ASPIRE and AspireRfid

Athens Information Technology

Agenda

- The FP7 ASPIRE project
- The Open-source AspireRfid project

The FP7 Project ASPIRE
(contract No. 215417)

Athens Information Technology

Motivation

- RFID can contribute to increased efficiency in trade, logistics and industry
  - Pilots have demonstrated tangible ROI
  - Innovative SMEs can leverage RFID to produce new products and services

Root Cause Problems (1)

- High Total Cost of Ownership, prohibitive for SME's
- Lack of business cases beyond conventional Supply Chain of Management
- Uncertainty, lack of awareness about RFID technologies, solutions and business benefits.

Root Cause Problems (2)

- European SMEs do not have sufficient equity capital to invest in RFID
- RFID incurs a significant TCO, comprising hardware, software, integration, consulting and training costs
- SMEs do not have the resources and expertise to research the optimal blending of RFID into their processes

Project Overview and Goals

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

- **Royalty Free Middleware**
- **Lower effort for developing and managing applications**

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

ASPIRE

Develops and will deliver a lightweight, royalty-free, programmable, privacy -friendly, standards-compliant, scalable, integrated and intelligent

middleware platform and related tools

Validate the above developments in RFID trials

Project Fact Sheet (1)

- Consortium
  - Aalborg University – CtiF, Denmark
  - INRIA (ObjectWeb, POPS), France
  - Université Joseph Fourier – Grenoble University – LIG Laboratory, France
  - 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

Project Fact Sheet (2)

- Timeframe: 01/01/2008 –31/12/2010
- Budget: 6.7M€
- EC Contribution: 4.4M€
- Web Site: www.fp7-aspire.eu

Technical Approach (1)

- User Requirements
  - Emphasis on SMEs
  - RFID Information Days (France, Greece, Denmark, UK, Portugal)
  - Identification of Trials
- Specification
  - ASPIRE Architecture
  - Middleware Specifications
  - Programmability Specification

Technical Approach (2)

- Create core middleware infrastructure
  - Leverage EPC Architecture Framework and Modules (EPC-ALE, EPC-RP, EPC-IS)
  - Reuse from background projects (UJF RFID Suite, Accada)
  - Augment EPC Architecture (JMX end-to-end Management, Sensor Data, Actuator Control, Business Event Generation (BEG))
  - BEG == Added-value EPC Capturing Applications
  - Edge Server Implementation – OSGi Gateway

Technical Approach (3)

- Implement Programmability Functionality
  - ASPIRE IDE Concept (Eclipse Plugin)
  - Business Users – RFID BPM
  - Exploit underlying RFID Infrastructure

Technical Approach (4)

- Trials
  - At least two (France, Greece)
  - Liaison with more trials in Europe (in the scope of FP7 PSP Projects (Farm-to-Fork, RFID-ROI-SME)

Technical Approach (5)

- Middleware Testing:
  - In trials and demonstrations
  - Using the ASPIRE OW2.org Middleware
  - Using the ASPIRE low-cost hardware as well (MELEXIS IC – Low Cost Reader)

ASPIRE and Privacy

- ASPIRE pays emphasis in RFID privacy issues through
  - OSS based Transparency
    - Open code is visible by everyone
  - Specification of privacy-friendly algorithms and techniques, and auditing and certification programmes
  - Incorporation of these privacy friendly practices and audits within the ASPIRE OSS middleware

Participating in ASPIRE (1)

- End-Users (notably SMEs) can
  - Fill-in the on-line survey (5 min)
  - Participate in the RFID Information Days (1 day)
  - Download and test/use the ASPIRE RFID middleware
- RFID Solution Providers
  - Use the whole or part of AspireRfid developments in building/integrating RFID solutions
  - Contribute to AspireRfid

Participating in ASPIRE (2)

- RFID hardware and/or ERP/WMS vendors
  - Pursue optimized integration of ASPIRE middleware with their products

The AspireRfid OSS Project

(http://wiki.aspire.ow2.org/)

