



NORWEGIAN DEFENCE
MATERIEL AGENCY

Securing 5G for military use

With Public and Private 5G Network

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Program Mime - Team 5G



*Smartphones used for
Intelligence, Surveillance
and Reconnaissance in war*

*Smartphones used to control
drones, document
minefields, document enemy
activities, communication...*





Threats in War:

- *Fake messages*
- *Fake calls*
- *Positioning of the Phones/Modems*

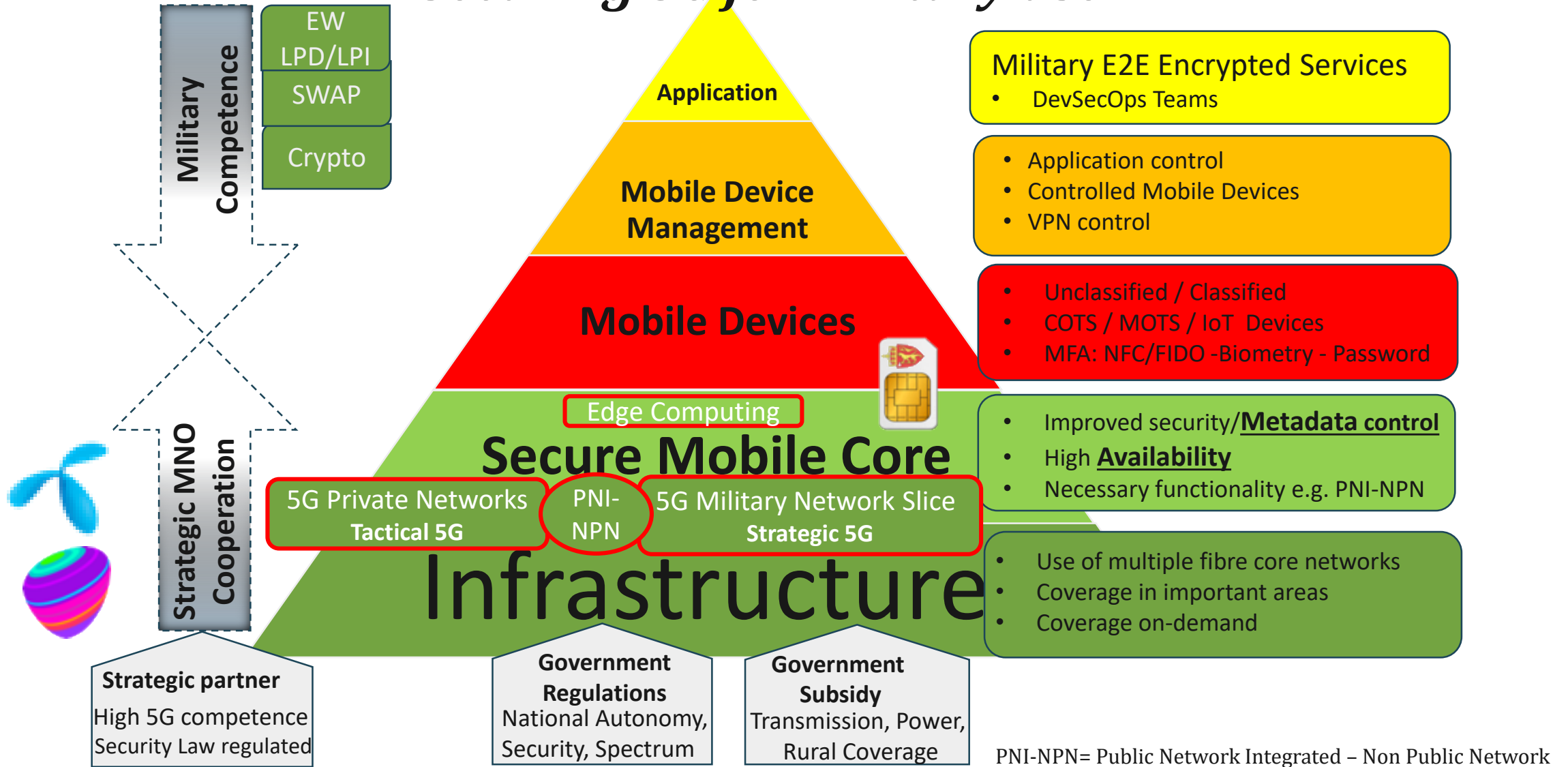
Mime - Team 5G Goal:

