



TETRA
ASSOCIATION

An Overview of TETRA

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Warsaw



Contents

- TETRA Design Aims
- Overview of Features
- TETRA Data
- TETRA Release 2
- Specialised TETRA Terminals
- Product Compliance
 - TETRA Interoperability

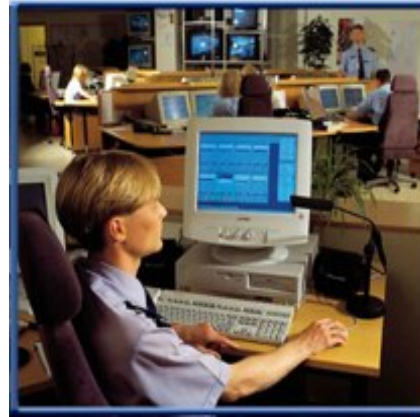


Goals set during TETRA standard creation



Users:

- Features
- Choice
- Competition



Regulators:

- Spectral efficiency
- Harmonisation

Operators:

- Desired features
- Data services
- Competition
- Cost effectiveness



Manufacturers:

- Open market volumes
- IPR - to ensure open standards, the ETSI IPR policy stipulates patented solutions to be made available on fair and reasonable terms



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

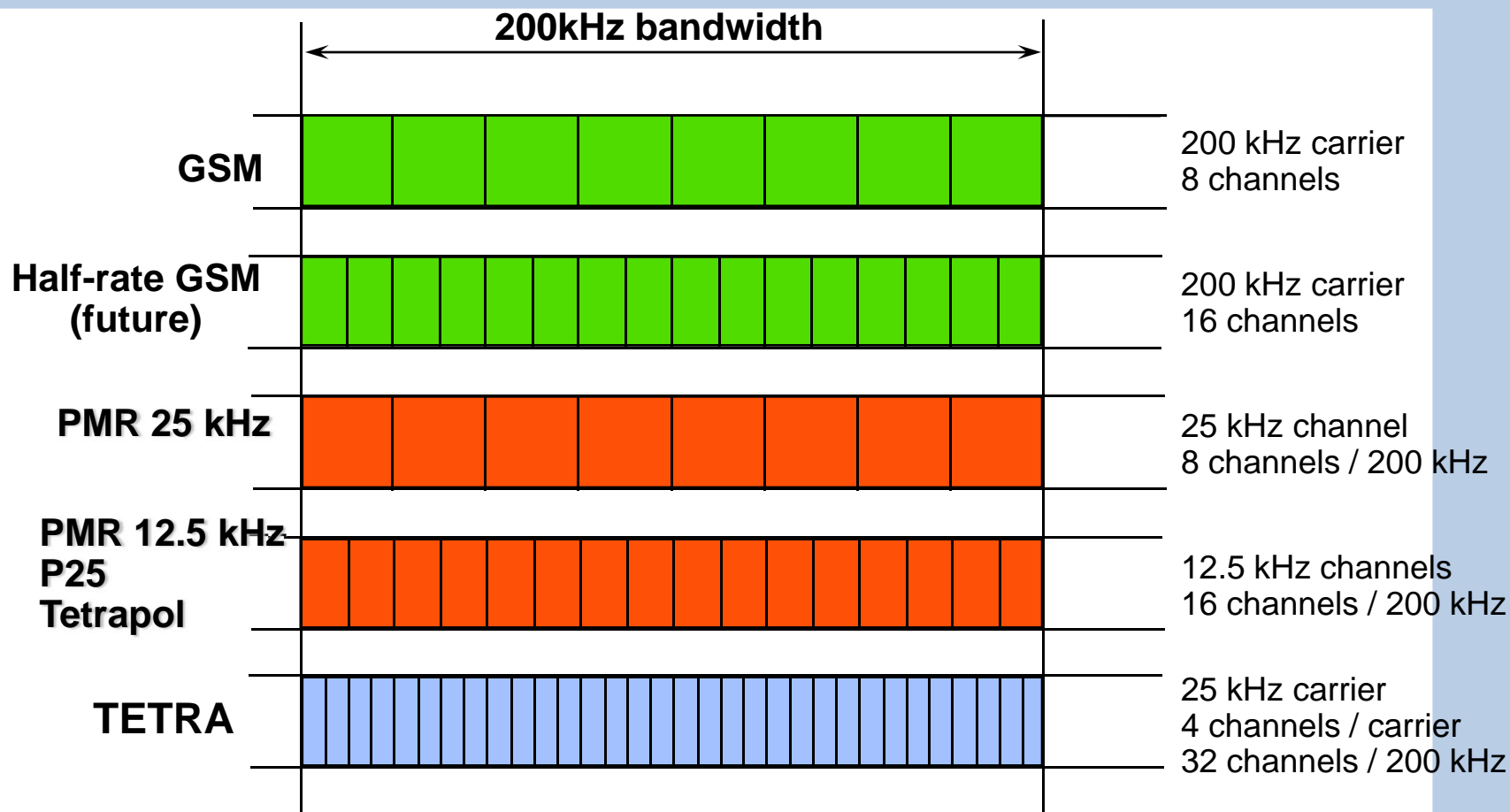
Pre-emptive communications system

End to end, secure voice and data transmission

TETRA Release 2 provides 3G-like data rates



TETRA spectrum efficiency





TETRA operation modes

Trunked Mode Operation (TMO)

