Aspects on interoperability between TETRA networks
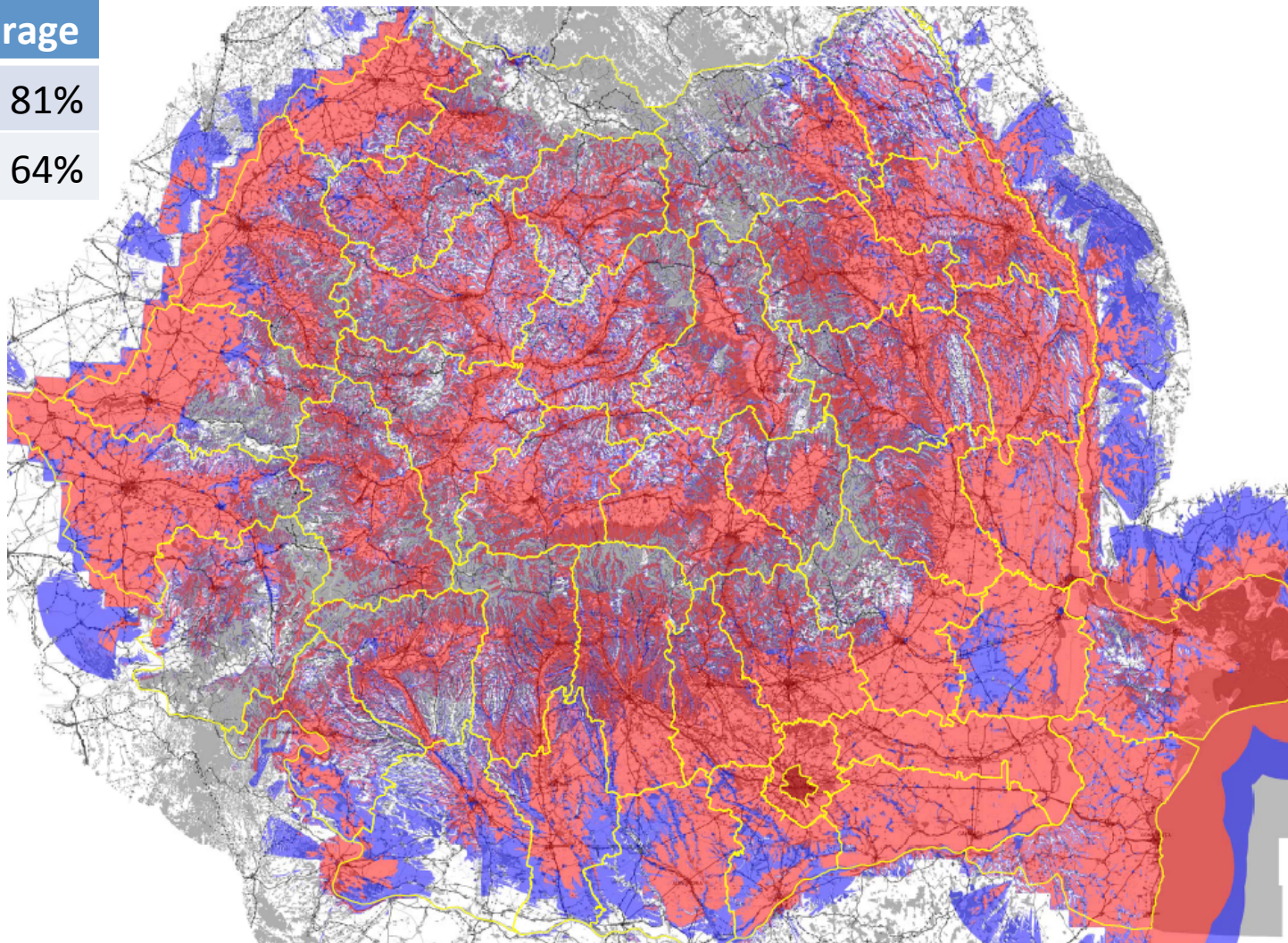
Presenter: Sorin Vasilca

Agenda

- Current TETRA networks implementation
- Interoperability of services
- Conclusions

