



PELASTUSOPISTO

# “Rescue field commanding: operative actions and ICT perspectives”

Mr. Kari Junttila (MSc, EE)  
Senior Research Specialist, Information Technology

Emergency Services College, R&D Services  
Finland



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## Agenda

- ESC (Emergency services college Finland)
- Operative environment
- Driving forces
- Evolution path
- Services
- Summary



## Abstract

- The information systems of emergency services are in transition.
- The ERCs information systems reform project has set in motion a process, whereby the field management systems (and related wireless data communication) of all security authorities are renewed.
- Some existing operative systems as well as the evolution path toward the 2nd generation systems will be described.

# ESC, Emergency Services College, Finland

- Provides education for rescue services
- The R&D Unit is in charge of the coordination of the research activities of the Rescue Services in Finland.
- CMC (Crisis Management Center)





## Background

- ERC renovation program (2011 – 2016) (from 15 to 6 ERC's)
  - New IT system for ERC's => Virtual ERC
  - Accident centric process
    - Common Operational Picture for multi-authority situations
    - IP data needed for the field units
- Rescue services Field organization of 4 levels:

Complex/large accident  
multiple authorities ▲

"Battalion"

CC-Rooms

Company

Platoon

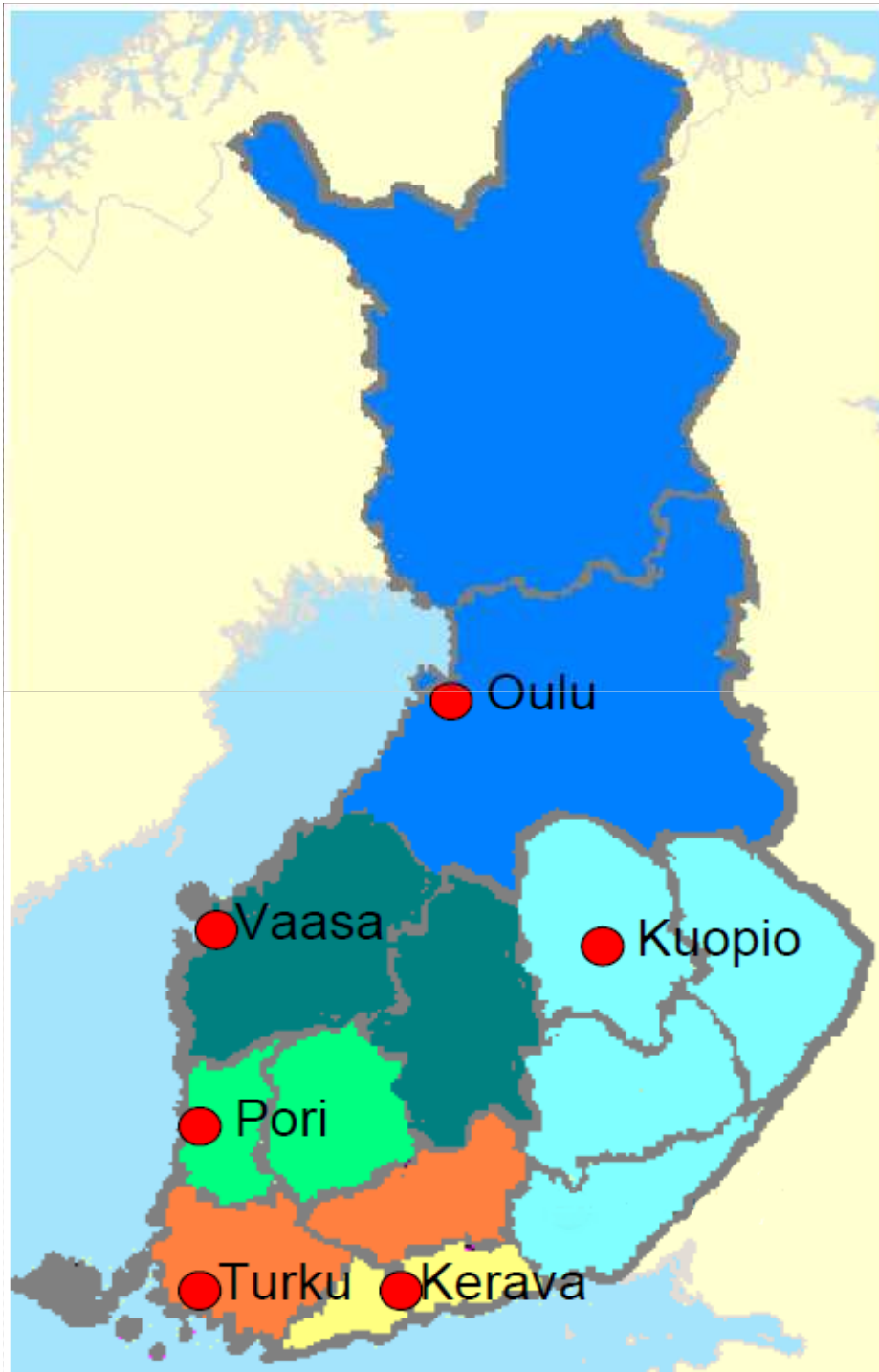
Field  
Commanders

Daily routines

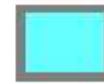
Squad 1+4



## Rearrangement of ERCs



Oulu area 2011



Kuopio area 2012



Pori area 2013



Vaasa area 2014



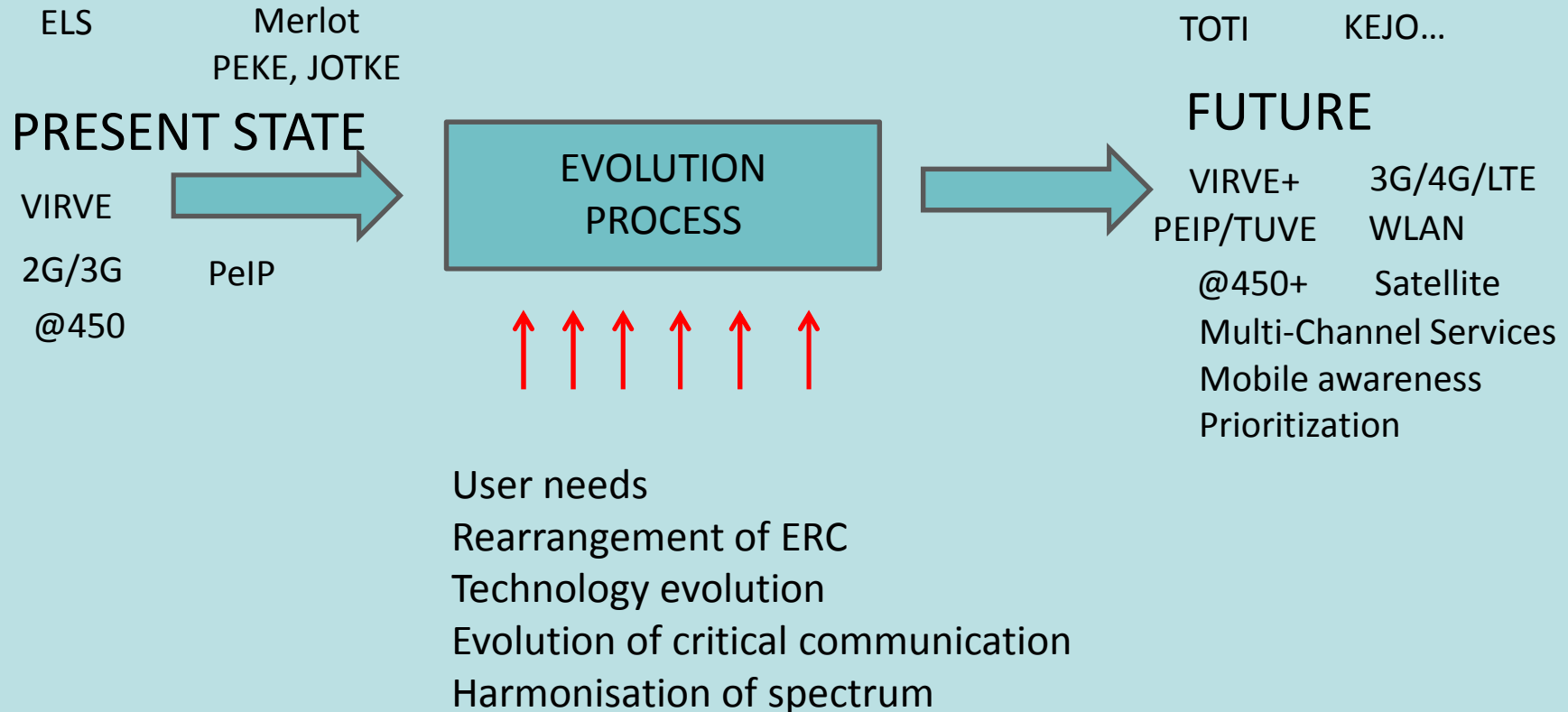
Turku area 2015



Kerava area 2015



# The evolution process:



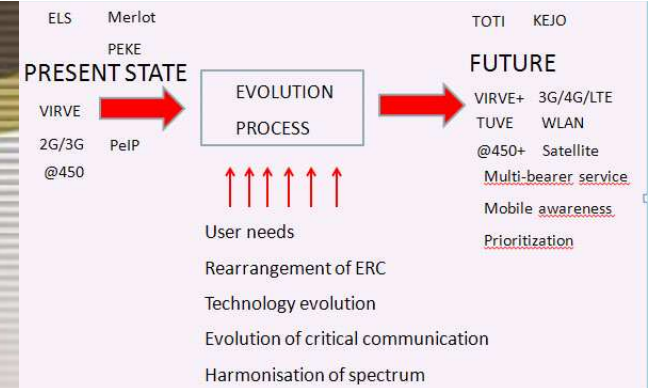