TMO requires a network
infrastructure

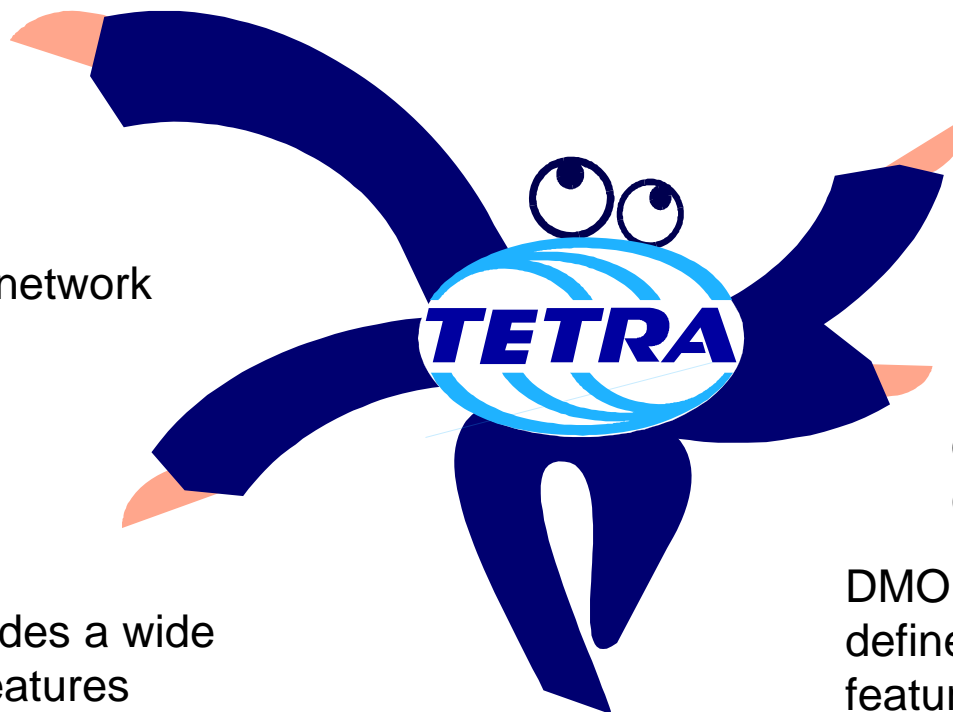
TMO provides a wide
range of features

Direct Mode Operation (DMO)

DMO doesn't require
an infrastructure

DMO adds border or
out of coverage area
communications

DMO provides a well
defined subset of TMO
features





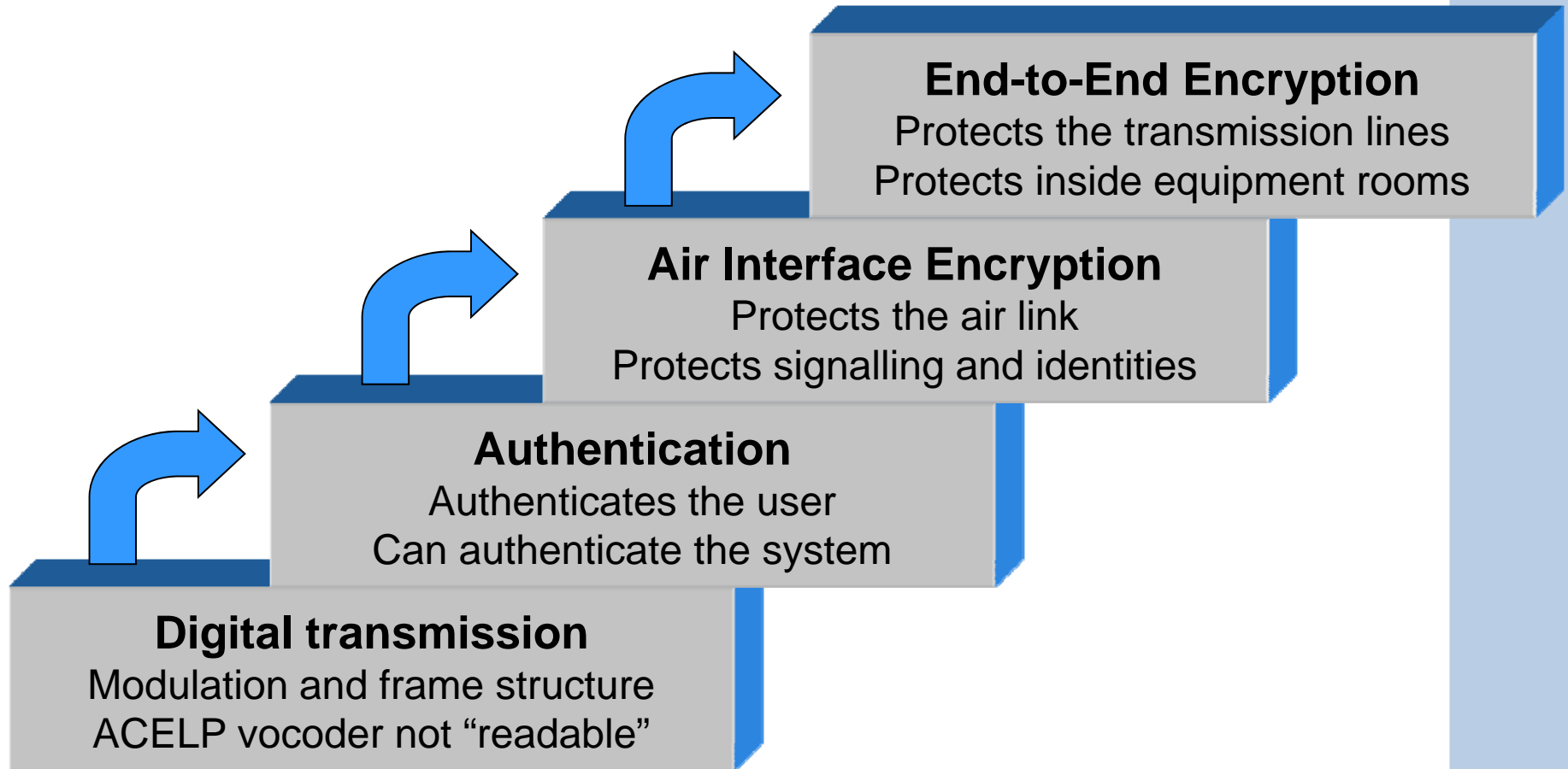
TETRA is “feature rich” including:

