



6G

FLAGSHIP
UNIVERSITY
OF OULU

5GTN+ – 5G Test Network Facilitating Vertical Businesses

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5G Test Network

Innovation platform for next generation services

www.5gtn.fi

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What are we?

How does it look like?

What have we done?

What do we offer?



What are we?

Full scale (micro, μ) operator ran by
University of Oulu and VTT (Technical
Research Center of Finland)

Open innovation platform

Scalable for various needs and
experimentations



How does it look?



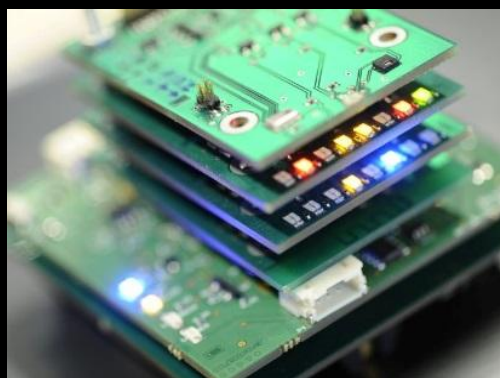
5G PoC
radios



LTE
small cells



Own SIM



IoT
sensors



5G NR and
LTE Macros

How does it look?

Frequencies

700 MHz, B28
2.6 GHz, B7
2.1 GHz, B1
3.5 GHz, B42

2.4 and 5GHz

868 MHz

3....5GHz
26...28GHz

Radio access



LTE, NB-IoT/Cat M1



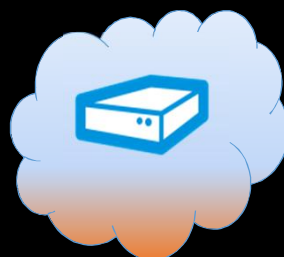
WiFi/BLE



LoRa



5G NR and PoC



MEC



Virtual EPC



EPC



VPN

To other
5G Test
Networks,
to other
remote
locations

What have we done?

Vertical use cases

1. Care, wellbeing and fitness
2. Media production and distribution
3. Conscious factory empowered by 5G

1. Care, wellbeing and fitness

Better life quality enabled by **technology**

Assisted living for persons with disabilities

Wearables always connected
Personalized services for
individuals & professionals



2. Media production and distribution

5G for live sports events,
music festivals and TV programs.

5G^{network}

Fast production environment
construction

eMBMS enables efficient
broadcasting to mobile users

AR/VR utilization in big events



3. Industry 4.0

Automated manufacturing in
People-Robot collaboration
Improved efficiency and quality
with new technologies
Integration of industry IoT and
digitalization towards 5G
enabled cyber physical systems



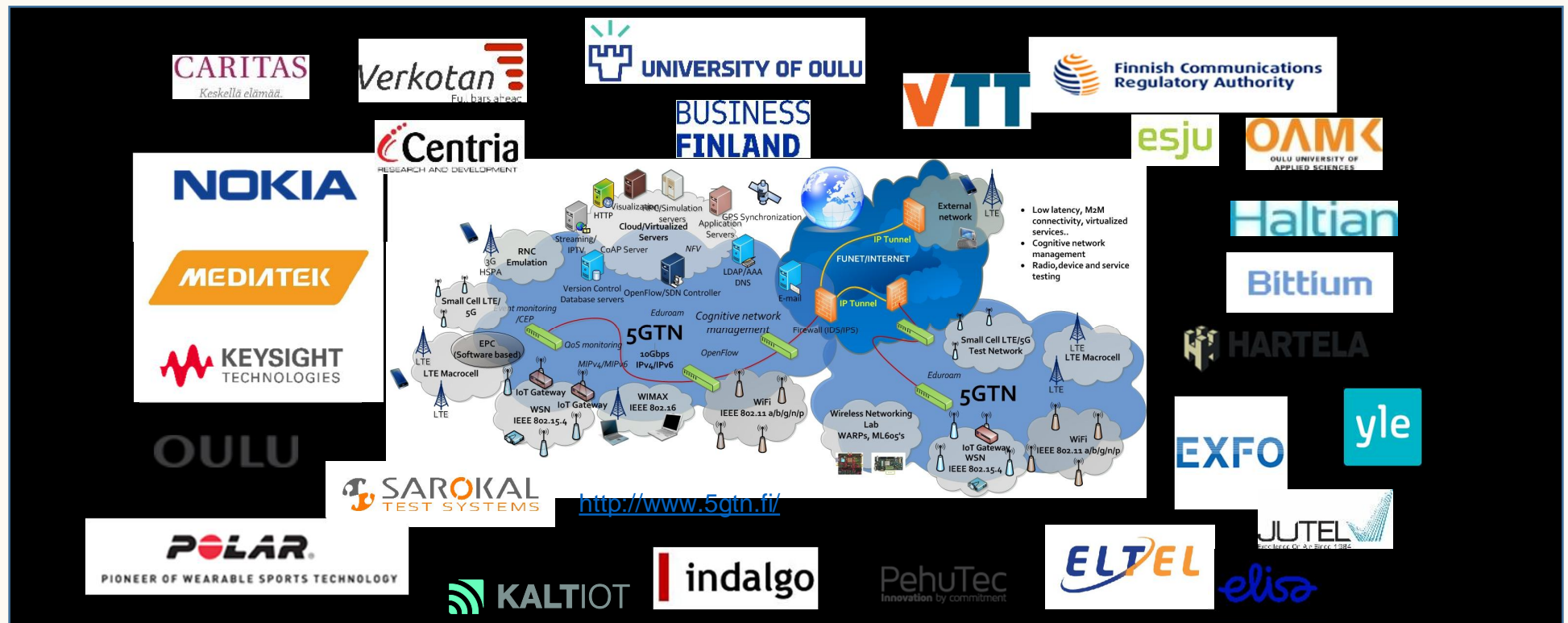
What do we offer?