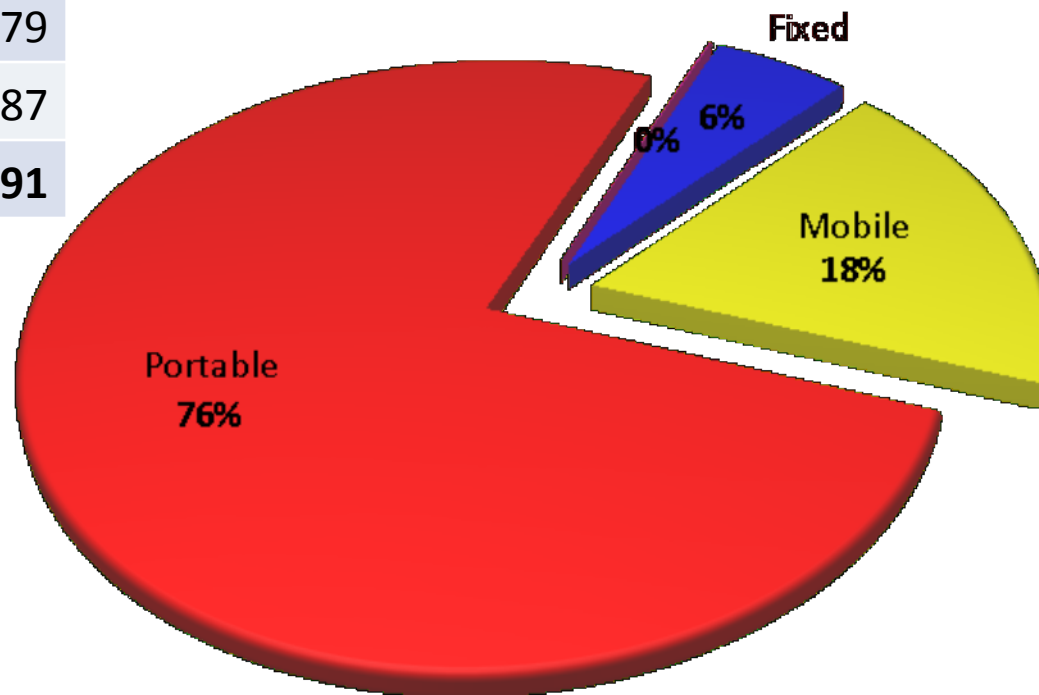# Current TETRA networks implementation

TETRA RO1 Coverage	
Mobile	81%
Portable	64%

Current TETRA networks implementation

TETRA RO1 Terminals	
Fixed	4.439
Mobile	13.886
Portable	58.379
Dispatch	87
TOTAL =	**76.791**

