5G INDUCE

Open cooperative 5G experimentation platforms for the industrial sector NetApps

www.5g-induce.eu

Infocom World Conference & Exhibition 2022

Research Projects for creating the Future and Innovative Telecoms Market

29/11/2022

5G Network Advantages in Predictive Maintenance

Christina Lessi

Hellenic Telecommunications Organisation S.A.

5G-INDUCE project

Open cooperative 5G experimentation platforms for the industrial sector NetApps

- ICT-41-2020 research projects
- 21 partners
- https://www.5g-induce.eu

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Vision

- **End-to-end orchestration platform for 5G applications:** easily ported, deployed and managed, showcasing advance 5G trial use cases, with demonstratable performance metrics that conform to specific KPI requirements

- **Interaction between a NetApp developer or service provider and a telecom infrastructure provider** with links to big customer private networks

- **Build of real 5G NetApp trial testbeds applied over a set of Industry 4.0-specific use cases**, addressing the three classes of ITU requirements (eMBB, mMTC, URLLC use cases)
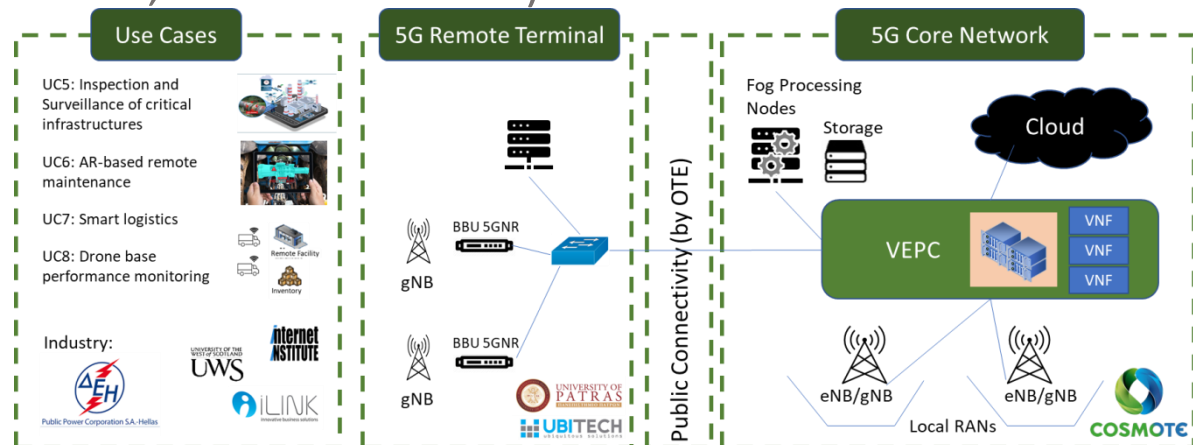
Use Cases tested in ExFa-Gr

UC 4: Predictive maintenance for Power Generator

Main objective:
Test bandwidth and latency on real time data flow for machine connectivity (PLC data and thermal camera images) via 5G
Secondary objective:
Evaluate netApp

UC 5: UAV inspection and survailance

Main objective:
Test bandwidth and latency on real time video streaming via 5G
Secondary objective:
Evaluate netApp

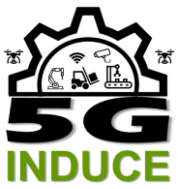## UC 6: AR assistance for maintenance procedures

Main objective:
Test bandwidth and latency on real time data flow for worker assistance and documents/ pictures/ video management via 5G
**Secondary objective:**
Evaluate netApp

5G technology added value in 5G-INDUCE ecosystem

- **5G is introduced**
  - to redesign the production line
  - to enable operating models with networking characteristics that enable added value services for enhanced productivity, quality, safety and security.

