

5GTNF result seminar – DAY1 (27.01.2021)

Theme 5G technology R&D and test network integration

Time At 13-15

13.00 – 13.10 **Opening, 5GTNF intro** (Kyösti Rautiola, VTT)

13.10 – 14.40 **5G key technologies**

- 5G-FORCE introduction and Network technology enablers R&D (Jose Costa, Aalto)
- Radio technology (Marko Leinonen, Oulu University, CWC)
- Artificial intelligence (Ahmad Iftikhar, Tietoevry)
- Cyber security (Valtteri Niemi, Helsinki University)

14.40 – 15.00 **Introduction to developed test network infrastructure**
(VTT, Sami Ruponen)

5GTNF intro

Kyösti Rautiola

VTT TECHNICAL RESEARCH CENTRE OF FINLAND

email: kyosti.rautiola@vtt.fi,
5GTNF: www.5gtnf.fi

27.01.2021

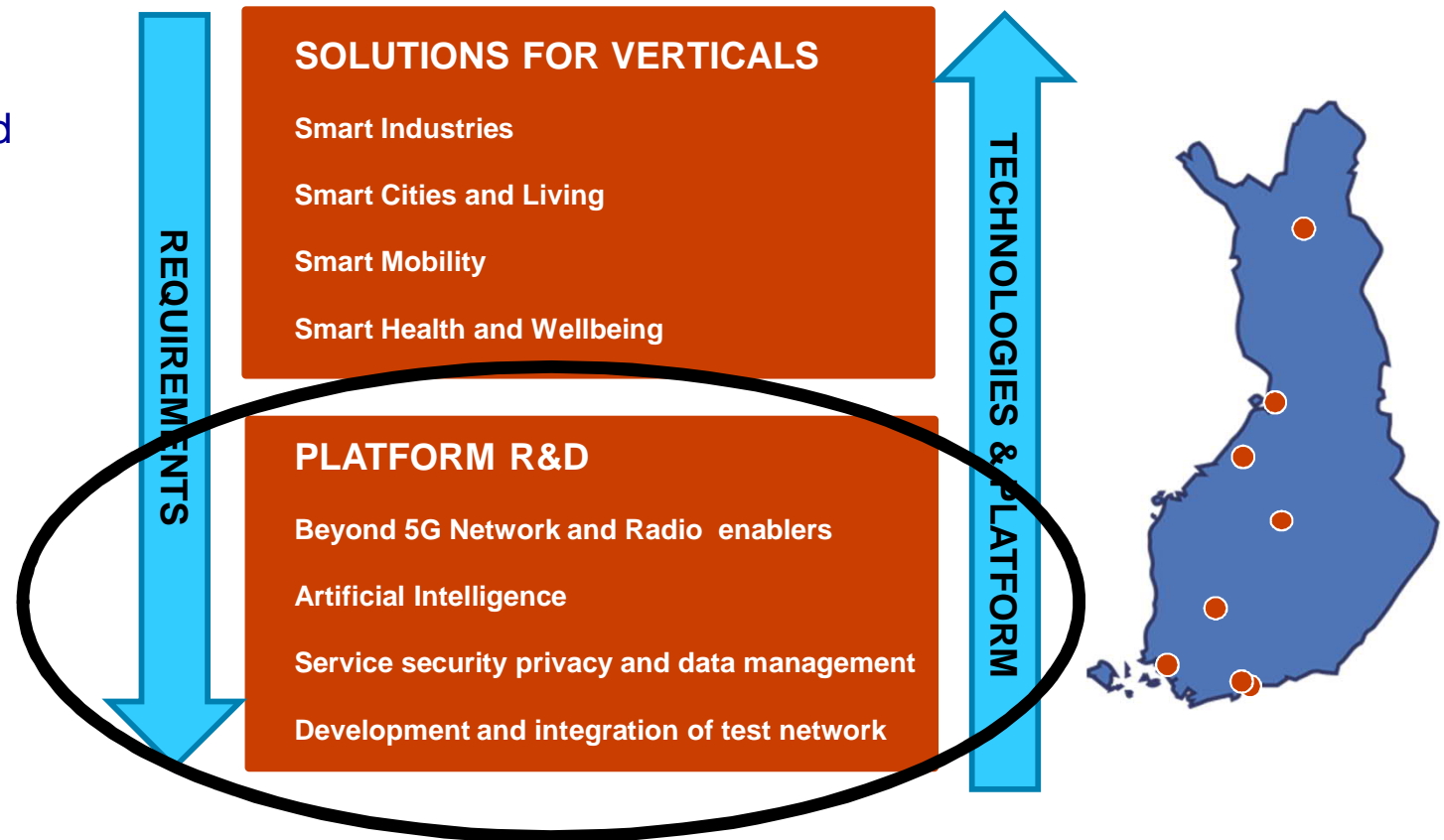
5G Test Network Finland Targets

MISSION

5G Test Network Finland is open and evolving innovation ecosystem supporting **5G evolution and Beyond 5G technology research and validation, vertical industry product development** and pioneer company experiments.

