European Research Cluster on the Internet of Things

Forewords *by Alessandro Bassi*

It's on the latest edition of Wired magazine, but this is not really surprising. It was on The Economist, but this might not be totally surprising as well. It's on mainstream newspapers, where self-certified experts show to the greater public "the magnificent ends and progressive", or else, the dark ages we will be entering if technology will have it course. It's on Gartner's key technologies forecast. We hear it on some radio transmissions, and in dozens of conferences and workshops, around the world. It's on the Council web page, where in the last 5 days there are news of at least 3 very respected thinkers forecasting that 2013 will be its year. The year of the Internet of Things. We, as humanity, are very bad in predicting anything, especially the future, as Yogi Berra famously said. We might be sitting on a greater revolution than the internet, one revolution that can mark the change of the era we are living in, and that can make the Internet look an obsolete if not primitive mean to exchange information.

But, while the Internet is working as a tine-accelerating tool - the mobile revolution and the tablet uptake show how exponentially faster new technologies have been picked up in comparison to the network technologies - questions are still arising. Still today, we find it very hard to give it a clear business value. On paper we all talk about how great will be for businesses, and how much this novel era will (or may) impact current practices. Nobody, though, made a fortune (yet?) on it. Just as an historical reminder, the "Contract of the Century" between IBM and Bill Gates was in 1980, a time when NCP, not TCP, was deployed on the ARPANET. There is no such a contract or dealings going on right now: Pachube had to count on a "black swan" like the March 2011 tsunami in order to show its business potential, and to be attractive to venture capitalists, but even today its current economical sustainability is under scrutiny by potential competitors.

The projects belonging to the IERC cluster, while big to our eyes, are just a tiny dots if compared to the investments that are needed to make technologies succeed; and the direness of the current economic outlook is hampering the needed developments. Even if researchers would be flooded with cash, security and privacy issues on one side, and governance schemes on the other, will need to be truly studied and globally agreed. While we need for sure dozens more fablabs and millions more arduinos, we also need the best world thinkers to agree on acceptable policies, and to define ethical behaviours of objects.

At this time of the year, we usually open a reflection on the past year and we set targets for the next one. As we say earlier, many forecasts predict that next year the IoT technologies will become mainstream. While we might trust those forecasts or not, it's very important that Europe will be at the forefront of the IoT technological movement. Parochialism is out of place in today's globalised economy. However, if we want to keep a competitive edge on other regions in the world and not only play a strong role in tomorrow's economy, but first and foremost avoid a social implosion, we need to develop technologies that make people's life better. While this might be a way too ambitious task for the IERC projects, there's not reason why we shouldn't try.

My very best wishes for all the IERC members and their families, to have a great holiday season and a fantastic 2013, hoping that our contribution to the IoT development will leave a significant mark.

Alessandro Bassi

Cost-effective and efficient method for 6lowpan and CoAP conformance tests
*by Philippe Cousin*

The Probe-IT project looking at IoT interoperability issues has developed and presented in June at IOT week first 6LoWPAN tests running into an open (TTCN-3) test environment. In order to address other important IoT protocols, the project has further developed another demonstrator, using the same approach running few CoAP conformance test cases which was presented at the CoAP workshop and Interoperability event, end November.

This keeps demonstrating that it is possible to develop tests for many IoT protocols using a same approach which not only is addressing important issue of time and resources optimization but with improve level of interoperability, very important matter to support mass market deployment in confidence. For more information:

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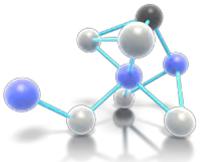
iCore @ ETSI M2M (Mandelieu) *by Vera Stavroulaki*

iCore with demo stand at ET 3rd ETSI M2M Workshop in Mandelieu (France), held from October 23rd to October 25th 2012. In the workshop, iCore presented an early prototype. The demonstration showed a working implementation of how cognitive technologies can be used to empower IoT applications in a Smart Home environment. More specifically, the demonstration comprised the virtualisation of sensing and actuating objects (iCore concept of Virtual Ob-

ject), the dynamic mashup of various Virtual Objects enriched with service logic (iCore concept of Composite Virtual Object) and used in a personalised way fitting the user context and application requirements, reusing as necessary objects outside the purpose for which they were originally deployed. Furthermore, the demonstration showed how the use of cognitive mechanisms (through cognitive mechanisms (such as Situation and Request

Matching and Decision Making) facilitates the autonomous, dynamic creation, instantiation and configuration of Composite Virtual Objects (and their components) also reducing the time needed for handling user requests and/or application requirements.

