A European Research Project

FRACTAL

Cognitive Fractal and Secure EDGE based on an unique Open-Safe-Reliable-Low Power Hardware Platform Node

ADRESSING THE CHALLENGE

The amount of data generated by digital devices is escalating day by day. As the proliferation of IoT devices advances, the cloud speed capabilities and energy demands are not optimal for the complex dynamic environments. Edge Computing can move this computational load towards the edge of the network. The computation will happen on the hardware nodes through which network traffic goes. This includes routers, switches, gateways and base stations or the so-called “edge nodes”. However, secure and scalable edge computing is still a concept under development. The aim of the project is to turn it into reality with the FRACTAL edge node.

STRAGETIC OBJECTIVES

1. To design and implement an open-safe-reliable hardware platform.
2. To guarantee extra-functional properties of FRACTAL edge nodes.
3. To evaluate and validate data analytics with AI.
4. To integrate fractal communication and remote management features into the FRACTAL nodes.

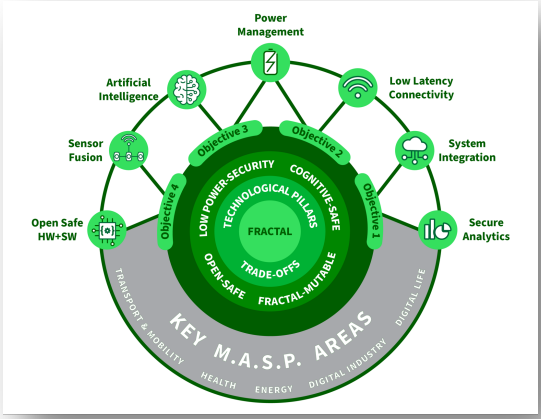
TECHNOLOGY PILLARS

The project objectives are held under four technology pillars. The node should have open-safe-reliable and low power architecture. While being low power, it should be secure and have high performance capabilities. It should be autonomous due to its cognitivity, but also safe. The node’s communication and storage capabilities should be both mutable and fractal, to allow scalability.

PROJECT IMPACT & ACHIEVEMENTS

Developed during the project, FRACTAL system high-level architecture consists of three layers:

- **A node layer** that refers to the element that provides certain low-level characteristics such as AI Accelerators or computing power.
- Over the node layer, **a service orchestration layer** is built that enables to manage the services that run over the node.
- The **application layer** describes the business logic for the different applications / use case.



Visual representation of FRACTAL’s four main objectives and technology pillars. The project specifications follow the multiple focus areas of the Multi-Annual Strategic Plan (“M.A.S.P.”).

EU2020 Horizon **Project N.877056**

ECSEL Joint Undertaking
Electronic Components and Systems for European Leadership

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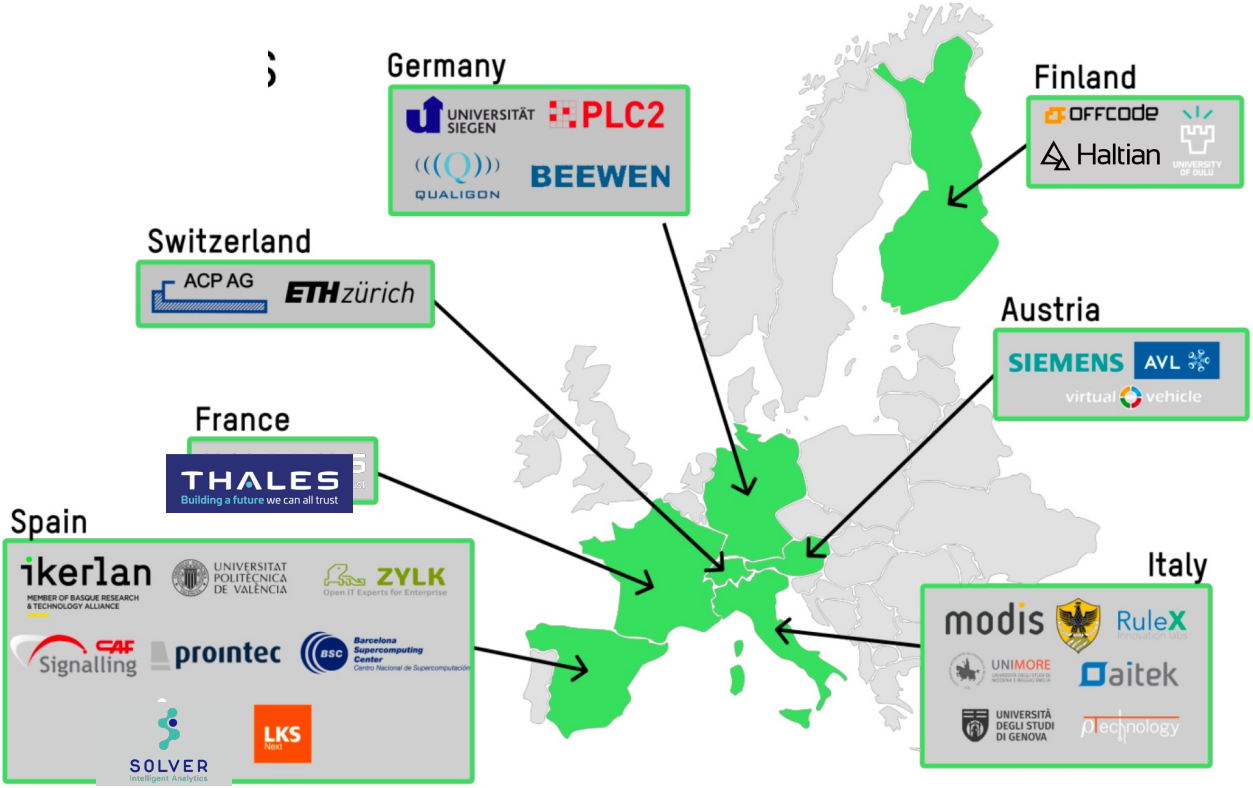
PROJECT EXCELLENCE

FRACTAL brings together knowledge, expertise and innovation potential of major European actors. Among them are leaders in edge computing and other key application areas of the project. The project consortium consists of 28 organizations from 7 countries. Industrial partners (64%) bring technical expertise and commercial exploitation prospects of the project results. While the knowledge providers (36%), such as universities, ensure the excellence of the project.

PROJECT COORDINATION

The consortium is led by IKERLAN, who is also a project coordinator. IKERLAN is a RTO with extensive experience in management of large EU projects and acknowledged expertise in integrating complex systems. IKERLAN has a proven track record of managing large scale research and commercial projects.



Project consortium on the map.

Project start September 2020	**Project coordinator** Ikerlan Scoop	**Project website** www.fractal-project.eu
Project end August 2023	**Project leader** Dr. Aizea Lojo	**Project email** fractal_coordinator@ikerlan.es