*Securing 5G for military use in
peace, crisis and war*

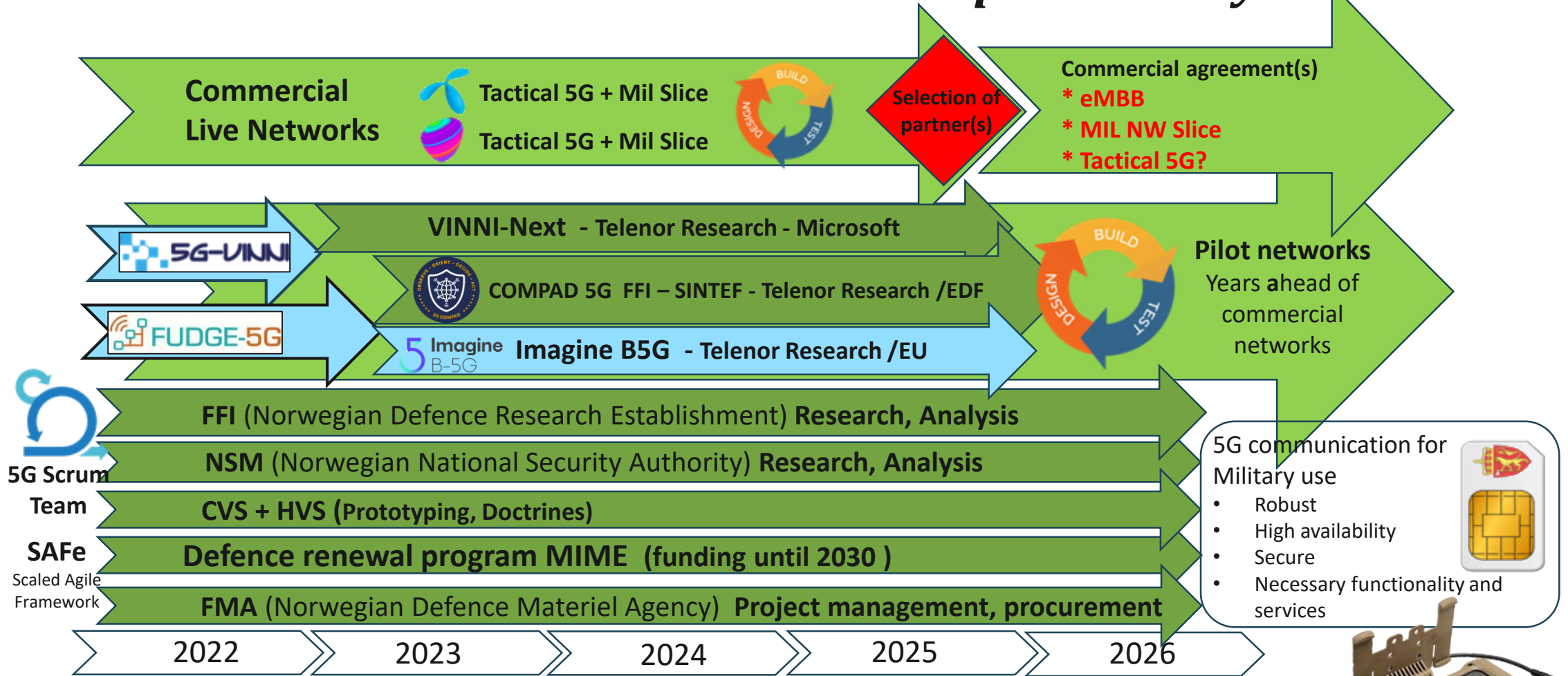
*Ukrainian army soldier Dasha, 22, checks
her phone after a military operation.
Smartphones have been essential for
combatants and civilians in the war.*