Fixed

0% 6%

Mobile
18%

Portable
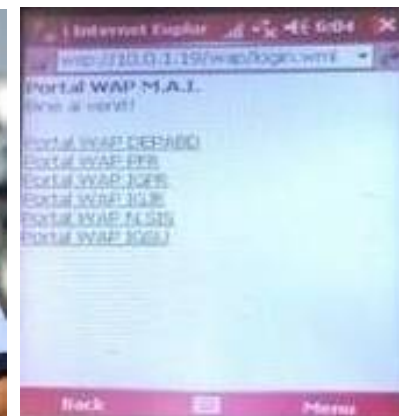76%

Current TETRA networks implementation

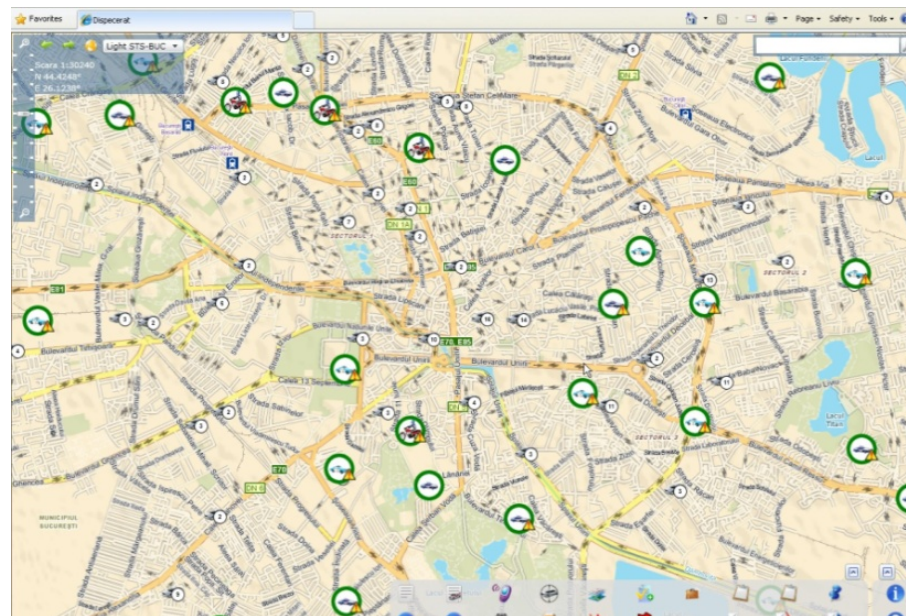**TETRA RO1 Operational Services**

Voice services

- Group call
- Selective call
- Phone call

Data services

- Packet Data
- Short Data

74% of terminals use PD access

58% of terminals use SDS AVL services
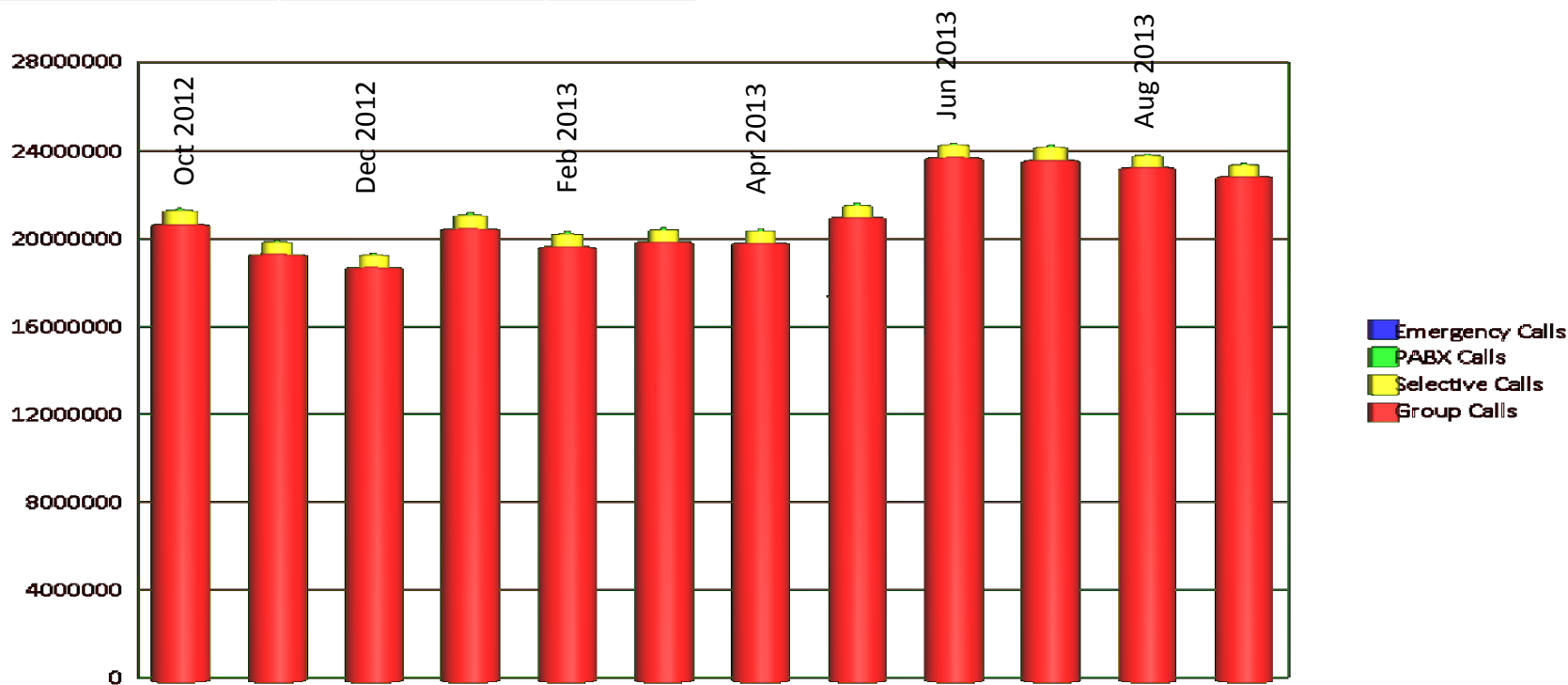
Current TETRA networks implementation

TETRA RO1 Statistics		
Type	**No**	**GoS**
Group Calls	251.357.845	0.09%
Selective Calls	6.833.765	0.17%
Phone Calls	1.258.021	0.30%

Current TETRA networks implementation

TETRA RO1 Ad-Hoc Services:
- Base Station over VSAT
- Mobile Command & Control Center
- Search & Rescue Operations

