ARTEMIS JOINT UNDERTAKING

The public private partnership for R&D in the field of Artemis

ARTEMIS

SHIELD

PILOT

Periodic Management Report

Oslo, 30 September 2011

ARTEMIS Call 2009 – SP6100204

SESM A Finmeccanica Company

Thyia Technologies

SAPIENZA Università di Roma

Hellenic Aerospace Industry

EuroTecH

MOVATION

ELSAG DATAMAT A Finmeccanica Company

Critical software

DIBE

SELEX Communications A Finmeccanica Company

I.S.I. Industrial Systems Institute

MONDRAGON UNIBERTSITATEA

ESI European Software Institute tecnalia

AnsaldoSTS A Finmeccanica Company

ISD S.A. Integrated Systems Development

CWI

Tecnologie nelle Reti e nei Sistemi T.R.S. SpA

Periodic Management Report

- January 1st 2011 – June 30th 2011

- Report of objectives vs. achieved results

WP2 main results (1/2)

- Objectives:
  1. definition of the SPD requirements and specifications of each layer, as well as of the overall system on the basis of the application scenario;
  2. definition of proper SPD metrics to assess the achieved SPD level of each function, as well as of the overall system;
  3. definition of SHIELD system architecture. Identification of the SPD layers functionalities, their intra and inter layer interfaces and relationships.



- The results have been reported in D2.1.1., D2.2.1 and D2.3.1. D2.1.2, D2.2.2. and D2.3.2 are under finalisation.

WP2 main results (2/2)

- Clearly significant and tangible results are:
  - SPD Node, Network, Middleware and Overlay architecture requirements specification
  - High-level Requirements specification for the SPD metrics
  - Additional results:
    - Top-level requirements specification for the application scenario
    - High-level pSHIELD system requirements specification
    - High-level SPD requirements specification for Node, Network, Middleware and Overlay Functional Layer
    - High-level pSHIELD reference system architecture requirements specification

WP3 main results (1/2)

- Objectives:
  1. Select a representative set of SPD technologies at Node level;
  2. Develop appropriate composability mechanisms at such level;
  3. Deliver a SPD node prototype.

- The activities performed are on-going and preliminary results brought to D3.1 and draft version of D3.2 and D3.3.

WP3 main results (2/2)

- Clearly significant and tangible results are:
  - Power Node PCB Layout design completed.
  - Development and implementation of application: A-FSK Demodulator code.
  - Design and development of DAQ Adapter hardware board.
  - Design of a protection circuit for a power supply (AC)
  - Additional results:
    - SPD conceptual models are proposed for sensor node based on the IEEE 802.11, IEEE 802.15.4 standards
    - Design of a protection circuit for a power supply (DC)
    - Development of SW/HW framework based on Xilinx development board.
    - Implementation of pSHIELD Node Layer blocks in VHDL and C language code.
    - Implementation of pSHIELD Node Adapter blocks: pSHIELD Interface and SPD Node Status.
    - Implementation of pSHIELD Node Adapter block: Security and Privacy based on hardware data encryption/decryption.
    - Implementation of pSHIELD Node Adapter block: Dependability based reconfigurable application bit-stream.

WP4 main results (1/2)

- Objectives:
  1. Improve SPD technologies at Network level;
  2. Develop potential prototype to be integrated in a demonstrator

- The activities performed are reported in D4.1 SPD Network technologies prototype and D4.2 SPD network technologies prototype report (on-going).

WP4 main results (2/2)

- Clearly significant and tangible results are:
  - Realization and adaptation of HW and SW of multicore platform for the cognitive algorithm validation on embedded system
  - Implementation of a Cognitive Radio Node software
  - Additional results:
    - Proposed new technologies enabling smart SPD driven transmissions.
    - Performance analysis of various waveforms has been completed to select best candidates for the foreseen applications, both at the physical and MAC layer
    - Identification of spectrum sensing features for Cognitive Radio analysis
    - Adaptation of sensing part of the Cognitive Radio simulator for pSHIELD
    - Study of the different IDS approaches (misuse vs anomaly detection, and architecture) taking into account the requirements of sensor networks.
    - Study the real resource footprint of wireless communication protocols (energy consumption among them) and its impact on performance on some commercially available devices.
    - Study of anomaly detection systems.
    - Transmission parameters smart adaptation according to radio resources observation towards trusted and dependable connectivity implementation.

WP5 main results (1/2)

- Objectives:
  1. Define a common semantic to describe the SPD interfaces and functionalities;
  2. Introduce the Overlay concepts and functionalities;
  3. Develop a prototype to be integrated in the demonstrators.



