

Annual review ROME 2012



WP2 – SPD metrics, requirements
and system design

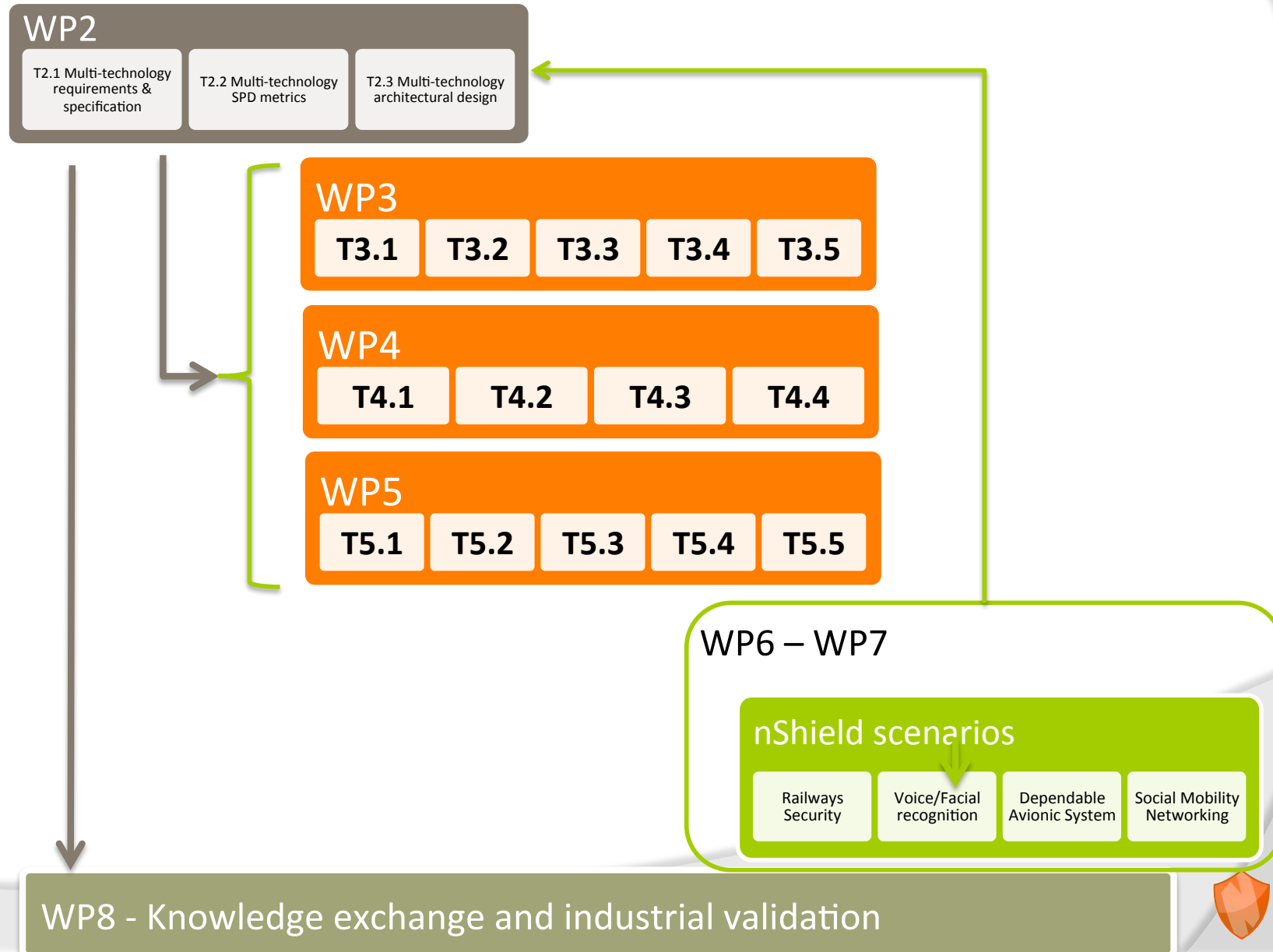
WP2: structure and deliverables (I)