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SmartSantander approaching the citizen *by Luis Muñoz*

The SmartSantander project has successfully ended its second year and made significant steps towards providing a facility for large scale experimentation with heterogeneous Internet of Things (IoT) in a SmartCity environment. More than 25,000 IoT devices are now deployed in the city of Santander. They include static sensors measuring environmental parameters such CO, noise levels, light intensity and temperature. Furthermore, two parks with an extension of around 55 Ha have incorporated sensors measuring ground and air conditions aiming at making irrigation much more efficient and sustainable. In terms of traffic, intensity-measuring sensors have been deployed at the two main entrance/exits of the city aiming at monitoring and predicting traffic conditions downtown. Indeed, these sensors will help to estimate the probability of finding a free outdoor parking lot in the city centre. Around 375 parking places also embed ferromagnetic wireless sensors which enable the status of outdoor parking areas to be monitored. Furthermore, public urban vehicles such as buses and taxis have been equipped with mobile sensing capabilities in order to complement this static IoT deployment. These

mobile nodes provide 12 different sensing parameters and the possibility to extract further information from the CANBUS. This means that a plethora of parameters are available to both the city authorities and the experimenters. So far, a total of 150 vehicles have been equipped. Plans are in place to increase their number to 250 during the third year. From the perspective of the experimentation, it is important to highlight that these mobile sensors, besides providing a cellular communications interface, also embed an IEEE 802.15.4 transceiver which can communicate with the fixed infrastructure. Hence, SmartSantander provides a platform which supports experimentation under real mobile conditions of the IoT nodes.

With the aim of involving the citizen, two main applications have been made available through the Google Marketplace and Apple Store, namely, augmented reality and participatory sensing. The former provides detailed information about the city events (culture, sport, shopping, etc.) and is complemented with dual QR/NFC tags deployed in the city providing enhanced information services to citizens. From the perspective of service experimenta-

tion, researchers will be able to trace mobility patterns and preferences of the users, type of terminals, etc. Participatory sensing is a new approach for sensing the city and reporting the pace of the city. In participatory sensing the citizens will provide information about noise, temperature, pressure, position - all in an anonymous way. Furthermore, an application has been developed aiming at providing information about incidents occurring in the city such as traffic jam, public street line problems, status of the beaches and many others. So far more than 5,000 users have downloaded the augmented reality application and 3,000, the participatory sensing one.

A second open call for experiments on top of SmartSantander has just ended. The two open calls combined have attracted 78 research proposals. We hope the IERC community will find our experimental facility interesting and useful and are always looking forward for interesting experimentation use cases and ideas.

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IoT Application - Value creation for the industry *by Nicolaie L. Fantana*

The industrial workshop "IoT applications and value creation for industry" was held during the 3rd International Conference on Internet of Things, IoT 2012, in Wuxi, China.

The workshop was organized and chaired by ABB Corporate Research in cooperation with KIT University Karlsruhe. The main goal of the workshop was to revise the experience with IoT applications and IoT use in industry cases and how they are creating value for industry. The workshop was also intended to identify and discuss trends and challenges, exchange ideas and estimate future evolution in the industrial IoT area.

Important for IoT applications in industry are value creation and sustainability. How these problems will be addressed and solved will influence the use of IoT technologies in the industry, on a larger scale, in the coming years.

IoT applications in the sense of the industry workshop have been considered IoT solutions which allow improving industrial manufacturing processes, enabling new and efficient ways to do operate production plants, create new service or supervision means for industrial installations, offer an optimized infrastructure, reduce operational cost or improve human safety in industrial areas.

Workshop presentations have been given by presenters form: European IoT research cluster (IERC), ABB corporate research, Bosch SI, IBM research, Lufthansa Cargo research and innovation, from academia: ETH Zürich, KIT, MIT, Tsing Hua University, Univ. Bamberg and from research institutes such as DFKI and Fraunhofer IIS. Geographically the presenters and participants came from Europe, USA, Asia. Spontaneously interested conference participants joined the workshop presentations and discussions.

The presentations included: a set of value-oriented requirements and constraints for IoT use in industry, a view of the European Union research cluster activities and opportunities, activity details on big data flows and IoT large data computational aspects, the role of IoT for industry and present industrial initiatives, approaches on smart objects for smart applications and IoT based information services.

Presentations on IoT applications for oil & gas industry, on technologies inspiring connected life, logistics for air transport, smart factory using IoT and factory automation as well as various applications cases have been shown.

