

Interoperable, secure communication in crisis situation

Observations & Findings of a related Workshop

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In crisis situations (e. g. after earth quakes, tsunami, other natural hazards, man made hazards like chemical and pharmaceutical industrial installations) authorities and aid organizations need to have validated and reliable information about impact of crisis

- ***Such information is provided by different teams (public as well as private)***
- ***Need for standards for validation of information***
- ***US and EU should launch such a process, e. g. through ISO***

In crisis situations (e. g. after earth quakes, tsunami, other natural hazards, man made hazards like chemical and pharmaceutical industrial installations) first responders from different nations, civilian as well as military teams

- need to work together
- Need to have interoperable communication
- Need to have secure communication (not everybody should have access)
 - ***We need to establish international standards in order to provide interoperable and secure communication***
 - ***By doing so USA and EU would support the international community***

Interoperable, secure communication in crisis situation

Findings of a related Workshop

Ispra, Italy
June 28 & 29, 2010

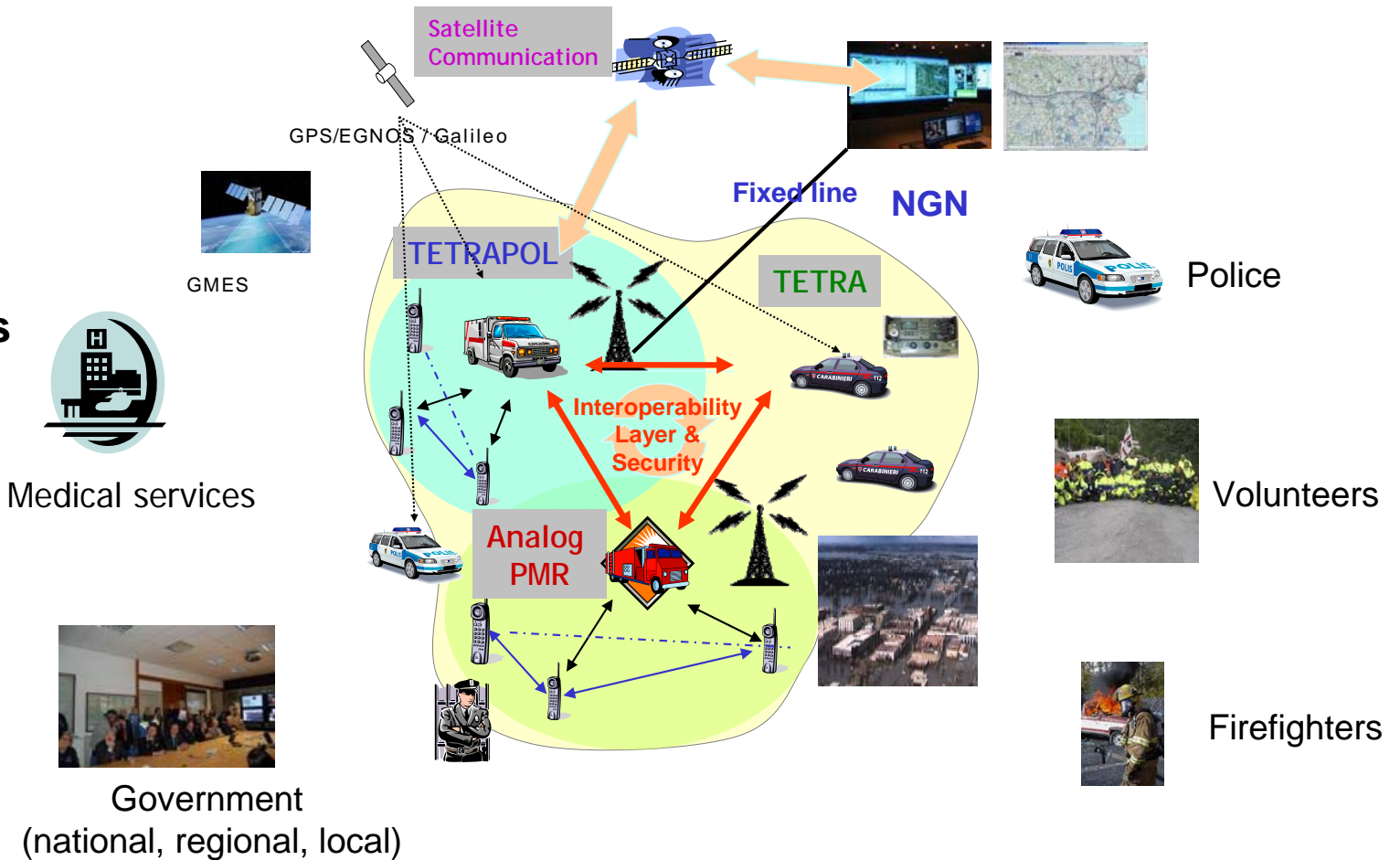


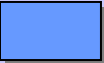

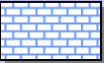



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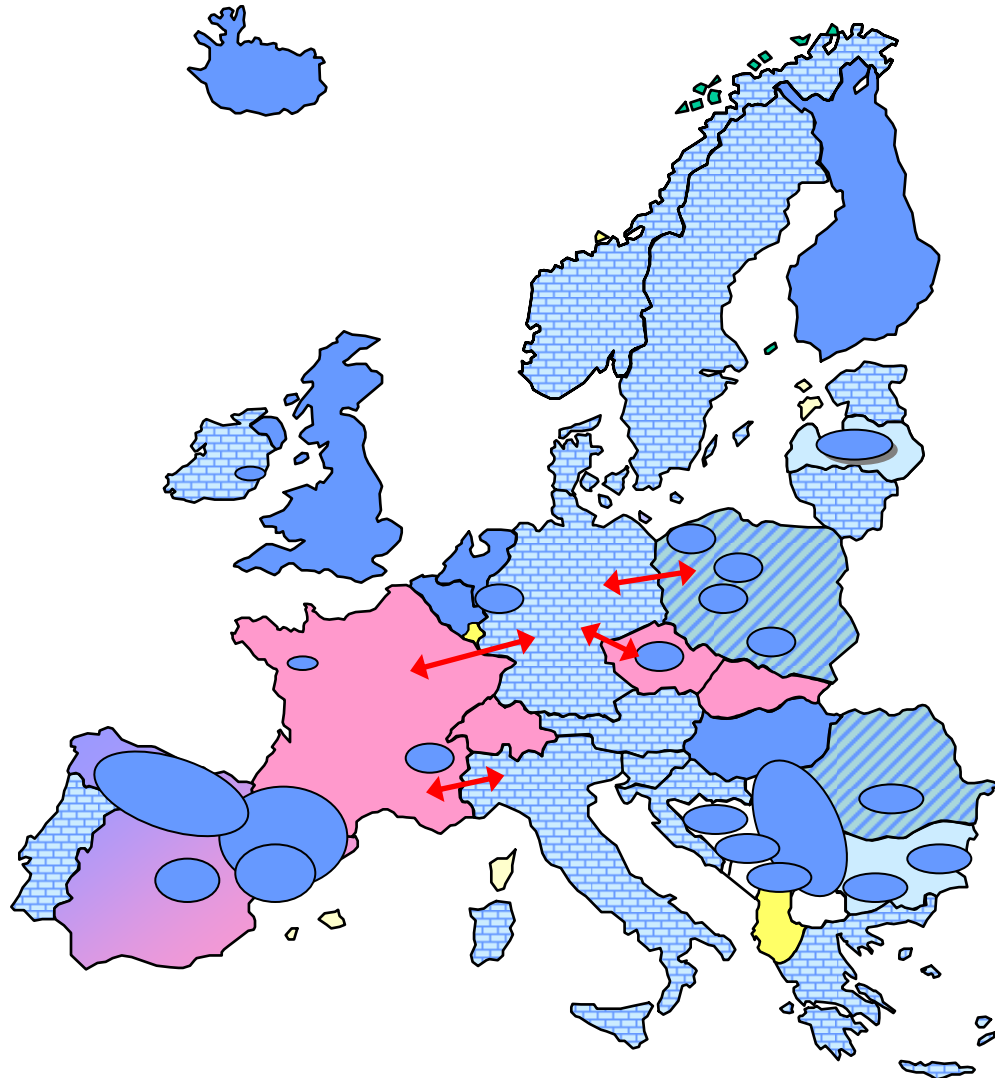


Today, PPDR organizations use different communication technologies, which could cause interoperability barriers.

