Rescue and Security:
How PMR Positions Itself among the New Infrastructure's Technology

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Contents:

- Benefits of a PMR system;
- Overview of the Main PMR Network Technologies;
- Radio Networks' Characteristics and Typical Applications;
- Mission Critical Applications.

Professional Mobile Radio (**PMR**) systems offer fewer services compared to public telecommunications networks, so then:

What is the benefit of having a radio communication infrastructure?

Public communications systems

- are used for a **large number of "standard" users**, sharing the same communication resources with an equal right to access;
- During an **emergency**, the traffic needed is multiplied, causing a network's **slow down** or, worse, its saturation;
- This is **unacceptable** for mission critical organizations operating in emergency situations.

Radio communication systems, instead:

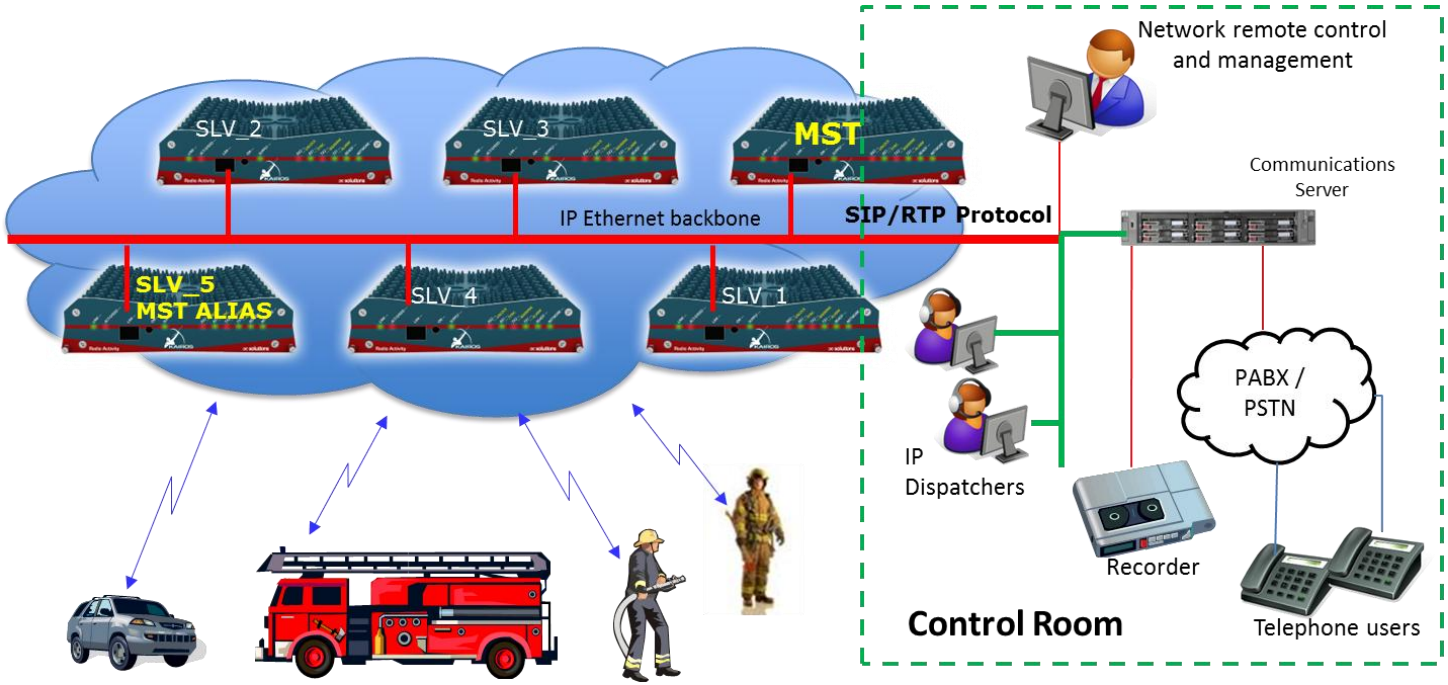
- Normally require **very short set-up** times;
- Are initiated by **simply pushing a button** (PTT), without the need to dial a number;
- Can conference in an **unlimited number of users** (group calls or all-calls).

Benefits of PMR

- Radio communications can also be made in direct mode among terminals, **without the need of a nearby network**;
- In a blackout occurrence, public networks can only guarantee traffic for a few hours, while radio networks **have very low power consumption** and can last for several days;
- Public networks' coverage is "designed" on population density, while radio networks can well cover also **rural** areas, **forests** and **sea/lake coasts**, where public coverage is often limited or inexistent.

Benefits of PMR

- In a professional mobile radio network a **very high level of privacy** can be ensured by simply enabling suitable encryption;
- Together with voice communication, the PMR digitalization also enabled **data communication**, such as: text messaging, GPS positioning, automatic alarm handling, etc.