- The activities performed are on-going and preliminary results brought to D5.1 pSHIELD Semantic model and D5.2 SPD middleware and overlay functionalities prototype.

WP5 main results (2/2)

- Clearly significant and tangible results are:
  - Prototypes of ontologies;
  - WP5 Middleware pilot;
  - Additional results:
    - Semantic models to enable the pSHIELD seamless approach definition of main services at middleware layer;
    - Experimental semantic engine for SPD composition;
    - Analysis of the OSGI Knoplerfish platform as technological candidate for pSHIELD
    - Service Oriented technology selection to address the seamless approach and interoperability requirements;
    - High level design of the pSHIELD Middleware Architecture;
    - High level design of a secure service discovery for pSHIELD Middleware;
    - Analysis of semantic based access system and suggestion for semantically supported attribute-based access system

WP6 main results

- Objectives:
  1. Integration of software components;
  2. Validation of implemented solution through an iterative and incremental process;
  3. Demonstration of the proposed architecture with pilot demonstrators.

- WP6 is at its initiating stage and practically out of the reporting period.
- No deliverables were requested for the reference period concerning the current report.
- The development of discrete demonstrational prototypes from several partners can be considered as the first step of WP6.

WP7 main results (1/2)

- Objectives:
  1. Industrial Dissemination,
  2. Industrial Exploitation of results.

- D7.1.1 it is an ongoing activity.
- Dissemination activities are currently collected on the pSHIELD wiki, and will be transferred from there to the public Web page and the D7.1.2 report
- D7.2.1 draft Exploitation plan has been circulated among the consortium members for feedback, suggestions and contributions.

WP7 main results (2/2)

- Clearly significant and tangible results are:
  - Industrial dissemination has establish an ecosystem for industrial applications of pSHIELD.
  - Excellent scientific dissemination: 6 PhD, 5 graduated, 8 conference papers and 2 journal papers.
  - We currently favour another phase of developments together with the telecom and power industry in order to develop closer to actual industrial needs.

Project Management

- **Project meetings**
  - 23 within the reporting period.

- **Web tools are used to store and share information and documentation**:
  - http://bscw.juartemis-pshield.eu
  - http://pshield.unik.no
  - http://www.pshield.eu

- **Project planning and status**
  - The project is now on track
  - 7 out of 7 deliverables released

Measures on how pSHIELD has reached the scope

- According to the Quality Control Guidelines, the evaluation shows that pSHIELD has received good results.
- The scope has been sufficiently outlined in the majority of areas
  - Performed R&D approaches received results in line with state of the art
  - Prototypical development demonstrates key features
  - The map of the business ecosystem contains identification of playmakers that have been contacted
  - Key players have been identified and contacted
  - Dissemination has been performed
- Few areas are identified for improvement
  - Architecture and APIs for networking weren't specified at an early stage
  - Dissemination through public documents
- Only 2 areas have not sufficiently outlined the achievements
  - The map of the business ecosystem is not established yet
  - Feedback from the scientific dissemination is not documented

PM status table per WP (M8-M13)

Work package 1:	Actual WP total	**20,38**
Management	Planned WP total	**26,78**
Work package 2:	Actual WP total	**40,60**
SPD Metrics, requirements and system design	Planned WP total	**42,60**
Work package 3:	Actual WP total	**69,20**
SPD Node	Planned WP total	**82,50**
Work package 4:	Actual WP total	**28,50**
SPD Network	Planned WP total	**23,00**
Work package 5:	Actual WP total	**55,89**
SPD Middleware & overlay	Planned WP total	**71,19**
Work package 6:	Actual WP total	**46,98**
Platform integration, validation & demonstration	Planned WP total	**66,00**
Work package 7:	Actual WP total	**10,45**
Support activities	Planned WP total	**9,80**
	Actual total	**272,00**

85% of planned PM

PM status table per Partner (M8-M13)

	SESM	ASTS	ED	ETH	SCOM	TRS	UNIGE	UNIROMA1	AS	TECNALIA	MGEP	ATHENA	HAI	CWIN	MAS	THYIA	CS
Actual	23,00	32,75	40,50	48,50	12,80	5,75	7,00	12,80	9,00	2,60	3,53	4,00	3,00	9,00	3,50	38,07	16,20
Planned	36,00	52,00	47,50	60,00	11,30	5,75	3,00	24,00	7,50	2,60	2,38	4,00	3,00	9,50	1,50	27,84	24,00
%	**64%**	**63%**	**85%**	**81%**	**113%**	**100%**	**233%**	**53%**	**120%**	**100%**	**148%**	**100%**	**100%**	**95%**	**233%**	**137%**	**68%**