

# How to adjust and improve the security level of infrastructure

**Andrea Demadonna – UNIFE**

**Luigi Rucher – ThalesGroup**

**Andrea Bastianelli – ThalesGroup**

**UNIFE**

**Florence, 25 November 2016**

- UNIFE represents the **European Rail Supply Industry** (rolling stock, infrastructure, sub-systems and signalling)
- UNIFE is a **trusted partner of European and international institutions** in all matters related to rail transport and industrial competitiveness
- Over 85 full members of the largest and small and medium-sized companies in the rail supply sector and 16 associated members including 14 National Associations (such as SWEDTRAIN), representing almost 1000 suppliers of railway equipment

### *World leaders:*

UNIFE Members have a 84% market share in Europe and supply 46% of the worldwide rail production



# UNIFE Members



# Associate Members



# A strategic industry for the European economy

**400 000 JOBS IN EUROPE!**



**INNOVATIVE**



**WORLD LEADER & EXPORTER**



# Digitalisation of Railways: the contribution of UNIFE

- Digitalisation and the “3Vs” (data volume/variety/velocity) offer both great opportunities and significant challenges for the railway sector
- In order to better respond to these challenges, UNIFE created a **Digitalisation Platform** and adopted a **Position paper on Digitalisation of Railways**, which proposes priorities for the European railway industry in the field of digitalisation
- The UNIFE Digital Platform has identified the following **priorities**:
  - Better use of existing infrastructure mainly through ERTMS deployment and predictive maintenance
  - Better accessing and using data
  - **Enhancing the security of the rail system, and maintain high reliability/safety and operational continuity standards**
  - Improving end-user's experience, by implementing TAP/TAF TSI and fostering multi-modal real time information and services for door to door journey



# PROTECTRAIL



***The Railway-Industry Partnership for  
Integrated Security of Rail Transport***

SEC-2009-2.2-01: Integrated protection of rail transportation



**13<sup>th</sup> Florence Rail Forum**

**Security of the rail passenger system: is it a  
challenge for the Single European Railway Area?**

25 November 2016 - Florence

# Security: A key point in Railway

- An increased demand for security
- A shared responsibility among stakeholders
- A framework increasing complexity
  - Opening the European market
- A policy based on 3 pillars:
  - Human factors
  - Technologies,
  - Regulations
- The research activities ->
  - a way to prepare the future
- In Europe : PROTECTRAIL & SECUR-ED



# PROTECT RAIL in short



**FP7-SEC-2010-1 - Security in Mass transportation**

**Ansaldo STS** A Hitachi Group Company - **Project coordinator**

**Budget = 22 M€**

**EC Funding = 13 M€**

**Sept 2010 - Oct 2014**



**PROTECTRAIL objective was to integrate the growing influx of security technologies into rail operations and make them interoperable to improve security.**





SECured URban transportation - European Demonstration

**FP7-SEC-2010-1 - Security in Mass transportation**

**THALES** - Project coordinator

**Budget = 40 M€**

**EC Funding = 25 M€**

**Apr 2011 - Sep 2014**



**Provide public transport operators of large and medium European cities with the means to enhance urban transport security**

**Enlarge mass transport security market for the European industry**



# Demonstrations



- WROCLAW: Main demonstrator in Zmigrod
- PARIS: Protection of HS tracks and Tunnel entrance at Villecresnes Tunnel - France South East HS Line
- SICILY: Intrusion detection functionalities on a track near Messina
- UNIFE has in charge the dissemination and exploitation of the results in the railway sector.
- UIC, representing all the « railway end users », will assure a control that the project permanently responds to users needs.

