



***T*Errestrial *T*runked *R*Adio**

# ***TETRA ARCHITECTURE AND INTERFACES***

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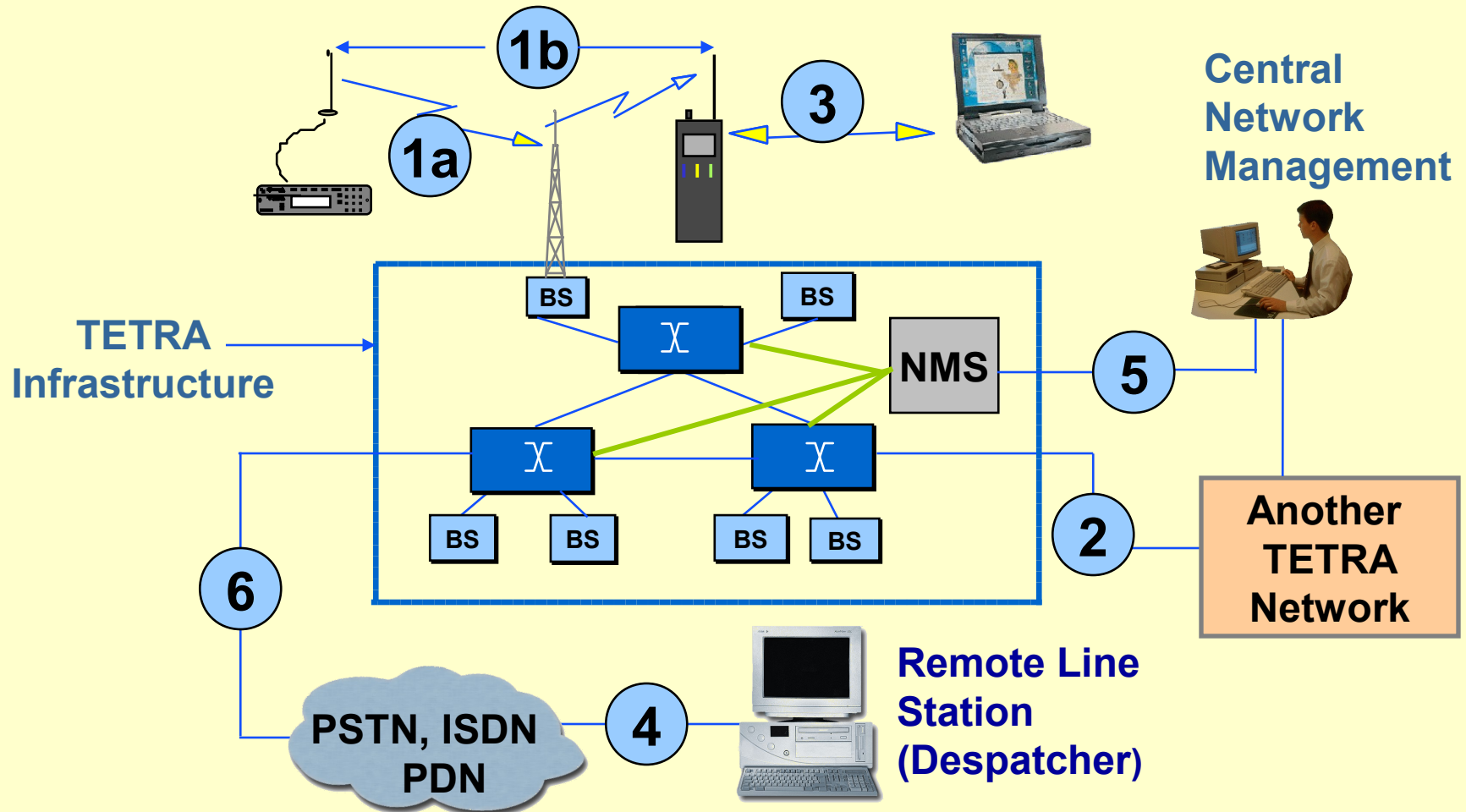
**New Technologies Senior Manager**

**Marconi Mobile**

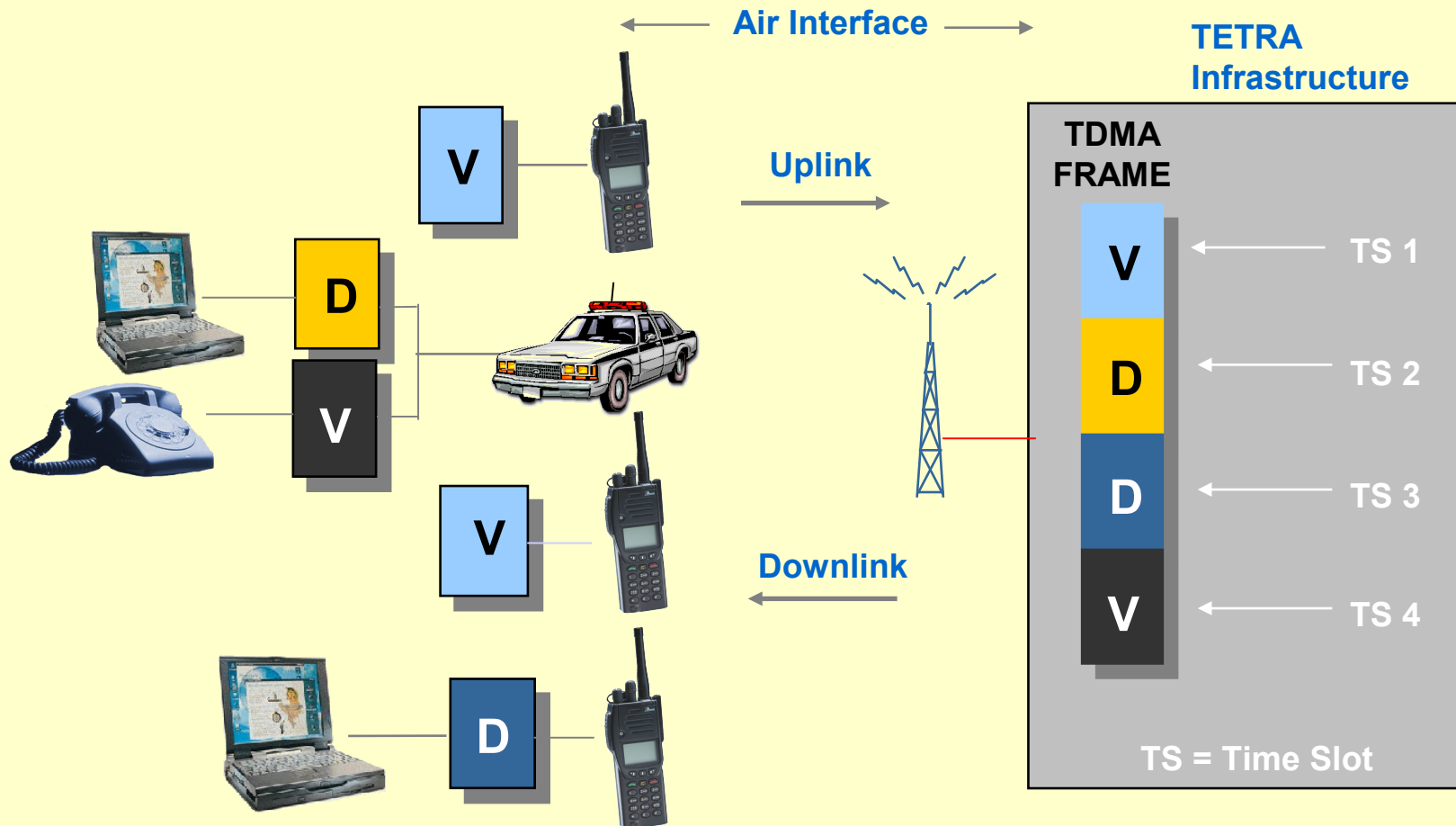
## ***Agenda***

1. TETRA Architecture and Standard Interfaces
2. Description of Individual Interface
  - **Network Aspects and Scenarios**
  - **Services**
  - **Protocols**
3. TETRA Standard Gateways
  - **Features**
4. Network Management System
5. Control Room Gateway
6. Conclusions

