



ICT 5: Smart Networks and Novel Internet Architectures*

ICT 6: Smart optical and wireless network technologies*

ICT 2013: Create, Connect, Grow
Vilnius 6-8 November 2013

Philippe Lefebvre

DG Communications Networks, Content and Technology (DG CONNECT)

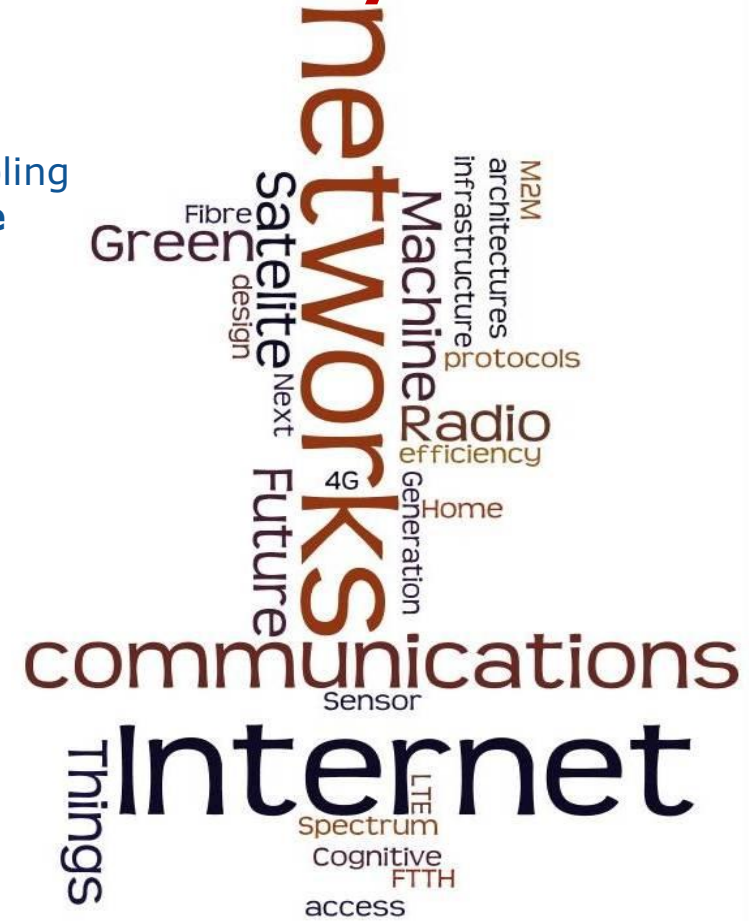
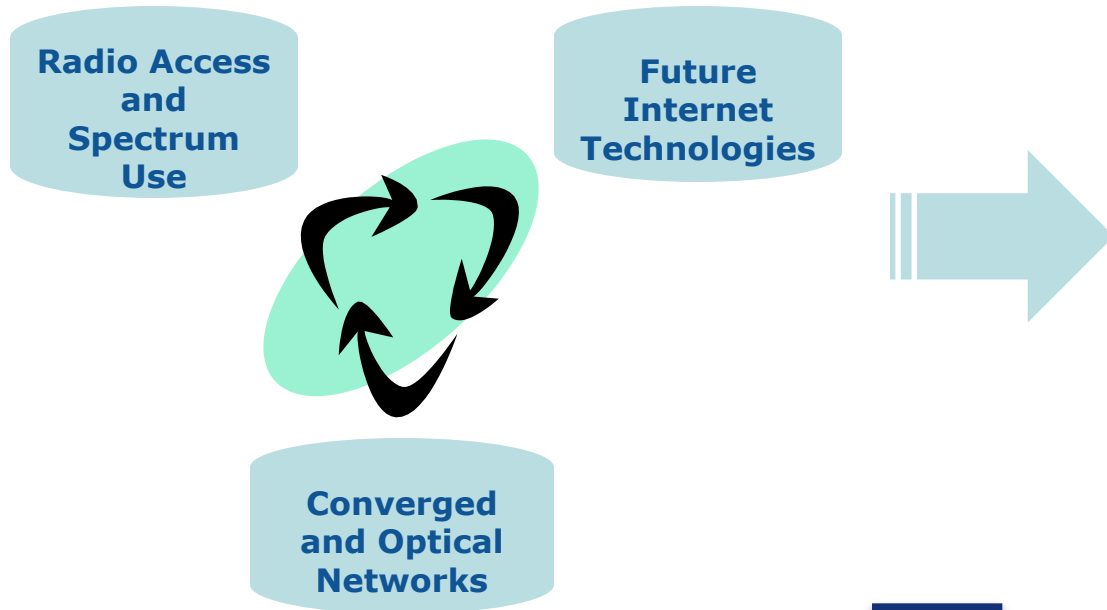
Disclaimer: the views expressed are those of the author and cannot be regarded as stating an official position of the European Commission

* Commission's proposal of 15 Oct. 2013

European Network Technologies Connecting the Digital Society

Future Networks EU Research

for the ubiquitous **ultrafast Internet of the future** enabling every European to have a **broadband connection to the digital society (Digital Agenda for Europe)**



TRAFFIC AND SPEED

50%

Internet traffic is increasing by 50% every year

2/3rd

Two-thirds of the world's mobile data traffic will be video by 2015

x100

Mobile internet traffic is expected to increase several hundred-fold between 2010 and 2020

100Mbps

Recent EU research shows that new optical access architectures can serve 100 Mbps to a 1 000 users at distances of 100 km

62%

Mobile internet take-up grew by 62% to 217 million mobile broadband subscriptions

2015

Mobile-connected traffic from tablets will generate as much traffic in 2015 as the entire global mobile network did in 2010

AND

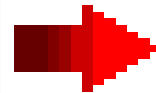
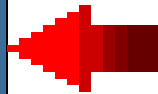
EU research is contributing to the next generation of LTE Advanced and beyond



Main trends affecting research and innovation in the communications networks area

Societal drivers:

- Urbanisation
- Smart cities
- Mobility
- Information availability
- Social networks
- Privacy
- Security
- Energy efficiency
- Demographic trends
- Healthcare
- Education
- ...



Research & Technology drivers:

- Capacity/Efficiency
- Service/Content centricity
- Virtualisation & “Cloudification”
- Cognition
- Context awareness
- Manageability
- Self-organisation
- Self-optimisation
- Cross-layer optimisation
- Flexibility
- Smart environments, Sensors M2M

Smart Networks & Novel Internet Architectures

Clean Slate/
Visionary Internet



Information-Centric Networks
Software Defined Networks (OpenFlow...)
Network of Objects and People
Virtualization
Content Distribution
Service-aware Networking
Cloud Networking
Network Coding
Delay-tolerant Networking
Design-for-Tussle
Mobile Cloud

Evolutionary
Internet



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- **NETWORK MANAGEMENT and CONTROL:**
measurements, QoE, self, autonomic
- **SOCIO-ECONOMICS OF THE INTERNET**
- **GREEN INTERNET**

ICT 5. Smart Networks and novel Internet Architectures *

Novel architectural and networking approaches to information delivery and access

Research and Innovation – Small projects

- Security, trust
- mobility and scalability (built-in)
- Greater efficiency (↗ link physical & information layers)

Impact:

- Strengthen the EU datacom/telecom industry
- Contribution to industrial strategies and roadmaps
- Establish links with international initiatives
- Contribution to at least one large scale validation trial

ICT 6. Smart optical and wireless network technologies*

1/3

Innovative network technologies addressing the increasing traffic and the multiplicity of usages

a. Research and Innovation – Small projects

Focus Optical networks

- Flexible management: Dynamic management across domains
- Very high speed transmission (10 Gbps/user within 10 years!)
- Efficient data centre architectures
- Scalability, cost and energy efficiency (anticipate compatibility with EU access products!)