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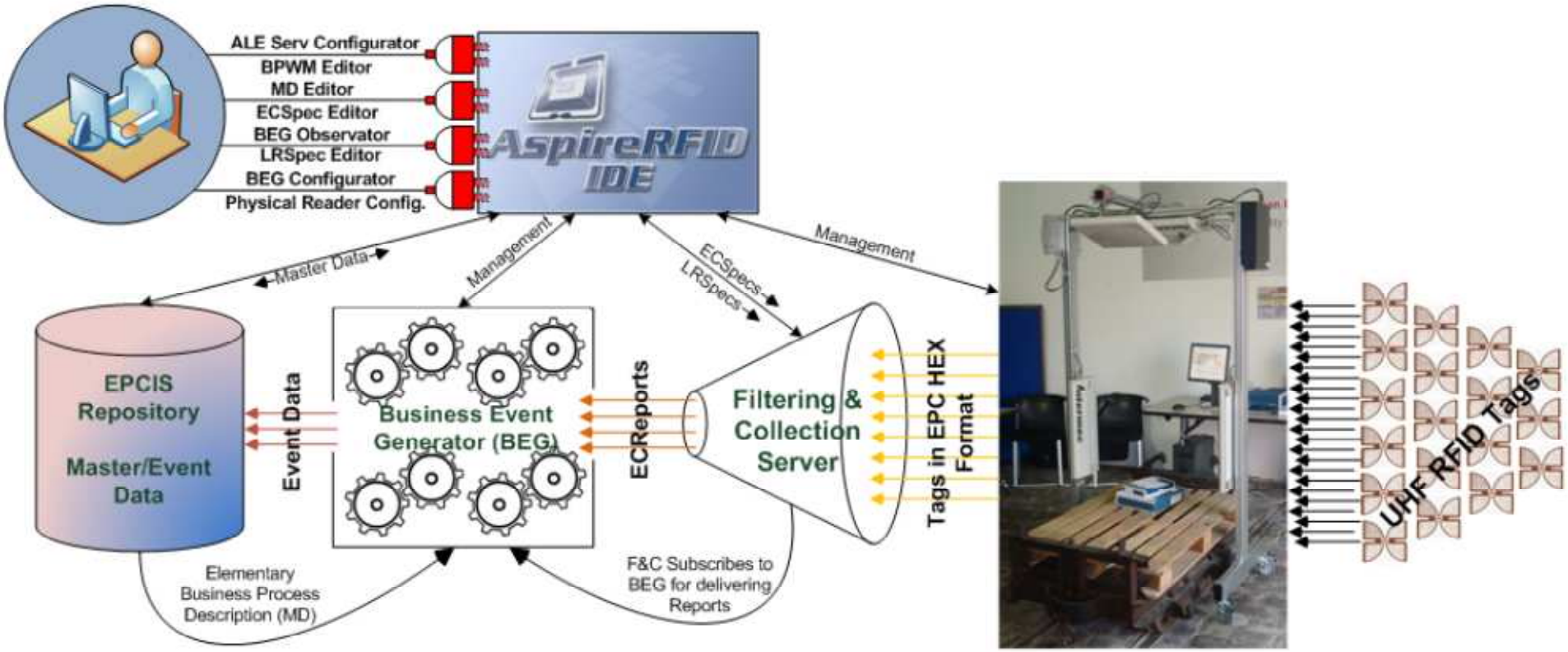
AspireRfid

- Middleware
- Open-source software
  - Distributed under LGPL v2 terms
- Includes partial implementations of several EPCglobal standards
- Designed to be lightweight, scalable
- Programmable
- Privacy friendly

AspireRfid Architecture



AspireRfid: A new OSS RFID Middleware Project (1)

- An OSS Project within OW2.org
  - Approved by OW2 Technical Committee (April 08)
  - Project Name: AspireRfid
- Leverage background work of the partners, as well as other projects
  - UJF RFID Suite
  - AIT Eclipse Based Tools
  - Other OSS projects: Accada/FossTrack