- TETRA
- TETRAPOL
- Analog PMR
- Satellite Communications
- Flash-OFDM
- GSM/GPRS
- UMTS



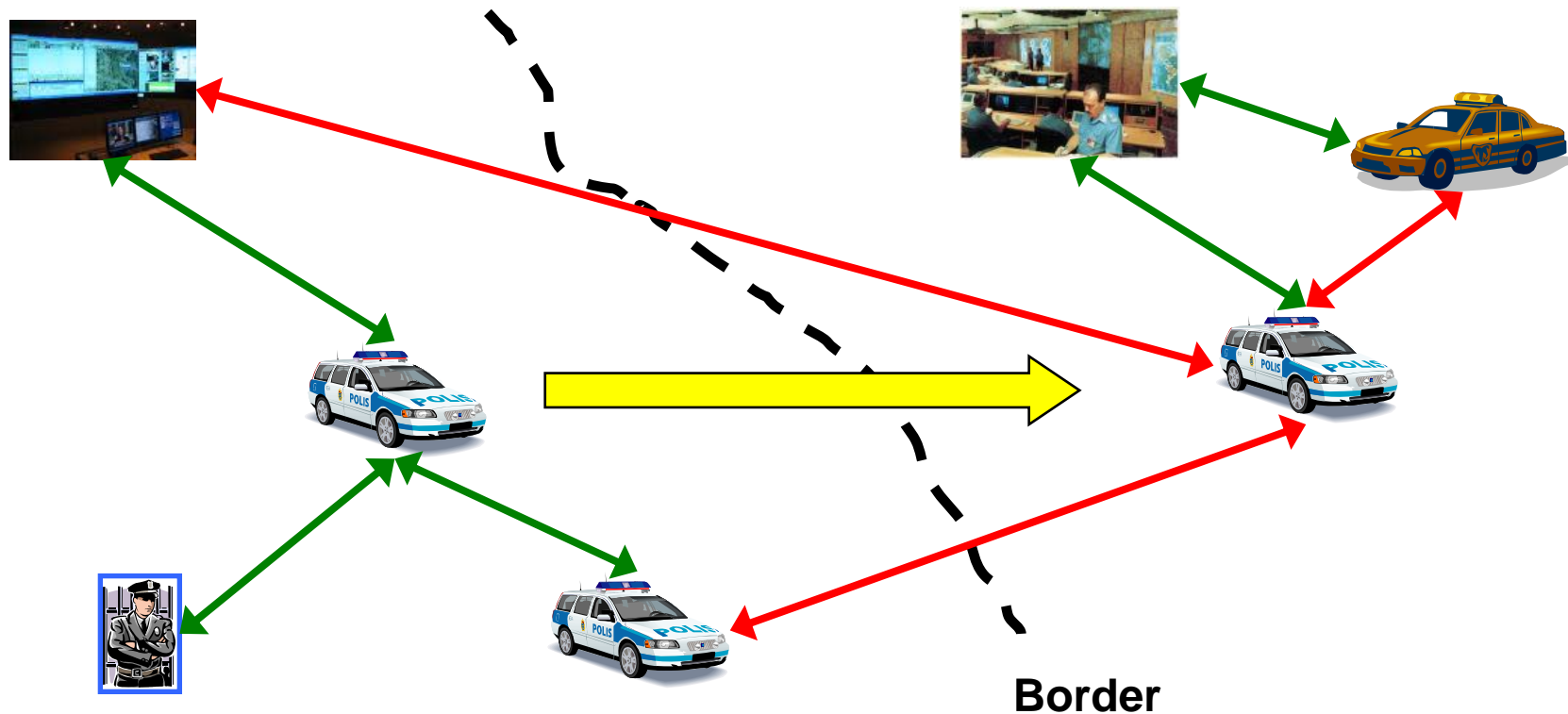
Key	
Nationwide TETRA	
Regional TETRA	
Nationwide TETRA under construction	
Project in progress likely to be TETRA	
TETRAPOL	
No project known	