- **Several complex and heterogeneous components**

- **Generic services are supported with vastly heterogeneous requirements**:
  - Enhanced Mobile Broadband (eMBB): aims to service more densely populated metropolitan centers.
  - Ultra-Reliable and Low Latency Communications (URLLC): addresses critical communications where bandwidth is not quite as important as latency.
  - Massive Machine Type Communications (mMTC): 5G enables an 1000X increase of devices connected to the Network

- **Service heterogeneity can be accommodated by network slicing**

# 5G technology added value in 5G-INDUCE ecosystem

5G technology characteristics

- Better network performance
  - High reliable and high available network
  - High throughput
  - Low latency
- Slicing

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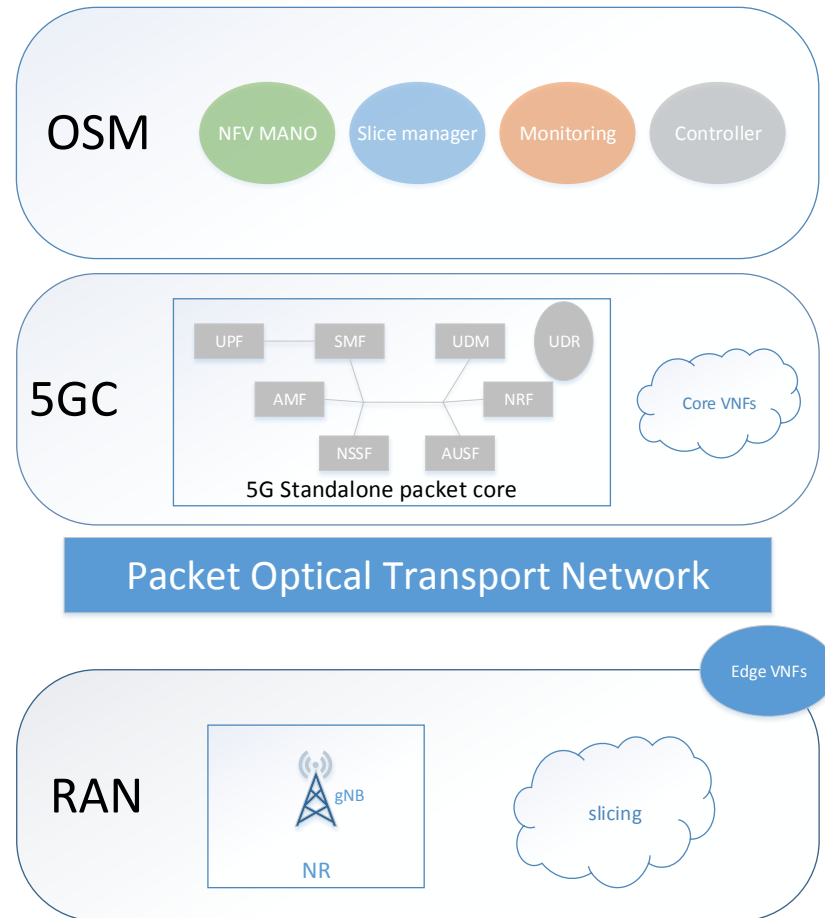
GR Testbed

Element	Description
Packet core	upgrade to next generation core
RAN	NR installation and configuration in PPC premises
POTP	network extension to PPC
OSS	integration between Packet core and OSS

