EURESCOM mess@ge 2/2009
The magazine for telecom insiders

includes CELTIC N • E • W • S

The Internet of Things

The Kennedy perspective

Five basic rules for the Internet of Things

European issues

Future Internet

Tutorial

Near Field Communication

NEM Summit 2009 – Towards Future Media Internet

Saint-Malo, France
28 – 30 September 2009

Networked and Electronic Media (NEM) offer a wide opportunity for future growth by taking advantage of generalised broadband access, increased mobility, availability of richer media formats and contents, as well as new home networks and communications platforms.

The NEM Summit, organised by the NEM European Technology Platform, is the major annual conference dedicated to the field of networked and electronic media. The second edition takes place in Saint-Malo, France, on 28 – 30 September 2009.

Building upon the success of its first edition, which attracted more than 400 attendees, the 2009 NEM Summit will allow visitors to network with leading researchers in the NEM sector and get first-hand information on the latest R&D trends in the area of networked and electronic media.

NETWORKED & ELECTRONIC MEDIA

Topics

The conference will address topics related to:

- Electronic Media Content
- Distributed Media Applications
- New Media Delivery Networks and Network Services
- User Devices and Terminals
- NEM Enabling Technologies

Organisers

The conference is organised by the NEM European Technology Platform, under the aegis of the European Commission (DG INFSO), and with the support of the Région Bretagne and the Images & Réseaux cluster.

Further information and registration

More information about the NEM Summit and the online registration form are available on the NEM Summit website at *www.nem-summit.eu*

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TridentCom 2010
18-20 May 2010 - Berlin, Germany
ICST

CALL FOR PAPERS

TridentCom 2010

The 6th International Conference on Testbeds and Research Infrastructures for the Development of Networks & Communities

Berlin, Germany
18-20 May 2010

Testbeds and research infrastructures have become ever more important for the development of information and communication technologies. Thus, we invite you to submit a paper or demonstration proposal for Tridentcom 2010.

TridentCom 2010 will provide a forum to explore existing and planned testbed concepts, infrastructures, and tools to address the research and business challenges of ICT convergence.

Scope

ICT networks and services are evolving at a rapid pace. The networked society is calling for service environments that will deliver new value-adding services to the customer, while maintaining the reliability of services and networks. This drives the need for flexible testing and experimentation environments responding to multiple requirements. The corresponding testbeds range from small, dedicated and well-controlled environments up to large-scale environments for future networks.

Major research and development programmes around the globe have started to develop and deploy large-scale experimental facilities. Due to the increasing complexity, attention is increasingly being given to cross-layer testbeds, which can support experiments spanning the network, service delivery and application layers. These testbeds and experimental facilities will play a pivotal role for the Future Internet. Thus, Tridentcom 2010 will give significant attention to them.

Prospective authors from academia, industry and government are invited to submit high-quality papers in two categories, Full Papers and Testbed Practices Papers. In adition, we invite demonstration proposals on all aspects of testbed and research infrastructure operation and management.

Further details on the topical scope are available on the TridentCom website.

Important deadlines

Paper submission:	30 October 2009
Demo and workshop proposals:	27 November 2009
Notification of paper acceptance:	15 January 2010
Submission of final paper:	15 February 2010

Further information

Further information about the conference, the call, and the submission process is available on the TridentCom website at *http://www.tridentcom.org*

You can also contact the organisers at tridentcom2010@eurescom.eu

Dear readers,

The Internet of Things has been a buzzword in the ICT research domain for a decade, being sometimes related to concepts like "smart dust" and "ambient intelligence". The concept of the Internet of Things is attributed to the Auto-ID Labs network, a research group in the field of networked radio-frequency identification (RFID) and emerging sensing technologies, which was established in 1999.

If you enter in Google the search term "Internet of Things", you will get 170,000 results. Compare this with the search term "Future Internet", which triggers 756,000 results, the figure appears relatively modest. However, the Internet of Things will be an important part of the Future Internet.

So what is the Internet of Things? There is no single, generally accepted definition. It all depends on the view you choose. From a computing perspective, the Internet of Things is nothing more than a network of electronic objects. From a Semantic Web perspective the Internet of Things consists of a network in which all objects, and not just those electronic, smart, or RFID-enabled, are addressable via the Internet Prototcol.

According to the definition offered by Wikipedia, "the Internet of Things will likely be a non-deterministic and fully open cyberspace in which autonomous and intelligent entities or virtual objects will act in full interoperability and will be able to auto-organize themselves depending on the context, circumstances or environments."

On 18 June 2009, The European Commission presented an action plan on the Internet of Things. The conclusion of this document is that the "Internet of Things is not yet a tangible reality, but rather a prospective vision of a number of technologies that, combined together, could in the coming 5 to 15 years drastically modify the way our societies function." The plan urges Europe to adopt a leading role in making the vision of the Internet of Things happen, in order to reap economic and societal benefits in the shape of economic growth and individual well-being.

This issue of Eurescom mess@ge presents a glimpse of the ongoing research, which will help create the vision of an Internet of Things that will be an Internet of Things for People.

Milon Gupta
Editor-in-chief

Events calendar

28–30 September 2009
2nd NEM Summit
Saint-Malo, France
www.nem-initiative.org/public/Summit/Summit.asp

23–24 November 2009
Future Internet Assembly
Stockholm, Sweden
www.fi-stockholm.eu

24–27-November 2009
ICSOC-ServiceWave 2009
Stockholm, Sweden
www.servicewave.eu/Nessi

9-11 December 2009
UCMedia 2009 – 1st International ICST Conference on User Centric Media
Venice, Italy
http://www.usercentricmedia.org/index.shtml

12–13 April 2010
Celtic Event
Valencia, Spain
www.celtic-initiative.org

15–16 April 2010
Future Internet Conference
Valencia, Spain
Website not yet available; further information at www.future-internet.eu

18–20 May 2010
TridentCom 2010
Berlin, Germany
www.tridentcom.org

16–18 June 2010
Future Network & Mobile Summit 2010
Florence, Italy
www.futurenetworksummit.eu/2010

Sn@pshot

Mobile lab

Researchers at the University of California, Berkeley, have developed an add-on to a camera-enabled mobile phone that can take detailed images and analyse them to diagnose and monitor infectious diseases such as tuberculosis. The CellScope works as a so-called fluorescence microscope that can identify the markers of disease.

Further information:

http://fletchlab.berkeley.edu/research_cellscope.htm

http://blumcenter.berkeley.edu/global-poverty-initiatives/mobile-phones-rural-health/remote-disease-diagnosis

Imprint

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Eurescom study programme 2009 – Three new studies

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Almost two decades after the Eurescom study programme was started, this unique way of performing collaborative research between telcos has kept its high for major European industry p Three new studies have started re which will address some of the burning issues in the telecoms sect

Short and focused

One of the strengths of the Eurescom community is its commit ment to engage in short and focu collaborative studies. The Eurescon programme is an instrument that enables the efficient setup and execution of such studies. The programme is financed by its subscribing member companies, and their commitment is underwritten by their upfront payments to the programme's budget.

The Eurescom study programme continues to demonstrate its flexibility in bringing together leading experts from its members to address topics of common interest. Eurescom studies develop conclusions on specific topics and pave the way for larger collaborative initiatives.

Competitive advantage

The fundamental working principle within the Eurescom study programme is collaboration. Any network operator or service provider may become a subscriber of the study programme and participate in it, if they share the interest of addressing the substantial issues facing the telecoms industry in a collaborative way. The results of the studies are exclusively available to the members of the programme so that the study subscriber organisations benefit from a direct competitive advantage from collaborative work.

Following the first call for proposals in 2009, a large number of very interesting study proposals were evaluated. Due to budget constraints, only the four best studies were recommended by the study management group to start. Three of them have started recently and should conclude by the end of 2009 or very early next year.

The issues addressed in these studies include (i) networks for cloud computing and software as a service, (ii) IPv4 address exhaustion from the viewpoint of service providers, and (iii) privacy and identity management as a business opportunity.

Networks for cloud computing

Cloud computing is an emerging service

tential to all parts omputing unication ustry. Cloud omput- ng, which a mani- ion of the f comput- ing as a utility, refers to the provisioning of software as a service (SaaS) applications over the Internet and the operations of software and hardware platforms used to support these applications. Cloud computing relies on recent advancements in technology domains such as virtualisation networking, high-performance computing, and information technology resource consolidation and management. Network operators are involved in all these technology developments, and are in the front line concerning networking issues. The purpose of the study is to understand the role of networks for cloud computing and SaaS, and to identify possible business opportunities for operators in the area.

