



Global solution for interoperability between
PPDR communication systems

????? - ??????

*PSCE 2016
Brussels, 18-19 May 2016*



The ISITEP Project

Inter **S**ystem **I**nteroperability for **T**Etra-tetra**P**ol networks

- Seventh Framework Programme - TOPIC SEC-2012.5.3-4: Global solution for interoperability between first responder communication systems
- Total cost of over 15 million Euros
- 40 month length: 1/9/2013 – 31/12/2016
- Consortium of 15 partners from 10 countries



ISITEP:
Whatever the situation, interconnecting forces beyond national borders

- **End users Partners**

- Service Public Federal Interieur / Belgian Federal Police (BFP)(BFP, BE)
- Norwegian Ministry of Justice and Public Safety (DNK, NO)
- Swedish Civil Contingencies Agency (MSB, SE)
- Ministry of Security and Justice (VenJ, NL)

- **Research Center**

- TNO (NL)
- University of Rome Tre (IT)
- UPC (ES; Universitat Politècnica de Catalunya)
- ISCOM (IT; Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione)

- **Industry**

- FINMECCANICA (IT: TETRA Manufacturer/Operator)
- Motorola Solutions (DK: Tetra Manufacturer)
- Airbus Finland (FI: Tetra Manufacturer)
- Airbus FR (FR: Tetrapol Manufacturer)
- Amper Sistemas (ES Tetra-Tetrapol integrator)

- **SMEs**

- Net Technologies (GR: Tetra R&D and consultancy)
- Exprivia (ES; Software R&D)



- European Countries exposed to **increasing cross-border crime**
- **Growing impact** of natural disasters in the last decades:
 - Financial costs double every 12 years; in 2011, 300 natural disasters with 27,000 deaths and 380 billion Euros of damage (source United Nations Office for Disaster Risk Reduction)



- **National Budget** for Public Protection and Disaster Relief (PPDR) mainly **decreasing** due to economic downturn in the last years
- **National resources** mainly **limited** for large-size events



- *Pressure for **more efficient** and **cost effective** usage of available PPDR resources*

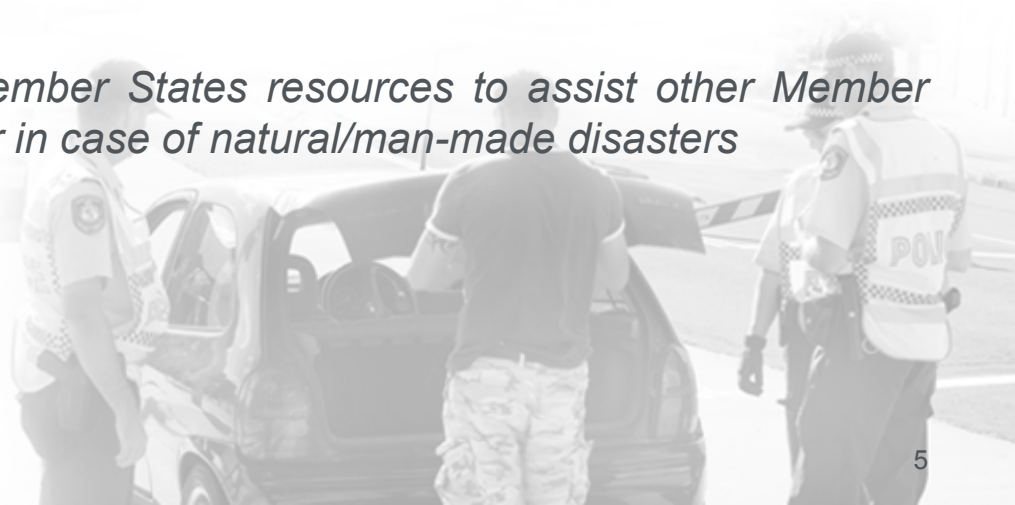


.... *Moreover ...*

- **International crime** (drugs, human trafficking, smuggling...) requiring **joint police operations** on the field:
 - cross-border pursuit of criminals, cross-border patrols and controls, joined investigation teams, international observations, controlled deliveries.
- In **Disaster Relief**, PPDR resource demand often concentrated in **unplanned time** frames different across Countries and
 - the more the cooperating resources available on the field, the more the effectiveness (e.g. less casualties, ...)