Current TETRA networks implementation

Since 2009 the 2nd TETRA Network in operation

- Service Area: Romanian Border
- Operator: Ministry of Interior
- Main Customer: Border Police
- Services: Voice & Data
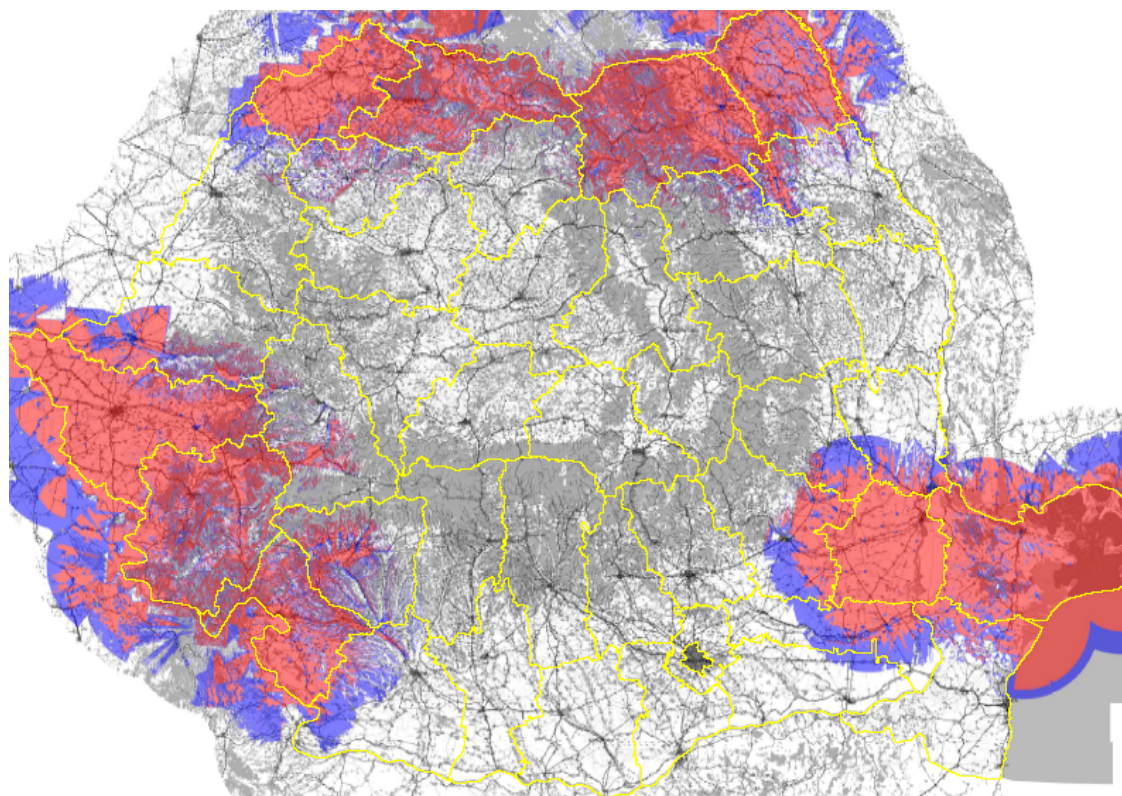- Performance: Same SLA, GoS

TETRA RO2 Coverage	
Mobile	91%
Portable	79%

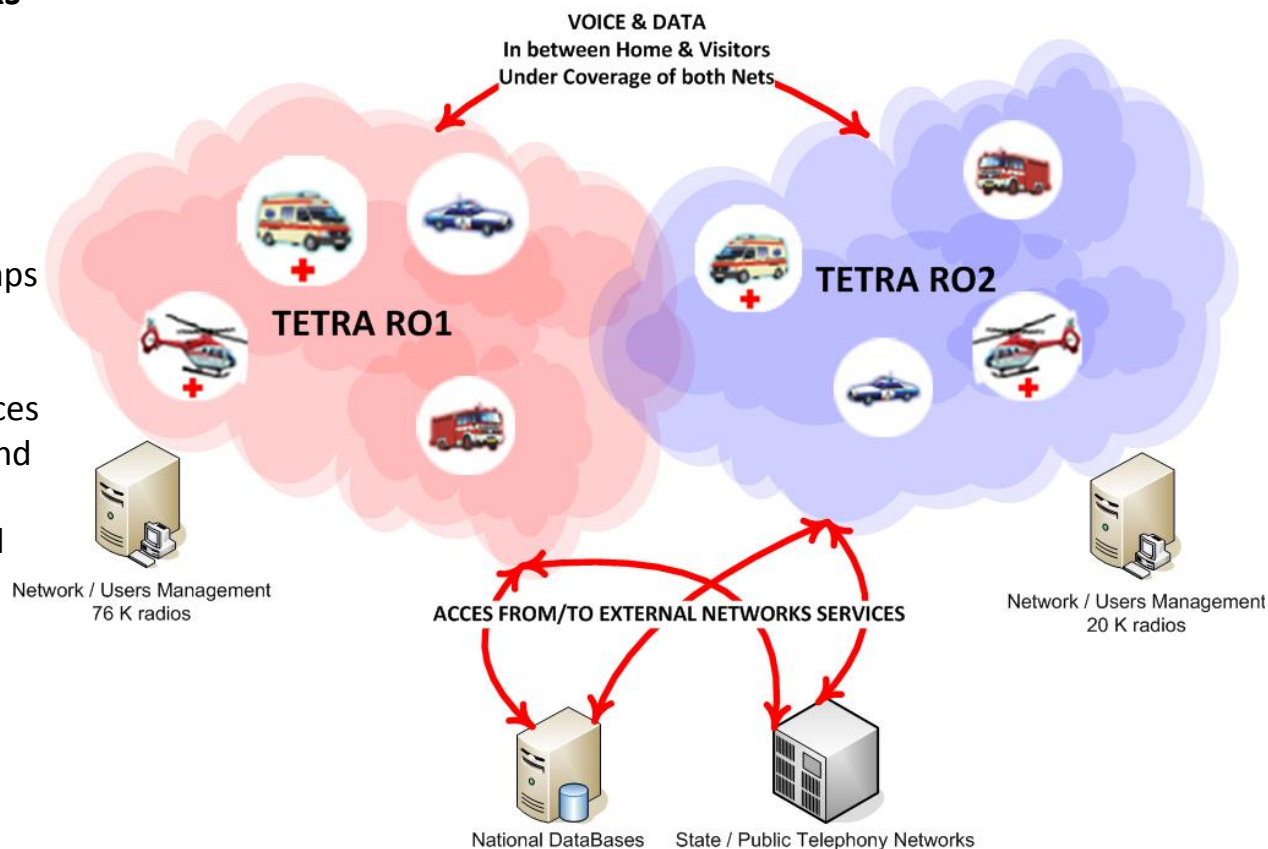| TETRA RO2 Radio Terminals	
Fixed	1.098
Mobile	3.513
Portable	15.645
Dispatch	17
TOTAL =	**20.256**