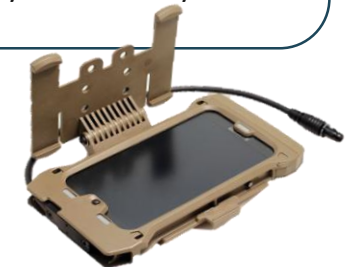
Securing 5G for military use



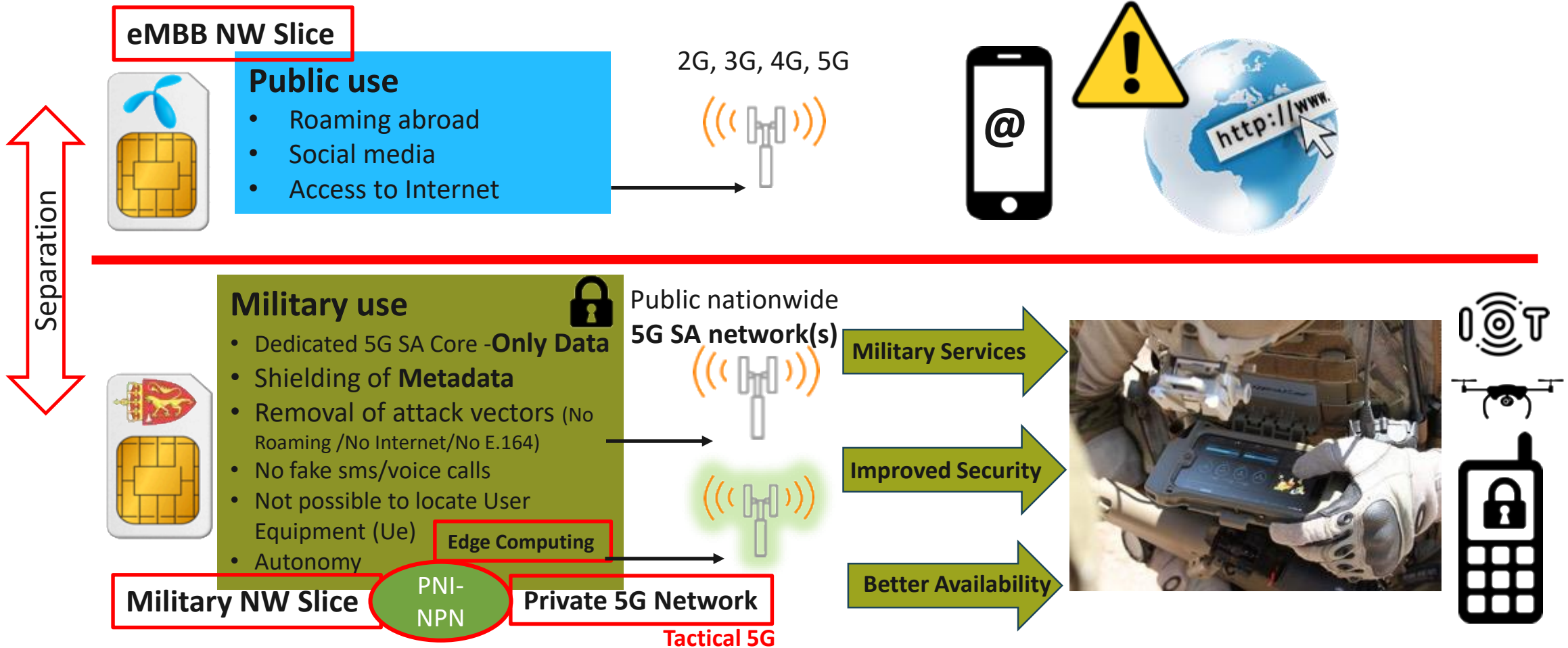
Broad collaboration & Iterative Development > Key to success