- *European Union shall mobilize Member States resources to assist other Member States in case of terrorist attacks or in case of natural/man-made disasters (Lisbon Treaty)*



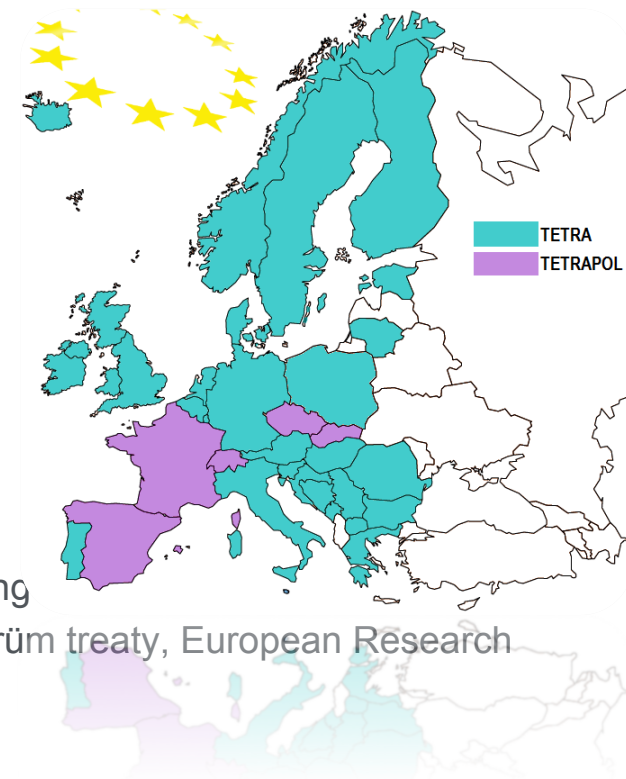
- European **cross border Police cooperation** is an effective/required approach for improving citizens' security
- **Sharing resources for Disaster Relief** at European level improves effectiveness of fire fighting, civilian protection, medical and rescue operations

• **Cooperation on the field requires:**

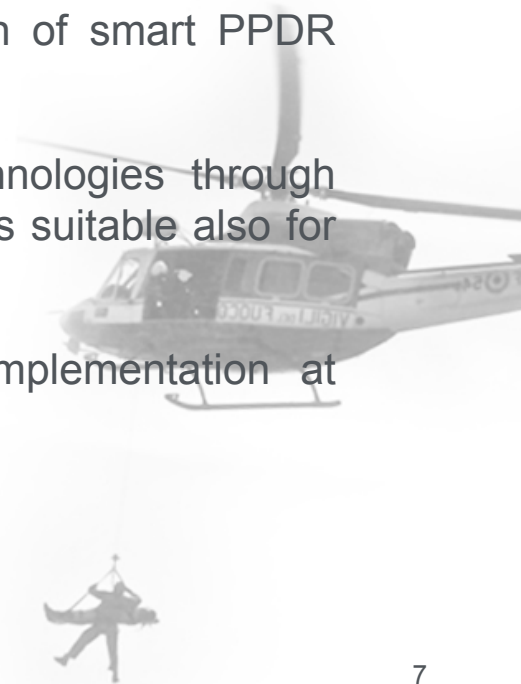
- Interoperable communications
- Jointly agreed procedures
- bi/multilateral agreement in place

• A European approach is now **feasible** due to:

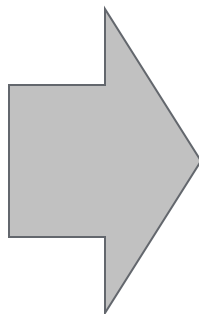
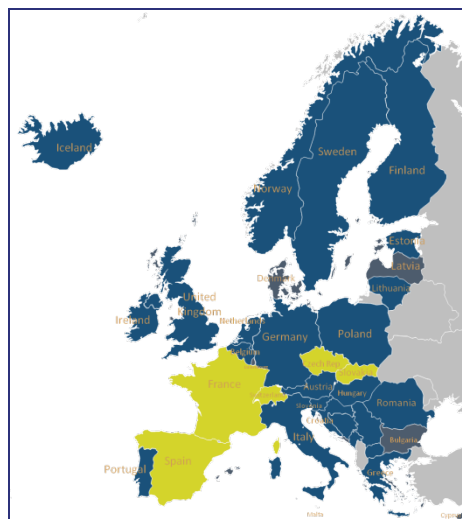
- Reduced cost and risks in technical implementation
- Procedures and agreements harmonization underway among
- Strong support at European level (e.g. Schengen acquis, Prüm treaty, European Research Council (ERC), ...)