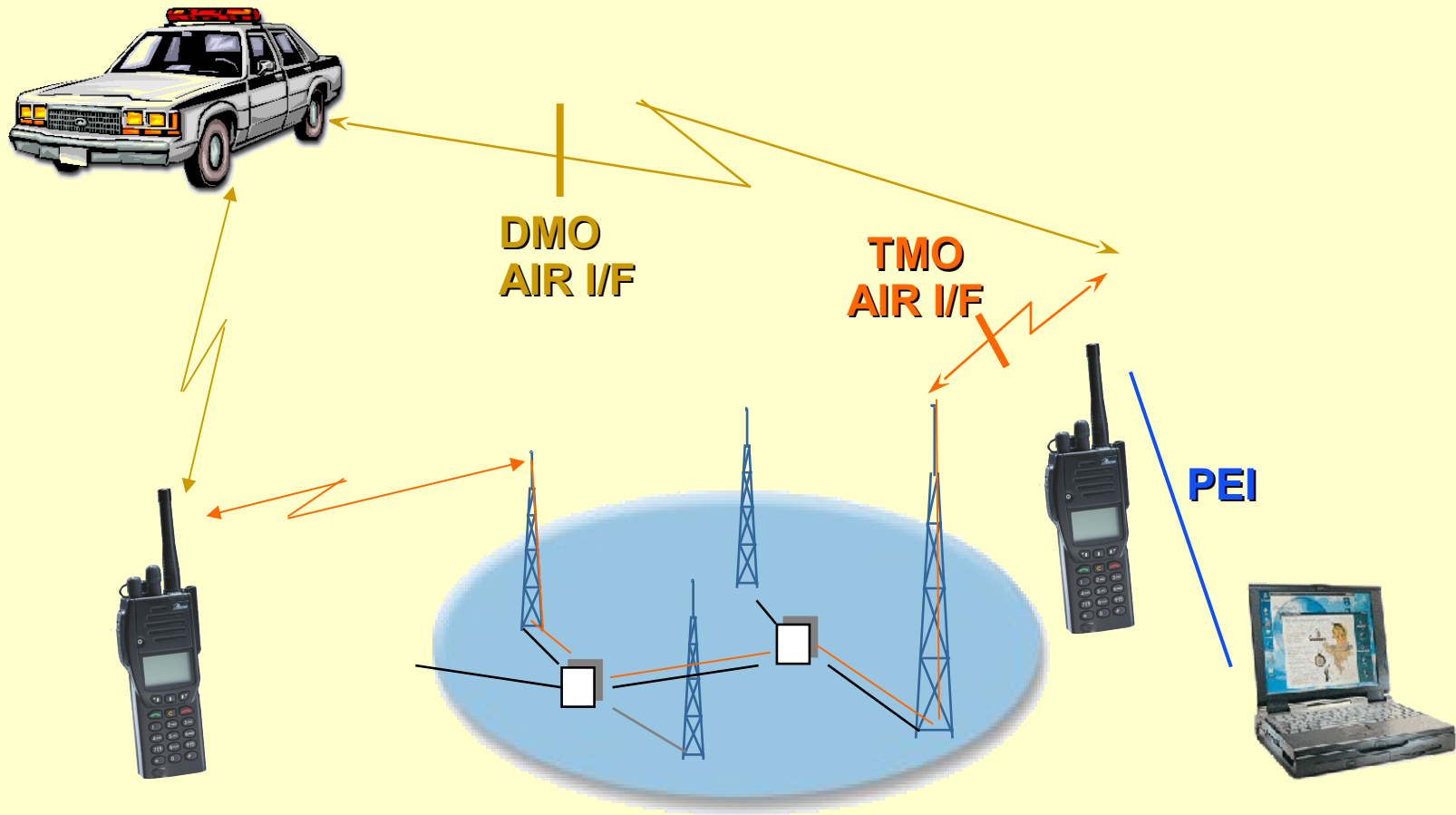
# Typical TETRA Network



# ***TM V+D Air Interface***



## ***Air Interface (AI) Variants***



## ***TM V+D AI Data Rate Capacities (kbit/s)***

### **BANDWIDTH ON DEMAND**

Number of Timeslots	1	2	3	4
No Protection	7.2	14.4	21.6	28.8
Low Protection	4.8	9.6	14.4	19.2
High Protection	2.4	4.8	7.2	9.6

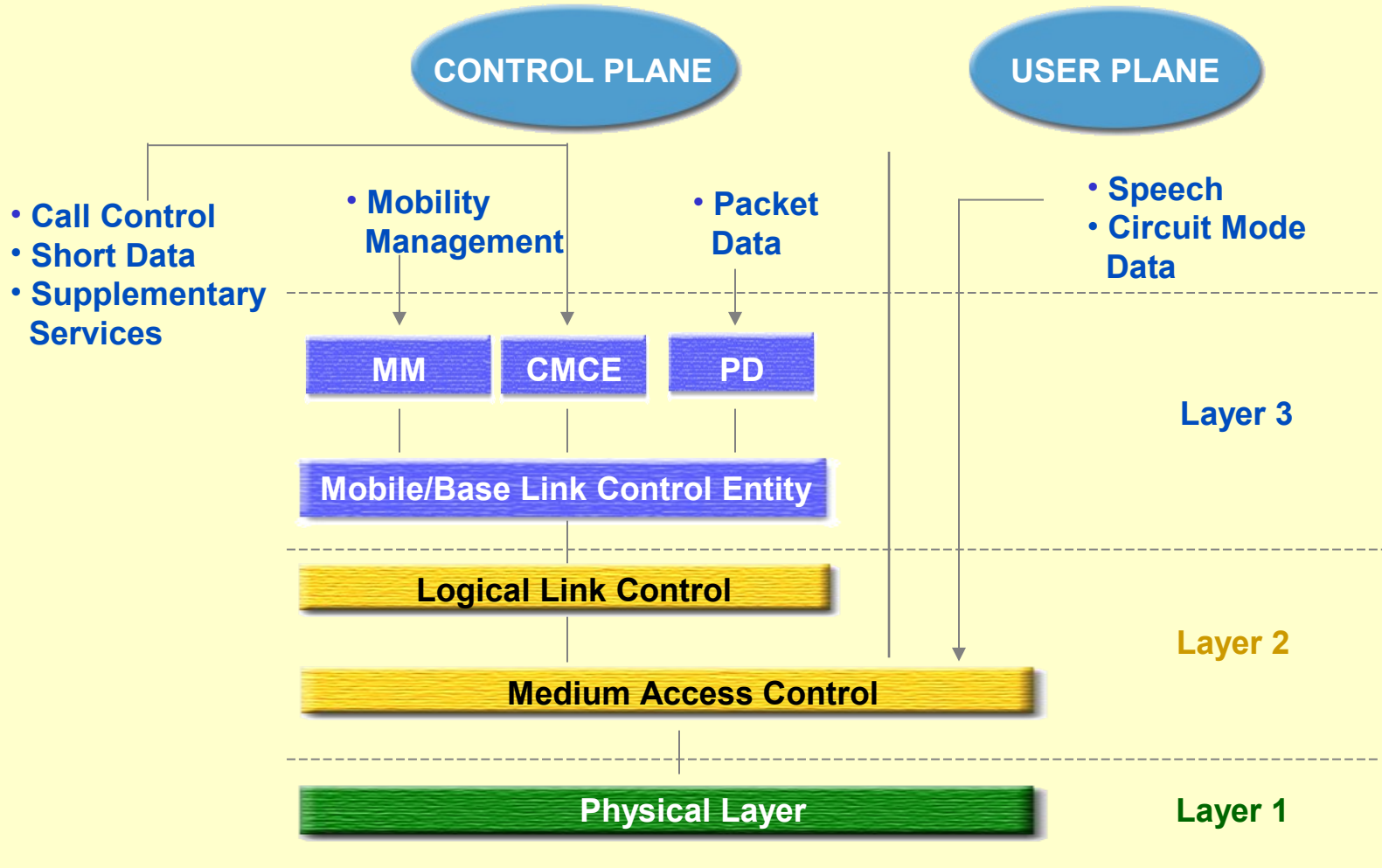
## ***TM V+D AI Services***

- Speech
- Data
  - Circuit mode
  - Packet mode
  - Short data service
- Supplementary Services
- Call Control
- Mobility Management
- Security Services