ICT 6. Smart optical and wireless network technologies*

2/3

Innovative network technologies addressing the increasing traffic and the multiplicity of usages

a. Research and Innovation – Small projects

Focus: Wireless networks

- New paradigms for wireless connectivity
- Flexible use of spectrum
- Addressing usage diversity
- Hybrid (terrestrial/satellite) infrastructure for extensive coverage and resilience

(complementary to ICT14 – 5G PPP)

ICT 6. Smart optical and wireless network technologies*

3/3

b. Coordination and Support Actions

- Support to dissemination, standardisation (e.g. wireless/optical domain), international cooperation, industrial roadmapping, contribute to metrics, demonstration and validation strategies, etc.

Main expected impact:

- Strengthen current EU industrial capabilities on wireless and optical (min. 20% market share?)
- Fast metro and core networks (Pb/s throughputs, Tb/s I/F speeds)
- Reduce energy consumption (10x)
- Higher spectrum efficiency, lower radiation
- Support new applications and services
- Community building, coordination with national initiatives (Support Actions)

Inducement Prizes Network Technologies*

1/2

Impact:

- Stimulate high-level scientific work
- Attract new organisations
- Create ICT awareness on public and young researchers

Note: Implementation details for the Inducement prizes are still under preparation

Inducement Prizes Network Technologies*

2/2

a) Breaking the optical transmission barriers

Maximise the fibre transmission capacity per channel

- Under consideration: "First European team to break the current record and achieve a transmission rate > 100 Tb/s over a single fibre design" (e.g. 200 Tb/s using spatial multiplexing and MIMO techniques)

b) Collaborative sharing of spectrum

Novel methods for decentralised spectrum management

- Under consideration: Reward excellence in demonstrating one or several novel methods providing empowerment of local user communities with decentralised spectrum management capabilities through "collaborative sharing". (e.g. using real-time and "social networks" type of spectrum coordination)



Thank you...and... Good luck!

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DG Communications Networks, Content and
Technology

<http://ec.europa.eu/digital-agenda/>

Network Technologies

<http://cordis.europa.eu/fp7/ict/future-networks/>

and

<http://ec.europa.eu/digital-agenda/en/network-technologies>



HORIZON *2020*

LE PROGRAMME DE RECHERCHE ET
D'INNOVATION DE L'UNION EUROPÉENNE

BROKERAGE SESSION

Future Internet

PRESENTATIONS



□ 14 presentations

- 6 projects
- 8 profiles



UK NCP

NOW:

UK NCP – STEPHEN ALEXANDER

NEXT:

INTERRINOV – JACQUES MAGEN

UK Collaboration

- UK National Contact Point
- Enterprise Europe Network
- Regional Governments
- Industry Networks
- **ICT Knowledge Transfer Network**
 - **6000 members, 80000 + with networks of networks**
 - **160 events per year, working groups, reports**

UK Collaboration

- **ICT Knowledge Transfer Network offer..**
- If delegates wish to build consortia with UK partners, send you presentation to...
- Eddie Townsend, ICT KTN
eddie.townsend@ictktn.org.uk
- Presentations will be placed on the ICT KTN site
www.ictktn.org.uk
- URL will be circulated to their membership
- Potential UK partners will contact you directly



Project idea

NOW: INTERINNOV – JACQUES MAGEN

NEXT: TELECOM BRETAGNE – NICOLAS MONTAVONT



Community Building / Stakeholders' Engagement



Promotion & Communication / Dissemination



International Relations and Coordination



Coordination of Work Packages & Tasks



Support to technical activities



Support to Proposal Drafting and Project Management – Finding relevant partners

Some references



Net!Works



▶ www.interinnov.eu

▶ contact@interinnov.eu



:@interinnov_eu





Project idea

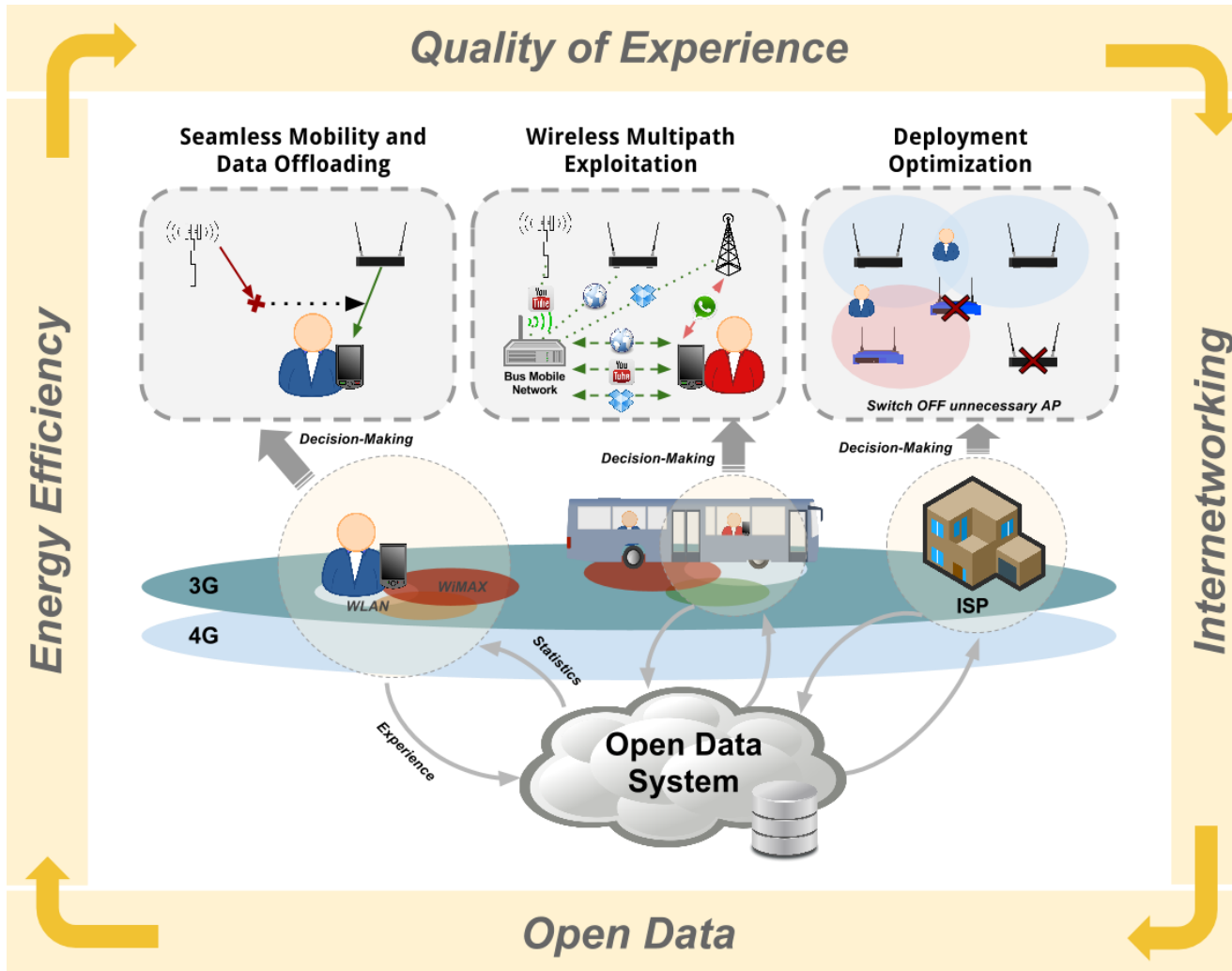
NOW:

TELECOM BRETAGNE – NICOLAS MONTAVONT

NEXT:

JERUSALEM COLLEGE OF TECH. – YORAM HADDAD

Open Data System for Quality of Experience



- Offloading
- Always Best Connected
- Energy aware
- Collaborative framework

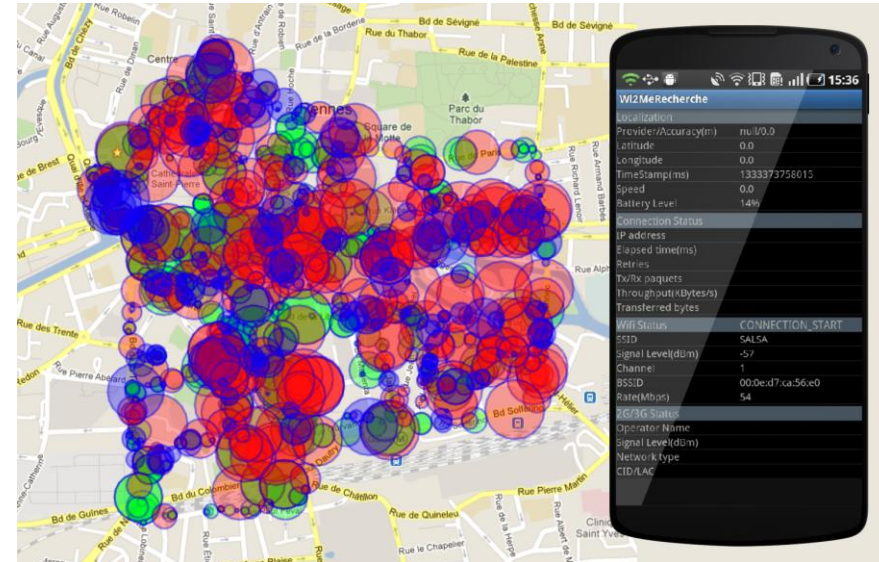
Current Status

■ Consortium

- FON (Es)
- AVEA (Tr)
- Telecom Bretagne (Fr)
- University of Luxembourg (Lu)

■ Key features

- Sensing applications
- Shared data system
- Handover optimization
- Machine learning
- Community Network



■ What we are wishing for...

- Device manufacturer
- Operator
- Security / cloud experts



Project idea

NOW:

JERUSALEM COLLEGE OF TECH. – YORAM HADDAD

NEXT:

CNRS/LAAS - KHALIL DRIRA

ICT 6:

Spectrum efficiency through accurate deployment and Green networking

Expertise

- ▶ MAC (Modeling,...)
- ▶ Layer 3
- ▶ Spectrum sharing schemes between multi-tier networks (femtocell-Macrocell)
- ▶ Cognitive Radio
- ▶ Green Networking
- ▶ Mesh and Ad Hoc networking
- ▶ Algorithms for deployment and resource allocation

Institute and Lab

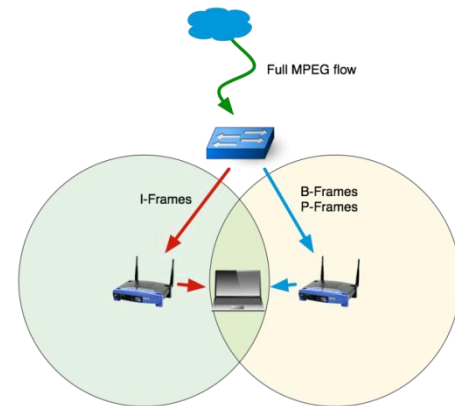
- ▶ Jerusalem College of Technology
 - Oldest (since 1969) school of engineering in Israel (not university)
- ▶ Computer Science Dept.
 - 200 graduates per year
 - 30 faculty members
 - MSc devoted to Communication System Engineering
- ▶ FTNet (Future Networks) Lab
 - Head: Dr. Yoram Haddad
 - haddad@jct.ac.il



Idea

▶ Efficient spectrum sharing

- Accurate deployment
 - Mature theory , critical to face future flood of small cells
 - SINR diagram (scalable !)
 - Interference Cancellation opportunity
 - Adaptive
 - machine learning – neural network methods
 - Distributed Power control limited to cluster



▶ Mixed with Disruptive

- Coverage and high data rates → higher power
 - Out of the box thinking:
 - unlimited EIRP → Game theory (tested !)
 - Additional Channel generally automatically invalidated → tests on possible 4th CH in WiFi !



Project idea

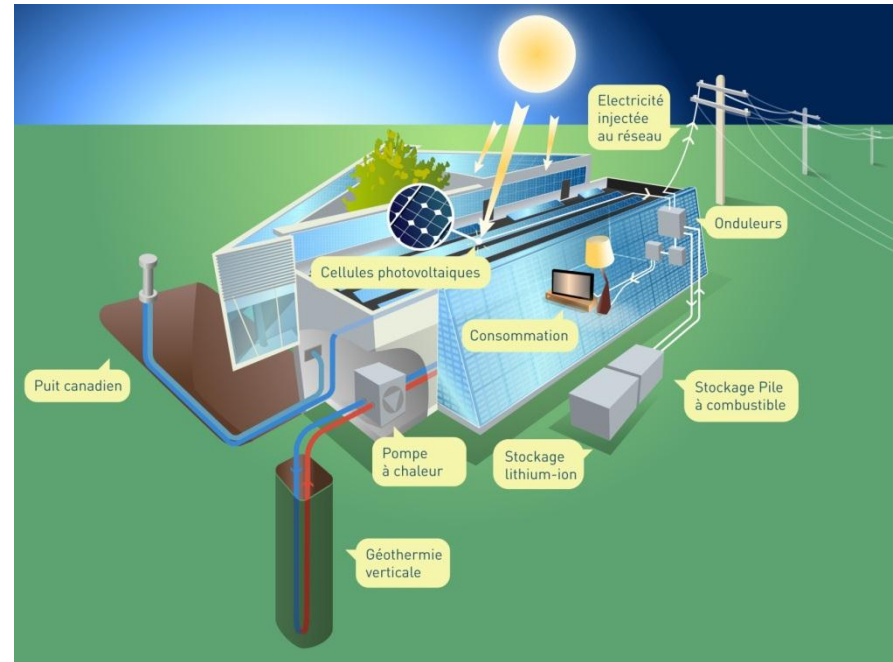
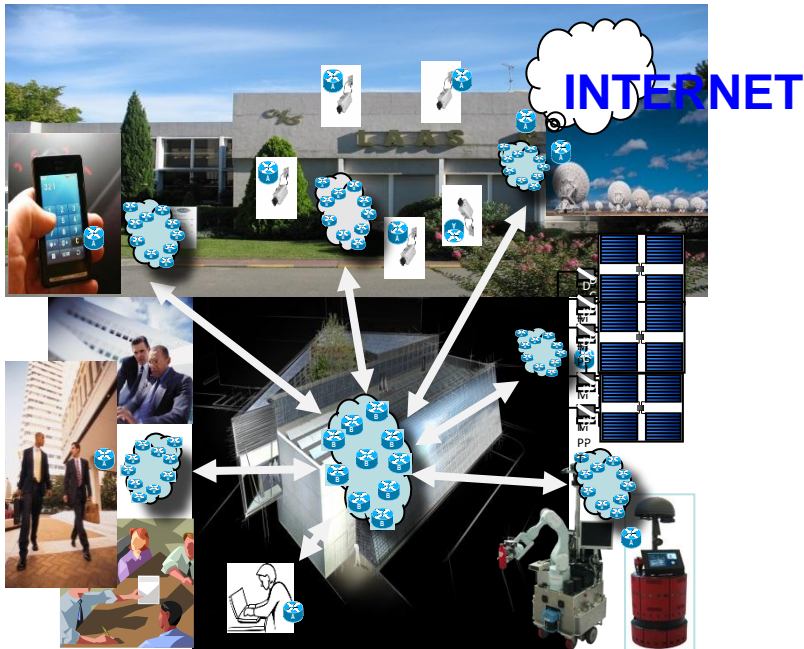
NOW: CNRS/LAAS - KHALIL DRIRA

