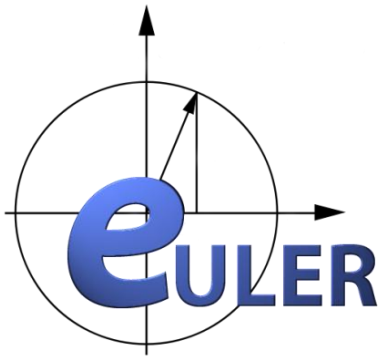

EULER - The first pan-European SDR-based public safety communications platform project

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Table of Contents

1 Introduction

- Difficulties in the use of radio communications
  - lack of interoperable interfaces
  - prohibits effective roaming.

- Public Protection Disaster Releif (PPDR)
  - effective cross-border cooperation
  - adequate communication capabilities
  - interoperable radio communication systems

- Security is needed
  - avoid possible SDR communication attacks
  - Protect Public Safety officers and the people.

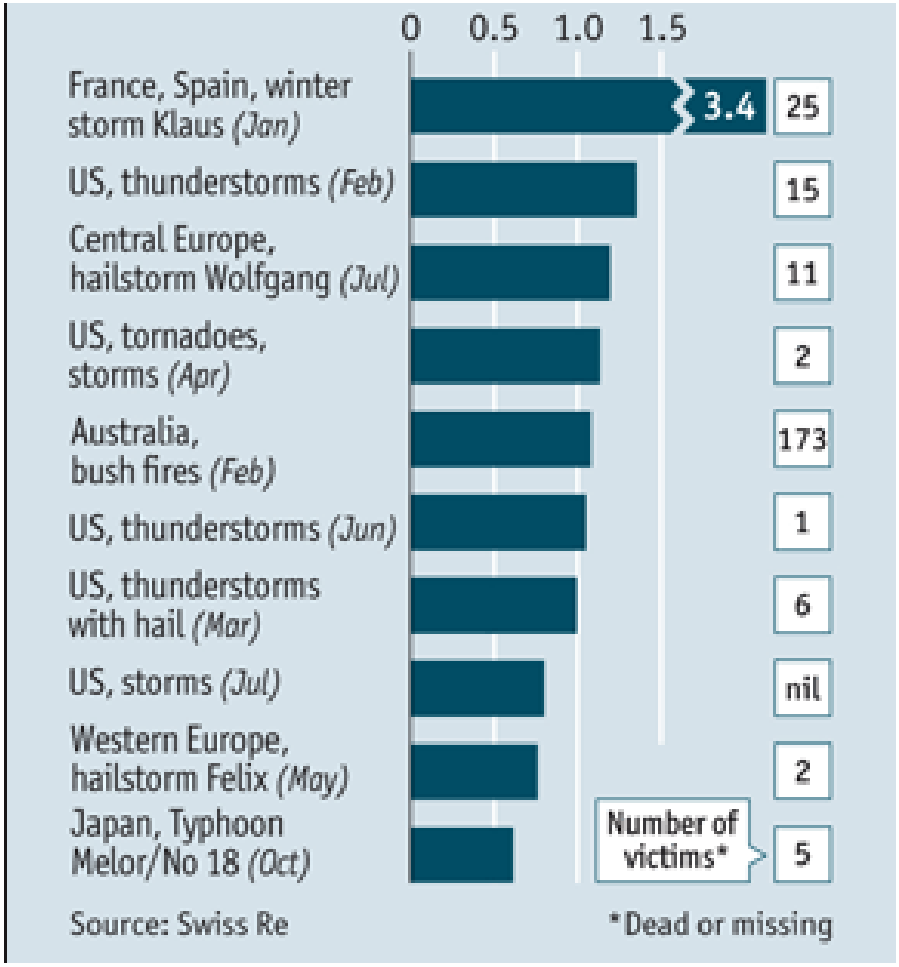
- The EULER network and nodes are
  - based on SDR technology
  - WF implementing the 802.16 standard (WiMAX).

