PROTECTRAIL – The Railway-Industry Partnership for Integrated Security of Rail Transport

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Authors of Paper:

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PROTECTRAIL – At a glance

- Submitted under call SEC-2009-2.2-01:

  Integrated Protection of Rail Transportation

- Budget: €21.78 million (EU = €13 million)

- Start date: September 2010

- Duration: 42 months

- Consortium: 29 Partners

The PROTECRAIL Consortium

A **well** _balanced_ **consortium** bringing together industry, operators (users), academia and sector associations. The project is supported by a **Stakeholder and User Advisory Group.**

Project coordinator: Ansaldo STS

Background

- Various means of transport including rail are the "lifeblood" of modern society

- Terrorist attacks as well as other forms of crime can cause damage to society through harm to people and property – increasingly considered as a threat in Europe and ROW

- Security in rail transport is currently predominantly dealt at a national level however threats are becoming more globalised

- Via an integrated approach, these assets can be protected – current threats need to be considered when identifying solutions

- The frequency of terrorists attacks is low however human and economical loss is large – security assessments should analyze this impact

- Robbery, assaults, trafficking illegal substances, vandalism and fraud must also be considered

Main Objectives

- To improve rail transport security for users by providing a viable integrated set of railway security solutions, which consider:

  - the extent of the assets involved,

  - the nature of the possible threats,

  - the amount of technical requirements and operational constraints.

- Develop mission orientated solutions that answer an asset-specific threat, and which are interoperable and modular

The PROTECTRAIL Challenge

The PROTECTRAIL approach is to face the problem of railway security by:

- avoiding over ambitious systematic top-down approaches,

- selecting and prioritising user requirements and threat scenarios,

- splitting the problem into smaller asset-oriented issues (missions),

- developing solutions applicable and reusable in different threat scenarios,

- making interoperable the single asset-specific solutions,

- conceiving and designing a modular architectural framework where each asset-specific solution can be "plugged",

- assuring a streamlined process of federation, integration and interoperability of respective solutions.

PROTECTRAIL Security Building Blocks

Sub-mission A
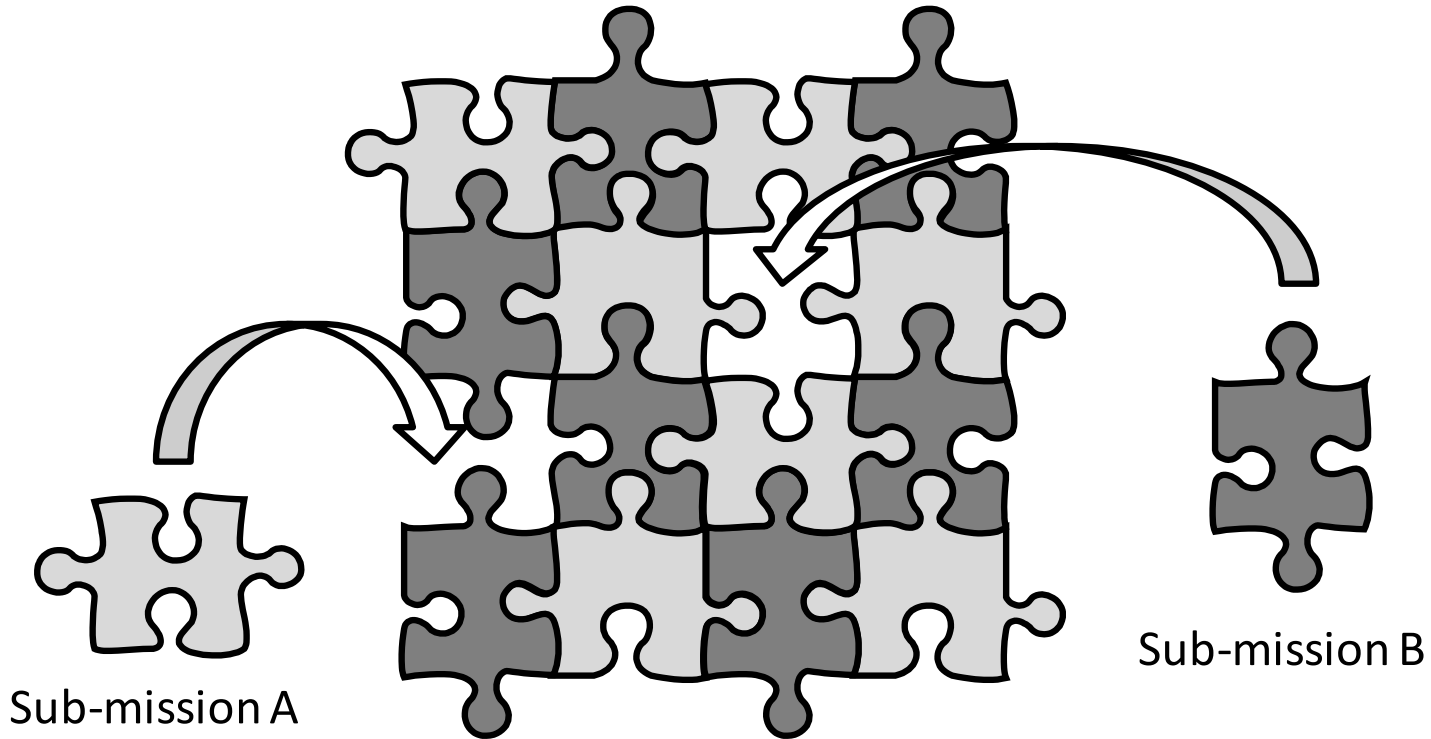
Sub-mission B

Security sub-missions are a set of realistic needs and requirements for protection in rail transportation systems

