Celtic-Plus
Smart Connected World

EUREKA

Pitch Summaries of Celtic-Plus Proposers Day Paris, 29 June 2015

https://www.celticplus.eu/project-ideas-from-proposers-days/

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OISE - Optimization Integration Energies Systems

Delivering abilities to reach 100% sustainable energy sources for any kind of territory, whatever its size, resources, needs, situation

-> scheduling and monitoring energies flows, according production – consumption at RT, considering many scales (time, space …)

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Optimization and Integration of the energies systems

Levels for flexibility :

- Demand side response
- RES as part of the grid (ancillary services)
- Multi sources Hybridization

So, the system you have to optimize is the whole value chain of local energy area

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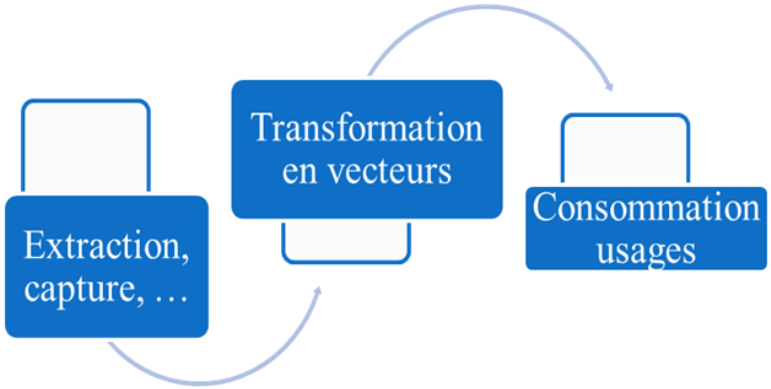

Smart & Energy Efficient end to end security deployment platform for IoT

Need 2 types of credentials:

- *Credentials to secure transport*
- *Credentials for applicative security*

Challenge: move from manual to managed provisioning

Content:

- An innovative architecture supporting the separation of data communication & credential distribution
- Fine grain authorization management to automate credential distribution.
- Enhanced credential protection in IoT nodes
- Ultra low power secured radio
- Energy efficient cryptography
- Final demonstration via use cases in smart city environments

Expected Outcome:

- Solutions provided will allow secure and reliable deployment of IoT services in a short term perspective
- Facilitate the deployment of use cases involving a peer to peer business model in addition to the traditional provider/subscriber model
- Ultra low power secured IoT Nodes
- Standardization of credential management for IoT

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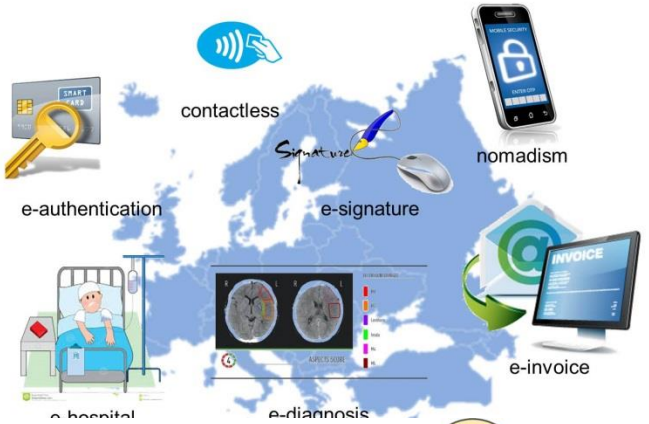
Secure Service-Oriented Scalable Smart IoT (SIoT)

Motivation: Increasing need for secure services that are
- Web-based, agile, software-defined, QoS enabled
- Connecting many smart IoT devices
- Interoperable among EU countries
- Secure, privacy-aware and auditable
- Safe, robust and scalable

Use Cases:
- e-Health: *manage a patient from country A in country B*
- e-Invoice: *manage invoice from country B to country A*



Research Problems:

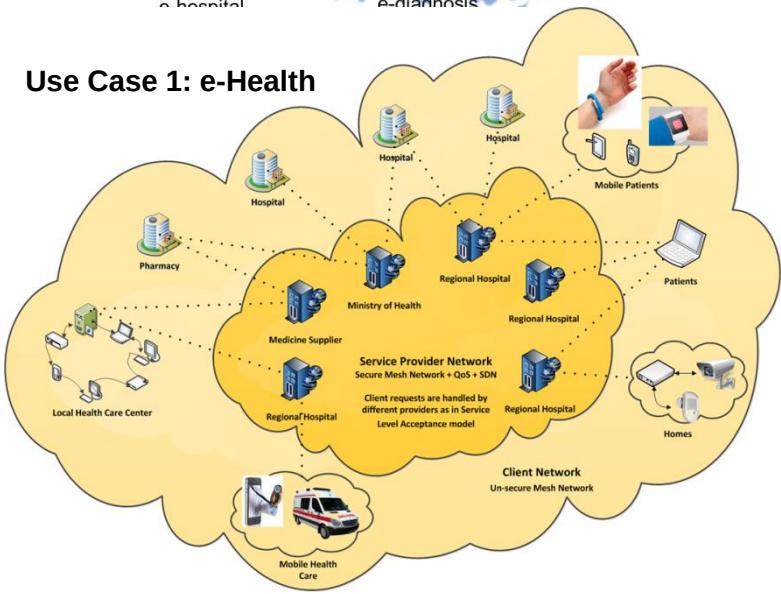
Services
- Service discovery and handshakes
- Service controller design (cross-layer interactions)
- QoS management
- Service-oriented networking

Interoperability
- Manage diverse authentication mechanisms
- Comply with different regulations regarding transactions & patient data privacy
- Standardize data formats and ensure compatibility
- Manage centralized / decentralized network architectures

Security
- Strong authentication based on smart devices
- Data privacy, confidentiality, integrity and auditability
- Resilience to cyber-fraud and data theft

Safety
- Reliability & autonomy of smart devices
- Network self-healing & automatic reconfiguration
- Seamless scalability

Use Case 1: e-Health



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Tele-Monitoring System for Water and Underwater Environments using Cloud and Big Data Systems

Main benefit of the idea?
Real time visualization and analysis of risk factors for environment, public health and public safety.
What makes the added value?
The platform provides an interface that users can access anywhere, at any moment, via Internet.
Why should I participate in the project?
To participate into an innovative consortium in order to accelerate and implement new IoT, M2M-radiotelemetry solution.

Objectives:

- Develop a tele-monitoring system that integrates an water and underwater network with different sensors connected to a cloud platform that can offer real time information
- Advance the technology for M2M communications in water and underwater environments, especially where no GSM coverage is available
- Solve the constrains produced by the water environments, caused by the specific channel propagation and harsh operating conditions must be taken into account

Expected results:

Tele-Monitoring system for water and underwater environments using Cloud and Big Data systems

Market relevance?

accidental water pollutions, water hydro-plants, public safety

What is the innovation?

Wireless communication in the water and underwater environments, real time visualization of the water and underwater events

Business impact?

reduced costs and risks through cloud, integration of existing systems, new applications

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Some satellite related aspects and topics

Considering the still persisting gap between the two communities, satellite and terrestrial, Eurescom sees a role for itself to support a dialogue between the two communities eventually leading to the proper integration of satellite networks with terrestrial ones.

The 5G, IoT and satellite triangle

5G and satellite

- 5G was identified as a unique opportunity for integration of satellite with terrestrial as 5G by definition should encompass all transmission technologies

5G and IoT

- IoT is identified as a major application area in 5G, representing a completely different set of requirements than the other major application area, content delivery

Satellite in 5G and IoT

- Satellite can bring unique benefits to 5G and nicely complement terrestrial solutions (broadcast, large coverage area, very high sharing of the backhaul environment)
- Satellite can also contribute to the support of IoT applications in 5G (e.g. maintenance of edge nodes)

Potential topics of interest

- Need for trialling and demonstrating key 5G technologies incorporating satellite components and using IoT as one of the main application area – the other being content delivery
- Satellite can bring/offer mature technology and solutions, (e.g. regarding modems, etc.) that may fit in terrestrial concepts and nicely complement them – connectivity for very high speed mobile nodes (high speed trains, etc.)
- The satellite ground segment is currently being re-thought and undergoing the same transformations dictated by software defined networking just as any terrestrial network components
- Early attempts are on their way to make space segment technologies and payloads ready to accept virtual machines, offering entirely new opportunities, including separation, redundancy, testing in lab on the ground and shipping to space new functions
- IP enabled video distribution via satellite is another interesting segment and likely candidate for convergence with terrestrial in the process of CDN evolution

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Indoor geolocation application on smartphone / tablet / Loc[k]os

LOCKOS main objectives:

- *Develop an indoor geolocation solution at lower cost*
- *Use last generation smartphones / tablets as hardware platforms*
- *Minimize the support infrastructure of this solution*
- *Provide end users with a calculation engine*

Project advantages:

- Autonomous solution based on inertia: no need to deploy a significant hardware architecture
- Solution optimally using inertial sensors (not reduced to the Dead Reckoning = pedometer) in the form of a strap-down navigation
- Solution exploiting all available sensors on a smartphone (magnetometer, GPS, Wi-Fi, 2G/3G/4G, photo and video) through an optimal data fusion
- Solution performing all the calculations "on board", exploiting the computing resources of modern smartphones
- Scalable solution based on the available sensors (pressure sensor, NFC ...)

