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February 2009

RFID VIEWPOINT

CASAGRAS
an EU Framework 7 Project

Welcome...

...to the Casagras e-Newsletter

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Promoting international collaboration on RFID standardisation for **The INTERNET OF THINGS**



INTERNET OF THINGS - DEFINITION AND VISION STATEMENT AGREED

Partners in the CASAGRAS project agreed a definition and mission statement for the Internet of Things at their Shanghai workshop
Page 2 (Page 14 for a fuller paper on the definition)



WOW - IT'S THE WORLD OBJECT WEB

Introducing WOW – the World Object Web. Prof. Anthony Furness explains the concept
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TRONSHOW 2009 ATTRACTS 10,000 TO TOKYO

CASAGRAS partner Chiaki Ishikawa reports on the success of this technical showcase for ubiquitous computing and embedded systems technology.
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To read the full CASAGRAS Newsletter
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CASAGRAS project



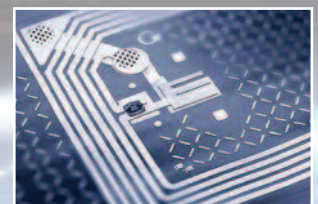
CASAGRAS
welcomes new
members to
Extended Experts
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**Meet the CASAGRAS
Partners**
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**UPDATE FROM WP
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Work package leaders
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CASAGRAS and The Internet of Things - Definition and vision statement agreed



Partners from the EU Seventh Framework Programme CASAGRAS (Support Action for global RFID-related standardisation activities involving organisations from Europe, China, Japan, Korea and the USA) made significant progress at their December meeting in Shanghai, China.

They were able to critique seven white papers which will be published in Spring this year and, as a result of this detailed work, they unanimously agreed a vision statement and a definition for the Internet of Things.

Project co-ordinator Ian Smith (President AIM UK) emphasised the importance of the two descriptions. "We needed a simple one sentence 'vision statement' which would explain the potential of the Internet of Things to the widest possible global audience. Our partners believe the following achieves this objective:

"A world where 'things' can automatically communicate to computers and each other, providing services for the benefit of human kind."

Prof. Anthony Furness, CTO of the European Centre of Excellence for AIDC, is the project's technical co-ordinator. He had prompted the need for a technical definition of the Internet of Things and was equally pleased that the partners unanimously agreed the following statement:

"A global network infrastructure, linking physical and virtual objects through the exploitation of data capture and communications capabilities. This infrastructure includes existing and evolving Internet and network developments. It will offer specific object-identification, sensor and connection capability as the basis for the development of independent federated services and applications. These will be characterised by a high degree of autonomous data capture, event transfer, network connectivity and interoperability."

The partners agreed that Global coding would be one of the most important considerations and challenges within the CASAGRAS project.

It was critical that the approach to this issue should accommodate legacy coding systems and provide an ongoing basis for global coding with appropriate registration and support capability, linking too with issues of governance and revenue models.

The CASAGRAS partners from Korea saw the need for a three layer model, inclusive of data carrier, interface and resolver requirements. It was generally agreed that a resolver approach was necessary to accommodate the issues, including appropriate linkage to Internet-Protocol (IP) based systems.

Experts within the CASAGRAS partnership will contribute to the resolver solution and potentially produce a demonstrator model.

Representatives from major Chinese Government departments, academic and commercial institutions, as well as leading RFID solution providers, attended a one day workshop which was co-sponsored by GRIFS, another EU FP7 project. A second joint workshop was presented in Hong Kong later in the week.

The CASAGRAS project is due to present its final report and recommendations on June 18, 2009, with an open meeting in either London or Prague. Full details will be posted on the CASAGRAS website www.rfidglobal.eu. Copies of the presentations in both Shanghai and Hong Kong are also available at this site and also at www.aimuk.org

see also page 14 defining the internet of things



INTRODUCING the World Object Web - "WOW"



Prof. Anthony Furness

Professor Anthony Furness, technical co-ordinator of the CASAGRAS project, explains this exciting new concept

Partners in the CASAGRAS project have seen the importance of considering the integration of the Internet of Things with the development of the Internet. As a consequence it sees a parallel between the World Wide Web and the need for a World Wide Web of Objects, a World Object Web – or WOW.

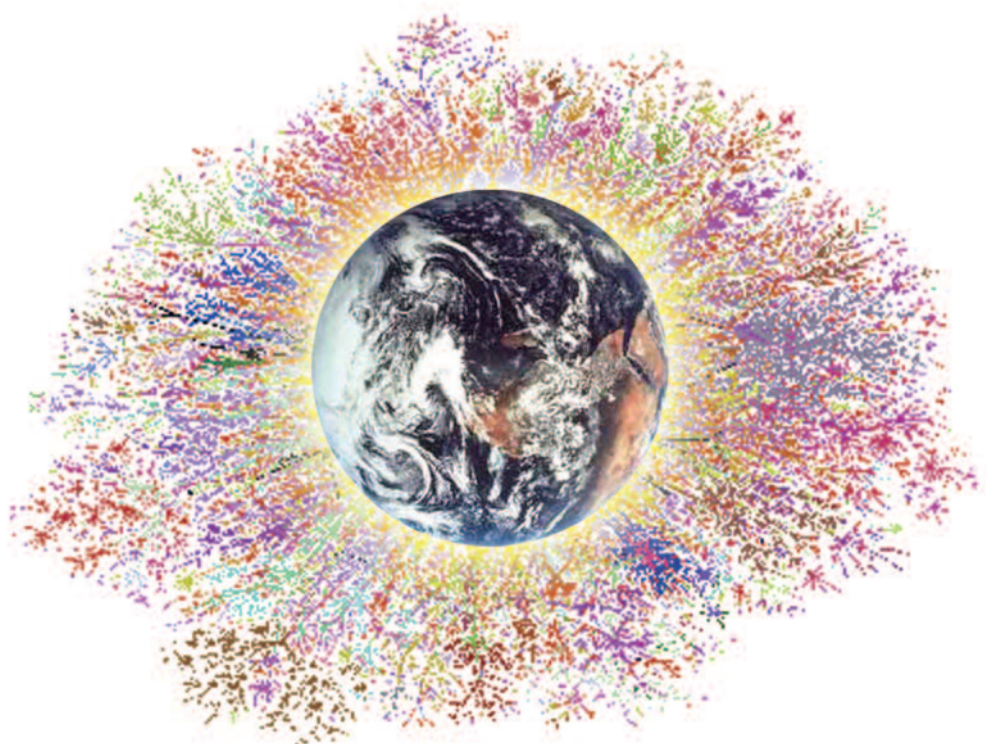
Through project work package developments with respect to global identification, a scheme has been identified that can exploit global resolution to identify various legacy identification schemes using URLs and EPC, ISBN numbers and so forth. We now see the opportunity to introduce an equivalent to the URL with respect to a new domain, or set of domains, that come under a working title of the World Object Web (WOW).