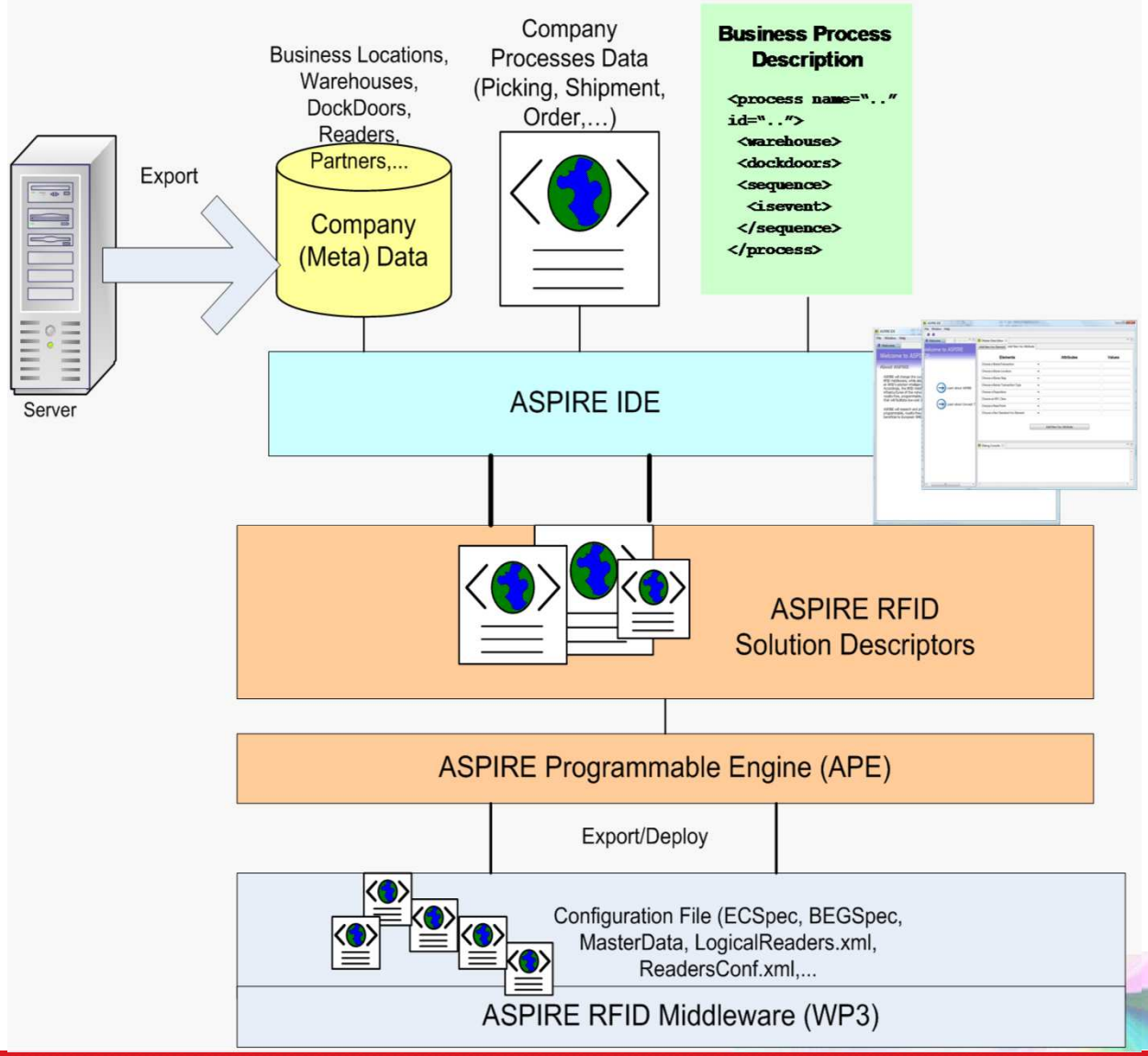
AspireRfid: A new OSS RFID Middleware Project (2)

- http://wiki.aspire.ow2.org/ (Wiki)
  - Documentation for End-users and Developers
  - Demonstrations
- http://forge.objectweb.org/projects/aspire/ (Forge)
  - Source code access
- Longer Term Vision
  - AspireRfid to become synonymous to royalty-free RFID Middleware

Licensing

- License used by AspireRfid sources is the LGPL v2.1
- License used by AspireRfid documentation is the Creative Commons Share Alike (by-sa)

ASPIRE IDE Concept (1)



ASPIRE IDE Concept (2)

Company Data

Warehouses

DockDoors

Readers

. . .