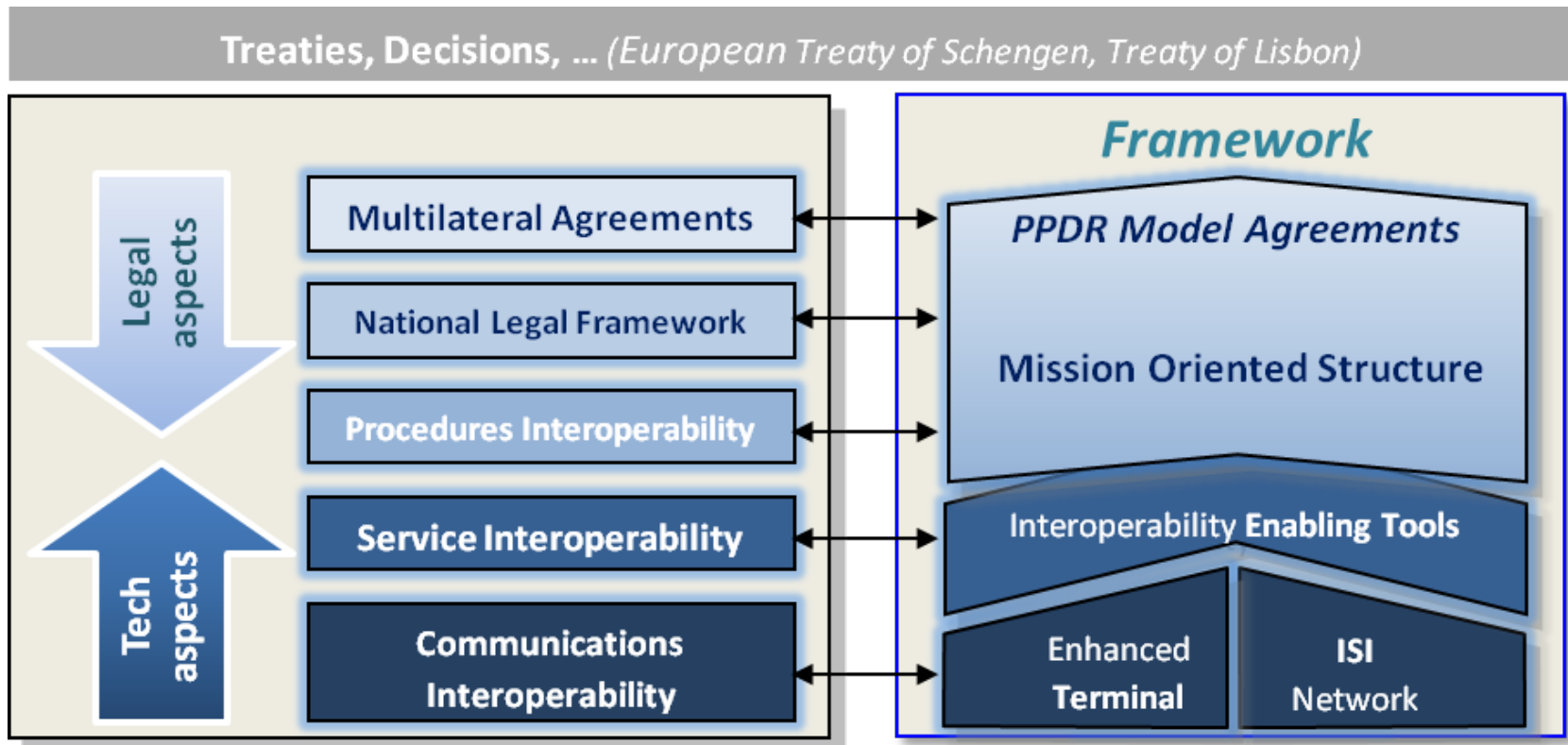
- Provide **interoperability** among PPDR resources of ISITEP federated Countries overcoming current operational and technological barriers;
- allow **migration** of PPDR resources with their own terminals;
- simplify the **entrance of new Member Countries** into the ISITEP European network;
- enable **cooperation** on the field through a new generation of smart PPDR terminals empowered with PPDR applications;
- sustain **open knowledge** on PPDR procedures and technologies through public specifications and protocols for networks and terminals suitable also for future networks;
- define a **business model** sustaining interoperability implementation at European level.