# ***TM V+D AI Protocol Stack***





## Direct Mode AI Scenarios



1. INDIVIDUAL CALL



2. GROUP CALL

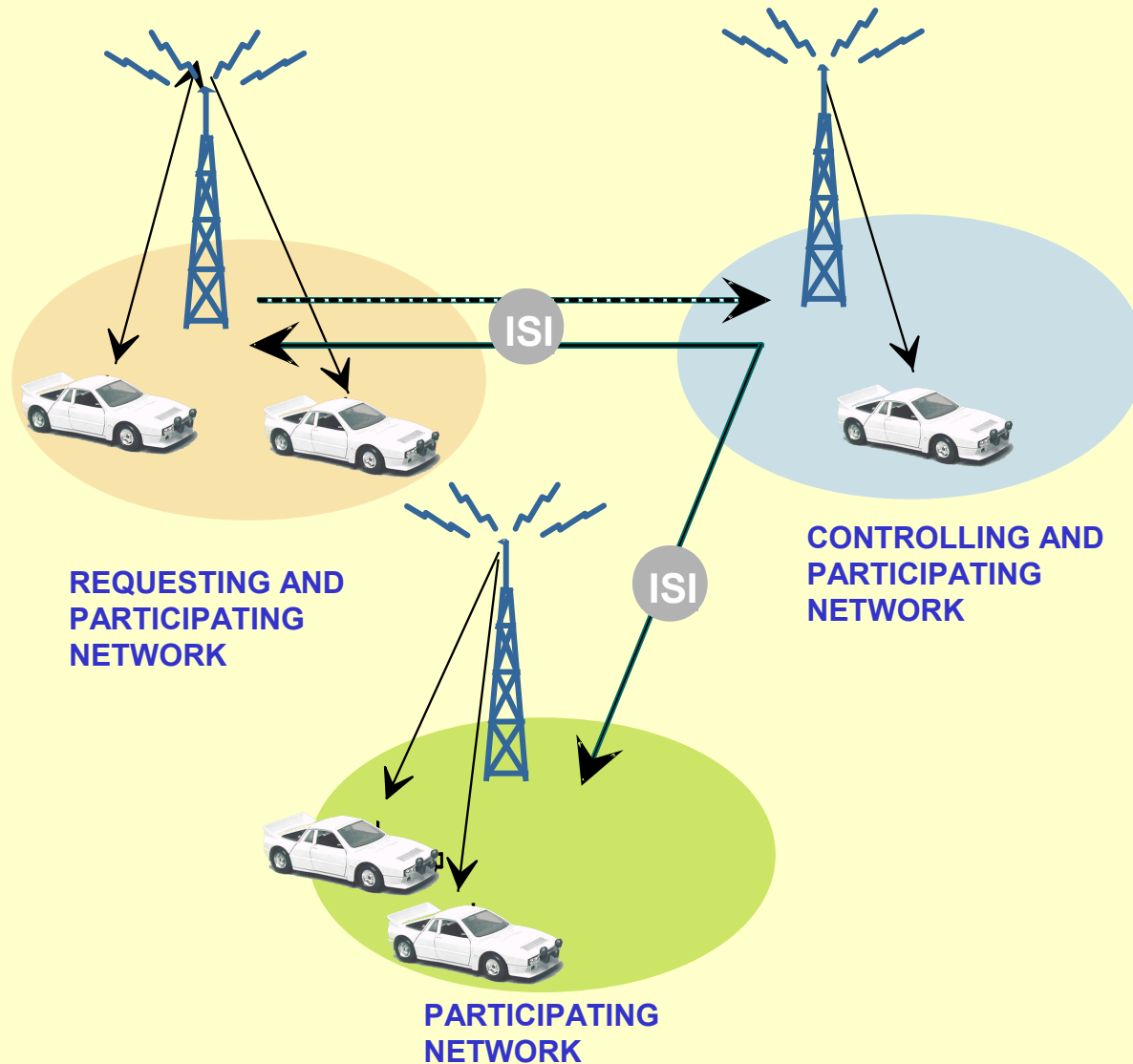


3. DUAL WATCH

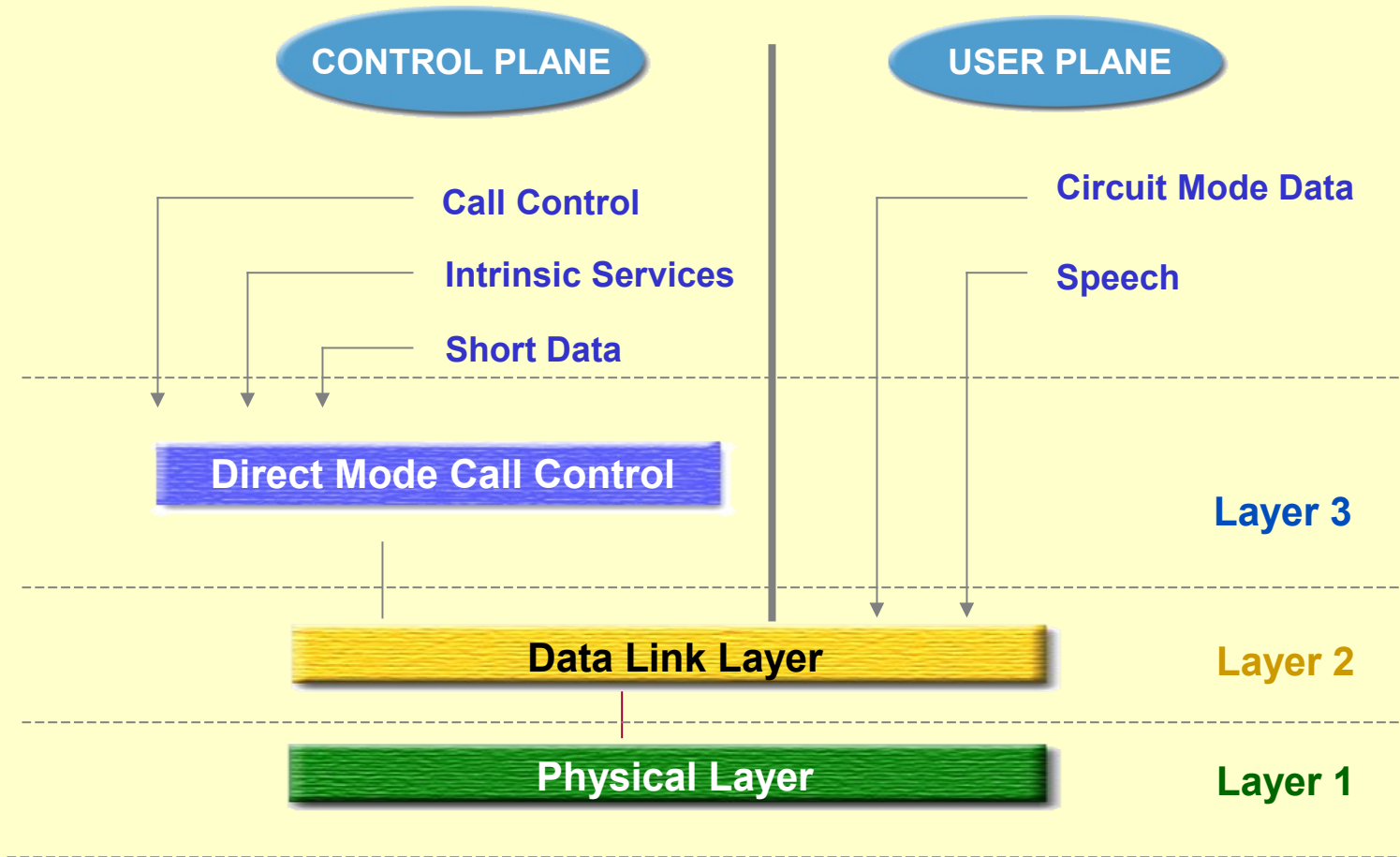


4. MANAGED DIRECT MODE

# Example: ISI Group Call Configuration



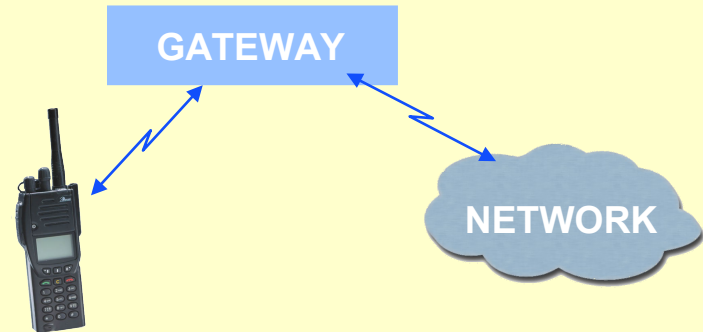