→ PROTECTRAIL is defining a modular architectural framework to enable "plug and play"

The Security Sub-Missions

- Security submissions embrace the physical, operational and transported assets of the railway system

- Security solutions are to be implemented for each submission – these solutions will be interoperable and designed under a common architecture to enable modularity

- Security protection will serve two main types of assets:

Physical and operational assets:

- Stations and buildings
- Structures
- Track
- Signaling and power
- Communication and information systems

Transported assets:

- Rolling Stock
- Staff clearance and access right management
- Passenger clearance control
- Luggage clearance control
- Freight clearance control

Security Solutions

- Diverse security solutions will be integrated to answer the security sub-missions
- Solutions are largely based on state of the art solutions that are available now
- Not necessarily solutions used in railways at the moment
- Scalability and transferability of solutions will also be considered
- Project currently has began defining these solutions – these will be integrated into a common design framework hosted by a Service Orientated Architecture (SOA)

The following are examples of the types of solutions considered in the project:

- Cyber security protection
- CCTV and video analytics
- Threat detection and sensors

- Ballast and track inspection
- Communication systems
- Operational procedures and more…
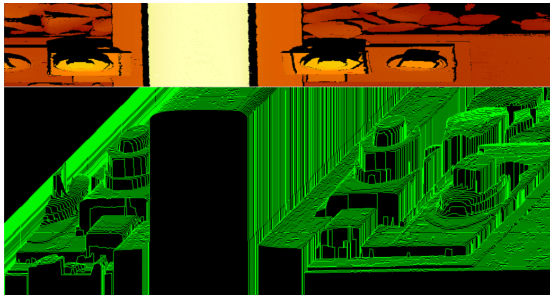
The Open Architecture Framework

- This framework is one of the first tangible results of PROTECTRAIL

- It provides an open and flexible integration framework

- Based on the following core requirements:

  - **Interoperability** – allowing exchange of information reliably between **different** sub-systems, interfaces and technologies – both legacy and new.

  - **Modularity and Scalability** – allow solutions that can be integrated together via their interfaces but are autonomous and replaceable.

  - **Integrative** – allow subsystems of rail transport security to combine and coordinate in a flexible system of system (both legacy and future)

**To achieve this, PROTECTRAIL implements a Service Oriented Architecture**

Service Oriented Architecture

- The PROTECTRAIL SOA will underpin the design of security solutions

- The SOA takes into consideration the interface description but also sets out the design principles to ensure scalability, modularity and interoperability

- Each module connected to the SOA is to be event driven including common time reference and geo-location

- Via the interface description ,services will be discoverable by the SOA

- Web-service can be used to implement the SOA in a standardised way

- These web-services will allow for functional building blocks to be accessible over standard internet protocols – irrespective of programming language or platform

- Links established with standardisation activities such as IEC TC9 WG46

Demonstration

- Integration and interoperability of solutions and systems developed by PROTECTRAIL will be validated by demonstrations

- Main demonstration will take place in Poland and will demonstrate how integrated solutions coming from the project improve security and protection of assets

- Demonstrations will be based on realistic scenarios defined by the project and based on user needs and requirements

- Results from demonstrations will be used to evaluate the solutions developed in the project
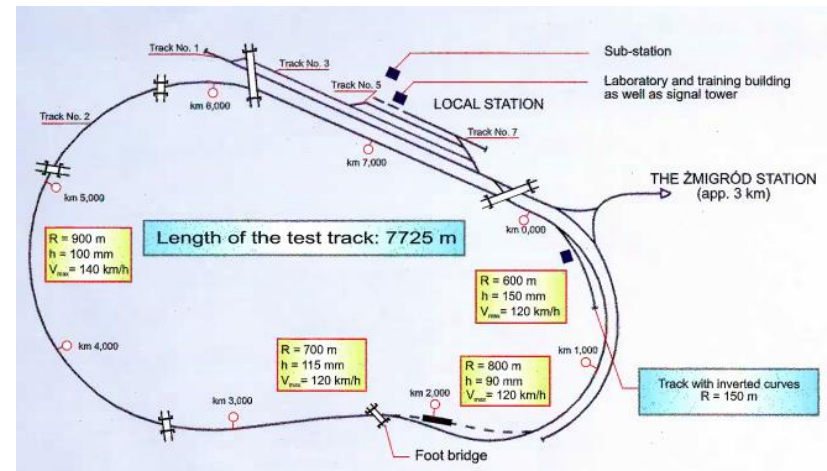
Conclusions

- Integrated security solutions will allow for a more **efficient** threat detection and better threat intelligence

- Allow for better **coordination** and **management** of security systems

- Currently no common European approach to managing rail security – PROTECTRAIL amongst other projects are initial step into a more **coordinated approach** – based on increasing **commonality of threats** across Europe

- Based on an identification of risks, PROTECRAIL develops and implements security solutions underpinned by an **interoperable architecture framework**

- Solutions are largely based on state of the art of solutions

Implementation of the outcomes of PROTECTRAIL should lead to an improvement in security for rail passengers and users

Thanks for your attention

- Questions are welcome
- For further information,
  - Please visit www.protectrail.eu
  - Or contact franco.cataldo@unife.org

The Railway-Industry Partnership for Integrated Security of Rail Transport. Funded under 7th FWP (Seventh Framework Programme).

SEVENTH FRAMEWORK PROGRAMME