NEXT: THALES R&T – FABRICE LEMONNIER

Research Skills

- **LAAS-CNRS : 650 persons, experience in European projects since +20 years**
- **3 main departments with skills in connection with Smart Networks and Novel Internet Architectures and Tools and Methods for SW developement, and cloud**
- **Networks & Communications :**
 - **WSN Platforms & Open Source fully ETSI-Compliant M2M SCL Platfoms : see **M2M.FR****
- **Energy Management**
- **Decision & Optimisation**
- **Crucial computing**
- **See www.laas.fr**

Experimental platform : ADREAM



A micro-grid , An instrumented smart building:

- Heating and air conditioning, Lighting-smart meters, Environment (weather, temperature, ...), Photovoltaic Electricity Production, Storage and Energy Consumption, Services Vision Network Camera, Service Supervision



Project idea

NOW: THALES R&T – FABRICE LEMONNIER

NEXT: ONERA – MARIE-THERESE VELLUET



www.thalesgroup.com

Thales Research & Technology (France)

ICT 9

OPEN

THALES

High Performance Computing Architectures

- ◆ Multicore on FPGA
- ◆ Hardware accelerators
- ◆ Dynamic reconfiguration

High Performance Programming Methods & Tools

- ◆ Modeling for parallel objects
- ◆ Data and task parallelism
- ◆ Virtual prototyping (Performance simulation) for parallel machines (e.g.: architecture sizing)
- ◆ Rapid prototyping (Generation of parallel codes) for (homogeneous / heterogeneous) parallel architectures
- ◆ Acceleration of functional simulations

OPEN

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OPEN

THALES

Context

- ◆ Loss of information between different software engineers that yield misunderstandings and costly development errors

Improving the complete software lifecycle of complex (more dynamic behaviours) and data-intensive (parallel) systems

- ◆ Filling the gap between levels of representation provided at any level
 - System: high level details including non functional properties
 - Algorithm: functional validation through dynamic execution
 - Implementation: parallelisation (data mostly known at compilation-time)
- ◆ Ensuring a seamless flow (around a heterogeneous tooled-up approach) without losing data integrity through different methods and trade-off (e.g.: coding rules, loop back)

OPEN



Profile

NOW: ONERA – MARIE-THERESE VELLUET

NEXT: INSTITUT TELECOM – PIERRE SIMAY



Onera's competencies in Free Space Optics domain



retour sur innovation

Experience in atmospheric turbulence

- For more than 20 years, ONERA has been involved in **optical propagation through atmospheric turbulence** for both military and civilian applications through:
 - Theoretical studies of spatial and temporal effects of turbulence (RD 1 and 2)
 - Development of dedicated models to study the influence of turbulence on imaging and laser beam delivery (PILOT (RD 3) in particular for strong turbulence regime (no analytical approach available)
 - Validation in weak turbulence regime by comparison with analytical models and in strong turbulence regime by experimental tests in laboratory or test fields (RD 4)
- In the field of **Adaptive Optics** (AO), ONERA has performed concept and system studies, and has developed specific wavefront sensors and control strategies. In particular, ONERA led NAOS project (VLT UT4 AO system) and is currently responsible for SAXO (AO of SPHERE instrument), and was involved in preliminary studies of AO for the E-ELT.
- In the field of **optical telecommunications**, ONERA was responsible for the simulation of the propagation channel in LOLA program. ONERA has delivered to CNES an optimized version of PILOT dedicated to ground to satellite telemetry (RD 5), has validated on a laboratory bench an iterative AO system between two transceivers for horizontal communications in IR over 20 km (RD 6).
- Onera develops methods to measure C_n^2 profile along the line of sight (RD 7)
- Onera leads a NATO task group on AO and turbulence mitigation for imaging and laser beam (RD 8)

References

- [RD 1] J.-M. Conan, G. Rousset, and P.-Y. Madec, *Wave-front temporal spectra in high-resolution imaging through turbulence*. J. Opt. Soc. Am. A 12, 1559-1570 (1995).
- [RD 2] C. Robert, J.-M. Conan, V. Michau, J.-B. Renard, C. Robert, and F. Dalaudier, *Retrieving parameters of the anisotropic refractive index fluctuations spectrum in the stratosphere from balloon-borne observations of stellar scintillation*. J. Opt. Soc. Am. A, 25(2):379-393 (2008).
- [RD 3] M.-T. Velluet, V. Michau, T. Fusco and J.-M. Conan, *Coherent illumination for wavefront sensing and imaging through turbulence*, Proc; SPIE n° 6708, (2007).
- [RD 4] L. Hespel ; M. T. Velluet ; A. Bonnefois ; N. Rivière ; M. Fraces ; D. Hamoir ; B. Tanguy ; B. Duchenne ; J. Isbert *Comparison of a physics-based BIL simulator with experiments*, International Symposium on Photoelectronic Detection and Imaging ISPDI, Beijing China (2009)
- [RD 5] N. Védrenne, M.-T. Velluet, J.-M. Conan, M. Séchaud, M. Toyoshima, H. Takenaka, F. Lacoste, and A. Guérin, *Turbulence effects on bi-directional ground-to-satellite laser communication systems*, International Conference on Space Optical Systems and Applications (2012).
- [RD 6] Rudolph Biérent, Marie-Thérèse Velluet, Nicolas Védrenne, and Vincent Michau, *Experimental demonstration of the full-wave iterative compensation in free space optical communications* Opt. Lett. 38, 2367-2369 (2013)
- [RD 7] N. Védrenne, V. Michau, C. Robert, and J.-M. Conan. *C_n^2 profile measurement from Shack-Hartmann data*. Optics Letters, 32(18):2659-2661 (2007).
- [RD 8] M.-T. Velluet et al, *Turbulence characterization and image processing data sets from a NATO RTO SET 165 trial in Dayton, Ohio, USA*, Proc. SPIE 8380, (2012)