# ***DM AI Protocol Stack***



## Direct Mode AI Scenarios (contd.)



5. DIRECT MODE REPEATER



6. DIRECT MODE GATEWAY

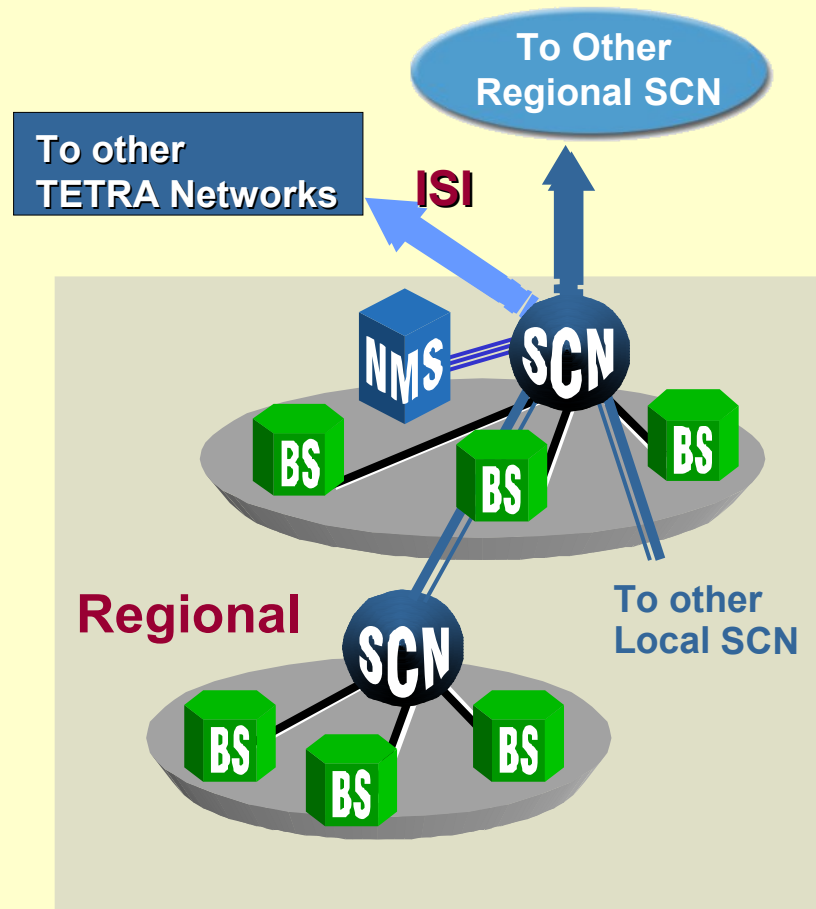


7. DIRECT MODE REPEATER/ GATEWAY



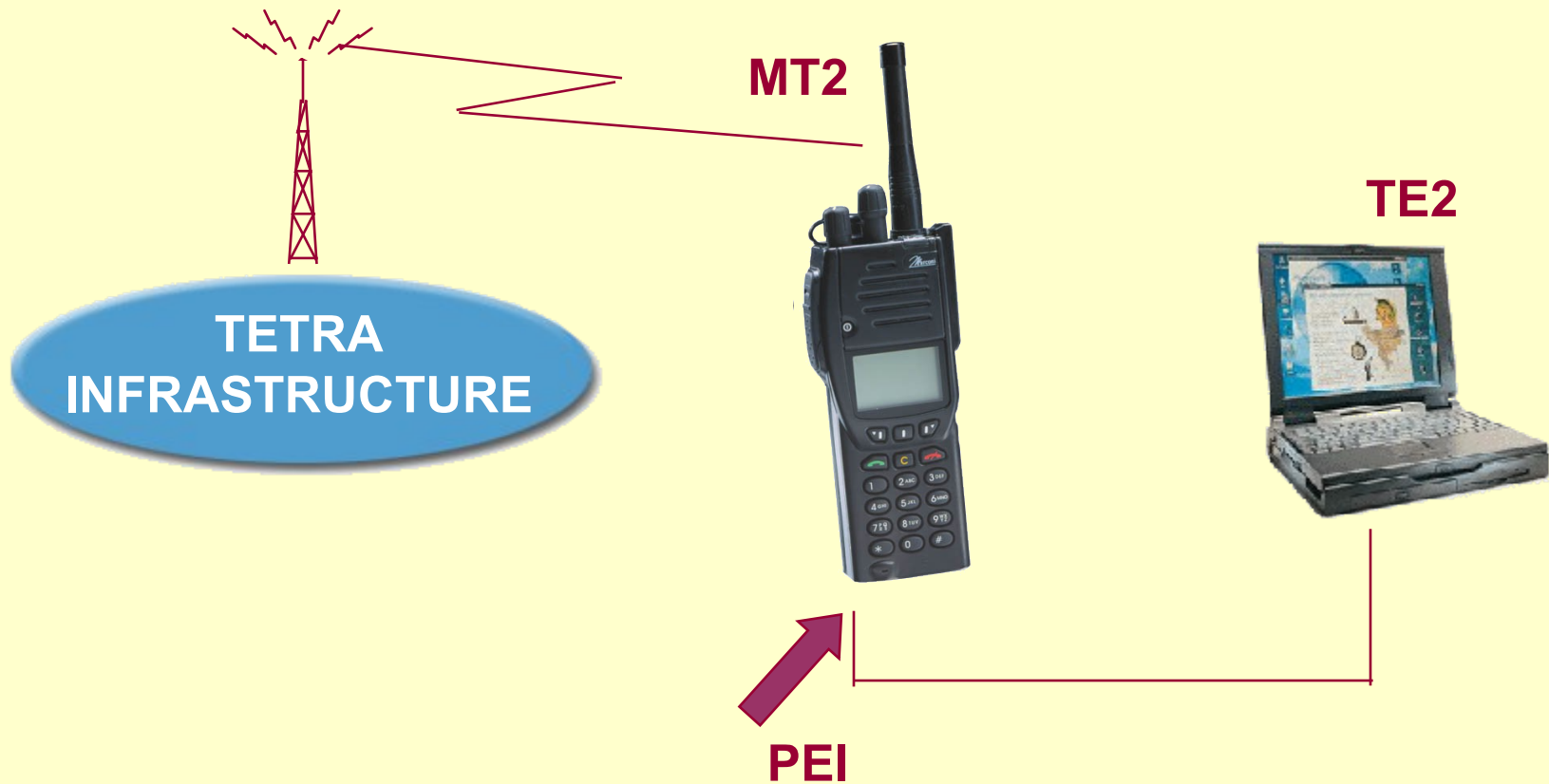
8. MANAGED REPEATER/ GATEWAY

