Annual review ROME 2012

Major Findings

Goal

Introduce the most important achievements of nSHIELD project during its first year with a special focus on lesson learned topics as well as the main challenges nSHIELD is going to face

Major Achievements and Challenges

- The process of requirements definition
- New approaches adopted for architectural framework designing
- Novel SPD metrics
- Overlay composability
- An emerging approach to be considered: secure execution environment
- How can nSHIELD concepts be effectively delivered to industry?
- Artemis compliant security designing

nSHIELD

The process of requirements definition

First approach

- Top-down
- Mainly derived from pSHIELD
  - Drawbacks:
    - Too many requirements
    - Requirements duplication
    - Either too generic or too specific requirements

Current approach

- Bottom-up
- Driven by scenarios
- Mainly focused on demonstrators' feasibility
  - Advantages:
    - Better traceability vs demonstrators
    - Redundancy elimination

nSHIELD

New approaches adopted for architectural framework designing

- 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

nSHIELD

Novel SPD metrics

- Several types of SPD metrics have been identified across 4 layers: Node, Network, Middleware and Overaly
- Connections to SPD requirements have been made
- Formalisation has been developed through requirements and metrics tracing and convergence to other documents such as those related to architecture and scenarios

nSHIELD

Overlay composability

Hybrid Automata approach

- Easy composition
- Scalability issues

DES and Colored Petri NET approach

- Hierarchical structure allowing to overcome scalability issues
- Possibility to model heterogeneous systems using the composition of simple, basic elements representing SPD functionalities

nSHIELD

An emerging approach to be considered: secure execution environment

- Virtualization can be a mean to provide security through isolation and monitoring
- Secure isolation provides secure execution as well
- The concept of trusted virtual domain can be used in nSHIELD
- nSHIELD could provide isolation and monitoring through own developed virtualization software

How can nSHIELD concepts be effectively delivered to industry?

- The most important goal of nSHIELD is to define a secure framework to be adopted by industries while developing Embedded Systems
- The key stakeholders for the purpose of the above goal are managers in charge of proposing and developing new ES
- As a consequence dissemination of nSHIELD concepts using effective means becomes a must

Artemis compliant security designing

- Another important goal of nSHIELD is that of creating impact in the framework of ARTEMIS project
- This goal can be achieved defining standards for measuring SPD of Embedded Systems through metrics
- Moreover the definition of standards for semantic overlay and implementation should be achieved through synergies within ARTEMIS

The END

That’s all folks!

ARTEMIS