IPv4 address exhaustion

The starting point for the study on IPv4 address exhaustion is the expectation that by the end of 2012 the Regional Internet Registries (RIRs) will have no more public IPv4 addresses to allocate. At the exhaustion date, service providers will wind up with public address pools that cannot grow. Offering only an access to the IPv6 Internet will not be satisfactory for the customers, because plenty of services will remain IPv4-only accessible. This study will provide a description of the technical issues and solutions to cope with the IPv4 address shortage, identify and elaborate a set of requirements, and propose solutions that European ISPs could endorse.

Privacy and identity management

The study on privacy and identity management starts from the observation that the wide diffusion of sensing, computing and communication technologies renders the ubiquitous computing and communication concept technologically feasible. However, from the users' perspective this results in a serious threat for their privacy, and users are becoming aware of it. As a response to this awareness, identity and privacy management solutions are being

developed. This study will provide an overview of the latest technological developments in this area as well as explore how identity and privacy could be enhanced and offered as a service by telecom operators.

For more information on the study programme, or if you are interested to subscribe to the study programme, please visit the Eurescom website at *http://www.eurescom.eu*

Five basic rules for the Internet of Things

David Kennedy
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There is much excitement about the Internet of Things at the moment. Researchers discuss wonderful scenarios, where each device has an identity and can communicate. Just think, nothing would ever be lost again, as we would simply be able to ask it where it is – or would we?

When I think about the Internet of Things, I begin to have a problem with the basic concept of devices giving out information in an unintelligent way. If we consider today's RFID scenarios, there are hundreds of IDs associated with objects that can be read if you approach the passive object or carry the object to a reader device. This is good in a scenario like a shop, where the basic principle is to move goods through entrances and exits.

If we take the model to the home, then we have to consider how we manage it. Do we have a reader on the doors to see what is brought in and out of the house? How is the control, if something is thrown out the window? Should we then put readers in every door and window in the house to capture the full movement of objects? At least, then we can say in which room an object is.

If we expand the scenario to the point where each object actually has some intelligence, then life gets more interesting. The basic model would be that the device has some knowledge about its own functions and can "call for help" if it doesn't work. Current model cars can now tell the driver, if any of the light bulbs are not working, and maybe devices in the home could achieve this level of communications soon.

However, if we expect the device to do more, we need to give it additional sensors, processing power, and fill it with functions that are not related to the original function of the device. In some larger machines, like the washing machine, this can be relevant as the washing machine's ability to detect water on the floor may act as a check on other "less intelligent" devices – the water pipes for example.

The communicating washing machine may allow a new business model where we don't buy a washing machine any more. We just get one from the supplier, and once it is working, it reports its usage levels to its provider as we get billed for that. These models are exciting, as they actually may stimulate new economies where we don't borrow money for capital goods but pay for them as we consume them. One of the reasons for pushing the Internet of Things now is that these new business models might free up more money for other purchases and stimulate additional growth.

I believe that the Internet of Things will be successful if we adopt some basic rules; let us say we need five basic rules for the Internet of Things to be effective.

Don't overload the functionality in objects. Rule 1

If they need additional information, they can ask a dedicated device or sensor rather than loading each device with copies of the same functionality.

Don't expect all devices to communicate with the world. Rule2

I don't need to talk to your fridge and you are not welcome to read my sensors. This questions, if I need a unique global address for each thing or just a unique address within my domain.

Determine a common language for things that talk. Rule 3

The most damaging aspect of modern technology is that the level of expertise needed to get new devices and software communicating is growing with the complexity and intelligence of devices. This means that the average user cannot hope to make all his devices work together unless we reduce the number of options to the point where things can talk and understand each other with little or no intervention.

Determine a strategy for communication between public and private devices. Rule 4

We need a little organisation in the Internet of Things. It will be possible to get information from the surroundings when we are out or in other people's domains. Here we need to know what the boundaries of what we are allowed to do are, just as much as we need comfort that the surrounding infrastructure cannot be hostile to me or my equipment.

Allow for nested things. Rule 5

Sometimes my wife just needs to know where her handbag is without discussing what is in it. In the same way when we have assembled objects into something bigger we need clever mechanisms that integrate the identities logically until more detailed information is needed.

So here we have some basic guidelines, but I am sure there are probably a few others. Maybe we should invite proposals for adding some more or clarifying a few of mine to see what it takes for us all to be happy with things that talk.

The Internet of Things

Connecting the real world with the digital world

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The term Internet of Things spawned from the idea of Radio Frequency Identification Tags (RFID) in every object, allowing them to be identified and possibly located. Today, the term has transformed into a much broader vision. A vision of blurring the lines between the real world and the digital world, providing accurate information about situations and status of places, things and people in digital format through the use of very diverse technologies.

RFID still stands at the forefront of the technologies driving the vision, mainly due to its maturity and low cost, and consequently its strong support from the business community. However, more and more device, network and service technologies enter as components that will eventually build up the Internet of Things. Technologies such as Near Field Communications (NFC) and Wireless Sensor and Actuator Networks (WSAN) together with RFID will provide the atomic components that will link the real world with the digital world. Integration of these atomic components into wider networks, mobile or fixed, will allow the interconnection with the Future Internet; for instance Machine to Machine (M2M) communications is an important part of this development. But with the interconnection come other challenges. The primary one is the terabit torrent of information from the atomic components that needs to be transformed into knowledge and integrated into the social and business fabric of the web. In turn this will open the discussions on privacy and governance as the main societal and policy challenges and which need to be addressed as an integral part of the Internet of Things and integration into the Future Internet.

Early applications

Early applications of the Internet of Things already have a foothold in our economy. The Electronic Product Code (EPC) standard developed by EPCglobal uses RFID to tag products for identification for applications such as supply chain management. But there are other initiatives such as ubiquitous identification (uID), predominantly used in Japan.

These early identification-based applications are just the tip of the iceberg. Healthcare, entertainment, transport, urban living, business processes and automation, the list goes on, are all application spaces that can benefit from the Internet of Things and at the same time will grow the Internet of Things from within their domains using technology that suits their requirements.

Eventually the number of places, objects and people that are participants in the Internet of Things will grow and so will their heterogeneity. Their interconnectedness is key and will eventually result in a densely woven real-world information fabric, encompassing all aspects of our society and interactions.

Transforming today's business

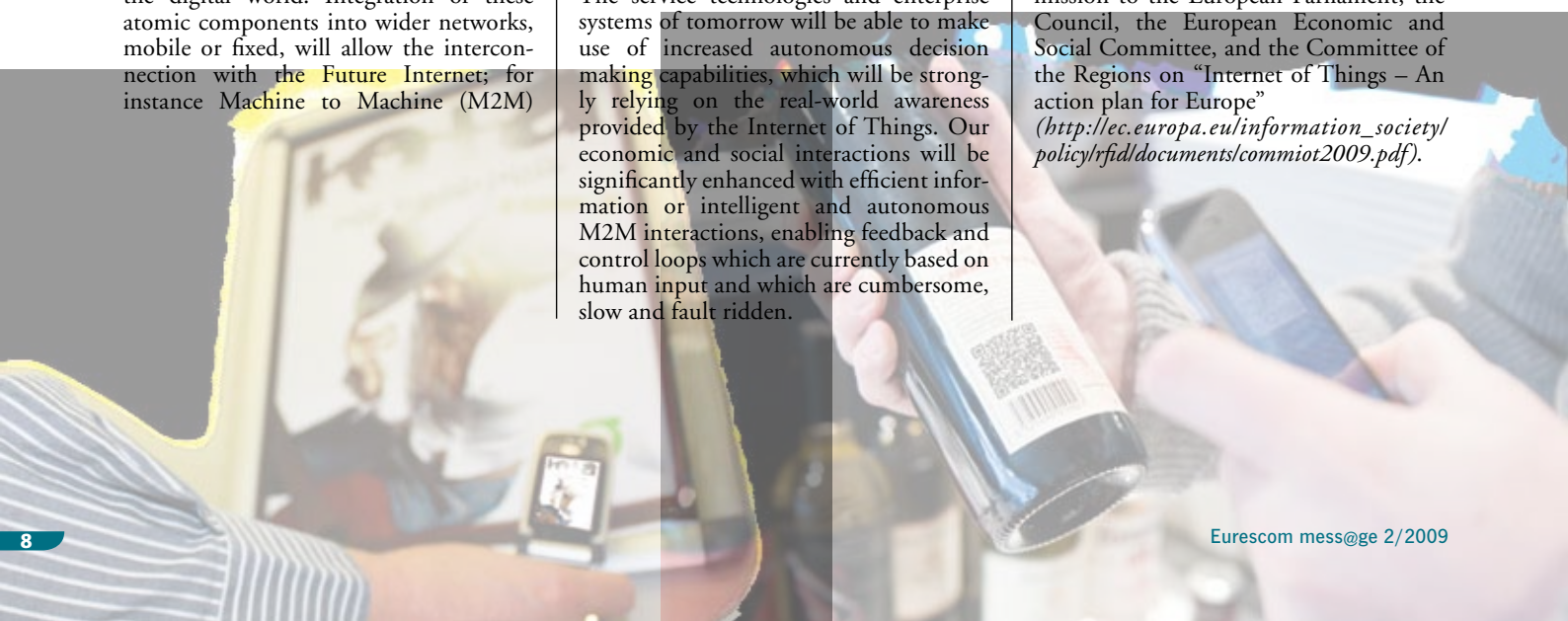
The service technologies and enterprise systems of tomorrow will be able to make use of increased autonomous decision making capabilities, which will be strongly relying on the real-world awareness provided by the Internet of Things. Our economic and social interactions will be significantly enhanced with efficient information or intelligent and autonomous M2M interactions, enabling feedback and control loops which are currently based on human input and which are cumbersome, slow and fault ridden.

