[AIOTI Days 2024] – 24/09/2024

A **Cognitive** Serverless Framework for the **Cloud-Edge Continuum**

Aritz Brosa

Edge computing Engineer

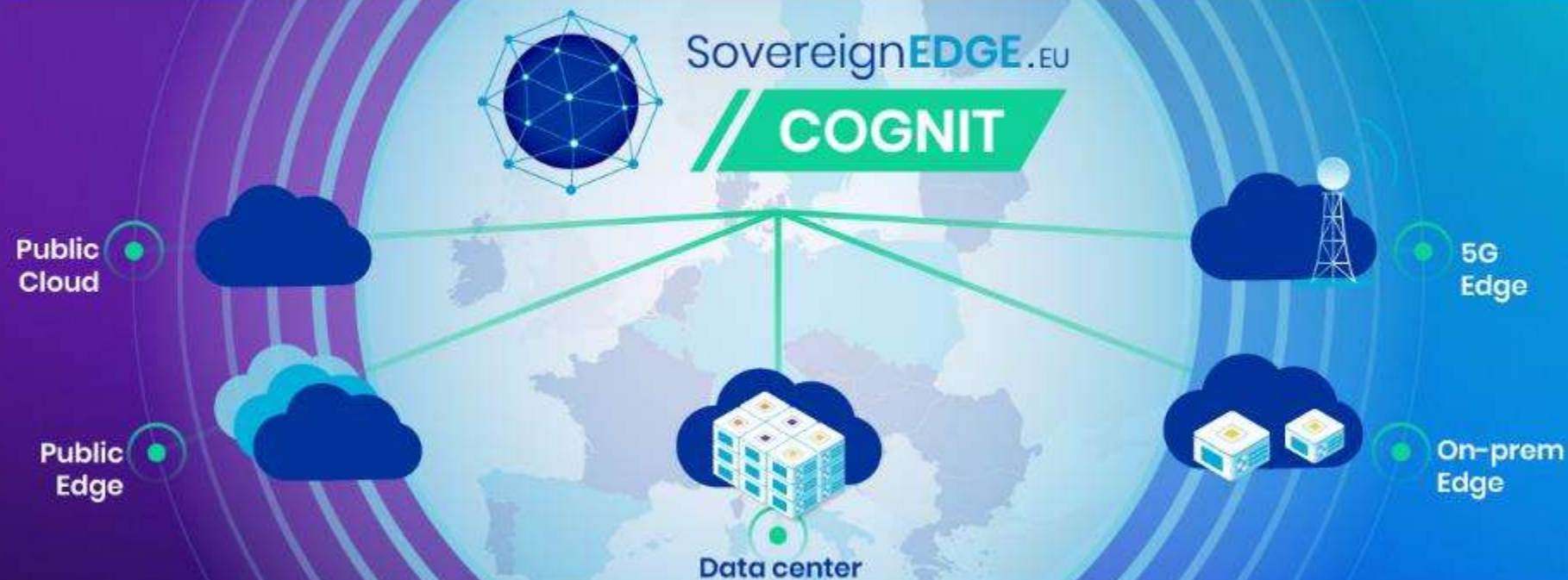ikerlan

MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE
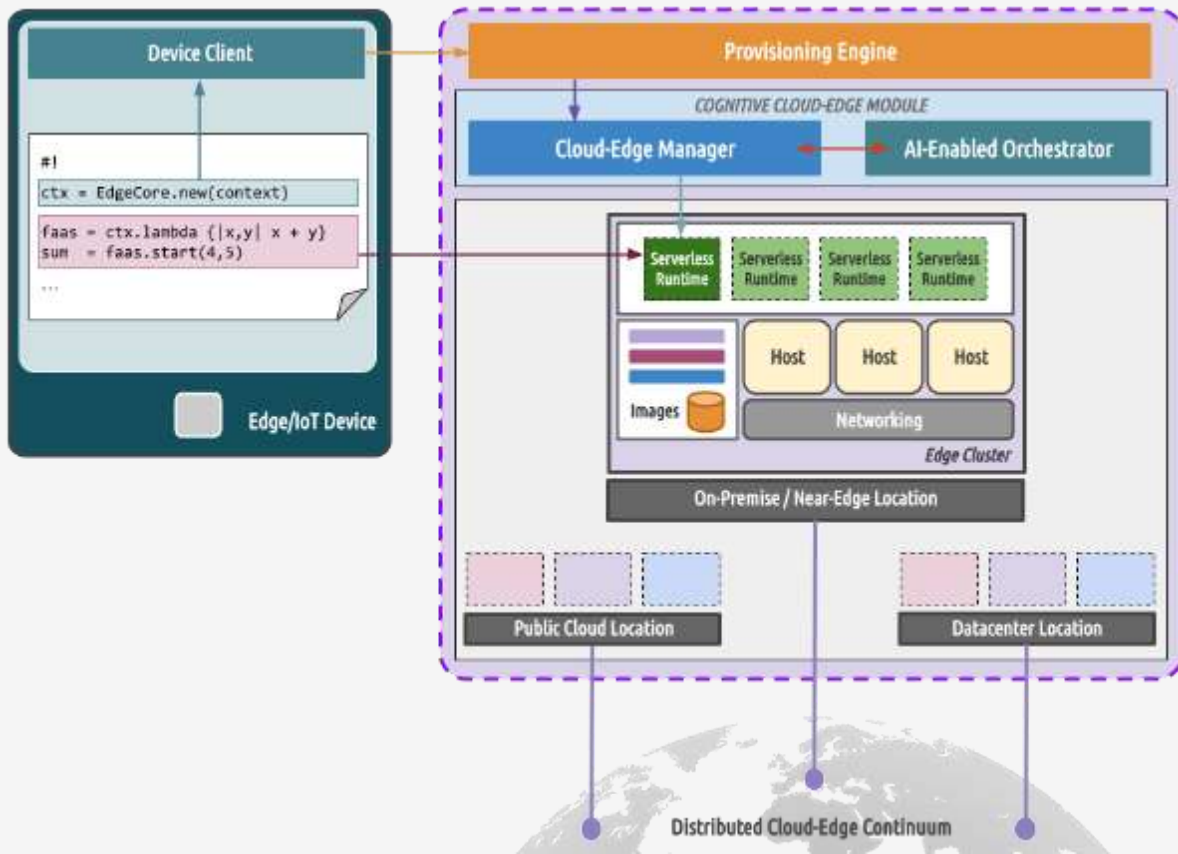
COGNIT Project (2023-2025)

AI-enabled Adaptive Serverless Framework for the Cognitive Cloud-Edge Continuum