- Realize **a future-proof** pan-European framework for the integration of different Public Protection & Disaster Relief (PPDR) national organizations, merging communications technology, operational procedures and the legal framework
- Deliver operational procedures, functional models and legal agreement in an integrated European communication network framework with new smart terminals



- Interoperability on the field can be achieved **addressing coherently all the legal-technical «layers»** involved in PPDR operations
- ISITEP will address all the involved layers in a specific framework



ISITEP will deliver a framework with four components:

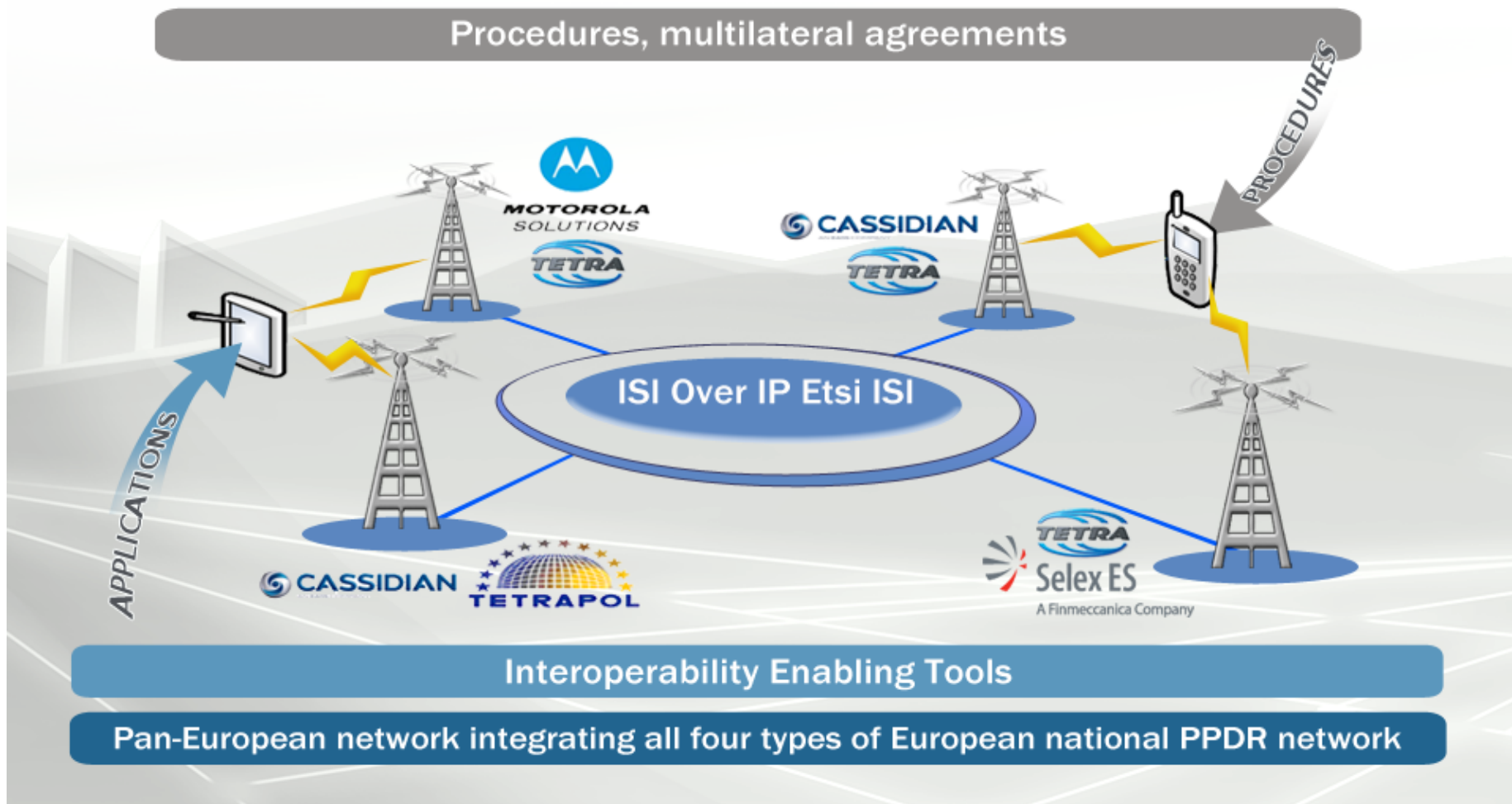
A Mission oriented framework :