Adaptive optics for optical telecommunication systems

WHY

- Because of high data rate needs, use of components (detectors) developed for fiber telecommunications
- Implies to inject the signal into a monomode fiber
- The optical response of the system must be diffraction limited even through turbulence
- That leads to the use of adaptive optics systems

CHALLENGES

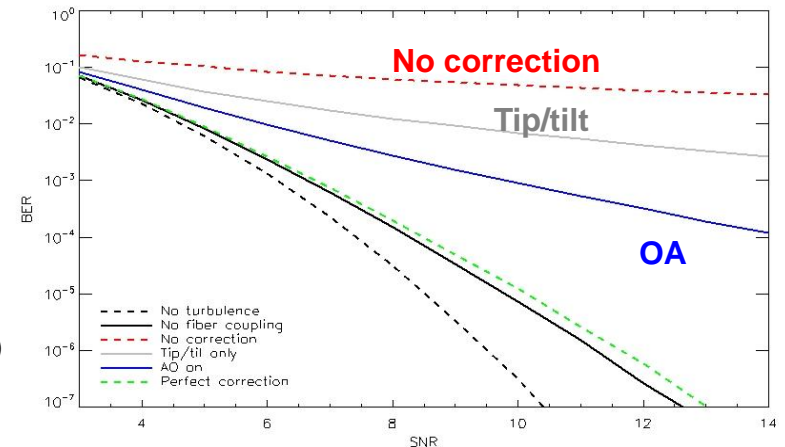
Horizontal telecommunication over long range

- Use of wavefront sensor (WFS) in strong scintillation regime
- Requires to correct both phase and amplitude

DEVELOPMENTS

- Study and implementation of new WFS (simultaneous measurement of phase and amplitude)
- Study and implementation of AO systems correcting both phase and amplitude
- Modelling and laboratory experiments
- Development of an end-to-end model of temporal sequences after coupling into a monomode fiber including AO (RD 9)
- Evaluation of the BER (Monte Carlo approach)

BER evaluation (OOK coding)



References

[RD 9] N. Védrenne, V. Michau, M.-T. Velluet, J.-M. Conan, C. Robert, *Optique adaptative pour les télécoms satellite - sol*. Journées Recherche Industrie de l'Optique Adaptative, (juillet 2013).

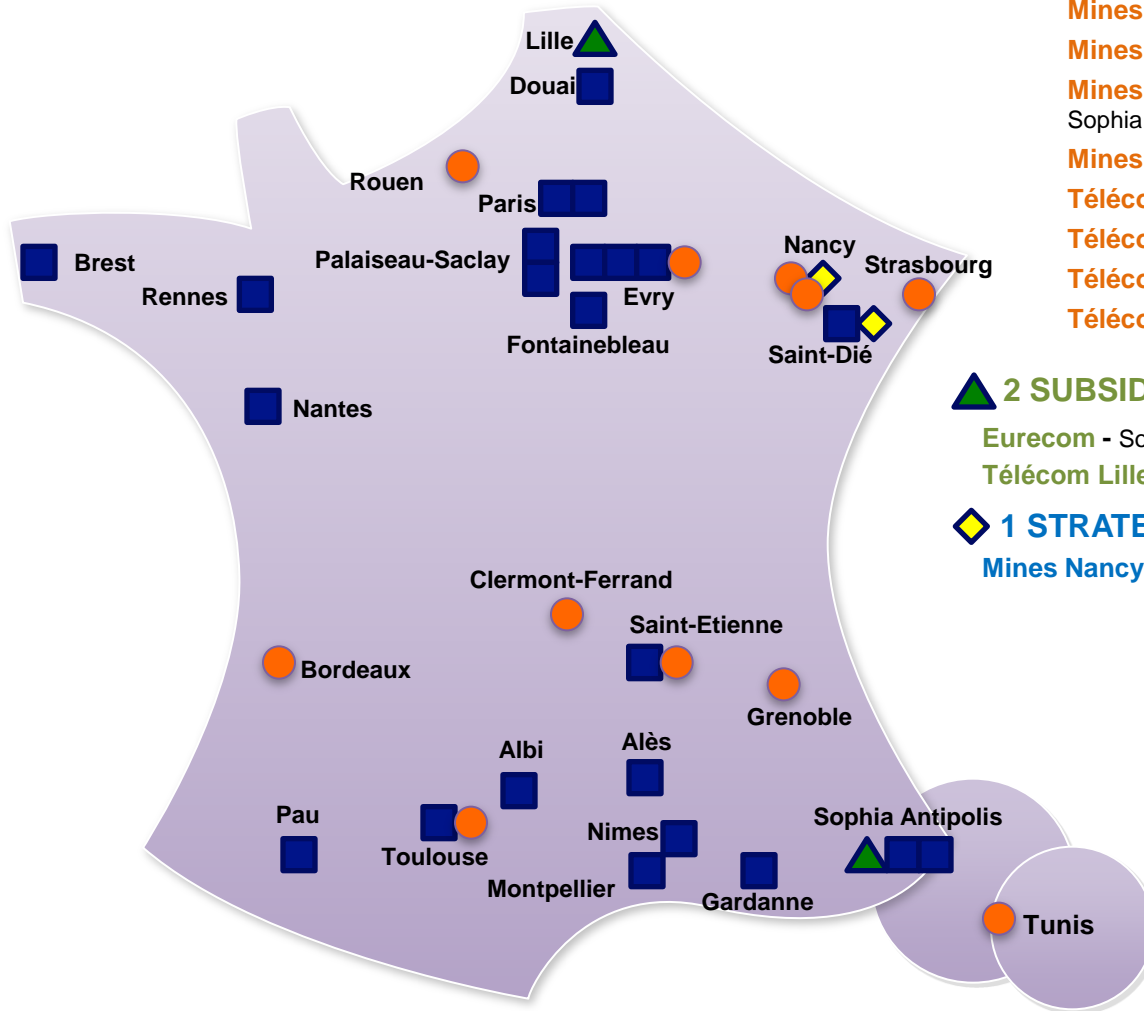


Profile

NOW: INTITUT TELECOM – PIERRE SIMAY

NEXT: CEA LETI – SYLVIE MAYRARGUE

National coverage



10 GRADUATE SCHOOLS : 6 MINES AND 4 TÉLÉCOM

- Mines Albi-Carmaux** - Albi, Saint-Dié
- Mines Alès** - Alès, Montpellier, Nîmes, Pau
- Mines Douai** - Douai
- Mines Nantes** - Nantes
- Mines ParisTech** - Paris, Palaiseau-Saclay, Evry, Fontainebleau, Sophia Antipolis
- Mines Saint-Etienne** - Saint-Etienne, Gardanne
- Télécom Bretagne** - Brest, Rennes, Toulouse
- Télécom Ecole de Management** - Evry, Palaiseau-Saclay, Paris
- Télécom ParisTech** - Paris, Sophia Antipolis
- Télécom SudParis** - Evry

2 SUBSIDIARY SCHOOLS

- Eurecom** - Sophia Antipolis
- Télécom Lille1** - Lille

1 STRATEGIC PARTNER SCHOOL

- Mines Nancy** - Nancy, Saint-Dié

11 ASSOCIATED SCHOOLS

- ENSEEIH** - Toulouse
- Enseirb-Matmeca** - Bordeaux
- ENSG** - Vandœuvre-lès-Nancy
- ENSIIE** - Evry
- ESIGELEC** - Rouen
- Grenoble Ecole de Management** - Grenoble
- IFMA** - Clermont-Ferrand
- Sup' Com Tunis** - Tunis
- Télécom Nancy** - Villers-lès-Nancy
- Télécom Physique Strasbourg** - Strasbourg
- Télécom Saint-Etienne** - Saint-Etienne

