



Pilot Overview

Review September 2011

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ARTEMIS Call 2009 – SP6100204



Overview - prototypical demonstrations

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- SPD levels are achieved through specific configurations by the overlay
- Composability Middleware prototype
- Monitoring trains with WSNs
- FPGA Power Node Prototype
- Cognitive Radio Node Prototype

Also prototypes for

- pSHIELD semantic model prototype (ontology)
- Policy-based management and hybrid-automata model

we will see them all in the demo room

ARTEMIS Call 2009 Project

p.S.H.I.E.L.D.

pilot embedded Systems archItecturE for multi-Layer Dependable solutions

EXECUTIVE summary
To help safeguard society, pSHIELD will guarantee the privacy and security of embedded systems by making these 'built-in' features of future designs.

RELEVANCE CALL 2008 objectives
The SHIELD consortium proposes a compact R&D, or pilot, project (pSHIELD) to address the core concepts of SHIELD. The pilot is intended to be a pioneer investigation enhanced with R&D activities that will be proposed in the future ARTEMIS Calls.

MARKET innovation
The project will have a great impact on the market of the ES. By addressing the reusability of already designed solutions, the interoperability of architectures, technologies and the standardised SPD certifiability, it is possible to estimate an overall 30% cost reduction for a full SHIELD compliant design methodology. The composability of the SHIELD architectural framework will have great impact on the system design costs and time to market of new SPD solutions in ES. The integrated use of SPD metrics will have impact on the development because the qualification, (re-)certification and (re-)validation process of a SHIELD framework instance will be faster, easier and widely accepted.

TECHNICAL innovation
pSHIELD will approach SPD at 4 different levels: node, network, middleware and overlay. For each level, the state of the art in SPD of single technologies and solutions will be improved and integrated (hardware and communication technologies, cryptography, middleware, smart SPD applications, etc.). The SPD technologies will be enhanced with composable functionality to incorporate the pSHIELD architectural framework.
The pSHIELD project will be focused on:
> Demonstrate composability
> New technologies
> Modularity and expandability
> Innovative, modular, composable, expandable and highly dependable architectural framework
> Metrics
> Validation of the SHIELD integrated system in one application scenario.

PROJECT COORDINATOR	START
Antonio Di Marco	June 2010
INSTITUTION	DURATION
SESM - FINMECCANICA	12 months
KWAL	TOTAL INVESTMENT
adimarco@sesm.it	5,4 ME
WEBSITE	PARTICIPATING ORGANISATIONS
www.pshield.eu	18
	NUMBER OF COUNTRIES
	6