15km

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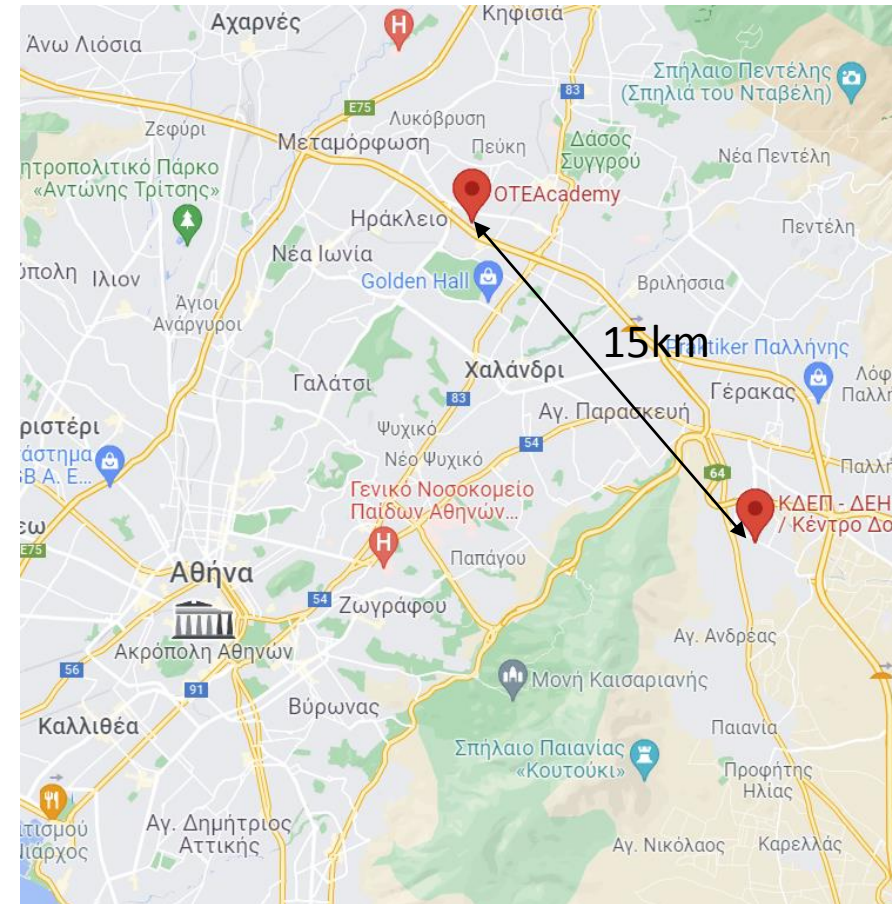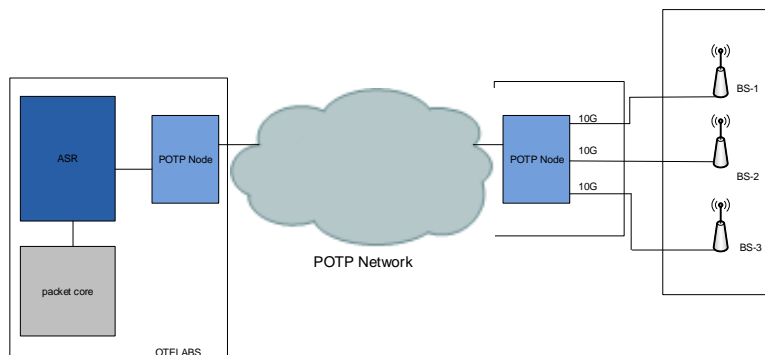
5G Coverage area

Ground floor: 18.7x21x6 m
1ˢᵗ floor: 8.8x8.5x3 m
Basement: 18.7x21x6 m and 20x3x6 m
Outdoor: 600 m^2

Freq bands, spectrum: 3500, 100MHz
Modulation: 256 QAM
mMIMO: 4x4
RAN slice template: eMBB
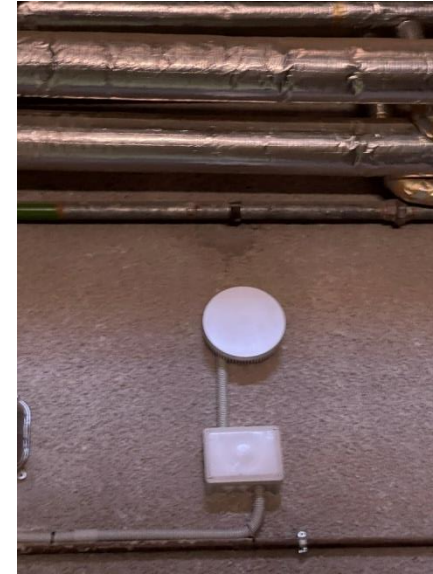
Baseband Unit	1
Indoor Radio Unit	1
Radio Dot	4
Outdoor antenna	1

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Conclusion

- **Industry 4.0 focuses on**
  - manufacturing productivity efficiency
  - work safety
  - supply chain optimization
- **5G technology supports the operating models with networking characteristics**
  - enable added value services
  - support NetApps
- **5G SA architecture is implemented to offer 5G network capabilities**

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THANK YOU!