Such an approach gives rise to the potential for independent federated sites that exploit the connection of objects in networks and non-network form into service structures that can support a wide range of applications at local domestic level, company level, national level, European level and international level.

The opportunity is there to determine what sort of applications there might be that embrace not just RFID but further Edge Technologies and the identification of all sorts of objects within the physical world.

We would welcome YOUR thoughts on what these applications might be; how the World Object Web might evolve; how it might be governed and how it might link even better with the World Wide Web and the Internet.

Please log on to **www.rfidglobal.eu** and post your comments in our Global Forum – they will be invaluable in helping to ensure the cohesive development of WOW through attention to the widest range of interests and opinions.



Work Package leaders review progress

A significant part of the partners' meeting in Shanghai was devoted to reports from Work Package leaders reviewing progress to date. However, it was agreed that a definition was required for the Internet of Things to provide a reference point for WP leaders when aligning their respective white papers and recommendations.

Prof. Anthony Furness offered a prospective definition which, over the two days of the meeting, was refined and agreed by partners:

Internet of Things – a definition

A global network infrastructure, linking physical and virtual objects through the exploitation of data capture and communication capabilities. This infrastructure includes existing and evolving Internet and network developments. It will offer specific object-identification, sensor and connection capability as the basis for the development of independent federated services and applications. These will be characterised by a high degree of autonomous data capture, transfer event network connectivity and interoperability.

The CASAGRAS partners also agreed a vision statement to help promote the concept on a wider, more public basis:

Internet of Things – vision statement

A world where things can automatically communicate with computers and each other, providing services for the benefit of human kind.



Paul Chartier

Work Package 1 – standards and procedures

WP leader Paul Chartier reported on the relevance of the parallel GRIFS work in relation to RFID standards. The GRIFS Standards report was an extensive 200 page report covering the range of existing standards for RFID and those that were in progress, particularly sensor-related standards. The GRIFS work also included the specification of a WIKI based upon the structure and content of the report and providing a "click and view" facility to ease navigation of the standards framework. It was seen as a suitable model for CASAGRAS.

Mr Chartier said that the RFID standards work clearly fulfilled the initial remit for CASAGRAS and that the model structure was seen to be a suitable basis for accommodating standards relating to other edge and communications technologies that could be recognised as important within the fully inclusive IoT model proposed in CASAGRAS.

It was agreed that the WP deliverable should offer as a recommendation for the final project report that the primary technologies, additional to RFID, should be considered in a comparable manner and the same model adopted to that used for RFID.



David Armstrong

Work Package 2 – regulations for RFID and radio-based technologies

In reporting on developments of WP2 and its white paper, David Armstrong drew attention to the initial remit of CASAGRAS with respect to RFID and the IoT and the wider aspects introduced by the proposed CASAGRAS inclusive model. In addition to the other radio-based technologies relating to spectrum usage, he emphasised that other regulatory issues would have to be considered including those relating to privacy and security.

Mr Armstrong said that the WP's deliverable was seen to satisfy the initial CASAGRAS remit but that it now needed the broader framework for the inclusive model of the IoT to be defined and appropriate recommendations developed to meet the regulatory requirements of the wider model.



Craig Harmon

Work Package 3 – global coding issues

WP leader Craig Harmon was unable to be in Shanghai but in a full debate on global coding issues it was agreed that the approach to this issue should accommodate legacy coding systems and provide an on-going basis for global coding with appropriate registration and support capability linking, too, with issues of governance and revenue models.

Representatives of ETRI (Korea) saw the need for a three layer model, inclusive of data carrier, interface and resolver requirements. It was generally agreed that a resolver approach was necessary to accommodate the issues, including appropriate linkage to Internet-Protocol (IP) based systems and that others within the CASAGRAS partnership could contribute to the resolver solution and potentially develop a demonstrator model.



Yong-Woon Kim

Work Package 4 – ubiquitous computing and networks

WP leader Yong-Woon Kim presented a review of the work undertaken by the Korean partner in consultation with the Japanese partner from YRP. This work clearly indicated the layering features for an IoT that accommodates developments in ubiquitous computing and networks defining next generation network and the evolving Internet, developments in sensors and sensor-based networks and developments in ubiquitous computing.

The group saw the value of agreeing a definition for the IoT as a basis for refining and aligning the output of WP4 in relation to other work packages and the overall aim of defining a practical, workable structure for the IoT.



Prof. Anthony Furness

Work Package 5 – functional issues and developments

A central feature for consideration by this WP, being developed jointly by Anthony Furness and Paul Chartier, was the resolver functionality to accommodate legacy coding schemes and supporting new schemes. It was felt that a great deal more consideration was required on the resolver side, including the IP aspect of integration with the evolving Internet. This would be considered in relation to the developments of WP3 and with respect to the CASAGRAS definition of the IoT. A draft white paper would be delivered as soon as practicable.

Work Package 6 – applications

A draft white paper had been submitted on the subject of IoT applications but WP leader Anthony Furness emphasised the need for a working CASAGRAS definition of the IoT.

The draft white paper highlighted the need for a framework model and associated tools for better understanding objects and grouping objects for applications or services supported by the IoT, together with further principles and methodology relating to business processes and the possible structuring for exploiting multiple identification in IoT applications and services. This was generally seen as academic underpinning that would be better accommodated within annexes of the CASAGRAS report or as a follow-on from a set of application scenarios providing exemplars for IoT applications and services. Because of the proposed positioning of these principles within a body of ICT recognised as Object-connected ICT, it was suggested that this approach to accommodating the IoT components should be adopted in this way, rather than in the body of an Applications white paper.

It was agreed that the format for the Applications white paper should concentrate on application exemplars and exemplars at different levels, from personal, domestic, corporate, public and regional, environmental through to national and international levels. In contrast to many of the applications proposed in the media and elsewhere for the IoT, Anthony Furness indicated that they should clearly and effectively indicate the functionality being exploited that relates to the IoT. It was also agreed that the CASAGRAS partners would offer application scenarios for consideration by WP6.

