



OW2 Aspire RFID

@ FOSSa 2010



Toward FOSS & Privacy-friendly IoT Middleware

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RFID Everywhere

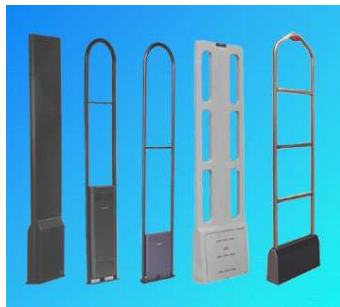
The first wave of the Internet of Things

■ Identify everything!



■ Readers everywhere!

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Store portals



RFID tunnel



Reader for pickin



NFC phones
Over 47.000.000
in Japan



Nabztag/tag
Over 200.000

Trends #1

- From warehouse to EC mass market

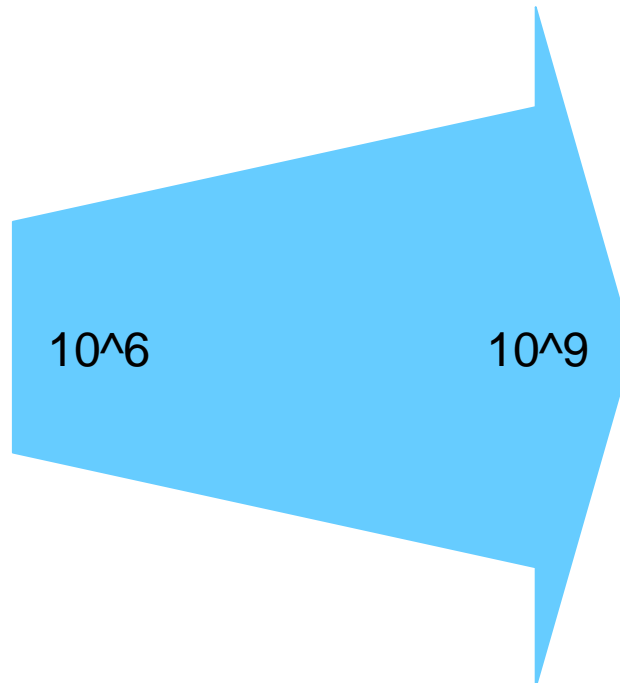


RFID tunnel



RFID handset

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NFC phones



Nabztag/tag

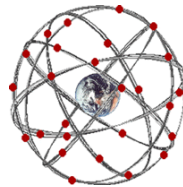
Trends #2

- Exploit sensors measurements in applications
 - Environmental sensors (scattered in warehouses, containers, you ...)
 - Sensors embedded in the tagged object (*ie data loggers in BAT*)

Location
[timestamp],[position],
[symbolicPos], [cellID] ...

Measurement
[temperature], [humidity], [pressure],
[weight], [distance], [accel.], [shock],
[ECG], [O₂], [CO₂], ...

Audio-Video
[image stream],
[snapshot] ...



- Examples
 - Cold chain, Fragil shipping, Smart trash, ...

The Privacy (invasion) syndrome

May be a brake to large scale acceptance (then deployment)



Replacement hip
medical part #459382

Wig
model #4456
(cheap polyester)

