



Defence Materiel Organisation
Ministry of Defence



WinnComm-Europe 2016
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Mobile Military Networks

Challenges & Solutions

Joint IT Command
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Agenda

PART I: Challenges in military networking

Interoperability and Connectivity

PART II: Trend in commercial IT

Mobile is eating the world

PART II: Best of both worlds

How to combine the Mobile trend with the military challenges?

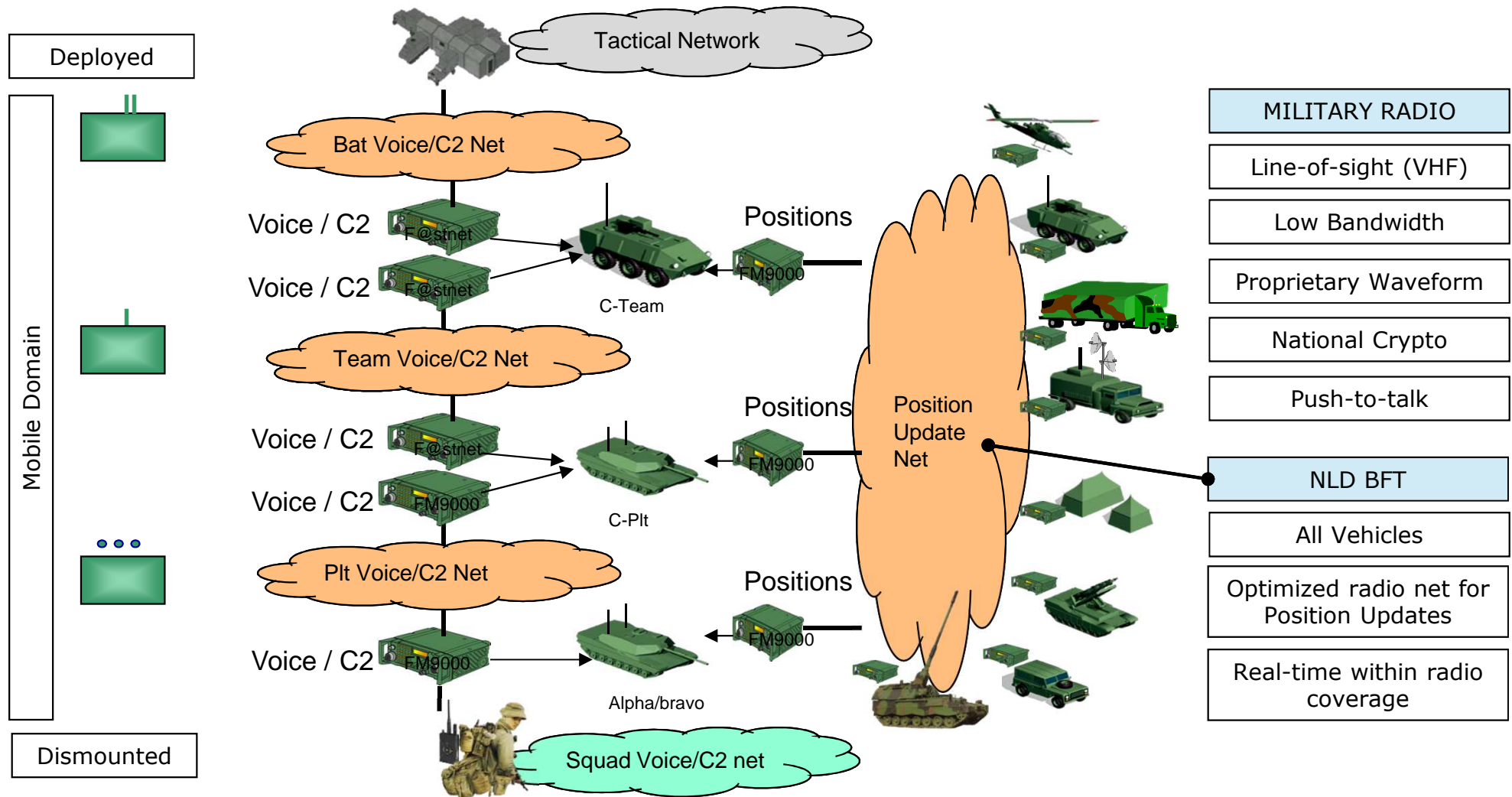
Practical steps taken within the NLD MoD