- WP2 aims at providing SPD requirements and specification for nSHIELD layered architecture as well as of the overall system on the basis of four application
- WP2 structure:
 - T2.1: Multi-technology requirements & specification (**THYA**, SG, ASTS, SE, ETH, HAI, S-LAB, SICS, T2D, TUC)
 - T2.2: Multi-technology SPD metrics (**TECNALIA**, SG, ASTS, ATHENA, SE, S-LAB, THYA, TUC)
 - Task 2.3: Multi-technology architectural design (**HAI**, AT, ATHENA, SE, SICS, T2D, THYA, TUC)
- 8 deliverables on three main topics: SPD requirements, SPD Metrics and SPD architecture, and four milestones (at M6, M12, M24 and M26).

WP2: structure and deliverables (II)

- D2.1 Preliminary System Requirements (M3)
 - Finished
- D2.2 Preliminary System Requirements and Specifications (M6)
 - Finished
- D2.3 Preliminary system architecture design (M9)
 - Finished
- D2.4 Reference system architecture design (M12)
 - Finished
- D2.5 Preliminary SPD Metrics Specification (M12)
 - Finished
- D2.6, D2.7 and D2.8 will be developed by next milestones.

WP3: role and relationships



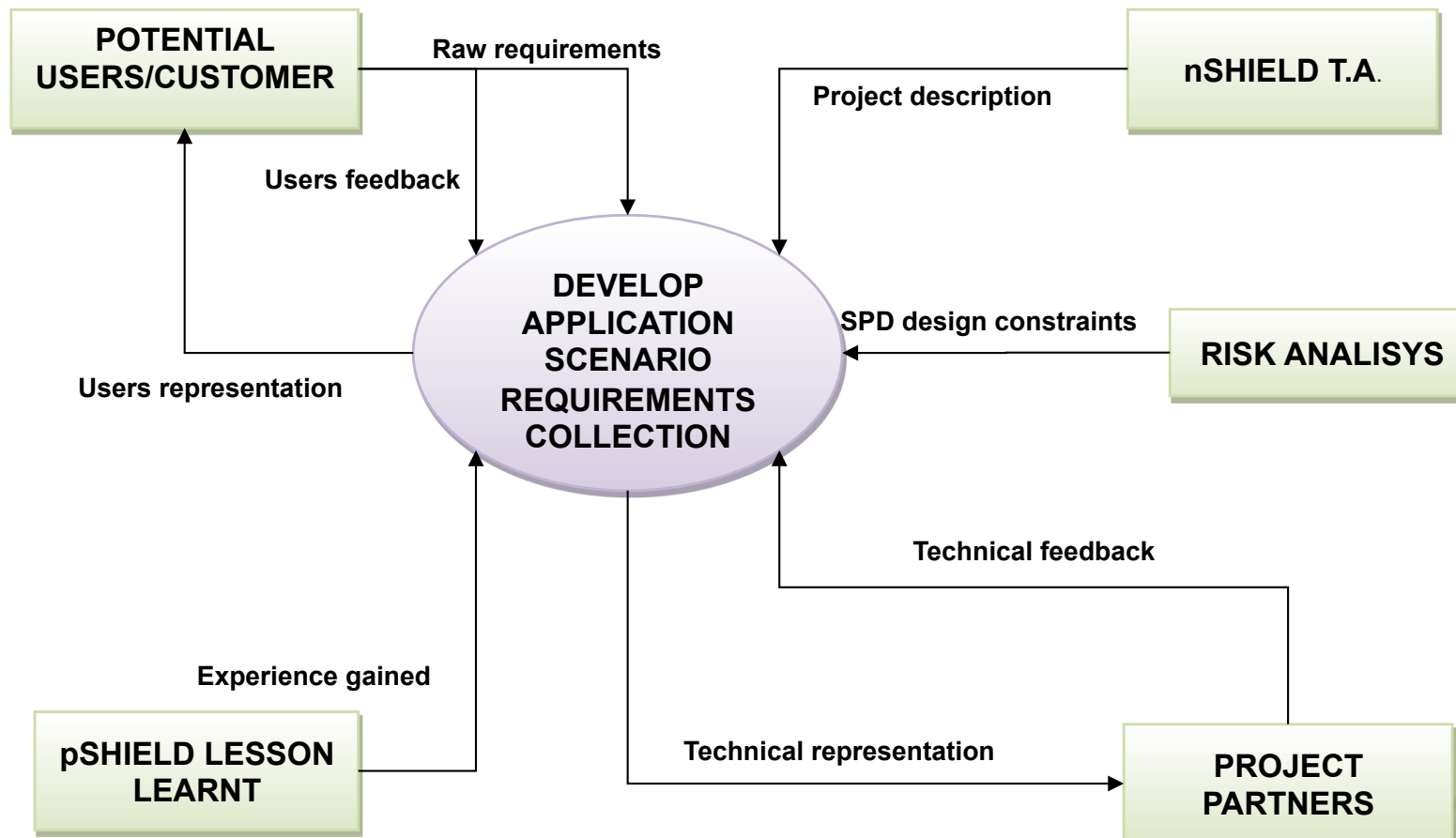
WP2: management details

- WP2 Management by THYA for year 1, by TECNALIA for the rest of the project.
- Duration: M0-M26.
- Effort: 141 MM.
- Status: ongoing
 - 5 of 8 deliverables submitted
 - Outcomes for 1st year achieved

T2.1: Multi-technology requirements & specification

- **Main topics and activities:**
 - Intrinsically define nSHIELD requirements,
 - Starting point: requirements from 4 selected scenarios
- **Main outcome:**
 - Requirements described in a standardised way to ensure a common understanding and to facilitate later exploration and usage for implementation

Sources for requirements collection



