



European Research Cluster on the Internet of Things

Foreword



Dear Reader,

I really do hope you had a good summer break. Europe and the world are constantly more excited about the possibilities of an Internet of Things. The IERC – Internet of Things European Research Cluster is equally back with fresh energy. The focus of activities in the coming months will be on architectures, standardisation requirements, privacy & security, IOT Governance, the link between EU and national IOT activities, and the creation of a Global IOT Forum. You might be astonished and consider this program a challenging one but these are the essential IOT fields for the moment where Europe could play a leading role. At the same time the Cluster with his more

than twenty projects has enough critical mass for a collective and beyond single scope of project exercise.

We are also content to announce that a substantial number of new projects from the last Calls for Proposals for FP7, CIP and the Future Internet - Public Private Partnership program will join the Cluster. They will be presented in the present and the next issue of the Newsletter but let me give you already a first overview here. Two new integrated projects on pervasiveness, context-awareness and security (BUTLER), and connected virtual objects and services (ICORE) will try to extend the scope of the current understanding what an Internet of Things might be. Targeted research will focus on IOT-IPv6 applications (IOT6), IOT open source solutions (OPEN-IOT), architecture for smart objects (CALIPSO), and

IOT driven services (IOT.EST). A new international support action will concentrate on IOT standardisations requirements and validation (PROBE-IT), thus completing the existing ones. From CIP we welcome a new project on Smart Cities (CITADEL) and from the FI-PPP an interesting application case in the field of agribusiness (SMARTAGRIFOOD).

Before wishing you a stimulating reading of this newsletter I wanted to remember that the social and ethical dimensions of the Internet of Things play steadily a crucial role among the stakeholders. When conceiving elements of an Internet of Things we are directly working on the foundation of tomorrow's society. Let's keep this mind for our next endeavours.

Peter Friess

Points of interest:

- New IERC projects
- IOT International Forum
- IoT News
- IoT Events
- Contacts

Inside this issue:

Foreword	1
iCore	1
1st IoT International Forum	2
OpenIoT	2
SmartAgriFood	2
IoT.est	3
IoT News	3
IoT Events & IERC Contacts	4

iCore: Internet Connected Objects for Reconfigurable Eco-systems

iCore (Internet Connected Objects for Reconfigurable Ecosystems) is an industry driven integrated project (IP) whose consortium is composed of 19 partners including 12 industrial partners spread across 11 countries in Europe, besides including partners from China. It is a challenging innovative research and development project there the main goal is to empower the *Internet of Things (IoT)* through virtual objects and cognitive technologies.

iCore will realise the principle that any real objects and digital objects, which are available, accessible, observable or controllable, can have a virtual representation in the Internet of Things (IoT). iCore will produce a cognitive control

and management framework that conceals the technological heterogeneity, comprising the perspective of users/stakeholders, and facilitates context-awareness and higher reliability.

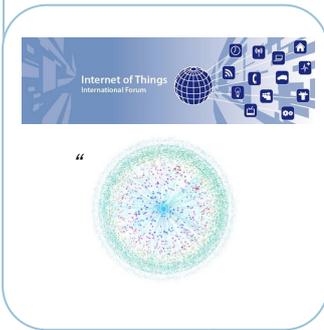
The project will be officially launched from the 1st of October 2011, for a total duration of three years. The kick-off will take place during 5-7th October, together with another FP7 IoT project, BUTLER (uBiquitous, secUre inTernet-of-things with Location and contEx-awaReness) at the International Conference Centre in Bremen, Germany. On 7th October, a joint iCore + BUTLER workshop will take place to find potential cooperation and harmonizing opportunities for progressing Euro-

pean IoT research.

iCore will organize a session on “Empowering IoT through virtual objects and cognitive technologies” at the Future Internet week, Poznan on 27th October. The session aims at providing interesting discussions on IoT enabling technologies and their integration, opportunities and challenges with future IoT architectures and services.

For more information on iCore, please click here: <http://iot-icore.eu>

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IOT International Forum

The first meeting of the new IoT-i International Forum will take place in Berlin, on the 23rd and 24th November, 2011. The Forum is your place to be a part of the global IoT community, and for the IoT community to come together with the legislators, dependant

businesses, and users of IoT. The first Forum meeting will feature a mix of plenary sessions, global perspectives, and working groups on topics such as societal, economic, legislative, governance and technical issues. **Registration for the event is free.**

For more information on the Forum and the Forum meeting, please visit and bookmark the Forum website and venue: <http://iot-forum.eu/>
 Quadriga Forum
 Werderscher Markt 13
 D-10117 Berlin <http://www.quadriga-forum.de/>



Open IoT

The main goal of the OpenIoT (FP7-287305) project is to research and provide an open source middleware framework enabling the dynamic formulation of self-managing environments towards offering utility based Internet-of-Things (IoT) services. Using the OpenIoT middleware framework service providers (such as smart cities) will be able to deploy cloud/utility based infrastructures.

