP UMTS, HSDPA and LTE, IEEE WiMAX, IEEE WiFi, wireless mesh networks). Self-NET outcomes benefit both the network operators (optimized utilization of resources, automatic planning and reduction of management time of complex network parameters and structures, easy adaptation of networks) and end users (improved quality of service and experience). Self-NET outcomes have started to penetrate the Internet and telecommunication standards (e.g., ETSI AFI).

For more information (Public Deliverables and Publications) you can check the web site of the project: <http://www.ict-selfnet.eu>

## Project Partners

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National and Kapodistrian University of Athens	GR
Thales Communications S.A.	FR
Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung E.V	DE
Organismos Tilepikoinonion Tis Ellados OTE AE (Hellenic Telecommunications Organization (OTE) S.A.)	GR
King's College London	UK
Telekom Austria TA Aktiengesellschaft	AT
Vodafone – Panafon Anonymi Elliniki Etaireia	GR

## Contact Details

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### Name

Nancy Alonistioti, Apostolos Kousaridas

### Organisation

National and Kapodistrian University of Athens

### Job position

Professor (Project Coordinator), Research Engineer

### Website

<http://scan.di.uoa.gr>

## Partner Expertise

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SCA-Networks is a new and pioneering Lab focusing on software based autonomic and reconfigurable systems in the Dept. of Informatics and Telecommunications, which belongs to the School of Sciences of the National and Kapodistrian University of Athens. The SCA-Networks Lab (Self-Configuring Autonomic Networks) operates under the supervision of the Lecturer Nancy Alonistioti and is a spin off lab of CNL. SCAN members have wide expertise in technical and project management, system design, reconfigurable and cognitive systems, autonomic and mobile computing, mobile applications and services. Over the past decade, UoA researchers have been actively involved in International projects, funded by the European Commission (ACTS WAND, RAINBOW, IST FP5 WINE, MOBIVAS, EURO-CITI, VIDEO-GATEWAY, BROADWAY, POLOS, ANWIRE, IST FP6 E2R I & II, LIAISON, CASCADAS, ANA, BIONETS, ICT FP7 E3, SACRA, CONSERN, Self-NET) and a vast number of National Initiative projects. UoA researchers have undertaken project and technical management roles (e.g., MOBIVAS, Self-NET, E2RI, E2RII, CONSERN). SCAN and CNL researchers have been actively striving for wide-area dissemination of its research results through interaction with UMTS Forum, 3GPP, DMTF, MEXE Forum and with EU DG INFSO for event organisation and meeting hosting activities.

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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MyFIRE - MULTIDISCIPLINARY NETWORKING OF RESEARCH COMMUNITIES IN FIRE

### Project Description

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The challenge for the project MyFIRE is to develop the use of experimental facilities in Europe in particular by increasing awareness of testing related best practices. The project will ensure a balance between the requirements for researcher's collaboration and the stakeholder's expectations. This means achieving the good experimental activities, developing the sustainable testing methodologies and paying a specific attention to the contribution to European standards development. The framework will be developed through the creation of open dialogue between the ICT networking research communities and experts from key areas of sociology, policy makers, economic models and standard.

In order to succeed in these challenges, MyFIRE's mission is organised around four activities:

- To identify the main issues and needs in the test beds approach:
  - Researchers and users needs for experimental facility
  - Standardisation
  - Exploitation process of Future Internet research
  - Economics data for testbeds sustainability
- To define the testing methodologies used by the projects in Europe and international testbeds, so that the best practices model can be analysed and documented leading to improved design, set up and use of the experimental facilities, and standards
- To build common tools and roadmap to increase effectiveness in the testing approach to improve the use of the FIRE Facility
- To disseminate the results and create a network: by a series of workshops in Europe and advanced emerging countries Brazil, Russia, India and China

The MyFire project will add its modest contribution in the methodologies related to efficient test beds design and set up and with approach cross over the multidisciplinary techniques and research areas. Making use of known standardised approaches, together with socio-economic analysis, MyFIRE will provide tools to optimize the design, set-up and usage of FIRE test beds. This will target the optimisation of investments in FIRE test beds and the further improvement of well established test beds. The efforts made on international collaborations with third countries will allow to further expand the FIRE community toward countries less covered up to now.

## Project Partners

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Inno TSD	FR
European Telecommunications Standards Institute	EU
University Edinburgh	UK
Fraunhofer- FOKUS	DE
BII	CN
ERNET	IN
ITMO	RU
Instituto de Pesquisas Technologicas	BR

## Contact Details

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### Name

Le Gall Franck & Baumberger Marianne

### Organisation

inno TSD

### Job position

Senior consultant – project coordinator

### Website

[www.inno-group.com](http://www.inno-group.com)

### Partner Expertise

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**Inno group** is a leading strategic management consultancy company operating in nearly all-European countries. Inno group has offices in Karlsruhe, Rostock, Sophia-Antipolis and Stockholm. Inno offers a multi-national, highly qualified team of more than 50 consultants who support their customers in their mother tongue, and who fully understand the specific cultural and national conditions that exist in Europe. Over the last 15 years Inno AG has combined highly specialised expertise, creativity and pragmatism to assist more than 500 clients all over Europe. One of the core activities of inno is to provide management support to complex inter-institutional and trans-national projects relevant to innovation, science and technologies. This includes consortium & knowledge management, reporting, accountancy and financial controlling, IPR issues, dissemination and exploitation of research results, support of spin-offs as well as general marketing and public relations activities. Inno also leads various European projects involving dissemination of scientific knowledge, training and implementation of pilot projects.