## Driving forces behind the evolution:

**User needs are always the starting point, when planning to renew of functions /processes & ICT systems supporting those.**



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## VOICE + SDS



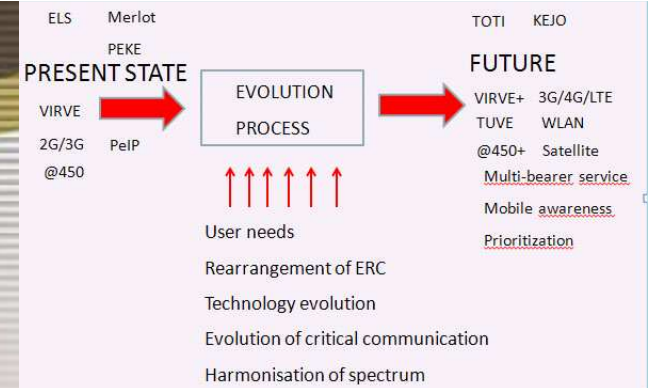
- **The operational communication** of all authorities is based on using the national mission critical TETRA network (= VIRVE)
- Emergency Response Centre (ERC) sends task related information by **using TETRA voice, status- and SDS- messages.**
  - SMS service of commercial mobile networks is also used to reach resources, which don't have TETRA radios.
  - Resources will acknowledge to ERC by status messages.
- **TETRA group call for Voice communication:**
  - Task related information from ERC to all resources.
  - Communication between resources at the same duty
  - Communication cross authority boundaries.





