5G Non-public Cellular Networks on Demand

FUDGE-5G Project Newsletter #1 August 2021

FUDGE-5G is a European research project conceived to offer 5G networks on demand, non-public cellular networks with revolutionary features for the industry and other environments such as hospitals or universities. 5G non-public networks (NPNs) do not share the spectrum with other networks, a key difference from traditional Wi-Fi. This guarantees a fixed bandwidth, which is a requirement of many critical applications.

The technical characteristics of 5G enable three major improvements: (i) full network coverage, (ii) ultra-high speeds (Gb/s) and (iii) very low communication delays. With 5G NPNs, any organization can benefit from these 5G capabilities no matter its size. 5G NPNs also provide improvements in terms of privacy and security since the network is isolated from the public and only accessible to its owner. A private network management further allows for greater control of Quality of Service (QoS) and Network Slicing, which allows devices with different network requirements to coexist in the same network without impacting each other. For instance, robots in a factory (which usually need an Ultra-Reliable Low-Latency network connection) would not be disturbed by the employee's smartphones.

Germany was a pioneer in reserving spectrum in the 3.5 GHz band locally for 5G NPNs at the end of 2019, and in less than one year almost 100 licenses had been allocated. These networks are designed for closed scenarios with many users and/or connected devices, not for individual end-users. They are of special interest to industry, and other environments such as hospitals, universities or corporations.

The FUDGE-5G project will establish the guidelines for deploying 5G NPNs in the cloud to reduce the cost of infrastructure and to increase the flexibility of the deployment, so that it always adjusts to the needs of the

vertical end-user. One of the main advantages of using the cloud to host this infrastructure is elasticity, which allows the allocation of resources assigned to the network to be performed dynamically, helping to cut costs by optimizing the usage of resources towards the load at any given time. However, to achieve this benefit, cloud-native developing principles should be followed, which is not a trivial task. A cloud-native approach does not just mean that the application runs in the cloud. Instead, cloud-native means that a microservices architecture is followed, applying CI/CD techniques in the development and deployment using virtualization technologies such as containers.

Five testing grounds

The project started in September 2020 and will run until February 2022. It includes the development of different pilot tests for the deployment of 5G NPNs, which will all be carried out in Norway, using Telenor Research as the network operator.

The locations in which the pilots will be carried out are a hospital (5G Virtual Office use case), the Norwegian public television NRK (Multimedia use case), the Norwegian Defence Material Agency (NDMA) (Public Protection and Disaster Relief use case), the multinational company ABB (case of Industry 4.0, where the performance of these networks for connected robotics applications will be evaluated), and at a university (Interconnected NPNs use case). In the latter use case, the main goal is to connect the UPV campus with a Telenor site and the Fraunhofer FOKUS German research institute in Berlin, deploying an Eduroam-style network with non-public 5G networks in different countries connected to each other.

5G World - UNLEASHING THE POWER OF 5G

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21 - 23 SEPTEMBER, 2021
ExCel., London

VIRTUAL EVENT:
20 - 24 SEPTEMBER 2021
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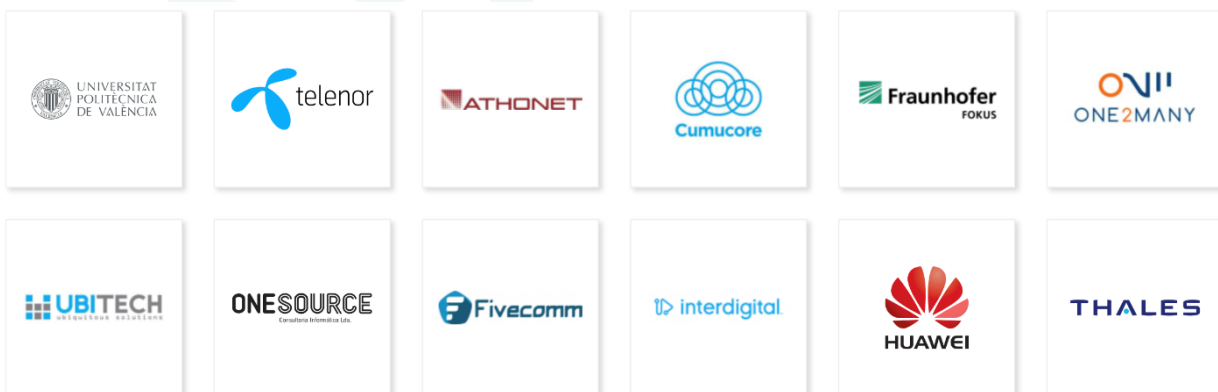
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