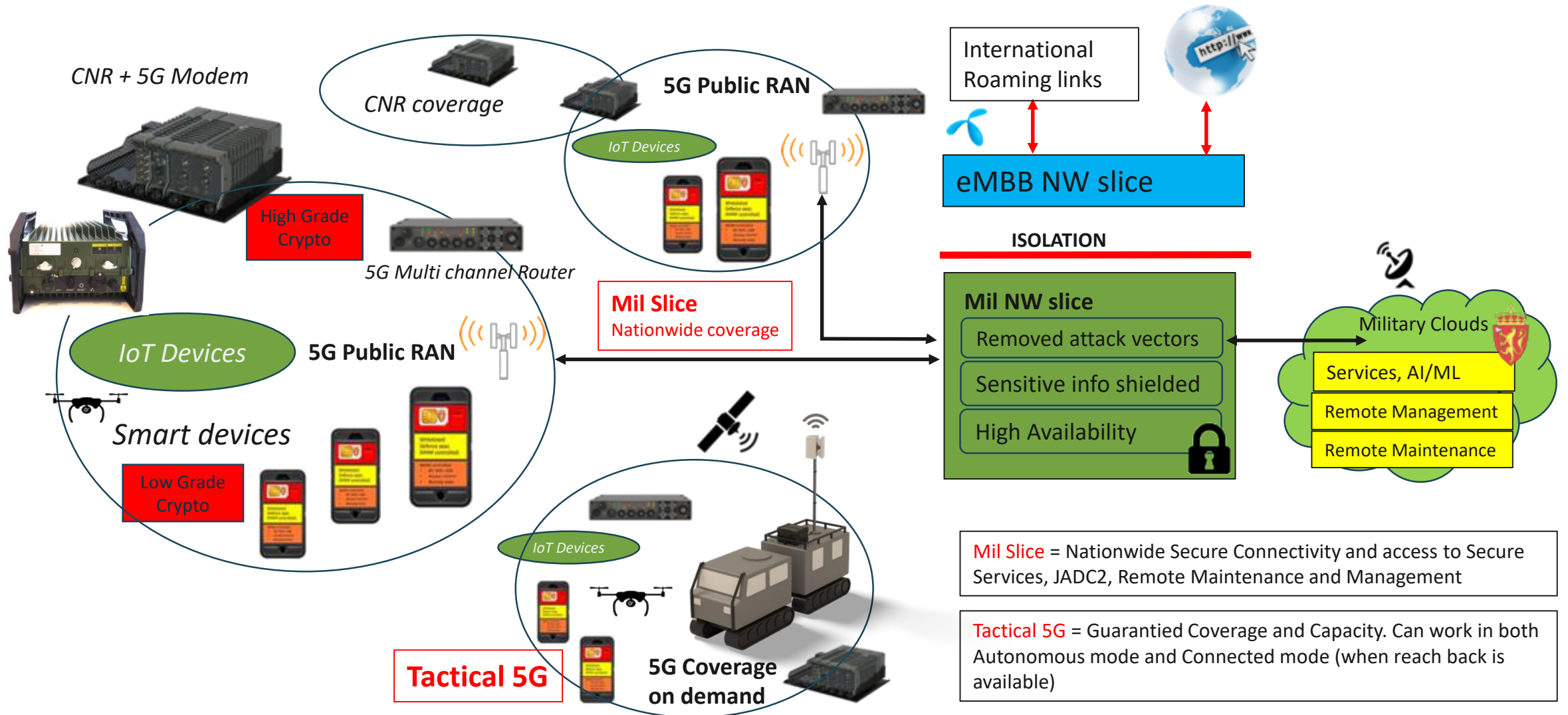
Adapting 5G to military use



Network Slicing to separate Public and Military traffic



Vision - Network based Defence



Smart Port

Cold Response 22



NORWEGIAN ARMED FORCES

cold response

PARTICIPATION AND BED DOWN OF FORCES
25 Nations, a total 35 000 participants, envisaged 16 000 landtroops

1. ÅRSBERG
EIVINGSGÅRDEN
SILVERÅSEN
REISÅSEN
SÅRØ
HILLINGØEN
BARDUFJØS
EIVANG
BODØ-BODIN

2. ØSTLANDET
VITNES
KINNLEIKET
HAMARSTRENGEN
FREDSTAD
RYGE
SØSVOLLMOEN
KREISÅSEN
TORNINGEN
RENA

Changes are expected

The complex block contains a map of Europe with several locations marked with icons. To the right of the map is a grid of national flags representing the 25 participating nations. The flags are arranged in four rows: the first row has 5 flags (USA, France, UK, Germany, Canada), the second row has 5 flags (Sweden, Finland, Denmark, Norway, Poland), the third row has 5 flags (Slovenia, Czech Republic, Hungary, Turkey, Bulgaria), and the fourth row has 5 flags (Croatia, Spain, Netherlands, Greece, Portugal). A small "NEW LOGOS" label is in the top right corner of the block.

Smart Port

Optical Video Sensors
Thermal Video Sensors
Gunshot Detection System
Drone Detection System
Counter UAS System



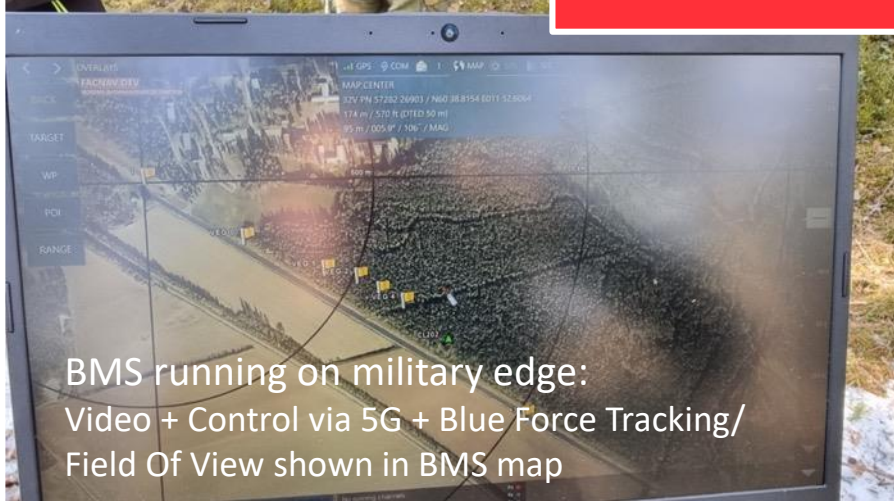
Tactical 5G



Private 5G > Guaranties Coverage, Capacity, Mobility to advanced sensors



Internet of Military Things controlled over 5G



BMS running on military edge:
Video + Control via 5G + Blue Force Tracking/
Field Of View shown in BMS map



UGV control



Robot control



Drone control

Foto: Torbjørn Kjosvold / Forsvaret

HD Video over 5G used in combination with Autonomous vehicles in dangerous areas

Scenario: Rescue operation in a area with no phone coverage

Task:

- Create coverage with Private 5G in disaster area for SAR team
- Establish “reach back” between Private 5G and Public network
- Establish video conference between users in Private 5G network and remote HQ to improve SA and coordination