Missions/Scientific disciplines

1) Higher Education (13.000 students/1900 PHD students)

2) Scientific and technological research (4200 researchers: Faculty, PHD, engineers and support)

3) Support for innovation and economic development (more than 100 new start up each year, a network of 150 high tech SME, Telecom Foundation with ICT industrial partners, 2 Carnot Institutes)

8 main disciplinary fields

Earth and environmental sciences

Energy and process engineering

Science and materials engineering

Electronics and communication

Signal and image processing

Computer science and networks

Mathematics and systems

Economics, management, society

9 application domains

Energy: production, efficiency and distribution

Materials processing

Natural and recycled resources

Risk and security

Transports

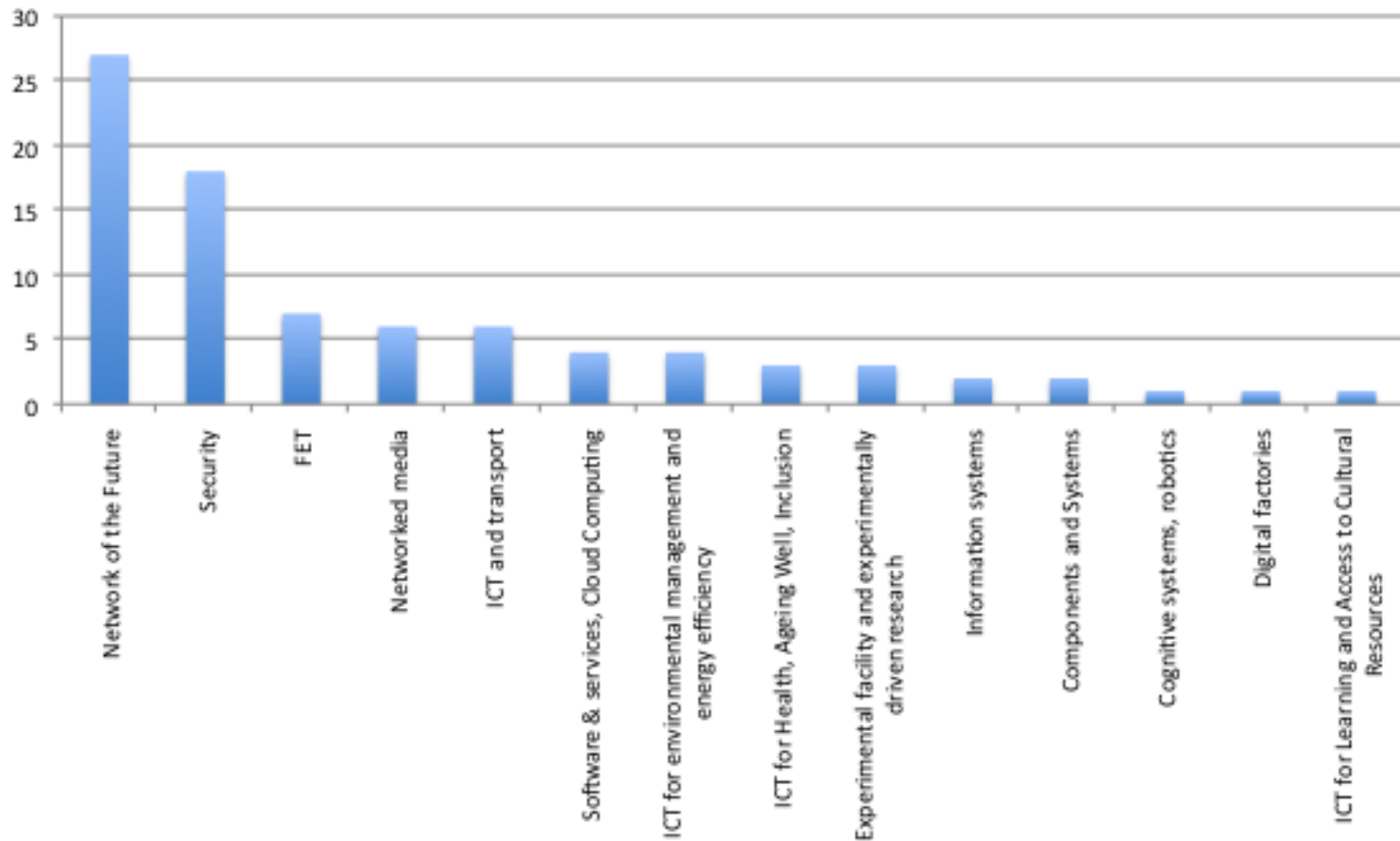
Industrial engineering

Healthcare and autonomy

Telecom, Information Technology and components

Media and services

Our participation per thematic in the FP7/ICT programme (number of projects)





Profile

NOW: CEA LETI – SYLVIE MAYRARGUE

NEXT: TEAMCAST – ALAIN UNTERSEE

leti

*innovation
for industry*

CEA-LETI

S.MAYRARGUE CEA-LETI/DSIS

Sylvie.mayrargue@cea.fr

Domains of expertise/cooperation

- Internet of Things/Smart Cities
 - Wireless sensor networks
 - MAC and Routing protocols
 - Energy efficiency
 - Security
- BANs (Body Area Networks)
- Energy Harvesting for Small sensors
- Security
 - for RFIDs
 - for small devices in the context of IoT and smart cities: deployment protocols, lightweight embedded cryptography for small sensors and/or RFIDs
 - More generally: issues of protection of intellectual property, user's identity & privacy, goods,...for small objects, & wireless link security at physical level

Domains of expertise/cooperation

- Cellular Communications (4G, 5G, etc...)
 - Heterogeneous Networks
 - Femto-Cells
 - Advanced receivers
 - Cognitive Radio
 - Cloud RAN
- Visible Light Communications
- mmW communication (baseband, RF and antennas).
- Geo-Location (UWB, Cellular, BANs, any...)
- Real-time Prototypes (FPGA) for any above topic
- Small Antennas for any above topic

leti

LABORATOIRE D'ÉLECTRONIQUE
ET DE TECHNOLOGIES
DE L'INFORMATION

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www.leti.fr



Thanks for your attention





Profile

NOW: TEAMCAST – ALAIN UNTERSEE

NEXT: WBS – PETER MASON

TEAMCAST COMPETENCIES PROFILE

H2020 ICT – European Brokerage Event
Paris, January 10, 2014

Alain UNTERSEE – Collaborative Projects Manager
Alain.untersee@teamcast.com



Company profile & competencies

- **SME of 50 people,**
 - HQ in Rennes (France)
 - Sales Offices in NY (USA) and Singapore,
- **Manufacturer of wireless network equipment**
 - telecom & broadcast infrastructures,
- **Specialist of radio access technologies**
 - for one-to-one and one-to-many communications,
 - all waveforms, frequency bands and power levels,
- **High level of R&D activities,**
 - focused on the convergence of broadcast & broadband accesses,
- **Widely involved in collaborative projects**
 - Celtic, Eurostars, French ANR, ...
- **Highly active in standardisation forums**
 - ETSI, DVB, FoBTV, ...

