Summary

o **TDR Interworking key facts**

o **PCC recommendations**

o **Interworking critical issues**

o **Operational requirements**

o **Interworking objectives**

o **TETRAPOL contributions to requirements in Europe and USA**

  • **ITU, ETSI, TIA**

o **TETRAPOL operational interworking references**

o **Global architecture**

TDR interworking key facts

o Disaster Relief is not day to day operation (ITU-R8A/64-E)

o Interworking is involving different organizations communicating

o Key problems are more operational than technical

o More actors are involved such as civilians

o Inter working is between groups with their own methods of working, with their own hierarchy for decisions...

o Most Communication 'Problems' are not local to the disaster area but more with communications to remote sites

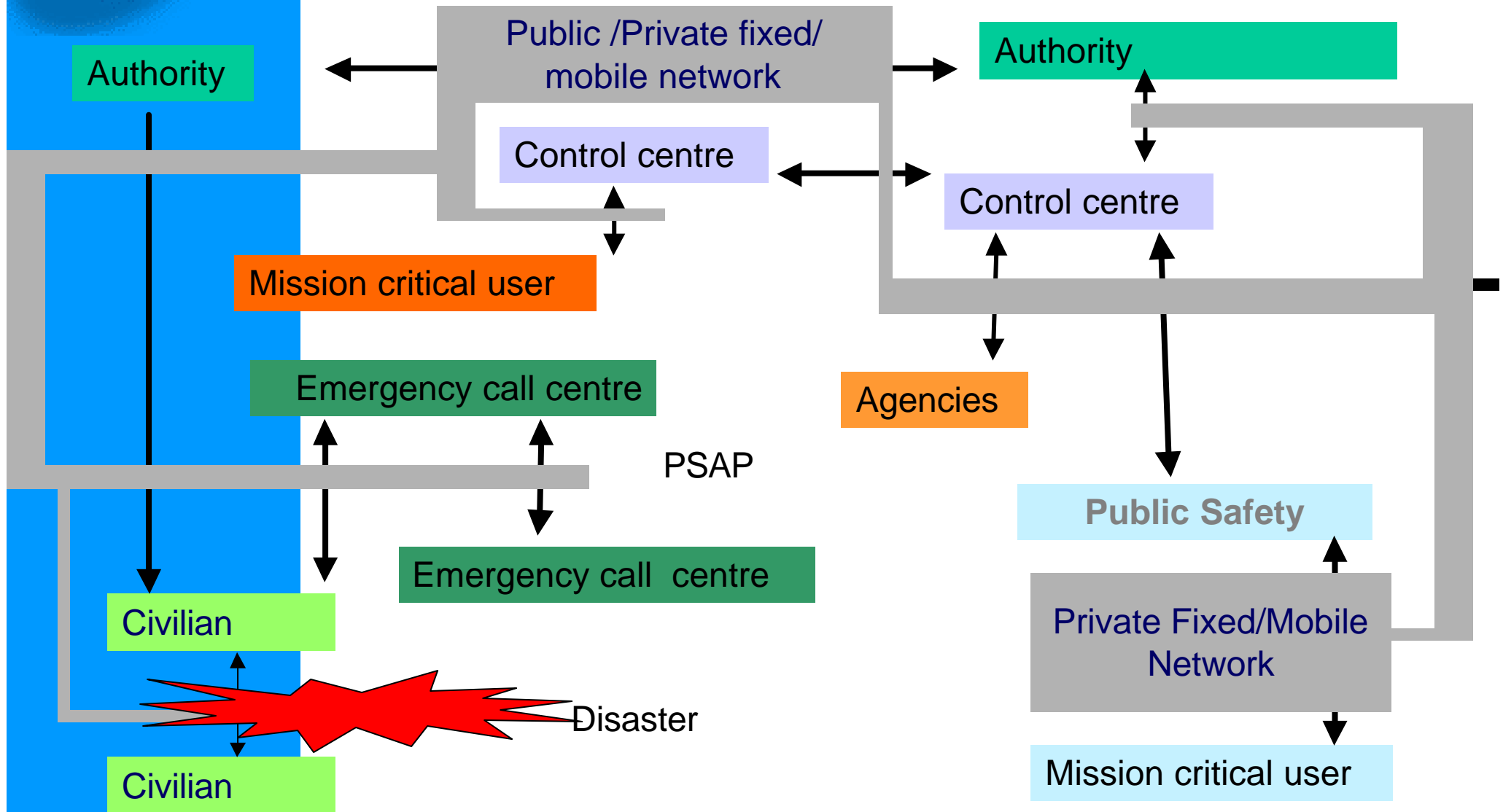o Networks are generally partly/completely destroyed

