



TETRA
ASSOCIATION

Shared Networks - The Advantages of TETRA

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TETRA Congress Turkey

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What is TETRA?

International digital radio standard

Designed specifically for public safety professionals and for those who work and need to communicate in groups

Evolving, open, ETSI-standard



Instant push to talk, group voice communications

Pre-emptive communications system

End to end, secure voice and data transmission

Future Releases will provide faster data rates



Feature-rich TETRA

- Very, very, very clear digital speech
- Group calls, personal calls, telephony, direct mode
- Fast call set up times
- Seamless roaming
- Equipment interoperability
- Operational and administrative interoperability and flexibility
- Total management
- Privacy and security
- Spectrum efficiency. TDMA trunking
- Voice and data – approx. 150 kbits with TETRA release 2

As much as you want or as little as you want



Benefits of an open, multi-vendor market

- ***User benefits***

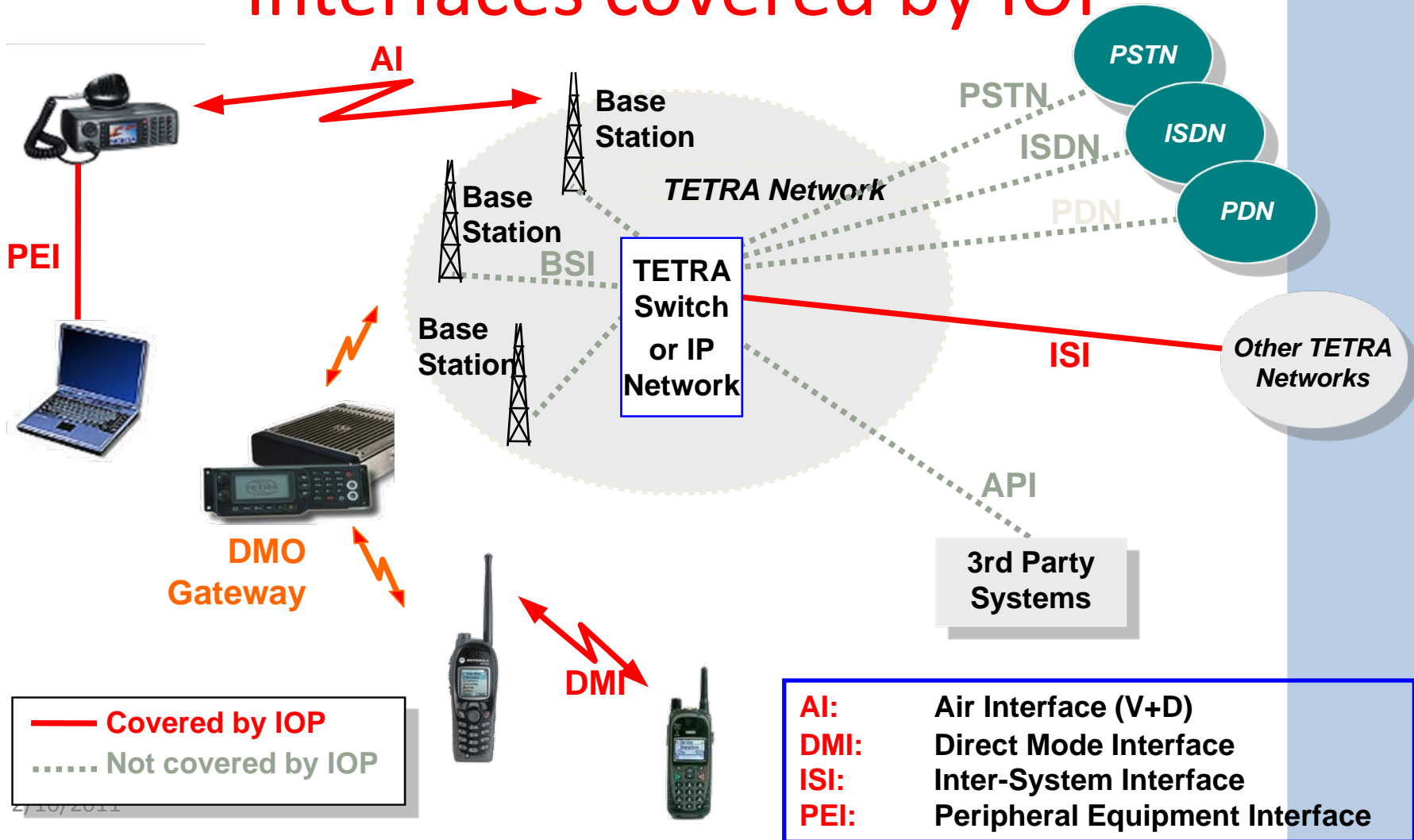
- wide choice of compatible terminals – 10+ suppliers
- specialised products for special needs
- continuous and fast product development & innovation
- genuine competition, hence lower prices (c.f. P25)
- reduced dependency on a single supplier