Examples of Project Applications:

Civil: Alert message dissemination in case of aggression in the metro, Navigation to an underground car parking

Security: Guidance of firemen in buildings

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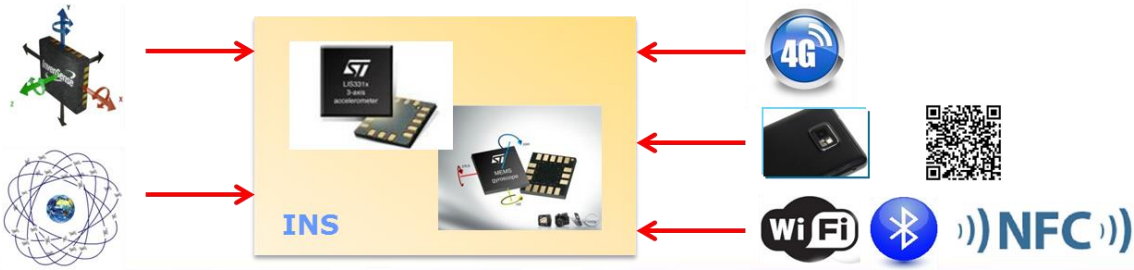


UNITed - Utilization of NFV to support IoT services in heterogeneous networks and clouds

NFV and Distributed Computing applied to IoT infrastructure and services

- convergence of IoT function virtualisation, software networking and heterogeneous clouds
- handling and processing of IoT traffic efficiently throughout the network, from centralised clouds to distributed network edges
- easy scale up/down and mobility of IoT services

“IoT virtualisation”

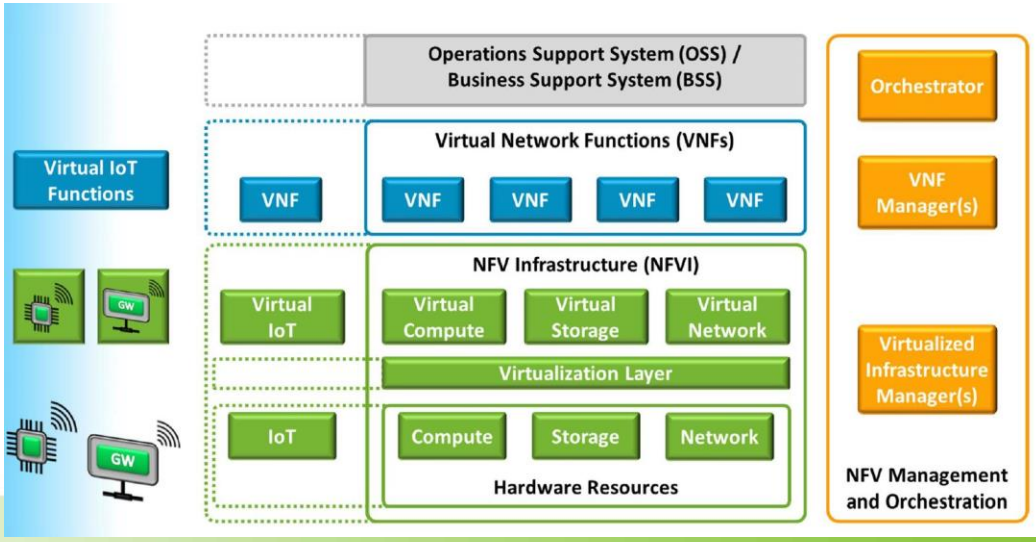
- access to local/platform physical capabilities (HW, sensors, locality, etc.)
- abstraction of the dispersed HW platforms using lightweight virtualization mechanisms
- sharing of IoT infrastructure in multi-service, multi-tenant environments

Outcome

- flexible IoT HW deployment and service provisioning, and service migration and mobility
- common NFV management and service (lifecycle) orchestration
- facilitated IoT application development for heterogeneous clouds
- Open Innovation Platform
  - combining SDN, NFV and lightweight IoT virtualisation

Impact

- rich and novel IoT services offering and cost-efficiency, new business models



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Scene Interpretation For Blind And Visually Impaired People - ProVisual

Vision

- ProVisual aims to support independent active living of the blind and visually impaired people and enhance their quality of life and integration within the society. .
- ProVisual will enable the blind to detect, identify and avoid obstacles on his way and assist in finding his way to a specific target or object.