- Very, very, very clear digital speech
- Group calls, personal calls, telephony, direct mode
- Fast call set up times
- Seamless roaming
- Equipment interoperability (Product Compliance)
- Operational and administrative interoperability and flexibility
- Total management
- Privacy and security
- Spectrum efficiency - TDMA Trunking
- Voice and data – up to 600+ kbits with TETRA release 2

As much as you want or as little as you want



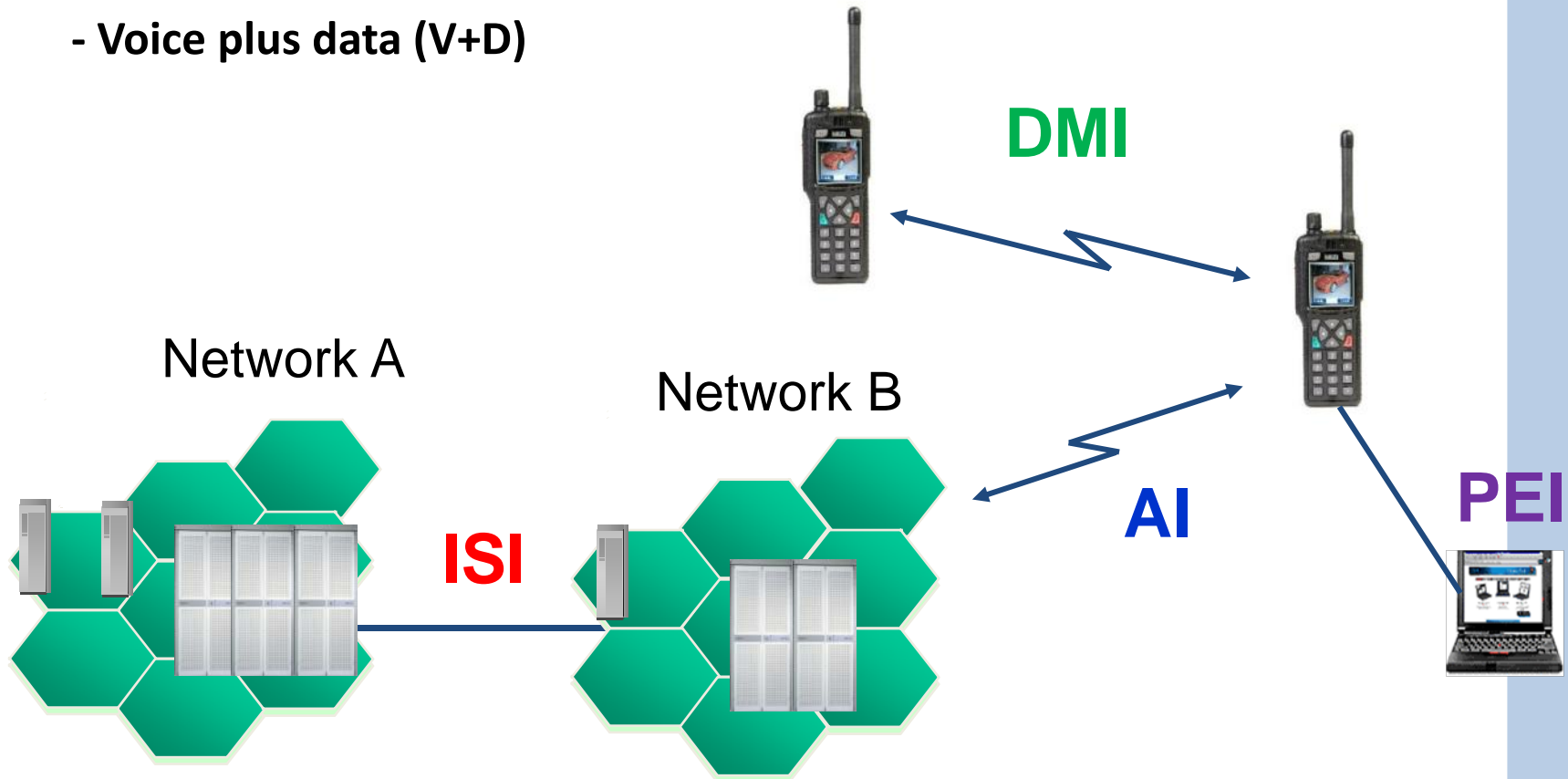
The most secure PMR technology in the world