Work Package 7 – socio-economic issues

WP leader Anthony Furness again referred to the need for the CASAGRAS working definition and the scope of considerations required to cover the socio-economic issues. These should include the implications of integrating with the evolving Internet and the bearing that this could have on governance. It should address the revenue models and registration requirements to accommodate a solution to resolving legacy and new coding schemes; standards handling issues; environment, social impact and, of course, the needs for accommodating privacy and security issues.

Prof. Furness once again promoted the design approach in such considerations. It was generally agreed that the white paper should be further developed and comments sought from partners accordingly.



CASAGRAS welcomes - new members to Extended Expert Group

CASAGRAS is delighted to welcome the following as members of an Extended Expert Group which will add value to the project by reviewing white papers produced by work package leaders and the project's final report which will be submitted to the European Commission in June this year.



Vassilis Kostakos,

University of Madeira : Vassilis Kostakos is an assistant professor at the Laboratory for Usage-Centred Software Engineering (Lab:USE) at the University of Madeira and an adjunct assistant professor at the Human Computer Interaction Institute at Carnegie Mellon University, USA. He holds a BSc and PhD in computer science from the University of Bath and lists among his interests mobile and pervasive computing, human-computer interaction, social networks, security and privacy, modelling and simulation, epidemics, wireless technologies and space syntax.

Lab:USE is a unique research and development initiative dedicated to making technology more useful, more usable and more accessible. Founded in 2005, it comprises 14 faculties representing 11 nationalities. Lab:USE has a dual mission: bridging the gap between software engineering and interaction design by developing practical tools, techniques and practices for software engineering approaches centred on human needs; and exploring and expanding the potential of computers in supporting human communication by designing and developing novel systems and interfaces and by investigating their usage and effectiveness in real world applications.
vassilis@cmu.edu



Partick Grossetete,

Arch Rock, France: Patrick Grossetete is technical director of product management and customer solutions at Arch Rock, a pioneering company in IP-based wireless sensor network technology located in San Francisco. He previously led a product management team at Cisco Systems and was responsible for a suite of Cisco IOS software technologies including IPv6 and IP Mobility.

Before joining Cisco in 1994 Patrick worked at Digital Equipment Corporation as a consulting engineer for network design and deployment. He is a regular speaker at conferences and industry events including the IPv6 Forum which he joined in 1999 as a Cisco representative. Patrick has co-authored two books on IPv6 networks and strategies and in 2003 he received the IPv6 Forum Internet Pioneer Award at the San Diego summit. He holds a degree in computer science from the Control Data Institute, Paris, and continues to live near the French capital.
pgrossetete@archrock.com



Stephan Haller,

SAP Research, Zurich, Switzerland: Stephan Haller is a senior researcher and architect in the smart items and research programme at SAP Research in Zurich. He has been working on technologies relating to the Internet of Things for many years and is therefore deeply involved in European research activities in this area. He is currently overseeing the IST SENSEI project which is concerned with integrating wireless sensor networks into the network of the future. He was previously the project lead of CoBlis which developed a service-oriented architecture to deploy business logic to the network edge e.g. to wireless sensor networks. He is also participating in the RFID Expert Group of the European Commission.

Stephan initiated RFID research and development activities at SAP in 1998, which led to the SAP Auto-ID Infrastructure. He was a co-chair of the Reader Protocol working group at EPCglobal, and also worked as a technical consultant on several RFID customer projects such as the Metro Future Store and Fraport.

Before joining SAP in Tokyo in 1997, Stephan spent three years as a research engineer at Matsushita Electric Works' Central Research Laboratory in Osaka, Japan. He holds a master's degree in computer science from the Federal Institute of Technology (ETH) in Zurich.

stephan.haller@sap.com



Prof. Y. Fun Hu

Prof. Y. Fun Hu received a 1st Class B.Sc degree in Mathematical Science and a Ph.D. degree in Information Systems Engineering, both from the University of Bradford. After working two years in industry as a communications system engineer, she returned to academia in 1992. In 2005, she was promoted to Professor of Wireless Communications Engineering in the School of Engineering, Design and Technology (EDT) at the University of Bradford. Since taking up her first academic post, Prof. Hu has been actively involved in the development of 3G mobile communications systems through participation in numerous high profile EU framework programme projects and national framework programmes. Currently, she leads the Mobile Networks and Applications Group in the Mobile and Satellite Communications Research Centre of the Bradford University. Activities within the research group cover a wide spectrum of areas including network protocol design, integration of heterogeneous mobile/wireless networks, mobility management, radio resource management, network management, network security, wireless sensor networks, SOA, enterprise networks, with funding support from the European Commission, the European Space Agency (ESA), the Engineering and Physical Sciences Research Council, the Department of Trade and Industries, the Leverhulme Trust and various industrial and research organisations. She was a UK delegate of the different EU COST Actions between 1996 and 2006, a member of the editorial board of the International Journal of Services and Standards, Indscience, an executive member of the IET Electronics and Communications Divisions Professional Network Group on Satellite Systems and Applications (2000-2002) and has been a member of the Technical Advisory Panel of the same Professional Network Group since 2002. She is author and co-author of three books and two book chapters and published widely in international journals and conferences in mobile and wireless communications. She is the course co-ordinator of the MSc taught programme in 'Wireless Sensor and Embedded Systems', which started in September 2005 and was the first of its kind in the UK.

Prof. Hu is a member of the management board and the Networking workpackage leader of the EU project SatNEx. In 2007, Prof. Hu was awarded the Yorkshire Forward Professor of Wireless Communications by the Regional Development Agency, Yorkshire Forward, for her contributions to the mobile and wireless communications research and knowledge transfer activities.

