Interoperability in FP7 Security Research

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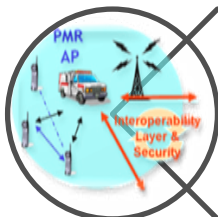**European Commission**
Enterprise and Industry

GENERAL OVERVIEW

INTRODUCTION

INTEROPERABILITY CHALLENGES

INTEROPERABILITY IN REDIOCOMMUNICATIONS

SOFTWARE DEFINED RADIO – SYNERGIES WITH DEFENCE

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INTEROPERABILITY CONCEPTS

Integration: The activity of bringing together different subsystems into a new one capable of working as a whole, being the outcome of this activity a final system or product.
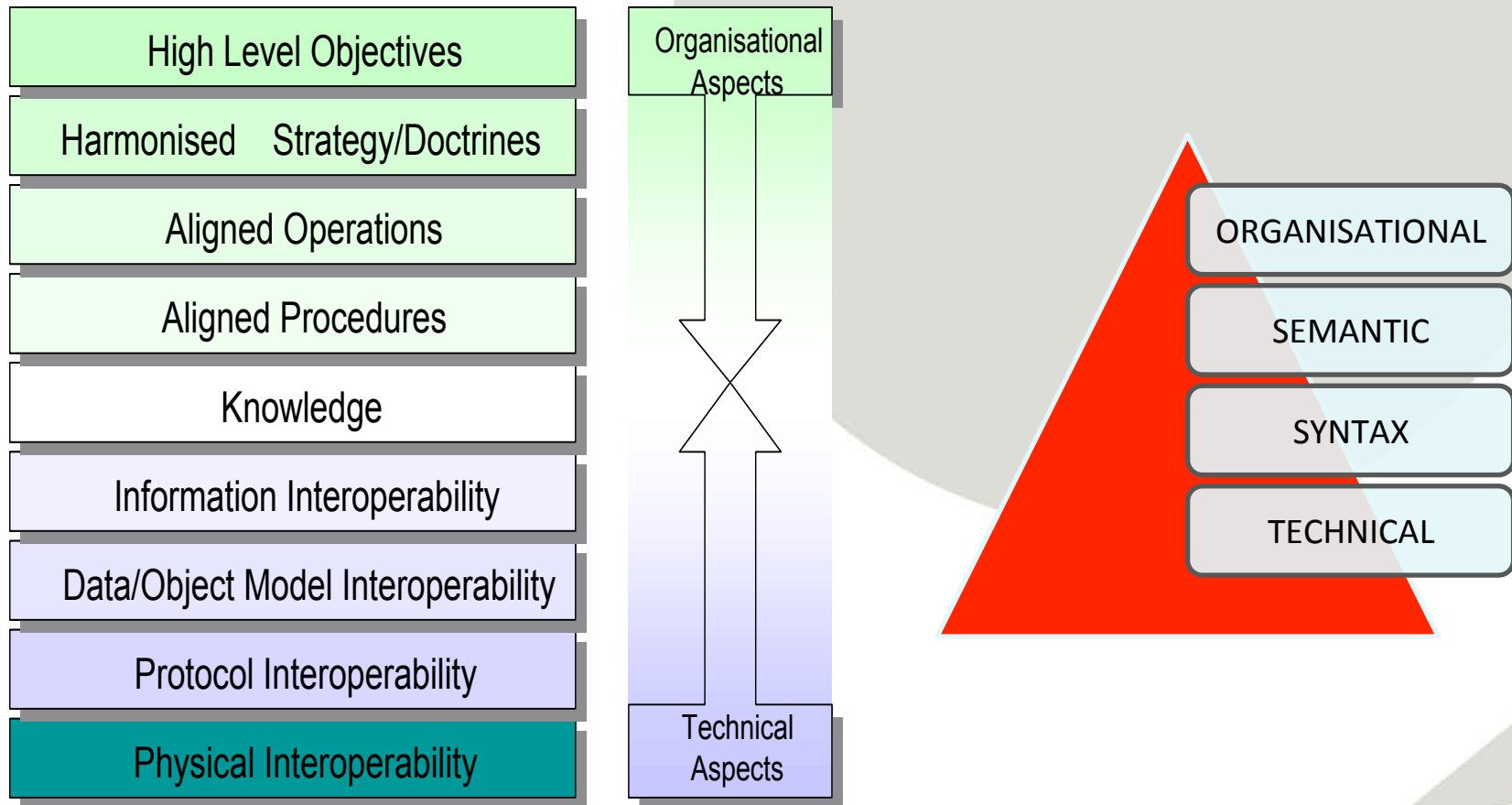
Interconnectivity: The capability of different systems to interact with each other, exchanging information, products or processes that they need for their own purposes.