Current TETRA networks implementation

2 Operational TETRA Networks

Infrastructures
- Critical – Public Safety & Law Enforcement Agencies
- Similar Coverage, Performance, Services – min overlaps and min gaps

Users requirements
- Intensive Usage of RT/NRT services under each net, in between nets and toward external networks
- Transparent migration – manual or AIM
- High Mobility
- Separation of technical / operational management

VOICE & DATA
In between Home & Visitors
Under Coverage of both Nets

TETRA RO1

TETRA RO2

Network / Users Management
76 K radios

Network / Users Management
20 K radios

ACCES FROM/TO EXTERNAL NETWORKS SERVICES

National DataBases

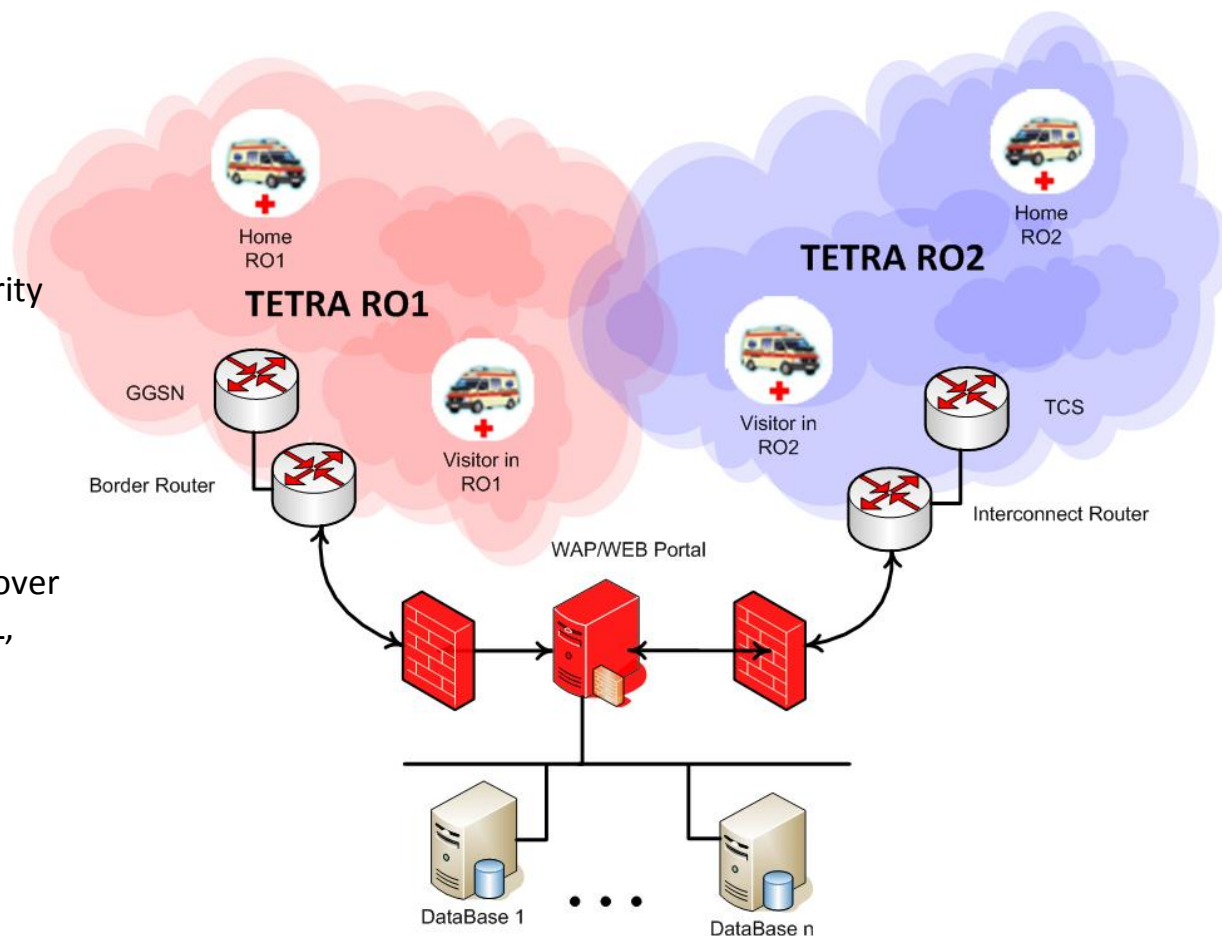State / Public Telephony Networks

Interoperability of services

Data Services – Packet Data

Infrastructure settings:
+ ISSI national planning
+ Similar user rights to use PD
+ IP allocation and routing
+ New Portal Server, Firewalls, security rules installed and commonly agreed
+ Application Development

Terminals settings:
+ Home page
+ Optimization of data applications over TETRA: (HTML, HTTP, TCP) vs (XHTML, WSP/WDP, UDP)
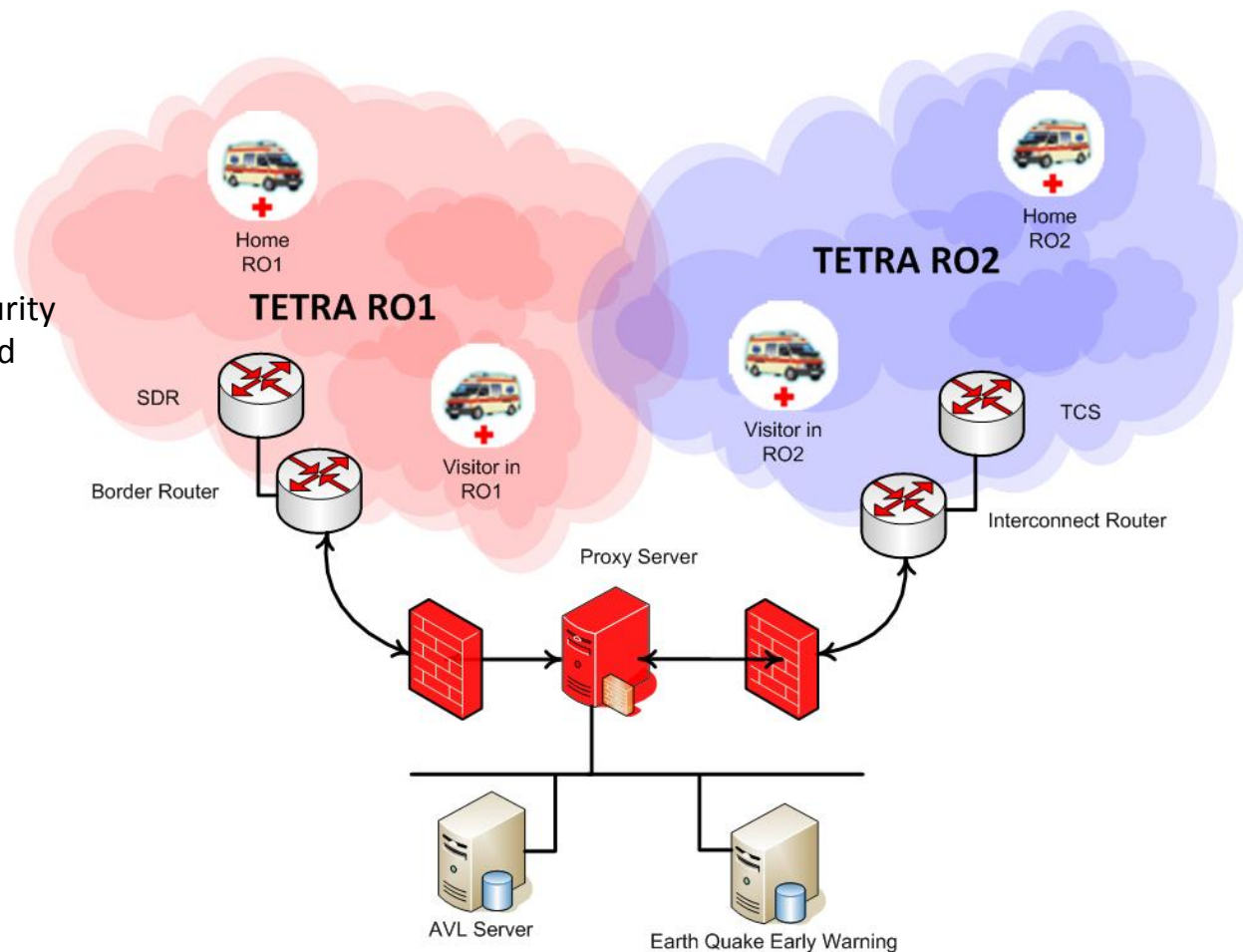
Interoperability of services