nSHIELD requirements collecting



Architectural components requirements

High level requirements identified for each scenario were broken down into more detailed requirements on the different nSHIELD components defined in the nSHIELD architecture, i.e. node, network layer, middleware and overlay

T2.2: Multi-technology SPD Metrics

- Main topics and activities:
 - Intrinsically define nSHIELD metrics,
 - Starting point: requirements from 4 selected scenarios and layered architecture
- Main outcome: nSHIELD full domain metrics have been identified and quantified. Methods and tool are envisaged to implement.

T2.3: Multi-technology Architectural design

- To define a reference system architecture for the SHIELD system that:
 - Supports requirements defined in task 2.1 (derived mainly from application scenarios)
 - Builds on previous work performed in pSHIELD project
 - Investigates composability of SPD capabilities at design and runtime level
 - Can be implemented-adapted-validated for each TA defined scenario

Achievements

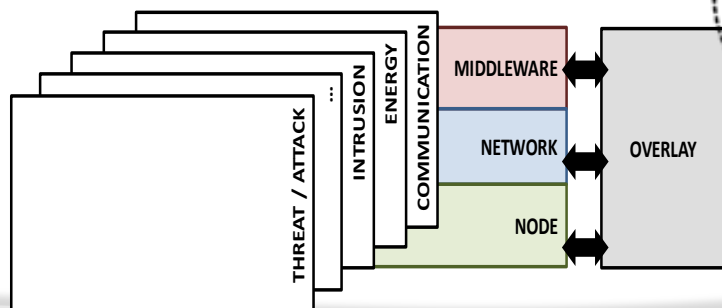
- Established/Proposed a design methodology based on:
 - modified Embedded Systems Development Lifecycle Model
 - A viewpoint driven approach addressing each of the 4 nSHIELD functional layers (**Node, Network, Middleware, Overlay**)
- A reference overall architecture:
 - based on 3 main types of nSHIELD Embedded System Devices (ESDs)
 - Addressing legacy devices support
- An analysis of services, capabilities and structuring of each nSHIELD functional layer based on architectural views
- A preliminary definition of interfaces and information flows to be detailed in implementation WPs (WP3-WP5)
- Realization of the architecture for an application scenario (Railway SMS)