A survey on the industrial aspects and value creation form industry applications was filled by workshop presenters and the results have been discussed with all participants. The results are indicating that logistics will remain the major area in IoT industrial applications in the near future, but there is a strong increase of IoT industrial applications in automation and mobile maintenance.

The workshop was concluded by wrapping up of presentation and discussions and remarks from the chair, followed by a visit to IoT facilities in Wuxi IoT Valley research area. The IoT valley lab of the Tsing Hua University has been visited and allowed an insight in the research activities related to environmental supervision and a good exchange among researchers.

All workshop presenters intend to prepare a more detailed overview paper to be possibly published as a chapter in the IERC 2013 IoT book.

The workshop was well appreciated by participants and Wuxi committee and the organizers have been asked to do a similar workshop during the next IoT conference 2014.

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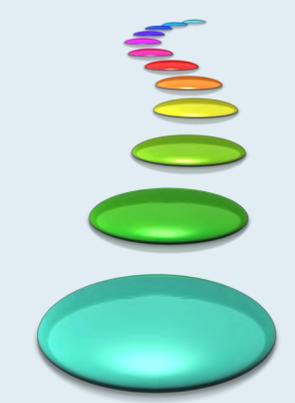
Participants at the IoT 2012 industry workshop 24.Oct. 2012, Wuxi

IPv6 and the Future Internet of Things at IoT 2012 *by Sébastien Ziegler*

In the frame of the IoT 2012 Conference in Wuxi (China), the IoT6 research project (www.iot6.eu) has organized a one day workshop on "IPv6 and the Future Internet of Things", in close cooperation with the IPv6 Forum (www.ipv6forum.org).

The workshop benefited from various keynote speeches, including Prof. Vint Cerf (videonote) and Prof. Kirstein. It brought together a nice combination of academic and industrial partners, coming from Europe and Asia.

The first session on "IPv6 enablers and perspectives for IoT" illustrated the diversity of issues related to the integration of IPv6 and IoT.

Emerging IPv6-based solutions for security and unique identification of IoT were presented, as well as the potential use of the IPv6 version of the Handle system (www.handle.net) developed by Prof. Bob Kahn to address and locate IoT components.

A specific session was dedi-

cated to "IPv6 and European projects perspectives" involving IoT6, IoT-I, IoT-A, Butler and Probe-IT. The panel presented different perspectives on IPv6-IoT interactions.

There was a clear consensus on the relevance of IPv6 for the future IoT. However, the question was raised on how far should IPv6 penetrate the IoT: at the gateway level or down to the IoT level.

Many sensors are already using 6LoWPAN addresses, but when it comes to other devices, such as light bulbs, could they have their own IPv6 addresses and would it be relevant?

It seems that clearly combinations of ways of IoT integration will come within the next years. The question is open, even if a few days after the workshop a press released answered to the first part of the question: GreenWave Reality and NXP were releasing an IPv6 addressable light bulb on the market.

The workshop ended by a

closing session on IoT international collaboration, with high-level contributions from China, Japan and South Korea. Each presenter highlighted the importance of IPv6 for future IoT in Asia, with innovative and large scale deployment projects.

Globally, the workshop highlighted a global convergence among several research teams from both continents. It also enabled many promising informal contacts paving the way to a strengthened international cooperation in this domain of research.

Finally, a few days later IoT6 and Probe-IT were also invited to present their activities in the frame of the IEEE International Conference on Cloud Computing and Intelligence Systems with a strong interest from Asian counterparts.

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4th IoT Europe - Working group on IoT Business Models *by John Soldatos*

OpenIoT is leading research on IoT business models, OpenIoT has allocated significant efforts towards researching the emerging and novelty IoT business models. This workshop was an initiative to disseminate the preliminary research result on IoT business models as result of the survey's and questionaries' partners in OpenIoT has successfully conducted during the first twelve (12) months of the project.
The production of these surveys and that form part of the project deliverables represent an opportunity to document and illustrate the different IoT business opportunities alike

industry requirements and interest in the IoT sector.
This workshop was co-located with the 4th IoT Europe in Brussels (12th-15th November 2012). In the format of working group, IoT business requirements and emerging new business models were discussed considering as starting point simple questions if IoT is a horizontal operation that can be extremely disruptive. What does full traceability really mean for current business models? What new actors will emerge? What will the private grid operator facilitate?
Our colleague in OpenIoT, Thomas Usländer, head of the