Das Kapital and
Communist-
party handbook

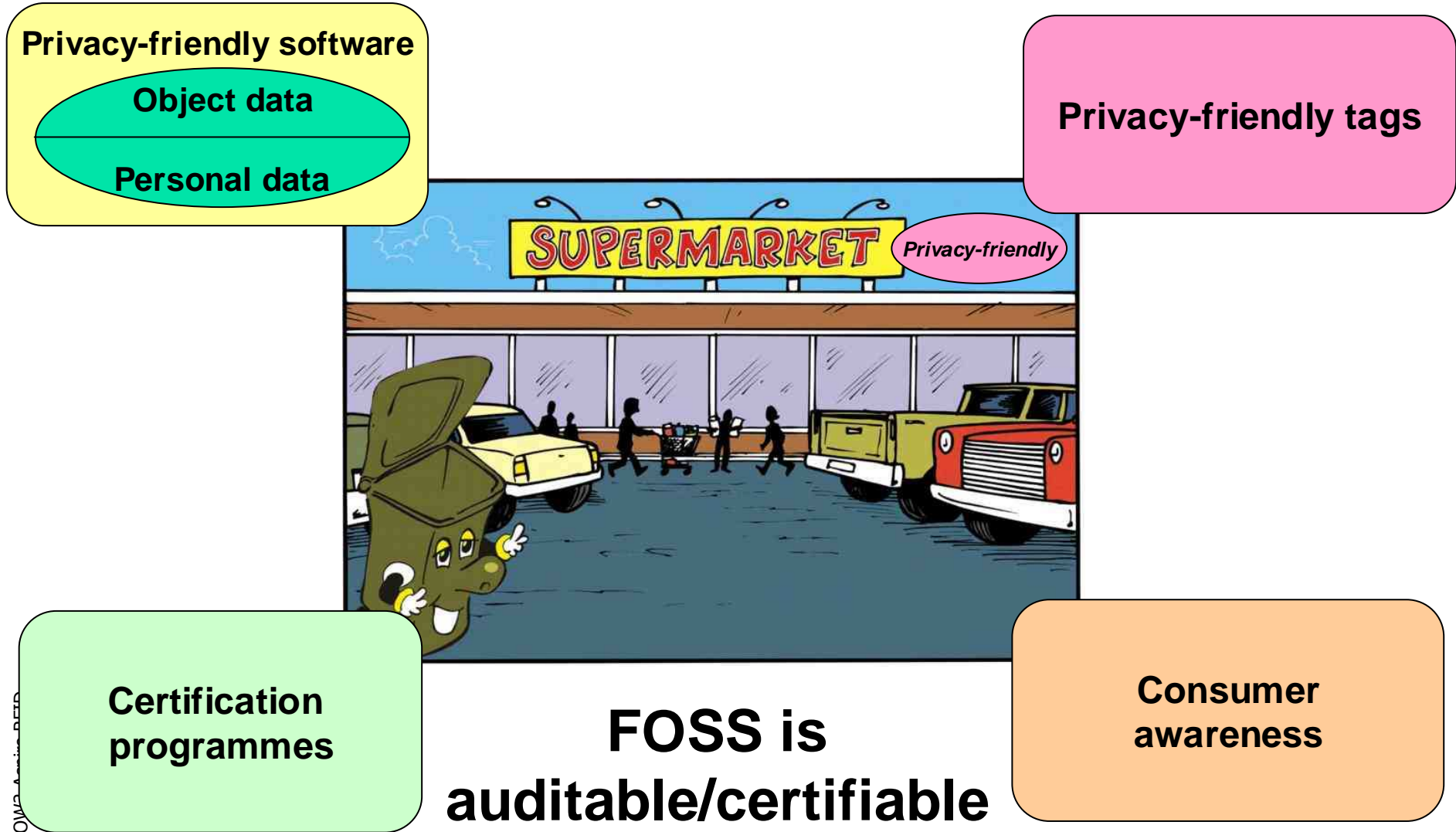
1500 Euros
in wallet
Serial numbers:
597387,389473
...