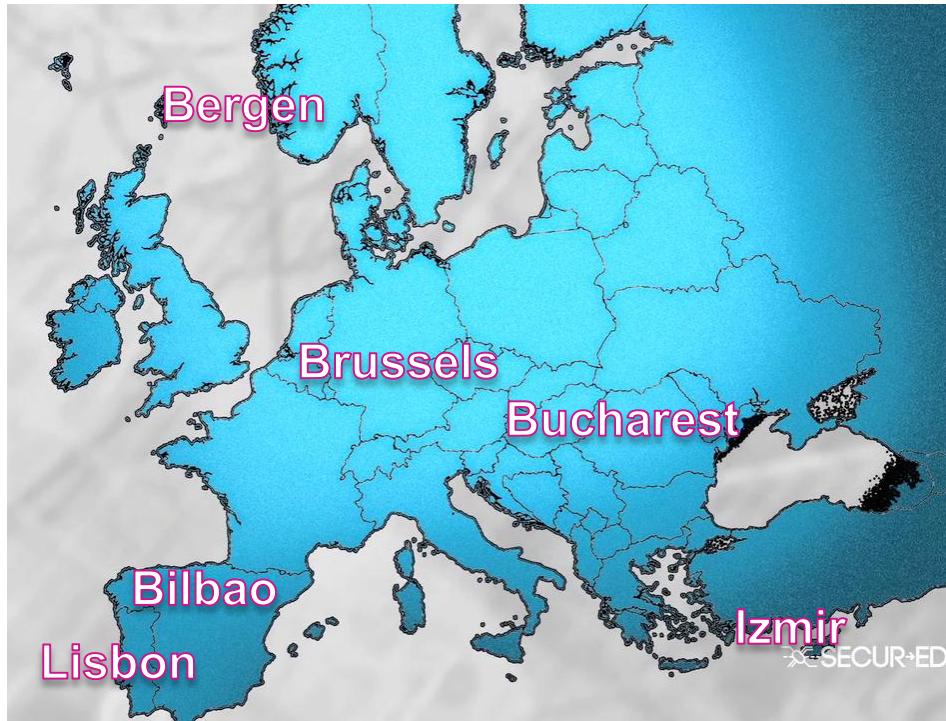


**PKP POLSKIE LINIE KOLEJOWE S.A.**



**The demo site identified by PKPPLK.  
Focused on the Security Toolkit setup.**

# Satellite demonstrations



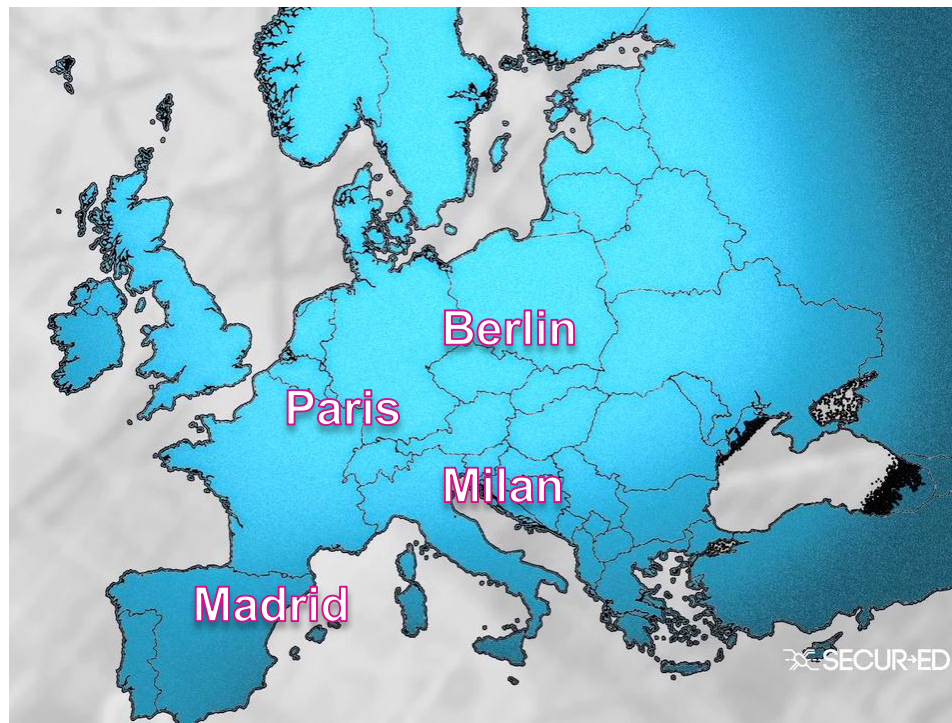
- Relevant security solutions identified with the risk assessment method
- Demonstrate the solutions scalability and modularity
- Assess security enhancement and cost-effectiveness in various environments



**Apply the complete toolkit to answer various security situations  
from risks assessment to concrete solutions**



# Satellite demonstrations



Mobility  
Networks  
Logistics

- **Milan: Prevent events** (Simulation tools, Depot/Yard and vehicle protection, System of systems integration, Crisis management)
- **Madrid: Enhance stakeholders cooperation** (Identification of priority procedures, Orchestration of coordinated response from different stakeholders, Interconnection of real-time information systems)
- **Paris: Limit events impact** (Video tracking of identified suspects, CBRN-E detection systems, Fast service restoration, Cyber-security)
- **Berlin: Identify & manage threats by staff training** (Raising security awareness of staff and customers, Training of staff assigned to security or Customer Service, Crisis Management)

