

Multinational Collaboration on 5G

Effectively and efficiently exploiting the potential of 5G
for military applications



The 5G Context

5G breaks new ground in many technical domains and is poised to introduce revolutionary technical features in several fronts. This new technology will dominate the telecommunications landscape in the near future, and 5G networks will be the enabling backbone of future societies, which raises pertinent security concerns. However, 5G, as an emerging and disruptive technology, also brings new opportunities to military users.

In its 2020 working paper on 5G [1], the NCI Agency identified the significant potential of 5G technologies to enhance capabilities in different military domains. However, this potential entails several challenges that need to be investigated and addressed in an informed dialogue with military stakeholders, industry and academia.

Multinational Collaboration on 5G (MN5G)

By concerting efforts via a multinational (MN) programme supported by the NCI Agency, NATO and nations can pursue opportunities effectively and concurrently, exploiting synergies and influencing the development of 5G technologies and systems for military use. This approach would allow the development of cost-effective, gap-filling and/or augmentation solutions to future national and multinational military capabilities.

Motivation for MN5G

The motivation for the establishment of a MN5G programme stems from the interest manifested by nations to the NCI Agency and the findings of the NCI Agency's working paper [1]:

- **5G is a complex and fast-evolving topic** requiring significant effort for meaningful work to be conducted – for instance, participating in and influencing standardization work, proof-of-concept implementation and experimentation activities, etc;
- **5G will dominate the civil telecommunications landscape** in the future, and military stakeholders need to be informed of its technicalities, potential impact and opportunities, for effective decision-making;
- **5G technologies offer great potential to enhance military capabilities** in different military application

domains, but there are challenges that need to be overcome to make a number of concepts possible and ultimately available in the market;

- **The development of viable 5G-based military capabilities requires an informed dialogue** between military users, subject matter experts and industrial stakeholders;
- **A multinational collaborative effort explores synergies and helps achieve critical mass** in a complex area, and is more able to influence industrial development than isolated efforts by nations.

Benefits to Participating Nations

- Nations can stay abreast of international 5G development and implementation on many fronts, such as 5G technology, 5G security, military applications of 5G, and 5G evolution;
- Nations can have their military interests in 5G represented at influential organizations (e.g. 3GPP), making sure that military interests are considered;
- Nations can achieve quicker results in 5G technology insertion in future military capabilities;
- Nations can facilitate the creation of an enabling market, by influencing the military communications industry in addressing particular technical challenges and developing products for MN5G-promoted use cases;
- Nations can directly benefit from NATO capability development activities involving 5G and related technologies and align their future national capability programmes with NATO concepts;
- Nations can have their industry involved in the development and testing of key 5G-based concepts in support of military applications at different levels – e.g., technical forums and experimentation and testing activities;
- Nations can benefit from the development of cost-effective 5G-based military communications concepts and products able to fulfill national capability gaps and to support coalition (federated) scenarios;

- Nations can share ideas with NATO stakeholders, other nations, organizations and industries, by creating an independent community of trusted subject matter experts (SMEs) on 5G in the military context.

NCI Agency Expertise

- NCI Agency subject matter experts (SMEs) have expertise in both 5G and military topics and are neutral, as they are both nationally and commercially-unbiased;
- The NCI Agency has experience in de-risking technology insertion in NATO military capabilities;
- The NCI Agency has SMEs in all C4ISR [2] domains, which facilitates the development of C4ISR applications running on 5G-based systems;
- The NCI Agency has experience in leading multinational projects and initiatives with NATO, Allies and Partner Nations in several C4ISR areas related to Smart Defence.

Potential Scope for MN5G

The scope of MN5G needs to be defined with interested nations, and different work strands can be created and/or prioritized. The following topic areas are already envisioned:

- **[Awareness & Influence]** Closely follow and participate in 3GPP work, to inform nations on 5G development and to ensure that key 'military 5G features' are pursued in 5G standards;
- **[Capability Development]** Develop future gap-filling and/or augmentation military capabilities based on 5G technologies and systems, to address multiple military application scenarios in parallel (for effectiveness);
- **[Opportunities of Public 5G]** Investigate the opportunities, challenges and risks of the military use of public 5G networks, to tackle associated challenges independently of commercial influence;
- **[Security of Public 5G]** Address the security concerns of civil public 5G infrastructure (including liaising with other communities), to provide nations with informed advice.

- **[C4ISR Applications of 5G]** Develop C4ISR application-layer military applications enabled by 5G networks (massive Internet of Things, Artificial Intelligence, etc.), to develop and assess second-order military applications and use cases independently from commercial pressure;
- **[Side Opportunities]** Assess the potential of related non-5G high-performance wireless technologies, to leverage the potential of some 5G military scenarios.

Next Steps

Triggered by nations, the NCI Agency is organizing a 5G event to discuss early findings on military opportunities of 5G technologies [1]. The event will include participants from NATO, the Nations, industry and academia. A session dedicated to MN5G will offer NATO and national representatives a chance to discuss their interest in this initiative and the way forward.

References

[1] "Potential of 5G technologies for military application", NCI Agency working paper, 15 Sep 2020

[2] Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR)

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