30 items
of lingerie

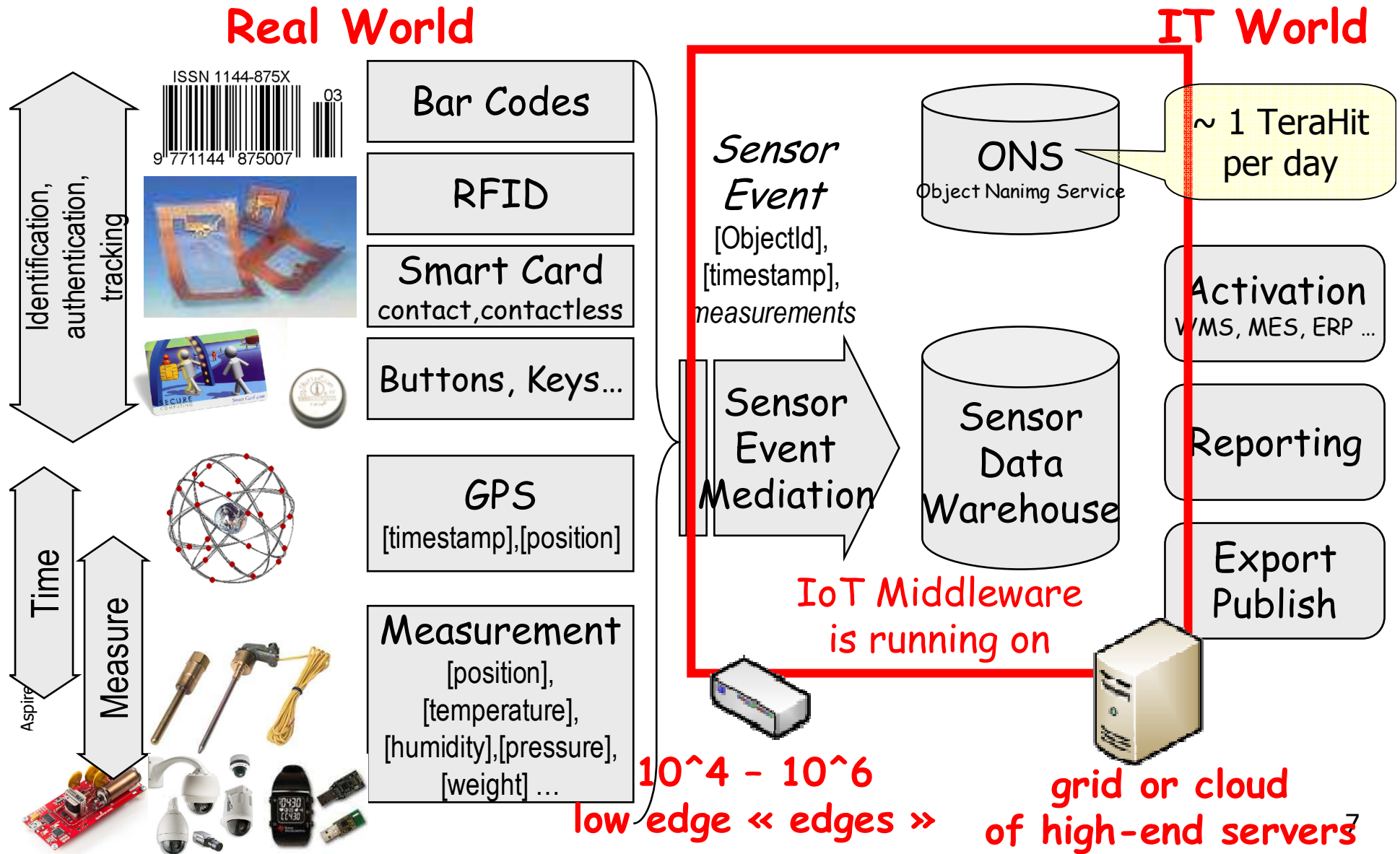
Big brother is scanning you !

From [Ari Juels 05] 5

The privacy-friendly society: Fundamentals



Toward IoT middlewares



Initiatives in IoT Middleware

- Hundreds of *ML formats/API
 - More or less FOSS

- EPC Global(target the supply chain)
 - Supply chain (open loop)
 - GUID-oriented

- NFC Forum
 - Cell phones market
 - Content-oriented

- KML (Google Maps)
 - (GPS)GeoPosition-oriented

- EEML (JPachube)
 - Sensors data streams

The *ASPIRE* FP7 Project

Aspire Today, Inspire Tomorrow



- Research project funded by EU
 - FP7 ICT-215417
 - Leaders: Neeli Prasad (Adm.) & John Soldatos (Tech.)
- Timeframe: 01/01/2008 – 31/12/2010
- 10 partners (companies and academics)
 - Aalborg University – CtiF, Denmark
 - INRIA (ObjectWeb, POPS), France
 - Université Joseph Fourier – Grenoble University – LIG Laboratory, France
 - Research and Education Laboratory in Information Technologies – Athens Information Technology, Greece
 - Melexis technologies SA MELE, Switzerland
 - Open Source Innovation Ltd OSI UK
 - UEAPME, Belgium
 - Sensap S.A, Greece
 - Pole Traceability Valence, France
 - Instituto Telecomunicações IT, Portugal



<http://www.fp7-aspire.eu/>

The *ASPIRE* FP7 Project

Aspire Today, Inspire Tomorrow

Overview and Goals

Significantly lower the SME entry cost barrier and Total Cost of Ownership (TCO) for RFID technology solutions:

- Free Middleware running on Low-cost hardware
- Lower effort for managing the infrastructure and developing applications

Enable RFID scenarios (based on ASPIRE middleware and added value sensors) that improve business results



Validate the above developments in RFID trials




ASPIRE RFID @ OW2

<http://wiki.aspire.objectweb.org>

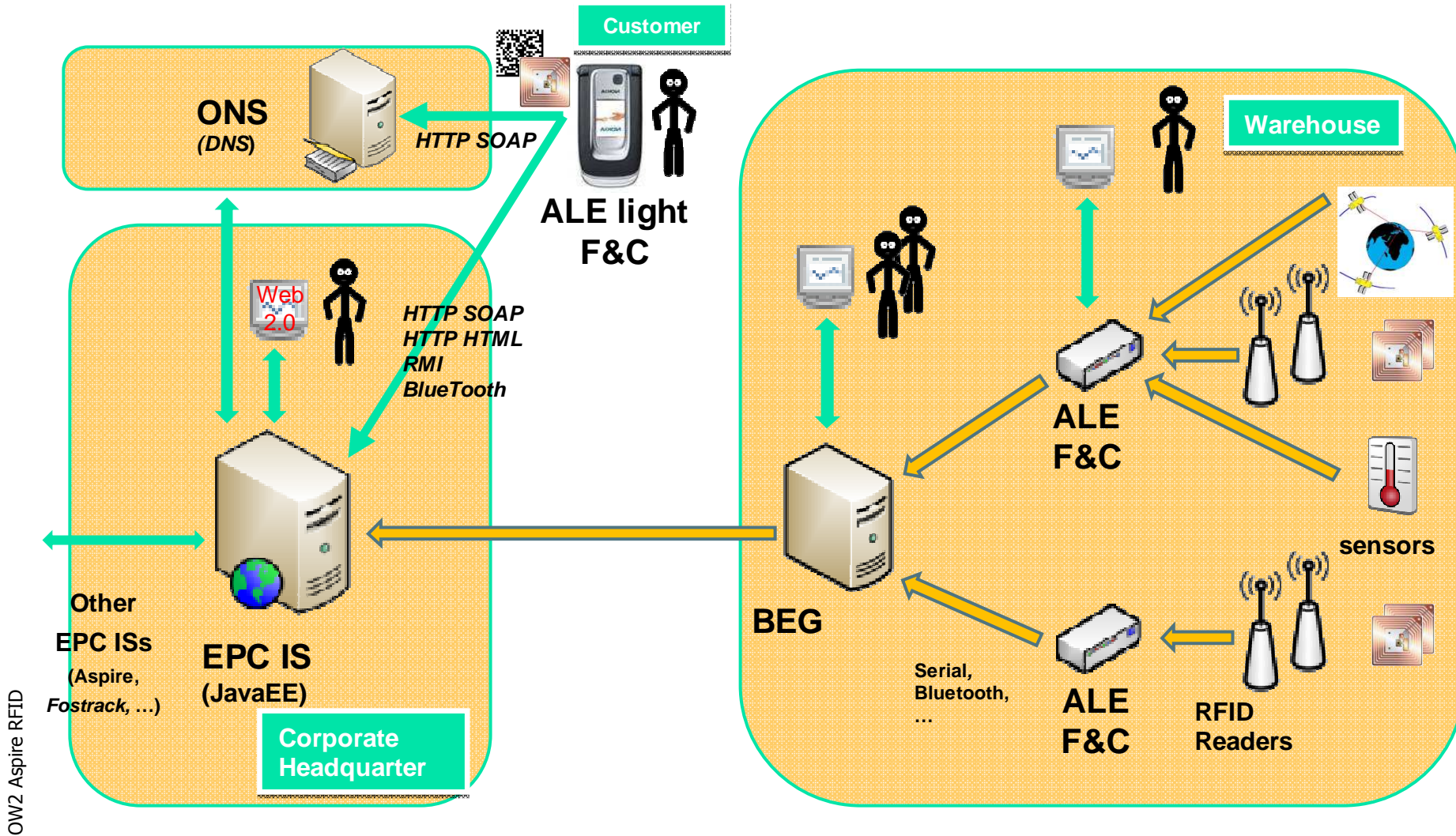


OW2 project

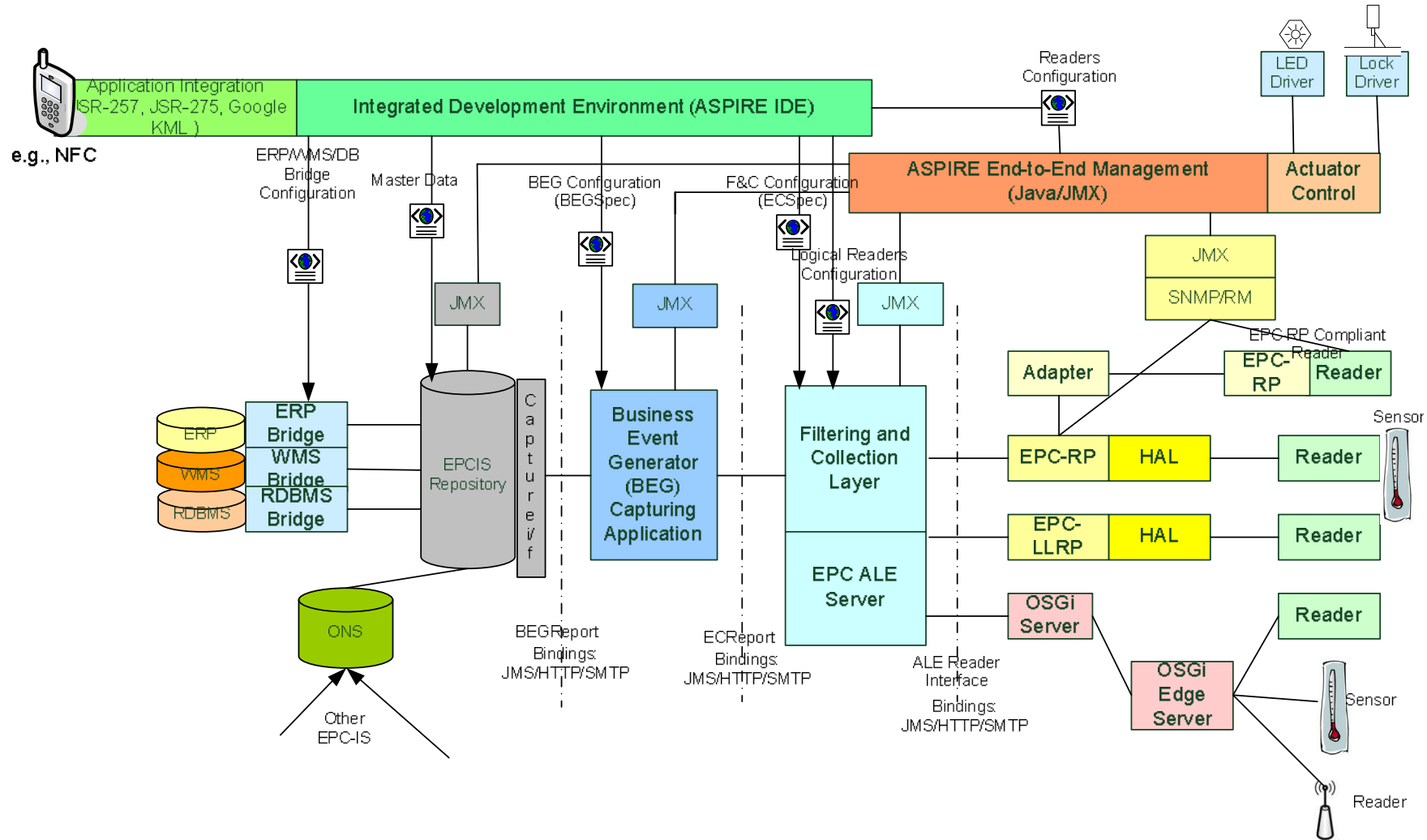
- Leaders: Nikos Kefalakis, John Soldatos & Didier Donsez
- Targets non-trivial RFID-based applications
- FOSS SW
 - RFID/Sensor Middleware
 - RFID/Sensor Apps Tools 
 - RFID/Sensor Applications samples
- Compliances
 - with standards (*EPCGlobal, NFCForum, ...*)
 - with legacies (*1D/2D barecods, ...*) and proprietary (*iButtons, ...*)
- Extensions
 - Sensors (temp., shock occur., geoloc, video streams, ...) and BAT (Zigbee, 6LoWPAN, 433Mhz, ...)
 - Surveys and BEG
- Namespace: *org.ow2.aspirerfid*
- Licence: LGPL v2.1 and CC by-sa