Core TETRA standards and standard interfaces

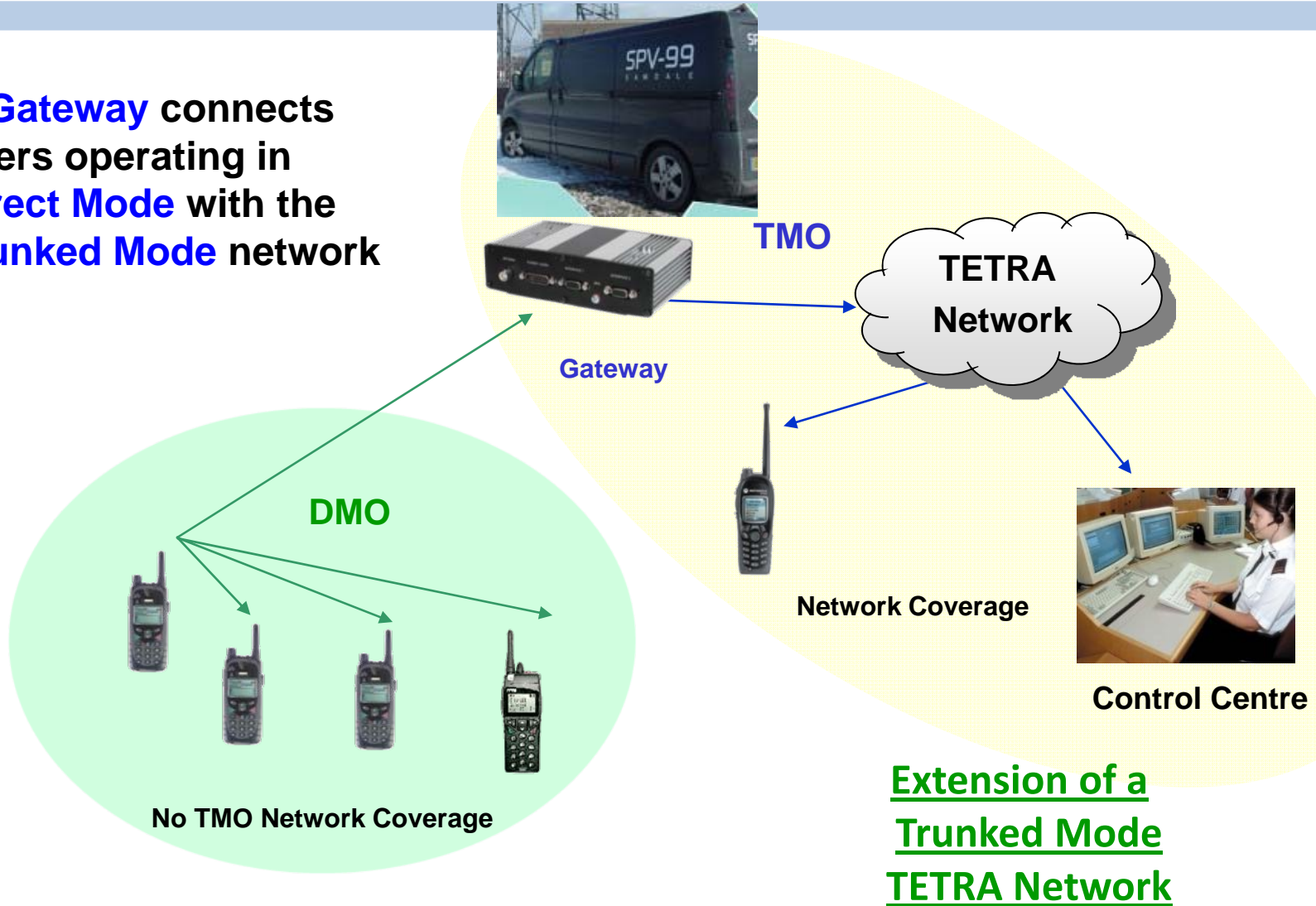
- Air Interface (**AI**)
 - Voice plus data (V+D)
- Direct Mode Interface (**DMI**)
 - Voice plus data (V+D)
- Inter-System Interface (**ISI**)
- Peripheral Equipment Interface (**PEI**)





