

5G-DIVE: Edge Intelligence for Vertical Experimentation



MISSION

5G-DIVE targets end-to-end 5G trials aimed at proving the technical merits and business value proposition of 5G technologies in two vertical pilots: (i) **Industry 4.0** and (ii) **Autonomous Drone Scout**. These trials will put in action a bespoke end-to-end 5G design tailored to the requirements of the applications targeted in each vertical pilot, such as digital twinning and drone fleet navigation applications.

VISION

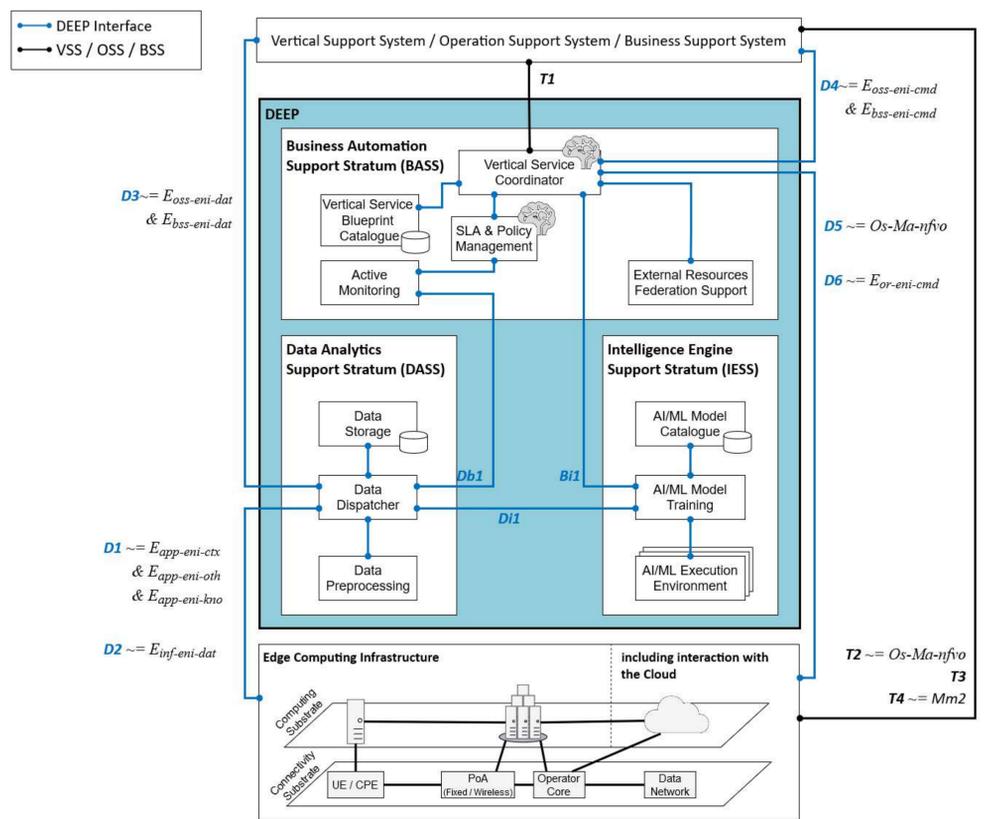
5G-DIVE is an end-to-end Platform-as-a-Service (PaaS) build on top of an Edge and Fog computing platform (developed by the project 5G-CORAL). 5G-DIVE aims to enhance the management and automation of business processes of the 5G-CORAL platform using **data analysis** and **Artificial Intelligence (AI)** to maximize the value proposition of 5G for different type of vertical industries.

5G-DIVE ELASTIC PLATFORM (DEEP)

5G-DIVE architecture aims at providing a higher-level of abstraction to its customers (e.g., the verticals) by providing a set of supporting strata that would enable enhanced business automation and ease the provisioning of intelligence capabilities into the vertical services. In doing so, 5G-DIVE positions itself on top of Edge Computing Infrastructures, allowing the shift from an Infrastructure-as-a-Service (IaaS) service model towards an end-to-end Platform-as-a-Service (PaaS) service model.

The above concept is materialized in a new building block called 5G-DIVE Elastic Edge Platform (DEEP), which spans as an add-on on-top of existing Edge Computing Infrastructures while underpinning vertical industries OSS/BSS systems. The DEEP building block envisions three supporting strata which offer unique capabilities tailored to the support of the vertical industries OSS/BSS systems with the goal of enhancing day-by-day operations and business processes:

- I. **Data Analytics Support Stratum (DASS):** offers the necessary support for pre-processing, storage and sharing data generated from vertical services operation which can be potentially enriched with a variegated set of context information, both from the local environment and the virtualization infrastructure.
- II. **Intelligence Engine Support Stratum (IESS):** allows vertical industries to augment their applications and operations with AI techniques, including machine learning support for complex systems, event predictions, pattern recognition, anomaly detection, etc.
- III. **Business Automation Support Stratum (BASS):** offers the necessary support to the vertical industries to achieve the automation of their business processes by allowing to plug their OSS/BSS systems in the platform.



5G-DIVE USE CASES

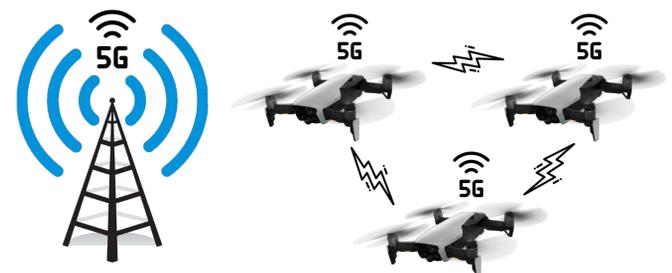
Industry 4.0:

- **Digital Twin application:** a robotic arm will be controlled remotely in real time using a digital twin located at the EFS, demonstrating the 5G performance and exploiting the low latency and computing capabilities of the Edge and Fog
- **Zero Defect Manufacturing:** real-time 4K video analysis of production lines to detect possible manufacturing defects, demonstrating the high bandwidth and low latency capabilities of 5G Fog computing environments



Autonomous Drone Scout:

- **Drone fleet navigation:** evolved navigation system that enables local processing of information and dynamic modification of the trajectory of the drones by a controller using advanced coordination mechanisms (centralized or distributed)
- **Intelligent processing of images in the Drones:** integration of drones into the 5G-DIVE platform as volatile moving resources taking benefit of the Data Analytics and Intelligence Engine strata allowing:
 - Image stitching to map a certain area automatically with the help of the Drone fleet
 - Pattern recognition of certain events such as the detection of fire in buildings or the detection of human live risks



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Call Identifier: H2020-ICT-2019-1

Project lifetime: 01/10/2019 - 30/09/2021

Cost: €4.304.416,25

Project Coordinator: Dr. Antonio de la Oliva (UC3M)

Technical Managers: Dr. Alain Mourad (IDCC), Dr. Maria Yuang (NCTU)

uc3m

Universidad Carlos III de Madrid

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