As more decisions are pushed into the digital world without human involvement, it is very important to increase the accuracy of such autonomous decision making by providing detailed real world information to computer systems. The variety and level of detail of the real-world information that is made available to digital systems will determine the level of success of these ICT-based services and pace of adoption that can be achieved in this area. Making accurate sense out of this terabit torrent of information will be a great challenge.

European activities

The activities in the Future Internet Assembly and the recent communication by the European Commission on "Internet of Things – An action plan for Europe" highlight the importance of the Internet of Things for Europe. Commissioner Viviane Reding recently stated in her speech on "Internet of the future: Europe must be a key player", 2 February 2009, that the Internet of Things is one of the main drivers for the Future Internet with a vast potential for business and market opportunities. But there are many challenges that need to be solved to make the Internet of Things a reality. In this article we mentioned technologies for networking, information integration and architecture, but there are other challenges concerning privacy and governance that are important topics that need to be brought to the dialogue between stakeholders.

You can find more information on the Internet of Things at the Future Internet Assembly on Real World Internet *(http://rwi.future-internet.eu)*, the FP7 ICT-SENSEI Project *(http://www.sensei-project.eu)* and the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions on "Internet of Things – An action plan for Europe" *(http://ec.europa.eu/information_society/policy/rfid/documents/commiot2009.pdf)*.



Machine-to-machine communication

European push for M2M standardisation

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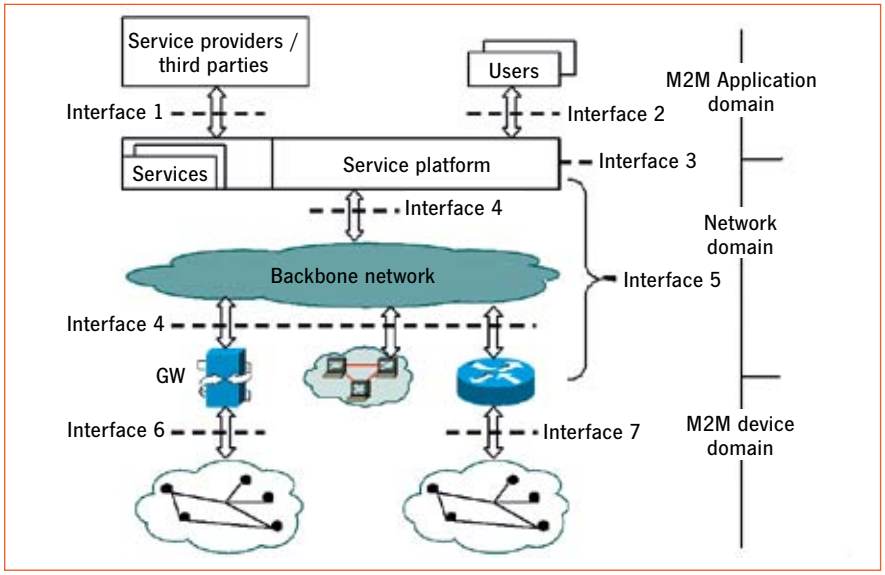
Several forecasts state a significant growth for the machine-to-machine (M2M) market over the next years. Many M2M devices will be connected to the Internet, originating the Internet of Things. This will make it possible to build new services, which could benefit the society in many areas, including environmental protection, healthcare, trade, transportation, home automation, smart metering, industrial control, sensor monitoring, alarms and surveillance.

However, almost as broad as the application fields are the available technologies. Particular segments of industry have often harmonised on one or another M2M area network technology. Also, as needs evolve, further technologies will be developed based on emerging requirements. There may be additional divergence in this market, rather than convergence. Besides, service providers may not have means to adopt a specific technology, but they will certainly need interoperability.

Interoperability is not only required for provision of a standard QoS controlled IP bearer, but also for cross domain security, mobility, multicast, location, routing and management, including fair compensation for service provisioning. And the communication features shall enable the M2M roles to be played by different stakeholders. In order to reach the necessary service ubiquity there is a need for an end-to-end service control standard (i.e. an API – Application Programming Interface), providing service, management and diagnostic capabilities. This is necessary to decouple the innovation of services and their logic from protocols and network elements, as well as support services portability between different systems.

For these reasons the Eurescom study P1856 (Pre-study for European level M2M standardisation), which contributes to the ETSI Technical Committee (TC) M2M, was initiated to alleviate the lack of standards in the area of M2M. Among the P1856 study outputs, there is an M2M service architecture, which summarises the components and the relationships in a standardised M2M ecosystem, depicted in the figure. The ecosystem can be segmented in three domains: The M2M application domain supported by APIs, the network domain, and the M2M device domain (see figure above).



M2M service architecture

Interface 1: for application developers and service providers.
Interface 2: for customers. It is basically XML Web Services.
Interface 3: for remote operation and for inter-operator cooperation (load management, reduced traffic capacity, etc.)
Interface 4: the standard interface towards the backbone network. It includes functionalities related to the 3 lowest OSI layers. (AAA, QoS control, Mobility, Multicast ...)
Interface 5: for support of Connected Objects (COs). It encompasses Transport, Session, Presentation and Application layer functionality, (e.g., via XML Web Services) over the Interface 4 (Internet). Basic capabilities are Messaging, Transaction and Compensation. The Presentation layer contains the vocabulary described as ontology. The Ontology represents the services and capabilities of an M2M system, providing a common understanding for all stakeholders. It shall be dynamic enough to reflect the application fields' evolution, while keeping formality to represent functional components and their interrelationship.
Interface 6: for communication with application specific or proprietary protocols.
Interface 7: is like Interface 4, but optimised for low-power devices.

Recommendations

The ever-growing availability of M2M solutions lead to a scenario in which the telecom operators shall:

- Avoid solutions which inhibits interoperability with other networks, but rather look for integrated M2M solutions;
- Participate at the ETSI TC M2M, as the standardisation process is ongoing.

Conclusion

In order to take advantage of the huge opportunities raised by a global M2M market, the first need is a standard end-to-end architecture. Therefore, the established ETSI TC M2M is acting as a focal point for standardisation activities, gathering consensus on requirements and enabling members to co-ordinate their activities in other M2M related standardization bodies.

The authors would like to thank the members of the P1856 study and the ETSI TC M2M for the fructiferous partnership.

Further information about Eurescom study P1856 is available at *www.eurescom.eu/Public/Projects/P1800-series/P1856*

Internet of Things "already a reality today"

Interview with Anthony Belpaire from Alcatel-Lucent

The Internet of Things is on the horizon, but what impact will it have, and how will communication as we know it change? Eurescom mess@ge editor-in-chief Milon Gupta asked someone who should know, as he is at the forefront of bringing the Internet of Things to the market: Anthony Belpaire. He is the General Manager of touchatag, an Alcatel-Lucent Venture based in Antwerp, Belgium, which offers contactless application services (www.touchatag.com).

What is your vision of a future in which all things are connected via the Internet?

Belpaire: There are millions of applications today, which can become more effective, more and more intuitive for end-users, if the interaction with the applications can be done in a contactless manner via things.

Take the example of a nurse who needs to visit patients at their homes. Thanks to the Internet of Things, the nurse no longer has to fill in the paperwork that she has visited the patient. Through interaction between her smart phone and an object in the home, the visit of the nurse is recorded.