Interoperability: The capability of different systems (in its widest sense) to interact or operate with each other, exchanging information, knowledge, products or processes, and in doing so generating extra value above that produced when they work separately, therefore operating in synergy.

Interoperability has to encompass technical and cognitive as well as organisational and doctrinal dimensions.
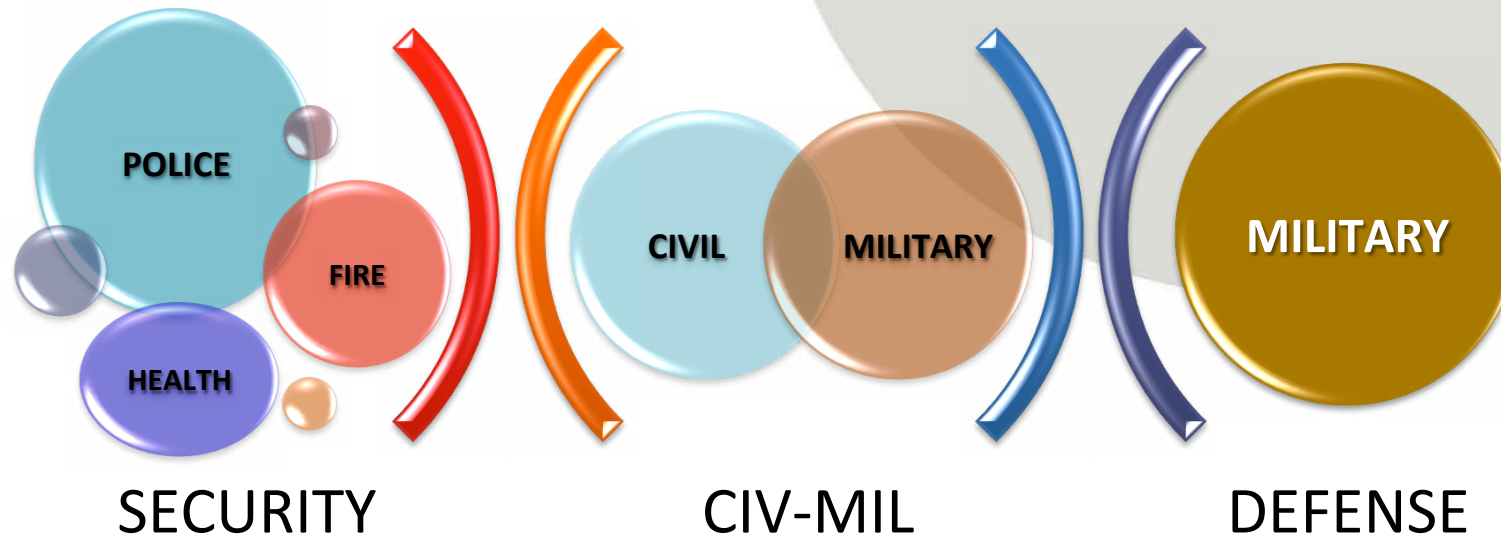
INTEROPERABILITY LAYERS

High Level Objectives
Harmonised   Strategy/Doctrines
Aligned Operations
Aligned Procedures
Knowledge
Information Interoperability
Data/Object Model Interoperability
Protocol Interoperability
Physical Interoperability

Organisational Aspects

Technical Aspects

ORGANISATIONAL
SEMANTIC
SYNTAX
TECHNICAL

Secricom ©

INTEROPERABILITY: WHERE IS IT NEEDED?