Current Situation: Mobile Network

Part I



Biggest Challenges: Interoperability + Always Connected + Ease of use



Mobile Network Challenges-1

Part I

Interoperability

RNLA units need interoperability at all command levels



The challenge is interoperability at the lower tactical levels

RNLA units always operate with partners (with other equipment)

Some RNLA units must integrate with DEU units

PTT Voice + BFT + Chat + Battlespace Objects



Short term solution: Radio Gateway

Short term solution: Loaned Radio Concept

Long term solution: Common Waveform e.g. NBWF

Long term solution: Loaned Radio Concept e.g. 4G

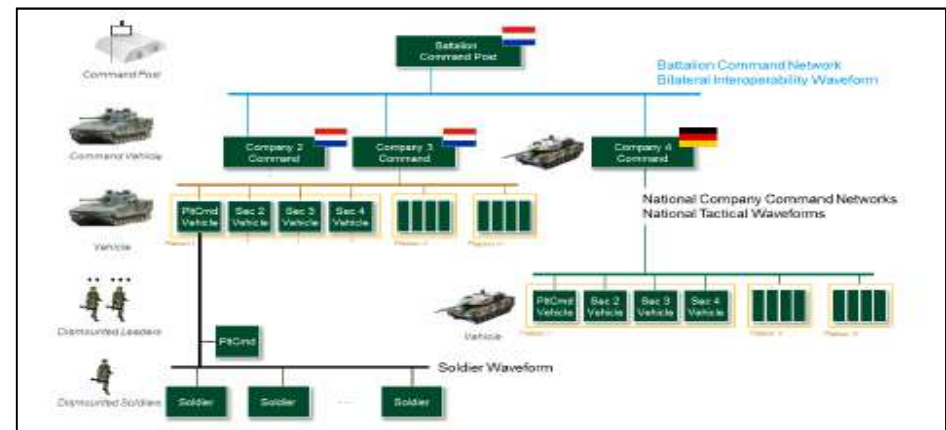
Interoperability: Additional Solutions must be fielded

Interoperability

Process

Data/Information

Technical



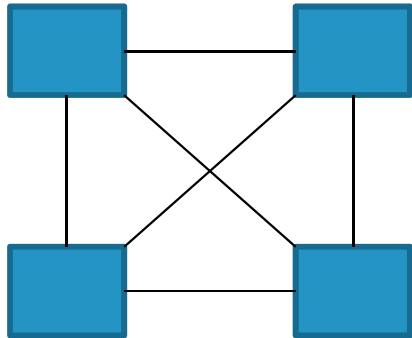


Interoperability

Part I

Option 1:

Use the same system



Remark:
Keep systems
& standards
up-to-date

Tactical Data Link

NATO FAS

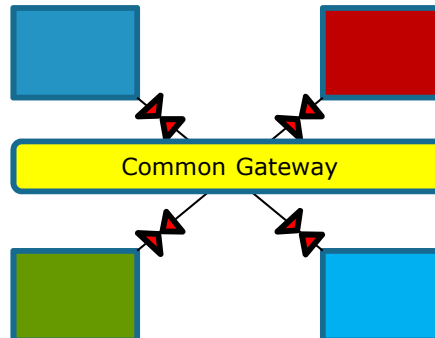
Common Radio
(e.g. PRC117)

Public / Private LTE

Common Waveform
(e.g. NBWF)

Option 2:

Use a common gateway



FMN

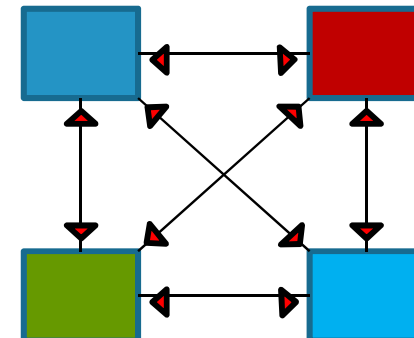
MIP, NVG

FFI MFT, JDSS

Radio Gatewau

Option 3:

Use a proprietary gateway



Interoperability: In the real world all options co-exist together



Mobile Network Challenges-2

Part I

Always Connected (Phone-like)

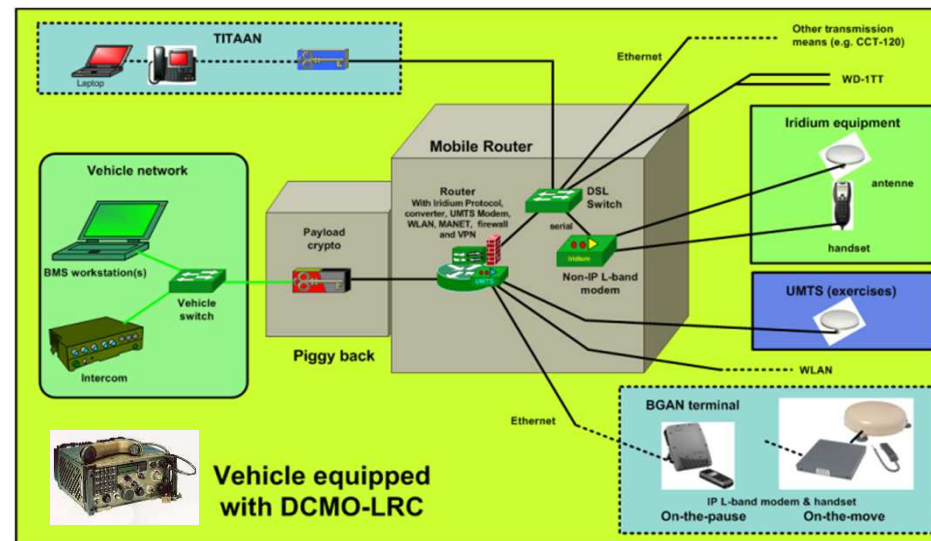
All RNLA units need Beyond Line-of-Sight Connectivity



BLOS is additional to VHF: HF and/or different types of Satcom

Mix of transmission bearers + Crypto + Network Device

Be aware of integration issues (e.g. vehicle)



Ease of use (App-like)

All end users need intuitive applications



Military processes (e.g. change ORBAT) makes it complex

Back-end systems are complex & Extreme robustness

Signal Personnel: more people with better technical skills



Always Connected: Mix of Military & Civilian Transmission Systems



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Mobile is eating the world-1

Part II



Everybody has a supercomputer
Smartphone has 625x more transistors than 1995 Pentium



+

Everybody is connected
In 2020 80% of adults will have a smartphone

=



Mobile phones have scale that is unique in IT



Δ

Mobile does not really mean mobile
Any Place, Any Time people use a smartphone



Smartphone is more sophisticated than desktop
Sensors & Apps



How can the military benefit from 'Mobile' in Mobile Military Networks?



Mobile is eating the world-2

Part II

Figure 1: Understanding The Scale And Scope Of The Mobile Mind Shift



Mind*

Of smartphone users . . .

- 62% expect a mobile-friendly website.
- 42% expect to find a mobile app.
- 23% expect their experience to change based on location.

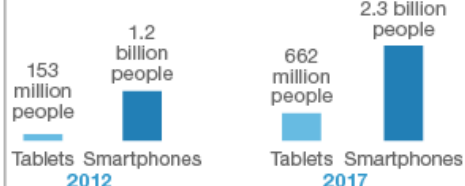
Applications†

The number of apps in the US Apple App Store will grow from . . .



Devices‡

Mobile device adoption will grow from . . .



Companies§

In 2017, firms will . . .

- Spend \$130 billion to engineer platforms and processes for mobile engagement.
- Drive \$1.3 trillion of the IT economy with systems of engagement.