Department Information management and Production Control, Fraunhofer IOSB was giving this talk and attendees (around 15) were actively participating afterwards in a chaired debate from Rasmus Blom, Director of Grundfos Connect.
Detailed information on OpenIoT Semantic for standardizers can be found in the OpenIoT Deliverable 7.5.1 Report on cluster activities M12 and at the workshop portal http://eu-ems.com/summary.asp?event_id=124&page_id=991

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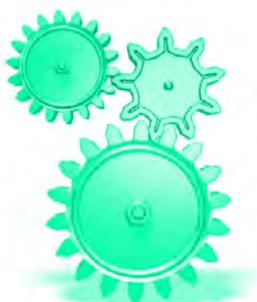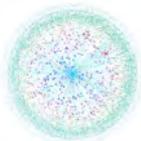
Stimulating innovation in the agri-food chain through the use of the Future Internet - Stakeholder event - *by Istvan Gabor*

Over the past thirty years, a great many ICT technologies have been introduced in the agriculture and food sector. The uptake of these solutions, however, has been slow due to a number of important yet unresolved issues. Some of the key challenges for ICT in the agri-food chain sector are related to information management, whether within specific domains or across the whole supply chain from farm to fork. The challenges of information management are compounded by specific characteristics of the sector, including the very large number of actors along the supply-chain and the heterogeneity of those actors. Although these issues have not been resolved, new ICT technologies are challenging the sector: all kind of sensors have been introduced producing quantities of 'big data' that potentially can be used for smarter production. The internet or 'the cloud' seems to be everywhere and not only computers but all kind of devices can communicate with each other. Last but not least social media are revolutionizing the way stakeholders in the supply chain network can communicate with each other.

The EU's Future Internet Public-Private Partnership (FI-PPP) program aims to make service infrastructures and business processes more intelligent, more efficient and more sustainable through tighter integration with Future Internet (FI) technologies. The SmartAgriFood project is one of the eight use cases in FI-PPP and addresses the challenge of applying ICT to three sub-domains: agricultural production ("Smart Farm-

ing"), the transport and logistics sector ("Smart Agri-logistics") and improving food awareness for consumers ("Smart Food Awareness"). For each of these sub-domains, the project has gathered user requirements and is currently developing pilot implementations. The aim is to explore the FI's capabilities to enable data integration amongst different systems, to allow easy and secure access to information along the supply chain, to simplify the discovery of stakeholders and services and the publishing of data to other stakeholders, to host software modules in the cloud to reduce costs, and to enable service composition and mash-ups to enhance the functionalities of applications offered.

Now, we would like to draw your attention to the European Stakeholder Event, organised by SmartAgriFood project funded by the EU 7th Framework Programme within the FI-PPP.

The objective of the event is to present the results of the SmartAgriFood project, and show how they can be used and applied in the agri-food chain and in the relevant sectors, and to contribute to the exchange of knowledge and views between the agri-food users and the ICT solution providers.

The event will start with a plenary opening session to introduce the project and several key note speakers will present the pilot cases developed in the project. After the plenary a series of separate discussion groups will be organized in order to collect feedback from the partici-

pants, and then a plenary closing session will conclude the conferences.

The presentations and sessions will cover the following topics:

- Objectives and benefits of the SmartAgriFood project

- Reducing environmental impact by Smart Spraying

- Improved greenhouse management with the future internet

- Higher resource efficiency in a smart flower supply chain

- Tracing vegetables with smart boxes

- Tailored Information for Consumers

- Tracking & Tracing for Awareness in Meat Chain

- Challenges and opportunities of the Future Internet for the food processing sector – towards the food factory of the future

- Next steps and potentials for Industry and Research for being involved in further phase

The event is to be held on March 5th, 2013 in Avenue de Beaulieu (Buildings BU25) B - 1160 Brussels, 0/S1 room. The preliminary program is now available and will be finalised soon. Information and registration will be available at www.smartagrifood.eu.

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Bon Preu carries out the second "Smart Food" workshop with consumers
by Harald Sundmaeker

After the execution of its first "Smart Food" workshop with consumers last 25th of April, Bon Preu Group has now carried out its second workshop inviting the same partici-

pants to test for the first time the first release of the Tailored Information for Consumers – TIC – application.
On April 25th, a panel of consumers consisting of 15 Bon

Preu regular customers were invited to participate in the SAF project within the TIC pilot that is being developed for an improved consumer awareness, with the objective

to know what product information consumer would like to know while doing their shopping, and how consumer would like to get this information.