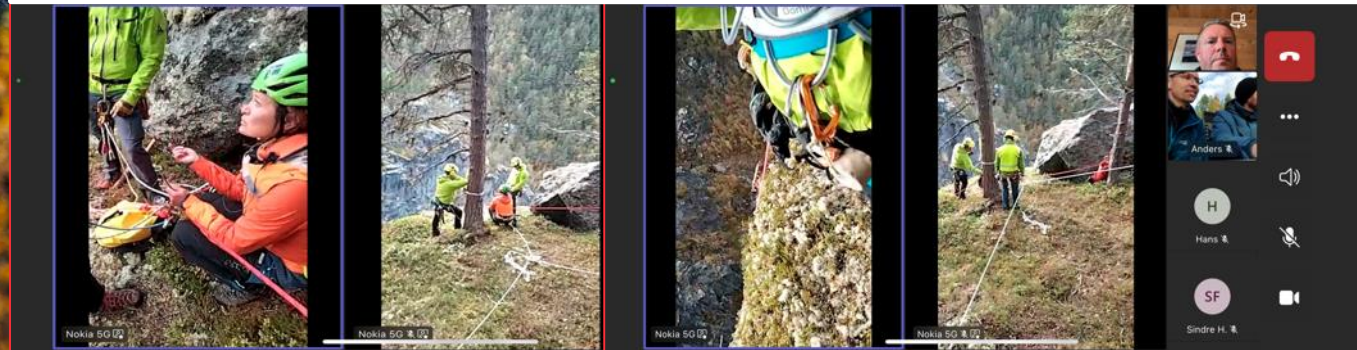


ULENDT. - SAR exercise
Lom 20-25 September 2022



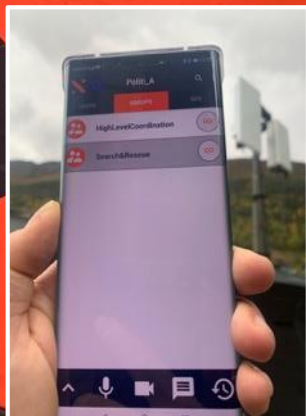
Alpine SAR Team (Private 5G) in Video conference with external users in Public NW

Video > Improved Situational Awareness
Private + Public NW > Improved Coordination



ULENDT. - SAR exercise

Lom 20-25 September 2022



Scenario: Locate missing persons in terrain

Task:

- Create coverage with high capacity Private 5G in search area
- Use UAV and AI/ML Edge in the Private 5G network to locate missing people using different camera sensors (HD Video/ IR camera).
- Use Mission Critical Push-To-Video for search personnel on the ground



DRONEPILOT

DRONEBERE

ZEPHYR





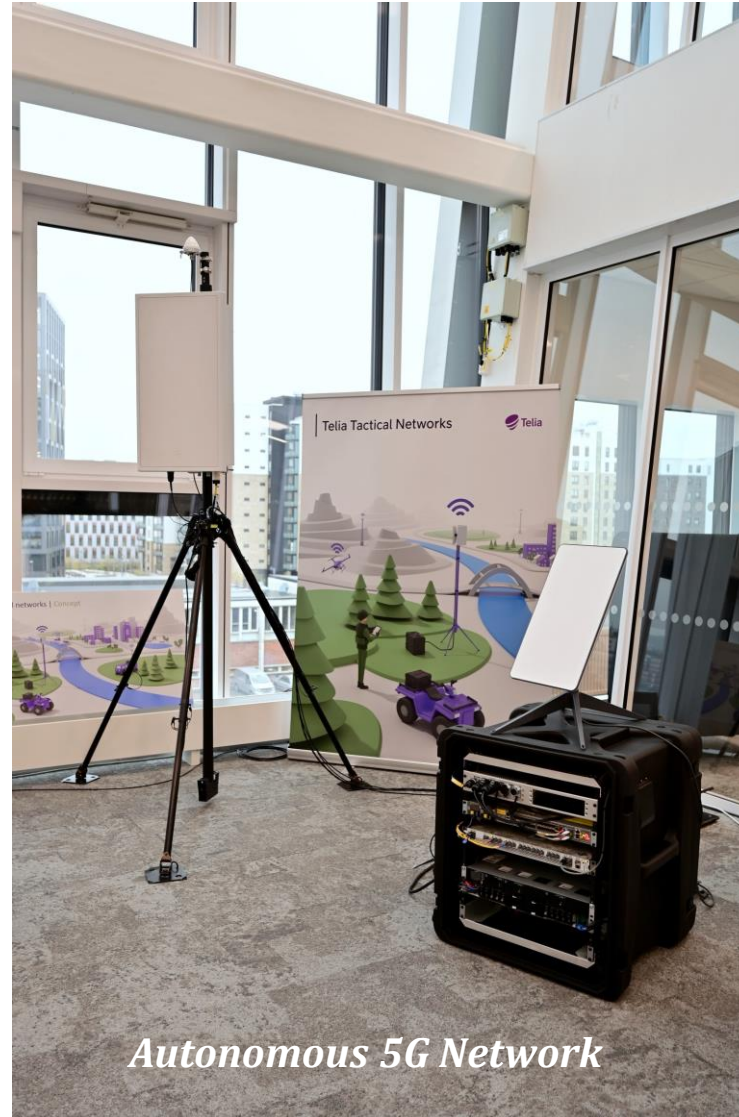
5G + UAV+ AI/ML = Possibilities

- UAV operated in Private 5G network and Public 5G network (BLOS)
- AI/ML analytics of High Quality video received from the UAV via 5G to detect relevant objects/persons on the ground
- Distribute video link from UAV (or Helicopter) with AI/ML content to relevant First Responders smart phones to get improved Situational Awareness