POLICE

FIRE

HEALTH

CIVIL

MILITARY

MILITARY

SECURITY   CIV-MIL   DEFENSE

INTEROPERABILITY: AT WHAT LEVEL?

REGIONAL

NATIONAL

EU WIDE

EXTERNAL

INTEROPERABILITY: WHO ARE THE ACTORS?
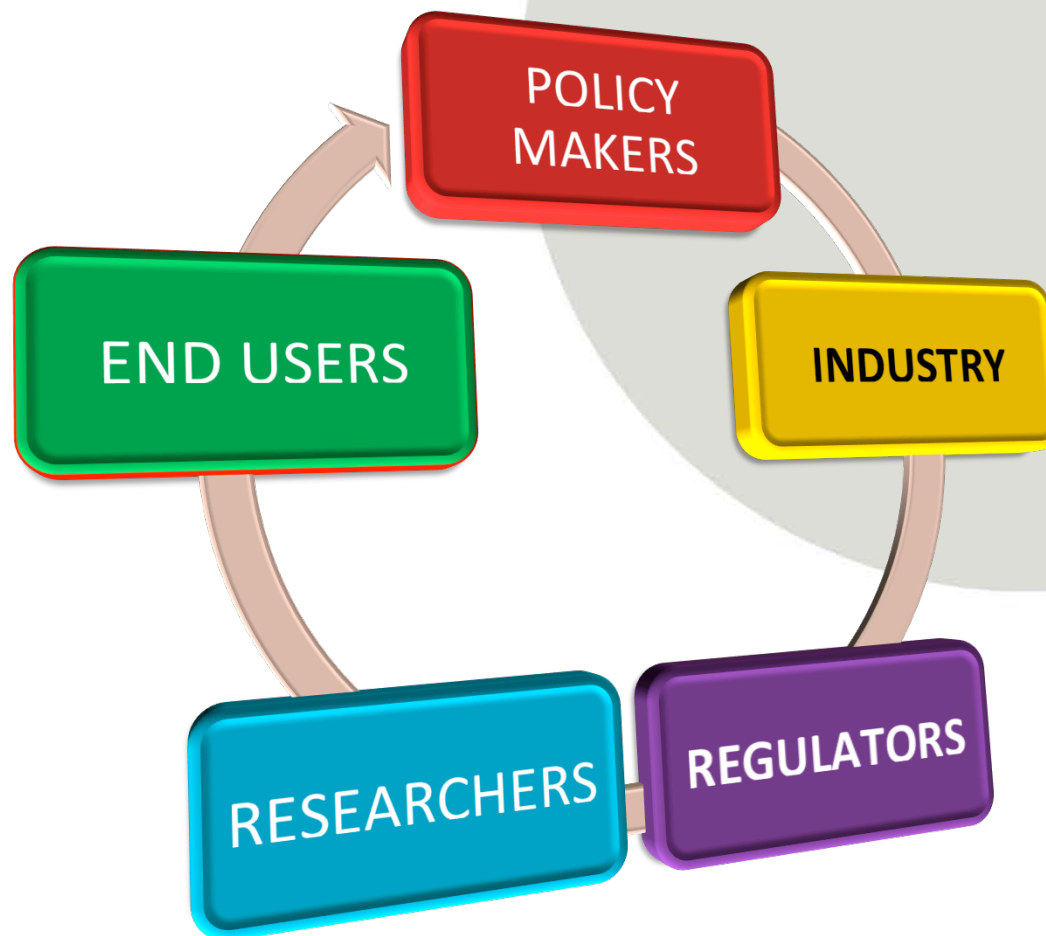
INTEROPERABILITY: WHAT ARE THE ENABLERS?