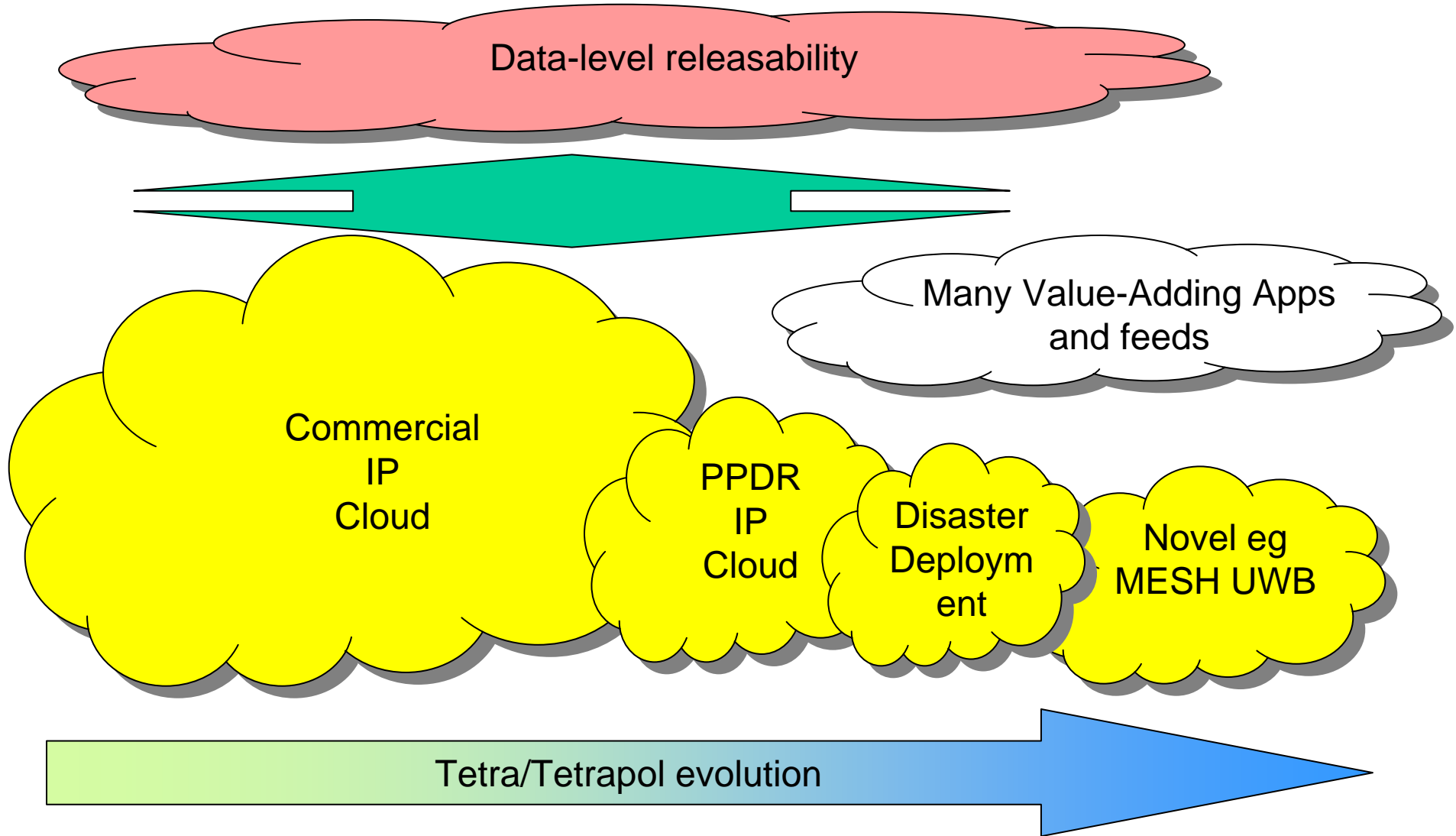
Source: TETRA web site

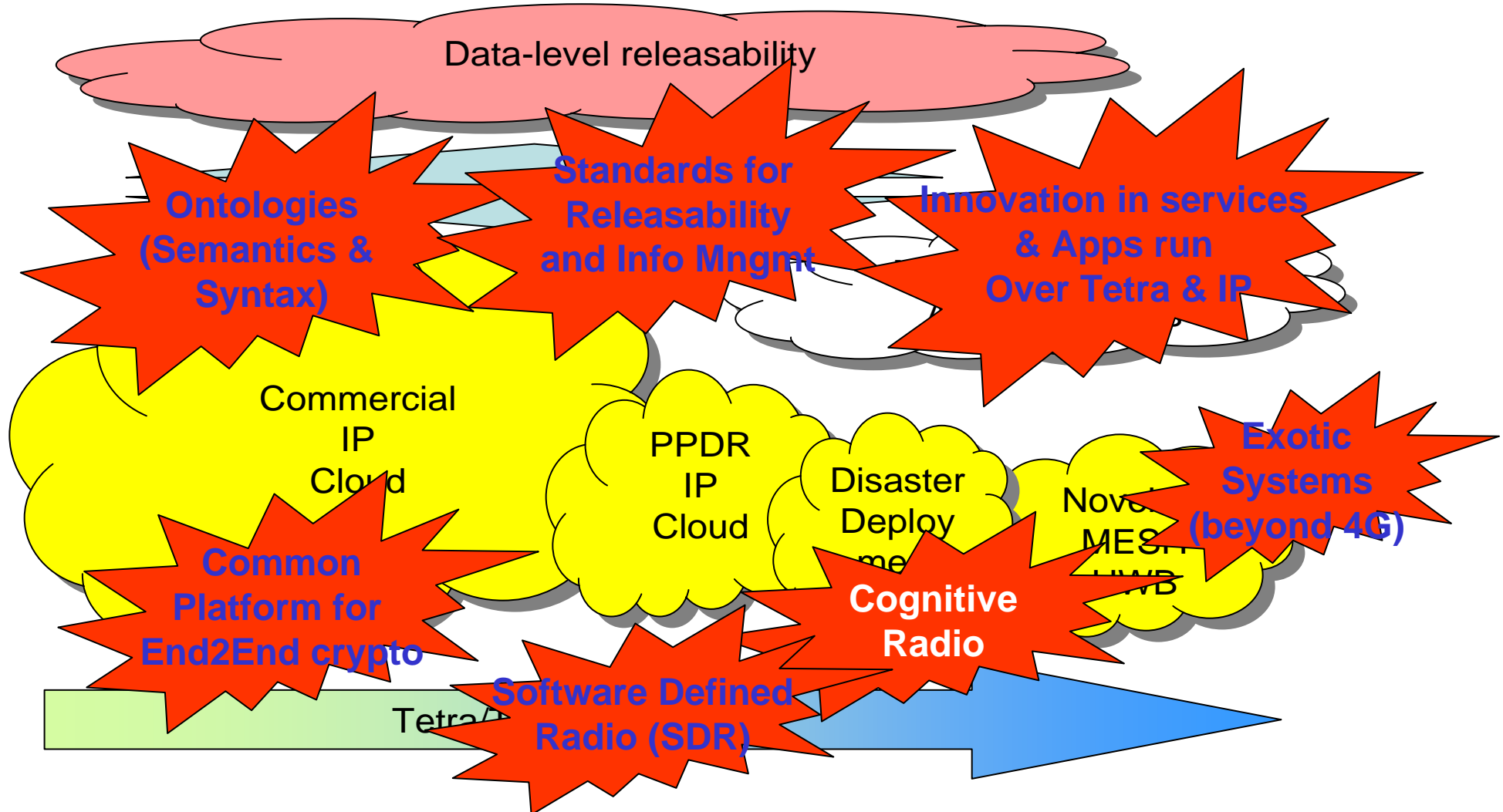
A **significant problem of interoperability** even among same networks (e.g. TETRA) is **missing simple roaming capability:**

A terminal belonging to one network will not be able to communicate or exchange information using the network of another nation based on the same technology.



One example, there are many operational scenarios with interoperability issues.

