SOCRADES
Service-Oriented Cross-layer infRAstructure for Distributed smart Embedded devices

Unprecedented constellation of all major European ICT players of the industrial value-chain

3-years Project (01.09.2006-31.08.2009)
Efforts: 1100 PM
Total Budget: 13.746.808 [Euro]

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SOCRADES
Service-Oriented Cross-layer infrastructure for Distributed smart Embedded devices

Industrial Automation applications

Requiring:

- Web-Service technology providing “agent-based collaboration” capabilities from the shop floor to the upper levels of an enterprise
- Real time / runtime autonomous and collaborative decision-making capabilities
- Services embedded in low cost smart devices
- Structural and functional plug & play capability of services in cross-layer infrastructures allowing: (re)-configuration, diagnosis, data acquisition, dynamic (re)-scheduling, etc.
- Wired and wireless IP communication

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Scenario

- A HL-PN-Orchestration Approach applied to a Virtual SOA-based Electronics Assembly Scenario:
  Covering more than one phase of the Life-Cycle of the system - from Engineering to Real-time Event-based Distributed Control

- DPWS-based integration and engineering of virtual services
- Modular design and control following the “Russian doll” approach
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A test rig provided by FORD, now implementing a fully Web Services distributed control

**Before:**
Standard (SE Unity) PLC system with remote IO

**Now:**
Fully distributed, plug and play, linked to SAP, ARC SCADA, and engineering tools, flexible and easily reconfigurable

The test rig control architecture, linked to SAP, Loughborough and ARC SCADA applications
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Web Services Based Shop Floor Integration

Scenario
Coupling ERP systems with shop floor devices
- DPWS-based integration
- High level composite services
- Enterprise control via web services
- Business process monitoring
- Cross-layer alerts
- Enterprise visualization
- Automatic workflow for alert resolution
- Timely information dissemination and visibility
- Better customer relationship management

Architecture

Devices
Gripper offers services:
- getInfo, start, stop, failure
SunSPOT offers services:
- Temperature, Battery status...

Middleware
SAP xMII
Collects data from devices and provides it to higher level applications.
Enables the modelling of business rules at run time.
Offers a mid-level business view on the services provided by shop-floor devices.

Dashboard
Offers a high-level monitoring of the data provided by shop-floor services.
Reacts to the triggering of business rules modelled in SAP xMII.

Demonstration

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