Dr. Jimmy Li

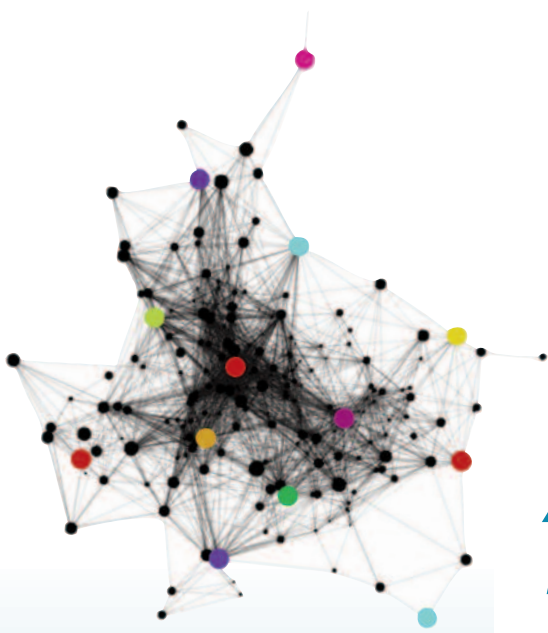
Dr. Jimmy Li is the Deputy Director of Initiative Office for Government RFID Applications of Ministry of Economic Affairs in Taiwan and also an advisor in Institute of Information Industry, a key IT research institute in Taiwan and technology think tank to Taiwan government. In his current capacity, Dr. Li is assisting Taiwan government to define the strategic development plan for the emerging RFID industry, and initiate government RFID applications to stimulate applications in private sectors. Dr. Li also lead R&D effort in developing an integrated software platform to facilitate future RFID-enabled application development and integrations. He is also building a comprehensive integration laboratory and solution promotion center for RFID technology testing, development and integration.

Prior to joining the institute, Dr. Li had more than 20 years experience in Silicon Valley in USA. He was the founder of IDVine Technologies developing RFID integrated solutions. He was also a founding member for Transcast International and in charge of T-commerce solution and service infrastructure development. Previously, Dr. Li had a decade of senior engineering management experience in some established hi-tech companies in Silicon Valley, such as Sun Microsystems and Borland as well as start-ups in factory automation.

Dr. Li received his Ph.D. degree in Industrial Engineering from Purdue University in Indiana, USA.

Dr. Li is currently serving as a member of trust mark review committee of Secure Online Shopping Association (SOSA) in Taiwan. Previously, he was a board member of SOSA and the President (2002-2003) of North America Taiwanese Engineer's Association, in San Jose, California, USA.

RFID related publication: Cheng-Ming Jimmy Li, "An Integrated Software Platform for RFID-Enabled Application Development", Proceedings of the IEEE International Conference on Sensor Networks, Ubiquitous, and Trustworthy Computing (SUTC'06)



Also joining the Extended Expert Group are

Dr. Frank Gillert (University of Applied Sciences, Wildau, Germany)

Linpeng Gao (CESI, China)

Kyoung-Seok Oh (TTA, Korea)

Bertus Pretorius (South Africa)

Prof. Xianwei Zhou (Beijing University of Science & Technology, China)

Our new colleagues join the following on our Extended Expert panel;

George Roussos (Birkbeck College, UK)

Dan Mullen (AIM Global, USA)

Shin'ichi Konomi (Tokyo University, Japan)

Robert Williams (CSI, UK)

Scott Cadzow (USA)

Trevor Peirce (Magellan Technology, Belgium)

Josef Preishuber-Pflugl (CISC Semiconductor, Austria)

News from GRIFS – the Global RFID Interoperability Forum for Standards

A world of global supply chains requires that RFID tags and associated sensors can operate, can be seen and can be interrogated anywhere. For maximum competitiveness and greatest efficiency this requires standards that are global in definition and application.

GRIFS is a support action project funded by the European Union's FP7 programme with the aim of improving collaboration and thereby to maximise the global consistency of RFID standards. This two year project started in January, 2008, and is run by GS1 (project co-ordinator), CEN and ETSI

GRIFS is undertaking the following work to achieve its objective:

- Analyse the national, regional and global RFID standardisation activities
- Create a number of liaison activities to disseminate information about the importance of global standards
- Initiate a forum that will continue to work constructively after the end of the project through a Memorandum of Understanding between key global standard organisations active in RFID

for more information visit www.grifs-project.eu

GRIFS HONG KONG WORKSHOP FOCUS ON INDUSTRY APPLICATION STANDARDS

The third GRIFS workshop was held in Hong Kong in December in partnership with CASAGRAS. It was one in a series of four such workshops in Europe and Asia to obtain feedback on the future Memorandum of Understanding and Forum of Collaboration. Each workshop addresses a specific topic and reviews standards-related issues which may need to be addressed by the GRIFS Forum. In Hong Kong the focus was on industry application standards.

The workshop also included a presentation on the work being done by CASAGRAS on the broader concept of the Internet of Things.

"A need for collaboration between the standards organisations will benefit the industry": The objective of this session was to assess the need for collaboration for industry application standards. Gordon Leung, deputy commissioner, Innovation and Technology Commission, HKSAR Government, reported on the efforts made by the Hong Kong Government in pushing for the development and implementation of RFID in local industry. As an example of best practice he cited Hong Kong International Airport which implemented RFID for the tracking of luggage, and the Octopus card, the RFID public transport card.

Mr Leung stressed the importance of standards as implementation of the technology quickened and became wider. Co-ordination between standards organisations would be crucial for successful global deployment.



MEMORANDUM OF UNDERSTANDING & GRIFS FORUM – OUTCOMES FROM THE WORKSHOPS

The Memorandum of Understanding (MoU) and the structure of the GRIFS Forum were presented and discussed with audiences at both workshop sessions in Hong Kong to obtain information and feedback on which organisations should be invited to participate in the Forum and to identify sectors where collaboration was most needed.

The MoU

The proposed MoU served as a basis for the formation of the GRIFS Forum. It was important to note that the current draft MoU was not a definitive document but a work in progress still needing input from stakeholders. The current draft was largely inspired by the MoU on electronic business between IEC, ISO, ITU & UN/ECE.

Its core principles were a strong commitment from the involved standards organisations to collaborate and share information while respecting each other's organisations and existing standards development processes. Another important principle was the involvement of the user community and the priority to meet their needs and answer their concerns.

The Forum of collaboration

The Forum in itself would be an informal organisation which would generate consensus – based recommendations on RFID standards to existing standards development organisations. They would implement them using their own standards development processes. The Forum is planned to be launched in May, 2009, with regular meetings around the world. Further information will be available on the GRIFS website <http://www.grifs-project.eu>

Feedback from workshop participants -- standards organisations need to work together: Discussions centred on the utility of such a forum and also on the likeliness of a collaboration between standards organisations. Delegates agreed that there was a clear lack of collaboration in the current standardisation processes and projects such as GRIFS, CASAGRAS or the CERP cluster were appropriate initiatives for getting these organisations together.