Anthony Belpaire

Another example: Imagine you walk down the street, and you see as a tourist various interesting monuments. Now, rather than going to the local bookstore and get a city guide, the Internet of Things would allow you to swipe your mobile phone by a small ID tag on the monument so you can right away have all the information regarding the monument.

So, the Internet of Things allows existing applications to become faster and easier in the way they interact with the end user. It makes business processes more efficient, and it enhances the ease-of-use of consumer applications.

What are the main technological drivers and challenges towards the Internet of Things?

Belpaire: A number of elements need to be in place to make the Internet of Things happen. First, we need cost-effective ways to tag objects in order to give them an identity. The price of RFID and NFC tags is going down, and we see a variation of Moore's law happening in this area.

The second requirement is that it needs to be very easy to link applications with sensor tags applied to objects. So we need an infrastructure for managing the object IDs. In this respect, we are at the starting point. Just like in the traditional Internet, where you type in www.eurescom.eu and are automatically transferred to the right computer hosting your information, exactly the same type of infrastructure is required for the Internet of Things. What we need is interoperability and a coherent numbering system to connect the different objects and services in the Internet of Things. This will require a number of standards to define exactly the numbering system of objects.

When do you expect the Internet of Things to become a global reality?

Belpaire: The Internet of Things is already a reality today. See, for example, in the consumer area the success of Nike shoes equipped with a sensor giving information to an iPod.

However, still 99 percent of machines are not yet connected. In this respect, we are really at the beginning. Nevertheless, I think the bigger vision of the Internet of Things can be achieved very rapidly. Within five years, a significant number of machines and objects will be equipped to enable a substantial amount of new Internet-of-Things applications.

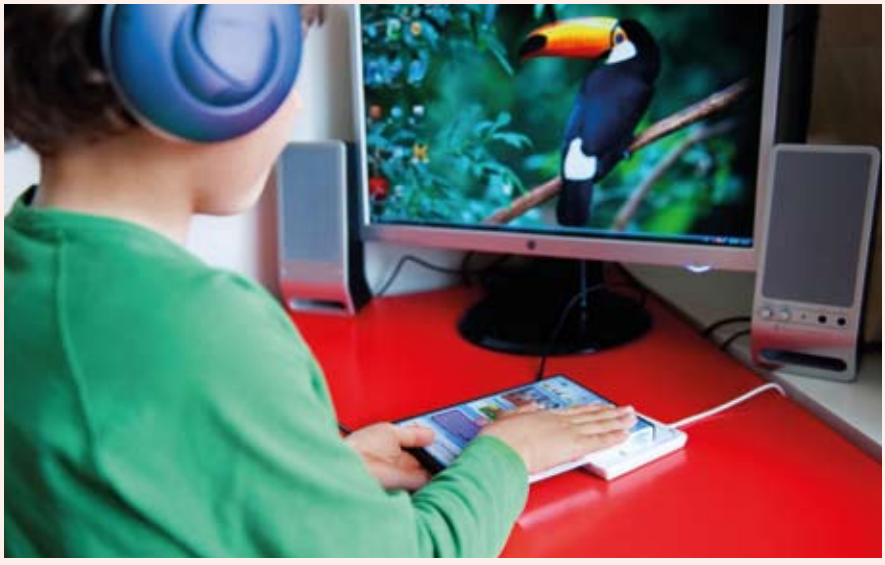
How will the Internet of Things change our daily lives?

Belpaire: The Internet of Things will change both our private life and our professional life.

Take a teacher educating 12-year-old kids. A tremendous amount of time is spent today on the registration of the pupils' presence. Having a tag on the back of the kids would automatically tell you when a kid is entering school. The same tag could be used to allow parents to upload some money to the kid's electronic wallet so the child can make small purchases.

Near-field communication cards or phones are becoming our new electronic wallet. Near-field-enabled phones will be the perfect way for consumers to get rid of their wallet, as their phone will be a convenient way to do a number of applications. Contactless cards or contactless phones can be a very fast and convenient way to identify a person for all types of personalised applications.

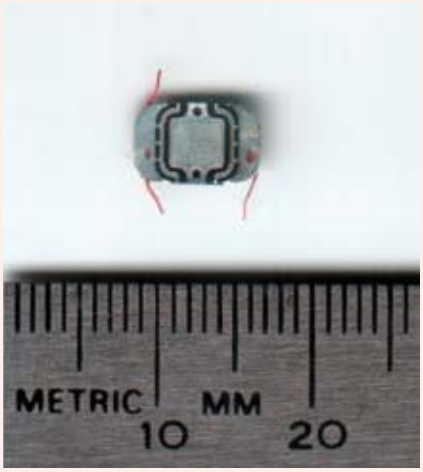
The second big application area is mobile workforce applications. A field engineer, for example, could use a near-field communication phone, a kind of mobile RFID reader, for repair or maintenance work. By holding the phone close to the object, it will provide more information about a specific object that needs to be repaired.



Which privacy and security risks do you expect in a world of smart and connected objects?

Belpaire: We need to differentiate between the type of technology used, whether long-range RFID tags are used or near-field communication tags.

If you have an RFID tag on a badge or on your clothes, it would be very intrusive, if it was always activated. So, wide-range RFID technology that could be used to identify you, or things close to you, is very sensitive in regard to your privacy. Long-range RFID tags entail certain privacy risks against which users should be protected. We will need initiatives to limit the lifetime of RFID tags, as the European Commission has already suggested. This should be an option for buyers of consumer goods, for example clothes.



In comparison, near-field communication tags are by far less intrusive. The consumer always knows what he is triggering compared to long-range RFID. The user needs to bring his NFC tag very close to a reader, in order to trigger, for example, contents on a hotel TV or contactless payments.

What are your personal hopes and fears, if you envisage your life in the connected world of the year 2020?

Belpaire: My hope is that life will be much easier due to the Internet of Things. I would never have to check again, if my gold fishes are properly fed – a sensor-based application would ensure that they automatically get the right amount of food. Sounds like a gadget, but think about memory hints for elderly people and healthcare products consumption.

Context-awareness meets multicasting

European research project C-CAST

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Being aware and communicating context is a key part of human interaction and a particularly powerful concept when applied to mobile users where network services can be made more useful. European research project C-CAST (Project Context Casting) combines context-awareness with multicasting technologies to bring mobile multimedia multicasting into the real world.

Context-awareness refers to the capability of a system or even an artifact being aware of its physical environment or situation and responding proactively based on such awareness. The increased computational power of mobile devices has the potential to empower people to generate their own applications for innovative social and cognitive activities in any situation and anywhere.

Wireless connection is not limited to user devices; almost any thing from clothing to buildings can be connected and collaborate. Furthermore, new sensor technologies and wireless sensor networks provide environmental intelligence and the capability to sense, reason and actuate. This leads to the exciting vision of the interconnection of artefacts embedded in our real environment, forming a society of "intelligent things" and "smart spaces".

Multicast services in the real world

The main objective of C-CAST is to evolve mobile multimedia multicast services and to exploit the increasing integration of mobile devices with our everyday physical world and environment. Places, devices and user-related activities are useful information sources, which – when combined with static context data such as profiles and user preferences – can be used in situation recognition and the selection of the most appropriate multimedia content to distribute to users present at a location. To optimise information delivery, mobile users in the same context and place are dynamically considered as a group so that content can be multicast in an efficient manner.

Context broker model

C-CAST context system

The C-CAST context system transforms public spaces into "personalised-group smart spaces" for content delivery. C-CAST scenarios are based on the principle that people during their daily routines often share common interests and exhibit similar behaviour especially when in public spaces such as railways stations, shopping malls or city centres. Context information gathered at any point in time is partial and incomplete, but combined with environmental information from sensors and with behavioural studies and models of such places enables the triggering of useful and assistive situational information.

Context information is gathered and disseminated via a distributed network of context producers based on a publish-subscribe broker model, as illustrated in the figure. In general context providers are lightweight XML interactions over http suitable for porting to almost any mobile device, Wireless Sensor Network (WSN) node, or other wireless things. More complicated providers reside within the network infrastructure. This federated model allows any number of providers and consumers to dynamically join or leave.

Service areas

The motivation for deployment lies in the value of context to assist and serve users, efficiency of operation of public spaces and economies of multicast transmission. Business opportunities exist for situational services, perhaps embedded with advertisement of available environmental facilities. For example, in-situ analysis of a city railway station and its environs reveals a diversity of context information seeking temporal groups of patrons. Group categories abound, ranging from daily commuters, tourists, foreigners, passengers, friends, railway employees, facilities staff, and shoppers. A day in the life of a railway station identifies common predictable and identifiable situational scenarios that can be sensed and service actuated such as:

- delayed train - new travel options
- platform change – alert message
- emergency help – video clip assistance
- tourist – digital city guide
- breaking news – video cast.