**Four complementary demonstrations field-validating generic solutions**  
**Relevance of these solutions illustrated by the satellite cities priorities**



## Public Transport Operators



## Industry



## Research



## SMEs



## Authorities & Organisations



## Public Transport Operators



## Industry



## SMEs



## Research

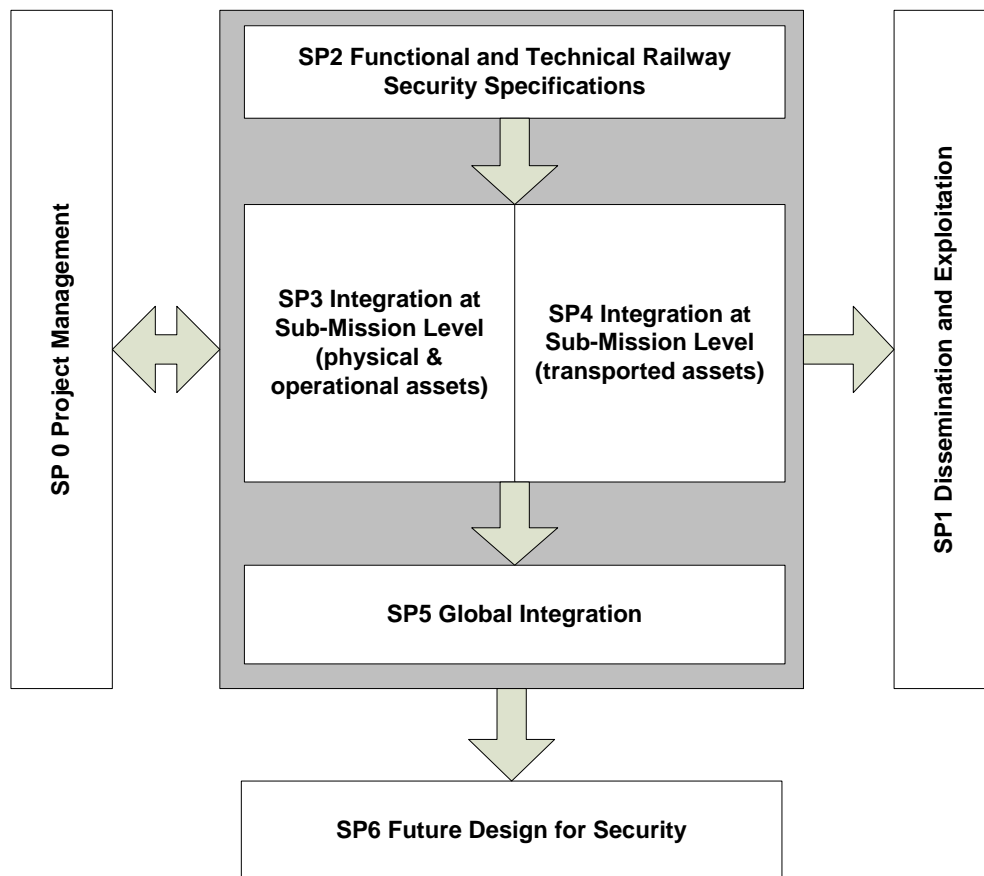


## Authorities & Organisations



# PROJECT STRUCTURE

The project has been structured in 7 Sub-Projects and 38 Work Packages.



THREAT	N.	Threats	Priority
Explosives & Chemical weapons	1	<b>Terrorist attacks</b> <ul style="list-style-type: none"> <li>Explosive</li> <li>CBRN</li> <li>Fire</li> <li>Hijacking of trains/cars</li> <li>Sabotage of tracks/equipment</li> <li>Black mail</li> <li>Etc...</li> </ul>	1
Biological, Radiological & Nuclear weapons			
Illegal access			
Metal/other theft			
Robberies			
Unattended luggage	3	<b>Thieves attacks</b> <ul style="list-style-type: none"> <li>Theft of copper</li> <li>Theft of equipment</li> <li>Theft of technology</li> <li>Theft of passenger's properties</li> <li>Etc..</li> </ul>	2
Aggressions to staff			
Aggressions to customers	2	<b>Vandalism attacks</b> <ul style="list-style-type: none"> <li>Graffiti</li> <li>Equipment damaging</li> <li>Interiors of trains damaging</li> <li>Stone throwing</li> <li>Etc...</li> </ul>	3
Cybercrime			
Vandalism (e.g. graffiti, stone throwing, set fire to railway assets, etc.)			
Obstacles on the line			
Sabotage			
Major malicious technical failure			