## ***Services Supported by ISI***

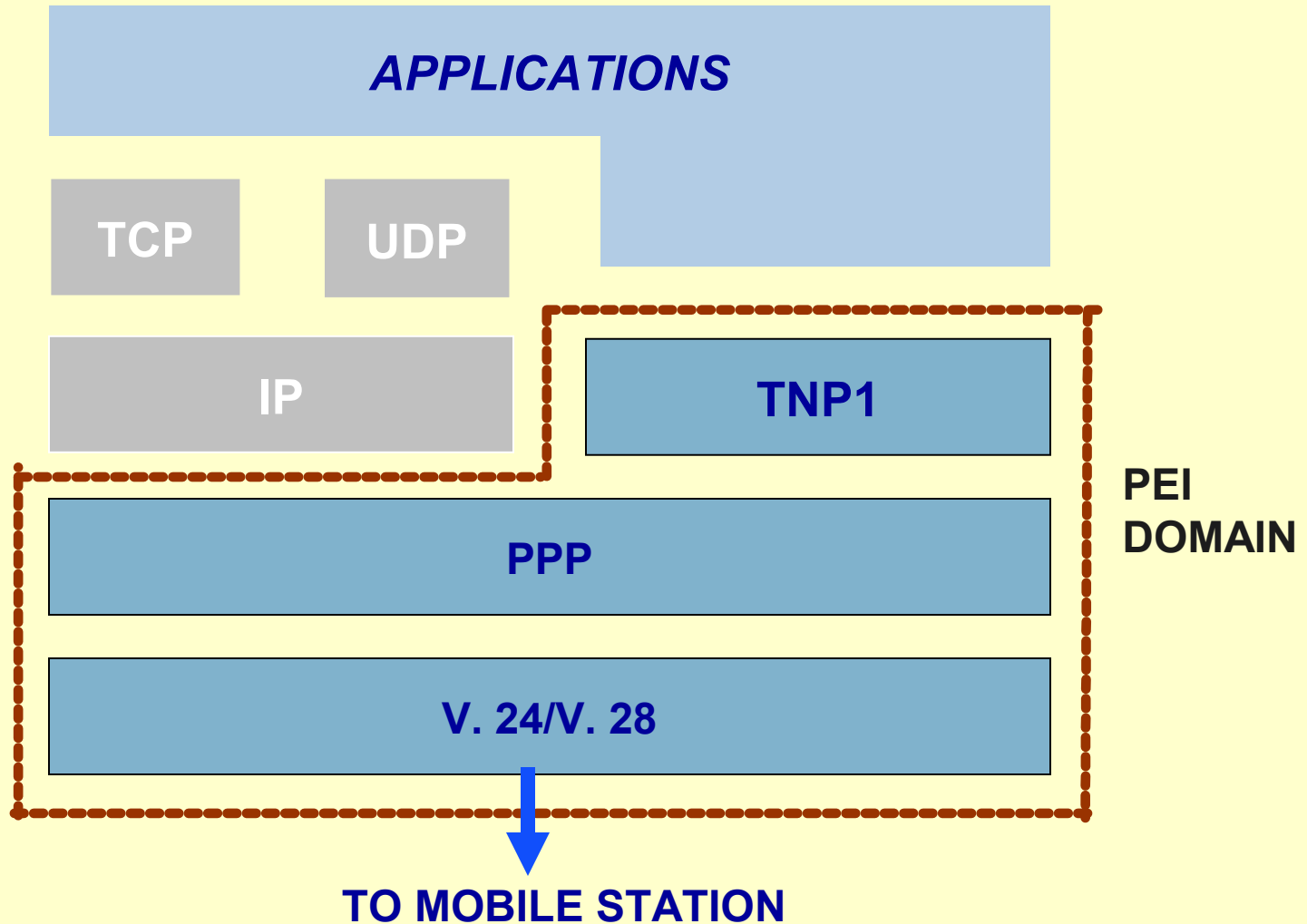


SCN: Switching Control Node  
NMS: Network Management System  
BS: Base Station

# ***Peripheral Equipment Interface (PEI)***

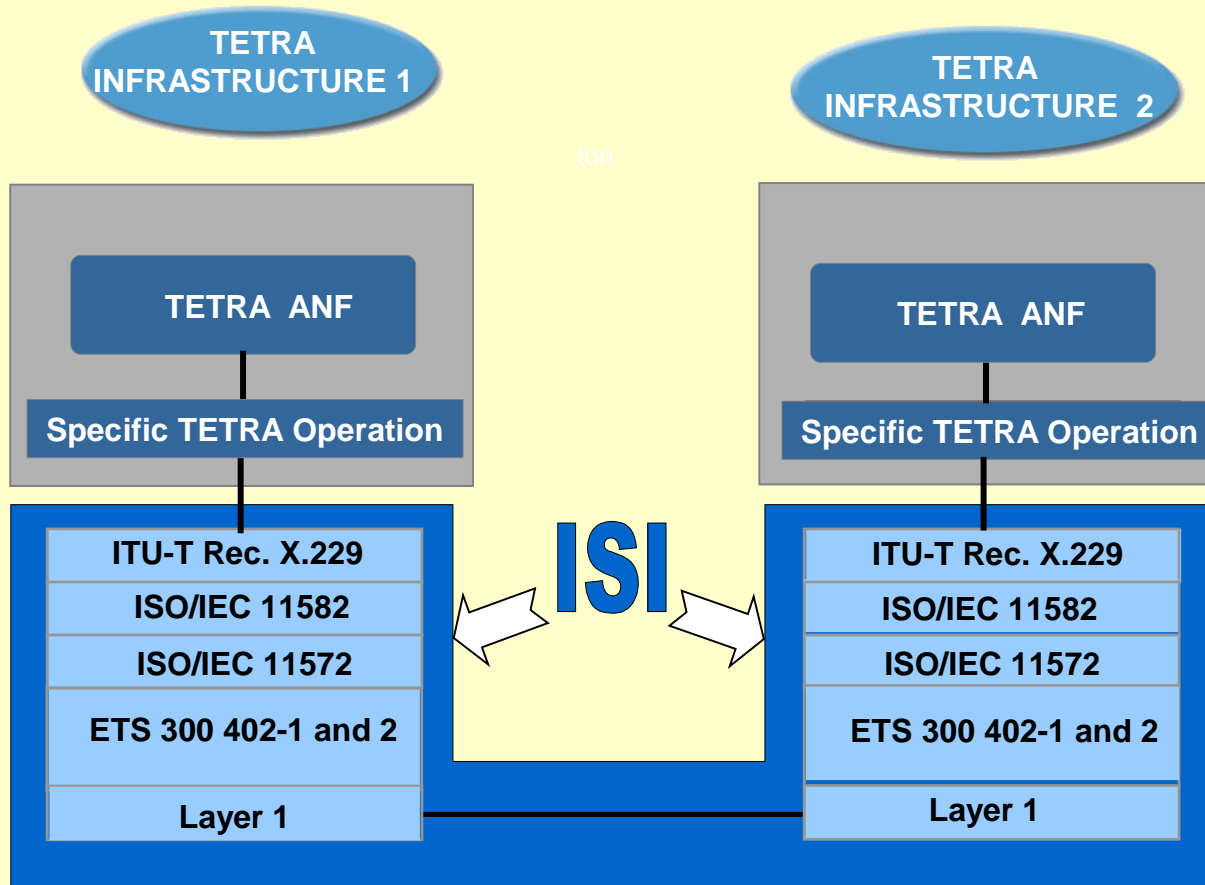


## ***PEI Protocol Layers***



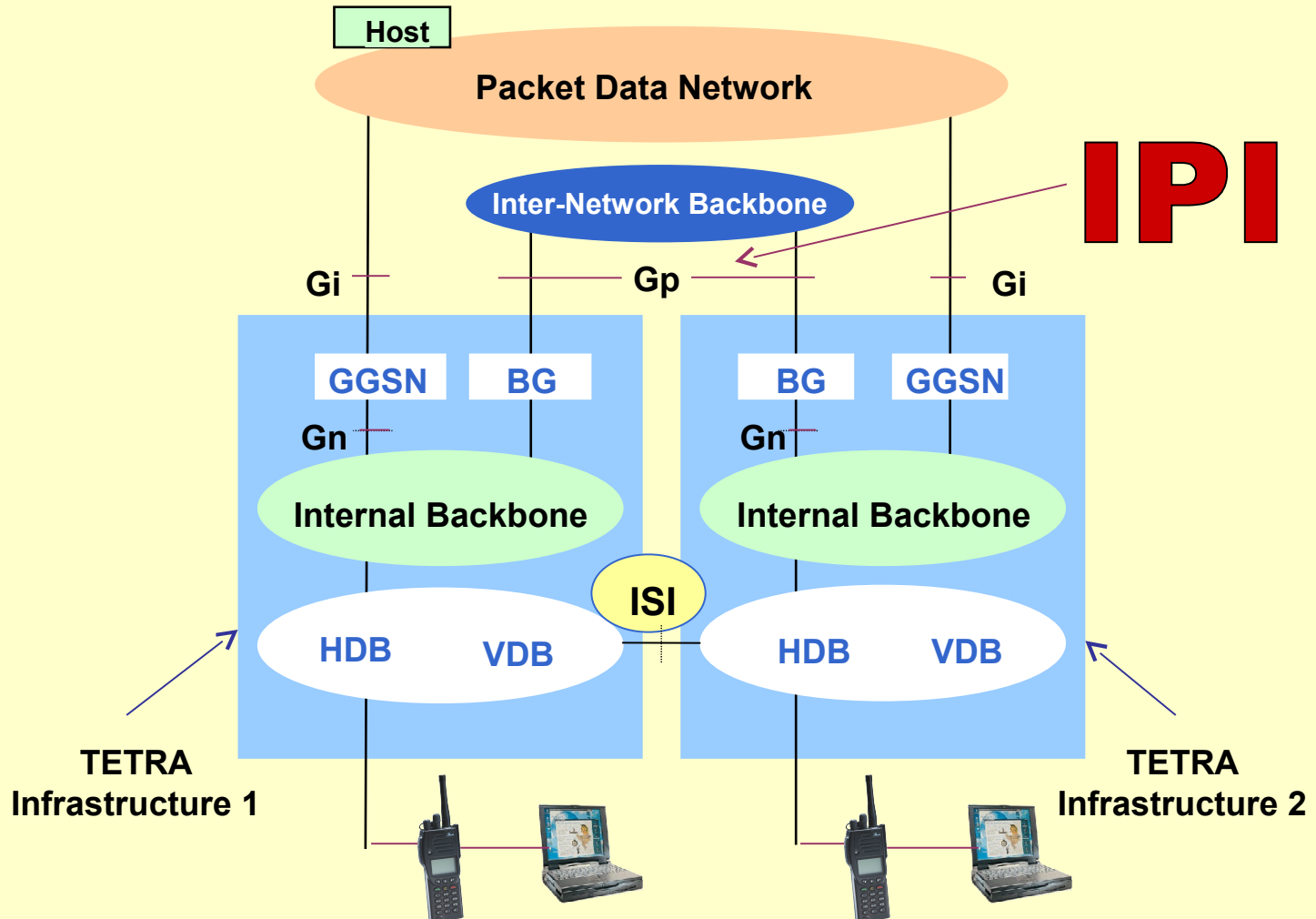