- ***Industry benefits***

- larger market, greater volumes
- increased possibility to invest – faster product creation
- Market longevity

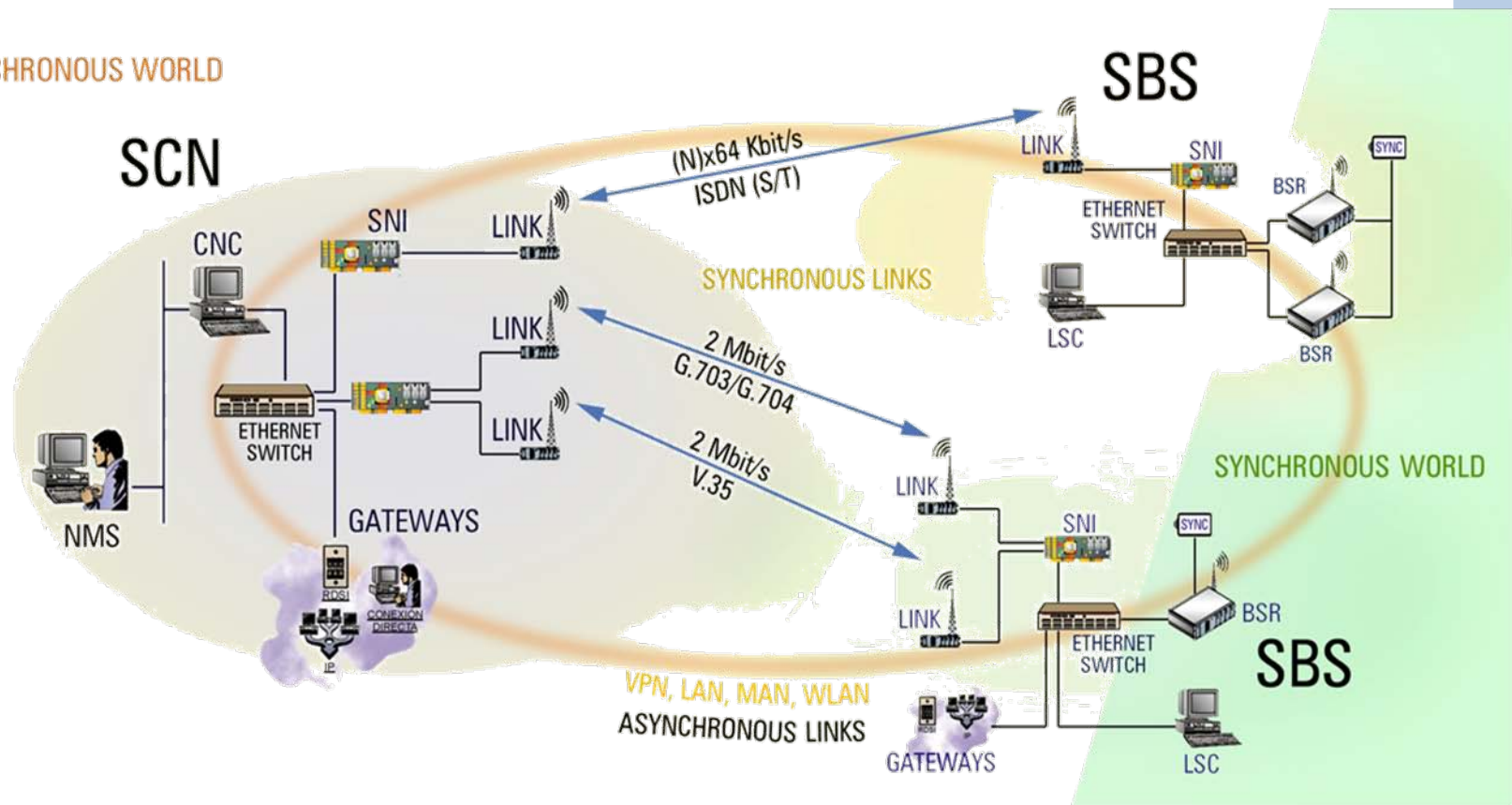
The TETRA Association created the IOP certification process to guarantee an open multi-vendor market