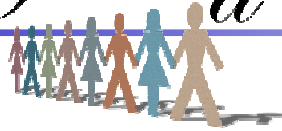
Architecture 30000 ft view



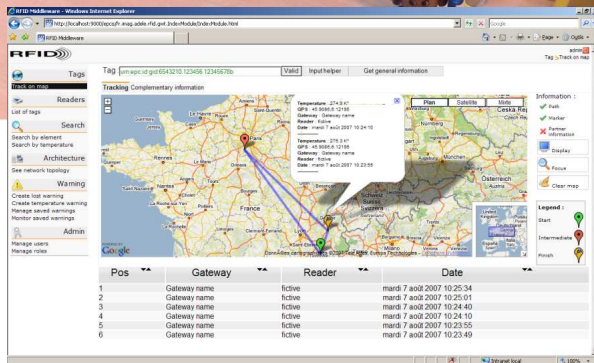
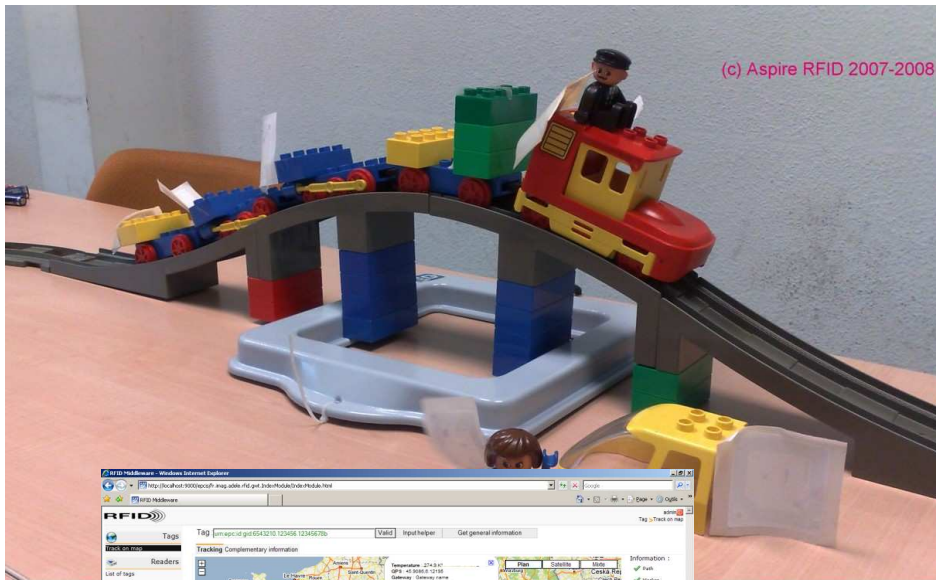
Detailed Architecture



Demos @ SOSSa 2010 Village



- In-vitro Supply chain demo
 - i.e. EPC Global' vision of RFID

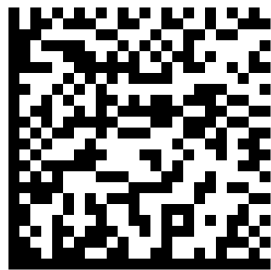


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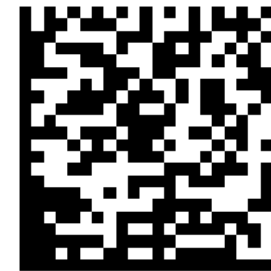
- Customer info @ POS, @Fair, @Museum, @Park ...
- Patient @ Home, Elder @ Home
- Professionals : Inventory, Maintenance, Picking ...
 - i.e. NFC Forum' vision of RFID



Q&R



<http://wiki.aspire.ow2.org>



<http://www.fp7-aspire.eu/>