Advanced Research & Technology for Embedded Intelligence and Systems

Pilot: Semantic Overlay and Composability

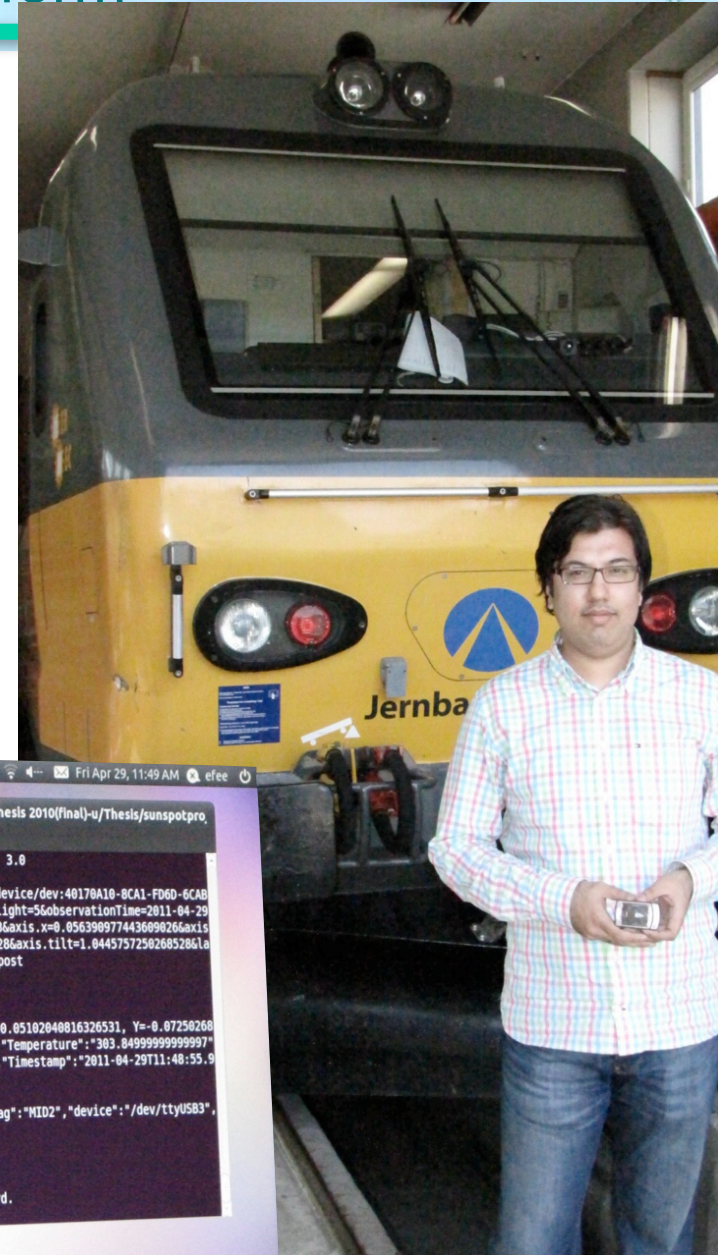
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- SPD levels are achieved through specific configurations by the overlay
 - demonstrating the behaviour of the pSHIELD middleware
 - demonstrating SPD-driven composability
 - using metrics-formulation from WP2



Pilot: Nano-Micro-Personal-M2M platform

- Nano-Micro-Personal-M2M Platform
 - security interworking between embedded sensors and Telecom service platform
 - Identify SPD functions in an integrated embedded sensor testbed
 - opens for SPD metrics based composability



```

efee@efee-desktop: ~/YenPham-Master-Thesis 2010(final)-u/Thesis/sunspotpro
File Edit View Search Terminal Help
[java] token = 1.0445757250268528. Tilt: 3.0
[java]
[java] Base URL is:https://api.m2m.to/v2/device/dev:40170A10-8CA1-FD6D-6CAB
-AB647016D88B/?temperature=302.84999999999997&light=56&observationTime=2011-04-29
T11%3A48%3A55.589&custom_id=0014.4F01.0000.52C3&axis.x=0.056390977443609026&axis
.y=-0.07787325456498396&axis.z=1.0445757250268528&axis.tilt=1.0445757250268528&a
titude=0.06&longitude=0.06&altitude=0.06 method=post
[java] HttpURLConnection is established.
[java] Setting properties...
[java] Ready to send...
[java] Spot data is: {"Accelerometer":{"X=0.05102040816326531, Y=-0.07250268
528464017, Z=1.0553168635875403, Tilt: 3.0, "Temperature": "303.84999999999997",
"Light": "6", "SensorID": "0014.4F01.0000.52C3", "Timestamp": "2011-04-29T11:48:55.9
75"}
[java] Length:470
[java] The GPS data is:{"class":"TPV", "tag":"MID2", "device":"/dev/ttyUSB3",
"time":1304070535.110, "ept":0.005, "mode":1}
[java] Sent to Shepherd!
[java] status code : 200
[java] Response: OK = 200
[java] Closed all connections to Shepherd.
  