Main PMR Network Technologies Available

MPT 1327

TETRA

P25 — Digital Wireless • Sans Fil Numérique • Inalámbrico Digital

DMR — Digital Mobile Radio Association

NXDN

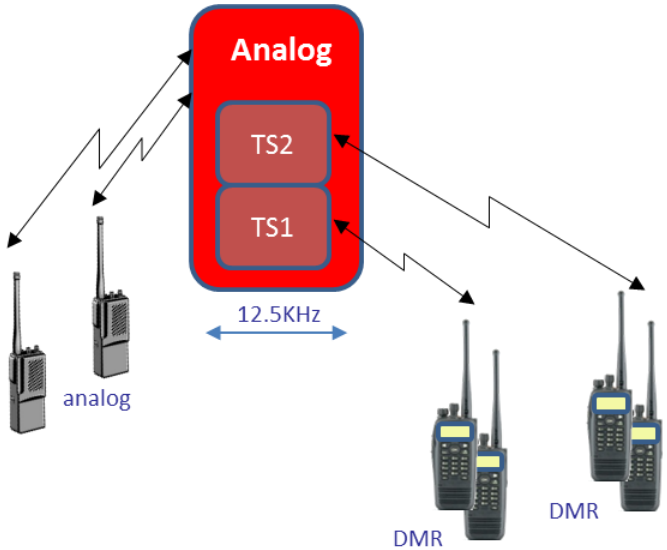
Main PMR Network Technologies Available

∞ ANALOG

Still used, mainly in **maritime** applications, but more and more replaced by digital technology.

Benefits offered:

- *Good coverage*;
- *Better voice quality than digital communications.*



∞ DMR (Digital Mobile Radio)

It already **supports over three million users** worldwide and we're here to see that continue to grow.

- DMR streamlines the ***migration*** *of existing analog systems to digital mode*;
- It is available in *all PMR radio frequency bands* (70/160/350/450/500/900 MHz);
- *Its **costs are similar** to analog systems'*, as it offers the ***same coverage capabilities***, allowing **to *reuse*** *both **existing sites** and **antenna systems***;
- It *doubles the **available channels*** and provides all digital benefits, such as ***data transmission***, ***encryption***, etc.

Main PMR Network Technologies Available

∞ TETRA

Consolidated digital technology, mainly used by EMSs and Police, and others.
The only available version is the **trunking** one, with a minimum of 3+1 channels.

- Suitable to systems requiring a *large traffic availability*;
- Available in *UHF* frequency band-only;
- *More expensive than DMR:* it needs more sites to obtain the same coverage;
- *More complex than DMR:* it needs larger power supply and conditioning systems.

∞ P25

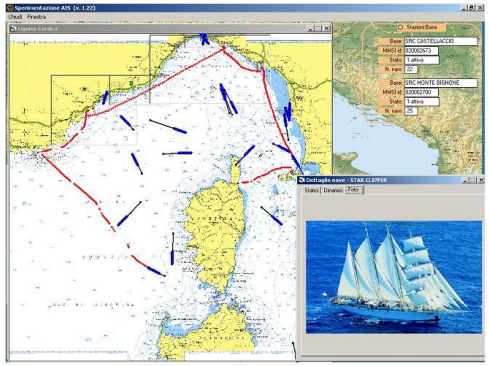
Digital system mainly used in North America by Police and Fire Departments.
Services are *equivalent to DMR*, but

- It offers a *single traffic channel* for each carrier (Phase 1 version);
- It is *more expensive than TETRA and DMR technologies*.

Main PMR Network Technologies Available

∞ **POCSAG** (Post Office Code Standardization Advisory Group) and more generally **paging systems**

Alert-only systems for *on-call personnel* (i.e., hospital personnel, volunteer Fire Fighters, etc.), or for entire cities' population, in case of imminent danger (*sirens*).



∞ **AIS** (Automatic Identification System)

Data-only digital navigation system for locating, identifying and tracking marine vessels.