SPECTRUM

SUPPORTING TECHNOLOGIES

STANDARDS

BUSINESS MODEL

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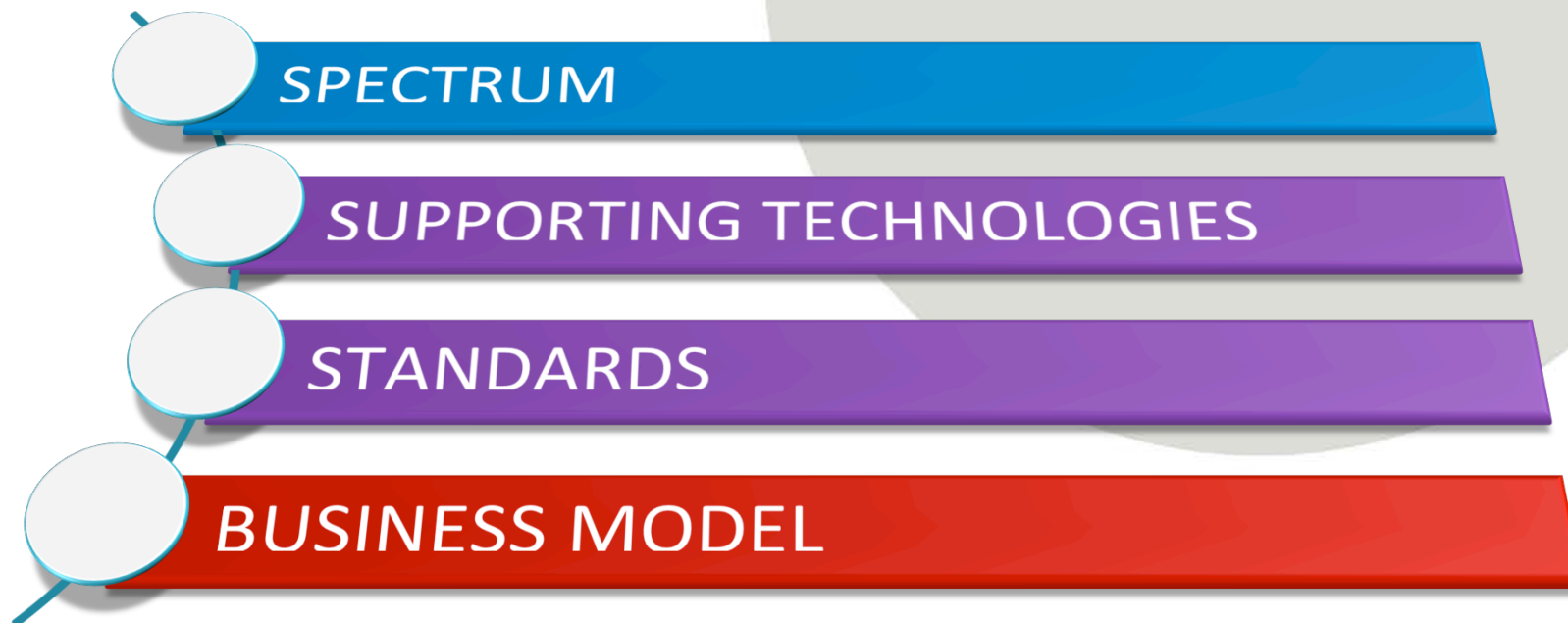
INTEROPERABILITY CHALLENGES

Interoperability general issues

- Service Oriented Architecture for interoperability at application layer
- Gateways, SDR, integrated solutions for communications

Wireless broadband connectivity

- Improved spectrum efficiency
- Dynamic Spectrum Access
- Harmonization of spectrum across Europe

Complex environments Communications

- Channel characterization
- Ad-hoc, mesh networks
- Spatial, frequency diversity

Situational awareness

- Sensor networks
- GMES
- Location/Positioning (EGNOS/Galileo)

Improved resource management

- Automatic Vehicle Location (AVL)
- Workflow management
- Integrated command and control

