



# Nokia TETRA System

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## Mission critical communications system for public safety

Matti Peltola

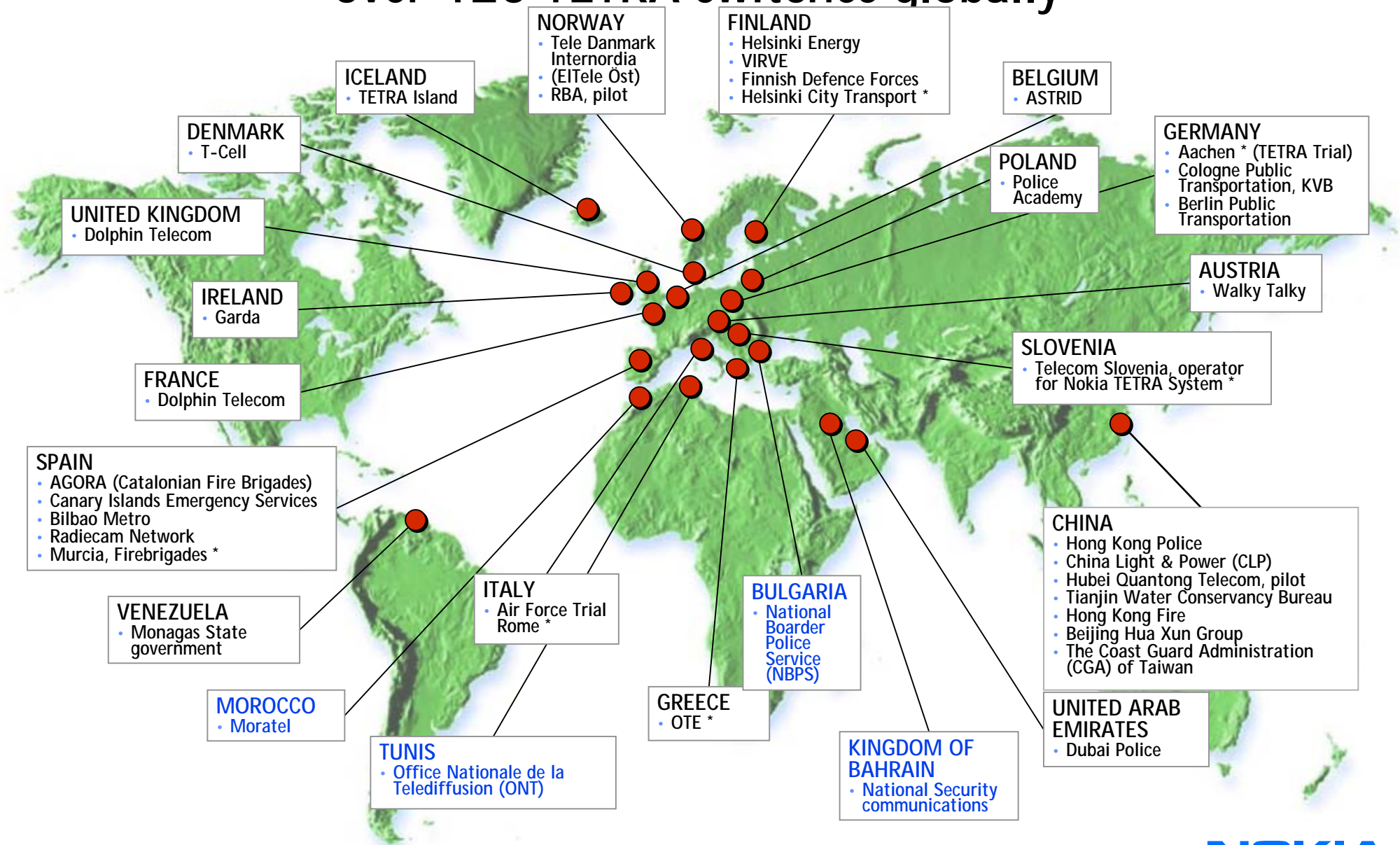
Senior Vice President

Nokia, Professional Mobile Radio

19.11.2002



# Nokia has delivered more than 4500 TETRA base stations and over 120 TETRA switches globally



# Public safety needs up-to-date and purpose built technology - TETRA

- Own network
  - Reliability to grant operations when other systems fail
  - Priorities to guarantee communication for the most urgent communication needs
- Support for fleet management
  - Local capacity need may be huge
  - Instant call connection (less than 0.3 s) - push-to-talk
  - Flexible data services
- Multi agency
  - Virtual Private Networks
  - Police, Fire, Ambulance, Hospitals, Management
  - Cooperation
- Nationwide
  - Emergencies don't know any municipal borders
- Encrypted channels