It could be argued that there was some competition between standards organisations which could hinder the success of such a forum. However, co-operation was thought to be essential and, although competition could be healthy, it should not prevent the development of efficient and interoperable standards. Some co-operation was already proposed with the ITU, the NFC or the Open Geospatial Consortium, among others.

Users need to be involved: The need to involve the user community had always been stressed and GRIFS had expressed a strong commitment towards users since they should be the first beneficiaries of such an initiative. The forum could also be a good opportunity to raise awareness among users of the importance of standards.

Overall, the vast majority of workshop participants were in favour of the GRIFS initiative and were willing to help in its development – a promising outcome for the Forum's planned launch in May.

10,000 VISITORS MAKE TRONSHOW 2009 ANOTHER HUGE SUCCESS

CASAGRAS
an EU Framework 7 Project



More than 10,000 delegates visited TRONSHOW 2009, a major international event showcasing the latest in ubiquitous computing and embedded systems technology and organised by YRP Ubiquitous Networking Laboratory (UNL), a partner in the CASAGRAS project.

Along with their organising partners, which included T-Engine Forum and uID Center, UNL ensured that TRONSHOW 2009 remained in its 25th year one of the most successful events of its kind.

What is TRON?

TRON stands for "The Realtime Operating system Nucleus" and is the name of a computer architecture project originated in Japan. It was begun in 1984 by Prof. Ken Sakamura of the University of Tokyo and who remains a director of UNL. The aim of the TRON project was to design the computer systems of the future with a major target being embedded computer systems.

The TRON project founders had a vision that objects in our everyday environment would have computers, sensors and actuators and be "intelligent objects" which would talk to each other via a computer network. They would act in a co-operative manner to provide people with better living conditions and higher levels of service, security, comfort and energy efficiency.

Sounds familiar? Yes it might, because it pre-dated the idea of the Internet of Things by at least a couple of decades.

Ubiquitous computing & embedded systems : two major topics at TRONSHOW

Since its inception the TRON project has carried out various feasibility studies and experiments with the results being presented each year at TRONSHOW. In recent years the show has addressed ubiquitous computing and embedded technologies with each having its own area in the exhibition.

New development methodology and tools for embedded systems, and the T-Engine hardware and software platform were all on show. In the ubiquitous computing area, the use of uID (ubiquitous ID) in areas such as logistics and for developing free mobility solutions for the physically challenged were exhibited.

In addition to having exhibitors from Japan, China, Singapore, Vietnam and elsewhere, TRONSHOW 2009 was delighted to welcome important speakers and exhibitors from Europe.

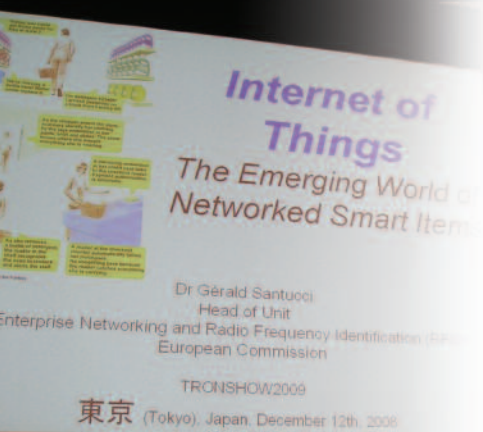
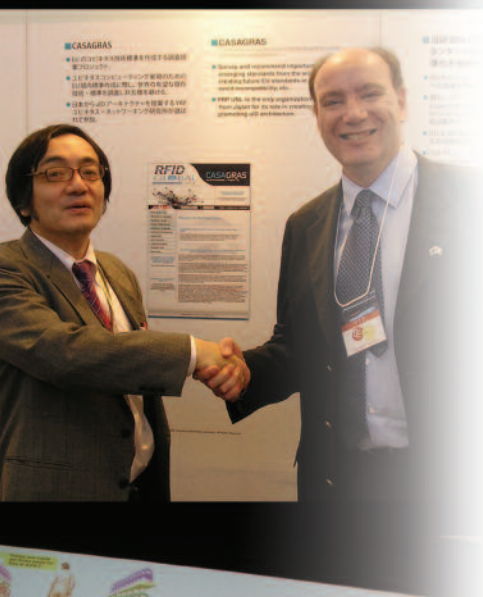
Officials from the European Commission were in attendance to explain policy principles relating to RFID and the Internet of Things with papers delivered by Dr Gerald Santucci and Peter Friess, both of the ICT for Enterprise Networking unit, and Thomas Sommer, principal scientific officer, integrated micro and nanosystems. Dr. Santucci expressed the hope that TRONSHOW might also take place in Europe – a suggestion which was warmly received by delegates.

In addition, Finland sent a delegation of more than 20 experts who presented a seminar on the socio-political and technological aspects of how Finland will use ubiquitous computing technology for the welfare of its citizens.

Also on show was NoTA, an architecture for mobile platforms proposed by a number of Finnish organisations including mobile phone leaders Nokia.

Already TRONSHOW organisers are planning the 2010 event, which will take place in December this year. They also look forward to possibly staging a TRONSHOW in Europe – the first ever outside Japan. see www.tronshow.org

- Chiaki Ishikawa, senior researcher/international liaison, YRP UNL



RFID GLOBAL FORUM OFFERS WORLD-WIDE STAKEHOLDER PARTICIPATION

Register FREE and be part of the debate !

It is an exciting world for anyone involved with RFID and its related technologies.

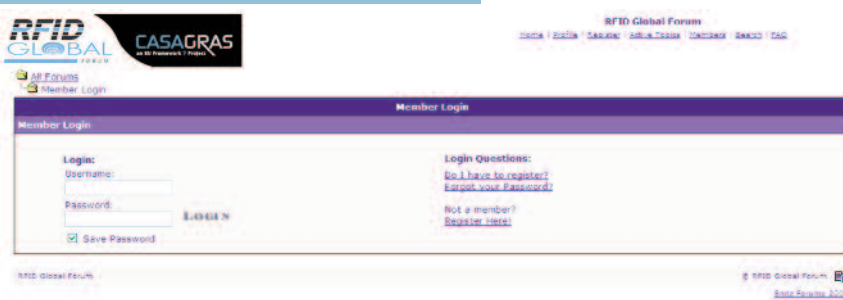
The international move towards the development of an Internet of Things continues to raise the profile of RFID as a technology with enormous potential to revolutionise global markets, bringing both economic and societal benefits.

How best to meet these global challenges and maximise the opportunities?