VISION

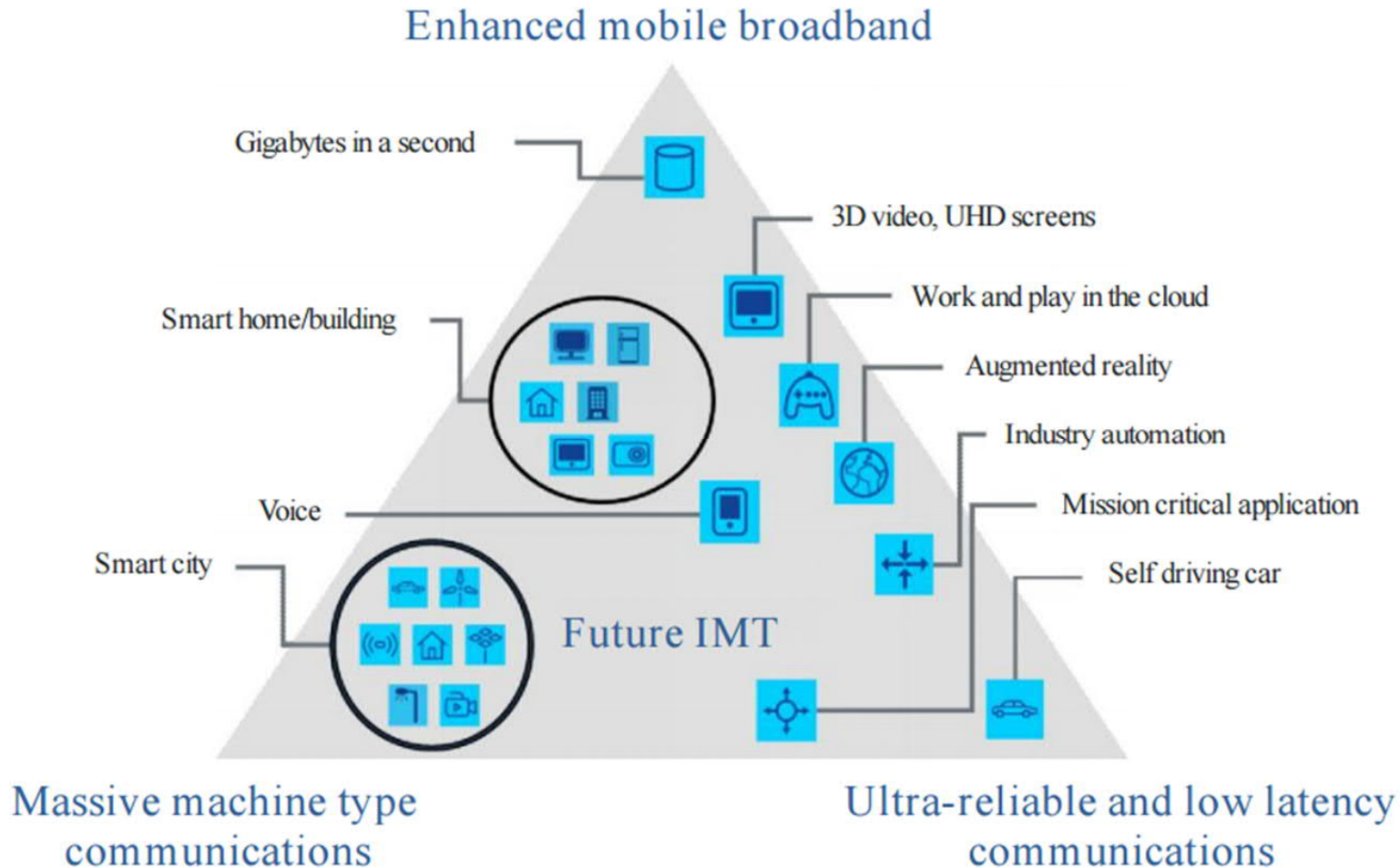
5G evolution and B5G R&D and utilization of AI and novel cyber security concepts are ramping up and offer excellent business opportunities to both telecom and vertical industries



General Targets

- regeneration
 - 3GPP Rel16->, **5G and beyond** communication concepts, towards 6G
 - **utilization of AI** in radio resource and network management and vertical use case implementation, novel **cyber security** concepts
 - **vertical use cases** utilizing 5G and beyond, AI and cyber security concepts
- interdisciplinary approach
 - co-operation between **telecom and vertical** (automation, energy, health, safety, media, automotive, buildings, ...) area technology and **business model** experts
- differences compared to existing research;
 - Strong support to **verticals**
 - **Integration** of Beyond 5G research, vertical use case design, utilization of AI, cyber security concepts and large area research infrastructure integration
- differences compared to pre-commercial test environments;
 - more **future looking**, non-commercial (still under standardization and research, utilization of AI, novel cyber security) technologies, flexibility, wide set of tools and co-operation possibilities with wide eco-system

Why we need 5G Test Network Finland ?