- Seamless integration with '112 / 911' emergency centres





# GSM or UMTS cannot meet the needs of authority communication

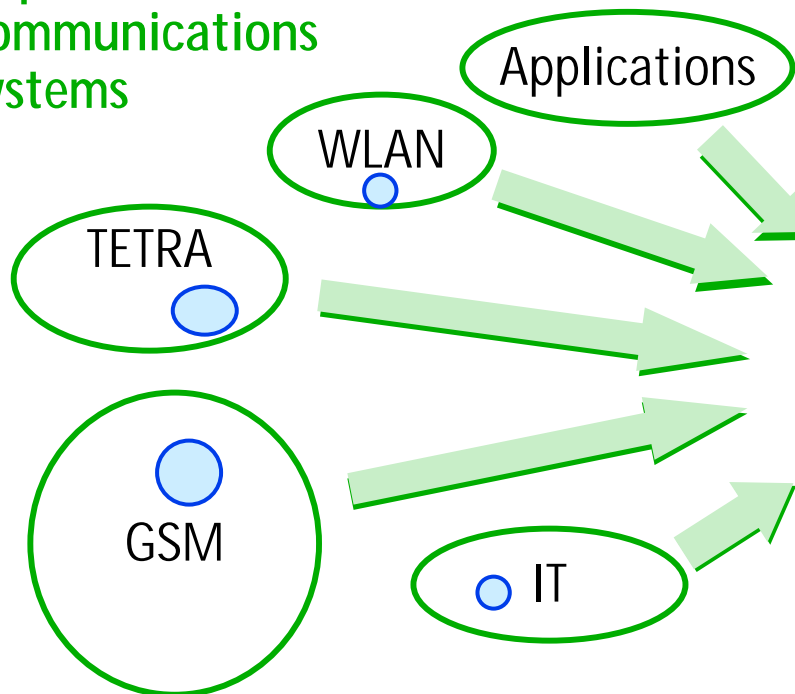
- Public cellular networks get congested during incidents
- GSM or UMTS cannot provide instant call connection
- There is no group call concept in GSM or UMTS
- There is no dispatching concept defined in GSM or 3G
- There is no direct mode (directly from radio to radio) operation in GSM or 3G
- TETRA, GPRS and 3G are complementary rather than exclusive technologies



# Nokia complementary technology solution

- Communication is not the key task for police but it should support main tasks
- TETRA is the core part of fully integrated public safety solution providing officer safety and ultimate reliable and secure access
- Effective operations are built on multiaccess solutions via TETRA, GSM/GPRS, WLAN and IP communications. Seamless communication & connectivity brings cost savings.