# ISI : Protocol Stack

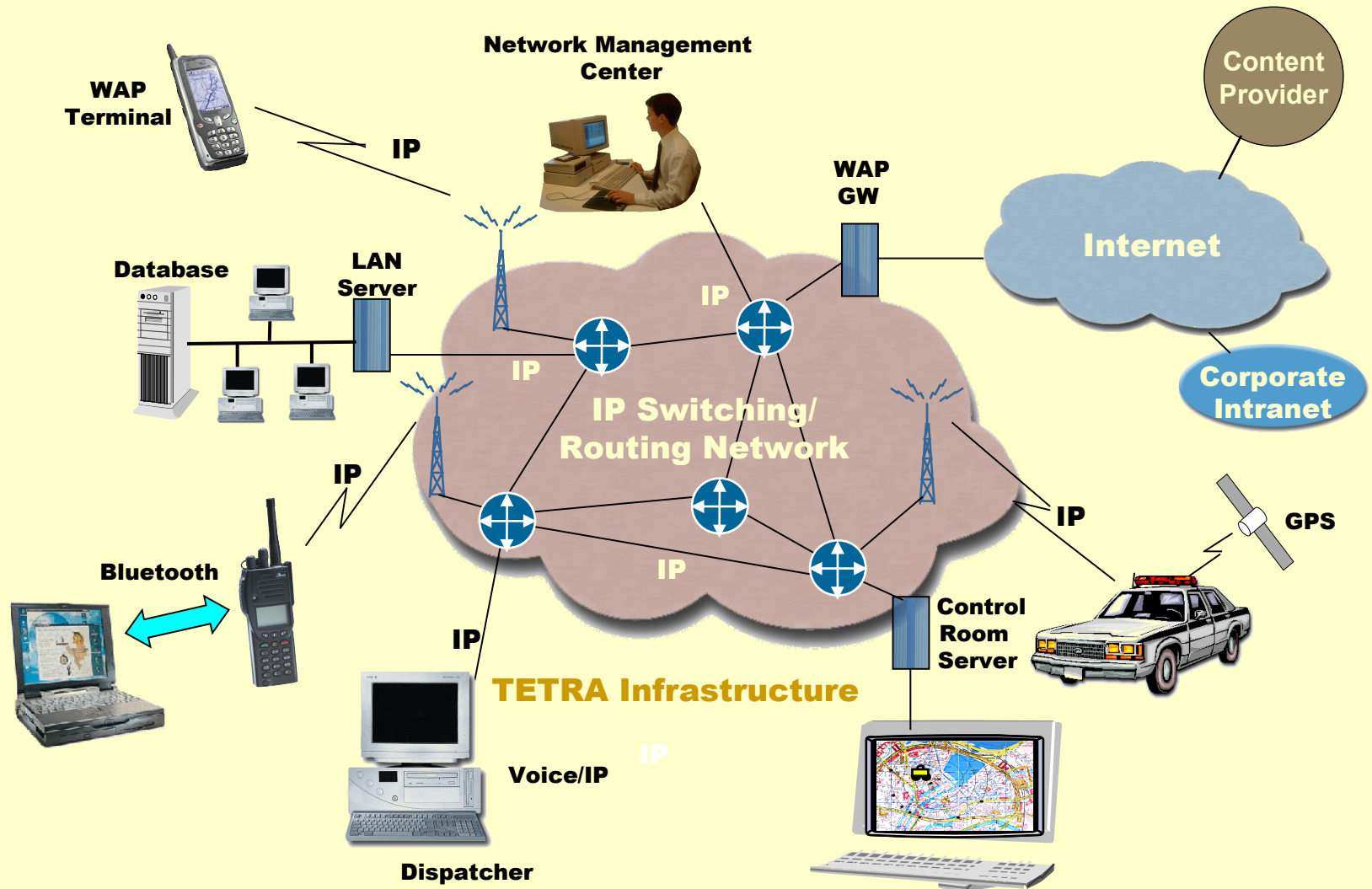


**PRIVATE SIGNALLING SYSTEM 1 (PSS1) USED IN ISI STANDARD**

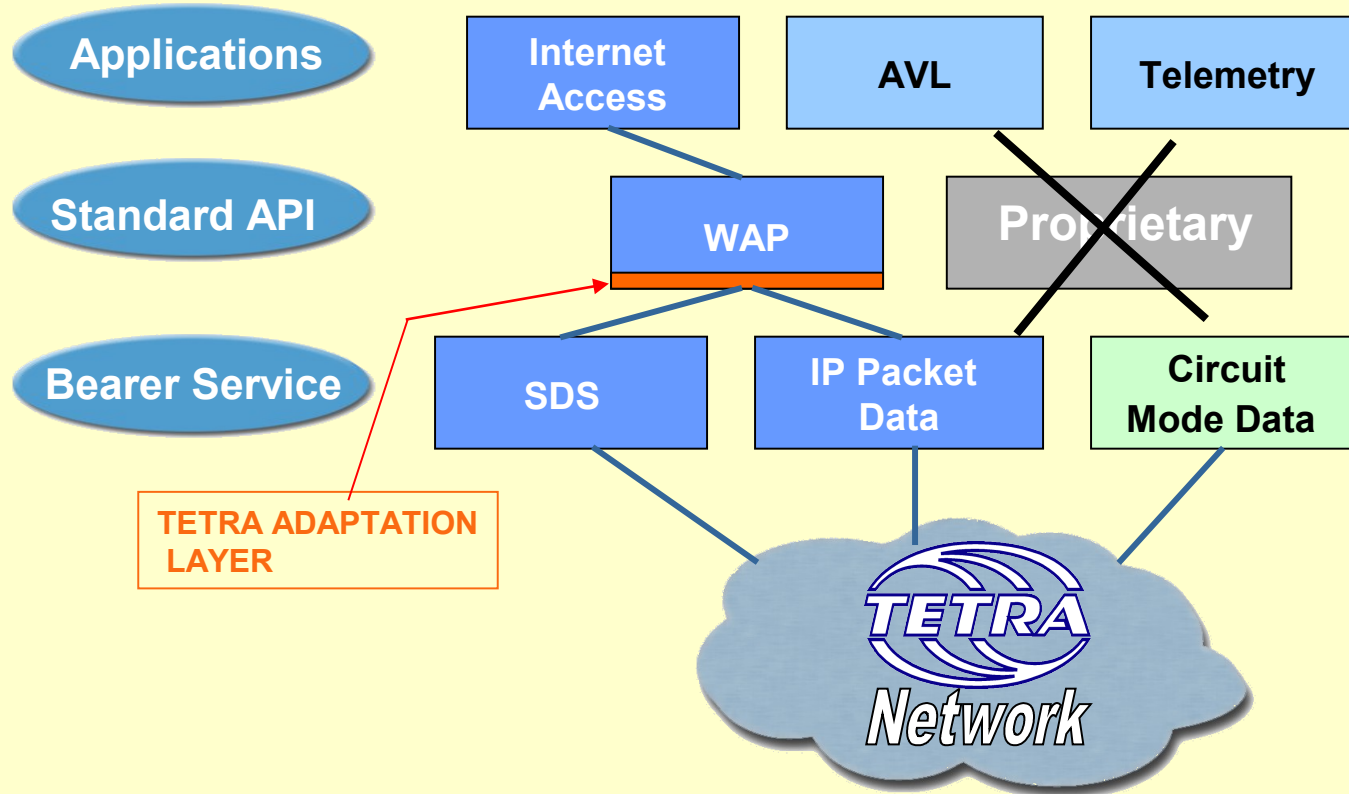
# IP Inter-working Interface



# ***TETRA as an IP Network***

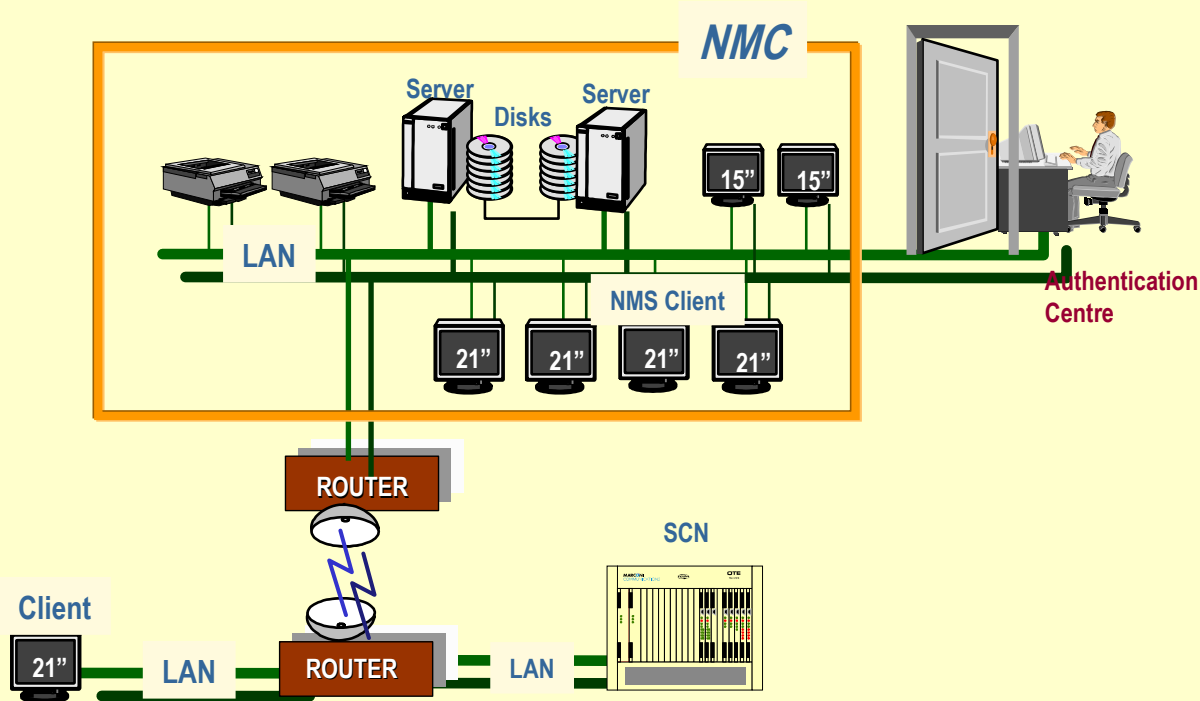


## ***Standard API and Applications***

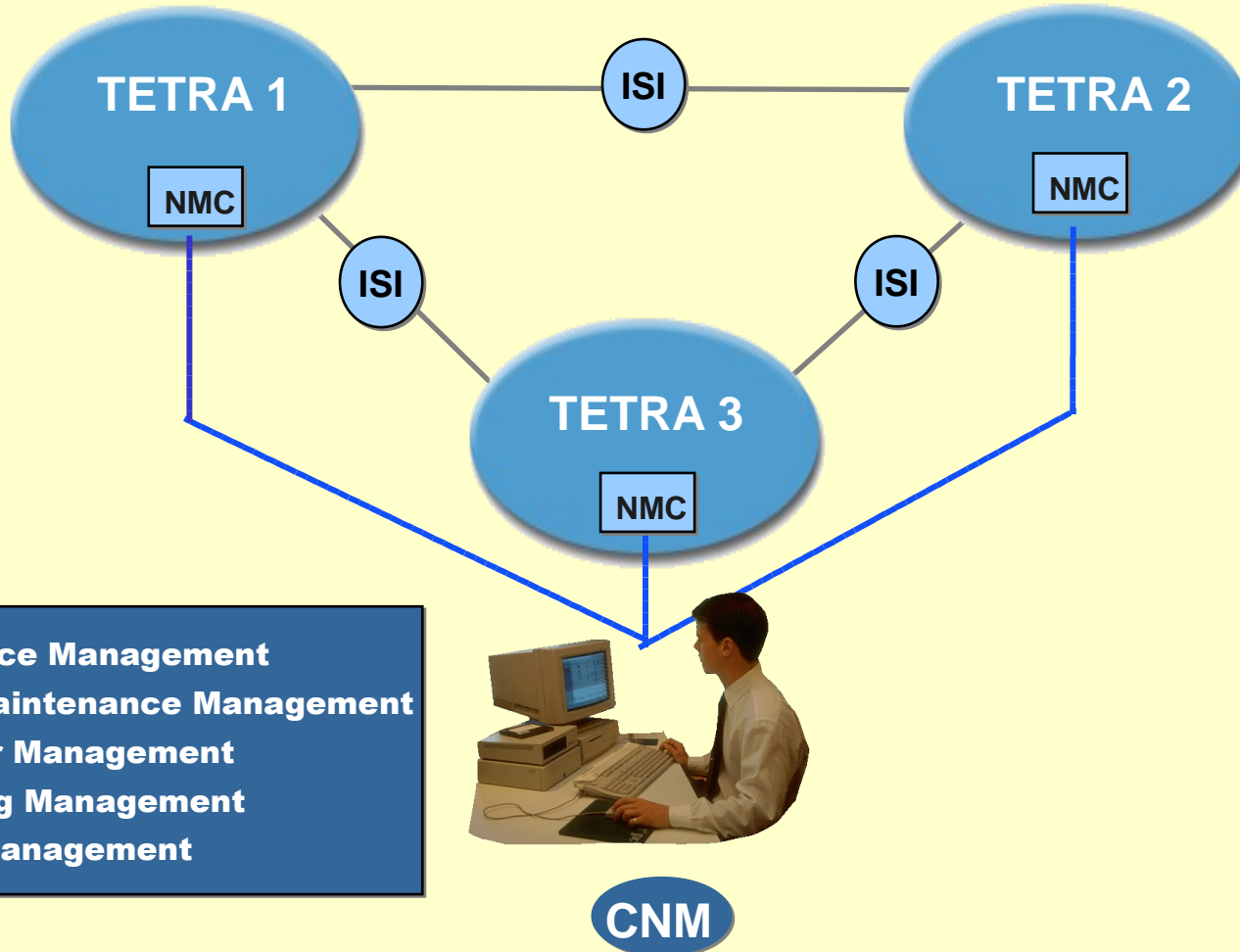