Data Services – SDS - TL

Infrastructure settings:
+ ISSI national planning
+ SDS routers programming
+ IP allocation and routing
+ New Proxy Server, Firewalls, security rules installed and commonly agreed
+ Application Development

Terminals settings:
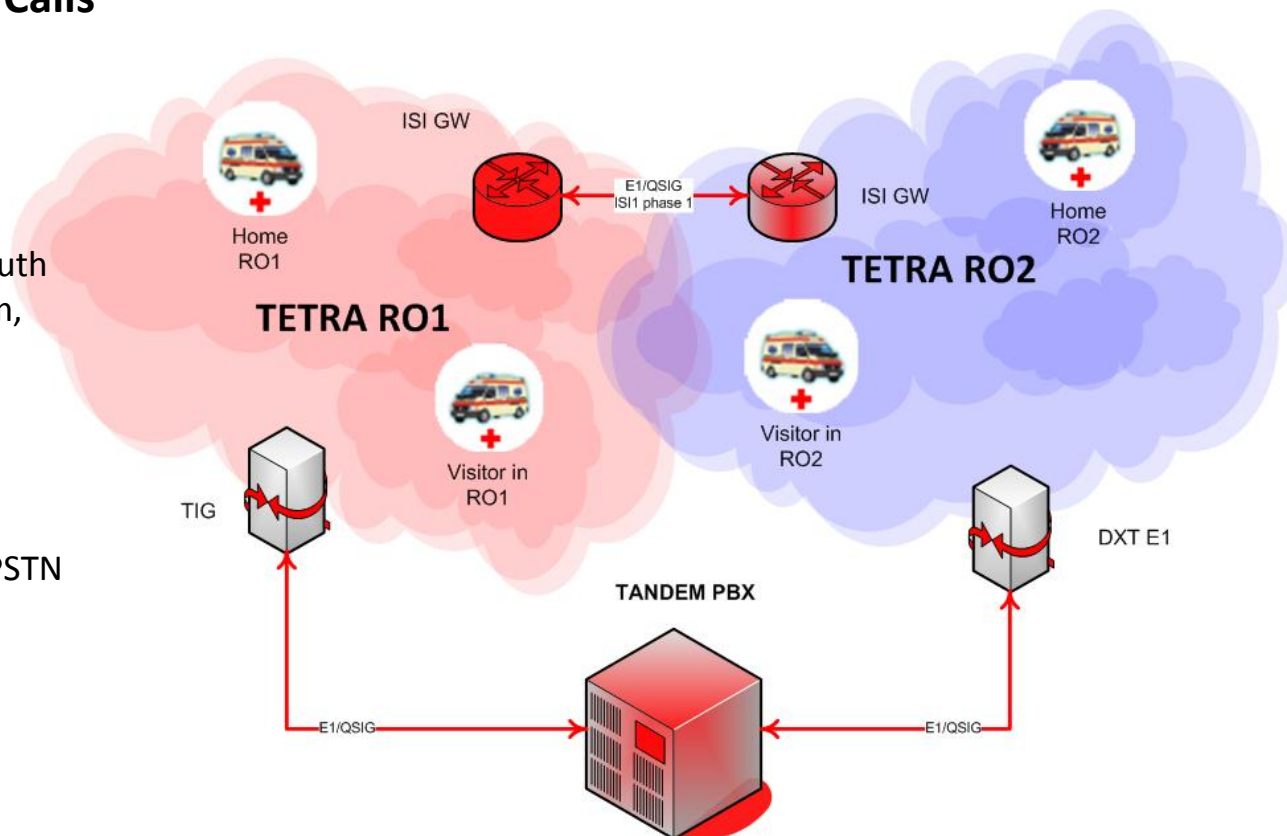+ destination ISSI for AVL