- A standardized model for the business processes and workflows required in main PPDR interoperability events harmonizing procedures and technology and taking into account procedures and legal agreements
- The model will be based on the inventory from the European working groups that study the best cooperation standards and practices to carry out these missions, and will use as main reference the Norway-Sweden example

A European Inter System Interface (ISI) cloud network

- This network integrates the PPDR national/regional infrastructures to allow roaming capability services and associated applications within a secure framework
- This capability is obtained interconnecting networks through proper TETRA-TETRA, TETRA-TETRAPOL, TETRAPOL-TETRAPOL gateways based on evolution of ETSI ISI standard

The European PPDR Integrated Network with ISITEP ISI



Enhanced User Terminals

- The enhanced terminal includes a new programmable terminal connected to existing Tetra-Tetrapol terminals.
- For an effective communication interoperability on the field, minimum functions are to be implemented at terminal and network level, e.g location assisted roaming, function based numbering, location dependent call, certified short message order application, translation engines, Workflow manager, Adaptive user interface, a common framework for application development

Supporting tools

- Infrastructures dimension tool based on statistics of PPDR events
- Training and simulation tools
- Business sustainability tool for ISI delivery, for estimating savings from cooperation through the ISITEP interoperability framework

- Through the proposed framework, PPDR agencies can achieve in the short term a cross-national interoperability that leverages existing technologies but is open to the benefits offered by emerging technologies in the long term
- Thanks to the increased cooperation achieved a better management of migration at the European national borders is expected with a reduction of cross border crime activities and a more effective protection of EU citizens. Similar significant improvements are expected in disaster relief management



The project has achieved so far most of its technical objective.
The main results were:

- Formalization of the end-user requirements
- System architecture definition (mesh network of ISI gateways and associated security gateways)
- Release of four gateways prototypes
- Detailed design of the TETRA-TETRAPOL Enhanced Terminal
- Assessment of the procedures for cross border operations across Sweden and Norway
- Release of four trials plans and requirements

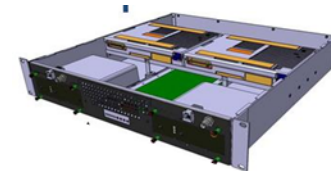
- The release of the TETRA-TETRA, TETRA-TETRAPOL and TETRAPOL-TETRAPOL gateway prototypes; the gateways integration and test plan and a consistent progress of the ISI over IP public specification within ETSI



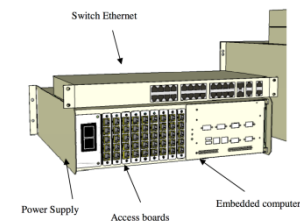
Selex ES TETRA ISI over IP GW
prototype



Motorola TETRA ISI GW prototype

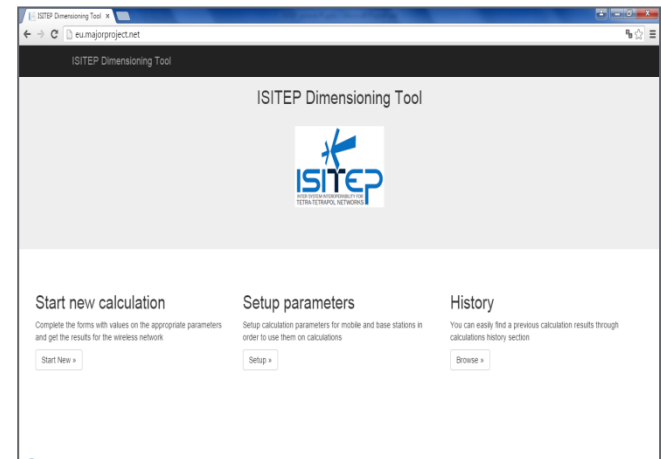
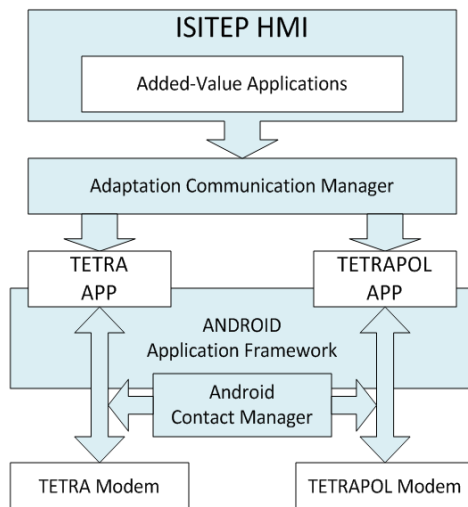