*Base: 4,404 US online adults (18+) who use a smartphone

†Source: US Mobile Mind Shift Online Survey, Q3 2013

‡Source: Forrester Research World Smartphone Adoption Forecast, 2012 To 2017 (Global) and Forrester Research World Tablet Adoption Forecast, 2012 To 2017 (Global)

§Source: 148Apps.biz, Forrester estimate

§Source: August 6, 2013, "Wanted: Mobile Engagement Providers" Forrester report and February 13, 2012, "Mobile Is The New Face Of Engagement" Forrester report

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Source: Forrester Research, Inc.

Messaging will become the new Business Platform

Whats App: > 30 Bn messages/day &
> 1.6 Bn photos/day

40 Engineers



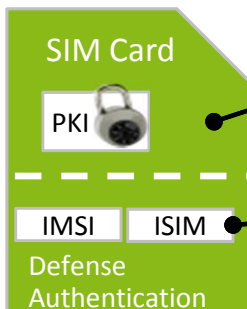
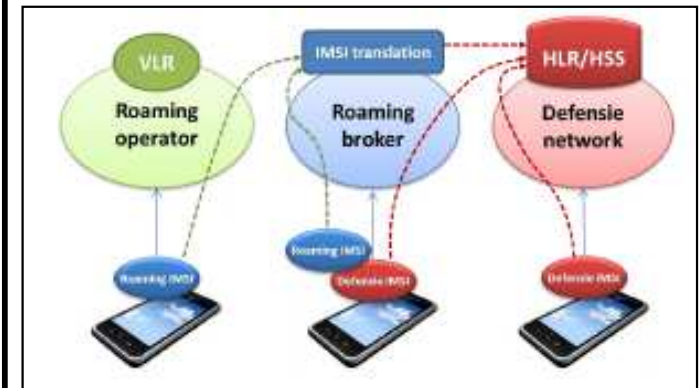
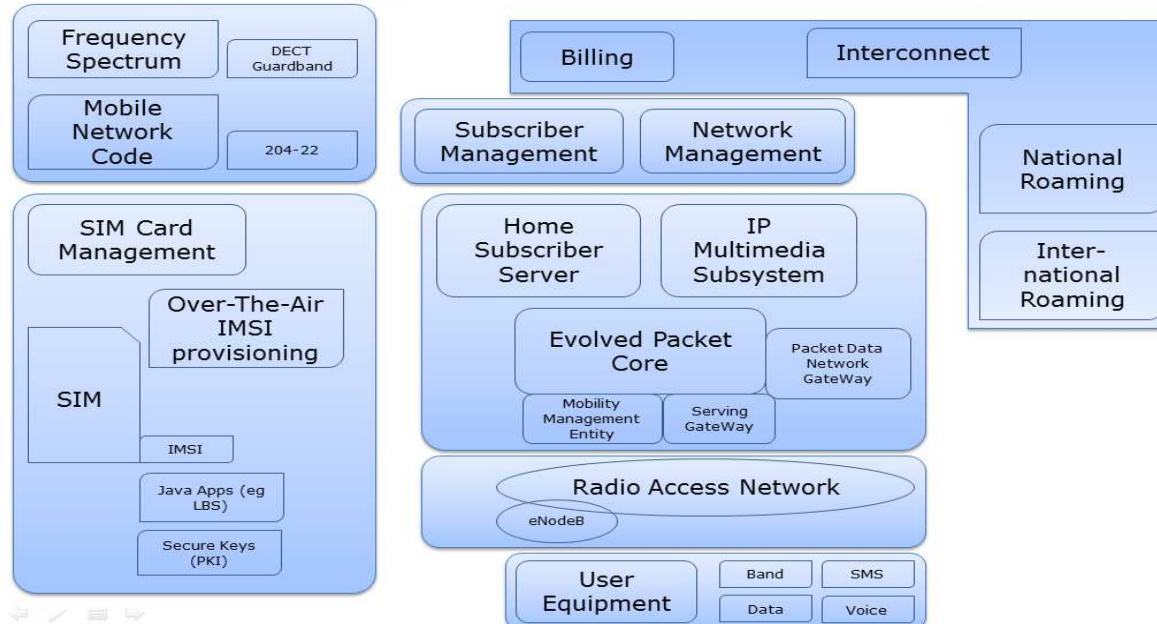
Do we understand the impact of 'Mobile' for Mobile Military Networks?