2-1 Motivation: Shared Spectrum

Service Type	Proportion of Spectrum
Defence	27.2 %
Transport	20.7 %
Emergency services	0.9 %
other public	1.4 %

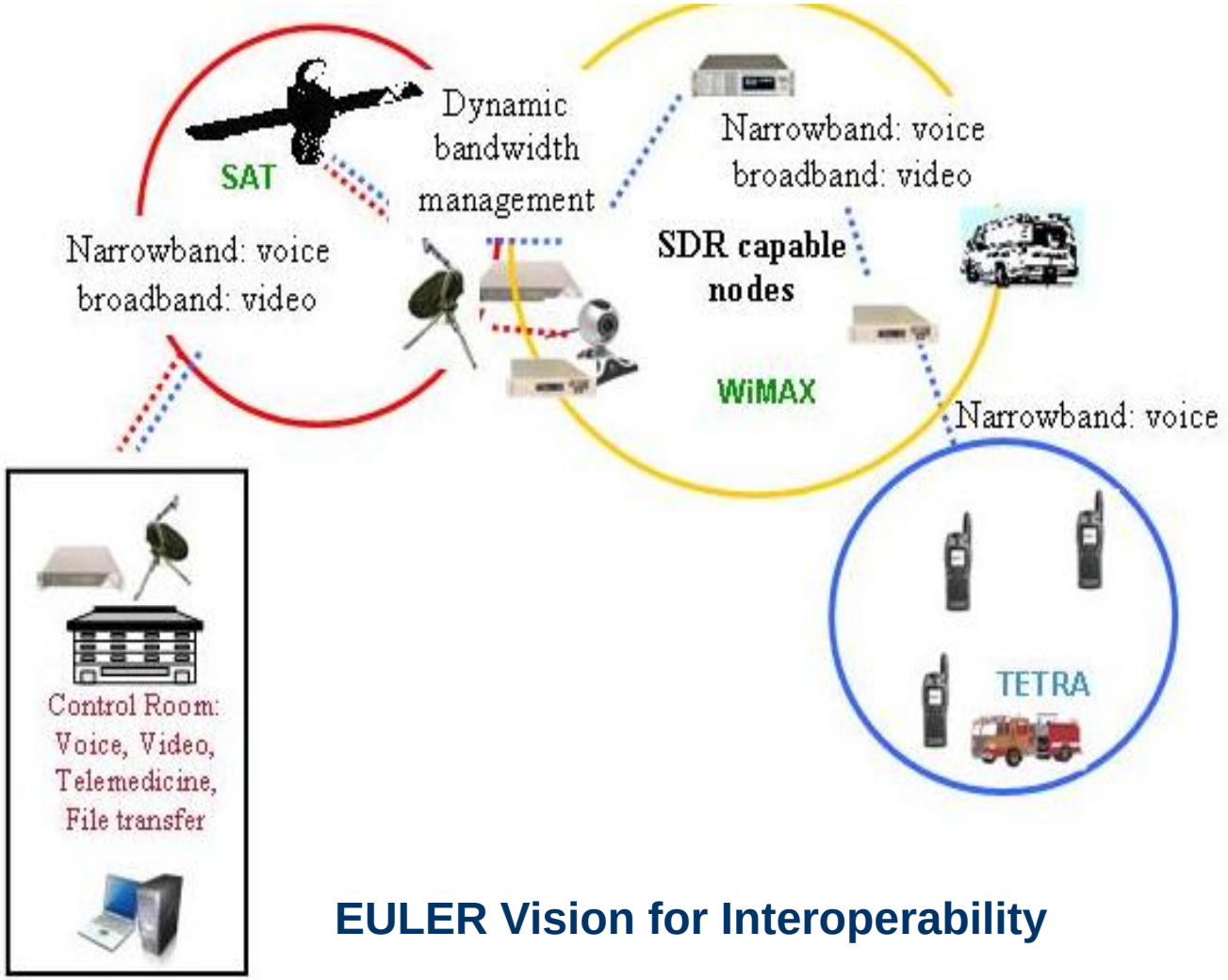
PUBLIC SECTOR SPECTRUM USAGE IN THE 108 MHZ TO 6 GHZ BAND

2-2 Motivation: Loss of Life and Cost



Natural Disasters in Terms of Biggest Insurance Losses and Loss of Life

3-1Interoperability issues



EULER Vision for Interoperability

3-2EULER Communication Attributes

- Physical layer and protocols characteristics
  - matched between the systems
  - RAT & RAN
  - conversion of physical and electrical states,
  - rate adaptation

- Mapping service data units with an inter-working protocol, including conversion, filtering and discarding;

- Handle compatibility information and service agreement;

- Provide conversion between numbering or channeling plans (see tuning range following);

- Information assurance.