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# DATA



- **The main bottleneck** is TETRA data transmission:
  - practical data rates between 2–4 kbit/s (SDS data only)
  - Data services of commercial mobile networks (2G/3G and @450) to be used e.g. video streaming and internet browsing etc.
  - **Not designed nor deployed keeping in mind the requirements of mission critical communication:**
    - when most needed they may be unavailable.
- **Secure (fixed) IP accesses (PeIP)**
  - Access common operational services.
    - Project for MultiChannelRouting -service for secure Broadband **ongoing**
    - Services available at emergency vehicles in the future

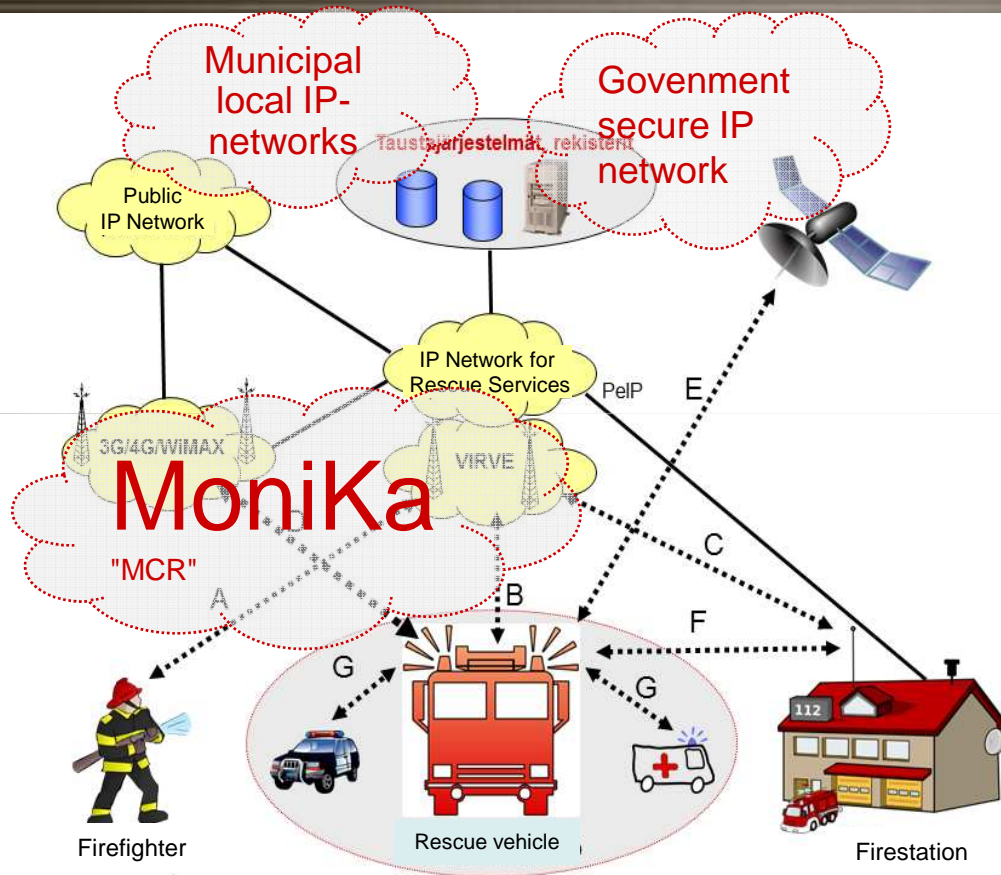


## Results of research works

- **Data of VIRVE(=TETRA Rel 1) does not fulfill future needs.**
    - Slow data is robust and working well (SDS Data /Not IP)
    - Wideband data with TEDS (=TETRA Rel 2) is possible to implement but doesn't solve all problems.
    - CCBG (Rel 3) is not available before 2020 including some degree of uncertainty about implementation (Harmonization of frequencies)
  - ➔ **In addition to TETRA, complementary technologies are needed anyway.**
    - Choices including 3G/HSPA, 4G/LTE, WLAN and SATCOM.
    - As "black horse" @450 remain best choice regardless future of it .
- ➔ **There is strong demand for dedicated broadband capacity for authorities**
- ➔ **One commercial supplier cannot provide reliable availability...**