Interfaces covered by IOP



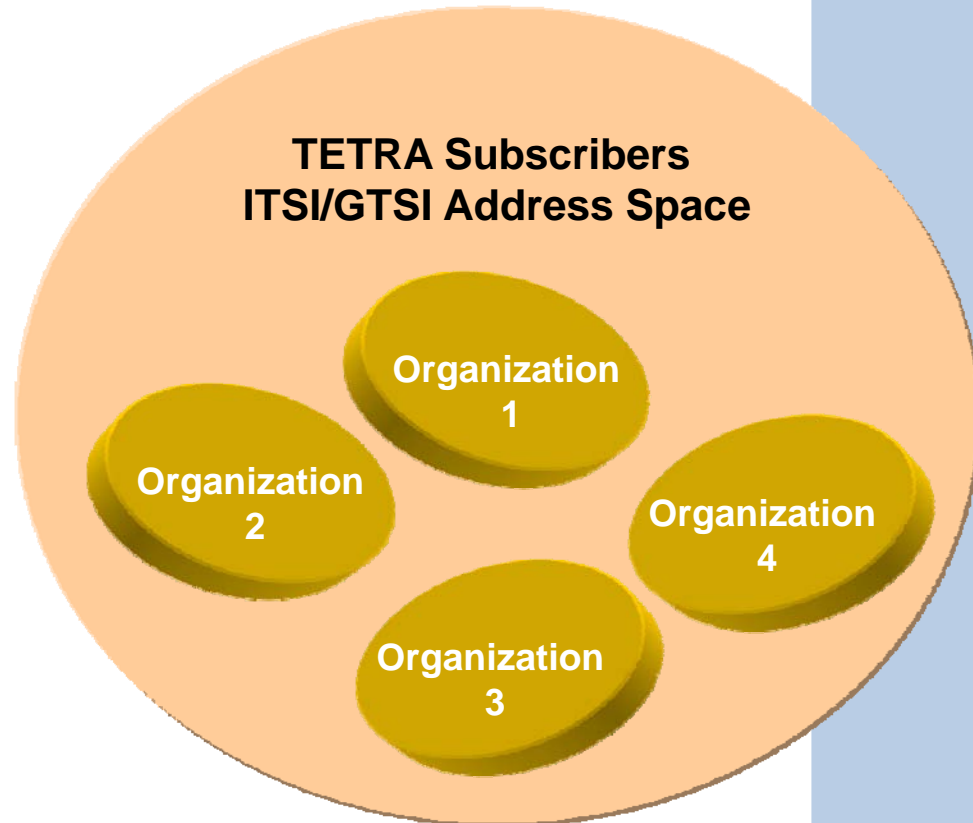
TETRA IP Network Architecture

ASYNCHRONOUS WORLD



VPN (Virtual Private Network) concept

- TETRA address space partitioning performed by the overall Subscriber Manager Authority
- Each Organization has a subset of subscribers and a “local” authority
- Calls between Organizations not allowed by default
- Subscriber manager of each Organization may dynamically grant / deny different privileges





VPN (Virtual Private Network) benefits

- Centralised responsibility for overall network :
 - Network Management System allows central supervision of the network configuration
 - Virtual Private Network allows central supervision of the subscriber configuration
- Cost reduction :
 - single infrastructure shared among multiple organizations
 - purchasing and maintenance costs are shared
- Focus on competence and responsibilities :
 - Each police organizations can concentrate on their assigned “non-technical” duties
 - A single specialized entity take care of the maintenance