Interoperability of services

Voice Services – Selective Calls

Infrastructure settings:

- 2 ways identified
    - ISI phase 1
    - Using Tandem - similar auth to access PBXs (new tandem, programming, prefix manipulations)

Terminals settings:

- Definition of Individual/PABX/PSTN contacts
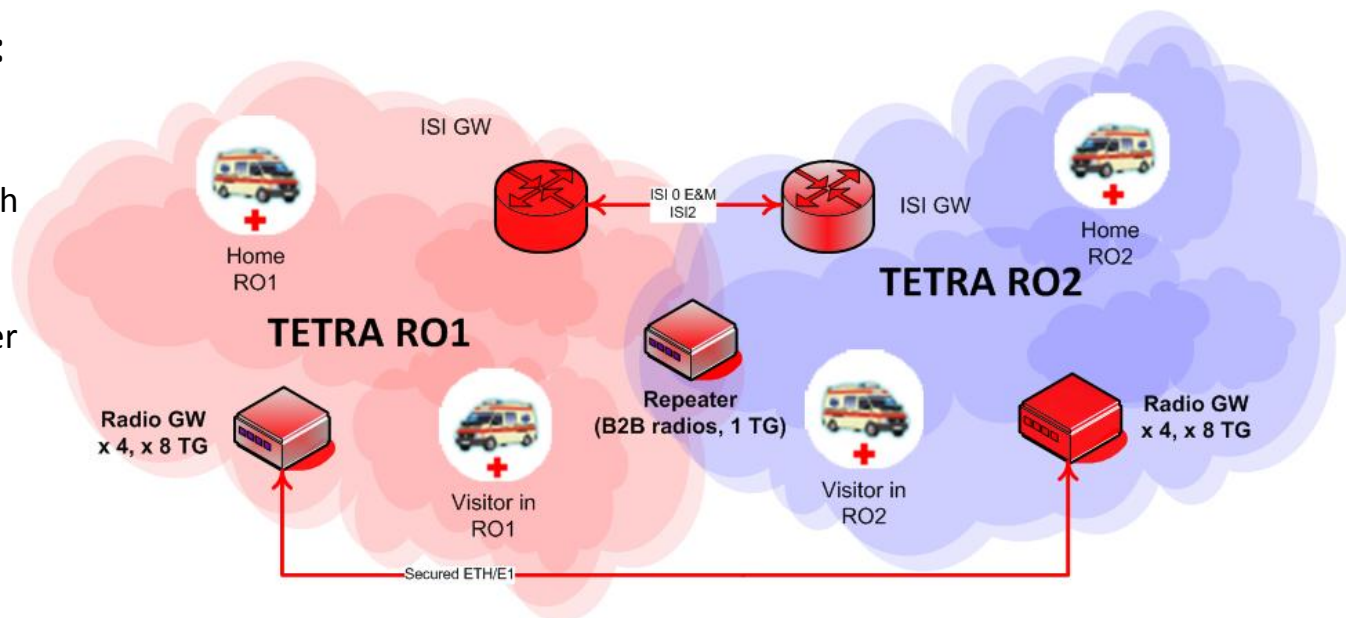- Instruction of the users

Interoperability of services

Voice Services – Group Calls

Infrastructure settings:

- 4 ways identified
  - ISI phase 0, E&M, 30 TG by dispatcher's patch
  - ISI phase 2, E1/ETH, 30TS?
  - Using B2B radio under overlaps 1 TG
  - Using RGW with x n TGs and secured trunk

Terminals settings:

- Definition of TGs on both networks
- Instruction of the users

Conclusions

General Remarks

- **Interoperability is instrumental and it could be partly achieved**
    - by technical & administrative actions
    - for basic/critical voice & data services for now

- **Most advanced services and features not all yet implemented**
    - TPI - talking party identification
    - Emergency calls
    - Priorities
    - Status messages
    - Management functions
        - NOC - FCAPS
        - Operational - DGNA, Radio Check, Radio ENA/DIS

- **Improvements for signaling & mobility management -** ask for orchestrated & sustained efforts, commonly agreed actions by operators, users, industry and academic representatives, and financial allocation for R&D

- Interoperability could be also partly achieved using **alternative solutions – air interface standard, dispatch APIs**

Conclusions

Specific Remarks

- **Real users needs for interoperability sharply increased our competencies and expertise as operators**

- **Key succes factor – Cooperation and works in the Technical Committee, supervised by top management**

- **Strong support from industry**

We are willing to share with you our knowledge and to contribute in new EU projects

Thanks for your attention!

Questions?