PCC (Police Cooperation Council) Helsinki 21-22 September 1999

o PCC (ex Schengen) conclusions and recommendations on interworking:

o Three preferred combinations are identified:

- A) Overlapping networks
- B) Use two terminals functionalities (Transponders, extra terminal, combined mobile installation)
- C) Simple interconnections between Control Rooms

o This concerned TETRAPOL and TETRA in Europe

o Similar requirements in North America with Project 25/34

Actors interworking

Public /Private fixed/ mobile network

Authority

Authority

Control centre

Control centre

Mission critical user

Agencies

Emergency call centre

PSAP

Public Safety

Emergency call centre

Private Fixed/Mobile Network

Civilian

Disaster

Civilian

Mission critical user

Interworking critical issues

o Fast re-establishment of minimum communications (ad hoc, WLAN...)

o Language and terminology, Terminal MMI

o Control Centres interoperation through fixed networks

o Call Centres interoperation through fixed networks

o Gateways and market

o PABX interworking

o Efficient and secured Direct mode/individual call

o Overlapping mandates and political issues

o Sharing the resources and information

o Service Level Specification and Agreement

  • QoS, Priority, Security...

o Addressing and network routing - ENUM

Operational requirements

o   Disaster Relief communications (TDR)

o   TETRAPOL Users Club – TUC requirements:

- Interoperability at authority high level
  - Decisions are made at that level which needs the right information
  - Individual (secured) fixed calls are made between PABXs
- Coordination between on site users
  - Users contact their Control Centre (fixed-mobile)
  - Individual (secured) fixed-mobile calls are made between Control Centres
- Group calls and Conference calls interconnection
- Quickly deployed networks – ad hoc
- Re configuration – re establishment of networks