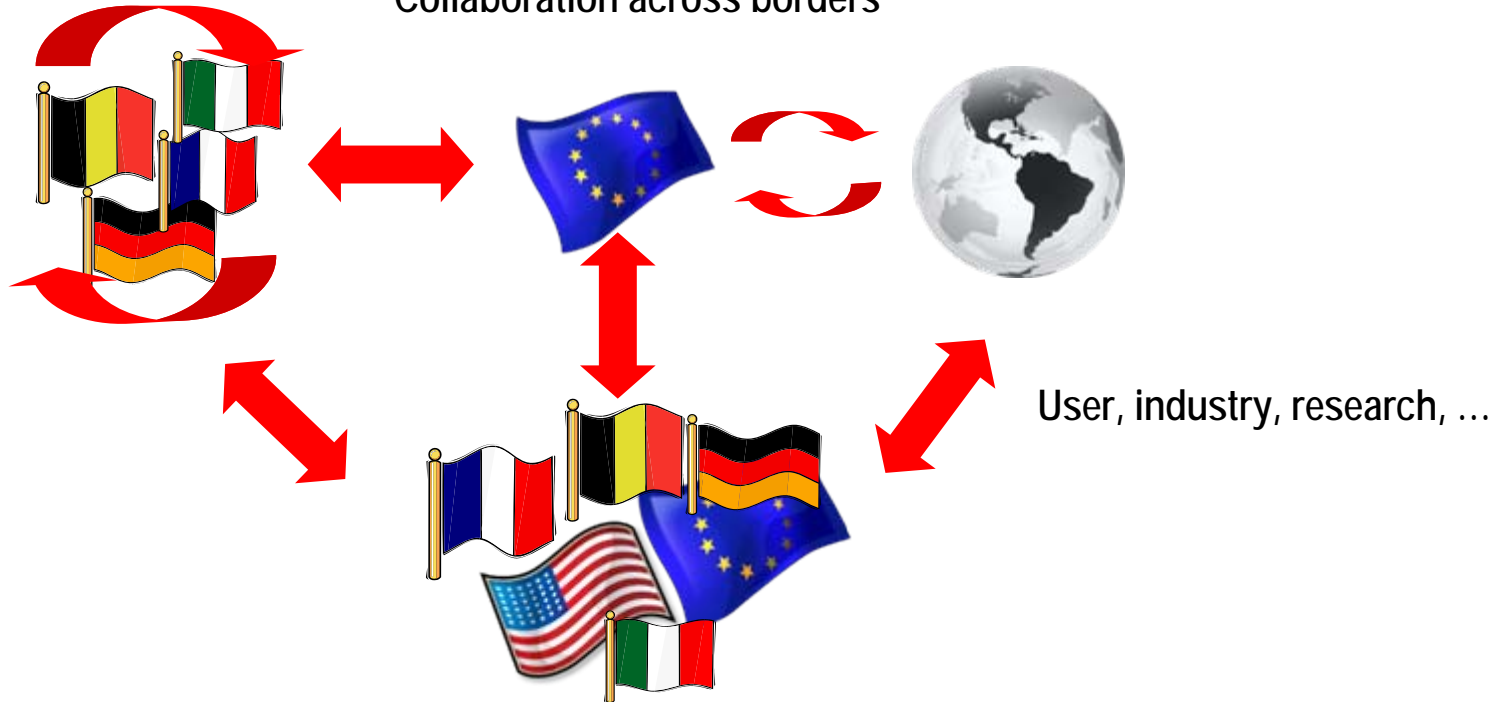




**ILLUSTRATIVE AREAS WHERE FURTHER RESEARCH
IS NEEDED FOR MEDIUM TERM NEEDS**



Collaboration across borders



Thank you for your attention.

Questions?



Public Protection and Disaster Relief (PPDR) services should **create a stable and secure environment**. The provision of adequate capabilities to PPDR organizations and its officers is a priority subject for citizens, National Governments and the European Union.

Telecommunications technologies have an essential role to improve the awareness and coordination of PPDR organizations during their operations.

The Workshop was called to assess that the **lack of interoperability was limiting the effectiveness of PPDR practitioners in actual operations**, and an evident lack of understanding as to whether these limitations arose from technology, operational procedures, gaps in procurement or research.

Meant to launch a **process aiming for interoperable, secure communication systems in crisis situations**

At short term: what processes are needed to secure interoperability of presently available systems e. g. further standardisation efforts?

At mid term: what additional research is needed in order to support further features (e. g. larger bandwidth, support of ad-hoc wireless sensor nets, monitoring of supply chain)?

=> the findings of this workshop will guide security research & standardization efforts in the field of PPDR communications

Around 50 representatives from various domains

European/International Organizations

- EC DG ENTERPRISE
- EC DG JRC
- EUROPOL
- FRONTEX
- ETSI
- Tekes

Public Safety users

- SOCA
- Italian Firefighters
- Police Netherlands
- Finnish Police
- Spanish Ministry of Interior
- Norwegian Emergency communication in Health
- French Ministry of Interior
- BDBOS
- BA THW