Mobile is eating the world-3

Part I

LTE components (simplified)



- Own SIM enables improved security (e.g. mobile PKI)
- Own SIM prevents SIM swap by MNO change
- Own SIM enables multiple MNO contracts, enables higher availability
- Own SIM enables Defense to act as MNO (e.g. garrison, compound)

The SIM Card is Key



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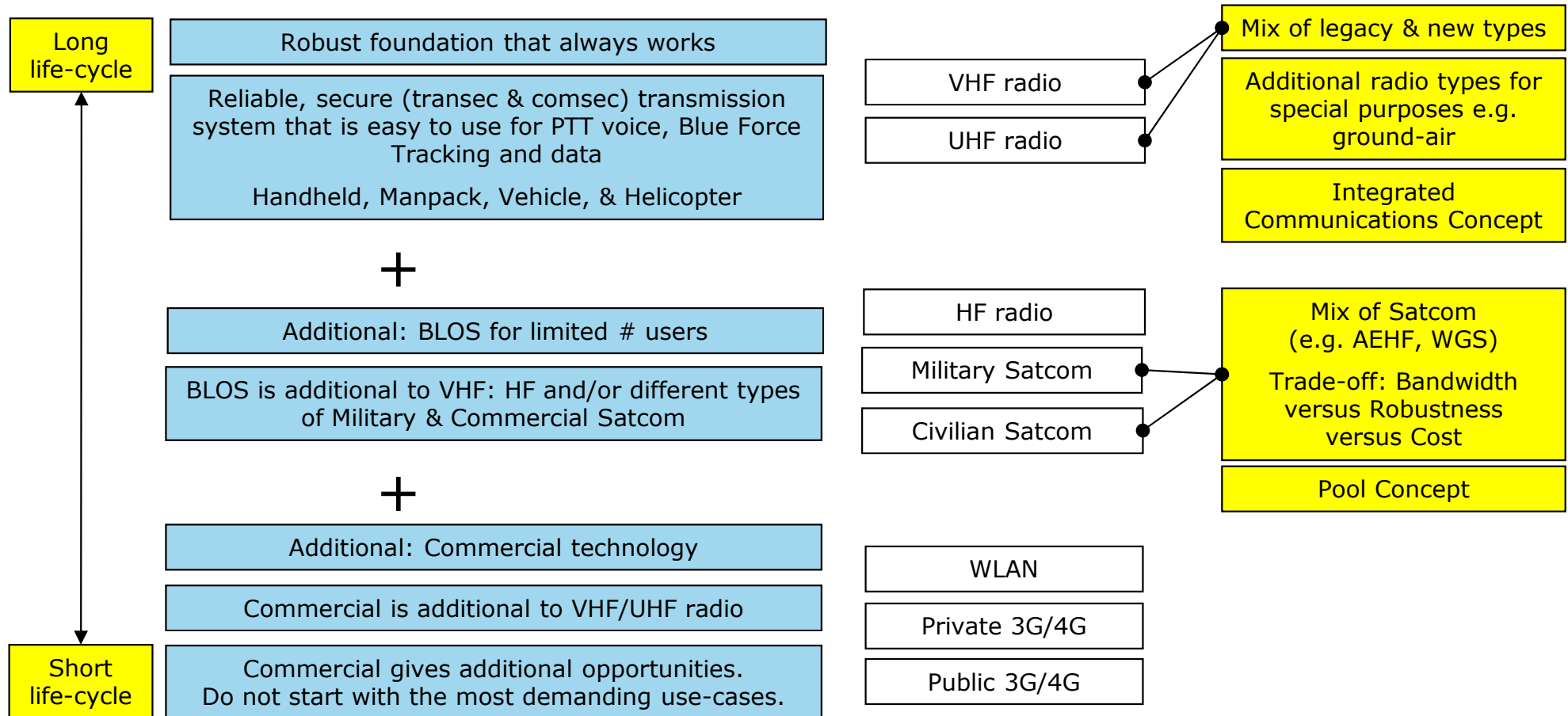
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Connectivity