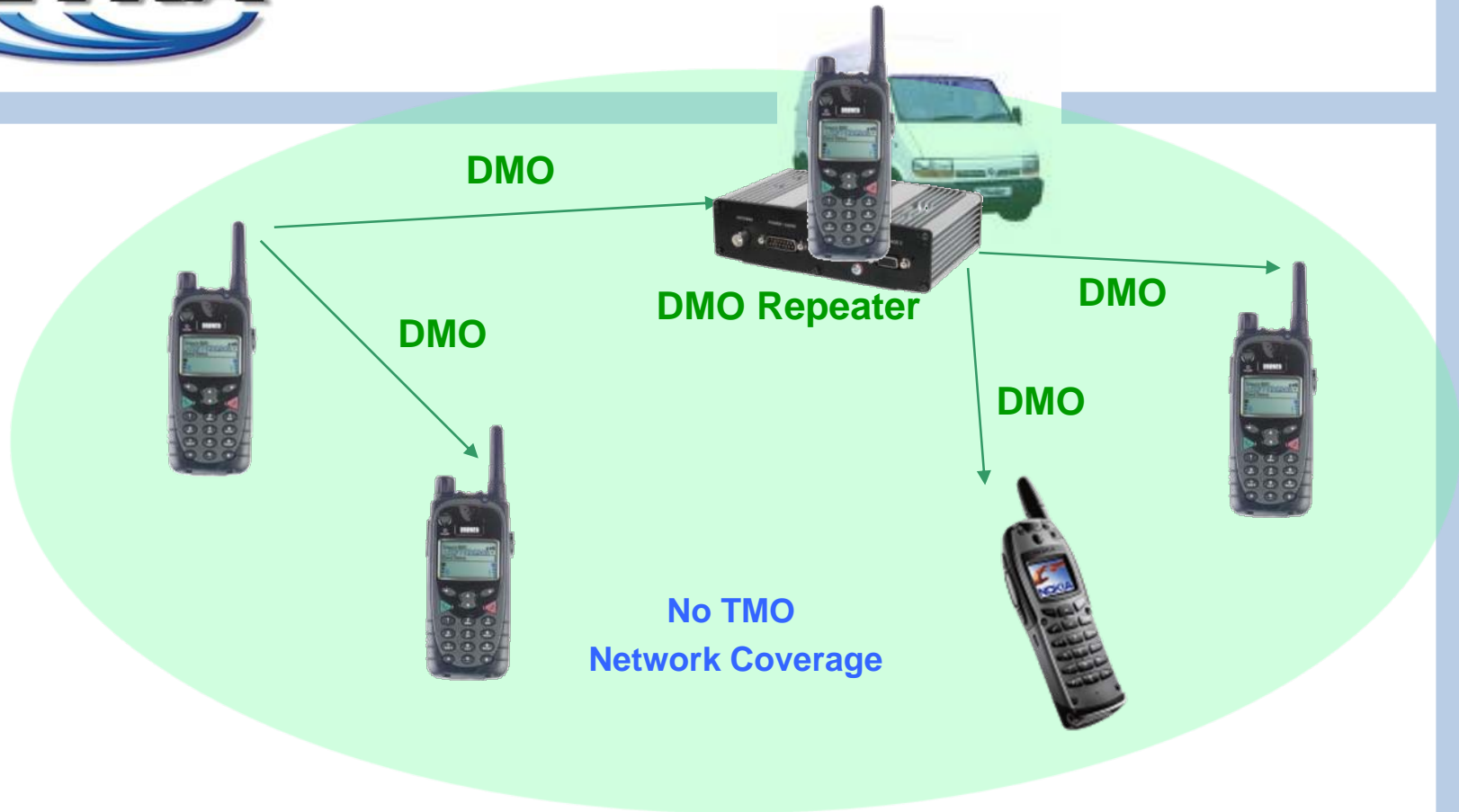
What is a Gateway?

A **Gateway** connects users operating in **Direct Mode** with the **Trunked Mode** network





What is a Repeater?



A Repeater extends coverage between DMO users

Typically a vehicle mobile strategically placed acts as a DMO Repeater to extend communications within a closed group.