SCN, IP, PMR, UMTS, WLAN, SAT… planes

SAT

Control Centre

UMTS

WLAN

PMR

Gateway

disaster

IPFN

IP

@

SCN

PSTN/ISDN…
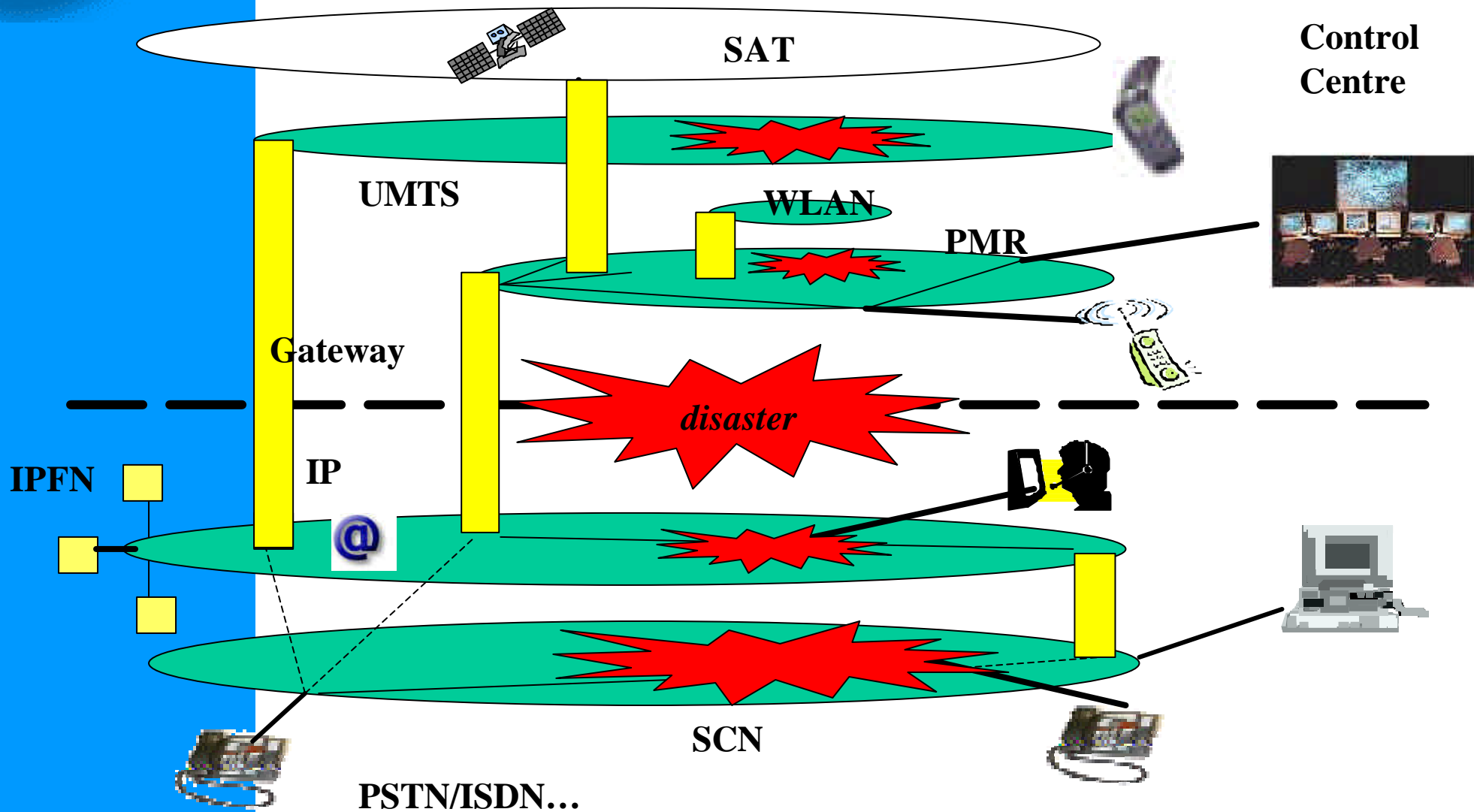
Interworking objectives

o Interworking of Public and Private networks (Gateway)

o Connection of Networks seen as a Federation of Networks (IPFN, NGN)

o Ongoing Convergence to IP core networks for VoIP and Multimedia (IP V6)

o Sharing information between organisations and agencies (IT)

o Standardisation of Meta Data (XML)

o End to end Security: trust in services and information resources (FNBDT)

o Priority, QoS schemes

o One Voice coding (NATO 4591 stanag)

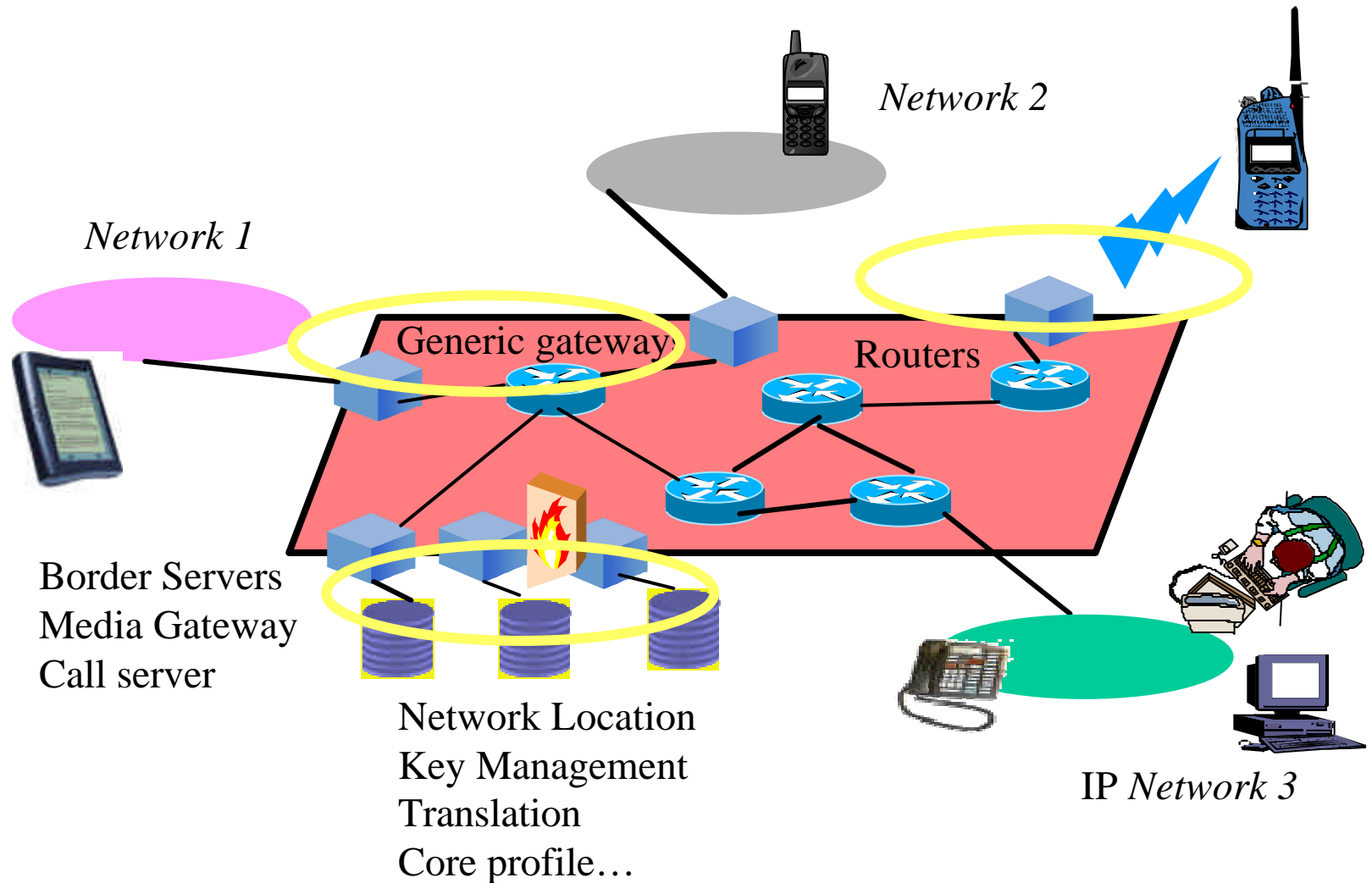o Simple solutions such as face to face terminals, direct mode, group to conference call