Conclusion

Providing context-aware services that attempt to recognise and respond to situations in the environment is a challenge. The conclusion is that best-effort reasoning and matching of a service response (adaptation) based on context is probably the best that can be achieved. Our ubiquitous context broker model scales well, but how far our concept of enhanced reasoning context providers can be taken is still an open research question.

Further information is available on the C-CAST website at *www.ict-ccast.eu*

Creating testbeds for sensor network applications

The European project WISEBED

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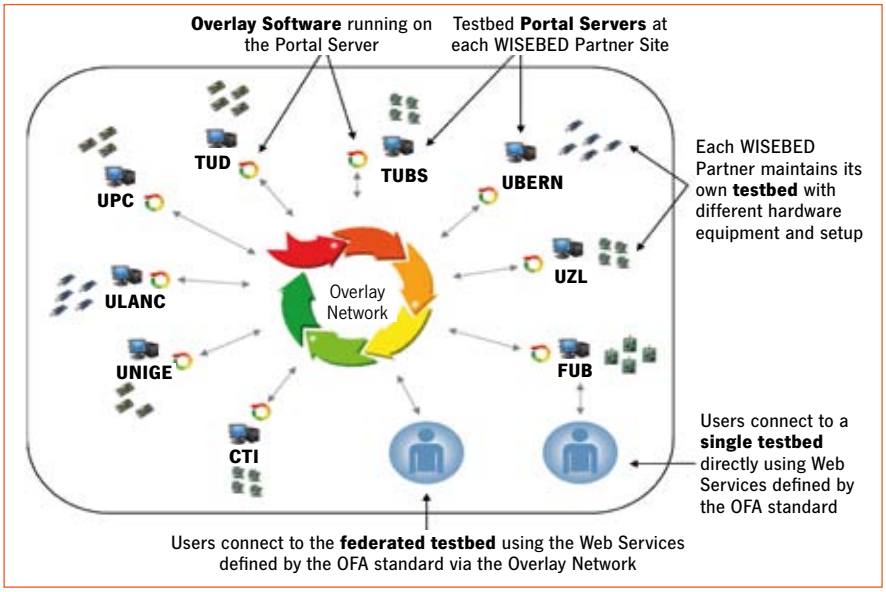
Sensor network technology has been under investigation for several years now and has matured to a degree which allows for commercial real-world implementations on a large scale. Before taking the step to deployment, however, it is crucial to evaluate the system, because detecting faults during runtime is extremely costly especially for sensor networks – just imagine re-accessing an installation which has been deployed in a jungle or under water.

While simulations have been an important evaluation tool for sensor network technology for a long time, it has also become clear that achieving results that reflect the reality to a high degree is extremely difficult. It will, thus, be of major importance to also test a system just implemented before deploying it. Multi-purpose testbeds for sensor networks are required, as they allow testing of different aspects of a sensor network system, such as scalability, mobility, and support for heterogeneity. The European project WISEBED created such a testbed by delivering the technologies necessary to federate existing sensor networks into new virtual facilities.



Accessing federations of sensor network testbeds

The WISEBED approach

The WISEBED testbed is based, in the beginning, on a number of sensor networks which are provided by the nine project partners. Within the project, four different aspects of creating sensor network testbeds are investigated. Apart from setting up the hardware itself, there is a strong need for operations and management software for creating virtual overlays of physical sensor networks. In addition, the partners provide a very powerful and flexible library of algorithms, which can be used in very different scenarios and applications. Finally, it is essential to provide tools for collecting and analysing data which have been collected during an experiment on the testbed.

One of the most important tasks is the provisioning of a unified way of accessing the testbed. The figure presents the WISEBED approach.

Each physical testbed is managed by a portal server which gives access to the network or to single nodes. These portal servers are integrated by an overlay software which allows users to configure a virtual testbed according to their needs. Such a virtual testbed is then accessed in exactly the same way as their physical counterparts. It is one of the major goals of WISEBED to standardize the APIs for creating and accessing testbeds in order to simplify the creation of large-scale testing facilities in an initiative called Open Federation Alliance (OFA).

Outlook

WISEBED has just completed its first year and is on a good way towards its goals. Still, the project partners believe that a pure sensor network federation is not sufficient. Rather, it will be necessary to create testbed federations which are much more heterogeneous than collections of sensor networks can be. When thinking about, for example, applications which integrate sensor information into business processes, powerful computers such as PCs or servers need to be integrated with all kinds of sensor technology. And obviously, testing such scenarios will become even more crucial than it is for "simple" sensor networks. To achieve this, it is the strong desire of all WISEBED partners to make the testbed infrastructure become part of the Future Internet Research and Experimentation facility, an overall testbed federation of heterogeneous testbeds throughout Europe, including installations from projects such as OneLab2, PII, Federica and Vital++.

Further information on WISEBED is available at *www.wisebed.eu*

Europe should push the multilingual Web

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The European Union has 27 member states and 23 official languages, but multilingual websites are still rare in Europe. If the EU wants to live up to the motto "United in Diversity", increasing the share of multilingual websites will be essential. This is particularly relevant for a "future Internet of contents, services and things, by and for people", and when we are preparing the Web 3.0, in which computers are supposed to understand the users.

A Web in which computers understand the users' requests and present concrete answers instead of a list of possible answers should be able to use multilingual content and retrieve multilingual answers. This would enable computers to search all available contents, independently of the language, and transmit the results to the users in the language that they understand.

The challenge in Europe

The Web provides a unique possibility to build an information network for the whole of Europe, but the speed of the information society nowadays makes it difficult to share a European culture in which more than sixty languages are spoken and, among those, twenty three are official languages in at least one state. Even if Europe has a long history in translation and its economy is used to deal with a multilingual environment, making information accessible to everyone would require translation between five hundred six pairs of languages, as not all of the European citizens are multilingual or willing to learn other languages than their mother tongue.

Global demand

Besides Europe, globalization creates an even bigger demand for a multilingual Web in the rest of the world, considering that out of an estimated 1.6 billion Internet users only about 464 million speak English, according to the latest Internet World Stats (31 March 2009). Access to online information is one of the big opportunities for society, and offering information for everyone is a major challenge that is far away from being solved. But, do we have the means to realise such a multilingual Web for a European Union united in diversity?

Multilingual Web requirements

Web development and management for multilingual websites involve acquisition and annotation of language resources and a structural organization that allows automatic language translation. Even if fully translated documents are not required, contents should at least be prepared for machine reading and be available for multilingual search and retrieval tools. In order to address future barrier-free human-machine interfaces, websites must include multilingual recognition and synthesis, dialogue and translation.

The situation today

Multilingual websites are already present in the Internet, but to what extent? It is not easy to manage a dynamic website in more than one language and it is certainly not easy to have new content available in other languages that are different from the original one. Multinational companies with a wide market view spend a lot of effort to keep their web-offer multilingual, involving a huge amount of resources and management.

The project BabelWeb

Already in 2000, Eurescom project BabelWeb developed best-practice guidelines for designing multilingual websites. The project developed a three-tier structure for the architecture of multilingual websites. Level one is a relational database for the contents; level two the overall structure, in which the contents are organised, and level three the presentation of the multilingual contents on the users screen. The translation of the contents was pointed as the crucial point for the planning of multilingual websites. We have today what is needed to implement the BabelWeb structure, with the advances of the language processing tools in the last decade. The general-domain automatic translation came to a point where it is good enough to support human translations on static contents. We can already have a reasonable automatic translation for specific domains, e.g., e-health applications, specific commercial areas, political dialogs, law related services, etc., and there are good results in multilingual search and retrieval systems to help finding contents in different languages.

Conclusion

The multilingual Web is not only essential to the European Union but also for the worldwide information society, and the best tool for sharing knowledge and markets globalization. Its importance is confirmed by the European Commission's efforts to promote multilingualism as part of the i2010 initiative to foster growth and jobs in the information society and media industries. A worldwide information space that offers content in every language and makes services available to everyone in their own language is a step towards a "Single European Information Space" in a multilingual Europe, where information access is no longer restricted by language barriers.

Further information on Eurescom project BabelWeb is available at *www.eurescom.eu/public/projects/P900-series/P923*

Future Internet by the people

FIREweek 2009 in Luleå

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The second annual FIRE event took place at the start of the Swedish EU presidency in the north of Sweden. The FIREweek 2009 was characterised by a multidisciplinary and innovative atmosphere facilitated by committed Swedes. In Luleå, FIRE (Future Internet Research and Experimentation) was complemented by the Living Labs, who promote a user-driven innovation approach in ICT.

