IoT-NGIN

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IoT-NGIN

EU H2020

Next Generation IoT as part of Next Generation Internet

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H2020 IoT-NGIN: Project At A Glance

Title:	Next Generation IoT as part of Next Generation Internet		
Start Date:	October 2020	End Date:	September 2023
Total Cost:	7.9 M Euros	Duration:	36 Months
EC Contribution:	7.9 M Euros	Project Coordinator	Capgemini

IOT-NGIN Vision

IoT-NGIN approaches IoT in a multi-layer holistic way and envisions to ensure across layers:

- Interoperability
- Security by design
- Privacy by design
- Traceability by design
- Data sovereignty by design

IoT-NGIN will empower Edge Cloud with federated on-device intelligence and will introduce novel human-centric interaction based on Augmented Reality
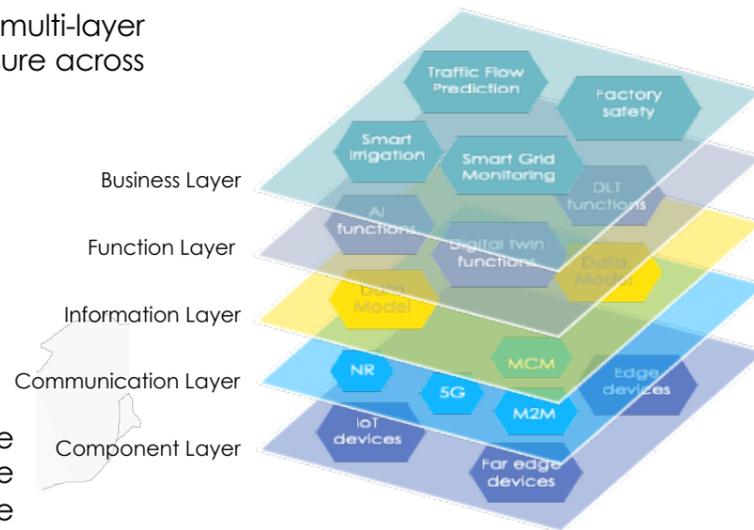
IOT-NGIN Objectives in a nutshell

- Patterns based meta-architecture
  - evolving, legacy, and future IoT architectures
- IoT-NGIN federation approach
  - on-the-fly adaptation and interpretation of heterogeneous data and control messages
  - privacy preserving federated ML training – Distributed AI
  - keeping the data in their original locations
  - Inter-DLT technologies for secure and trusted data sharing
  - Zero knowledge proof techniques for ML models verification without disclosing any data
  - meta-level digital twins

- Optimize IoT/M2M and 5G/MCM communications
  - secure-by-design micro-services to extend the edge cloud paradigm
- Enable user and self-aware, autonomous IoT systems
  - privacy-preserving federated ML
  - ambient intelligence, with AR support for humans
- Research towards distributed IoT cybersecurity and privacy
  - Self-Sovereign Identities
  - Interconnected DLTs
  - ML-based cybersecurity auditing and active protection

Living Lab Trials (LLTs)

LLT1 (IoT-NGIN Integration Infrastructure Technology Lab) The focus of the first trial is on comprehensive integration and evaluation throughout the development of the IoT-NGIN technologies. The trial will ensure that the IoT-NGIN components achieve the expected Technology Readiness Level (TRL). The OneLab facility of the Sorbonne University will be used for this trial.

LLT2 (Human-Centred Twin Smart Cities Living Lab) The ambition of this trial is to adopt an innovative cross-border-by-default twin city context with the city of Helsinki in Finland and the city of Tallinn in Estonia. The use case will be built on top of Finest Twin Cities platform, which facilitates collaboration and open innovation via cities' common data models for AI data capturing and processing on urban level. Geographically, it will be hosted at the Jätkäsaari Mobility Living Lab.

LLT3 (Smart Agriculture IoT Living Lab) This use case is expected to demonstrate significant benefits arising from exploitation of IoT, AI, edge computing, digital twins and DLTs' technologies in enhancing the efficiency of irrigation, spraying and harvesting processes. The crop diseases prediction and sensor aided crop harvesting use cases will be hosted at a commercial orchard in the region of Peloponnese, Greece.

LLT4 (Industry 4.0 Use Cases & Living Lab #1) The first Industry 4.0 Living lab will validate the IoT-NGIN framework against ensuring safe operation of Automated Guided Vehicles towards worker safety in a self-aware indoor factory environment. Moreover, Augmented Reality assisted guidance in the assembly and subassembly processes will be experimented in this trial. These use cases will be implemented at BOSCH's facilities in Barcelona.

LLT5 (Industry 4.0 Living Lab #2) The second Industry 4.0 Living lab aims to monitor sub-assembly location and movement, and to optimize production workflow. Also, the trial will test and validate the use of AR technology to support employees' training in the assembly process. The trial will be implemented in ABB facilities in Pitäjänmäki, Helsinki.

LLT6 (Smart Energy Grid Active Monitoring/Control Living Lab) This use case is expected to implement a smart energy pilot implemented by ASM, the Terni municipal electricity and gas distribution network operator, and EMOT in Terni (Italy). The trial will demonstrate a) the capability of smart grid asset performance management and b) creating human-centred smart micro-contracts and micro-payments in a fully distributed energy marketplace.

LLT7 (IoT-NGIN Technology and Living Labs Federation) IoT-NGIN pilots will be federated to enable cross-IoT-NGIN services deployment. This federation will be further extended via new partners joining IoT-NGIN via Open Calls. Several technologies developed by IoT-NGIN will be the enablers for the federation.