The conclusions of that first workshop showed that a high percentage of participants ignored the existence and the meaning of a big amount of logos and had different priorities concerning attributes that would like to know about products in the supermarket, hence reinforcing the need of the concept of *Tailored Information*.

The second workshop was held last 6th of November in Bonpreu's "Consumer' space" where the same panel of consumers were invited to come and test the first mock-up of the TIC application that has been developed during the last months. The main objective was to present to consumers the developed online application and to carry out a first validation process that allowed detecting functional problems, knowing consumers opinion about the app inter-face, design, operability, content, etc. in order to solve the detected problems, improve the app considering the panel recommendations and expectation and then validate this first release to continue working for a second release of the TIC app.

A variety of selected products were used for the experimentation, having each product its unique QR code. The process was quite simple: consumers needed to connect to Bon Preu WIFI and to access to the online app using an URL, select the language, then register to create their own consumer profile by filling a short questionnaire about their preferences ("*I am interested in: food origin, sustainability aspects, chemical content, allergens, animal welfare, etc.*"), afterwards scanning the QR code to get the product information that fits with their consumer profile and finally the application showed the tailored information of that product.

In general, participants showed a big interest in the TIC app, they found it an innovative tool with high capacity for improving awareness concerning agri-food products; it is user-friendly and intuitive. However, some problems and improvements were detected mostly in Samsung Galaxy Smartphone regarding web browser constraint and QR scanning.

Participants made interesting proposals concerning the interface (how to show product information) and enriched the attributes by suggesting new ones (like cholesterol level, harmful products for pregnancy...).

Developments will continue for a second release of the TIC app which will solve detected problems, include new features (such as logo recognition) and increase its reliability and interoperability. Bon Preu panel of consumers will be able to test it again next January 2013.

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IoT and IERC News

IERC Activity Chains:

The IERC projects are not stand alone but part of the activity chains in the Cluster (existing and developing). Activity chains are a method used by the projects to address European approach in different research areas such as:

- Technology
- Strategy
- Common Activities
- Responsibilities
- Cooperation
- Innovation

The IERC activity chains active from October 2012 are the following:

AC1 - Architecture approaches and models
AC2 - Naming and addressing schemes. Means of search and discovery
AC3 - Application scenarios, Pilots and Innovation
AC4 - Service openness and inter-operability issues/semantic interoperability
AC5 - Governance, Privacy and Security issues
AC6 - Standardisation and pre-regulatory research
AC7 - IoT Enabling technologies
AC8 - Cognitive Technologies for IoT

IoT and IERC News

- **IERC AC2 – Naming and addressing schemes. Means of search and discovery :** The activity chain focuses on the requirements and specifications for a naming system, needed to define and address an object or a sensor, possibly complemented with information related to the object. This has to be connected to an event reporting and storage system used to register the information related to a change occurring in the real world, either to the object or as monitored by a sensor/embedded processor. In addition the discussions have to consider a look up and routing system, enabling the linking of an object/sensor name with the address of the database where event information pertaining to that object/sensor is located and a discovery system, enabling the discovery within the accessed database of the relevant event information that corresponds to. During the next year the activity chain will address the "intelligence" in the discovery process by looking into the process of discovering alternatives that could fulfill a given task or provide a given service (e.g., "Find appropriate sensors for Task X"). The activity chain provided in 2012 the first document which illustrates and provides taxonomies of the various addressing/discovery schemes used in several IERC projects.

- **IERC AC4 – IoT Interoperability future plan:** As indicated within the community, IERC AC4 discussions are split over 2 groups, AC4-TI (Technical Interoperability) and SI (Semantic Interoperability). First good news is that AC4-SI is supported by Martin Serrano, DERI representing also Open IOT and now appointed as AC4 co-coordinator. University of Surrey from IoT.est supports also this coordination. After AC4 meetings organised in 2012 in March and June, Probe-IT together with OpenIoT and IoTest projects has successfully organized Semantic Interoperability Events on 22nd-23rd October 2012- Mandelieu (co-located with ETSI M2M WS and demos) (see more here http://www.probe-it.eu/?p=1106). The 2013 programme for AC4 meetings and related events is:
  - AC4 TI meeting together with AC1, Delft 7th-8th February 2013
  - AC4 SI and 2nd Semantic Interop event, Guilford 15th April 2013 @ EWC 2103
  - AC4 SI&TI @ IoT Week Helsinki 17th-20th June. AC4 white papers to be released
  - AC4 TI sponsored IoT 6LoWPAN interop event Berlin July 2013 @ IETF (tbc)