In past: isolated communications systems

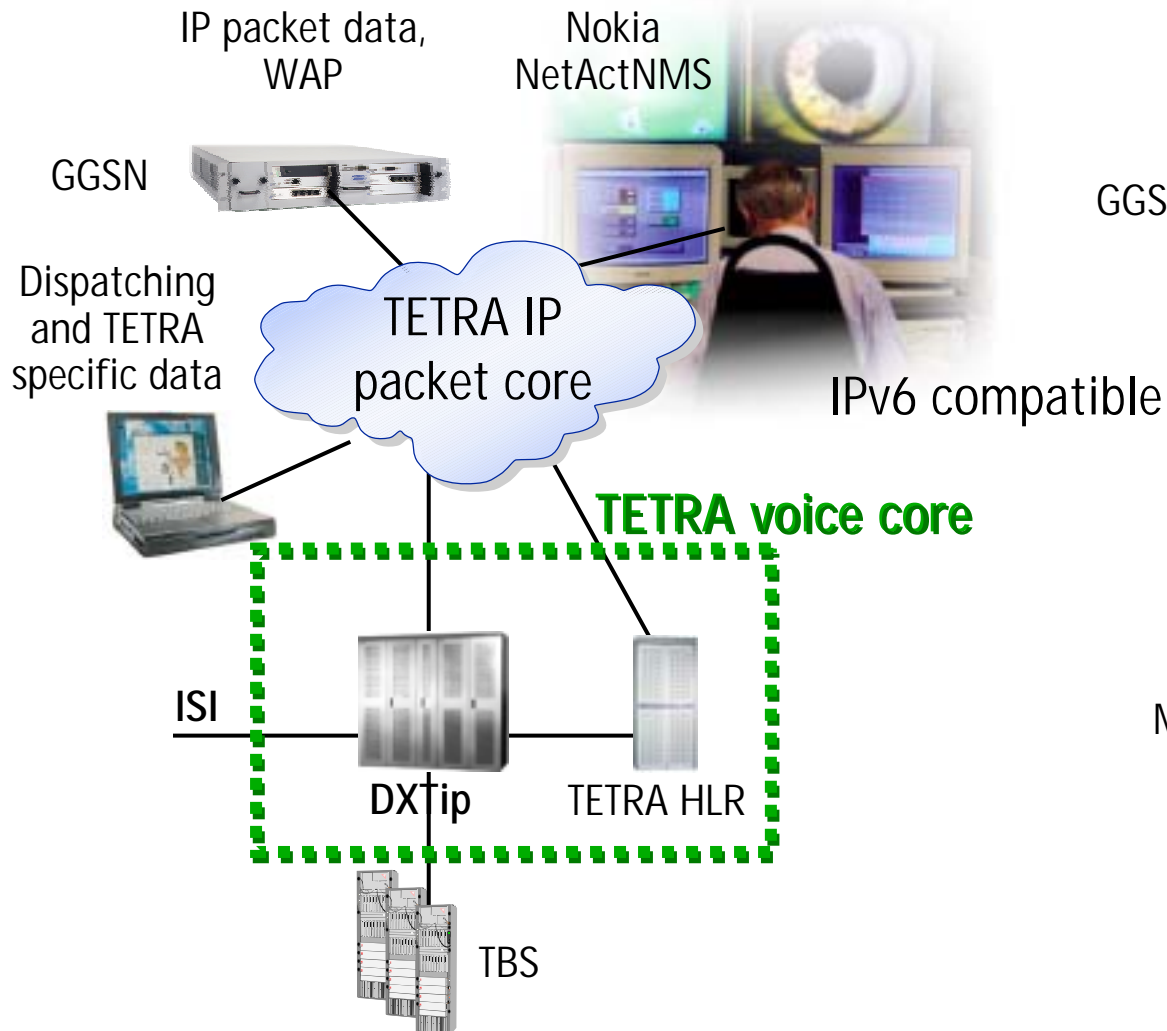


New integrated public safety communication environment

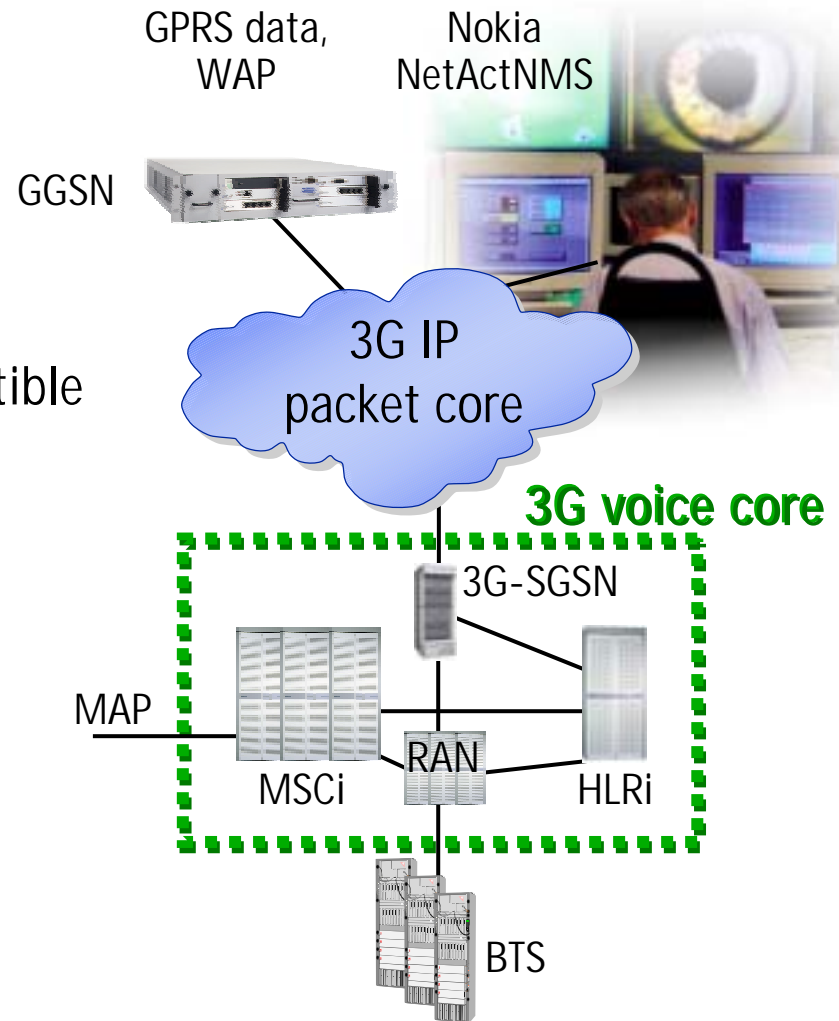


# TETRA system architecture is the same as in 3G

## Nokia TETRA



## Nokia 3G



# World's most innovative IP TETRA product

- Merges together the most innovative parts of both Circuit switching and IP technology
  - Most used IP technology in telecomms industry for the optimal cost efficiency
  - Nokia TETRA evolves together with Nokia GSM/3G
- 
- Nokia IP packet core and backbone for IP connected TETRA network elements
  - IP used in TETRA in powerful Nokia NetAct network management for high quality services
  - IP based open application interfaces
  - Nokia DXTip - IP capable secure TETRA switch





# Next generation IP technology switch

- **IP technology** – advanced 3G switching technology used now in Nokia TETRA
- **Long term support** – same hardware and software platform used in Nokia GSM/3G
- **Reliable and field proven** compact size switch
- **Scaleable** from single site to country wide
  - Allows limitless number of base stations
  - High processing power
- **Available today**



Nokia DXTip TETRA switch



# Nokia TETRA IP technology in use today, nationwide

- VIRVE network roll-out completed in time: 15 switches, over 1200 base stations
- Full nationwide coverage with seamless functionality
  - Nation wide group communication
  - Fast call set-up time (less than 0.3 sec) through the entire network



# End users expect solutions rather than technology



# Open interfaces, protocols and standards enable applications

## Automatic Vehicle Location (AVL)

- Position of every unit in real time
- Vehicle type and id in the



<http://www.sky>

## Command & Control and Communications Systems

## Automatic number plate recognition systems

- Video camera monitors road traffic or special entry points



## WAP over TETRA

- WAP brings access to data
- Instant and accurate access
- User-Friendly User Interface