Airbus FR TETRA-TETRAPOL ISI GW
prototype



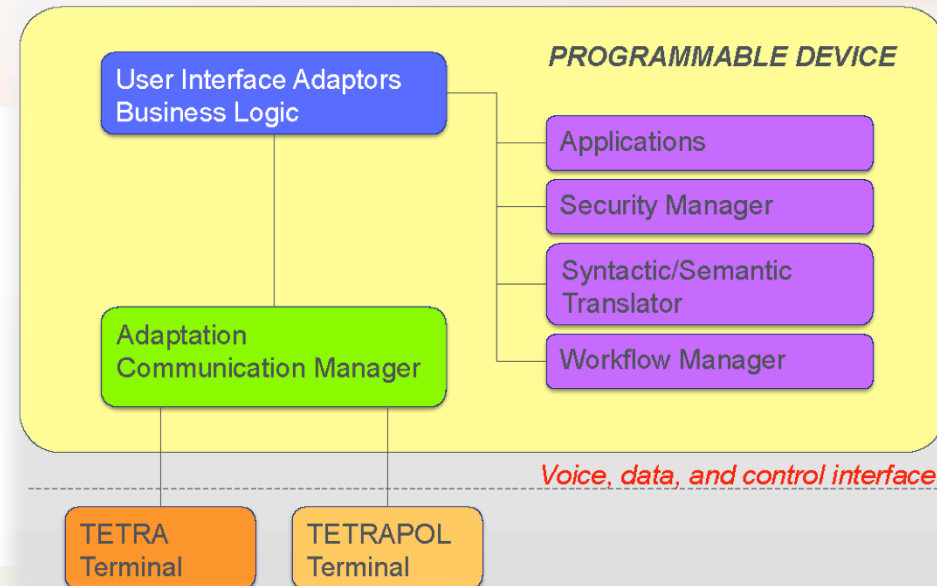
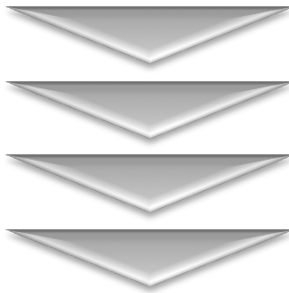
Airbus TETRAPOL GW prototype

- Detailed design of the enhanced terminal sub components
- Interoperability enabling tools detailed design with release of Open public functional specifications for Infrastructures Dimensioning and Training and Simulation tools



Before ISITEP

- PPDR Communication among states is limited due to radio access systems incompatibility (TETRA + TETRAPOL)
- lack of common procedures
- language barriers



