OSGi Alliance Community Event

SOA Enablement of Embedded Systems Using OSGi and Distributed Services

Roman.Roelofsen@iona.com
IONA Technologies

Experience Report, 26/06/07, 2:00 PM

Agenda

- Embedded systems and future networks
- 2 example scenarios and their problems
- How do we solve these
- Demo
- Where we are

- 5 minutes for questions

Embedded Systems and Future Networks

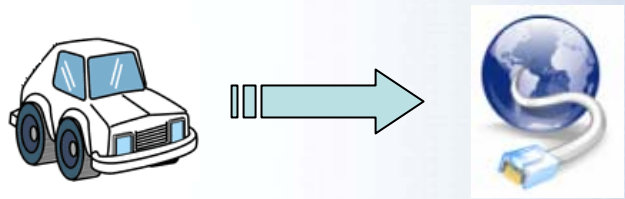
- **Embedded systems will continue to spread in end user's environments**
- **The tasks of embedded systems will increasingly require communication among each other**
- **Public Wi-Fi hot-spots, UMTS, etc. will clear the way for new kinds of applications**
- **But these environments will make the future tasks of embedded systems unpredictable**

- **Field of study: Automotive Industry**
  - **Two example scenarios**

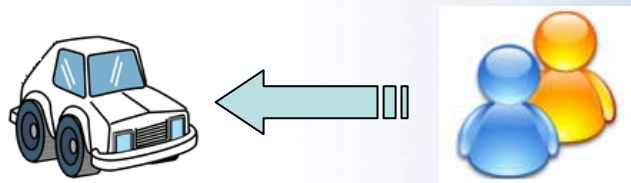
Example 1/2: Car Tracking Service

- **Install a service in the vehicle (PUSH)**
- **Expose GPS data**
  - **Web Service, SOAP**
  - **JMS**
- **Consume data**
  - **Language independent**
  - **Standardized format**
- **No Hub-and-Spoke architecture necessary!**

What we have

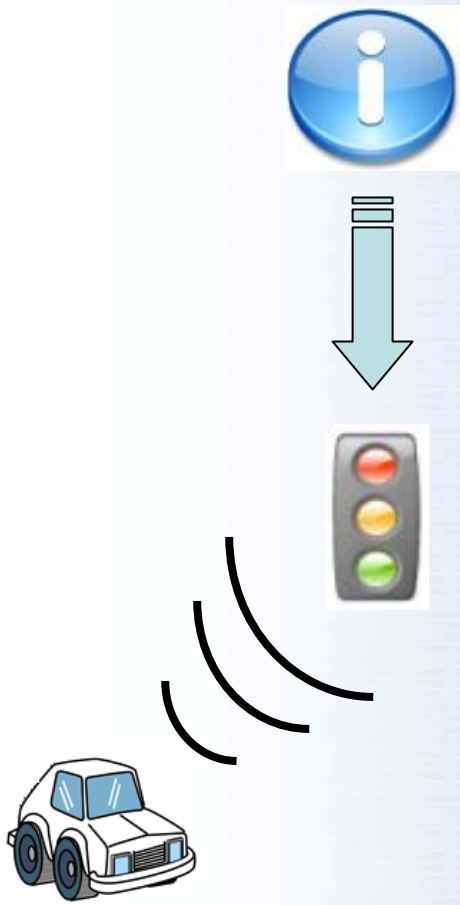


What we want



Example 2/2: Advertising Service

- Present advertisement to the driver
  - E.g. at traffic light
- Install a client to access the advertisement and to display it
- Each area can use a different technology
  - No standardisation necessary



Problem 1/2: Lifecycle Management

- How do we install a service from the outside?
- Which data can a service access?

- We don't know the offered services in advance
- Once we know, we can't assume their availability in the future

Problem 2/2: Communication

- We need independent transport technologies …
- To enable unobstructed communication …
- Between highly independent parties

- Service Discovery

- Maybe several vehicles are involved in responding to a request

How to Solve These Problems?