Interest in H2020 projects

- **ICT6-2014 : Smart Optical and Wireless technologies**
- **Looking for joining projects working on:**
 - Future **waveforms** and protocol stacks for **convergent multi-service platforms**,
 - Preparing the **fully integrated, ubiquitous and global 5G networks** of tomorrow
- **By working on high capacity, spectrum efficient and flexible wireless technologies**
 - **To uncorrelate** totally **services & infrastructure** granularity, communication types (i.e. unicast, multicast, broadcast)
 - **To improve energy efficiency** of the network infrastructures



Rennes - France

Elmira (NY) - USA

Thanks for your attention!

TeamCast

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Espace Performance
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Profile

NOW:

WBS - PETER MASON

NEXT:

CEA LIST – ALEXIS OLIVEREAU

Welwyn Business Services Limited (“WBS”)
a UK micro business for service solutions
Innovation and Commercialisation through Smart System Solutions
Future Internet

Services over ecosystem partners provides new competitive capabilities

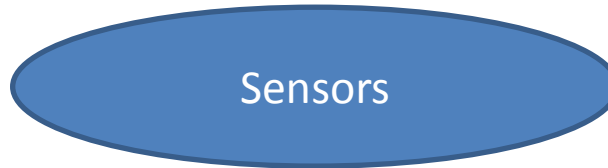
- End to end collaborative business approach with formal service systems engineering
- Contractually binding Standards (Structured Knowledge), Regulations and Metrics

Partners ?

- New wireless standards for IoT – Weightless / others? - certified products from Europe
 - Terminal, Base Station, spectrum (white space?)
- SMART Systems Laboratories – academic / industrial design and development support
 - Prototype / trial customer experience centred solutions by design – e.g eHealth
 - Software engineering for interoperable industrial and public sector applications
- Flexible Electronic Systems (printed and plastic) / integrated sensor manufacturer
 - Design, development, implementation and scale-able production as part of the fabric
 - Underpinned by new materials science
 - nanotechnologies, ink capabilities (graphene, other 2 D electronic materials) , metal nanowires
 - industrial printing maximising existing capacity providing training, technical and business support
 - DZP Technologies Limited (“DZP”) – Cambridge UK, Independent advisors – others?
- Skills / Training - develop enterprise design architects crossing social and business boundaries

SMART Systems Services ecosystem partnerships

Our surroundings, cities and communities are becoming instrumented with a fabric of sensors



Our world is becoming interconnected (Wireless platforms)



Objects, assets, “things” are becoming intelligent Internet of Things (IoT)



New & Optimised Business Processes

New Data



New Insights
per customer/industry/
market/ location



Process Innovation



Profile

NOW:

CEA LIST – ALEXIS OLIVEREAU

NEXT:

SETICS STTAR – ALAIN MELLER

FROM RESEARCH TO INDUSTRY

cea tech

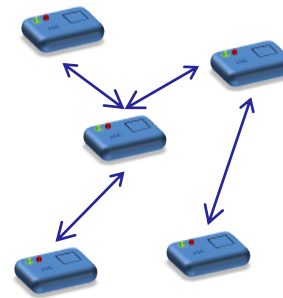
Communicating Systems Lab

CEA LIST / DIASI / LSC

Christophe Janneteau, Lab Manager

christophe.janneteau@cea.fr

list



Mission: Develop robust and efficient **radio** and **network** technologies for **M2M** and multimedia communications

- Innovation & Technology transfer
- Applications: Transportation, Defense & Security, Energy, Telecom...

Advanced network protocols and architectures

- Routing, Mobility, Security, Multicast, Transport, Software-Defined Networks...

Advanced radio technologies (PHY/MAC)

- 5G, LTE, 802.11 family, 802.15.4...

Applied to all types of networks and applications

- Internet, cellular systems, IoT, wireless sensor networks, vehicular networks...

Validation through **software prototyping** & simulation / emulation

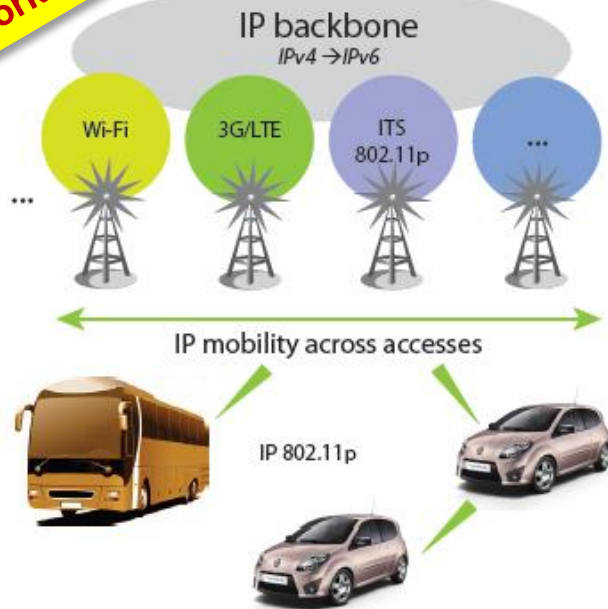
- Including fast software prototyping/emulation of radio technologies

Active in standardization (IETF, 3GPP)

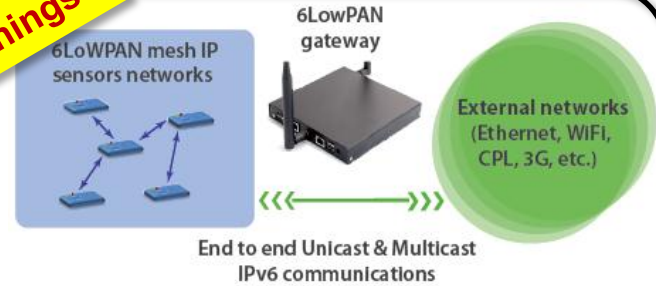
Strong experience of European projects

- FP7: C-CAST, EARTH, eCo-FEV, eDASH, EXALTED, Freedom, FUTON, IoT-A, Smart Santander, TROPIC, TWISNet...

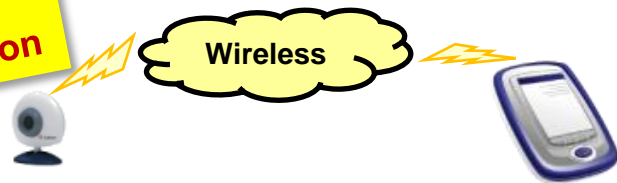
Wireless Vehicular Networking



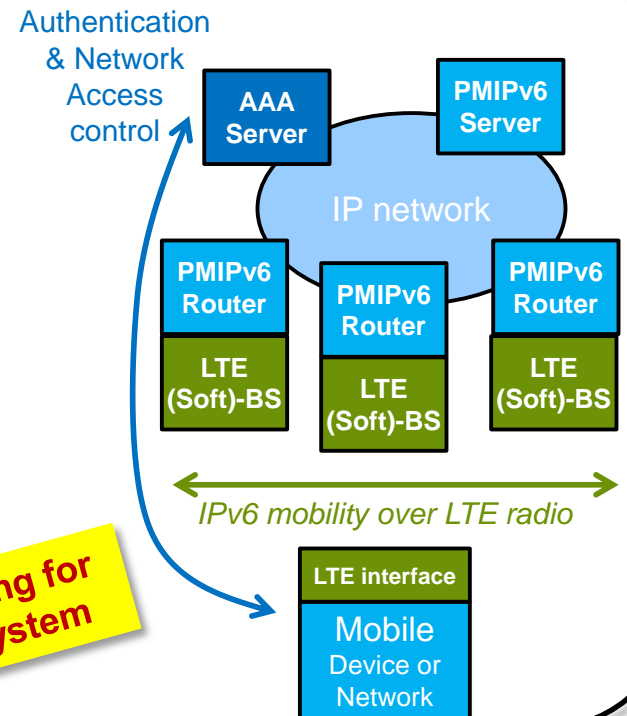
IP Wireless Sensor Networks & Internet of Things