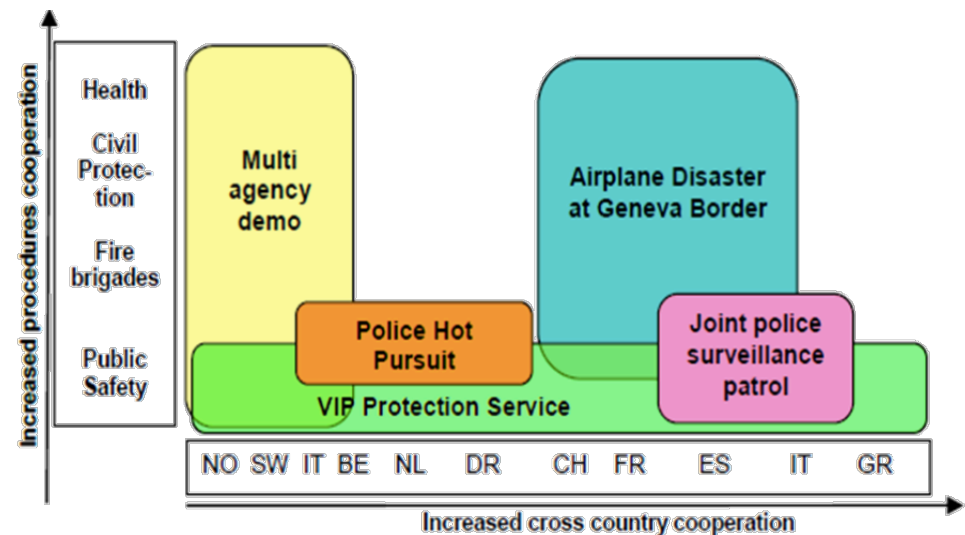
With ISITEP

- Enhanced terminals will allow roaming regardless the telecommunication technology.
- Human factors, workflow, and time will be jointly considered to enable communication interoperability on the field.
- In international PPDR operations, visiting resources will be able to communicate with the same approach used in domestic operations.
- Language barriers will be removed.

- ISITEP results are validated in five trials, involving different groups of European end-users with various degree of involvement in different operational scenarios:

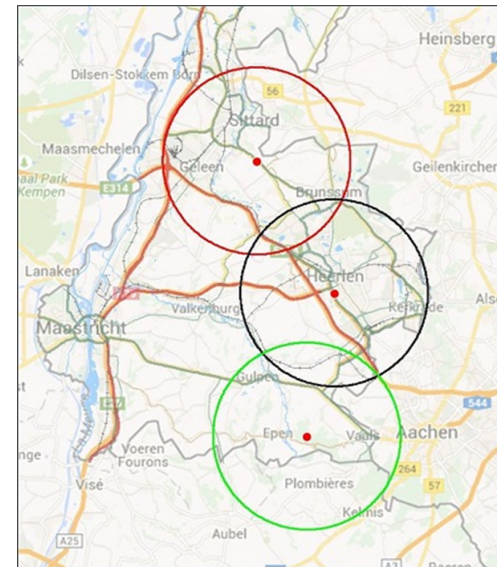


Demo title	Facilitator	Technology	PLACE
MultiAgency Demo	DNK	TETRA-TETRA	Norway-Sweden
Police Hot Pursuit	V&J	TETRA-TETRA	Netherlands
Airplane Disaster	Airbus FR	TETRA-TETRAPOL	Switzerland
Joint Police Surveillance	Amper	TETRA-TETRAPOL	Spain-->France
VIP protection	BFP	TETRA-TETRA TETRA-TETRAPOL	Belgium



- First ISITEP trial:

- First run of the trial has been performed on 26th April 2015, involving Dutch, German and Belgium TETRA networks, with the aims of demonstrating the feasibility of a police cross border cooperation using the ISITEP procedures, network technology, terminals, support-ing tools and associated benefits.
- During the trial communications over ISI gateways allowed interoperability and migration of terminals.
- Second run of the trial will be performed on 25th May 2016



ISITEP partners have been supported in project activities by a group of end-users, helping in strategically drive the project.

ISITEP Advisory board:

- Brussels Police (Belgium)
- Belgian Civilian Protection (Belgium)
- Ministry of Interior (Bulgaria)
- JRC (European Joint Research Center)
- Gendarmerie (France)
- Federal Agency of Radio (Germany)
- Ministry of Citizen Protection (Greece)
- TCCA (TETRA + Critical Communications Association)
- National Centre of Emergency (Norway)
- Guardia Civil (National Police Spain)
- Federal Police (Switzerland)
- Federal Office for Civil Protection (Switzerland)
- National Police (Sweden)
- State Security (Belgium)

ISITEP Advisory Board meetings:

- Brussels, 23 September 2014
- Brussels, 23 April 2015



- Major Dissemination Events:
 - 1st ISITEP User Forum: Brussels 24th September 2014
 - 2nd ISITEP User Forum: Stockholm 24th September 2015
 - Special session on ISI at CCW2015 on 19th May 2015



Publications from ISITEP project:

- F. Colangelo, F. Battisti, M. Carli, A. Neri, F. Frosali, and C. Olivieri, "*Enhanced Terminal for Secure Mobile Communication over TETRA and TETRAPOL networks*", Procs. of IEEE International Conference on Multimedia and Expo, June 29 - July 3, 2015, Torino, Italy.
- Ramon Ferrus, Oriol Sallent, Cor Verkoelen, Frank Fransen, Jaakko Saijonmaa, Claudia Olivieri, Michel Duits, Anila Galin, Franco Pangallo and Debora Proietti Modi. "*Security in Transnational Interoperable PPDR Communications: Threats and Requirements*". The 2nd International Conference on Information and Communication Technologies for Disaster Management, November 2015.
- F. Frosali, F. Gei, D. Marabissi, L. Micciullo, E. Lezaak, "*Interoperability for Public Safety Networks*", Wireless Public Safety Networks Volume 1, 1st Edition Wiley ISTE, 17 Nov 2015.
- R. Ferrús, O. Sallent, C. Olivieri, K. Aabye, A. Rashed, F. Pangallo and D. Proietti-Modi, "*Towards Transnational Interoperable PPDR Communications: the European ISI Cloud Network*" International Conference on Information and Communication Technologies for Disaster Management (ICT-DM'15).

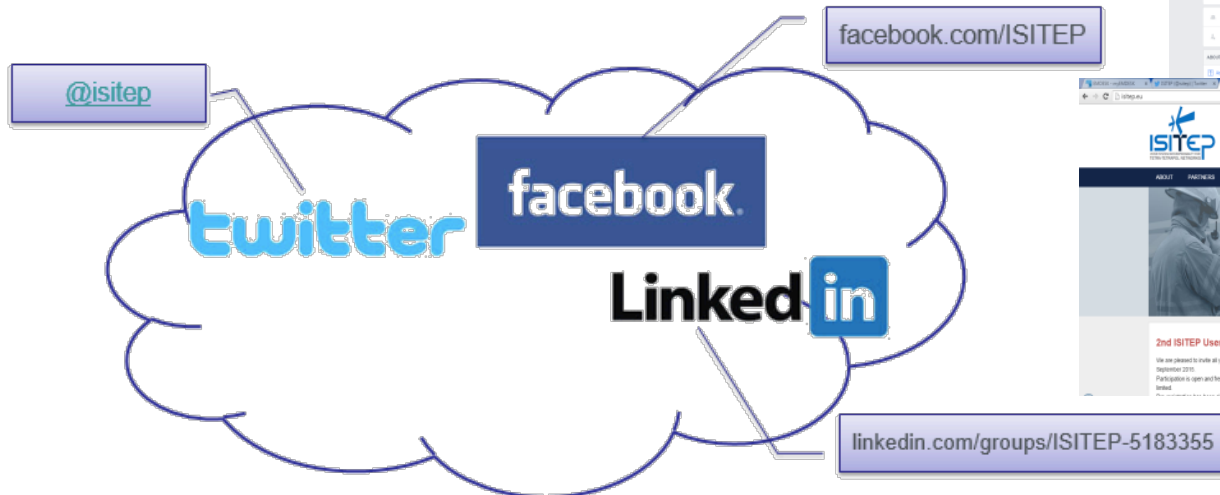
Other publications about ISITEP:

- On time, on target - Tetra today 2/12/2014
<http://www.tetratoday.com/news/on-time-on-target>.
- Norway and Sweden conduct industry's first interoperability testing of communications technology - Tetra today 27/5/20 15
<http://www.tetratoday.com/news/norway-and-sweden-conduct-industrys-first-interoperability-testing-of-communications-technology#sthash.97a63cVp.dpuf>.
- Norway and Sweden's ISI project: the story so far - Tetra today 30/9/2015 -
<http://www.tetratoday.com/news/norway-and-swedens-isi-project-the-story-so-far/>.
- ISITEP: enabling cross-border comms - Tetra today 04/02/ 2016
<http://www.tetratoday.com/news/isitep-enabling-cross-border-comms> .

- Dissemination to general public on major social media:

- Twitter: <https://twitter.com/isitep>
- Facebook: <https://www.facebook.com/ISITEP> (activated during 2nd year)
- LinkedIn: <https://www.linkedin.com/grp/home?gid=5183355>

- ISITEP website: www.isitep.eu



End of Presentation