N.	Requirements	Priority
1	To identify people (abnormal behaviour, tracking capability, face identification capability etc...)	1
2	To identify unattended luggage (detection capability)	2
6	To detect CBRNe	3
4	To control accesses (detection of unauthorized people, ID badge for the personnel, etc...)	4
13	To have human guards and employees with a high security awareness and vigilance	5
16	To have an integrated security system	6
3	To check luggage and neutralize dangerous contents	6
12	To integrate safety and security technologies	7
7	To protect dangerous goods	8
9	To protect plants (plants, power and signalling)	9
14	To have efficient communications channels to passengers/involve passengers in vigilance	10
10	To protect information systems (cyber-crime)	11
15	To ensure a connectivity link to Regional Polices and Ministry for Internal Affairs, Intelligence Agencies	12
5	To detect and extinguish fire	13
11	To protect from hijacking of trains or service vehicles and hostage taking	14
8	To install armoured or reinforced doors, gates, fencings	15
17	To protect from other threats	16



# PROTECTRAIL OBJECTIVES

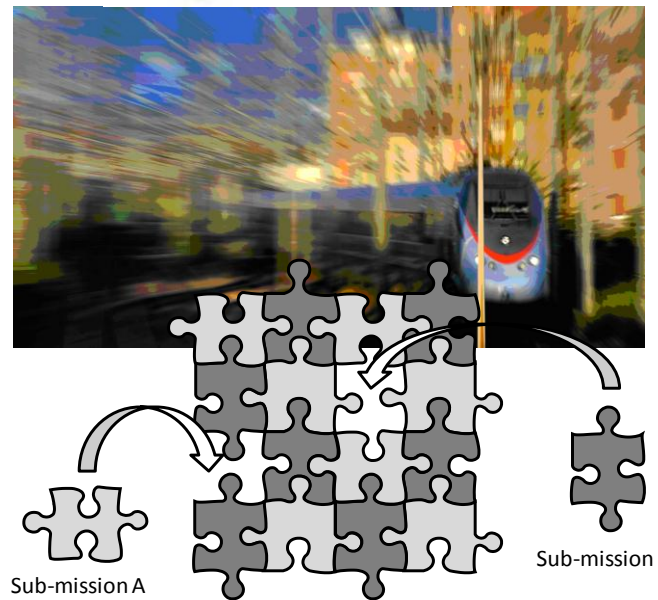
## **PROTECTRAIL will address the following sub-missions:**

- protection of signal and power distribution systems
- track clearance
- clearance of trains before and after daily use
- staff clearance
- luggage clearance control
- passenger clearance control
- freight clearance control
- tracking and monitoring of rolling stock carrying dangerous goods
- protection of communication and information systems
- stations, buildings and infrastructure protection



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

- avoiding too ambitious systematic top-down approaches
- selecting and prioritizing user requirements and threat scenarios
- splitting the problem into smaller asset-oriented issues (missions),
- developing solution 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