5G features:

- Unlimited Broadband experience
- Instant Action
- Things Connected
- Ultra Reliability
- Slicing
- Virtualization
- Energy saving

Source: 5GPPP

5GTNF – platform R&D

- 5GFORCE (BF)
 - 5G and beyond radio and network enablers, AI, service security privacy and data management, development and integration of test network
- EuWireless (EU)
 - Flexible sharing of regulated frequencies and network infrastructure with MNO's
- SAT5G (EU)
 - Satellite integration into 5G (backhaul and traffic offloading solutions)
- AI4Green (BF/Celtic)
 - AI based energy efficient algorithms and solutions for radio access and core networks, data centres and storage
- RF CONVERGENCE (BF)
 - 5G transceiver based radar
- TeraWave (EU)
 - THz backhaul for mobile communication networks

... 5GTNF status – trial domains

	Smart Industry	Smart Cities and Living	Smart Mobility	Smart Health and Wellbeing
5GVIIMA	harbors, factories, smart grids			
SMART OTANIEMI	remote monitoring and control of a self-sustained pico-eNodeB, remote inspection of facilities with drones	multi-point metering system to monitor of energy consumption of buildings' cooling and air conditioning systems, smart electric vehicle charging		
DECENT	cross-commodity sharing and management of energy in smart neighborhoods			
FUSE	solutions for demand response and predictive maintenance of the the grid			
5G-ENHANCE				AR/VR streaming from operation room to students and remote doctors
5G-DRIVE		Utilization of indoor positioning in eMBB	Green light optimal speed advisory, Intellig. Intersection	
5G-HEART			autonomous/ assisted driving	the use of rich media communications in the context of remote monitoring, education and robotics in patient treatment

... 5GTNF status – trial domains

	Smart Industry	Smart Cities and Living	Smart Mobility	Smart Health and Wellbeing
5G DRONES		UAV traffic management and related 3D mapping and visualisation, location of UE in non-GPS environments		
PRIMO		use of drones to enable immersive video services for firefighting scenarios		
PRIORITY		search and capture, support for rural use		emergency response
5GLuxTurri m+		5G light pole based network infrastructure with pole integrated 5G mmW radios, sensors, cameras, information displays and other connected devices. Navigation, information sharing & advertisement, public safety use cases	environmental monitoring and smart lighting for self-driving and automated vehicles,	
5GMOBIX		5G for cooperative & connected automated MOBility on X-border corridors		
MEGASENSE		air pollution status		
5G SAFE+			Road safety services	

Ecosystem founding members

Network manufacturers

Operators

Technology and R&D service providers

Testing systems and tools manufactures

Verticals/ applications developers

Public organizations

Research organisations



- **Ecosystem Services:**

- Access to state-of-art 5G infrastructure with expert support to:
 - test network operation/configuration and management
 - technology validations and application trials
- Expert services for 5G evolution R&D and different type application and system design with 5G infrastructure
- Participation to wide R&D ecosystem focusing on
 - technologies and innovations related to 5G evolution and beyond network and radio enablers, cyber security, utilization of AI and business models
 - 5G and AI enabled solutions for vertical industries; smart industry, smart cities and living, smart mobility and smart health and wellbeing

- **More information:**

- Kyösti Rautiola, Tel.: +358 400 582 246, email: kyosti.rautiola@vtt.fi
- www.5gtnf.fi

Benefits to members

- Promotion of members as early technology adopters with validation expertise in nation wide test platform
- Early visibility to 5G evolution and corresponding 5GTNF test network features
- Information about vertical industry/applications communication technology needs
- Possibilities to participate common customer funded (eg. vertical companies) service and R&D projects utilizing 5GTNF test network
- Access to state-of-art 5G infrastructure for own R&D and 5G expert support to test network operation/configuration and management and technology validations and application trials
- Participation to new 5G evolution and solutions related R&D projects (EU, BF) preparation
- Participation to the planning of 5GTNF test network investment roadmap and guidance of 5GTNF development
- Networking with leading 5G experts
 - support to holistic development of 5G strategy
 - latest information about 5G evolution and application status and roadmap
- Participation to wide R&D ecosystem focusing on technologies and innovations related to 5G evolution and solutions for vertical industries