Shared networks - Overview

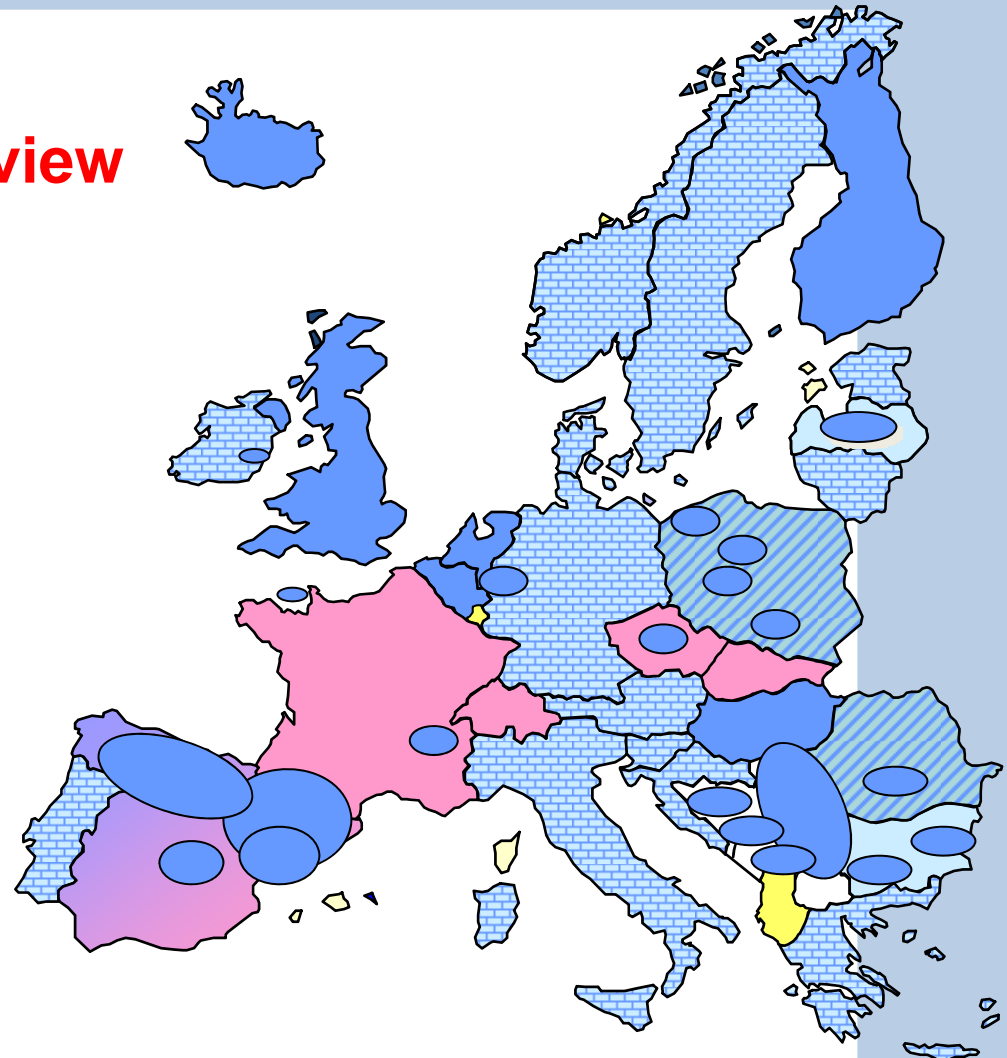
- Particularly relevant for Public Safety, Emergency, Disaster Relief etc. – although not exclusively
- Practically no limit to TETRA's capacity
- TETRA's flexibility due to IP networks, IOP: ISI etc.
- Nationwide, Regional, Municipal/City-wide



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European Public Safety Shared networks - Overview

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





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Finland - VIRVE, nationwide public safety network

- Shared network
 - Police, fire brigades, ambulances, civil defense, frontier guards, defense forces, customs, prison administration, social and health services, civil aviation, navigation administration, ...
- 15 switches, 1500 base stations (380 - 400 MHz)
- In operational use since May 1998
- Further improvements, including TEDS for test use ordered May 2008
- 40,000 users; secures 5,500,000 citizens





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Belgium - **ASTRID**, nationwide public safety network

- Shared network
- Local police forces, federal police, fire services, ambulance services, civil
- Defense, state security police, customs
- Communications for emergency operations
- 11 TETRA exchanges, more than 500 TETRA base stations (380-400 MHz)
- In operational use since September 2000
- Secures 10,300,000 citizens





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Sweden - RAKEL, nationwide public safety network

World's geographically largest TETRA public safety network

- Shared network, to be built for 50,000 users
 - Police, fire brigades, ambulances, civil defense, frontier guards, defense forces, customs, prison administration, social and health services, civil aviation, navigation administration
- Roll-out ongoing, network now secures 93% of Swedish population
 - Around 27,000 users on the network
 - Will secure 8,900,000 citizens
 - 18 switches, 2000 base stations (380-400 MHz)





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UK - Airwave, nationwide public safety network

Largest current TETRA network – sites & users

- Shared network
- 350 organisations: all Police, Ambulance, Fire & Rescue, Army, Navy, RAF, Highways Agency, Prisons, Customs, Border Poice etc.
- Communications for emergency operations
- 3,500 TETRA base stations (380-400 MHz)
- In operational use since 2001; full nationwide coverage since 2005
- Over 230,000 public safety professionals
- Secures 62,000,000 citizens





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Germany - BOSNet, nationwide public safety network