CASAGRAS is examining global standards, regulatory and other issues concerning RFID and will provide a framework of foundation studies that will assist the European Commission and the international community in influencing and accommodating the issues concerning RFID and the emerging Internet of Things.

In fact CASAGRAS is one of the most important RFID projects ever funded by the European Commission with a brief to make recommendations and to propose standards and best practice that can be agreed and applied world-wide.

To do this, CASAGRAS needs input from the widest possible range of stakeholders so that views, concerns and experiences from every world region and every industry sector can be considered. Solutions providers, hardware and software specialists, standards organisations, governmental and academic bodies and of course end-users all have an essential contribution to make to the shape of future RFID developments and the Internet of Things.



That's why the CASAGRAS partners urge you to sign up as a member of the project's RFID Global Forum. You will find it on our website www.rfidglobal.eu. Registration is FREE and you will be given a unique password enabling you to post comments and read the many strands of debate that CASAGRAS generates.

Remember, these are just a few of the generic topics CASAGRAS is addressing:

- The need for a global coding or numbering system that embraces existing legacy systems including EPC, ubiquitous ID
- An adopted set of data carrier and natural feature technologies and associated data structure and communication protocols to meet the needs of the Internet of Things.
- A universal data appliance protocol to accommodate a range of data carrier and natural feature technologies
- Network interfacing protocols to accommodate the range of heterogeneous network technologies and protocols called for with respect to the Internet of Things.
- Migration strategy to specify a pathway of development and agreements that will be necessary in realising the Internet of Things.
- The need and form for supporting international standards.

If you have an interest in these or in any of the many other factors that will influence the world's adoption and best use of RFID and the evolution of the Internet of Things then please make your views known through the RFID Global Forum at www.rfidglobal.eu and help shape CASAGRAS proposals and recommendations.

- Defining the Internet of Things

At their meeting in Shanghai in December CASAGRAS partners unanimously agreed a definition for the Internet of Things. Here the project's technical co-ordinator, Prof. Anthony Furness, explains how words and phrases within the definition need to be qualified to avoid ambiguity within a multi-faceted concept.

The concept of the Internet of Things as determined by the CASAGRAS project is embraced within the following definition:

"A global network infrastructure, linking physical and virtual objects through the exploitation of data capture and communication capabilities.

This infrastructure includes existing and evolving Internet and network developments. It will offer specific object-identification, sensor and connection capability as the basis for the development of independent federated services and applications. These will be characterised by a high degree of autonomous data capture, event transfer, network connectivity and interoperability."

As with many definitions that seek to encapsulate a multi-faceted concept there is a need to qualify what is meant by particular words in order to minimize ambiguity. Where a definition has to serve wide ranging nationalities and language barriers the difficulty of achieving clarity is even more demanding particularly where words are not seen to have any direct counterparts. This is the case with the definition of the Internet of Things. However, by way of qualification the following component parts of the definition are considered:

"Global network infrastructure" effectively describes what it is, a structure that is similar in many ways to that of the global or world-wide Internet itself, allowing messages from computer connections, packets of data comprising the message being sent via routing devices to the final destination and in the right order. The Internet of Things will invariably exploit this Internet infrastructure, at least initially, but with the computer nodes becoming increasingly replaced by autonomous computer functionality facilitated by "smart devices" or embedded computer-based systems that avoid the need for human intervention yet serve to satisfy human defined needs, be they personal, corporate or otherwise.

"Physical objects" refers to any tangible physical entity or thing, be it animate or inanimate, at item or any other level of complexity and able to be characterised in some ways for the purposes of type of unique identification. Virtual objects are those objects that are represented in media space and may exhibit a proxy relationship with a physical object. Again the need is seen to assign identity to the object if it is to be accommodated within the Internet of Things.

"Data capture" and **"autonomous data capture"** refers to the process of obtaining data from a particular source and introducing it into a computing, communication or other data handling system. Increasingly, the data capture process will exploit the advantages of automatic identification and data capture (AIDC) systems and with less and less human intervention when implementing applications or services within the Internet of Things.



- Initiate a forum that will continue to work constructively after the end of the

“Specific object-identification” refers to the way in which objects will be identified, either through natural features where this is appropriate or by codes in data carriers such as linear barcodes, two-dimensional codes or radio frequency identification (RFID) tags.

“Sensor or sensors” refer to a particular category of devices that can sense or measure defined physical, chemical or biological quantities and generate associated quantitative data. This is in contrast to other sensor definitions that are encountered in relation to the Internet of Things in which devices such as RFID readers are considered to sense the data they acquire.

“Connection capability and connectivity” both refer to the ability to introduce or interface between a source of data and a device that can carry or handle it. The greater the capability or connectivity the more effectively data can be transferred. Performance factors and criteria will be associated with such capabilities.

“Event transfer” refers to a transfer of functionality embedded in the message delivered from source to destination or any other situation or activity relating to an application or service.

“Independent federated services and applications” refers to services and applications wherein there is an agreement on the part of parties to use a particular infrastructure (albeit constrained by contractual details) to develop their respective applications or services but are free to determine the nature of those services and applications (within the contractual bounds of the infrastructure) and how they manage them.

The latter introduces a further, potentially very significant, dimension to object-connected ICT and the practical impact it can have upon businesses and life generally. By defining a suitable, commonly accessible communications and server support structure for object-based applications, the facility can be provided for independent development of these federated services analogous to and potentially as expansive as the world wide web (www). By exploiting the potential of new domain structures, such as a world object web (wow), the service and associated application framework can be considerably enhanced and expanded. The same sort of approach may also be used to accommodate within an Internet-integrated structure the emerging concepts of Internet of services, people and media



MEET THE CASAGRAS PARTNERS



Ian G Smith



Anthony Furness

CASAGRAS comprises a key group of international partners representing Europe, the USA, China, Japan and Korea who have come together to form this EU-funded 7th Framework initiative. Together they will look at global standards, regulatory and other issues concerning RFID and its role in realising the Internet of Things.

AIM UK: since its foundation 25 years ago AIM UK has been the leading non-commercial trade association for the automatic identification and data capture industry (AIDC). It is the longest established chapter of the AIM Global network and its member companies represent every aspect of AIDC including barcode, RFID, biometrics, mobile data capture, smartcards and voice recognition.

AIM UK members range in size from small niche consultancies to multi-national suppliers of software, hardware and turnkey solutions.