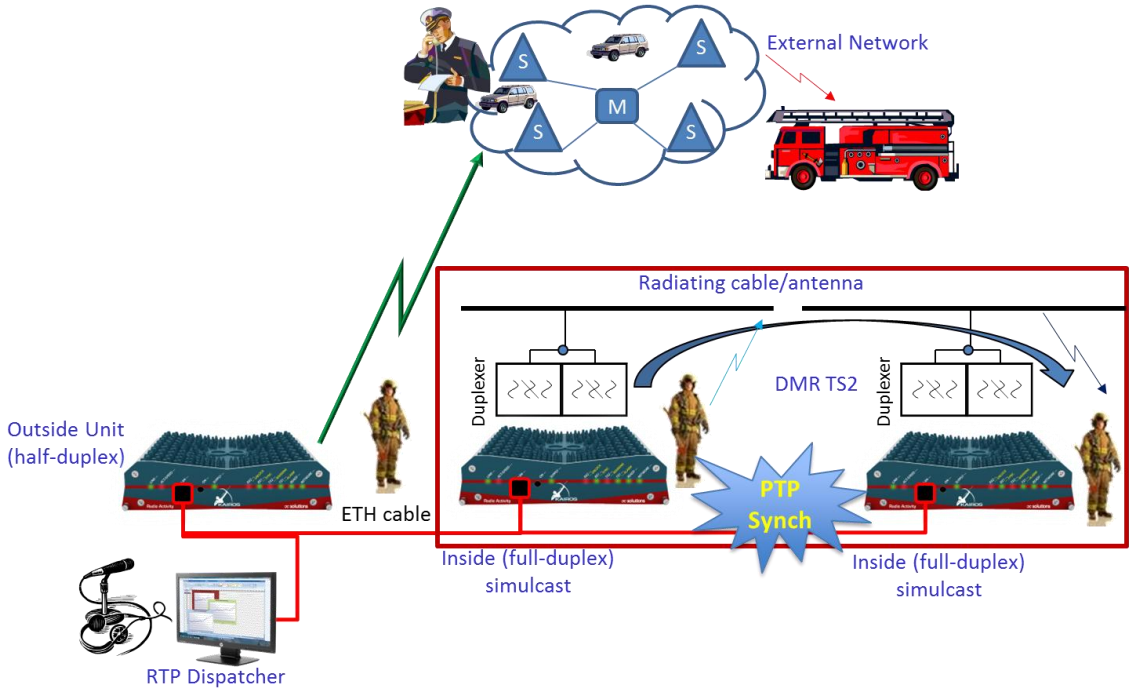
∞ **LTE** (Long Term Evolution)

Telephone and mobile broadband communication standard, currently offered only as a **public system**.

In the future, it should also *enable radios* to realize a similar use, for group and fast calls.

Radio Networks' Characteristics and Typical Applications

- Closed-group communications -> *conference/group-call, encryption, autonomy from public infrastructures, fast call set-up and great coverage in the interested areas*;
- Tunnel/in-building coverage;
- Rural area coverage using RF (VHF/UHF) links;
- Maritime traffic control and safety monitoring, thanks to the AIS service.



Mission Critical Applications

HUTRONIC®

RadioActivity
Infinite Solutions

FIRE BRIGADES

UTILITIES

MARITIME

WATERWAYS

RAILWAYS

POLICE

MOTORWAYS

MOUNTAIN RESCUE
and FORESTRY

Mission Critical Applications

FIRE BRIGADES & POLICE

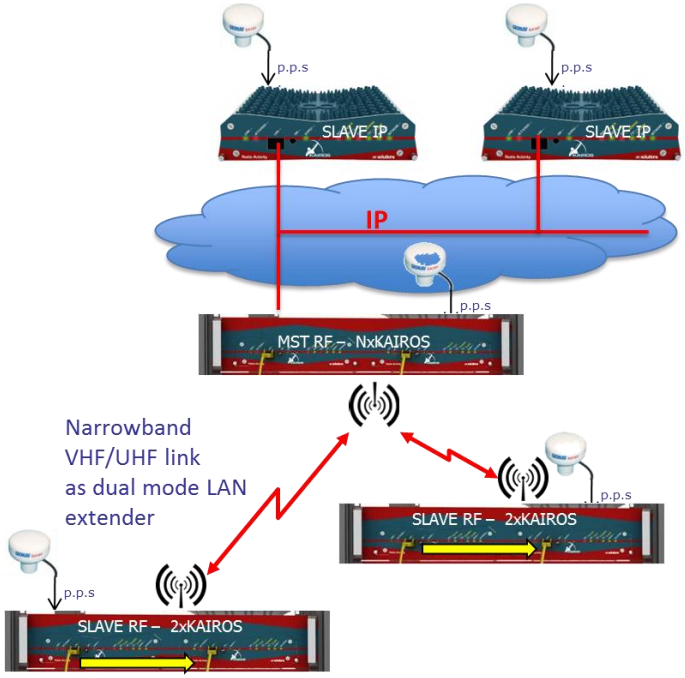
Canada – Norfolk, Elgin and Oxford Counties.

USA – Connecticut, New Hampshire, Maine, Massachusetts, West Virginia, New York City, Oregon.

Russia – Moscow Region.

Switzerland – Lötschberg tunnel.

- ✓ Analog/DMR Tier2/Paging networks;
- ✓ Simulcast;
- ✓ IP or RF or mixed IP/RF linked;
- ✓ VHF or UHF bands.



