AMIS

Application of Multiple and Independent Levels of Security (MILS) to SDR - EDA Study Overview

Wireless Innovation Forum European Conference 2013
11th June 2013 - Munich (Germany)

Overview

- **AMIS: "Application of Multiple and Independent Levels of Security (MILS) to SDR"**
- Contract 12.ARM.OP.303 (AMIS) is awarded by EDA in **November 2012** to an Industrial consortium formed by 7 SDR leading companies
  - Indra (Spain)
  - Rohde & Schwarz (Germany)
  - Selex ES (Italy)
  - Radmor (Poland)
  - SAAB (Sweden)
  - Thales (France)
  - Elektrobit (Finland)

- Expected finalization date of the study is **December 2013**

- Any results or rights obtained in the performance of Contract 12.ARM.OP.303 are EDA property

Objectives

- **Goal**: *Establishment of a common understanding, among the relevant EU stakeholders, on the application of MILS to SDR*

- **Outcome**:
  - Common set of operational and security requirements
  - Exhaustive impact analysis of its applicability in conventional SDR systems
  - Design and evaluation of candidate SDR architectures implementing MILS

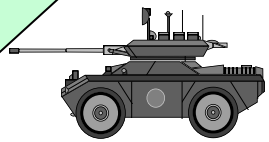
- **Expected impact**:
  - Provide referential requirements and designs for future national and European developments
  - Feed key SDR working groups and initiatives with project's technical findings
    - **Possible derived change proposals to current SDR/SCA specifications and standards should be managed under organizations or definition programmes' responsibility (out of AMIS scope)**

Objectives (II)

LOWER ECHELONS
- Highly mobile
- Compact solutions (space, weight , power consumption issues)

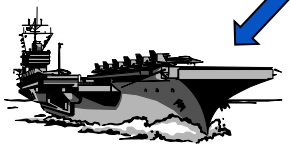
HIGHER ECHELONS
- High speed comms
- Based on wire, microwave or satellite
- Separated crypto equipment
- Posts' infrastructure issue

ARMY



MILS in SDR

- AMIS will focus on **Army Tactical environment up to battalion level**
- Considered the stringent scenario in terms of SWAP implications
- Easily adapted to Navy and Air Force contexts



NAVY

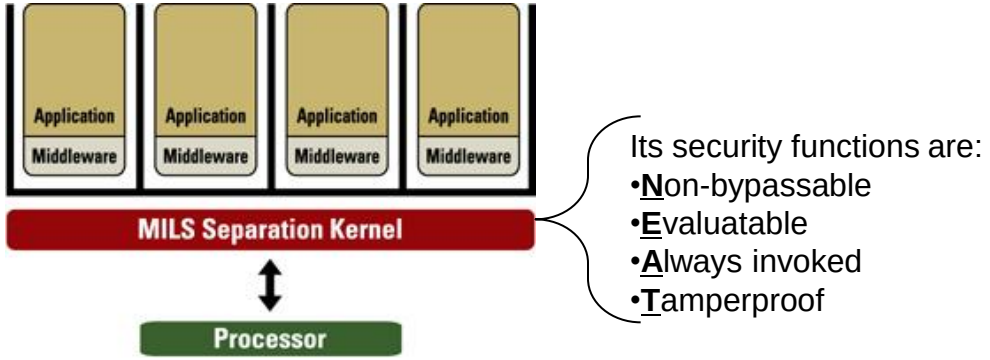
COMPARISON WITH ARMY
- In principle, same reqs for information processing
- Different crypto algorithms
- Less hierarchical interaction

AIR FORCE

Objectives (III)