One of the largest TETRA cases in history

- Roll-out ongoing
- 63 switches, 3500 base stations (380-400 MHz)
- Will serve over 1,000,000 current users of analogue radios and pagers
- To secure 82,400,000 citizens





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China - Beijing Government Shared TETRA Network

- Shared network for authorities in Beijing
- Government departments and services, including public safety and security, transportation, utilities, construction and emergency services
- More than 56,000 users
- During Olympic Games 2008: close to 90,000 users
- 5 switches, 300 base stations (800 MHz)
- In operation since 2003
- Secures 14,000,000 citizens





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Brazil – Rio de Janeiro Public Safety Shared TETRA Network

- Operational since 2007
- Network shared by 10 public safety institutions – interconnection with at least 4 others using alternative technologies
- 15,000 users (25,000 users during Pan-American Games)
- 31 sites covering entire Rio de Janeiro metropolitan region with 1W hand-portable coverage; secures 12m. people
- Upgrades during 2010 to allow additional coverage within “favelas” & gateways to armoured vehicles during disturbances





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Brazil - Bahia Government Shared TETRA Network

- Network Shared by:
 - Military Police, Civil Police
 - Scientific Police, Fire brigades
- To provide communications and security to more than 3 millions people:
 - City of Salvador Bahia
 - and the metropolitan surrounding area
- 18 sites – linked via WiMAX; 3,000 TETRA users; 3,000 MPT1327/analogue users; 70 operator positions
- Ethernet/IP-based Control Centre functionality





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Argentina – Neuquen Province Shared TETRA Network

- Network Shared by:
 - The Neuquen Police,
 - Fire Brigades,
 - Civil Protection,
 - High government officials and other users
- To provide communications and security to the province of Neuquen – low-density, mountainous
- 36 sites; 1,500 TETRA terminals; 7 operator Control Centre
- Finger-printing; CCTV etc. Integrated with broadband solution



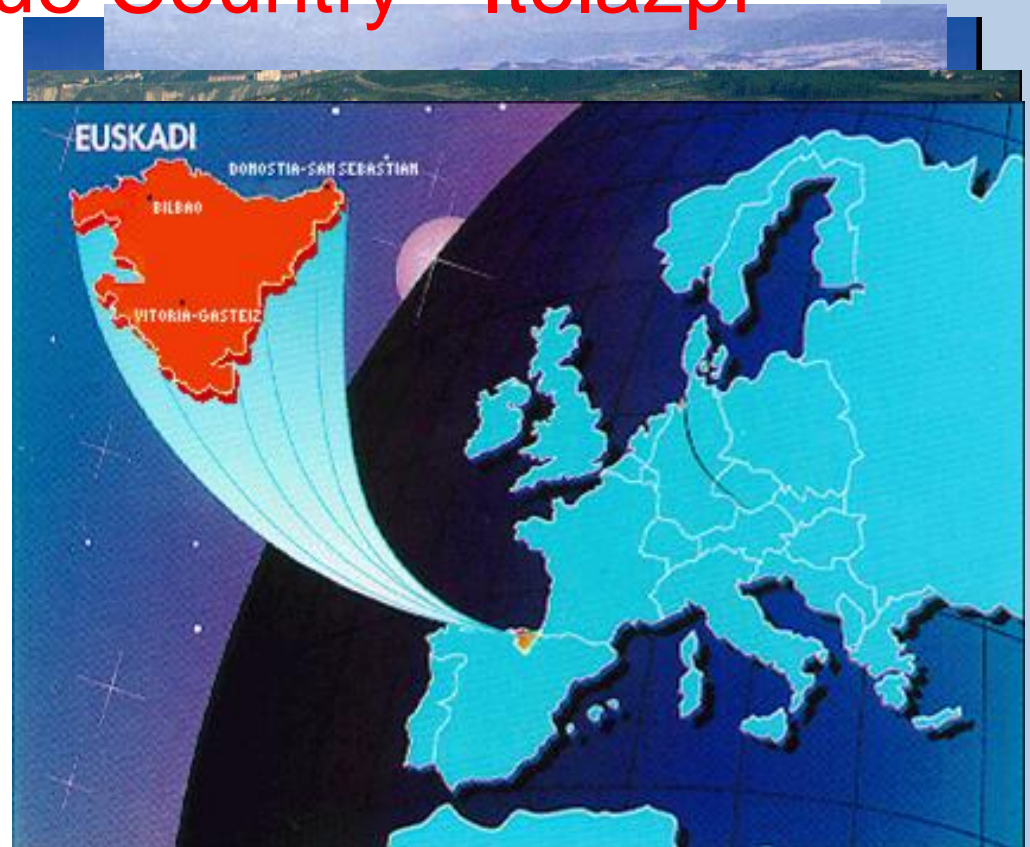
Case study: Basque Country - Itelazpi

► The Basque Country

- ❑ Population: 2,1 million
- ❑ Extension: 7,254 km²
- ❑ 3 Provinces/ Public councils
- ❑ 251 Municipalities