Legacy Systems

Business Process Description

```
<process name="..."
id="...">
 <warehouse>
 <dockdoors>
 <sequence>
  <isevent>
 </sequence>
</process>
```

Privacy constraints?

1. Compile
2. Package
3. Deploy

Solution in ASPIRE Language

ASPIRE RFID Solution Description

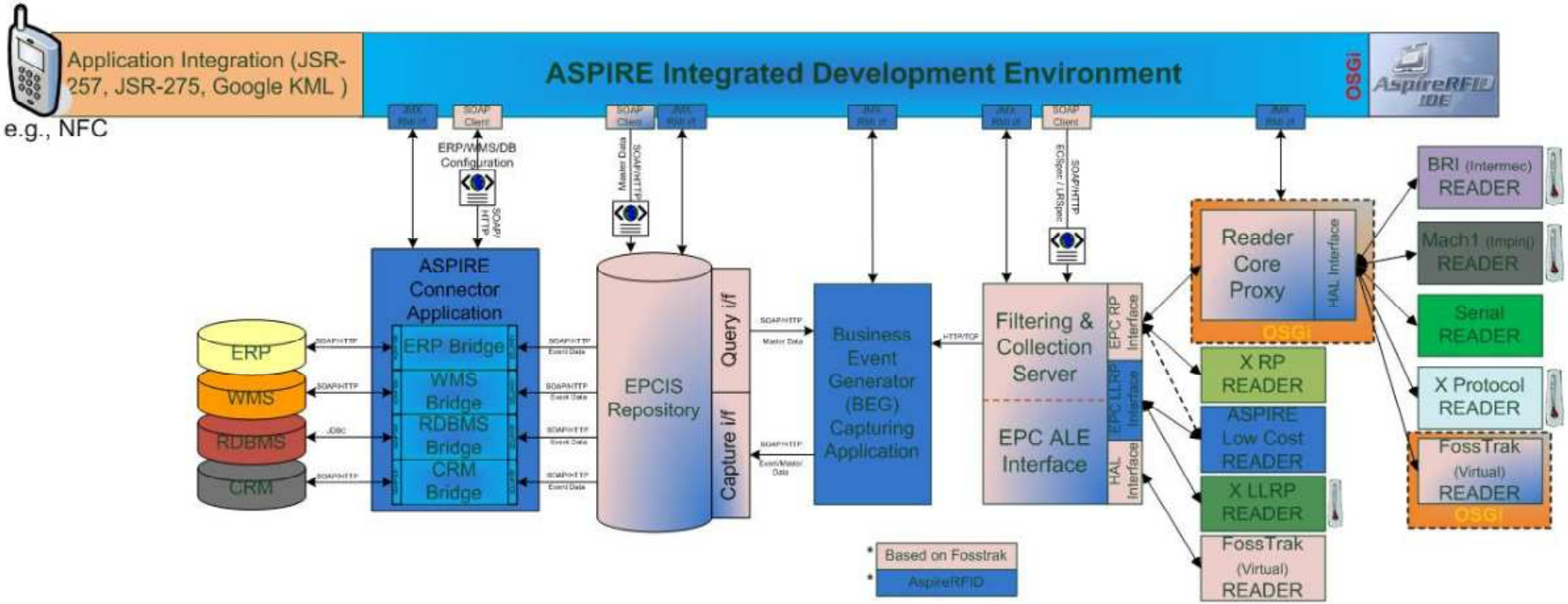
Generate Specs

ECSpecs / BEGSpecs / etc.