AIM UK has established excellent working relationships with UK government agencies for whom it has produced a wide range of authoritative guides and publications for the AIDC end-user community. It also enjoys an excellent working relationship with the European Commission following the success of several EU projects in which it has taken a key role. These include EU FoodTrace, the PETER project on traceability in the food supply chain and Bright Animal, a new project which will look at precision livestock farming. (www.aimuk.org)

AIM UK president **Ian G Smith**, co-ordinator of the CASAGRAS project, is also chief executive officer of the **European Centre of Excellence for Automatic Identification and Data Capture Technologies**, another project partner. The centre's head of technology, **Professor Anthony Furness**, acts as chief technology officer for CASAGRAS.

Opened in late 2007, the AIDC Centre of Excellence is a publically funded organisation responsible for raising awareness among end-user communities of the potential of AIDC technologies to transform business efficiency and profitability; to encourage excellence in innovation, research and development; to contribute to setting globally agreed standards; and to offer high quality training opportunities to both end-users and industry members.

The AIDC Centre of Excellence contains ten demonstrator units covering areas such as healthcare, manufacturing, food supply chain and logistics which allow visitors to see the technologies in action in real time and to better understand their potential and efficient application. (www.aidc.org)





The ETRI team, from left :
Junseob Lee, Byoungnam Lees,
Yong-Woon Kim, Sangkeun Yoo
and Eunsook Kim

ETRI (Electronics and Telecommunication Research Institute) Korea : ETRI is the biggest government-funded ICT research and development institute in Korea and takes the lead in: telecommunications, mobile communications, radio and broadcasting, software computing, telematics, intelligent robot, RFID and wireless sensor networks. It was established in 1976 and employs about 2,500 R&D engineers.

Yong-Woon Kim is the team leader and senior research engineer of the u-infra standards team of ETRI and is responsible for leading four work areas:

- standardization for USN (ubiquitous sensor network) networking and application/services technologies
- standardization for 900MHz based mobile RFID technologies
- standardization of IPv6 based mobility support on next generation network
- development of IPv4/IPv6 transition and security technologies.

The team has developed domestic standards to support mobile RFID services which provide RFID-triggered B2C and B2B2C information content to consumers and has contributed its achievements to international standardization works handled by IT-U SG 13, SG 16, SG 17 and ISO/IEC JTC 1/SC 31. The ETRI team has also studied sensor network technologies as characterized in ITU-T as ubiquitous sensor networks (USN) which provides context-aware information and knowledge services. (www.etri.re.kr)

YRP Ubiquitous Networking Laboratory, Tokyo: Prof. Dr. Ken Sakamura is director of the YRP Ubiquitous Networking Laboratory (UNL) in Tokyo and represents the organisation as a CASAGRAS partner. UNL was established in 2002 and is an independent laboratory for research and development in ubiquitous networking and ubiquitous computing. Dr Sakamura is also professor of the Interfaculty Initiative in Information Studies at the Graduate School of the University of Tokyo.

In addition to these posts Prof. Sakamura is also chair of the T-EngineForum, a non-profit organisation set up to promote the results from the TRON Project, and of the uID Centre which is at the core of the management of ubiquitous ID architecture promoted by UNL.

The TRON Project (The Realtime Operating system Nucleus) was established in 1984 and aims to improve the state-of-the-art of operating systems for realtime embedded devices. The project is characterised by an open approach. The technical specifications produced by the project are available, free, within the public domain and can be used to create royalty-free products (see www.t-engine.org)



Prof. Dr. Ken Sakamura

Prof. Sakamura is interested in making computers small and embedding them in many "real world" objects and the achievements of the TRON project have proved useful in promoting the future of ubiquitous computing. A ubiquitous computing paradigm is currently being promoted into a social infrastructure and research and development of RFID chips and application software systems is being carried out at the University of Tokyo and at YRP UNL.

The latest series of trials using RFID technology to offer sight-seeing, shopping, barrier-free facilities and other useful services to pedestrians have attracted world-wide media attention and trials are on-going in several Japanese cities. (See www.ubin.jp)

Supply Chain Innovation Centre, Hong Kong Science & Technology Parks Corporation, China: The Supply Chain Innovation Centre (SCIC) is a joint initiative between Hong Kong Science and Technology Parks Corporation (HKSTP) and GS1 Hong Kong. Its task is to bring supply chain management professionals and technology together to enable enterprises in Hong Kong and the Pearl River Delta to become more responsive to market needs and improve operational efficiency while bolstering overall economic competitiveness. Established in February 2007, the SCIC occupies an area of over 3,000 square feet at Hong Kong Science Park.



Ricky Ma

Sharing the common vision, the SCIC can leverage HKSTP's synergies in the Integrated Circuit Development Support Centre, the Material Analysis Laboratory and the Wireless Communications Test Laboratory becomes a focal platform for RFID development and activities.

The creation of the SCIC fulfils HKSTP and GS1 Hong Kong's mission to facilitate the local adoption of global supply chain standards, best practices and enabling technologies as well as providing implementation services and support to local enterprises. The SCIC aims to accelerate local adoption of RFID technology and showcase the latest RFID solutions through demonstrations of applications at work as well as training programmes. It shows how a complete supply chain covering the manufacturing, logistics and retail sectors increases efficiencies using the standards-based EPC network together with a suite of RFID integrated solutions.

Ricky Ma is senior manager of the HKSTP and champions the interests of the ICT, precision engineering technology (optoelectronics and nanotechnology) and industrial design clusters at the Science Park and at three industrial parks in Hong Kong. Ricky brings to bear over 25 years of private and public sector senior engineering and management experience in UK and Australia, in addition to Hong Kong. He is vice chairman of the Hong Kong Association for the Advancement of Science and director of international affairs for the Hong Kong Optoelectronics Association (HKOEA).



Eldor Walk

FEIG Electronic GmbH, Germany: FEIG was founded 30 years ago and now employs around 150 people. Main business activities include RFID hard and software, control equipment for industrial doors and induction loop detectors, and its products are used all over the world. FEIG develops and manufactures RFID readers and antennas. As an OEM supplier, the company delivers only to system integrators and resellers. FEIG offers components within the range of 125kHz (access control), 13.56 MHz (eDocument, ticketing, logistics etc). The company's R&D department has 30 engineers while sophisticated development work on products in the frequency ranges <135 kHz, 13.56 MHz and UHF (860-96 MHz) is carried out in its fully equipped laboratory.