The two constituencies from FIRE (Future Internet Research and Experimentation) and Living Labs projects joined forces and organised the first such event supported under the Swedish EU presidency on 1-2 July 2009. This cross-community series of events was masterminded by the FIREworks project and hosted by Luleå Technical University.

A multidisciplinary approach as well as the involvement of end-users have been identified as main features and research challenges for FIRE. Thus, the Living Labs are the given complement in addressing these challenges, as they are building communities which are engaging end-users. On the other hand, Living Labs need test-bed-like infrastructures for sustainable networking and managed interaction with end-users. The House of Culture in Luleå was big enough to accommodate both these research communities, altogether some 350 participants, and the conditions were more than acceptable for cross-disciplinary talks and future plans.

Economic crisis and climate crisis

At the two-day event 70 speakers from across the globe presented their views. Åsa Torstensson, Swedish Minister for Enterprise, Energy and Communication, , and Antti Peltomäki, Deputy Director-General from the EC Directorate for Information Society and Media, both stressed in their speeches the two crises at hand, the economic crisis and the climate crisis, urging for actions for recovery. According to them, ICT is key for tackling ecological issues as well as boosting the economy. Cooperation and sharing expertise across disciplines and across regions, they said, are elementary in finding solutions to remedy the negative results of the current economic downturn.

Future network and networking

Jan Färjh, Vice President and Head of Ericsson Research, presented in his keynote speech a vision for future networks and views on research and research facilities needed to accommodate this vision. The good interaction at the event led to an increased understanding of 'the user'. Initially, the different expert communities had a different understanding of the meaning and role of the word 'user'.

Lively interaction at the exhibition

Another outcome of the discussions was that openness and trustworthiness of the Internet should remain the main criteria for the design and development of future networks. Furthermore, there should be a combination of a bottom-up approach, where people using the networks define the technical requirements for networking, and a top-down approach for new future Internet paradigms.

Antti Peltomäki from the European Commission

People make the difference

In addition to the two-day event of FIRE and Living Labs, FIREweek`09 included also nine project review meetings, an ITU-T working group meeting on future networks, and many other gathering of technical bodies.

The announcement of ICT Framework Programme call 5 on the objective 1.6 "Future Internet experimental facility and experimentally-driven research" further motivated discussions and cooperation plans. People are called upon to take an active role in designing and building the backbone of the society and its services, which need to meet the criteria for greening and growing.

Future Internet by the people will serve better eco-efficiency and broader business opportunities across the globe. FIRE and Living Labs are unique environments for enabling and stimulating cross-disciplinary research and development which involves ICT users in the creation process in a mutually beneficiary way.

Further information is available on the event website at
www.fireandlivinglabs09.eu

Integrating TV narrativity and game-play

TA2 workshop at EuroITV in Leuven

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On 3 June 2009, FP7 Integrating Project TA2, (Together Anywhere, Together Anytime) organised a workshop dedicated to "Enhancing Social Communication and Belonging by Integrating TV Narrativity and Game-Play".

The workshop, co-located with the prestigious EuroITV 09 in Leuven, explored how ideas from TV narrativity and from game play can be used to enhance social communication and belonging. Representatives from seven EU projects, including Citizen Media, UNIC, ANSWER, iNEM4U, My eDirector 2012, PetaMedia and TA2, attended the workshop, as well as representatives from industrial companies like Motorola, BT, and Alcatel Lucent.

The workshop participants discussed how ICT can help enable social communication by borrowing thinking from two existing social activities, television and play. Specifically the attendees discussed how using techniques of film directors and editors could be adapted to provide a more engaging and stimulating visual representation of an interaction and how key social rules of play – such as 'the users are in control not the game' – can be harnessed to create experiences that are attractive and allow users to nurture social relationships.

EuroITV workshop on integrating TV narrativity and game-play

Marian Ursu summarised the successful outcome: "It was great to see TA2's ideas about annexing the approaches of television and play being embraced by key thinkers across the globe."

Doug Williams, technical project manager of TA2, added: "The ambitious goals of TA2 can only be realised through close cooperation of experts from narrativity, telecoms networks, equipment manufacturers and companies that know about play. We are grateful for the support the EU gives that enables such collaboration to take place."

TA2 has received funding from the European Community's Seventh Framework Programme. The project seeks to improve social communications between groups of people separated in time and space. TA2 will finish in 2012.

More information about the workshop and all papers and results can be found at *http://www.ta2-project.eu/euroitv-workshop2009/index.html*

Managing ICT projects in FP7

TA2 training seminar in Heidelberg

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On 20 May 2009, European ICT research project TA2 (Together anywhere, anytime) held a training seminar at the Eurescom premises in Heidelberg on Managing ICT projects in FP7.

The international audience consisted of current and prospective coordinators and technical managers of FP7 projects who were interested in improving their project management performance.

The success of ICT projects depends to a large extent on good management. The project management quality significantly impacts the overall performance – from the proposal phase to implementation and exploitation.

The training seminar aimed to exchange best practices in the management of ICT research projects in FP7, in order to achieve a better project performance. The contributions reflected practical experiences from the Integrating Project TA2 and other experiences of the TA2 partners. The discussion of best practices in each session was kicked off with a short presentation by an experienced project manager.

Doug Williams from BT and Technical Manager of TA2 explained how to form and manage a strong project consortium. Uwe Herzog, project manager at Eurescom, shared his experiences and insights on effective proposal writing.

Peter Stollenmayer from Eurescom and coordinator of TA2 presented his best practices on project management and reporting. This was complemented by the presentation of Eurescom's marketing manager, Milon Gupta, on project management tools for information and communication, in which he demonstrated how the EuresTools project management tools helped TA2 increase its efficiency. Finally, Doug Williams explained TA2 approach on dissemination and exploitation.

All presentation slides are available on the TA2 seminar web pages at *www.ta2-project.eu/events/seminar2009-agenda.html*

TA2 technical manager Doug Williams, BT, explaining how to form a strong consortium

TA2 coordinator Peter Stollenmayer, Eurescom, sharing insights on project management

Future Internet

European public-private partnership launched in Prague

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Currently, about 1.5 billion people use the Internet. The number of users is growing fast, ever more objects will be connected, and the Internet will become inherently mobile. To be ready for all this, the Internet must change profoundly. Europe is set to play a leading role in this process of shaping the Future Internet. An important step in this direction was made at a recent European conference in Prague.

From 11 to 13 May 2009, Europe's leading experts met at the Future of the Internet conference and the Future Internet Assembly meeting, which were held under the Czech EU Presidency in Prague. The event aimed at reviewing the strategic orientations and trends governing the future societal and economic developments of the Internet and mobile on-line societies. The event consisted of two parts: the high-level Future of the Internet conference on the first day, and the workshop-type Future Internet Assembly (FIA) meeting on the second and the third day.

Ribbon cutting for the "Future Internet Forum" – from left: Vlastimil Růžička, Czech Vice Minister of Education, Youth and Sports, and Viviane Reding, European Commissioner for Information Society and Media

Future of the Internet conference

The Future of the Internet conference was opened by European Commissioner Viviane Reding and representatives of the Czech EU Presidency. Mrs Reding explained that novel socio-economic trends fuelled by rapid technological developments will raise new challenges and opportunities for the Internet. Amongst those are Web 2.0 and social networks, mobility and nomadic usages, an ever richer content and media environment, the emergence of an Internet of Things, and the ever growing sensitivity to security and trust issues.

The conference assembled several high-level European and international speakers.

David Kennedy, Director of Eurescom, presented a new industry-driven public-private partnership initiative, which will ensure industry's involvement in Future Internet work.

Ilkka Lakaniemi from Nokia Siemens Networks and visiting professor at the Helsinki School of Economics introduced a "Connectivity Scorecard 2009" for the socio-economic take-up of ICT in Europe and beyond. The scorecard links increased national connectivity with socio-economic

Hand-over of the "Industry Call for Action on the Future Internet" – from left: Vlastimil Růžička, Czech Vice Minister of Education, Youth and Sports, Viviane Reding, European Commissioner, and David Kennedy, Director of Eurescom.

transformation. Such a scorecard is an important instrument for examining the contribution of connectivity to economic growth and social well-being in different countries.

Three panel sessions on the industrial perspective of trust in the digital life, on visions towards the Future Internet, and on Future Internet requirements and challenges rounded up the day.

Future Internet Assembly

The Future Internet Assembly on days two and three brought together more than 80 EU research projects and national initiatives instrumental in defining the future of the Internet. The meeting was organised in three parallel tracks, hosting seven break-out working groups on cross-cutting issues. These working groups discussed management and service-aware networking architectures, future content networks, Future Internet service offerings, trust and identity, the real-world Internet (Internet of Things), Future Internet research and experimentation, and socio-economic aspects.