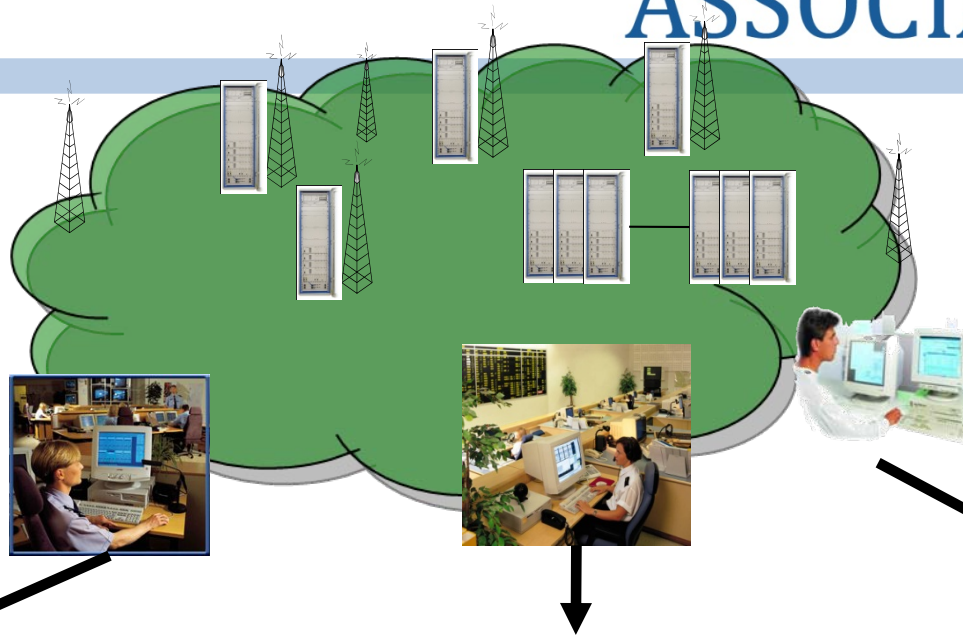
► Basque Government

► ITELAZPI: Public Operator





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Provincial Council Services

Town Halls

Other Public Institutions



Single Public Tetra Network





The Service Model

Shared public network - Benefits

- ✓ Public expenditure reduction due to shared costs
- ✓ Network infrastructure management responsibility: IT company
- ✓ Region wide coverage
- ✓ Every public organisation centres on its services
- ✓ Autonomous user and service management
- ✓ Many terminal suppliers, to suit customer needs
- ✓ Dynamic communication between different users



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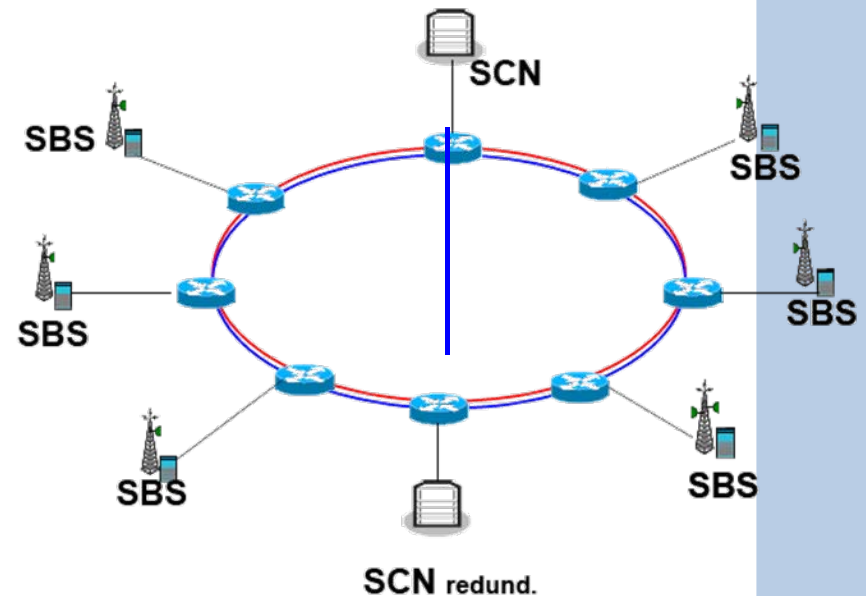
Multi-organisation network