4-1 Spectrum Allocation issue

- In Europe, 380-400 MHz frequencies are often used
  - 25kHz channels
  - Mostly voice
  - most common type of network is TETRA.

- Dedicated spectrum sufficient to carry video and other wide-band data for operational communications will increase

- Political diversity of Europe is reflected in the variety of spectrum regulations at national level.

- Within nations the need for harmonized frequency tuning ranges is important.

- Global spectrum identification is important to allow worldwide Disaster Relief communications

4-2 EULER Perceived Requirements

- Verification of biometric data.
- Wireless video surveillance and remote monitoring.
- Automatic number plate recognition.
- Documents scan
- Database checks.
- Transmission of Building/Floor plans.
- Monitoring of vital signs of Public Safety officers.
- Remote emergency medical services.
- Collect and share.
- Access to images.

These are wider scale than what EULER seeks to address in the short term.

5-1 EULER backbone discussion

Possible Spectrum Strategies

A) Licensed bands allocated allocations

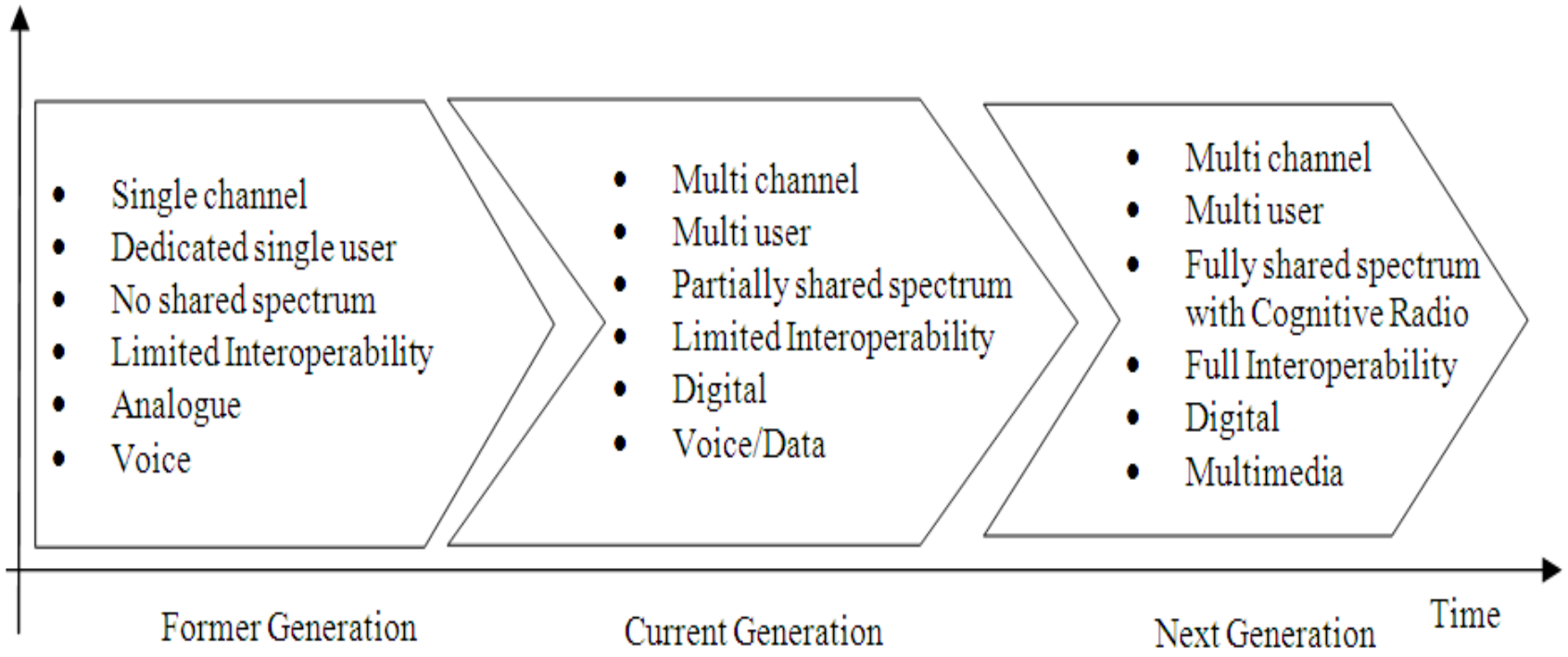
B) Licensed bands owned by another (primary) user, so that EULER would be the secondary users (suitable for scenario 2).