On top of these infrastructures end-users will be able to fulfill their demands for IoT services (e.g., “Sensing-as-a-Service”, “Traceability-as-a-Service”) according to a pay-as-you-go model. OpenIoT addresses a number of research challenges including: (a) The formulation of cloud/utility-based IoT environments, based on the automated orchestration of

internet-connected objects (ICO), (b) The self-management and optimization of the utility-based infrastructure (e.g., in terms of power and bandwidth usage), (c) The specification of utility metrics for applications involving ICO, based on a variety of parameters associated with IoT/ICO applications including usage, time, ICO location, ICO orientation, data volume, read cycles, data quality and more, (d) The research of utility-driven privacy mechanisms, where objects and actors will assess utility prior to their participation in an IoT application, (e) The provision of sensor and ICO Data as Open Linked Data, i.e. the blending of the emerging linked data concept (<http://linkeddata.org/>) into ICO/IoT applications.

The OpenIoT implementation will be open source based on background projects of the consortium partners, notably the Global Sensor Networks (GSN) (<http://sourceforge.net/apps/trac/gsn/wiki>) project. We expect that the open source nature of the project will facilitate enterprises to integrate novel added-value IoT solutions at a low Total Cost of Ownership, while at the same enabling students and researchers to experiment, innovate and advance their IoT knowledge.

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SmartAgriFood — Smart Food and Agribusiness

The Future Internet Public Private Partnership (FI-PPP) supported by the EU FP7 programme aims to make public service infrastructures and business processes significantly smarter (i.e. more intelligent, more efficient, more sustainable) through tighter integration with Internet networks and computer capabilities to increase the competitiveness of the European industry. Within that programme the SmartAgriFood project focuses on use case scenarios and early trials in the agri-food sector.

The overall objective of SmartAgriFood project is to boost the application and use of future internet ICTs in the agri-food sector by (1) identifying and describing the technical, functional and non-functional *FI-specifications* for experimentation in smart agri-food production as a whole system and in particular for smart farming, smart agri-logistics and smart food awareness (2) identifying and developing smart agri-food-specific *capabilities and conceptual prototypes*, demonstrating critical technological solutions including the feasi-

bility to further develop them in large scale experimentation and validation, (3) identifying and describing existing *experimentation structures* and start *user community building*, resulting in an implementation plan for the next phase.

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IoT.est

To date implementations of Internet of Things architectures are confined to particular application areas and tailored to meet only the limited requirements of their narrow applications. The ICT work programme highlights the importance of interoperability between the silo solutions and different technologies used in these disjointed sectors. Sensors/objects that provide information or perform as actuators implementing actions in the real world are plentiful and the range of communication technologies, networking protocols, information types and data formats used to exchange information or control data is vast.

To overcome technology & sector boundaries and therefore dynamically design and integrate new types of services and generate new business opportunities requires a **dynamic service creation environment** that gathers and exploits data and information from sensors and actuators that use different communication technologies/formats. To accelerate the introduction of new IoT enabled business services (in short IoT services) an effective dynamic service creation environment architecture needs to provide orchestration, self-management capable components for automated configuration and testing of services for “things”, and abstraction of the heterogeneity of underlying technologies to ensure interoperability.

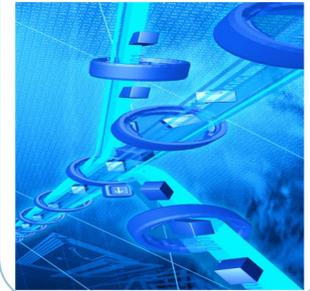
IoT.est will develop a test-driven service creation environment (SCE) for Internet of Things enabled business services. The SCE will enable the acquisition of data and control/actuation of sensors, objects and actuators. The project will provide the means and tools to define and instantiate IoT services that exploit data across domain boundaries and facilitate run-time monitoring which enables autonomous service adaptation to environment/context and network parameter (e.g. QoS) changes. The project will prototype its major concepts and will evaluate the results for exploitation towards future IoT service creation, deployment and testing products.