```

Pilot: Monitoring trains with WSNs

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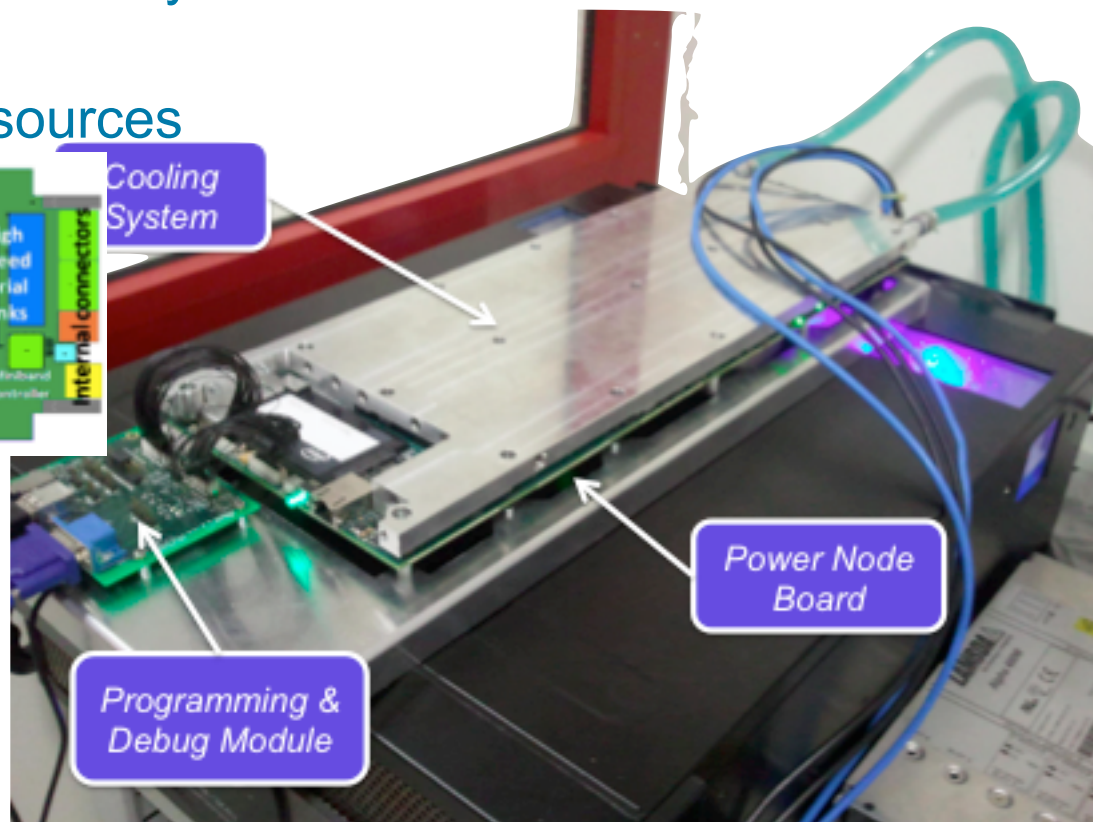
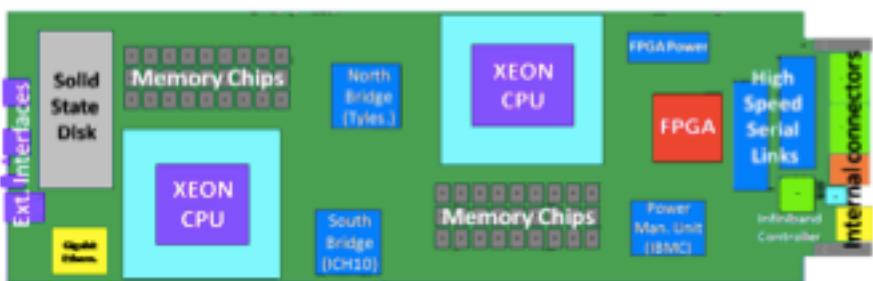
- Monitoring trains with WSNs
 - identity requirements of real-world applications
 - Identify SPD functions in an integrated embedded sensor testbed
 - opens for SPD metrics based composability



Pilot: FPGA Power Node Prototype

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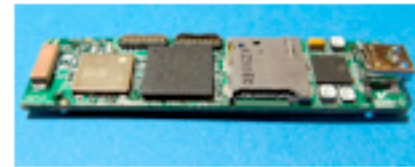
- FPGA Power Node Prototype
 - modular system reconfiguration
 - self-dependability at node layer
 - hardware and software security and privacy service provider
 - management of power sources



Pilot: Cognitive Radio Node Prototype

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- Cognitive Radio Node Prototype
 - reconfigurable radio components with waveform Tx parameters
 - Sensing mechanisms to acquire awareness about resources
 - Cognitive algorithms elaborating available resources
 - Embedded platform adaptation for validation of algorithms



*PCB OMBRA-pSHIELD – OMAP uP
(18x68 mm)
WCP (1K pieces) =~150 Euro
Computational Power 5X*

Life pilots

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**let us walk to
the demo room
and get something to
eat**