Eldor Walk, head of R&D and chief technology officer, leads FEIG's involvement in the CASAGRAS project. He is also currently : leader of work package for RFID standardisation of CE RFID (co-ordinating European efforts for promoting the European RFID value chain, member of ETSI ERM TG34 (RFID); member of ISO/IEC SC31 WG4 (item identification - RFID); member of EPCglobal hardware and software action groups; member of GS1 Germany steering committee RFID/EPC; member of German DIN committees; chair of AIM's European RFID expert group. (See www.feig.de)



Craig Harmon

QED Systems, USA: QED Systems was established in 1981 by **Craig K Harmon** and is the world's leading consultancy on automatic identification, having founded and chaired the AIM Global RFID Experts Group, the ISO/IEC JTC 1/SC 31 and the ISO Joint Working Group on Supply Chain Applications of RFID. The company provides end-users and technology providers with the expertise they require to navigate the world of barcode, two-dimensional symbol, RFID and RTLS technologies and has been responsible for the advancement of numerous corporate, national and international standards. QED Systems leadership chairs the international effort on the network-centric solutions of mobile item identification and management (JTC 1/SC 31/WG 5), real-time location systems - JTC 1/SC 31/WG 5, the US TAG to ISO TC 122 (packaging) and two ISO TC 122 working groups having developed the ISO standards for barcode and 2D symbols on product packaging (ISO 22742), product marking (ISO 28219) and shipping labels (ISO 15394).

QED President Craig Harmon and the company's chief operating officer are both AIDC 100 members, while Craig is also the senior project editor of the ISO/IEC 18000 series and was the 2004 Richard Dilling Award recipient. He was project editor of the first JTC 1/SC 31 standard (ISO/IEC 15434) and the first JTC1/SC 31 RFID standard (ISO/IEC 18000-7).

Craig Harmon also serves as an officer in numerous ANSI, ISO and JTC 1 groups and the liaison to ITU and ETSI. He participates in the specification development of EPCglobal, has written substantially on the topic of RFID and is the author of four books on data collection technology.

(See www.qedsysinc.com)



Patrick Guillemin

ETSI (European Telecommunications Standards Institute) France: ETSI is an independent, non-profit organisation whose mission is to produce telecommunications standards for today and the future. Based in Sophia Antipolis, near Nice, France, ETSI is officially responsible for standardization of information and communications technologies (ICT) within Europe. These technologies include telecommunications, broadcasting and related areas such as intelligent transportation and medical electronics.

ETSI unites 696 members from 62 countries inside and outside Europe, including manufacturers, network operators, administrations, service providers, research bodies and users - in fact, all the key players in the ICT arena.

ETSI also plays a major role in developing a wide range of standards and other technical documentation as Europe's contribution to world-wide ICT standardization. This activity is supplemented by interoperability testing and other services. ETSI's prime objective is to support global harmonization by providing a forum in which all the key players can contribute actively. ETSI is officially recognised by the European Commission and the EFTA secretariat.

ETSI's members determine the institute's work programme, allocate resources and approve its deliverables. As a result ETSI's activities are closely aligned with market needs and there is a wide acceptance of its products.

ETSI's participation in CASAGRAS is led by **Patrick Guillemin**. With 21 years experience in IT and telecommunications project management and 13 years in standardization, he is responsible within ETSI for development, co-ordination and management of new standardization initiatives in RFID and related fields.

Also taking part with him in the CASAGRAS project are **Ultan Mulligan**, director of strategy and new initiatives at ETSI, and **Philippe Cousin**, currently technical director of the FP6 GO4IT project related to overall testing approaches and open test platform. (See www.etsi.org)



Paul Chartier

Paul Chartier is founder and principal of the UK based Praxis Consultants, an independent business and technology consulting firm established in 1980. The company provides advice, information and educational services and specialises in barcode, the integration of RFID into open systems applications and advising on other AIDC technology. Praxis Consultants has a particular expertise in AIDC standards development: industry application standards, data structuring and protocol standards, symbology specifications, technology standards in the domains of ISO, CEN and EAN.UCC and EPCglobal. In 2003 Paul Chartier was appointed visiting professor at the Technology Innovation Centre, a subsidiary of the University of Central England. In this role he has contributed towards establishing a body of knowledge related to AIDC for it to be disseminated through research papers. He leads Work Package 1 for the CASAGRAS project - review of standards and procedures for international standardisation in relation to RFID and the emerging Internet of Things.



David Armstrong

David Armstrong is chief executive officer and co-founder of RFIP Ltd., a UK based supplier of RFID equipment, consultancy and training. He was previously a senior vice president of BTG plc, a world leader in the fields of IP management, technology transfer and innovation. David Armstrong has extensive business experience in technology transfer, company creation and funding. Other posts held include CEO of RFIP Solutions Ltd., a joint venture that developed and licensed IP for incorporation in RFID integrated circuits. The early part of his career was spent at Quantel where he established the company's military electronics division. Thereafter he was technical director of Kontron Electronics, part of a major medical group. David Armstrong has a Masters degree in business studies and is a chartered engineer, chartered physicist and chartered scientist. He leads work package Work Package 2 for the CASAGRAS project - regulatory issues in respect of RFID standards.



CASAGRAS

Final conference and presentation of conclusions and recommendations
October 6th and 7th, London
See www.rfidglobal.eu

GRIFS Project

The following forums will be held during 2009.
Please check at www.grifs-project.eu
for announcement of dates or
Email: Emilie.danel@gs1.org

May – Beijing
July – Washington DC
September – Seoul
November – Brussels

Workshop: - CEN Building, Brussels, February 20

ID09

Royal Armouries, Leeds, March 9 - 11
Conference and Exhibition sponsored by AIMUK
and European Centre for AIDC.
See www.id09.co.uk

ETSI

Workshop:- Intelligent Transport Systems, ETSI headquarters,
Sophia Antipolis, France, February 4 – February 6
See www.etsi.org

RFID Journal Live

Put RFID 2 WRK, Orlando, Florida, April 27 - 29
See www.rfidjournalevents.com

RFID World Asia

Singapore, April 21 – 24
See www.terrapinn.com

Scan & RFID China

Guangzhou, June 18 – 20
See www.exponet.ru

IC Card World

Tokyo, March 3 – 6
See www.shopbiz.jp/en/lc/

SECURITY

CeBIT, Hannover, Germany, March 3 – 8
See www.security-industry-today.com