TETRAPOL and Interworking

o   TETRAPOL is one of the 4 PMR (LMR) systems (TETRAPOL, APCO25, TETRA, iDEN) defined in ITU handbook ITU-R8A-205

o   TETRAPOL forum has made available its open interfaces in the Publicly Available Specification (PAS - www.Tetrapol.com)

o   TETRAPOL is built on:

- a fixed IP Core network (National, Regional, Local)

- a fixed and mobile Access network

- Open interfaces to:
  - Call centres,
  - Control centres
  - Network and Key management centres

- Gateways to:
  - PABX, Public/Private IP and non IP networks

TETRAPOL an interworking architecture

Network 2

Network 1

Generic gateway

Routers

Border Servers
Media Gateway
Call server

Network Location
Key Management
Translation
Core profile…

IP *Network 3*

TETRAPOL contributions to inter working in ITU, ETSI, TIA

Users requirements

- TIA MESA Interworking with legacy systems (Ref TSG RA02 006)
- Project 34 Specifications of Requirements (SoR)
- TETRAPOL - TETRA interworking URS (Ref TR 102-021)

Inter working

- TETRAPOL forum PAS open interfaces (Ref www.tetrapol.com)
- TIPHON change request for Gateway priority and security (Ref IPFN-TD013)
- TIA Task Group on Inter Sub System Interface -TSG ISSI (Ref TIA 102BACC)

TETRAPOL contributions to inter working in ITU, ETSI and TIA

o **(Inter working)**

- SPAN14 EMTEL
  - IP Federating Network - IPFN (Ref EG 201 936)
  - EMTEL Functional Architecture Requirements (Ref DEG 14005)

o **Security**

- TIA System Task Group on Encryption -STG Encryption (Ref TIA 905 AAAB)
- TIA MESA partnership project (Ref TSG RA02 006)

TETRAPOL operational Interworking references

UN UNMIK network
NATO KOSOVO network
US STIRCOM network
UK POLYGON network
Spain SIRDEE
Germany KINTOP...

TETRAPOL operational architecture

3G Control Node

Key Management

Tactical & Technical Work Position

3G Base Stations & Terminals

IP Backbone

Call Server

IP Phone
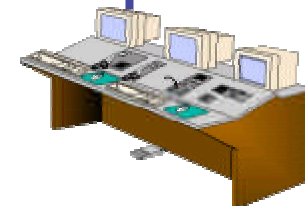
PSTN Legacy terminals

Media Gateway

Control Center

Global architecture

Agencies

IP service provider

Telecom operator

Sub network   Sub network   Sub network

RESOURCE NODES

WAN (Public, Private)