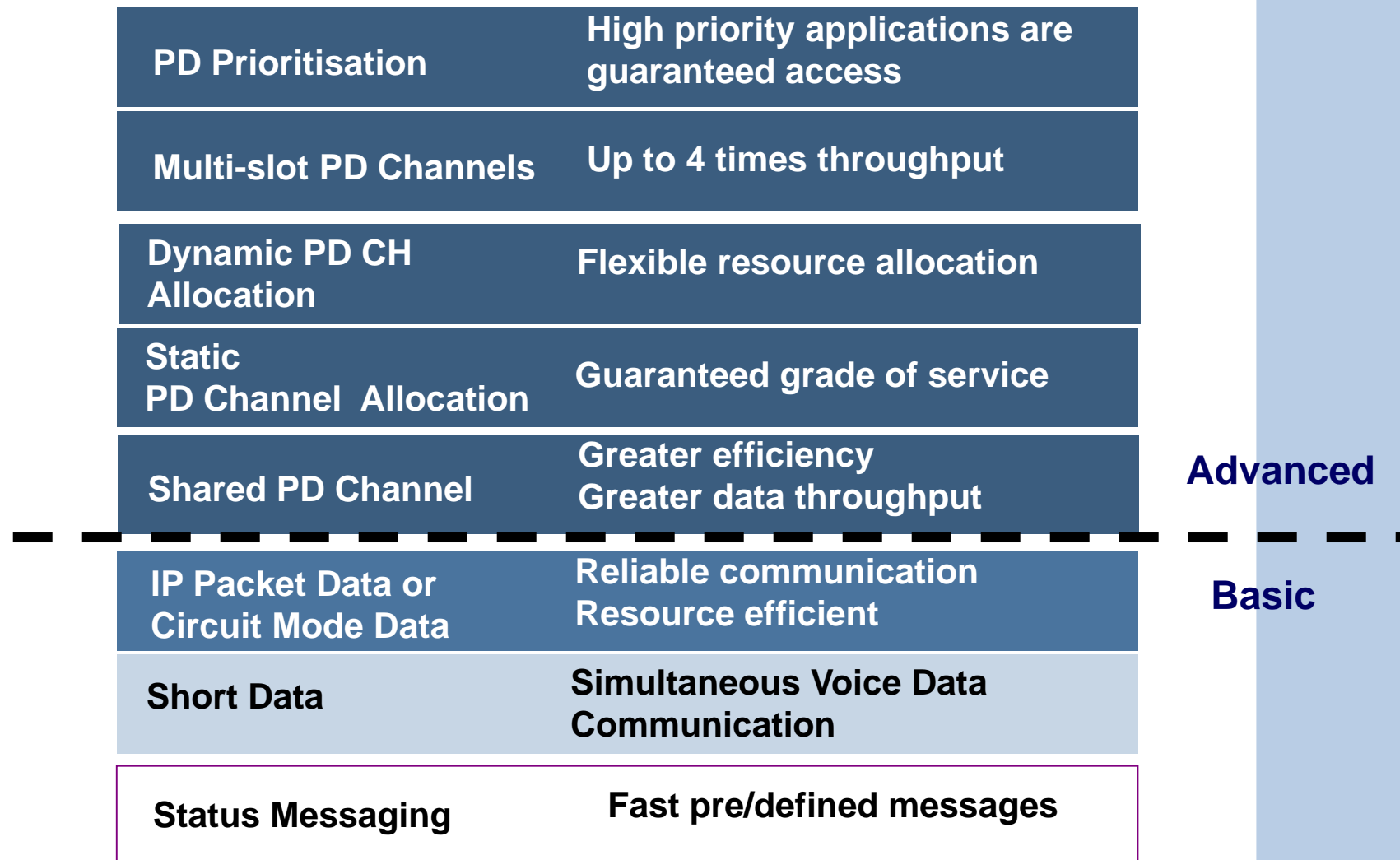


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Standard TETRA Data Capabilities





Status Triggered Functions

- Remote Control of Radio functions
- Authenticated Service
 - Examples include Paging, I/O Switching,
- Remote Control of DMO Gateway functions
- Macro capability allows actions to be linked
- Available in TMO, DMO & Gateway Mode (always available)

Status Messaging – provides so much more than just a simple status indication



Short Data Messaging

- SDS (Text messaging)
- Concatenated SDS (typically up to 1000 Characters)
- SDS Store and Forward (Delivery or re-direction)
- Individual and Group messaging
- Available in TMO, DMO and Gateway Mode (always available)

Short Data Messaging – provides so much more than just a simple Text Message



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TETRA Release 2 - TEDS

TETRA Enhanced Data Service = TEDS

- The Standard is complete
- InterOperability Profiles and test cases being written
- Product Compliance (IOP) Testing underway
- First orders placed
- First terminals launched (TWC 2010)
- First live trials underway



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Specialised TETRA terminals

- Gateways and Repeaters
- TETRA Surveillance Products
- ATEX terminals for hazardous environments
- Modems
- PDAs (Dedicated or linked by Wireless)
- Telemetry devices





Covert radio – User Requirements

- Light and small
- Accessory connectors - screw connections
- GPS
- Large range of accessories (audio, control units ...)
- Battery (duration and easy to change)
- E2EE (option)



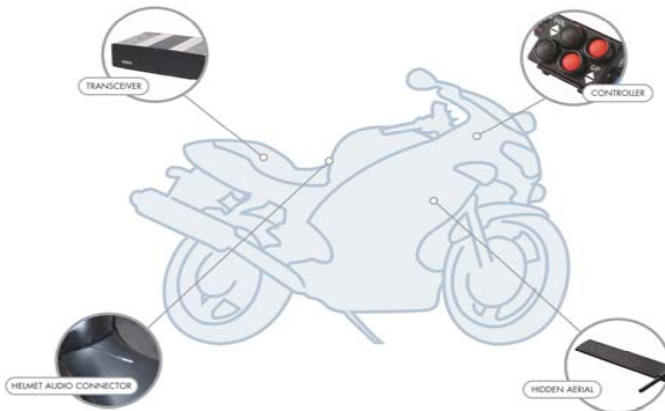
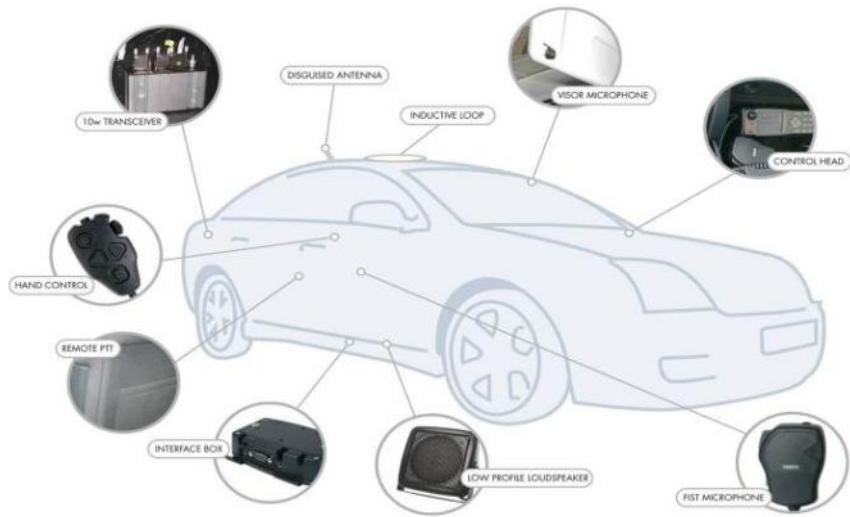


Typical body worn Radio





Typical Covert Car & Motorcycle





Hazardous Areas

Definition of Hazardous Areas

Area with possible presence of a **potentially explosive atmosphere**

An **explosive atmosphere** is defined as a mixture of:

- **flammable substances** (gases, vapours, liquids, mists or dusts)
- with **air**
- under atmospheric **conditions**
- in which, after ignition, the combustion spreads to the **entire** unburned mixture

An atmosphere, which could become explosive due to local and/or operational conditions, is called :
a **potentially explosive atmosphere**.