Network Configuration (I)

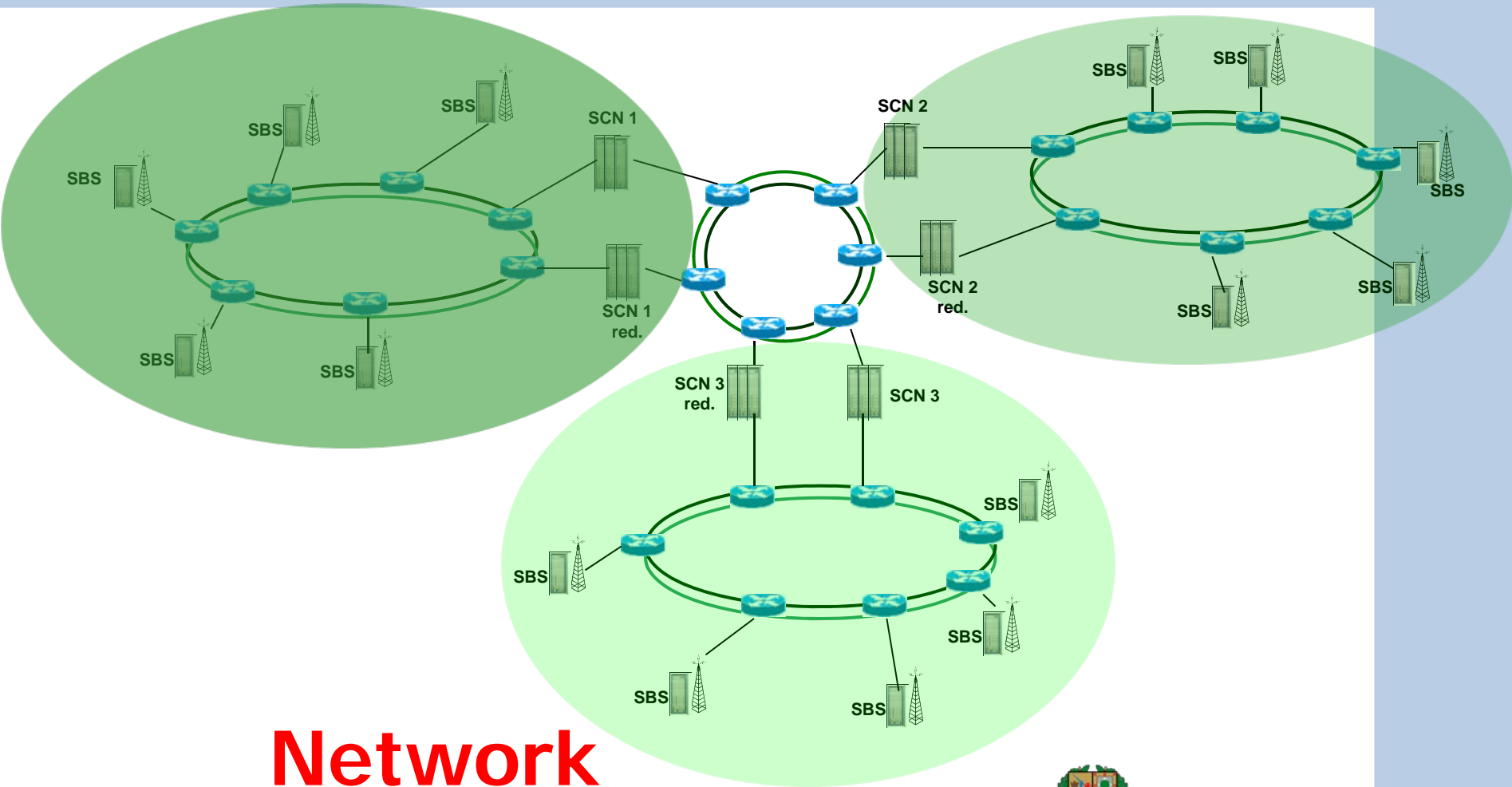
Teltronic **NEBULA** System:

- ▶ **140 SBS with LSC**
- ▶ 1+1 SIS
- ▶ 3+3 SCN (Provincial Segments)
- ▶ 19 SDH Transport Nodes
- ▶ AVL application
- ▶ 7-operator Command and Control Center
- ▶ 1 NMS Client / Organization
- ▶ Billing system





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Network Configuration (II)