Reliable Wireless Transmission



Radio & Networking for future cellular System



ICT 5 – Smart Networks and novel Internet Architectures

- Work on **novel routing, naming and addressing mechanisms** overcoming the limitations of the original Internet architecture, accommodating multiple stage deployments of mobile Objects
 - Connect **alternative addressing spaces** for a deep integration of entities of the future-generation Internets
 - Prepare for the **exhaustion of existing addressing resources** as well as the **ossification and over-crowding of the end-to-end connectivity paths**
- Enable **privacy by design** by using managed pseudonymity

ICT 6 – Smart optical and wireless network technologies

- **Multipoint-to-multipoint communications** between one or multiple small cells and one or multiple users
- **Device-to-device communications**
- **Small Cell / FemtoCell Cloud Networking**: Combine the wireless Small Cell paradigm with that of Cloud Networking

ICT 7 – Advanced Cloud Infrastructures and Services

- **Cloud security**
 - Authentication, Privacy, Adaptive Security, Security Outsourcing, Proof of Storage
 - Secure Coding techniques to enhance security from a physical layer perspective to complement higher layers security
- **Distributed Coding for storage**: restore reliably the data computed / stored on cloud nodes even in presence of nodes failures or bad wireless conditions



Profile

NOW:

SETICS STTAR – ALAIN MELLER

NEXT:

CNRS-MINES TELECOM/COMELEC – BERNARD HUYART



Setics SA, Digital infrastructure experts

Company description: core business

Created in 2000, Setics is an independent leading French consulting firm, dedicated to digital infrastructures and telecommunications. Consistent with its development strategy, Setics' mission towards its clients and partners is about:

- Providing assistance in telecommunications projects by offering high added value consulting,
- Providing strategic decision-making roadmaps in-depth analysis of technical, economic and legal issues,
- Developing a wide range of activities by accumulating experience throughout our different missions and by carrying out technological and regulatory watch.
- Developing and Providing Software Product around Broadband Networks

Consultancies Activity

Setics clients benefit from our acknowledged competence in the following fields of activity:

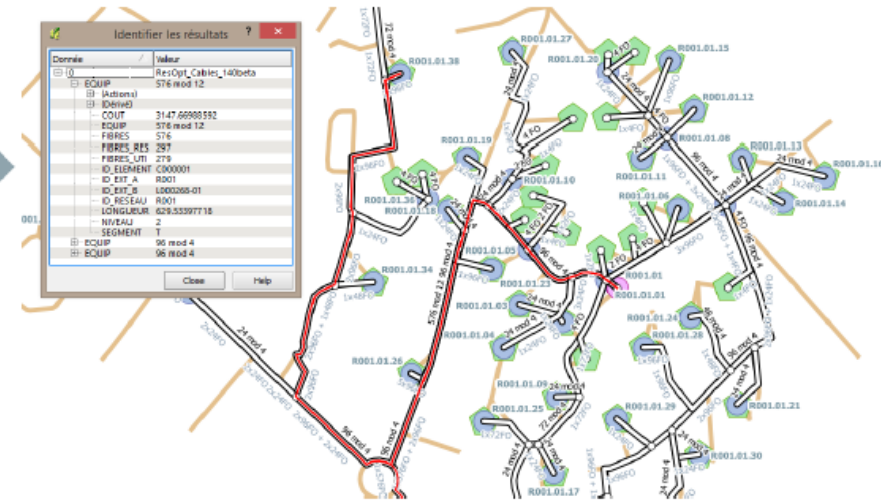
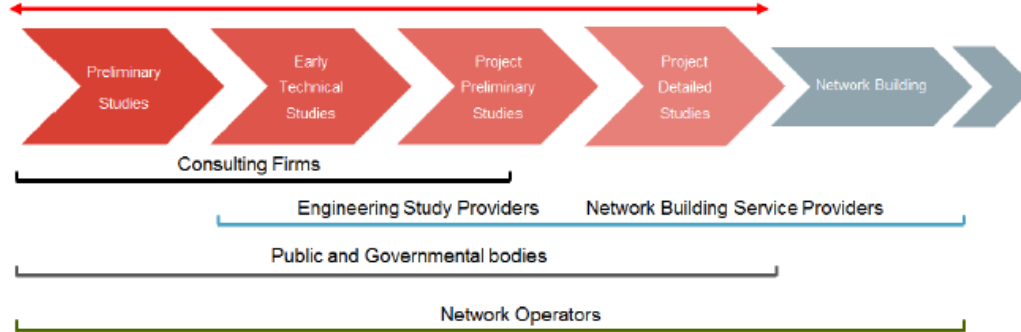
- Strategy and master plans for public bodies: Digital Territory Plans, ICT strategies, strategic positioning studies, feasibility studies
- Assistance in the set-up of broadband infrastructure deployment and operation: BOT, PPP, procurement contracts
- Broadcast: transition to digital TV
- Financial institutions: strategy studies, assessment of business plan, M&A assistance
- Audits, surveys and technical due diligences
- Project management, roll-out supervision: wireline (copper, optical fibre) and wireless (mobile, WiMAX, WiFi, PMR, ...) networks, backbone and Access
- Defense and security: "mastered" optical fibre, secured networks, roll-out of radio and fixed networks, CCTV

Setics Sttar Software

Setics develops and commercialises Setics Sttar a software for Fibre To The Home (FTTH) design and optimisation. Sttar has been used on many projects with an aggregate amount of Home Passed above 2 million units.

Customer of Sttar along the value chain of building FTTH network

Domain of use for Sttar software



Topics of interest:

- Network design automation and optimisation
- Field assessment software
- Deployment electronic assistants

Partners looked at:

- Software vendors in network management
- GIS, or other techno providers
- Potential customers for business cases

Contact: Alain Meller, meller@Setics.com





Profile

NOW:

CNRS-MINES TELECOM/COMELEC – BERNARD HUYART

NEXT:

END



Institut
Mines-Télécom



RFM Radio-Fréquences & Micro-ondes

Bernard Huyart

Département COMELEC

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<http://www.comelec.enst.fr/recherche.fr>



RFM research activities

■ Energy efficient RF front-ends and systems

- MMIC design for RF front-end,
- Automatic Matching Impedance Circuit,
- Load-Pull & Source-Pull setup for the design of linear power amplifier.
- New RF front end architectures

■ Smart and small antennas design

- Antennas for cognitive radio,
- Metamaterial Inspired Antennas,
- Robust antenna design for RFID tags and WBANs.

■ Radio channel modeling and localization

- Measurement and modeling of the radio channel,
- Electromagnetic influence on and of the human body,
- Radar & localization.