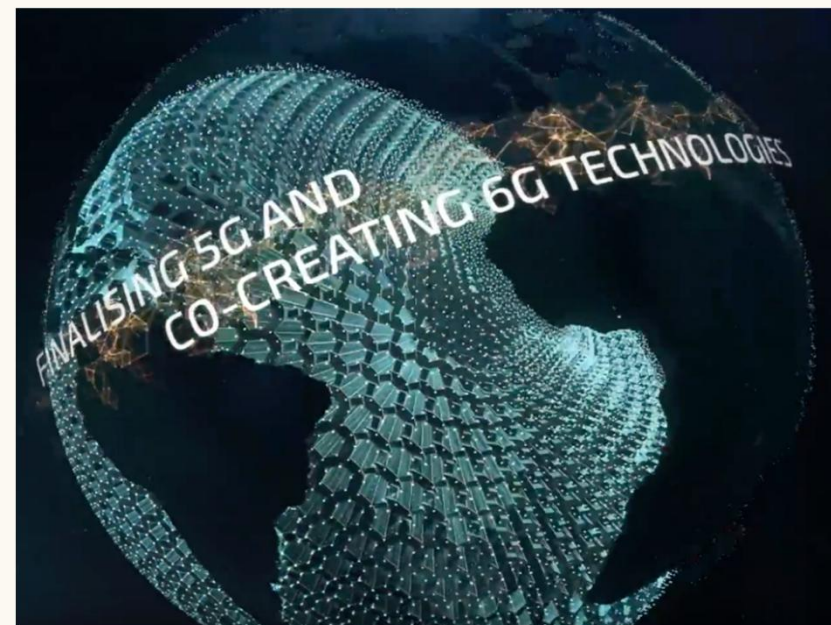
5GTN Community Membership

- § 5G and LTE access
- § IoT access and data storage
- § 5G expert support
- § Sandbox
- § Device loan
- § Network monitoring



5GTN Ecosystem

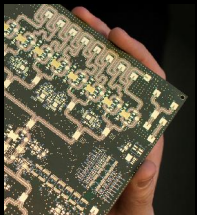




In Summary



- Open test network for co-creation (<https://services.5gtn.fi/>).
- Was used in EU-Korea demos at 2018 Winter Olympic Games.
- Operator grade live network with 5G NR and 5G prototype radios.
- Awarded Academy of Finland FIRI status Dec/2018
- Near future targets: become the first operational local micro-operator at University of Oulu Digital Campus.
- Long Term Target: World's First 6G Test Network



800 MHz @26/28 GHz
10 Gbps
Hybrid beamformer



5G PoC/
5GNR



IoT sensors
LoRa, NB-IoT, UWB, ZigBee, BLE



LTE Macros
with NB IoT



LTE small cell
@3.5GHz



5GTN SIM



6G
Flagship

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