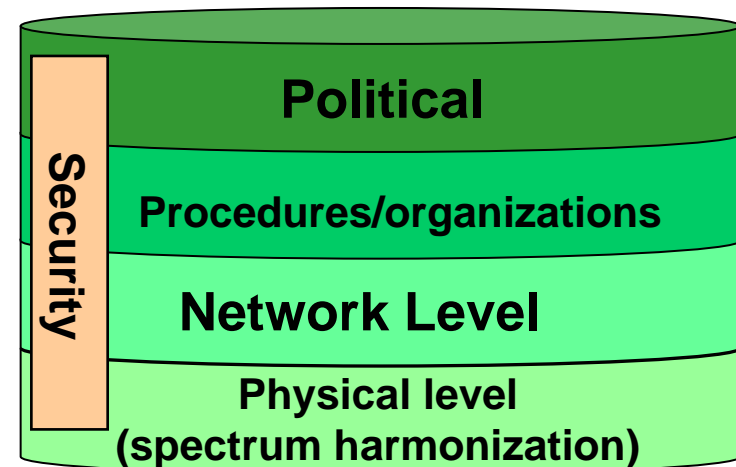
Industry/Research

- SEPURA
- SIEMENS
- MOTOROLA
- Selex Communications
- NearShore
- Thales Communications
- EADS Secure Networks
- Inmarsat
- TÜV Rheinland Group
- Telefonica
- Cologne University
- Ajeco
- Defence and Security Industry Association of the Czech Republic
- Czech Faculty of transportation sciences
- Laurea University
- University of Paderborn
- Athena GS3
- Poyry
- Pinoak

In Europe, interoperability barriers among PPDR organizations could be:

- different Public Safety organizations in the same nation **use different communications systems**. Terminals and networks are not interoperable because they are based on different standards and technologies.
- Public Safety organizations in different nations **use different networks, which may not be interoperable** even if they are based on the same technology.

Interoperability barriers could be present at different levels:
Political, Procedures, Network and Physical level.
Security may also create interoperability barriers.



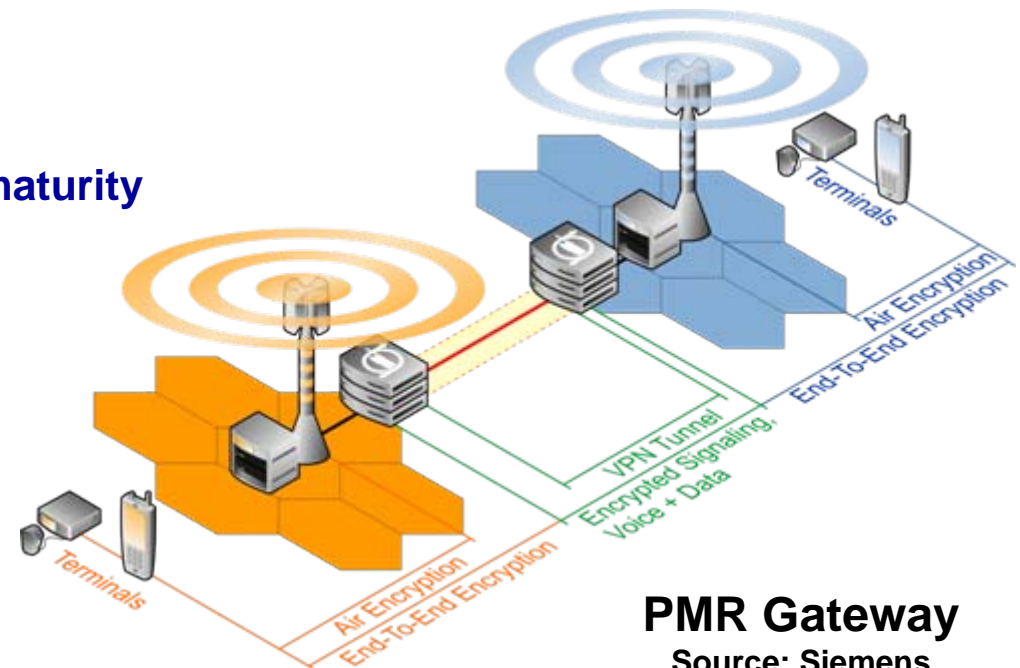
- **Defining the need for interoperability among Public Safety organizations at national and European level & international level**
 - **Lack of clarity in demand for interoperability, not technology, is limiting its achievement**
- **Developing realistic scenarios for interoperability (for law enforcement, crisis management, border control, etc) and associated business cases. In EU EUROPOL and FRONTEX have been asked to take on this duty.**
 - **Examples: cross-border operations, roaming across networks**
- **Harmonizing operational procedures and command practice, including 24x7 communication command centers.**
- **Need to align security policies at European level & international level.**
- **Achieving a coherent message from the many different groups addressing differing aspects of interoperability.**
- **Developing procurement approaches that enhance the competitiveness of EU industry**
 - **Interoperable secure communication has been recognized as potential lead market,**