Overview of System Architecture

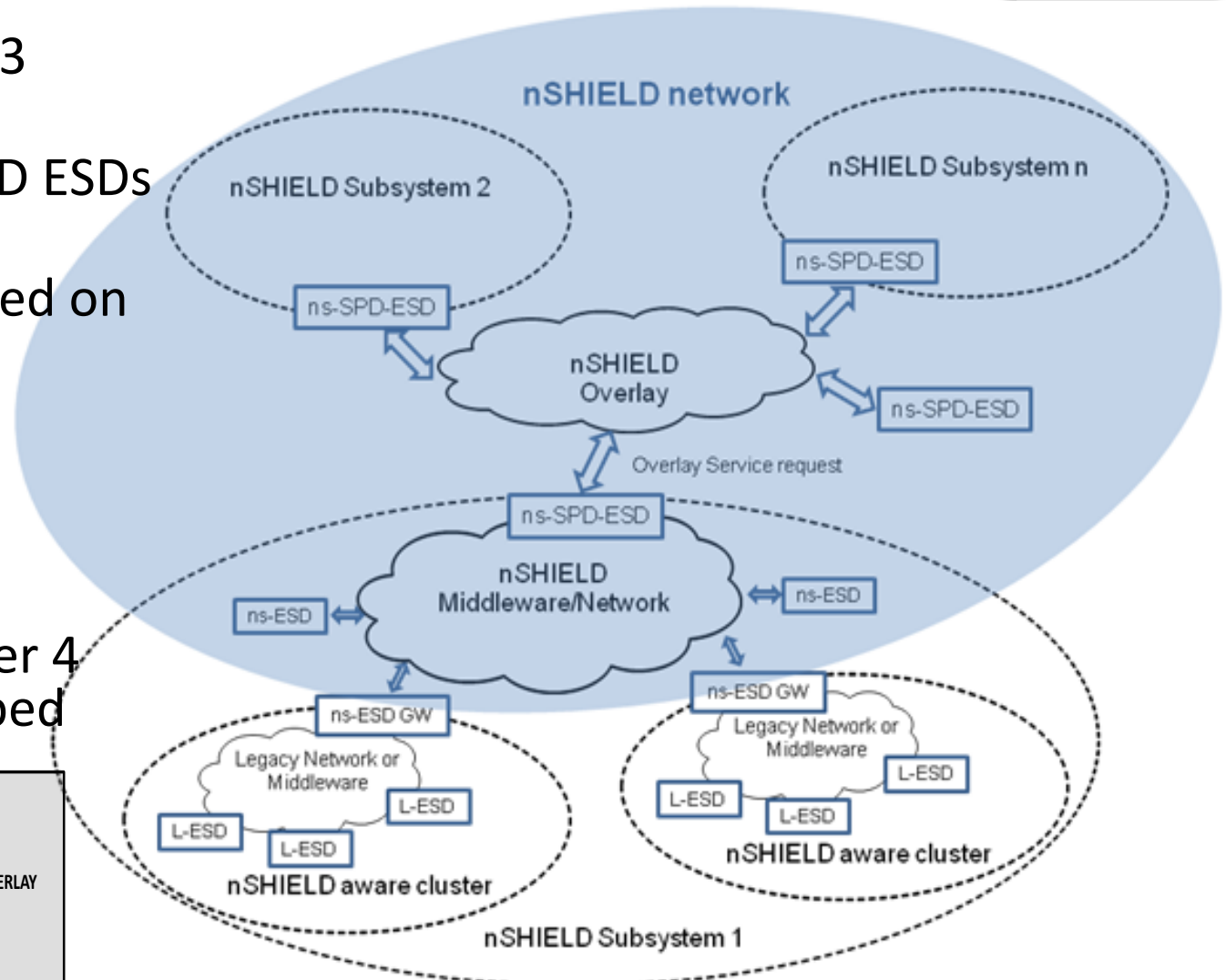
(i)