- You know how to solve the lifecycle problem … OSGi
- Communication problem … ?
  - Can we use WS-*, JMS, … ?
- Restricted deployment targets
  - Processor: ARM, PowerPC, x86
  - JavaME CDC, JavaSE 1.4, JavaSE 5 Embedded
  - Lesser memory

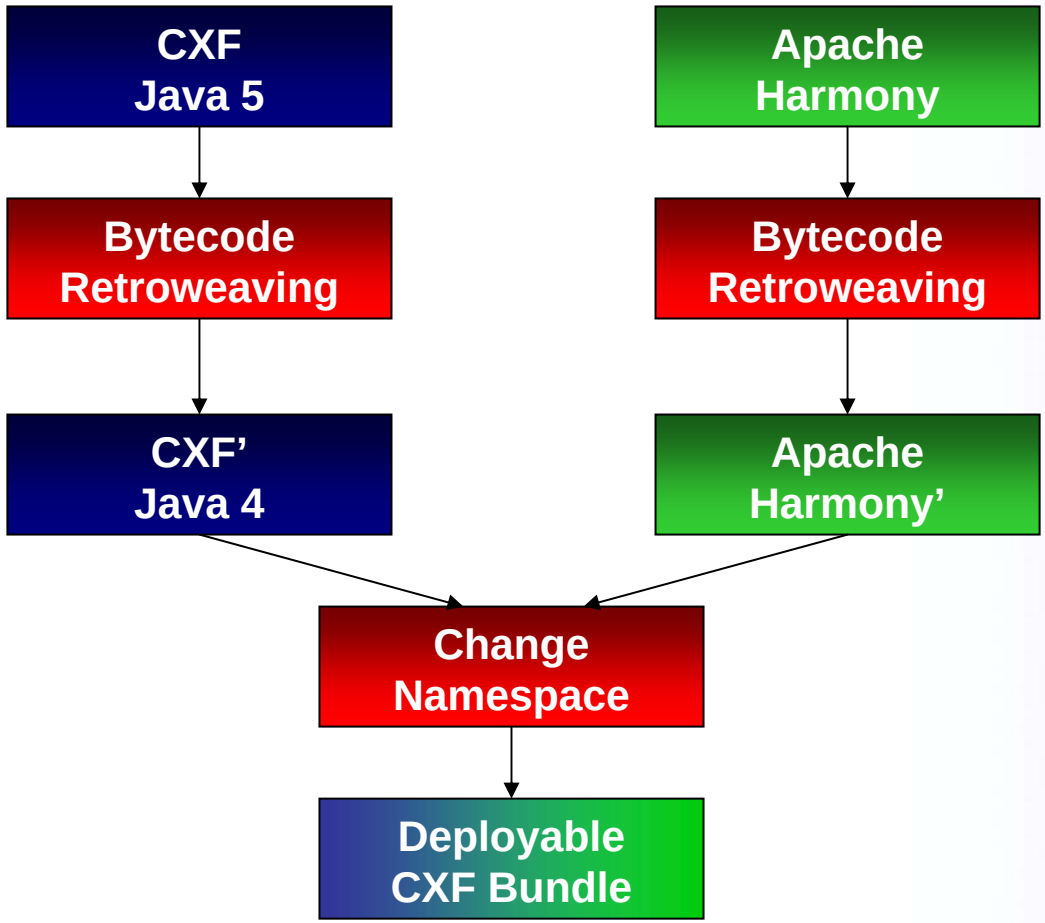
Using an ESB in Embedded Systems

- **Apache CXF**
  - **Fulfils the requirements**
  - **Open Source, active community**
  - **A lot of in-house experience**
- **But**
  - **High memory demands**
  - **Completely based on JavaSE 5**

Adjustment Apache CXF 1/2

- **Using OSGi for the bus extension mechanism**
  - **Register the “CXF bus” as a service**
  - **New bundles can add their extensions to the bus using this service**
- **User of CXF can bring their own extensions**
  - **Keep the core small**

Adjustment Apache CXF 2/2



Summary

- Work in progress
- We are already able to deploy on Java 1.4
- WORA?
  - More like WOTA: Sun's RI, phoneME, J9, …
- First, simple attempt to reduce the memory
  - Reduced by 64%
  - ~ 5 MB needed
- Almost done:
  Use your JAX-WS annotated classes in a CDC VM

Thank You!

Questions?