  Probe-IT workshops and interoperability events 2013 programme in EU, Brazil, Africa, China: www.probe-it.eu/?p=1206. Contacts: philippe.cousin@eglobalmark.com; martin.serrano@deri.org

- **IoT-A Stakeholder workshop:** The 5th Stakeholder Workshop of IoT-A took place in Bled on 26th November 2012. It focused on socio economic and business aspects, especially privacy and the potential of new business networks. The PIA exercise with the participants will lead to an article that will be published early 2013. There were presentations on oneM2M by Joerg Swetina (NEC), M2M R&D by Jim Morrish from Machina Research, and a strong focus on Health as it is one the use cases of IoT-A. Boris de Ruyter (Philips Research) addressed the dynamic capabilities of learning in IoT systems, both by the users and by the environment itself, that happens when situations arise that are not programmed but 'learned'.

- **OpenIoT @ SME Summit:** OpenIoT participated in the SME Summit organised by DG Enterprise held in Brussels on the 17th October. Bilateral meetings with entrepreneurs and SMEs from the various European member states happened throughout the day. OpenIoT was represented in both the technology group and in the Health & Care group. There was quite some interest in the actual middleware and applications that will be developed by the project since this could be a source of competitiveness for some companies in the future.

- **OpenIoT @ IoT Europe:** The 4th Annual Internet of Things Europe (12th-15th Nov 12012), explored the co-existence of real and virtual worlds in everyday life within areas such as health, transport and retail. The event facilitated debate among stakeholders on how both the public and private sectors need to work together to create an environment for increased innovation, investment and economic growth. A section for demonstrations and expositors was allocated in the main hall of the Management Centre Europe (MCE) in Brussels, Belgium. OpenIoT was represented by Prof. Arkady Zaslavsky (OpenIoT WP6 leader - CSIRO Australia) and Dr. Martin Serrano (OpenIoT Project Manager – DERI Ireland) with some demonstrators based on OpenIoT project scenarios and disseminations materials prepared and presented by OpenIoT partner AcrrossLimits (Mrs. Angele Giuliano and her team).

- **AC6 - Standardisation and pre-regulatory research:** The success of the Internet of Things depends on the development of smoothly interoperable global standards. The activity chain is preparing a position paper focusing on standardization as an innovation driver, by performing a gap analysis and identification of the IoT priorities for the next period. The position paper will identify future standardization needs in the area of IoT by consulting and involving various organizations including ETSI, CEN, ISO, ITU, IETF, OGC, GS1 and various experts working in the area of IoT.
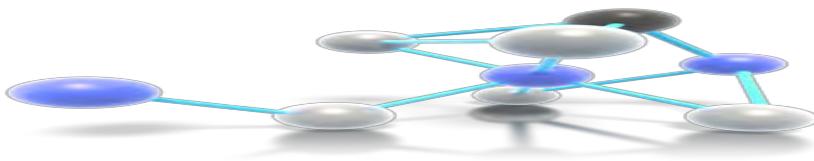
ABOUT IERC

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 organisational level.

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IoT Events

- **February'13**
  7th & 8th: IERC meeting
    Activity chain meetings (AC1, AC4, AC5, AC6), Delf, Netherlands
- **February'13**
  13th-15th: 10th European Conference on Wireless Sensor Networks (EWSN 2013), Ghent, Belgium
    http://ewsn13.intec.ugent.be/
- **March'13**
  25th-28th: International Workshop on Pervasive Internet and Smart Cities, Madrid, Spain
    http://ants-webs.inf.um.es/conferences/pitsac/?m=1
- **April'13**
  2nd-5th, IEEE 8th Intelligent Sensors, Sensor Networks & Informaton Processing (ISSNIP'2013),
    Melbourne, Australia
  11th-12th, Remote Encounters, Cardiff, UK. http://remote-encounters.tumblr.com/
  16th-18th, European Wireless'2013, Guildford, UK
    www.ew2013.org
- **May'13**
  08th-10th: Future Internet Assembly (FIA), Dublin, Ireland
    http://www.fi-dublin.eu/
- **June'13**
  17th-20th: IoT Week, Helsinki, Finland
- **July'13**
  03th-05h: Future Network and Mobile Summit 2013, Lisbon, Portugal
    http://www.futurenetworksummit.eu/2013/
- **November'13**
  06th-08h: ICT 2013: Create, Connect, Grow, Vilnius, Lithuania
    http://ec.europa.eu/information_society/newsroom/cf/itemdetail.cfm?item_id=9153