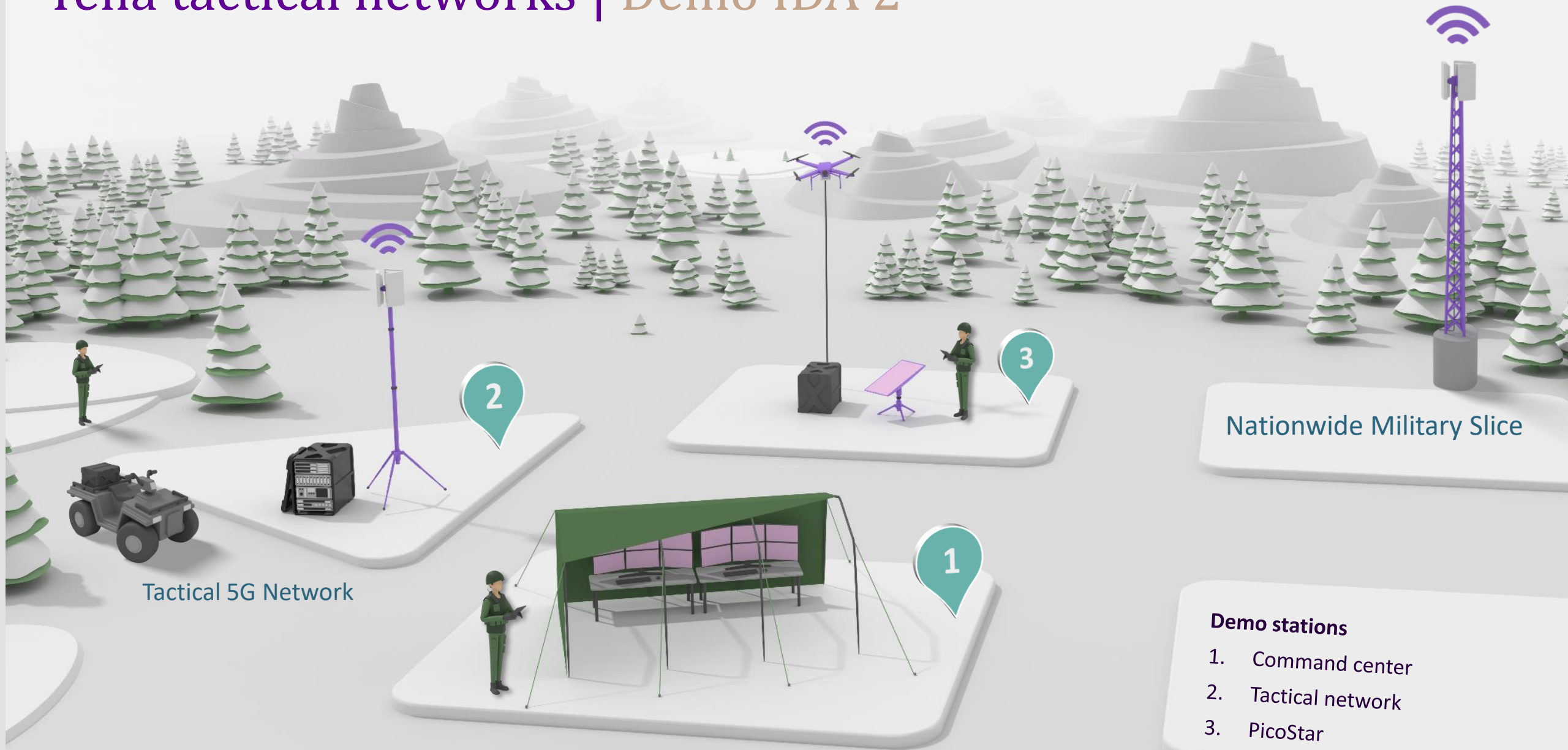


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Tactical 5G with Starlink



Telia tactical networks | Demo IDA 2

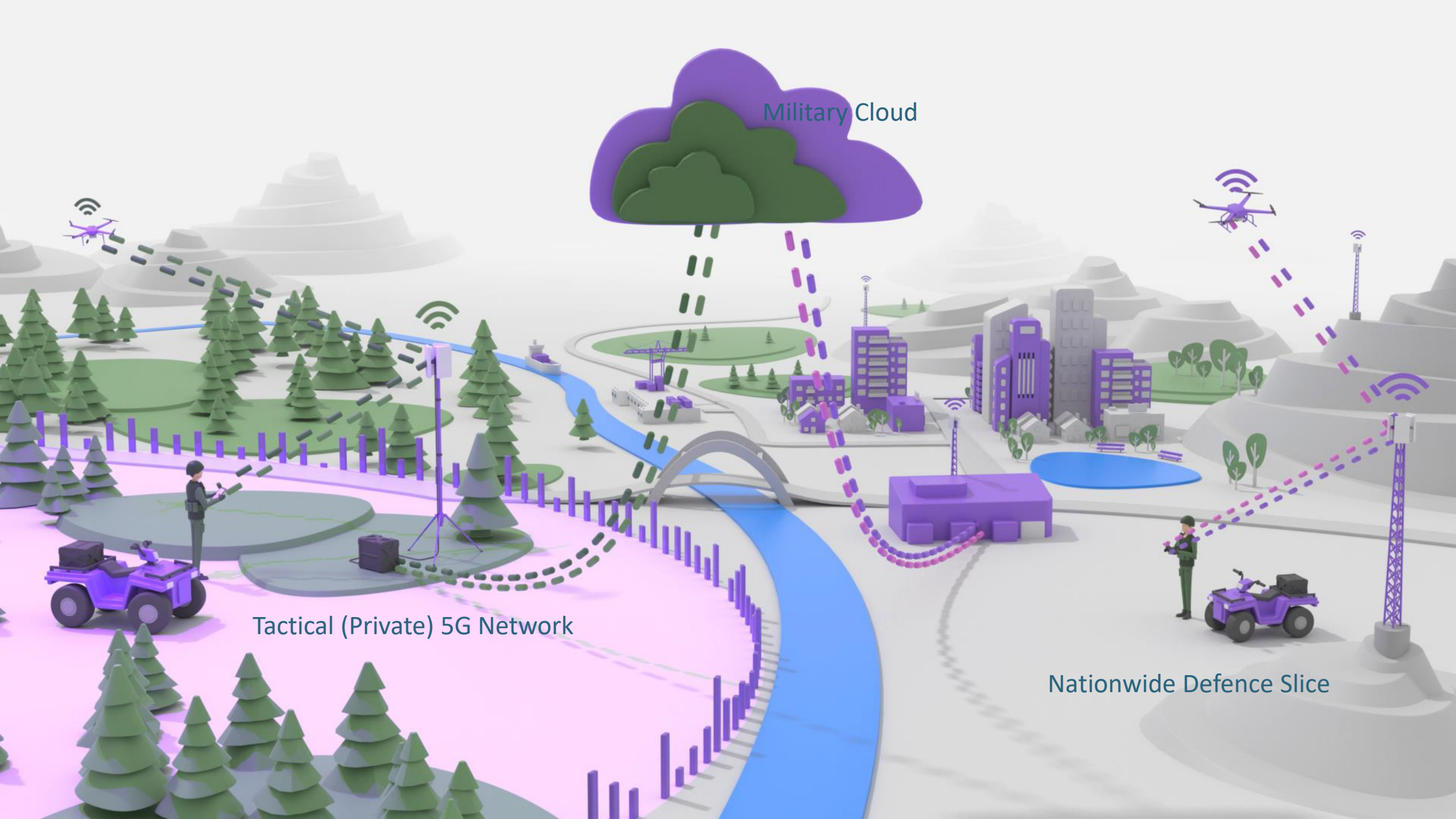