TETRA Equipment for Hazardous Environments

Products currently
available from four
manufacturers



Examples of ATEX certification:

II 2G EEx ib IIC T4

II 3D Ex tD A22 IP54 T85°C X





Ferrari uses Atex TETRA





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What is Interoperability (IOP)?

- IOP ensures that TETRA equipment from one manufacturer functions (interoperates) with TETRA equipment from another manufacturer.*





IOP Teams

Technical Forum (TF)

- Manages Interoperability Process
- Creates TIPs (TETRA Interoperability Profiles) and Test Plans

**Any Member of the Association is
welcome to join**

Operator and Users Association - OUA

- Creates usage scenarios for features
- Sets IOP TETRA feature priorities

Not open to manufacturers



Do I need Interoperability?

- ***One Supplier***

- makes life easier for operator & user
- the supplier ensures that infrastructure & terminals operate together

WRONG!

- No one supplier provides everything
- Dependent on one supplier
- Features not always released at same time
- Locked in – watch the price



nals

When you buy your cell phone, you are not supplied the



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

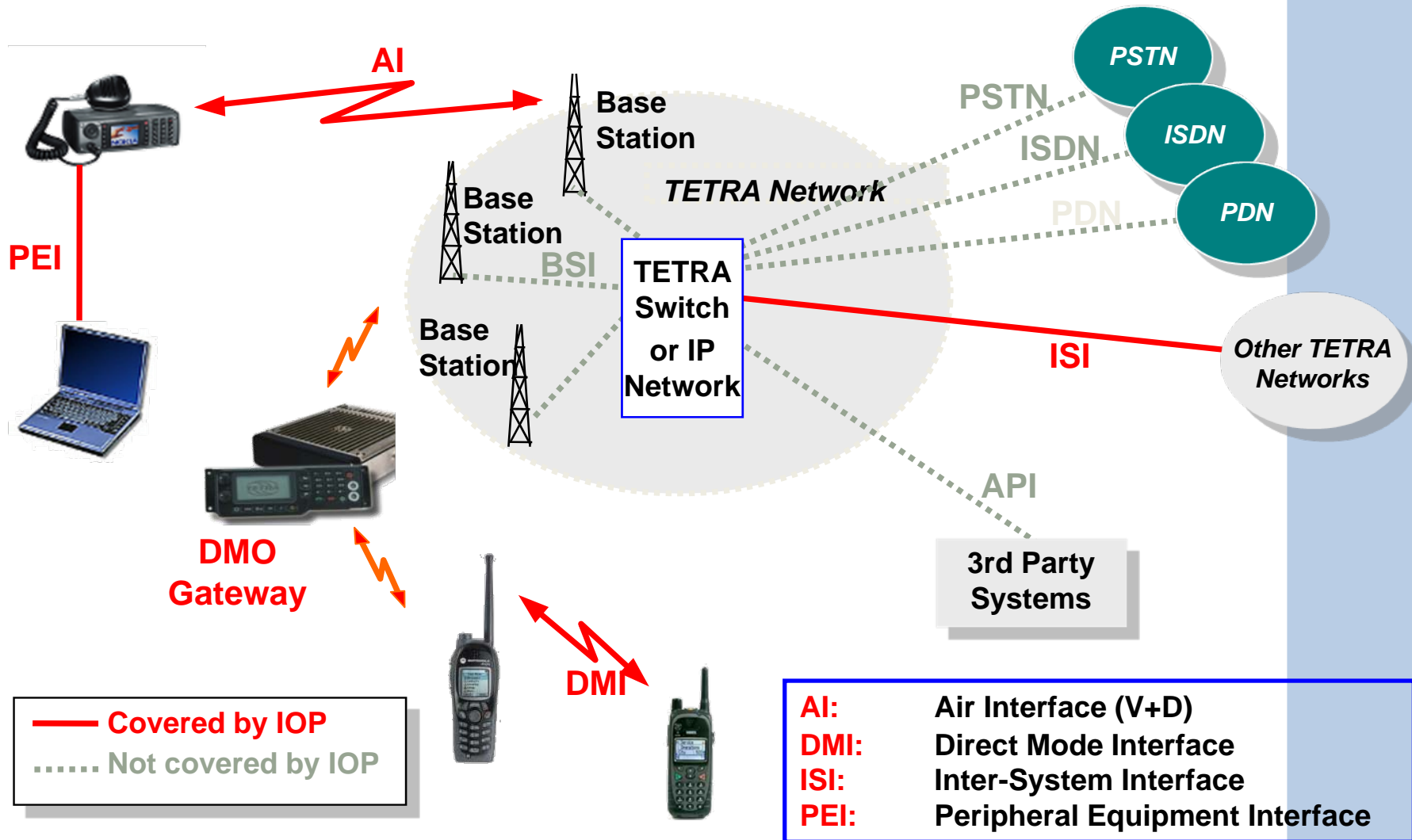
- ***Industry benefits***

- 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 Process





How does the IOP Process work?