# ***Network Management (1)***

## ***(Internal)***



## ***Network Management (2)*** ***(external)***



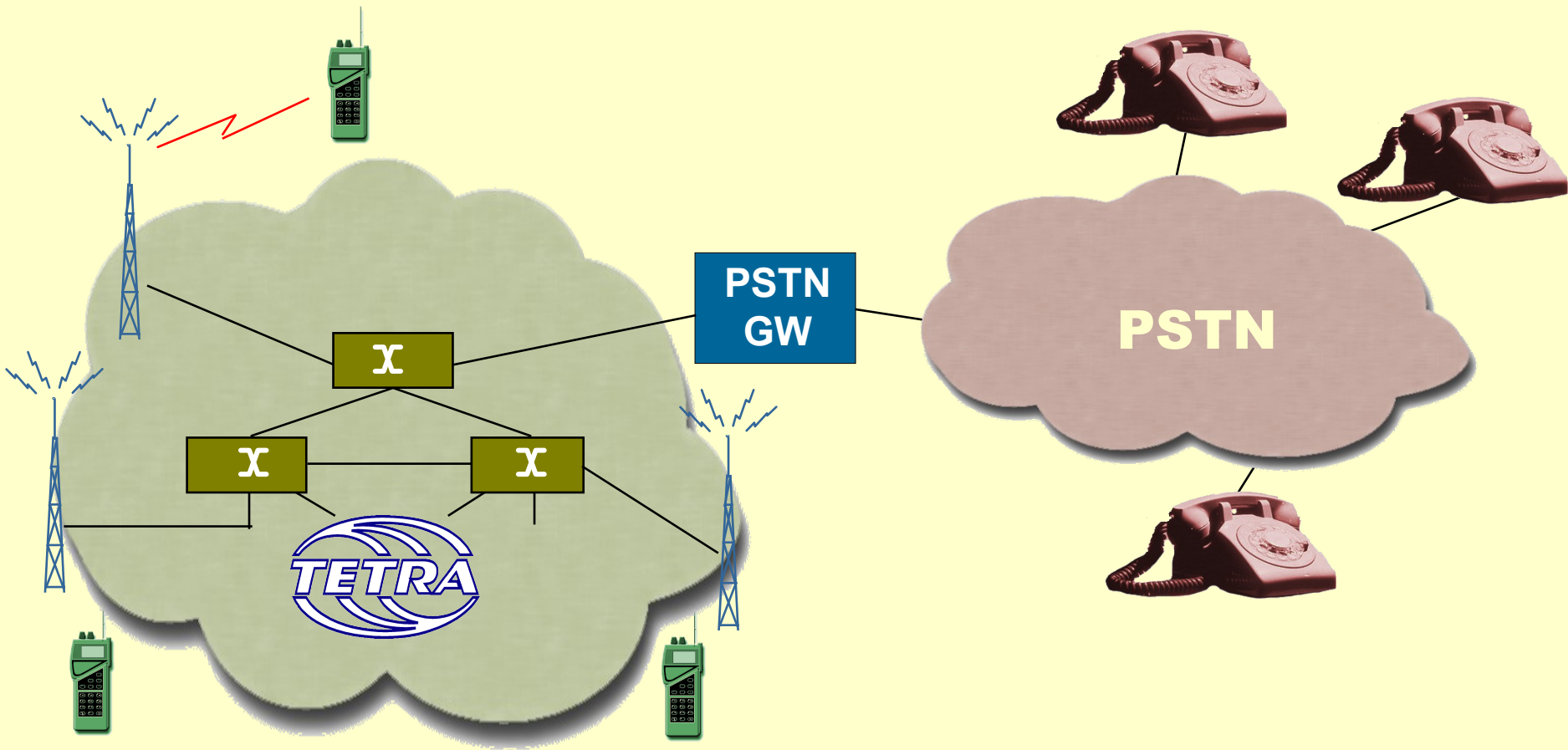
- Performance Management
- Fault or Maintenance Management
- Subscriber Management
- Accounting Management
- Security Management