The project will start on October 1st 2011 and will last for 36 months; the kick-off meeting will take place on October 17th and 18th at the Centre for Communication Systems Research, University of Surrey, UK. More information on IoT.est can be found at www.ict-iotest.eu

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IoT News

- The **CuteLoop** project (recently finalised) has just started a YouTube channel. The channel provides access to the videos that were prepared for the Food Chain and Craftsmen business cases for test and demonstration of the project results. <http://www.youtube.com/user/CuteLoopProject>.
- Butler and iCore (2 new IP projects from ICT Call 7) will co-organize their kick-off in Bremen on October 5th and October 6th. These kick-off will be followed by a joint workshops on the 7th during which, opportunities for collaborations between the 2 projects and within the IERC cluster will be analyzed.
- IOT-A will organize on November 23rd its 3rd Stakeholder workshop. Berlin, Germany.
- IOT-I has set-up the **iot-pedia** web page that anyone who is involved in IOT can use to describe entities, companies, activities, material etc. The IOT database is searchable and provide an overall view of the IOT landscape in Europe and World-wide. Visit <http://www.iot-pedia.org> By entering your data you will help us in consolidating the currently scattered knowledge of the state-of-the-art in different IoT technology domains and keeping track of new developments. Below you can enter individual bodies, networks of collaborating bodies and/or products resulting from their activities.
- OPEN DAYS 2011- Dialogue for exploring avenues of how Future Internet Platforms and stakeholders can best support the regions in their quest to become smarter, specialised and sustainable. http://www.fi-ppp.eu/open_days_2011/agenda_reg_open_days_2011/
- A concept demonstration of the ebbits platform took place at the project review meeting on 15 September in Brussels. For the ebbits scenario Automotive Manufacturing, the focus was on showing how tracking the energy and water consumption of a welding robot can be used to optimise production. During the meeting, ebbits partners presented a status update of first year activities and the advancements toward the definition of a middleware oriented platform enabling the convergence of the Internet of People, the Internet of Things and the Internet of Services into the “Internet of People, Things and Services (IoPTS)” for business purposes. To illustrate the progress in the automotive scenario, a prototype of the ebbits platform was presented with the aim to highlight the potentials of ebbits-enabled IoPTS applications to manage production optimisation. <http://www.ebbits-project.eu>.





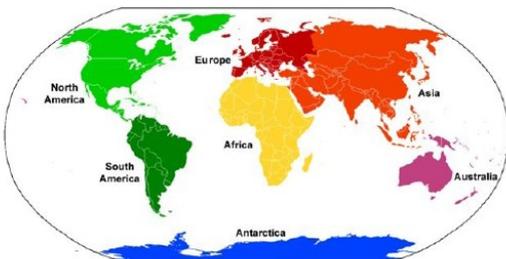
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IoT Events

September

IoT Expert Group meeting
30th - Brussels, Belgium

October

IoTech -IEEE Workshop on Internet of Things Technology and Architectures
<http://www.iot-a.eu/public/events/iotech-ieee-workshop-on-internet-of-things-technology-and-architectures>
17th - Valencia, Spain

[Future Internet Assembly, Poznan](#)
24th-28th Poznan, Poland

IoT Conference – Event organized as part of the in Future Internet Assembly Week 24th-28th
October 2011 (www.fi-poznan.eu),
26th - Poznan, Poland

IERC meeting . A full day of presentations on potential applications for IoT and a dedicated session to interoperability issues. Francois Carrez (Surrey University) and Amine Houyou, (Siemens), will be the co-organizers of this event.

27th - Poznan, Poland

IERC workshop . A half day workshop (09:00-13:30) on standardization activities related to IoT where ETSI, CEN, ISO, ITU, IETF, OGC, etc. will present their activities. The goal is to harmonize the efforts, avoid the duplication of efforts and identify the standardization areas that need focus in the future. Patrick Guillemin (ETSI), will be the co-organizer of this event
28th - Poznan, Poland

November

IoT Expert Group meeting,
15th - 16th - Brussels, Belgium

IoT International Forum
23rd - 24th - Berlin, Germany (www.iot-forum.eu)

RFID Privacy Impact Assessments Experts Symposium
25th - Austrian Embassy, Berlin, Germany

ABOUT IERC

IoT European Research Cluster

The aim of European Research Cluster on the Internet of Things is to address the large potential for IoT-based capabilities in Europe and to coordinate the convergence of ongoing activities.

European Dimension

IoT has the potential to enhance Europe's competitiveness and is an important driver for the development of an information based economy and society. A wide range of research and application projects in Europe have been set up in different application fields. Communication between these projects is an essential requirement for a competitive industry and for a secure, safe and privacy preserving deployment of IoT in Europe.

Global Dimension

IERC will facilitate the knowledge sharing at the global level and will encourage and exchange best practice and new business models that are emerging in different parts of the world. In this way, measures accompanying research and innovation efforts are considered to assess the impact of the Internet of Things at global and industrial level, as well as at the organizational level.



The “European Research Cluster on the Internet of Things-IERC” was established by the DG Information Society and Media, as part of Europe’s ambition to shape a future Internet of Things for its businesses and citizens.

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