INTEROPERABILITY IN RADIOCOMMUNICATIONS

- **End of TETRA / TETRAPOL deployment ~ 2015**

- **ROI ~ 10/15 years**

- **And beyond…**

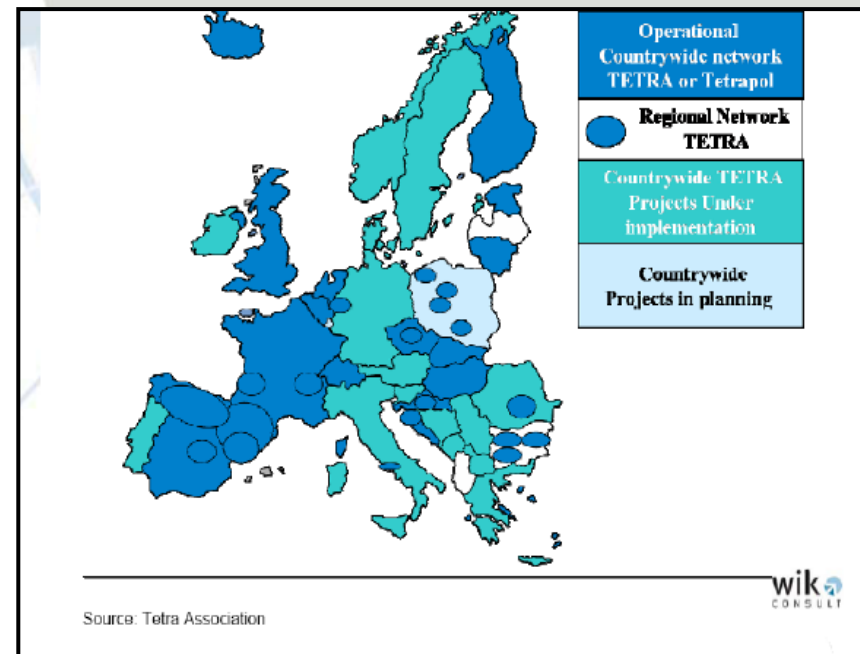 - **TEDS**

  - **LTE**

  - **RRS**

  - **Others**

Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

FCC White Paper

The Public Safety Nationwide Interoperable Broadband Network: A New Model for Capacity, Performance and Cost

June 2010

Source: Tetra Association

INTEROPERABILITY IN RADIOCOMMUNICATIONS SOLUTION POSSIBILITIES

• Deploy TEDS (an enhancement to TETRA), or TETRAPOL equivalent, in the existing PPDR frequency bands. This could provide an intermediate bandwidth, high availability solution, but existing bandwidth is already heavily used by voice services in many countries.

• Deploy TEDS in a new frequency band, preferably near the existing PPDR frequencies to enable existing base station infrastructure to be used.

• Deploy a true wireless broadband capability (e.g. LTE) in a new frequency band (as the US are doing at 700MHz)

• Use commercial mobile providers with pre-emption rights, perhaps supplemented by dedicated PPDR broadband in highly populated areas.

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Software Defined Radio – Synergies with Defence

- SDR is an enabler for Radio Reconfigurable Systems which could be a solution for Communication interoperability changes
- SDR as the driver for EU hybrid standards for interoperability
- Possible dependencies of this approach
- Example of Dual use Research affordable in FP7

POSSIBLE NEXT RESEARCH TOPICS RELATED TO INTEROPERABILITY

Preparedness for and management of large scale fires - Integration Project

Preparation of the next generation of PPDR communication network - Capability Project

Establishment of a first responders platform for interoperability - Coordination and Support Action

Establishment of interoperable platforms/centres for testing and validating security innovations - NoE

Global solution for interoperability between first responder communication systems - Integration Project

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CONCLUSIONS

- Interoperability is a key requirement for the Security systems design and development
- Interoperability is a complex concept comprising different levels and dimensions
- There exist several challenges in current Radiocommunications Systems that have to be addressed properly. FP7 projects results will collaborate to this aim.
- SDR may be an example of enabler for interoperability where hybrid Civ-Mil standards would be key to a broad interoperability

Thanks for

Your Attention

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