**inno lab** is the Central Technical Unit (CTU) of inno which deals with technological innovation. By being tightly coupled with the consultancy and valorisation activities of inno, the lab provides both strong technical knowledge and vertical competences. Thus, it helps its customer in commercialisation of new products and services through various approaches: technological watch to identify new concepts and techniques, prototyping to demonstrate a product/service, software integration and packaging, and technical workshops/seminars to disseminate the knowledge. Through those activities, inno lab helps commercialization by targeting the right market with the right product/service and by reducing the time to market needed by a product between its conception and its delivery.

**Franck Le Gall** is a PhD-Engineer in the physic and telecommunication fields. After 5 years in technical development of new generation optical networks (he authored several patents and scientific publications), he spent six years in the set-up and the management of large international and multi-cultural R&D projects focused on ICT systems (from the physical layer to applications) development. He is now involved in several ICT European projects and ensures the operational management of the Go4IT project.

**Baumberger Marianne** graduated from the University of Nice with two masters degrees in Economics of innovation and industrial development. She joined inno-TSD 2 years ago. She contributes to national and European studies dealing with economical development based on innovation: territorial diagnostic, policy recommendation and definition, policy evaluation. She actually works for ETSI to improve the access and the participation of SMEs to standards. Marianne is accustomed to the use of consultancy tools and methodology to be used within such studies: desk research and bibliographical analysis; benchmarking analysis and identification of best practices; development of web-survey and statistical and multicriteria analysis; facilitation of working groups and meetings; administrative management...

## Contact Details

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### Name

Alessandro Santiago dos Santos

### Organisation

Instituto de Pesquisas Tecnológicas do Estado de São Paulo

### Job position

Researcher

### Website

[www.ipt.br](http://www.ipt.br)

## Partner Expertise

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IPT – Institute for Technological Research, a public research institute linked to the São Paulo State Secretariat of Development, has been contributing actively to the country's development for over a century.

IPT is one of Brazil's largest research institutes, with state-of-the-art laboratories and a highly qualified team of researchers and technicians working basically in four major areas:

- Innovation,
- R&D,
- Technological services and metrological support, and
- Information and education in technology.

Heedful of the needs of the public and private sectors, IPT provides solutions and technological services aimed at increasing the competitiveness of companies and promoting quality of life.

Its twelve technology centers act multidisciplinarily in a broad range of fields, encompassing segments such as energy, transportation, oil and gas, environment, civil engineering, information technologies, cities, and safety.

IPT is also a national reference in the area of calibration, and was the first laboratory certified by INMETRO – National Institute of Metrology, Standardization and Industrial Quality.

In addition to its current research, development and innovation projects, the institute is expanding its areas of action to include biotechnology, new materials, and bioenergy.

Modern, highly integrated, attuned to the opportunities and demands of technological development and prepared to be a qualified link among universities, research centers and the business sector, IPT maintains its collaborative role in the country's development.

## Contact Details

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**Name**

PAVENTHAN Arumugam

**Organisation**

ERNET India

**Job position**

Senior Manager (R & D)

**Website**

[www.eis.ernet.in](http://www.eis.ernet.in)

## Partner Expertise

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ERNET is an Autonomous Scientific Society under Department of Information Technology, Ministry of Communications & Information Technology, Government of India.

ERNET provides pan-India network connectivity to the educational and research institutions through its 14 Points of Presence (PoPs) located across the country.

ERNET network is a judicious mix of fiber optic terrestrial backbone and satellite-based wide area network to address the connectivity needs of E & R institutions across India. It is the first network in India to support IPv6 in native mode. The countrywide backbone is connected to dedicated international links at Delhi, Mumbai, Pune, Chennai and Bangalore.

ERNET manages Indian GRID network GARUDA and today ERNET connects more than 1300 educational and research institutions that includes universities and other higher learning institutes, agricultural institutions, schools and engineering colleges. ERNET is connected to European research network GEANT over 100 Mb/s link supporting both IPv4 & IPv6. ERNET is also a member of the Trans Eurasia Information Network (TEIN3) program to extend connectivity to South Asia.

Research & Development in the field of Computer Networks and its applications forms an integral part of ERNET India as it continues to engage in collaborative research projects with premier academic institutes of India.