**Terrestrial Trunked Radio**

# ***PSTN Gateway***

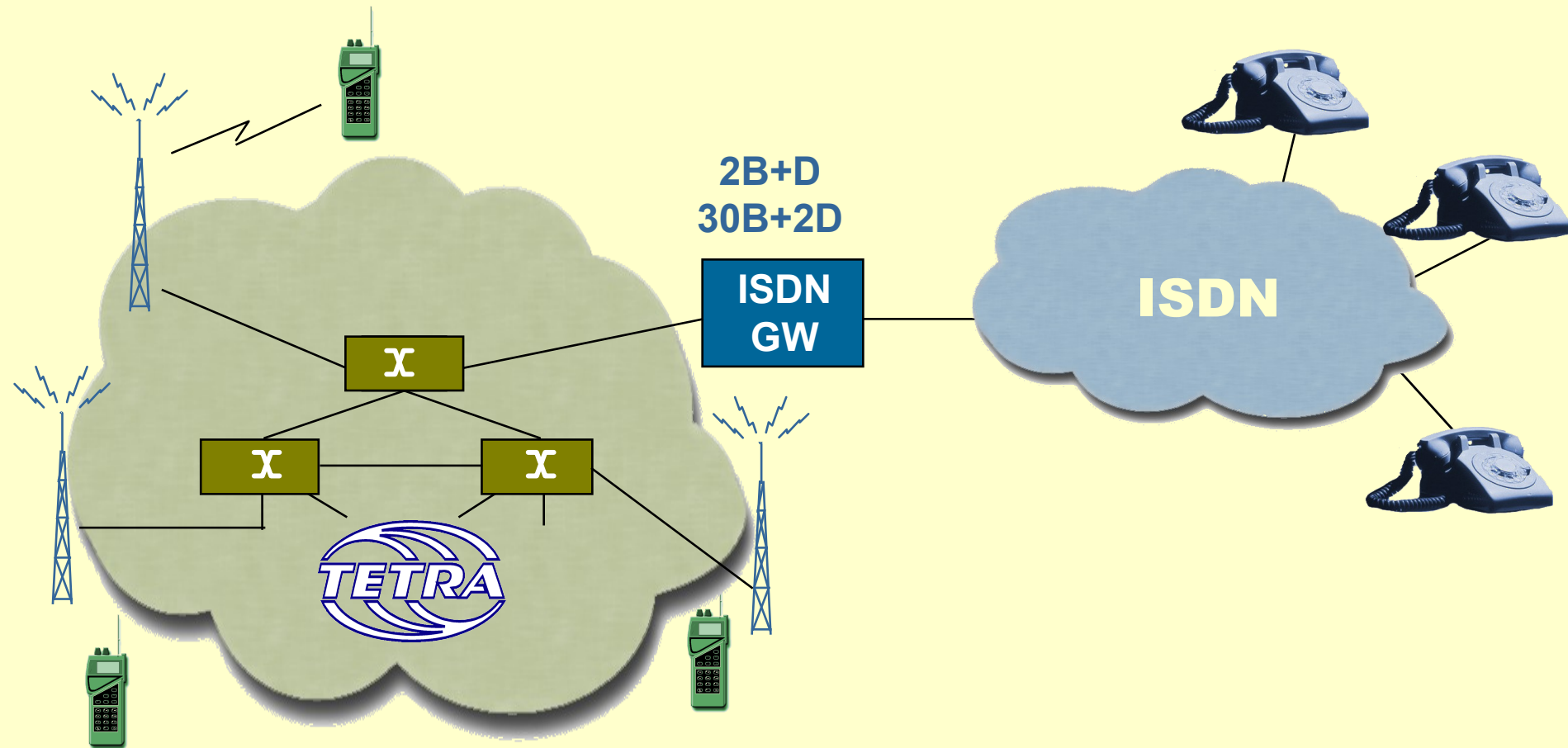




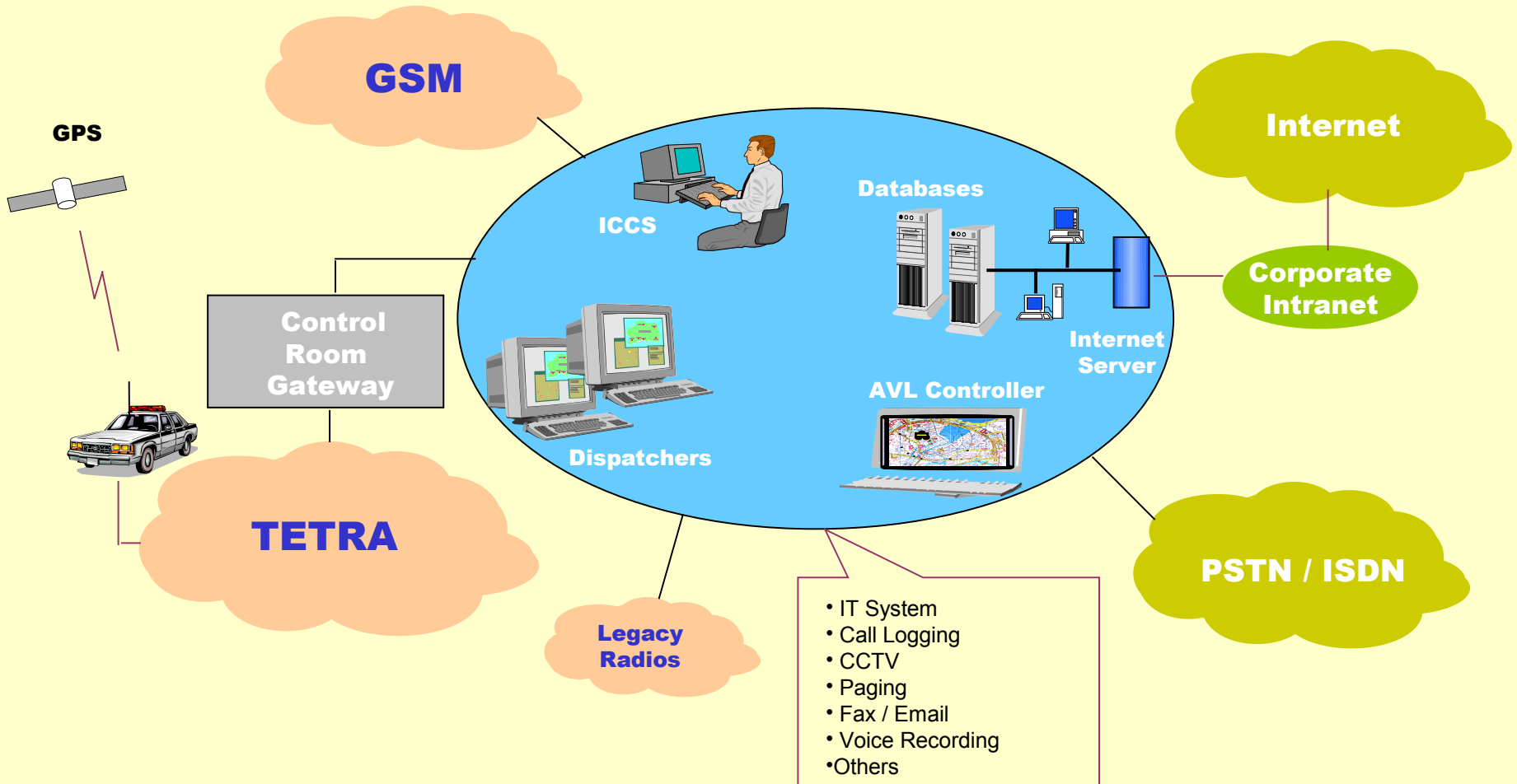


**Terrestrial Trunked Radio**

## ***ISDN Gateway***

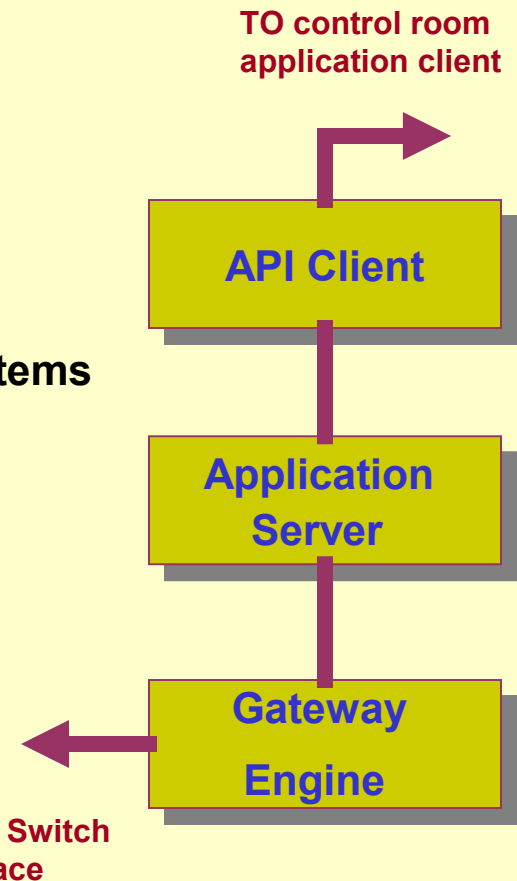


## ***Control Room Gateway (1)***



## ***Control Room Gateway (2)***

- Not standardized because of different applications requirements from different user sectors
- Current trend is to include Flexible Application Programming Interfaces (APIs) which:
  - **Facilitate Programming at a higher abstraction level**
  - **Allow integration of radio functionality in different systems**
  - **Guarantee flexibility of control center configuration**
  - **Allow GUI's customization**
- Management of following functionalities through API using API libraries or through messages :
  - **Audio parameters**
  - **Individual and Group Users**
  - **Supplementary services**
  - **Alarms**



## ***Conclusions***

### **TETRA Architectures and Interfaces allow:**

- Spectrally-efficient feature rich communication
- Choice of trunked or direct modes
- Interoperability between different TETRA networks
- Multimedia services, Internet access and mobile office capability
- Extensive data applications capability
- Inter-working with public networks
- High level of security