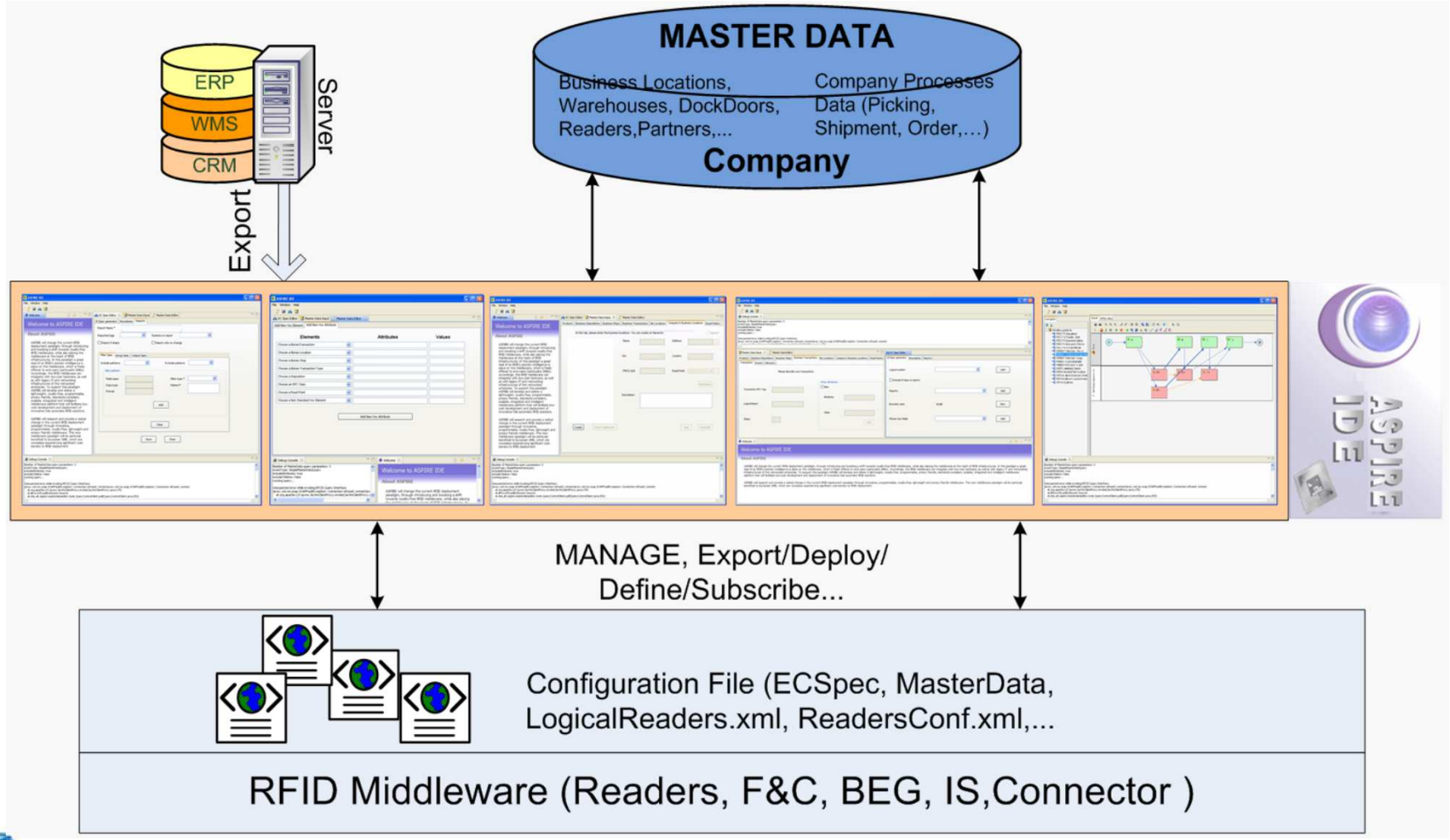
Deploy

ASPIRE Core Middleware Suite

Core ASPIRE Middleware Architecture



Roadmap: Programmability



AspireRfid: Related Standards and Technical Software (1)

- Standards
  - EPCglobal Standards
  - OSGi
  - NFC Forum

AspireRfid: Related Standards and Technical Software (2)

- Related Technical Components and Technologies
  - Java/JavaEE and several JSR specifications
  - Tomcat
  - Felix (OSGi container)
  - Eclipse
  - JBoss/ JonAS
  - XPDL

Conclusions (1)

- AspireRfid is an innovative project on RFID middleware
- AspireRfid will actively pursue liaison with OW2 Community
- Community Developers needed for AspireRfid evolution
  - OW2 can jointly work with ASPIRE on the development of an AspireRfid community

Conclusions (2)

- We also need End-Users (notably SMEs) to
  - Download and test/use the AspireRfid middleware
- RFID hardware and/or ERP/WMS vendors
  - Could Pursue optimized integration of AspireRfid middleware with their products