## Contact Details

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**Name**

Jørgen Friis

**Organisation**

ETSI (European Telecommunication Standards Institute)

**Job position**

Vice President, Standards Enabling Services

**Website**

[www.etsi.org](http://www.etsi.org)

## Partner Expertise

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ETSI produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies and is officially recognized by the European Union as a European Standards Organization. ETSI is an independent, not-for-profit association whose 766 member companies and organizations, drawn from 63 countries across 5 continents worldwide, participate directly in its work.

ETSI covers the full range of support activities from idea to product. This is to be understood as the standardization activity brings together results from research and in a neutral environment develop standards by consensus. This is the core activity of ETSI.

However ETSI also delivers test specifications that makes it possible for vendors to test their products against a standard.

Finally ETSI organized Plugtests™ interop events that bring together vendor, operators, developers, a.o. to test interoperability of products and services. This provides valuable feedback to the different parties as well as it provides feedback into the standardization process.

## Contact Details

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### Name

James Stewart

### Organisation

University of Edinburgh

### Job position

Senior Research fellow

### Website

<http://www.issti.ed.ac.uk>

## Partner Expertise

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ISSTI is the leading Scottish Centre for socio-economic research on science, technology and innovation with a distinctive record in interdisciplinary studies in collaboration with technical specialists and policy-oriented studies that dates back 20 years to the prestigious programme on Information and Communication Technologies. Its research was assessed in the top 5 in the UK in the latest Research Assessment Exercise. They have a strong record of joint collaboration in European Union research, particularly in the area of interoperability standards and innovation in information and communication technology products and services. Much of this work has been conducted in close collaboration with technical specialists from academic and industry and with users. Among their successful European research collaborations are included:

- An Open Architecture for Intelligent Tracing Solutions in Transport and Logistics (ParcelCall), EC FP5 Information Societies Technologies Programme Jan 2000 – Dec 2001). (Williams, Graham, Stewart)
- Flexible Convergence of Wireless Standards and Services (FLOWS) IST Jan 2002 – 31 Dec 2004. (Williams, Graham, Stewart)
- NO-REST, Networked Organisations - Research into Standards European Commission IST programme STREP (Jan 2004 –October 2005 (Graham, Williams)
- China EU IT Standards Research Partnership, CSA Mar 2008 – Feb 2010. building a network and knowledge base on the policy and practice in China in development of infrastructural ICT standards (Williams, Graham, Stewart, Shen)
- ISSTI is a member of the PRIME Network of Excellence (Policies for Research and Innovation in the Move towards the European Research Area).

Specific expertise includes research on innovation in ICTs, covering consumers, users, developers and policy makers, to inform strategy, theory and public policy, using qualitative and quantitative methods;

## FIRE Week 2010 Brokerage Event Profile

### Project Title

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N4C Networking for Communications Challenged Communities: Architecture, Test Beds and Innovative Alliances

### Project Description

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N4C is a STREP FP7 ICT project running May 2008 to April 2011.

The project envisions taking a major next research step in building converged networks that deliver delay and disruption tolerant Internet services for nomadic and other use. The challenge in that work is considerable: A full solution requires the development of networking infrastructures which are pervasive, ubiquitous and highly dynamic, supporting a wide variety of nomadic interoperable devices and services, a variety of content formats and a multiplicity of delivery modes. To do this will require an opportunistic use of all possible connectivity methods, including Delay Tolerant Networking (DTN) connectivity. This is a major challenge to advanced architectures and protocols. Through a focused European cooperation around a well chosen real life template scenario (i.e., the every-day situation of semi-nomadic reindeer herders in North Scandinavia), and dissemination to standards organizations that will be involved throughout the process, taking this step and assuring its impact becomes a realistic goal.

### Project Partners

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Luleå tekniska universitet (coordinator)	Sweden
Albentia Systems, S.A.	Spain
Universidad Politécnica de Madrid	Spain
INTEL PERFORMANCE LEARNING SOLUTIONS Ltd.	Ireland
Trinity College Dublin	Ireland
Northern Research Institute Tromsø AS	Norway
ITTI Ltd.	Poland
Instituto Pedro Nunes	Portugal
MEIS storitve za okolje d.o.o.	Slovenia
Tannak AB	Sweden
Power Lake AB	Sweden
Folly Consulting Ltd.	UK

## Contact Details

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### Name

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### Organisation

Luleå University of Technology (Luleå tekniska universitet) Sweden

### Job position

Lecturer, project manager N4C

### Website

[www.ltu.se](http://www.ltu.se)

## Partner Expertise

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As project manager I will as far as possible represent both the technical and “soft” social sciences side of the project, and also bring in the business and implementation part.

We work with DTN technology (Delay tolerant networking), routing and architecture, some hardware development (Intel), air-interface technology (including Wimax) and applications for DTN. System integration, meteorological applications, e-mail and other useful things for remote and rural areas are included in the project scope.

The Coordinator is particularly interested in interactive methods for technology development; cultural and gender sensitive technology design and project management with gender profile or strong gender mainstreaming strategy.

The project web site is [www.n4c.eu](http://www.n4c.eu)