Mission Critical Applications

TRANSPORT
(Motorways, Railways, Road service)

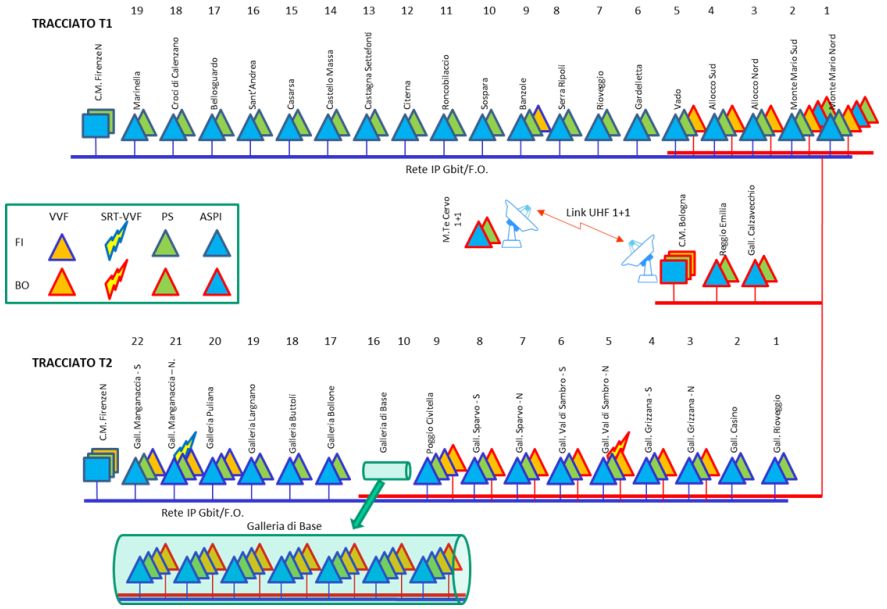
Switzerland – Rhätische Bahn RHB.

New Zealand – KiwiRail.

Italy – A1/A14 motorways.

Croatia – Dugopolje, Fiume-Zagreb motorway, Varazdin and Bjelovar regions.

- ✓ Analog/DMR Tier2 networks;
- ✓ Simulcast;
- ✓ IP or RF or mixed IP/RF linked;
- ✓ 80MHz, VHF or UHF bands.

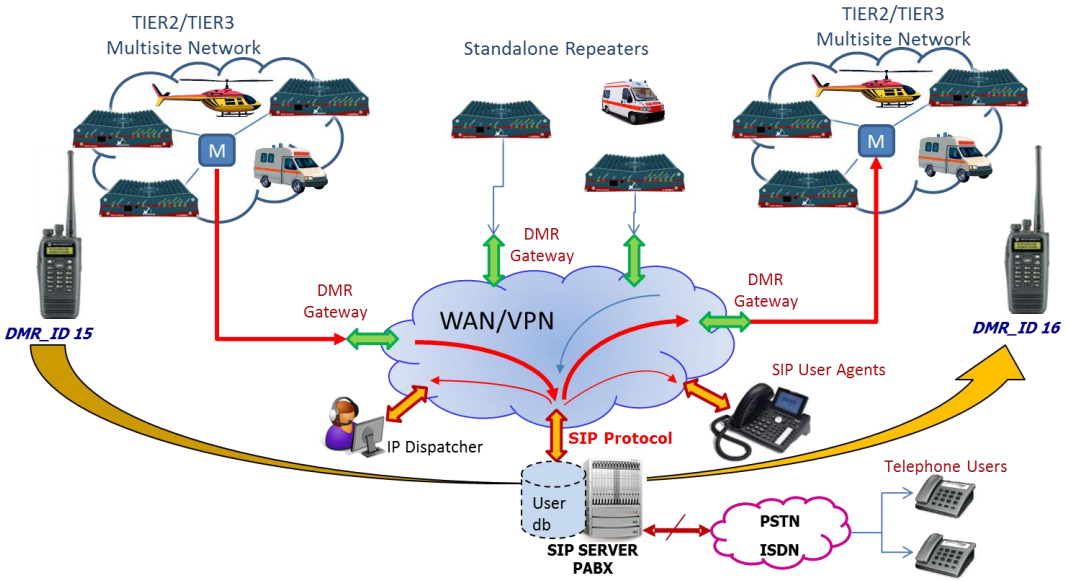


Mission Critical Applications

MARITIME
(Coast Guard, Harbor, Waterways)

France – VNF (Voies navigables de France).
Italy – Poseidon Project (Telecom Italia).
Belgium – Port of Ghent, Port of Antwerp.

- ✓ Analog/DMR Tier2 networks;
- ✓ Simulcast;
- ✓ IP linked;
- ✓ VHF band.



Thank you

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