Common Standard



**Define Rules
for Implementation**

**Practical
Equipment Tests**

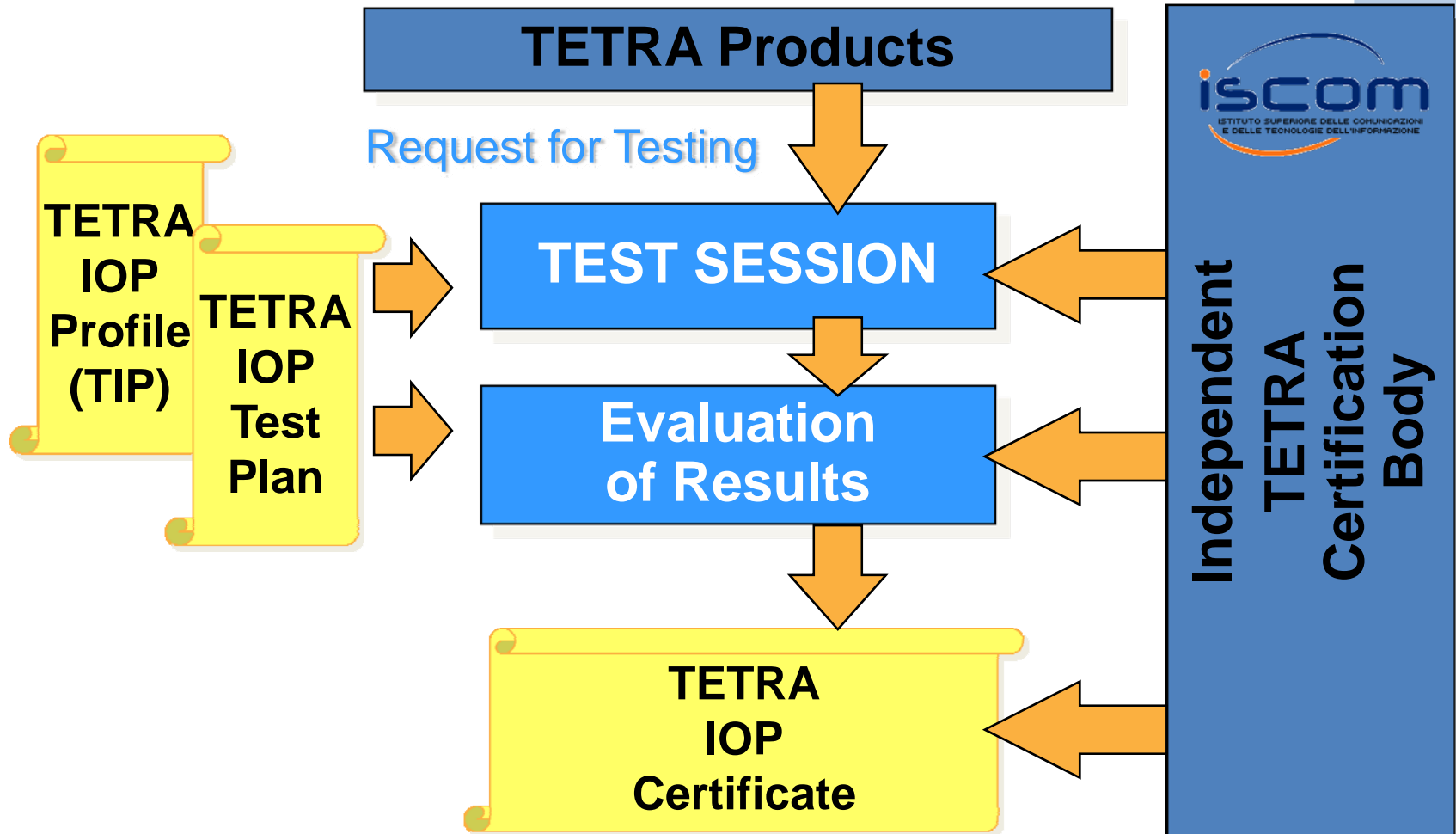


**IOP
Specification Process**

**IOP
Certification Process**

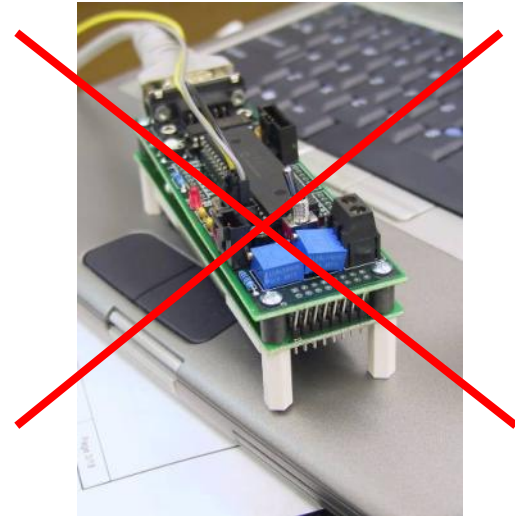


IOP Certification Process





What is Tested?



Commercial Products

- Infrastructure
- Terminals



IOP Certificates

- *Over 350 Certificates issued*
- *Certificates available* **(Free)**
for download:
www.tetra-association.com
 - Using TETRA
 - Interoperability

*IOP is a mature well established process
& A key factor behind the Worldwide
Success of TETRA*





Thank You - Any Questions?



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