



WP2 – SPD metrics, requirements and system design

pSHIELD Final Review Meeting Brussels, 14 February 2012

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- Overall summary for WP2
- WP2 achievements and tangible results
- Task 2.1: Multi-technology requirements & specification
- Task 2.2: Multi-technology SPD metrics
- Task 2.3: Multi-technology architectural design
- Conclusions



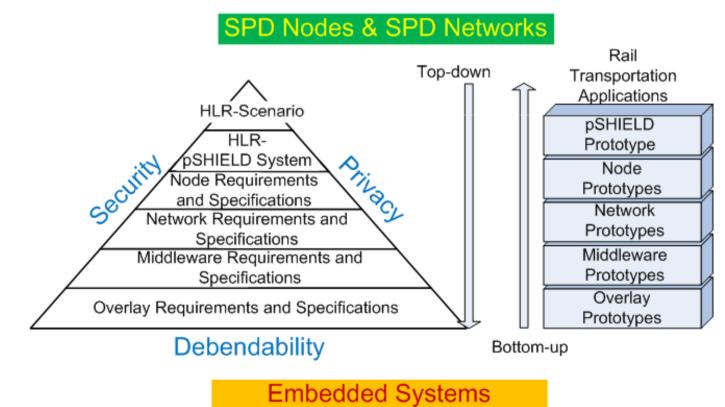


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HIELD

• Targeted objectives for D2.1.2 are achieved 100%

As major objective in these task: The definition of the SPD requirements and specifications of each layer, as well as of the overall system on the basis of the application scenario

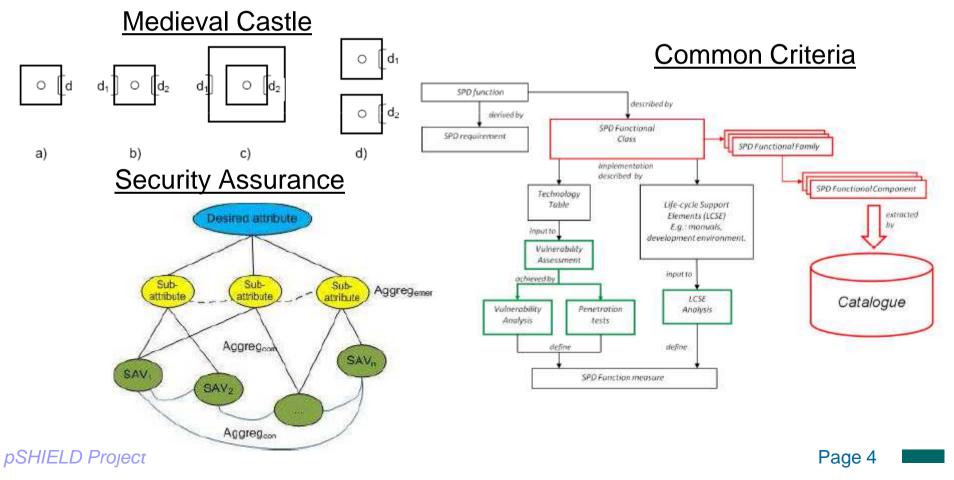




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•Targeted objective for D2.2.2 are achieved 100%.

As major objective in these task: The definition of proper SPD metrics to assess the achieved SPD level of each layer (node, network, middleware and overlay), as well as of the overall system, SPD composition/decomposition





SPD metrics

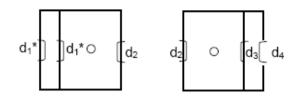


Figure 24

where:

d1* = SPD measure of sensor anti-tampering strength in a redundant configuration

d₂ = SPD measure of cipher strength

d3 = SPD measure of access control strength

d₄ = SPD measure of identification and authentication strength

The correspondent system tree representation of the application scenario is:

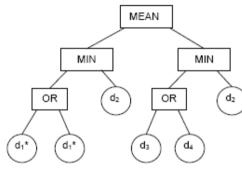


Figure 25

The mathematical expression for the SPD measure of this application scenario system can be defined as follows:

$$d_{TOT} = MEAN(MIN(OR_2(d_1^*), d_2^*)MIN(OR(d_3, d_4^*), d_2^*)) * d_{LC}$$

where d_{LC} = SPD measure of life-cycle documentation

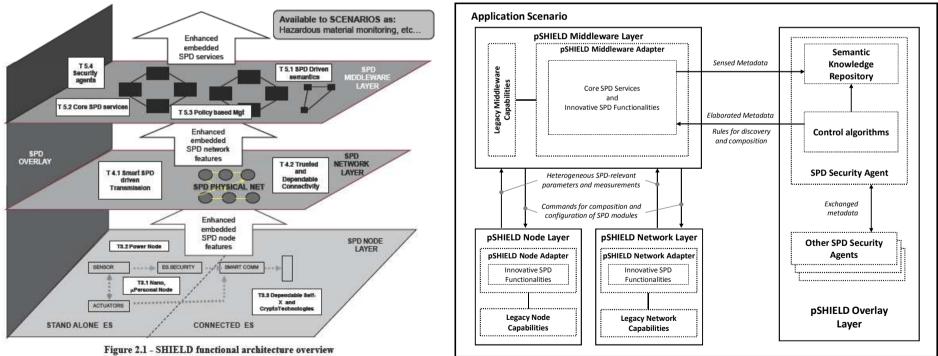


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Targeted objectives for D2.3.2 are achieved 100%.

As major objective in these task:

The definition of pSHIELD reference system architecture, definition of the SPD layers functionalities, design constrains for SPD devices, SPD networks, SPD core services, their intra and inter layer interfaces and relationships



pSHIELD functional component architecture

pSHIELD Project

pSHIELD Overlay COMMUNICATION pSHIELD Network Laver ENERGY INTRUSION MIDDLEWARE THREAT / ATTACK pSHIELD Network Adapter NETWORK OVERLAY Innovative SPD **Functionalities** NODE Legacy Network **Application Scenario** Capabilities pSHIELD Middleware Laver pSHIELD Middleware Adapter Semantic Sensed Metadata Knowledge **pSHIELD** Network Legacy Middlewar Capabilities Repository Core SPD Services Layer: Adapter and and Innovative SPD Functionalities Flaborated Metadata Legacy Rules for discovery **Control algorithms** and composition bdd pSHIELD SPD Node NC pS NC «block» SPD Security Agent Heterogeneous SPD-relevant ò--0 pSHIELD SPD Node parameters and measurements «block» «blocks SPD Node Status pSHIELD Interface Exchanged Commands for composition and metadata configuration of SPD modules «block» Dependability pSHIELD Node Laver pSHIELD Network Laver n 1 «block» pSHIELD Node «block» **Other SPD Security** Legacy Node Capabilities Adapter Agents pSHIELD Node Adapter pSHIELD Network Adapter «block» 0.1 Security and Privacy Innovative SPD Innovative SPD Functionalities Functionalities 1.4 0... «block» «block» «block» «block» Node pSHIELD Node Legacy Device pSHIELD Overlay Power Managemer Reconfiguration «provide SPD Specific Component Component Legacy Node Legacy Network Layer Capabilities Capabilities Formal conceptual model of pSHIELD SPD Node Layer. pSHIELD Middleware layer

pSHIELD Project



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- The WP2 main results and achievements are:
 - the pSHIELD system for rail transportation scenario is well defined,
 - one SPD metric method and two composition approachs are proposed for the pSHIELD system,
 - a demonstrable overall functional and pSHIELD system architecture is designed for different application scenarios.
- Based on the WP2 pSHILED framework
 - □ A limited set of SPD metrics are demonstrated
 - Composability of networked "SPD nodes" is achieved with limited SPD functionalities
 - Prof of the concept for Middleware and Overlay/Corss-layer SPD functionalities as well as management capabilities are encouraging that the overall pSHIELD system is achievable and it is based on the pSHIELD objectives, requirements and specifications