IP, RTCP, ISDN, ATM, SAT…

Sub network

TETRAPOL, TETRA,
Project 25

APPLICATION NODES

Sub network

Emergency

Public Safety
Civil protection
Fire brigade
Ambulances

Event management

Sub network

MESA, TETRAPOL
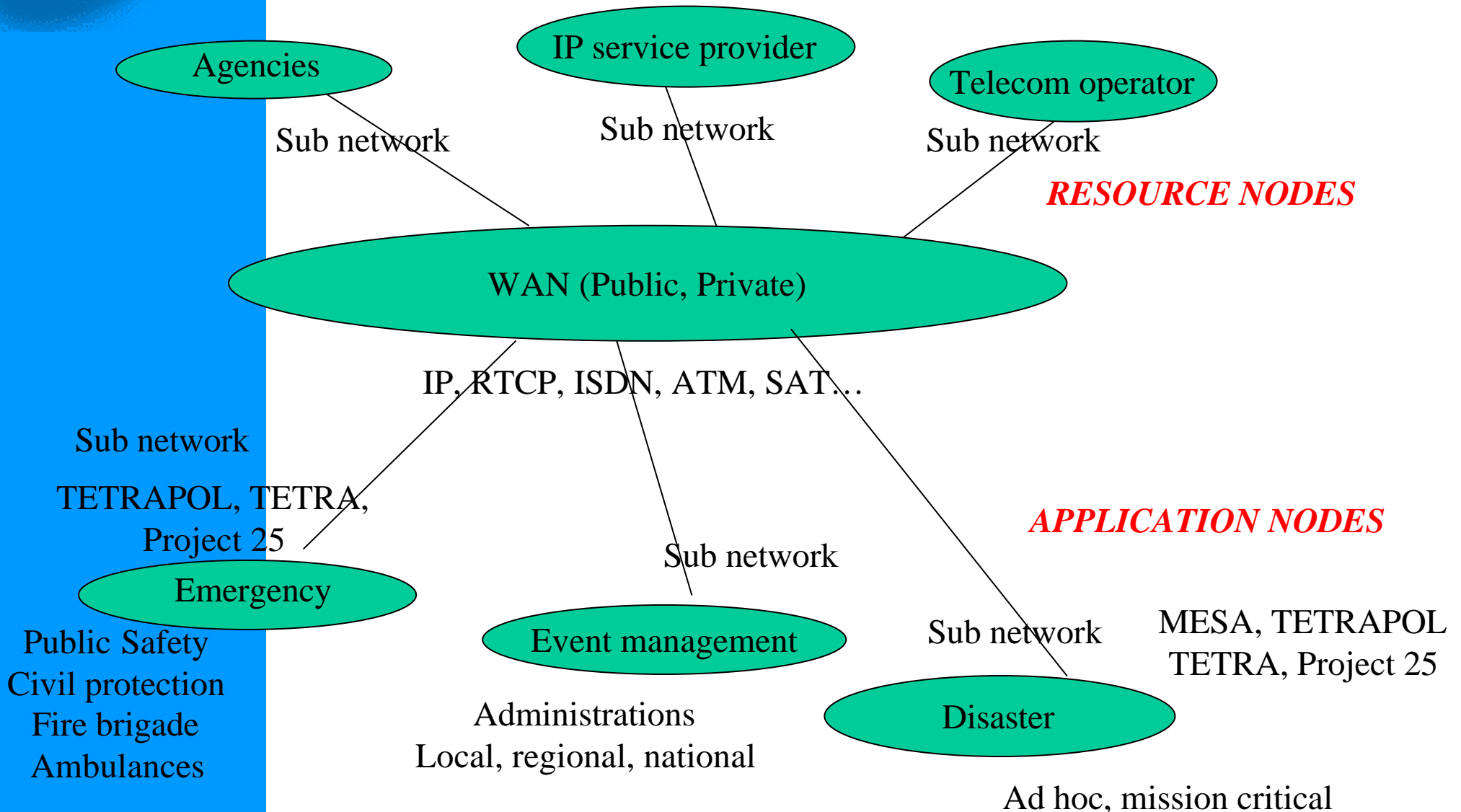TETRA, Project 25

Administrations
Local, regional, national

Disaster

Ad hoc, mission critical

Conclusion

o Interworking of public safety organisations with different technologies concerns:

- A real operational need requiring simple solutions
- Fixed and mobile public and private (possibly ad hoc) networks
- Border nodes as Control centres, Call centres, Gateways

o It requires an open IP interworking architecture as done in TETRAPOL

- TETRAPOL operational references exist

o It requires a standardised Gateway between public and private networks

o It requires standardised meta data for services and IT