- **Interoperability in Public Safety requires a complex mix of standards, profiles, procedures, system management and policy.**
- **Operational Research has a dominant contribution. Technology capabilities play an important supporting role. Operational incompatibilities can often be mitigated by technology. There is some evidence that full capabilities of TETRA/TETRAPOL are not being exploited**
- **In most cases, existing standards and technology capabilities can meet current interoperability needs but gaps are present. Gaps arise through lack of demand or fragmented information command.**
- **Different national or organizational crypto policies are another obstacle to interoperability.**
- **There is a clear need to engage more fully Public Safety end-users in research**

Industry has presented a wide range of technological solutions to mitigate the interoperability challenges including:

- Professional mobile radio (PMR) Gateway based on circuit-switched technology (already existing)
- PMR Gateway based on IP (in development phase)
- Software Defined Radio terminals and base stations
- ALL-IP network architectures
- Use of commercial networks (e.g. LTE)
- Multi-level security

Each of the proposed solutions is in different development phases and technology maturity



PMR Gateway
Source: Siemens

Other challenges for PPDR organizations in the area of communications:

- **Public Safety responders need high communication bandwidth to transmit images and video.**
- **Public safety operations are usually unplanned and communications facilities are not guaranteed.**
- **Evolving Technologies and standards may cause the existing wireless equipment to become obsolete. Equipment lifecycle can be a problem.**
- **Secure tracking and tracking of goods is an important functionality in natural disasters (e.g. Haiti)**

In Europe, **lack of communication bandwidth is an increasing concern for many PPDR organizations. New PPDR applications will require transmission of data and images to support the operational capability of PPDR officers.**

- The existing spectrum identified for PPDR type services does not meet the actual need, particularly for high speed data communication (From CEPT PPDR Workshop, Mainz, March 2010)
- The highest bandwidth requirement results from operation categories of “demonstrations and mass events“ and “natural and other major disasters“
- New spectrum bands should be allocated. Preferably below 1 GHz. The spectrum bands be “harmonized”: they should have the same allocation in all European member states
- CEPT FM 38 has the task to identify new spectrum bands. The first conclusions are that wideband connectivity could be provided with 2*3 MHz bands but not broadband connectivity, which requires 2*10 MHz. New solutions or frequency bands should be identified.

- **Generalised interoperability is expensive, long term and likely to conflict with policy. Focus on real interoperability needs . We must rationalise and raise impact on the most significant needs. Identify realistic operational scenarios (EUROPOL and FRONTEX could be Point of Contact).**

- **Definition of experimentation facilities to explore interoperability scenarios and clarify benefits from interoperability or improved broadband connectivity.**

- **Pre-procurement and support for specific solutions where national markets are too limited**
 - **TETRA Inter System Interface (ISI) to support roaming and cross border interoperability**
 - **Encouraging manufacturers to supply multi-standard architecture and handsets, aiming for affordable upgrades and ‘future proofing’ as well as TETRA/TETRAPOL compatibility**

- **Develop harmonized procedures at European level for defining groups across systems, command doctrine, training & rehearsal.**

- **Identify the main application and requirements for broadband connectivity. Investigate alternative ways for broadband connectivity (different spectrum bands, satellite, cognitive radio).**

- **Define experimentation facilities to steer research and stimulate new ways of working. Opportunity for new technology and new processes to be prototyped bringing together users, research and industry. It can be distributed (network of research centers) across Europe.**
- **Widen standards and certification activities to new areas like definition of common ontologies (semantics, syntax), smart sensors networks, etc**
- **Investigate IP access to commercial networks with supplementary capability for Public Safety when and where required.**
- **Adopt open innovation approach to applications for Public Safety based on clear business models (e.g. link to insurance companies).**
- **Stimulate research into novel extensions (e.g cognitive radio, monitoring of supply chain) or overlays to meet long term needs. Support to EU industrial competitiveness is essential.**
- **Definition of a formal process for proposing, commenting upon and agreeing evolution of standards. Focus on ETSI (technical standards) TETRA Association and PCWG (profiles and procedures). Do not forget about collaboration with non-EU countries. E.g TETRA is also used outside EU.**