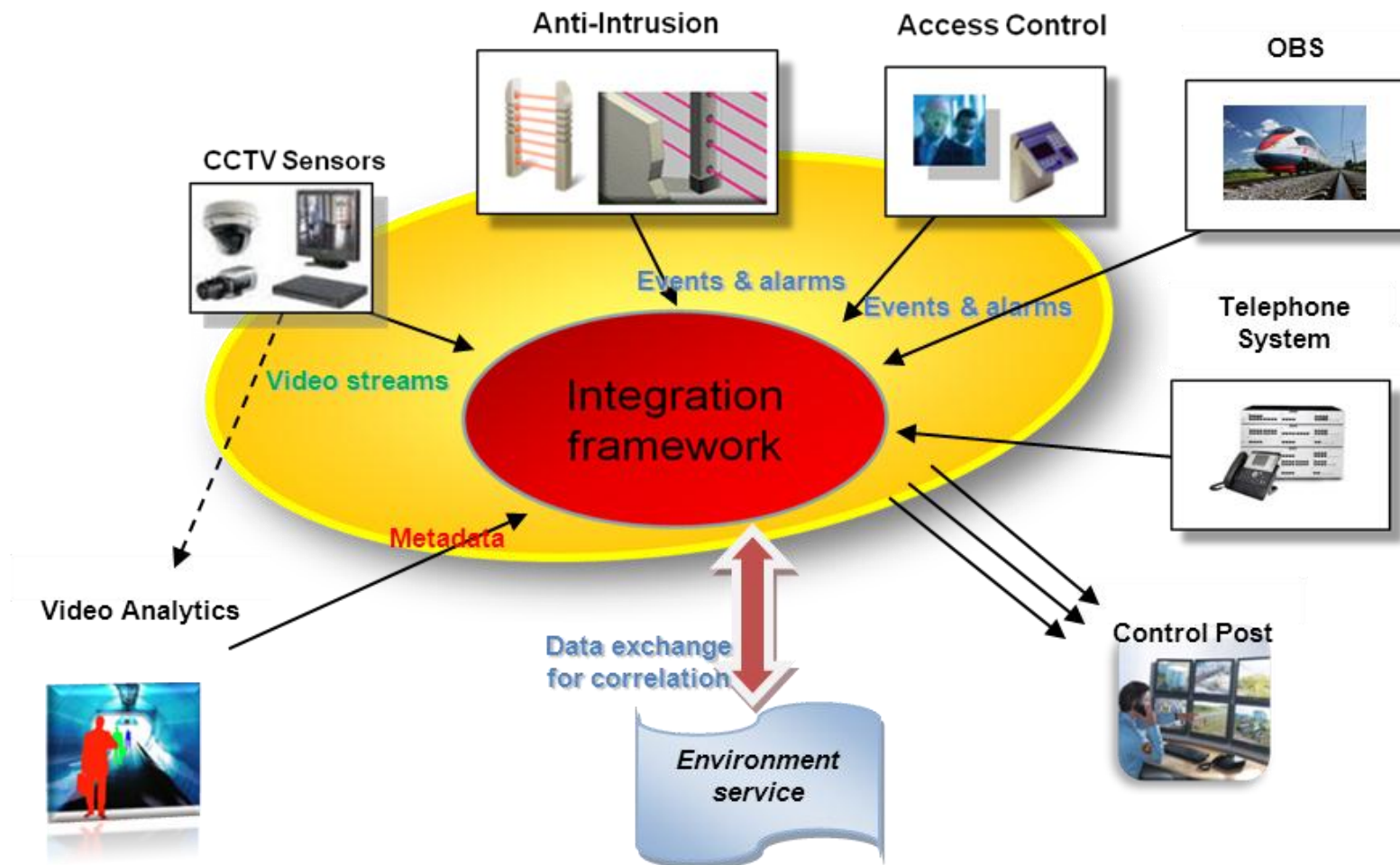


**PROTECTRAIL** based its interoperability framework on design patterns which are successfully used in other industries. These include the following elements:

- A reusable **Service-Oriented Architecture (SOA)**
- An **Event-Based Architecture** for data exchange between various security components and decouple the components from each other
- Reusing of well-established and proven **standards** which reduce the non-recurring cost of software integration
- Planning of an extendable architecture for the future to **extend the framework** with upcoming standards
- Building modular components with **web services**
- Supporting **discoverable** components to reduce the configuration effort and improve the reusability
- Building on an **IP network** (cabled or wireless) which is dimensioned to support consistently the video surveillance streams necessary to assess, confirm and investigate security incidents



# INTEGRATED SOLUTION

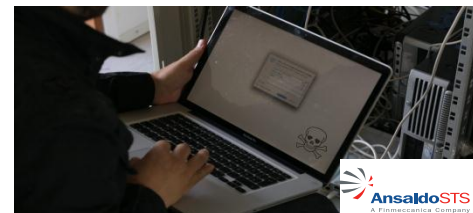




**By establishing standardized events and SOA principles in security and rail infrastructures, the industry achieves a better interoperability, and the time to integrate new security solutions, the cost to develop and test new solutions is reduced drastically, and security stakeholders understand each other during security events and crisis situations.**

**Capabilities -> Orchestration -> Holistic approach**

**Security is built from its foundations!!**



**For more information please visit:**

<http://www.protectrail.eu/>

<http://www.secur-ed.eu/>

# THANK YOU