Part III

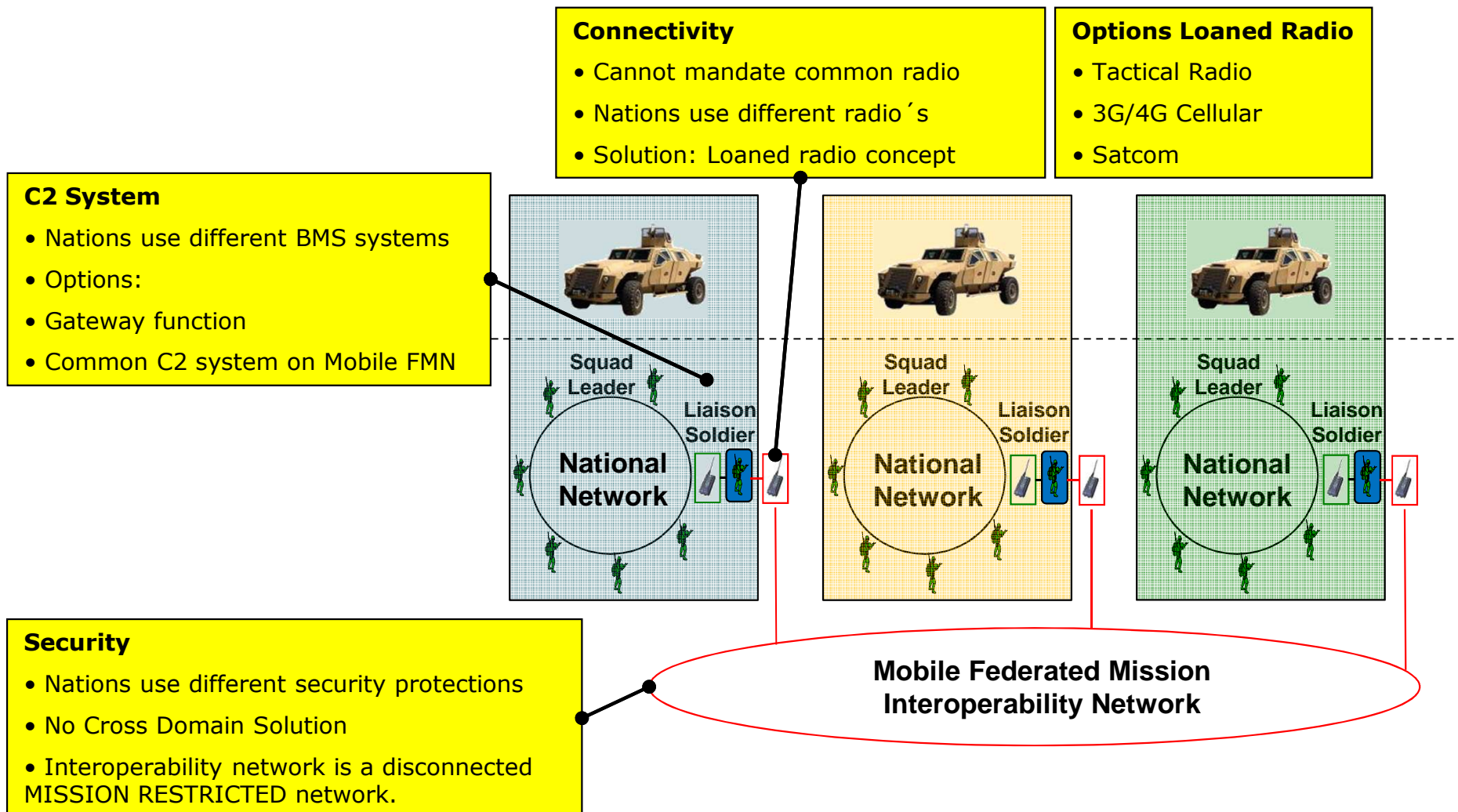


Mix of military & civilian and legacy & new transmission systems



Interoperability

Part III

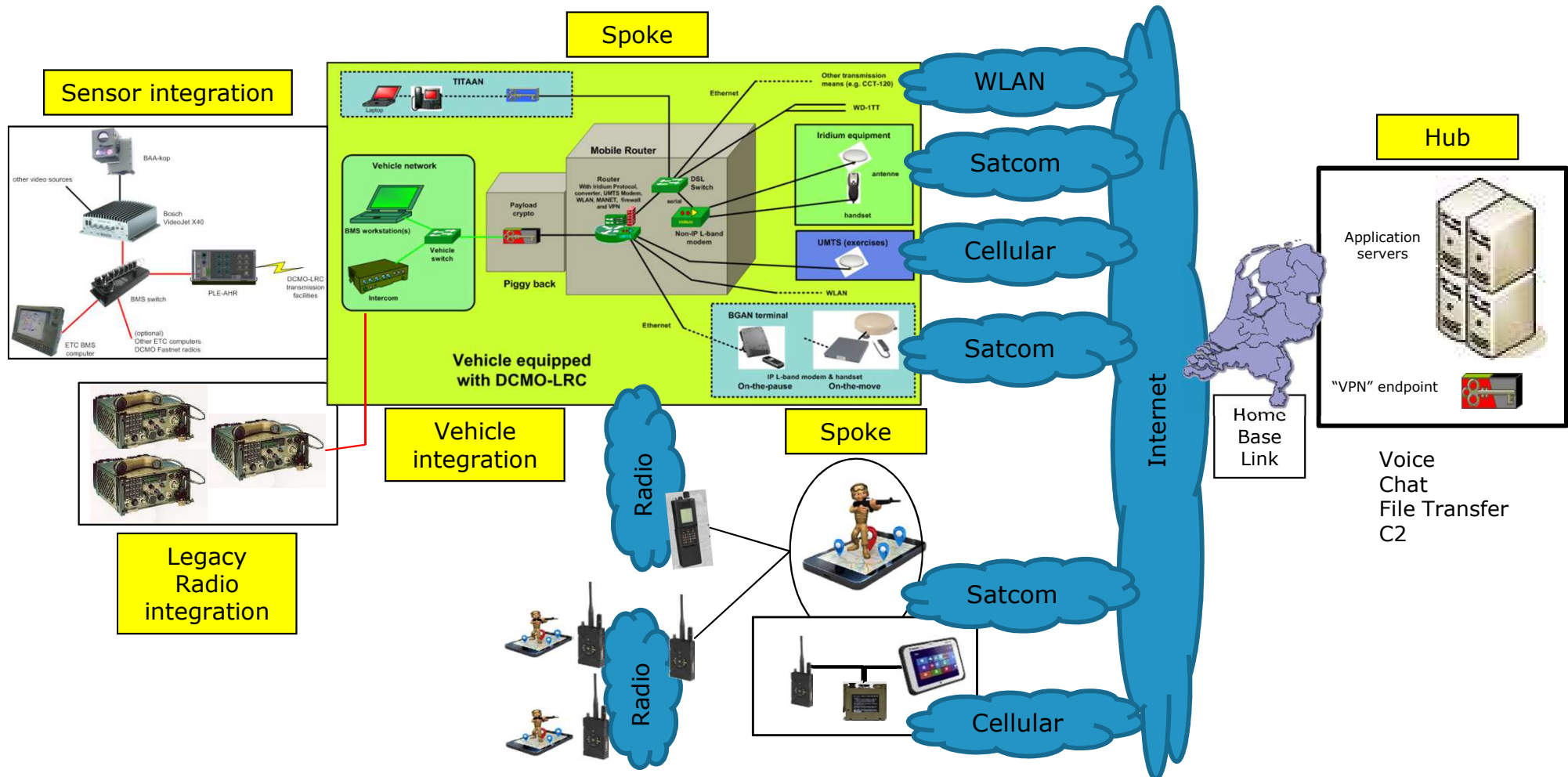


Create Common Interoperability Network: Mobile FMN



Communication Concept

Part III



Short Term Solution for Connectivity & Interoperability