## Fingerprint Authentication and Access Control

- Scans fingerprint and verifies against the database
- Highest level of security during login to PC or access to network resources
- Product examples:



## TETRA IP transmission optimization software

- TETRA IP transmission optimization software

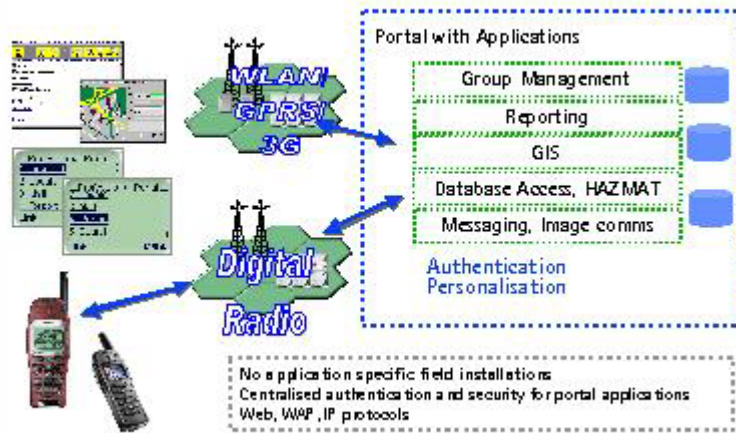
## Dangerous Goods info

## Recording systems

## Image communication over TETRA IP

- TETRA IP one slot packet data

## Accessing information via Application Portal



## Wireless telemedicine



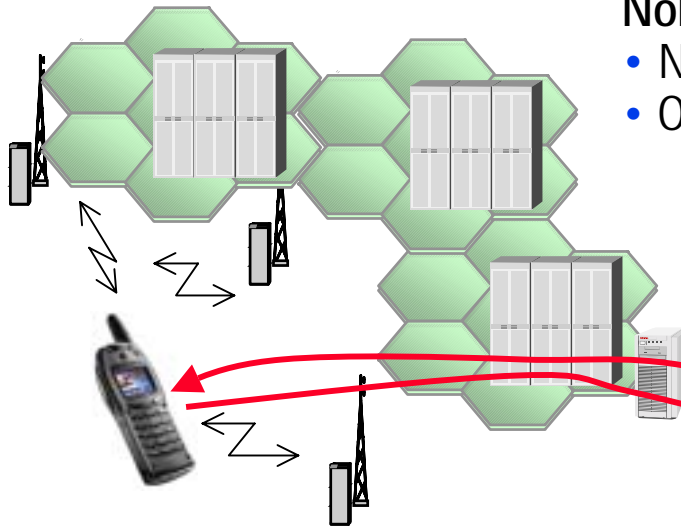
## Real time model of chemical spreading

units for logging data can be fixed or mobile  
logging, monitoring, modeling and simulation tools





# Nokia TETRA network based location system



## Nokia TETRA System

- Network wide data services
- Open Interfaces for applications

## Nokia TWISP partner's location server

- Calculates location of TETRA terminal
- Sends location data to GIS application

## Nokia THR880 handportable radio or Nokia TMR880 mobile radio

- Measures field strengths of neighbouring cells and on request sends information to a location server



## Map/GIS/AVL application

- Utilise location information in application





# Summary

- TETRA is the only technology that truly offers the mission critical functionality and security that public safety users must have.
- Commercial services (WLAN, GPRS, 3G) may be complementing TETRA.
- Nokia is best placed to provide a total solution that integrates all these technologies working together automatically and seamlessly.

## NEW from Nokia:

- Nokia DXTip TETRA switch
- Nokia network based location solution



A man in a red jacket and black cap is using a walkie-talkie on a ship's deck. The background is a bright, hazy sky. The text "Thank you" is overlaid in the center.

# Thank you