# Operative Interfaces



**A:** TETRA voice for firefighter

**B:** TETRA voice+SDS data for emergency vehicles

**C:** TETRA voice+SDS data for fire stations

**D:** Commercial networks, Multiple channels

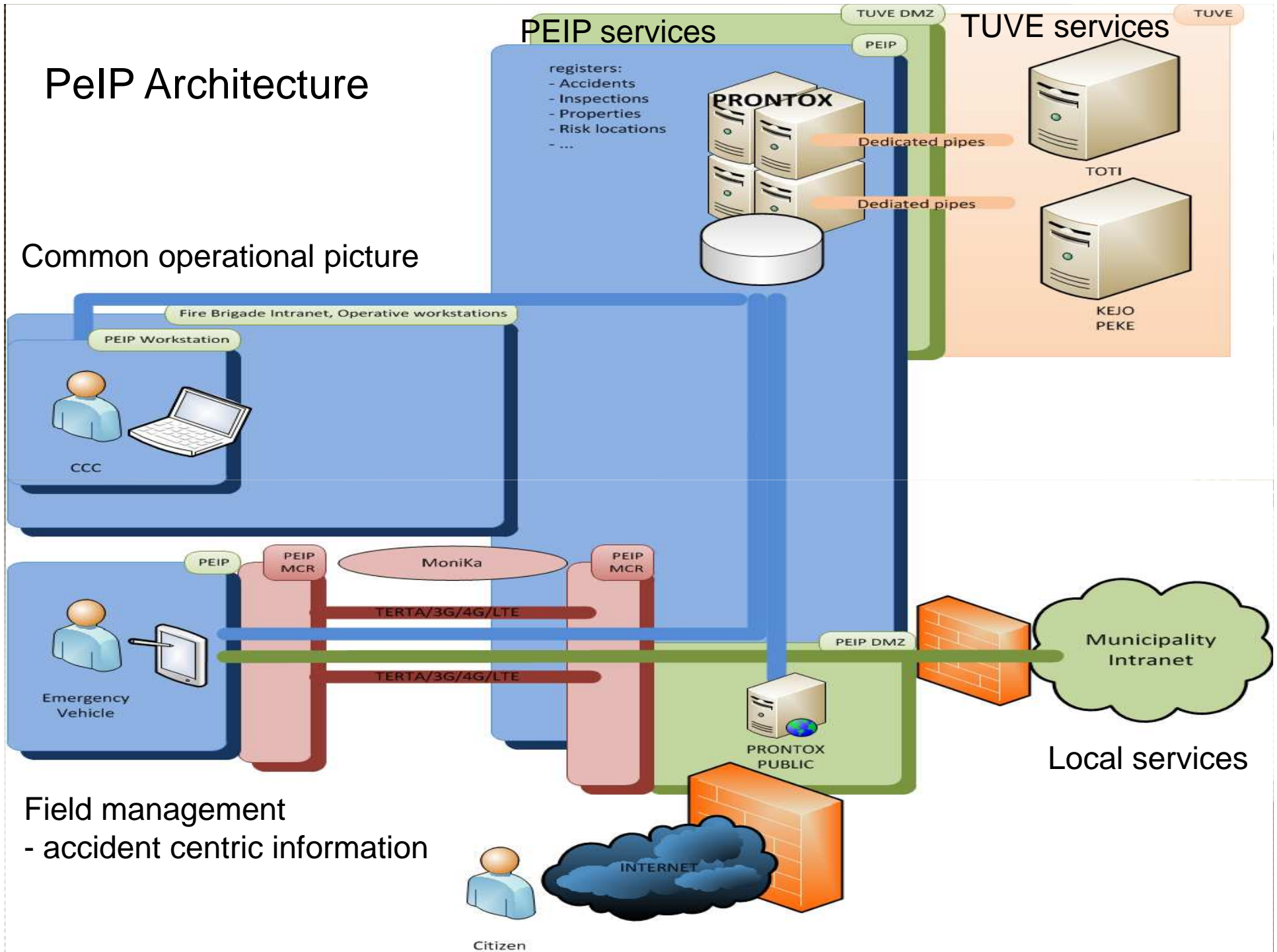
**E:** SATCOM

**F:** WLAN- interface at fire station

**G:** (W)LAN at accident location between units and authorities

# PeIP Architecture

Common operational picture



Field management  
- accident centric information



# The new eco-system

- **Demand for secure mobile broadband for all authorities**
  - **Rescue Services**
  - **Ambulance services**
  - **Police**
  - **Providers of critical infrastructure (M2M)**
    - **Intelligent energy networks**
    - **Water supply**
    - **Radiation safety Centre**
    - **Meteorological Institute, etc...**
- **Intelligent wireless communication systems improve efficiency**
  - **Mobile awareness**
  - **Intelligence of applications**
- **One supplier for all services (Voice and Data (MVNO) => same service for all authorities (=cost efficient)**