Objectives

- To revolutionize quality of life and significantly enhancing the mobility and independence of the blind and visually impaired people.
- Enabling the blind to detect, identify and avoid obstacles on its way and assist in finding the way to a specific target or object.

Content

- Implementation of wearable prototype consisting of the multi-sensors unit, the data processor and the Gigabit communication link.
- Implementation of Simulator emulating 3D imaging sensor emitting cloud of voxels representing 3D physical surrounding.
- Implementation of algorithms for sensing the environment and analysis of 3D and 2D data for building World Model information describing the semantic properties of the environment

Expected outcome

- Implementation of wearable compact multi-sensors unit, including 3D imaging sensor and high resolution CCD cameras, linked by Gigabit communication link to parallel processing unit enabling image understanding, scene description, obstacles detection and objects recognition in a dynamic environment.

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CitySense

- *The City owns the real estate and is investing in infrastructure, gateway solutions, standards, and platforms*
- *Piloting the business & service value-model*
- *Research on social acceptability: privacy, security, benefit*

1. Easy Experimentation

- Experimentation is made easy for horizontal apps
- City owned real estate, which is close to city center
- City committed to build sensor and ICT infrastructure and facilitating trials
- Application infrastructure for horizontal apps from energy and utility to wellbeing and senior services.
- Greenfield apartments with pre-installed infra + retrofit office to old paper mill.
- It is a “manageable size” of an area, construction starting now and growing gradually to 5000 inhabitants / 2200 workplaces by 2025.

2. Ecosystem evolution

- City is supporting the ecosystem and willing to hand it over to a operating company.
- We invite companies experimenting with their offering and positioning them in the Kangas ecosystem.
- The users range from kids to seniors, workers of firms and educational institutions who are participating in experiments.
- Available infra and experimentation culture supporting trials with data and feedback collection.

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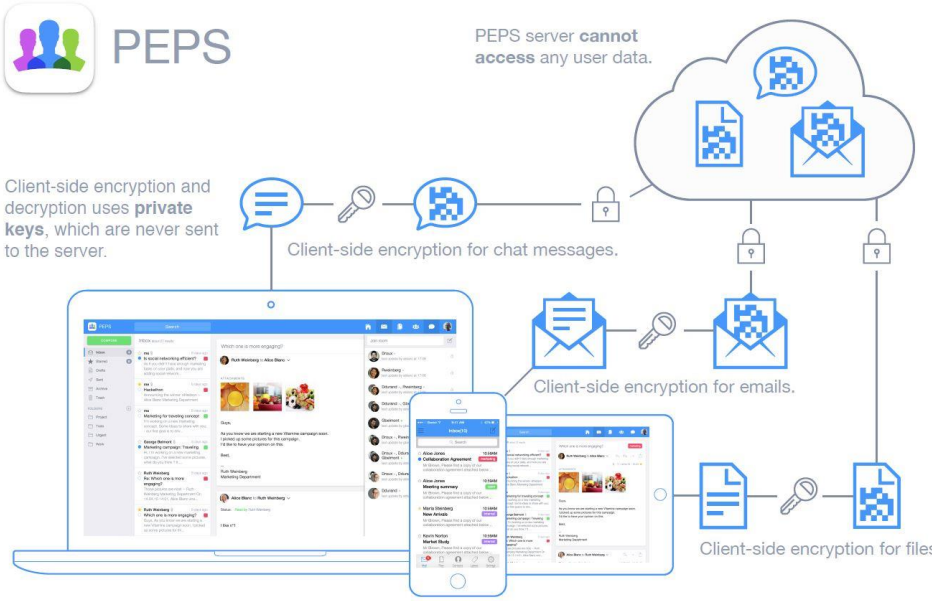
Encrypted Cloud Platform PEPS

- Cloud platforms are increasingly popular (analogy with electricity production in factories)
- But raises major concerns: Who controls the data? How is privacy treated?
- PEPS proposes to use end-to-end encryption to manage confidential data while being interoperable with cloud platforms and services

Outcome:
A cloud-based platform to handle confidential data compatible with major cloud platforms, that has a rich set of APIs to be easily integrated in other applications

Impact:
- Provide technical barriers to control data
- Enhance privacy of end-users (business and citizens)



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