Process

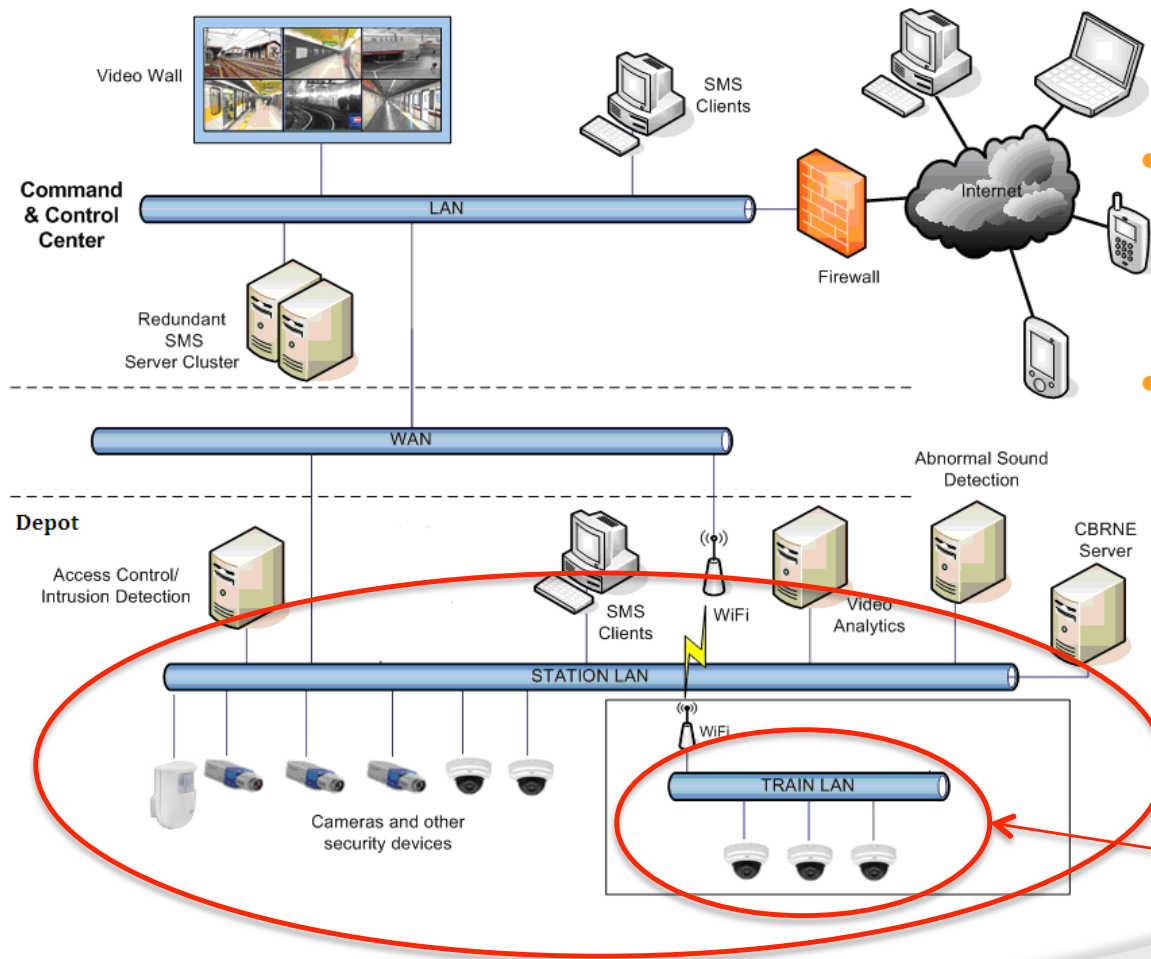
- Hierarchical structure (3 tiers)
- 3 main types of nSHIELD ESDs + the L-ESDs.
- ESDs are described based on 4 functional layers:
 - Node layer
 - Network layer
 - Middleware layer
 - Overlay layer
- For Each functional layer 4 viewpoints are prescribed



Hierarchical structure of nSHIELD System network



Application Scenario Realization



Railway SMS

- Compatible with nSHIELD network architecture
 - Hierarchical structure
- Possible device mapping
 - Sensing Devices ↔ L-ESD
 - SMS Clients ↔ nS-ESD
 - Access Control ↔ nS-SPD-ESD

Maps to **nSHIELD sub-system**

Can map to **nSHIELD aware cluster** or to **nSHIELD sub-system**

Conclusions

- Summarising we achieved:
 - Standardised system requirements
 - Quantitative SPD metrics
 - Means of reference architecture (different view points, scalable)

WP2



More info on wiki:

<http://nshield.unik.no/wiki/WP2>