In a plenary session representatives of the European Commission, industry and academia informed the audience on various activities, such as the "Future Internet Visionary Expert Panel".

Six high-level experts have developed a set of potential scenarios for the post-2020 Future Internet. These scenarios will be examined in respect to how Europe can drive and exploit such developments.

Thomas Skordas from the EC introduced the "European Commission Task Force on the Future Internet Content", which will explore the challenges and research priorities necessary for achieving the Future Internet.

Conclusion

Following the meetings in Bled (March 2008) and Madrid (December 2008), this was the third event driven by the Future Internet Assembly. A lot has been achieved since then: many high-level stakeholders have been mobilized, a much better communication between individual projects has been achieved, and many projects are collaborating on important cross-domain issues, such as architectures, socio-economic issues, security and trust, test platforms, and many more.

The next Future Internet Assembly meetings will take place on 23-24 November 2009 in Stockholm, Sweden, and on 15-16 April 2010 in Valencia, Spain.

More information is available at:
http://www.future-internet.eu
about the Future Internet in general and at
http://www.fi-prague.eu
about the conference in Prague.

Near Field Communication

Wireless, effortless, secure

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Mobile phones have revolutionised the modern way of life, making it easy to be in touch with people from just about anywhere: no cords, no coins, no laborious connections or tedious routines to remember. One cannot help but think about what it would be like if other electronic devices worked as easily and as intuitively – if connections could be set up with a simple touch or information transferred from one device to another just by bringing them close to one another.

This is the promise of the Near Field Communication technology – to deliver the key to ubiquitous wireless networking. It is a catalyst that provides intuitively simple and safe two-way interactions between electronic devices, with the objective to make almost all wireless technologies easy enough so that everyone, even the non-technical, can use them.

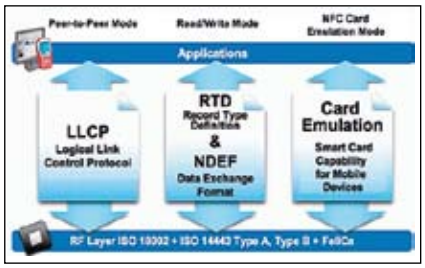


Figure 1: NFC Communication Modes (Source: NFC Forum)

Near Field Communication (NFC) is a short-range wireless-connectivity technology – also known as ISO 18092 – that enables intuitive, simple, and safe data exchange between electronic devices. Communication occurs when two NFC-compatible devices are brought within four centimeters of one another. The technology is primarily aimed at usage in mobile phones.

NFC Technology

NFC evolved from a combination of contactless identification and interconnection technologies. The architecture enables manufacturers and application developers to create powerful new consumer-driven products.

Four initial tag formats have been specified, based on ISO 14443 Type A and 14443 Type B standards, and on the NFC standard ISO 18092. NFC Forum-compliant devices must support these formats:

- NFC Data Exchange Format (NDEF)
- NFC Record Type Definition (RTD)
- NFC Uniform Resource Identifier (URI) Service Record Type Description
- NFC Text Record Type Description
- NFC Smart Poster Record Type Description.

The NFC forum defines three communication modes, as illustrated in figure 1:

The three communication modes are:

- Peer-to-Peer mode, defined for device-to-device link-level communication
- Read/Write mode allows applications for the transmission of NFC Forum-defined messages; this mode is not secure
- NFC Card Emulation mode allows the NFC-handset behave as a standard Smartcard; this mode is secure.

Applications

NFC is distinguished by its intuitive interface and its ability to enable largely proprietary wireless networking platforms to interoperate in a seamless manner. Early uses of the technology are expected to be with NFC-enabled mobile phones, which can easily be configured to become the only thing anyone needs to carry. Everyone will be able to accomplish daily tasks, ordinarily requiring the availability of different items (e.g. credit cards, code generators, tickets, etc.), using only their NFC-enabled phone.

The primary uses are to:

- connect electronic devices, e.g. wireless components in a home office system, a headset with a mobile phone, or a PC with a camera, etc.
- access digital content using a wireless device such as a mobile phone to read a "smart" poster or billboard embedded with an RF-tag
- make contactless transactions, including payment, access and ticketing (e.g. make payments with a wave or touch anywhere contactless card readers have been deployed, store tickets to access transportation gates, parking garages, events, etc.)
- Users seem eager to adopt such evolvement, as can be seen in figure 2.

Beyond the phenomenal success of the mobile phone, the adoption of mobile communications technologies has not progressed to the level that industry observers predicted. NFC aspires to leverage wireless connectivity between consumer electronics, and enhance the capabilities of mobile devices to offer novel, advanced, ubiquitous services, through a radically simplified user experience. Several trials are in operation around the world, while the limit on potential applications is set only by imagination.

Further information about NFC is available at

- *http://www.nfc-forum.org/aboutnfc/consumers*
- *http://www.forum.nokia.com/Technology_Topics/Mobile_Technologies/Near_Field_Communication*
- *http://www.nfcmagazine.com*

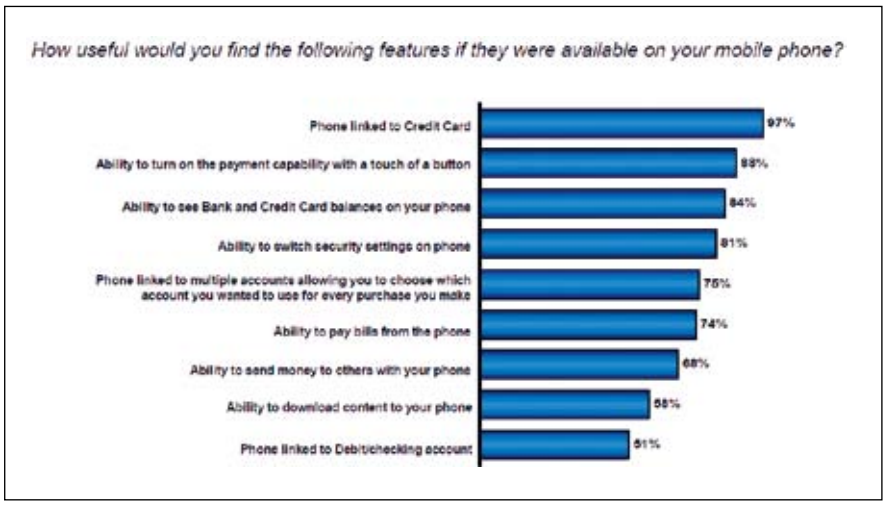


Figure 2: User acceptance of NFC features

+++ News in brief +++ News in brief +++

China now has the most Internet users worldwide

China has become the world's biggest Internet nation. By the end of June 2009, according to a report by the China Internet Network Information Center (CNNIC), the People's Republic had 338 million Internet users, which is more than in the USA. However, with a population of 1.3 billion people, the report also said that only one in four Chinese are using the Internet.

Chatting on message boards, cruising around social networking sites, and pursuing other entertainment were among the most popular activities for Web users. The center also said, in its report, that more than 25 percent of Chinese Internet users now shop online.

China also leads the world in the number of registered Web sites – nearly 13 million are using the .cn top-level domain, the report stated.

Nearly all of the Internet users have broadband, which China is working to link to more remote areas.

However, the report painted a different picture of the prospects for mobile broadband, which the Chinese government is also pushing. The number of Chinese using mobile phones with access to online services rose to 155 million, but just one in four of those having access said they would use 3G to surf the Web in the future.

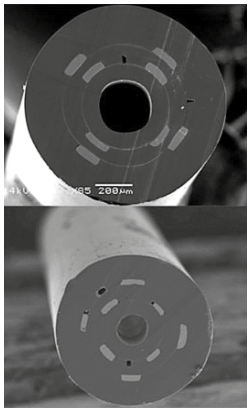
The report also showed the severity of malware and other security problems in China. Over 100 million Chinese had passwords or account numbers stolen in the first half of 2009, and almost twice as many experienced virus or trojan attacks.

www.cnnic.cn/en/index

MIT researchers create clothes with vision

MIT researchers have developed light-detecting fibers that, when woven into a web, could act as a flexible camera. The MIT research team, led by Associate Professor Yoel Fink of the Department of Materials Science and Engineering (DMSE), reported in a recent issue of the journal Nanoletters about using such a fiber web to take a rudimentary picture of a smiley face.