Nationwide Military Slice

Tactical 5G Network

Demo stations

1. Command center
2. Tactical network
3. PicoStar



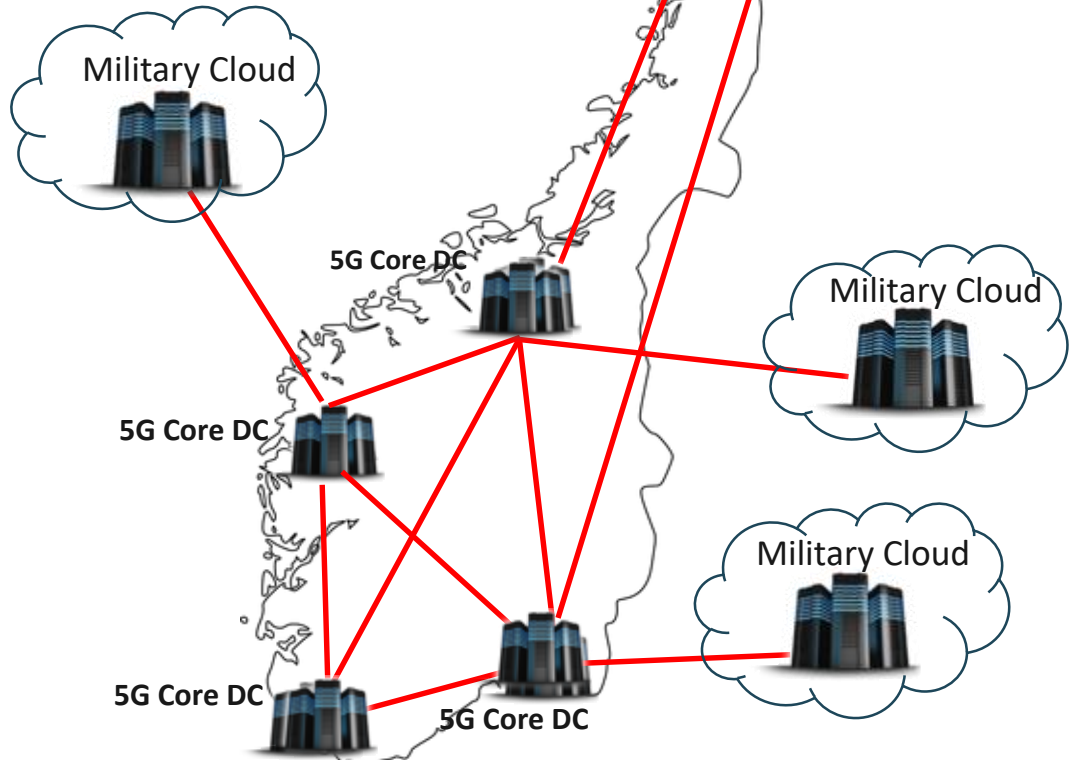
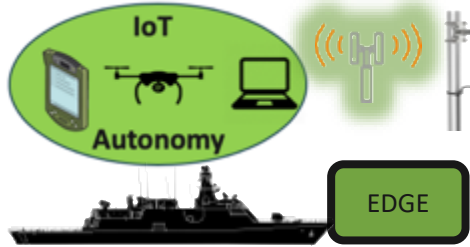
Military Cloud