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Provincial Councils

**Highway maintenance
Public transport (Trains and
buses)
Public work squads ...**

Town Halls

**Local police
Public works
....**

Basque Government

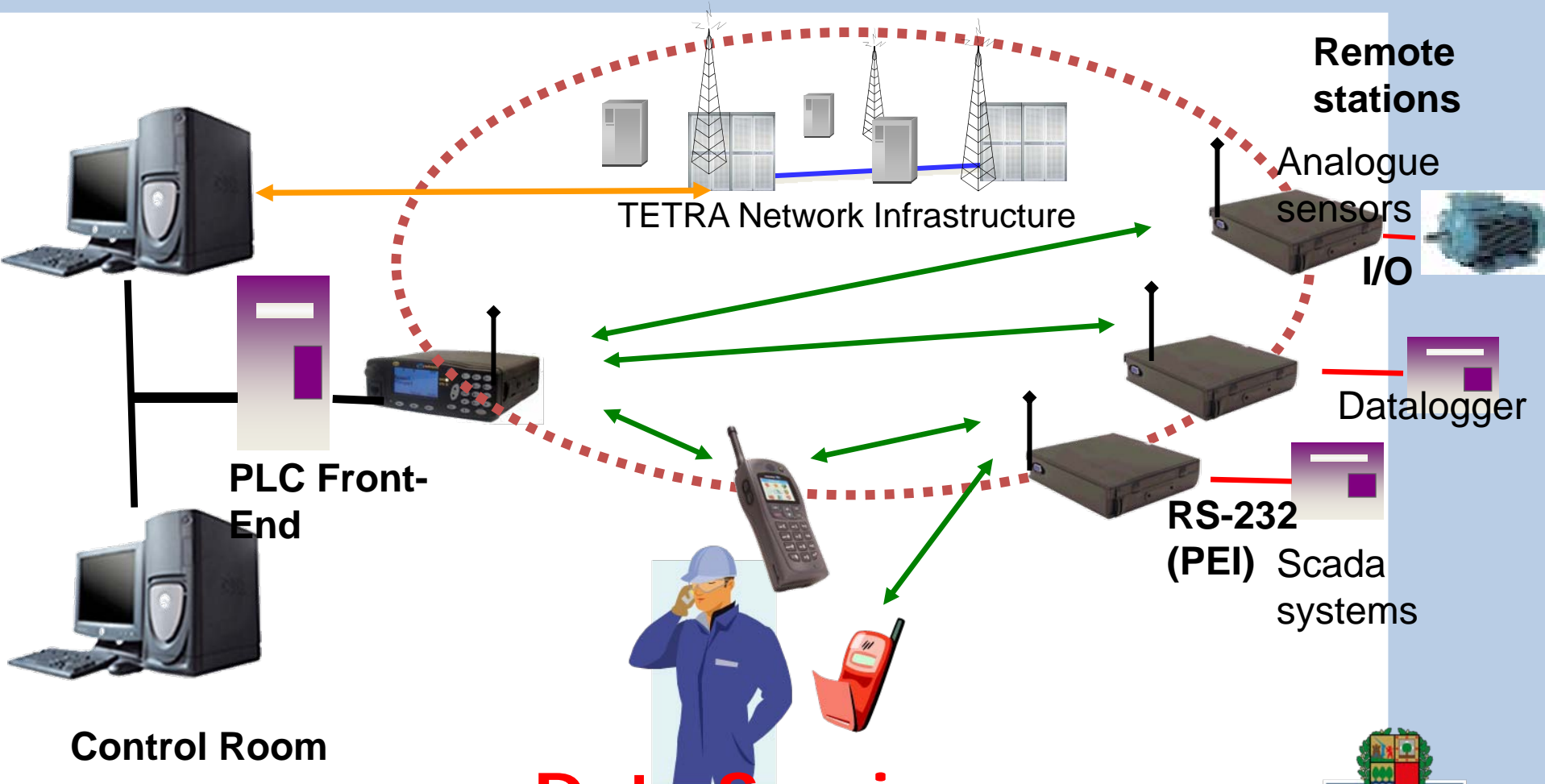
**Ambulances
Private security services
Meteorology ...**

Service Users





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Data Services

(Meteorology, Hydrology, Telemetry...)



And more...

- ❑ Private security companies
- ❑ Public Transport (Trains, Buses, Trams)
- ❑





The alternatives?

P25?

Tetrapol?

DMR?

Cellular/3G?



The future

- TETRA 1,2,3,.. = TETRA
- TETRA + wideband
- TETRA + broadband
- The future of critical communications is TETRA



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**Thank You For Your
Attention
Any questions?**



Contact

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