



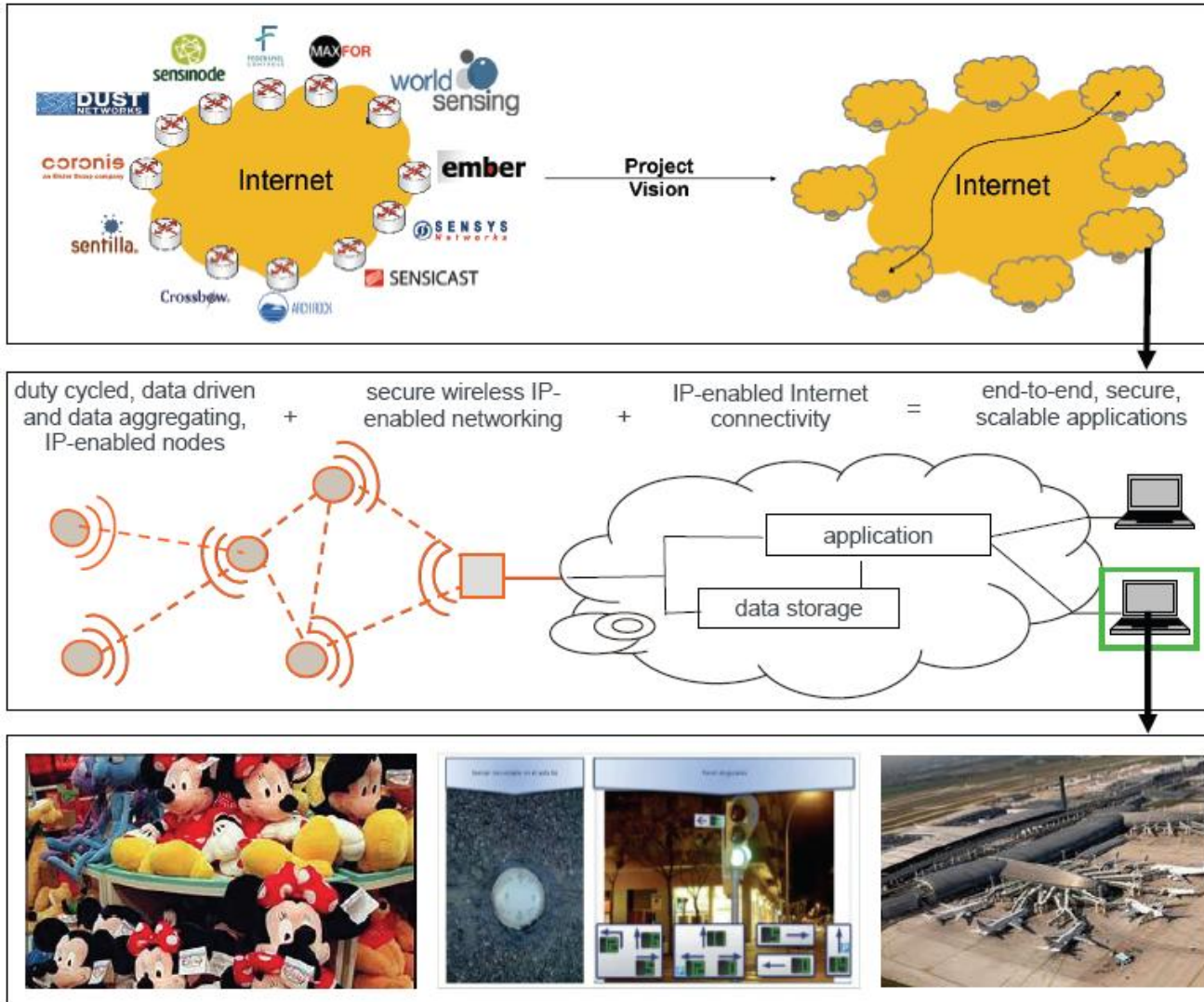
IoT interoperability workshop

Paris - March 26th, 2012

CALIPSO

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- Internet Protocol (IP) connected smart object networks, but with novel methods to attain very low power consumption
- Partners
 - Thales, CNRS, Swedish Institute of Computer Science, University of Parma, Disney Research Zurich, Worldsensing, CISCO
- IETF/IPv6 framework (6LoWPAN, RPL, CoAP)
- Platform for developments: Contiki
- Three applications:
 - Smart Infrastructures,
 - Smart Cities, and
 - Smart Toys



1. Design of the architecture for the Internet of Smart Objects
2. Optimization and enhancement of IP interconnection over duty-cycled nodes and lossy links
3. Design and development of a support for applications and end-to-end communications
4. Evaluation and experimental validation on testbeds with target applications

- End-to-end IP communications
 - Addressing, naming, and identification
 - Mobility & security
 - Transport protocols and service layer

- While using energy saving mechanisms
 - low duty cycling (<1%)
 - energy harvesting

- Layers interaction
 - MAC–IP integration (15.4 vs. RPL)
 - RPL enhancement (duty cycling, trickle, metrics)
- Optimization of network data transfers
 - handling/using multiple border routers
 - efficient data aggregation and dissemination
- Support of mobility
 - enhancement to RPL
 - new energy-efficient and disruption-tolerant forwarding (CoAP)

- Transport layer
 - analyze the behavior of TCP over duty cycled MAC
 - stream-transmission support to Contiki
- Application layer
 - sensor nodes viewed as web services
 - relies on RESTful CoAP over UDP
 - large-scale service discovery even for mobile nodes
- Data centric approach
 - view of typed data chunks forwarded in the network

- Global integration of all layers
- Smart Toys
 - mobile sensors
 - 802.15.4 and LP 802.11
- Smart City/Parking
 - multi sink RPL
 - secure aggregation
- Critical Infrastructures
 - service discovery
 - robust transport and eventing



www.senslab.info

4 sites in Lille, Strasbourg, Paris
and Grenoble

Use of field testings and testbed experiments (SensLab)

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