Tactical (Private) 5G Network

Nationwide Defence Slice



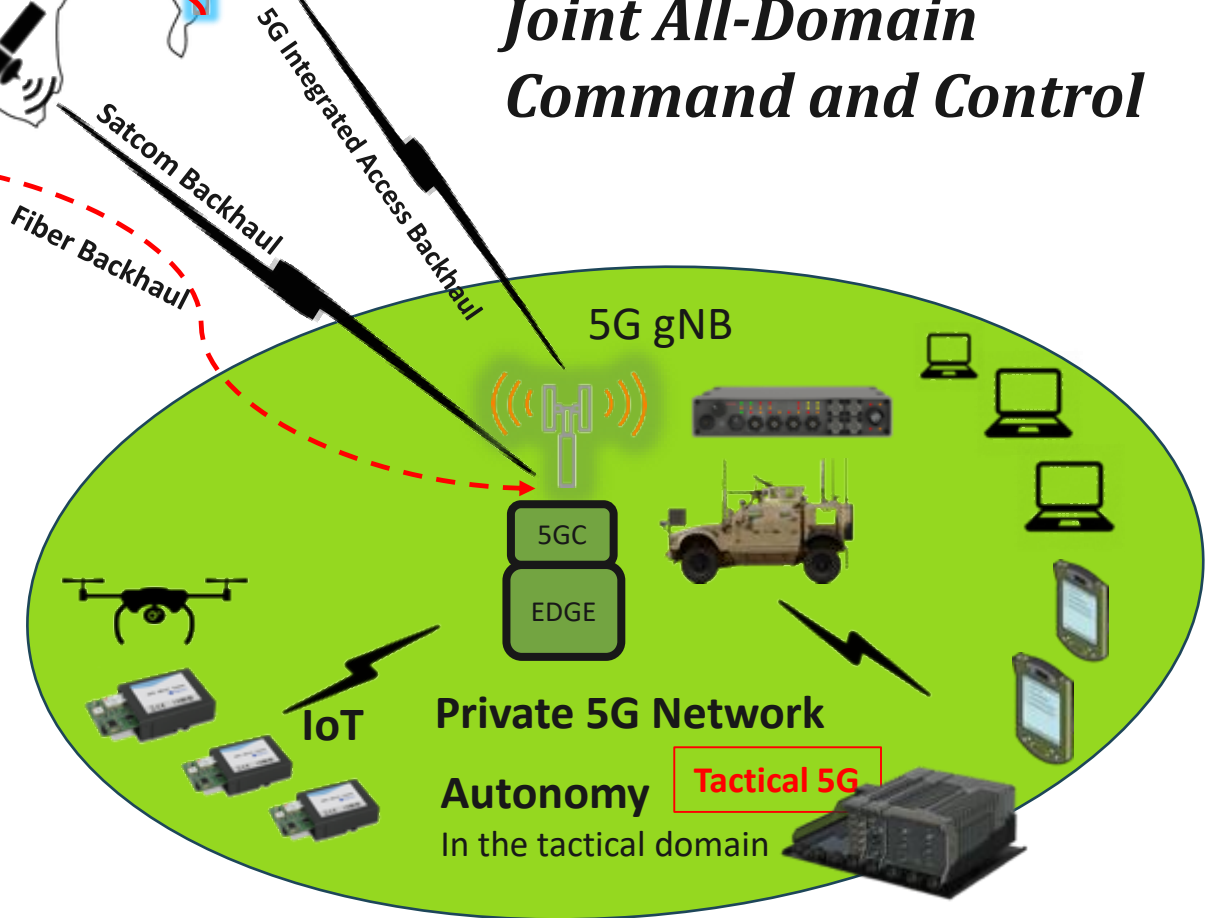
Private 5G Network



Mil Slice

Mil Slice

Joint All-Domain Command and Control



Edge Computing...the extended cloud

Utilize centralized clouds, 5G and Edge to create
Common SA and more Robust services



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5th Generation Changes Everything

Kennet Nomeland
Radio System Architect
Program Mime - Team 5G

Foto: Morten Hanche/ Forsvaret