Lähiviran hankintoja pelastuslaitoksilla

OSTAVÄT YHTEISPALVELUT

markot / PeIP-palvelut

tytyksessä olev... mahdollisuus PeIP:n kautta

Classification and prioritisation of services

- **STUK ja**
- Viranom...

Reitityk... toturvaa ja palvelu... yhteiskunnan häiriötilanteissa

PEKE

F1 F2 F3 F4 F5 F6 F7 F8

**F1**  
Näytä

Kohteet

Piirtotasot

Merkkipiste

Reitti

Etsi sijainti

Osoita koordinaatit

Koordinaattimuoto

PALUU

Tilannekuva - Windows Internet Explorer provided by Tieto

http://prontoke.fi/jotke/Jotke\_tilannekuva.aspx

File Edit View Favorites Tools Help

Tilannekuva

**JOTKE v1.0** **TILANNEKUVA - Koko maa** Päivitetty 12.3.2012 10:45:22

**Tilannekuvan tiedot**

Tilanteet  
 Tehtävät  
 Havainnot  
 Tiedotteet  
 Sanomat

Koodistot  
Havaintojen raja-arvot  
Käyttäjätiedot  
Käyttäjaluettelo  
Järjestelmäasetukset

**Järjestelmät**

- Fingrid Käyttöhäiriöt
- Ilmatieteen laitos
- Pelastustoimen sääpalvelu
- Itämeri Nyt
- Portnet
- VNTIKE
- Säteilyturvakeskus
- Tiehallinto
  - Liikennehäiriöt
- USVA
- Yleisradio
- Ympäristöministeriö
- CECIS
- VOSOCC
- MarineTraffic

**Muut toiminnot**

Vaihda salasana  
Alkunäkymä  
Päivitä  
Käyttöohje  
Lopeta

**Aika**

10:47:42

maalisuu 2012

ma	ti	ke	to	pe	la	su
27	28	29	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

**TILANTEET - Koko maa**

Número	Tyyppi	Nimi
1642	Tilanne	Käynnissä oleva tila...
1640	Tilanne	seppo.mikkonen@sa...
1620	Tilanne	Päiväkirjan liitteen t...
1580	Tilanne	tapion testi 2
1603	Tilanne	test

**TEHTÄVÄT - Koko maa**

Número	Ilmoitus aika
6	8.3.2012 10:00:00
348477	6.2.2012 0:08:00
348477	6.2.2012 0:08:00
1200004947	9.1.2012 14:18:32
1200004940	9.1.2012 14:04:18
1200004918	9.1.2012 13:15:24
1200004829	9.1.2012 10:32:01

**HAVAINNOT - Kaikki**

Número	Kuvaus
4550	kjn,n
4543	tallennustesti
4542	Käynnistynyt tehtävä "Rakennuspalo: su...
4540	testausta
4521	Tehtävään hälytetty yli 15 yksikköä

**TIEDOTTEET - Kaikki**

**SANOMAT - Kaikki**

Número	Suunta	Tyyppi
421	Saapuva	Havainto
420	Saapuva	Havainto
409	Saapuva	Uhkasanoma
408	Saapuva	Uhkasanoma

SMART

eBeam

Cisco

webex







# Summary

- **User needs** are always the starting point (based on process)
- **Multiauthority co-operation at the accident scene**
  - **Same systems for all authorities**  
( difference between Safety and Security)
- **There is demand for secure and reliable mobile broadband services**  
(all capacity will be used)
- **What is Critical – assessment**
- **COTS = Cost efficient**