The new fibers, less than a millimeter in diameter, are composed of layers of light-detecting materials woven one within another. The researchers claim that these



A Micrograph showing the cross-section of a new optoelectronic fiber. Courtesy / Fink Lab, MIT

light-detecting fibers offer some advantages to lenses. Lenses of natural or man-made origin have a limited field of view and are susceptible to damage, leading to the loss of the imaging or seeing capacity altogether. Optical fiber webs, in contrast, provide a distributed imaging capability provided by the entire surface of a fabric, which is in principle much more robust to damage and blindness. If one area is damaged, other fibers can still function, extracting the image.

The MIT envisages, in particular, military applications. Fabric composed of their light-detecting fibers could be joined to a computer that sends information to a small display screen attached to a visor, providing soldiers with greater awareness of their surroundings.

http://web.mit.edu/newsoffice/index.html

Website of Research Laboratory of Electronics at MIT – *www.rle.mit.edu/*

New institute for multilingual technologies

On 3 July 2009, a new institute for multilingual technologies was inaugurated in Paris. The Institute for Multilingual and Multimedia Information, short: IMMI, is an international joint research unit in the field of multimedia and multilingual document processing. Three partners are cooperating in this joint research unit: CNRS / LIMSI, France; RWTH Aachen / HLTPR, Germany; and Karlsruhe University / InterACT Center, Germany. The joint research is focusing on the areas natural language processing, statistical machine translation, speech and audio processing, multilingual document processing, and multimedia document indexing.

www.immi-labs.org/immi-info.html

Vanish - new tool to make online personal data disappear

Researchers from the University of Washington have developed a way to make online private data expire. The prototype system, called Vanish, places a time limit on text uploaded to any Web service through a Web browser. After a set time period, electronic communications such as e-mail, Facebook posts, and chat messages automatically self-destruct, becoming irretrievable from all Websites, inboxes, outboxes, backup sites, and home computers.

The Vanish prototype washes away data using the natural turnover on peer-to-peer networks; it creates a secret key, which is never revealed to the user, and then encrypts the message with that key. It then

divides the key into dozens of pieces and sprinkles those pieces on random computers that belong to worldwide file-sharing networks. The file-sharing system constantly changes as computers join or leave the network, meaning that over time parts of the key become permanently inaccessible.

Vanish was released in July 2009 as a free, open-source tool that works with the Firefox browser. To work, both the sender and the recipient must have installed the tool. The sender then highlights any sensitive text entered into the browser and presses the "Vanish" button. The tool encrypts the information with a key unknown even to the sender.

The researchers say that simply encrypting the data can be risky in the long term. The data can be exposed years later, for example, by legal actions that force an individual or company to reveal the encryption key. Current trends in the computing and legal landscapes are making the problem more widespread.

http://vanish.cs.washington.edu

Twitter – Between nuisance and killer application

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No Internet application has divided users as much as Twitter. Some regard the micro-blogging service as the biggest waste of time ever invented while others embrace it as a central social networking tool of high societal impact. Both sides are probably right.

Twitter has been called the "SMS of the Internet" because every text-based post, called Tweet, has a limit of 140 characters, like SMS. In fact, Tweets can be sent and received via SMS. The big difference, however, is that you normally exchange SMSs only with people you know, while at Twitter anyone can receive anybody's Tweets. The other significant difference is what is communicated. The question above the text entry field on the Twitter home page is "What are you doing?". And especially in the early days of Twitter people did just that – tweet what they or their cat or dog were just doing at that moment.

Banalities from everyday life

So far, humans have not exactly missed the information that Kim in Ohio is bringing the kids to school while John in Manchester is cooking some delicious spaghetti and Michelle's cat in Montreal is playing with a ball of wool. Before Twitter started in 2006, any marketing manager suggesting that banalities from the lives of normal citizens would arouse the interest of millions of people would have been declared insane. Obviously, Twitter has satisfied a latent need for spontaneous self-expression and voyeurism, which other Internet services had not satisfied.

One of the drivers of Twitter is that people can follow some celebrities by subscribing to their Tweets. Not surprisingly, the top three ranks in the statistics of Twitter followers are occupied by celebrities from the entertainment sector: 1. Ashton Kutcher, actor – 2,76 million followers, 2. Ellen DeGeneres, TV star – 2,46 million followers, 3. Britney Spears, singer – 2,41 million followers; while the highly popular US president Barack Obama is ranked seventh with 1,75 million followers (source: twitterholic.com, 16 July 2009).

Event-driven popularity

What gave Twitter a real push from the start were events which allowed micro-bloggers to give short live reports faster and more widespread than with any other means. Events like the 2007 South by Southwest festival in Austin, Texas, and the Macworld 2008 boosted the interest in Twitter, causing considerable downtime (2% in 2007) – Twitter's "fail whale" error message has become famous.

Twittered revolution

In 2009, Twitter further climbed the ladder of importance by becoming a tool for protesters and revolutionaries, who made use of its speed and widespread impact. On 7 April 2009, anti-communist protesters stormed the parliamentary building in Chisinau, the capital of Moldavia, accusing the government of fraud. Twitter was used to mobilise protesters, using the hashtag #pman.

In June 2009, following allegations of fraud in the Iranian presidential election, protesters used Twitter as a rallying tool and as a method of communication with the outside world after the Iranian government blocked several other modes of communication (hashtag: #iranelection).

Marketing tool

Not surprisingly, Twitter has also become quite popular as a marketing tool. Multi-level marketers, self-declared social media gurus, and many other marketeers use Twitter as another distribution channel for their products or services.

The interesting question for marketing experts is who is using Twitter. According to a recent study by Sysomos, there are more women on Twitter (53%) than men (47%). Another result is that two thirds of Twitter users are under the age of 25, with 31% in the age group 15-19. Contradictory to this is another recent study, by Morgan Stanley, which claims that "teenagers do not twitter". This result, however, is not based on a quantitative survey but on the observations and insights of Matthew Robson, a 15-year old intern at Morgan Stanley.

Another interesting aspect is the active or passive usage of Twitter. A study by Harvard University published in June 2009 discovered that 10% of users created over 90% of Twitter's content. The study was based on a survey among 300,542 users.

Twitter business model

Despite its huge popularity, Twitter is still looking for a viable business model. Twitter Inc. was founded in 2006 by Jack Dorsey, Biz Stone, and Evan Williams in San Francisco, California. Since then, the main source of finance has been venture capital – according to Internet sources over 57 million dollars.

How Twitter is making money at the moment is not publicly know, but so far it seems that Twitter Inc. has not yet found a viable business model. According to a Reuters report from May 2009, Twitter co-founder Biz Stone said that Twitter would not look for revenues from advertising but rather offer commercial add-on tools for business users. Although the business model does not seem to be clear, Twitter already turned down a 500 million buying offer by Facebook in 2008.

Time will tell if Twitter is just a fad or if it will become an established communication service in the already large arsenal of social media applications.

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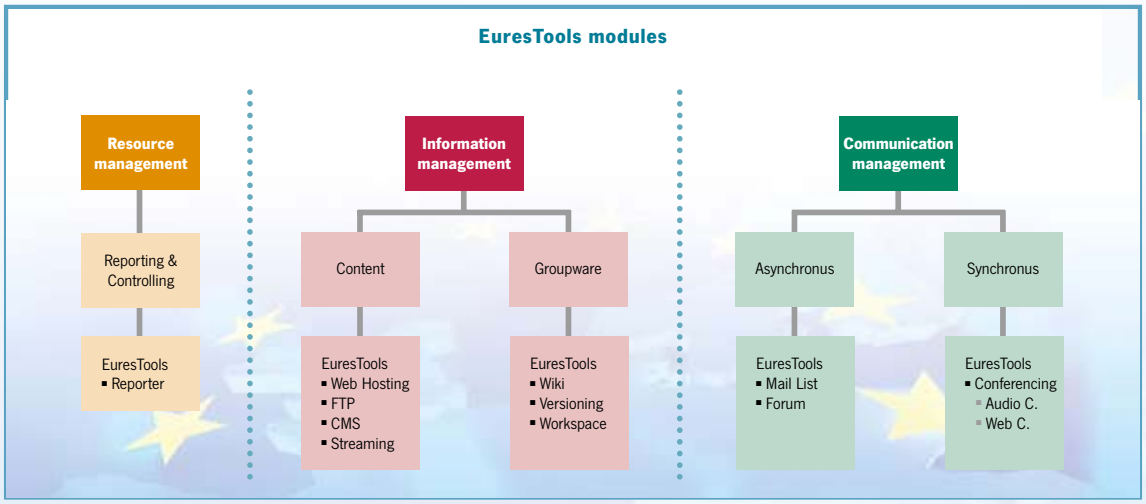

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