C) Licensed bands shared between EULER and another network(s) with a spectrum sharing mechanism for the band, where EULER has priority.

D) License-exempt bands requiring no license

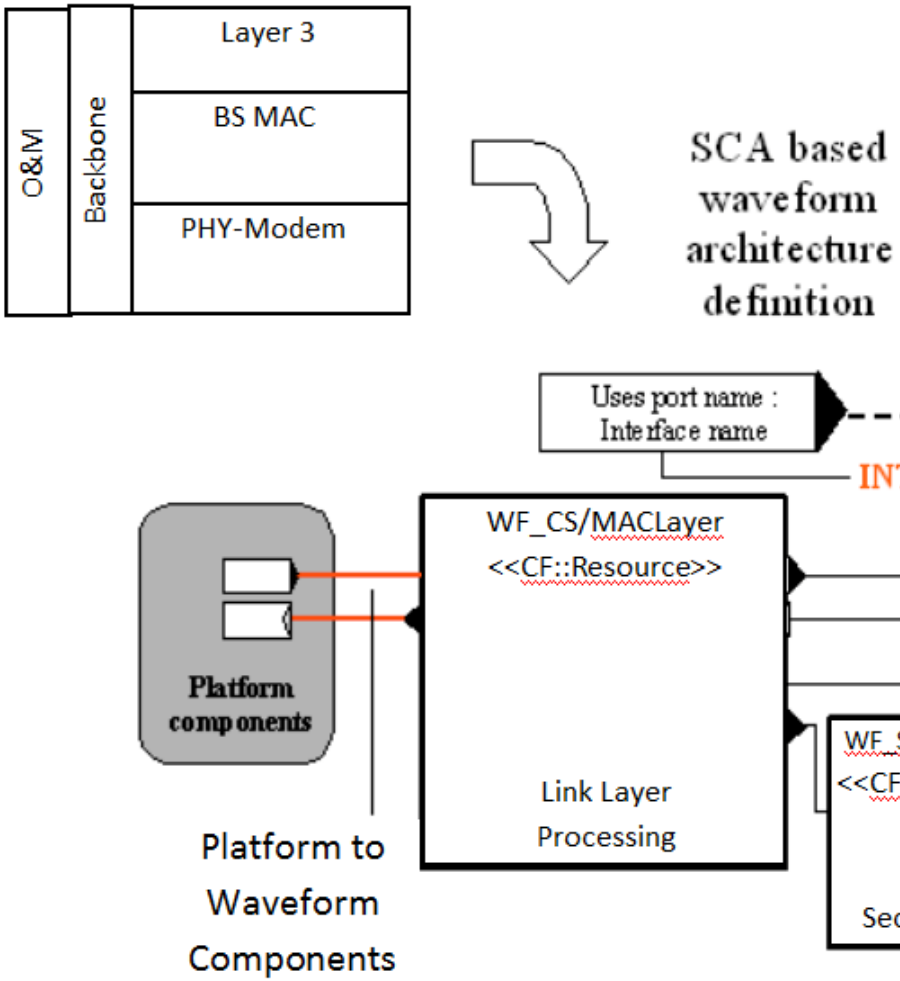
These are aspects beyond technical, more legal and political - Needs coordinated assessment

5-2 Public Safety Evolution



6 Perceived EULER WF architecture

EULER HDR WF architecture definition



7 Security issues

•Security enforcement is constrained by the information sensitive level,
•Aspects of INFOSEC, COMSEC and TRANSEC

•A wider-scale vision of interoperability has to consider components provided by SDRs and the correspondent subsystems hosting AAA:

- •A = Authentication:
  - • the service to ensure that the communication entity is the one that it claims to be.
- •A = Authorization:
  - •function determines whether a particular entity is authorized to perform a given activity.
- •A = Availability:
  - •that the wireless communication resources are available and usable by authorized users.

8 Conclusions & Future Developments

- There is an increasing demand for the Military and public safety services to provision interoperability and support spectrum sharing

- This demand is driven by the need to increase the capabilities of military and public safety organizations in the resolution of man-made and natural disasters.

- The EULER project advocates the use of SDR systems and terminals to implement “spectrum sharing”.

- In Europe, spectrum challenges are even more severe than in other political regions, because of the political diversity and consequent fragmentation

- Our solution is in the developmental stage and explores these aspects to enhance to communications and networking with interoperability features.

Thank you ?