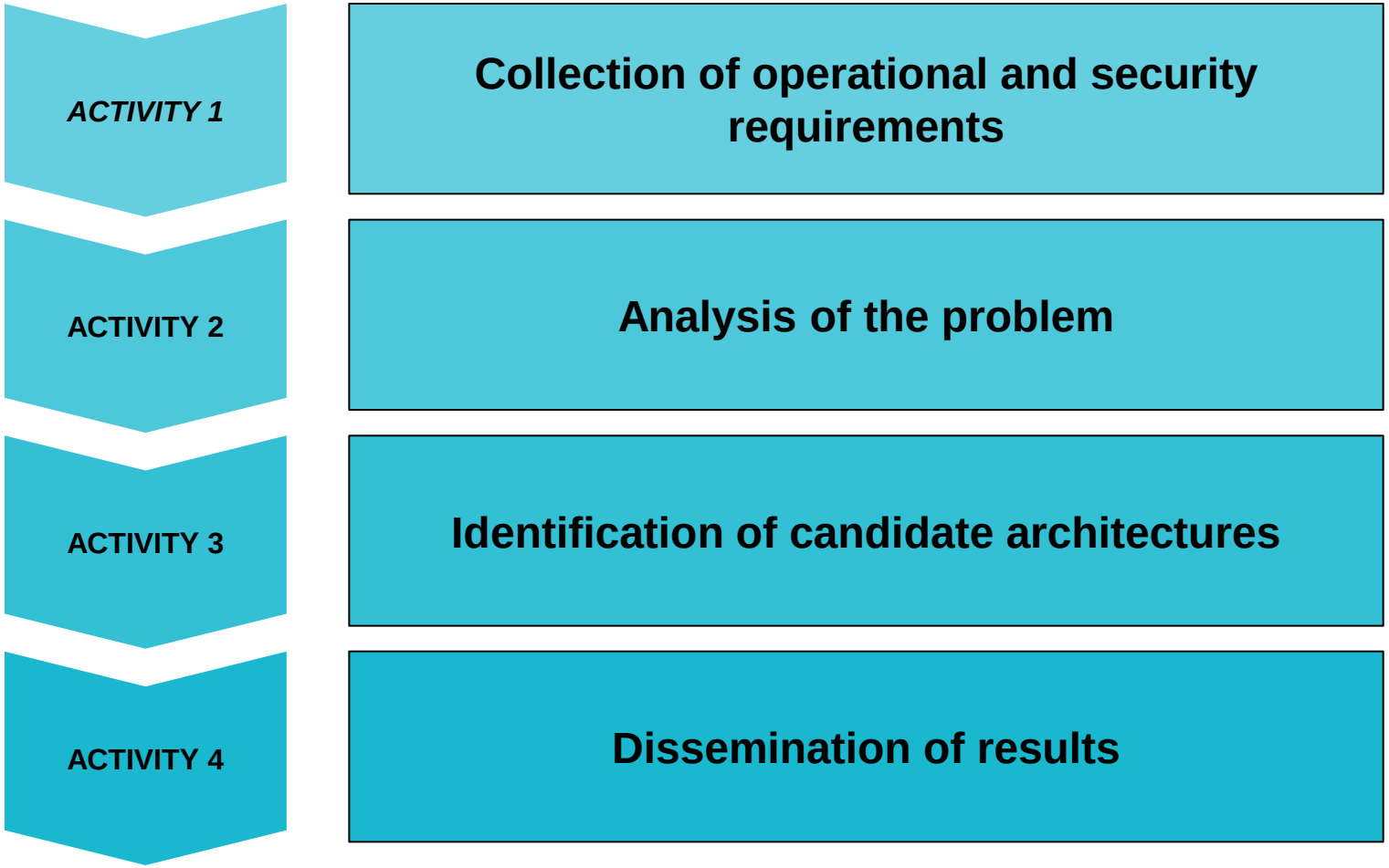
- Base concepts
  - MSLS: Multiple Single-Level Security
    - **System that securely separates data of differing classifications, one level at a time (e.g. communications platforms and infrastructures).**
  - MLS: Multi-Level Security
    - **System that securely process data of differing classifications (e.g. guards, downgraders, firewalls, data fusion, databases).**
  - MILS: Multiple Independent Levels of Security
    - **Layered software architecture (kernel, middleware and applications)**
    - **Supports multiple, separated entities, each operating at a different classification level (safety/security/domains). Enforces:**
      - SW architecture that support MLS and MSLS
      - Robust time and space partitioning scheduler
      - Secure information flow, data isolation, periods processing and damage limitation (mathematical verification is possible!)

AMIS target



Its security functions are:
- **N**on-bypassable
- **E**valuatable
- **A**lways invoked
- **T**amperproof

AMIS Study Activities



AMIS Study Activities

Collection of operational and security requirements

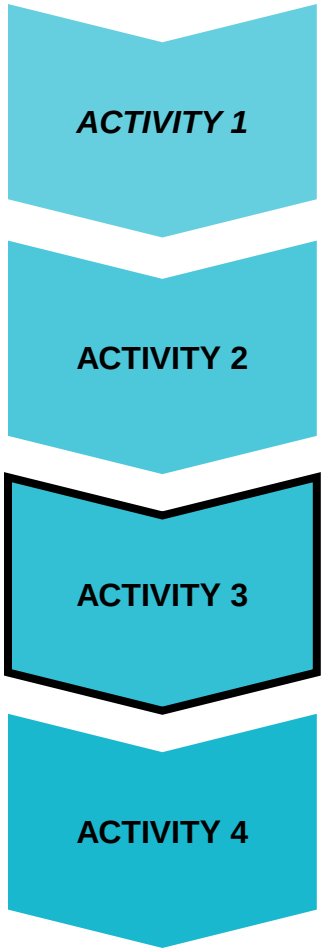
- **Provide a common basis for elaboration of the other work packages**
- **Focus on user aspects**
- **Elaboration of threats applicable to tactical SDR and to MILS**
- **Derive relevant security requirements**
- **Derive associated EAL and Assurance Requirements according Common Criteria**

AMIS Study Activities

Analysis of the problem

- Analyse the impact of the MILS application to the different elements composing a SDR set
- Impact analysis on SDR hardware
  - Memory, power supply, ports, buses, interfaces
  - Processing elements (GPP, DSP, FPGA…)
- Impact analysis on Operating Environment
  - Survey of applicable software COTS products
  - Impact of MILS on the middleware
- Impact analysis on Platform and Waveform components deployment and interactions
- Global impact analysis on MILS application to SDR

AMIS Study Activities



Identification of candidate architectures

- **Identify possible solutions that could meet MILS characteristics and constraints**
- **Highlight solutions to be applied to an SDR platform in order to satisfy MILS requirements**
- **Provide suggestions and best practices to be adopted when designing an SDR Architecture implementing MILS**

AMIS Study Activities

Dissemination of results

- Dissemination and presentation of AMIS results on the appropriate channels, including EDA and specialized forums
- Presentation of final results of the contract to EDA
- Eventual provision of AMIS main findings to different technical working groups (WGs) where AMIS industries are participating

Questions?