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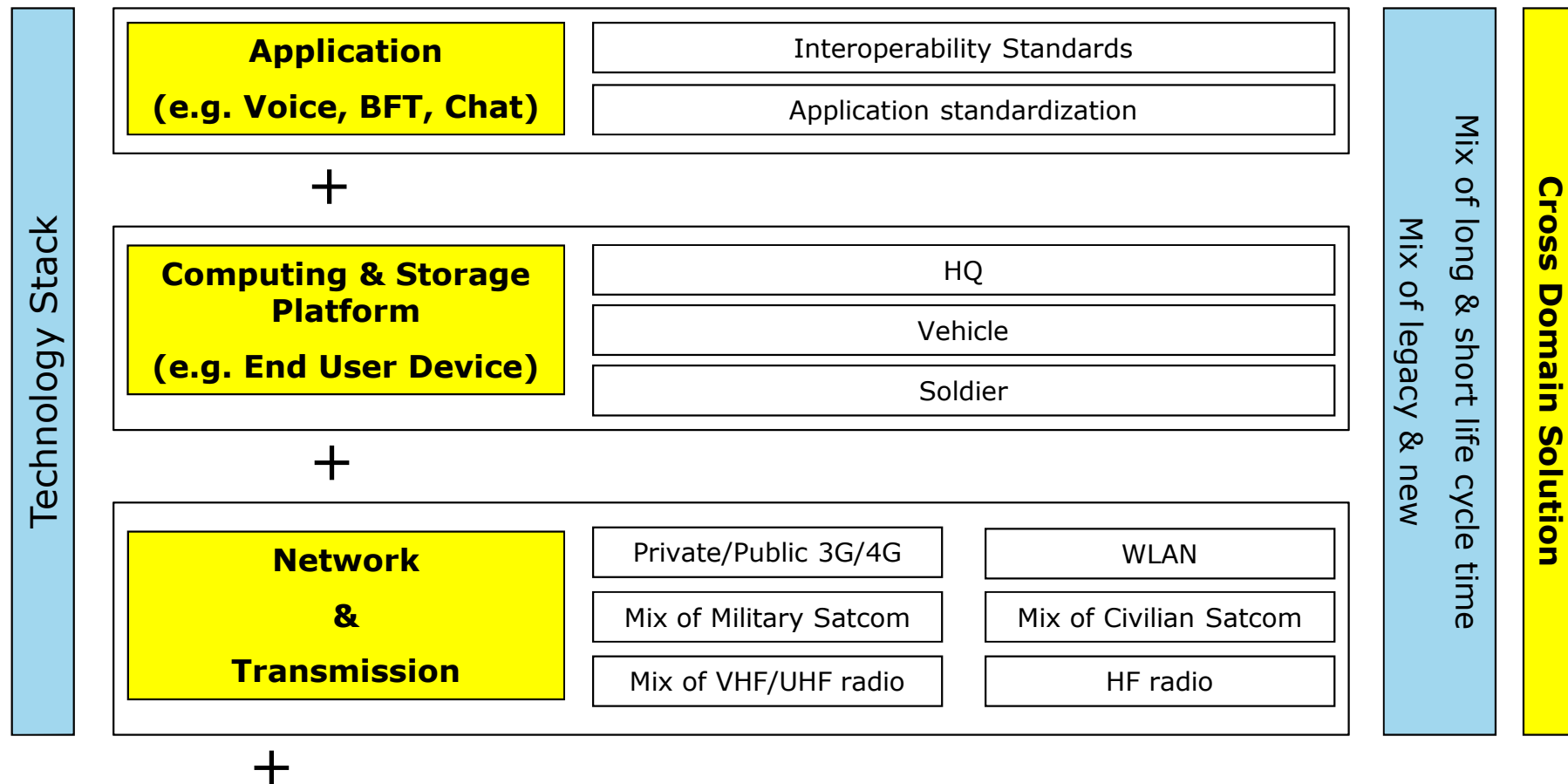
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Summary

In order to support all RNLA missions, the RNLA needs a mix of systems that is affordable, secure and interoperable



CIS organisation that is able to deploy and maintain all parts of the technology stack



What do we need from industry?

Interoperability is key:
We need common waveforms

We want to use commercial technology.
Help us to solve the issues:
SWaP, frequency spectrum, security, integration in platform
&
We need an integrated communications concept
instead of mix of stovepipe systems