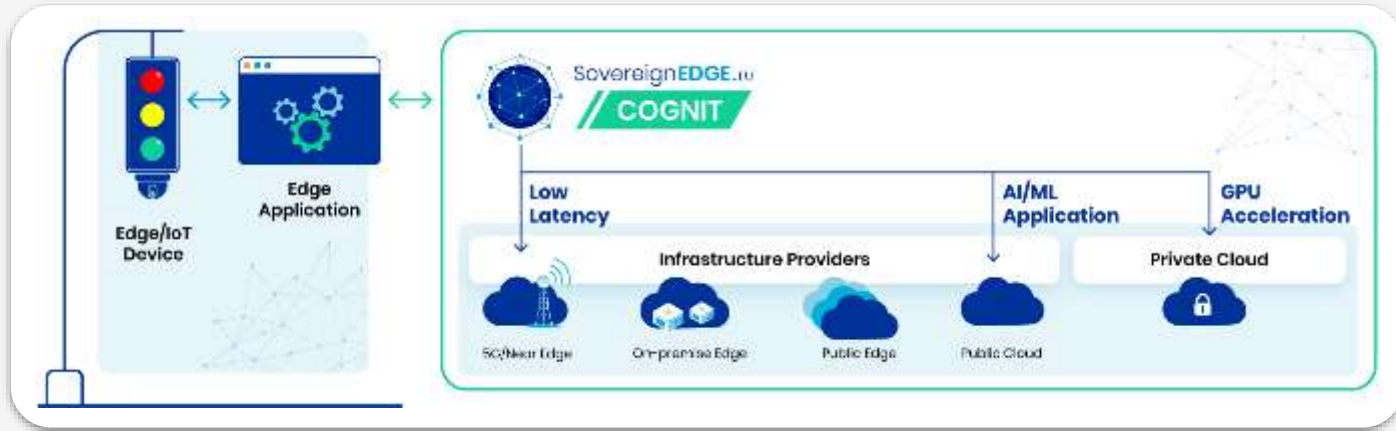
*PROVIDING EDGE DEVELOPERS WITH A SMART PLATFORM TO EASILY **MANAGE, AUTOMATE,** AND **OPTIMIZE** THE DEPLOYMENT OF **CONTINUUM-NATIVE APPLICATIONS***

COGNIT Architecture

Device Client

```
#!
ctx = EdgeCore.new(context)
faas = ctx.lambda {|x,y| x + y}
sum  = faas.start(4,5)
...
```

Edge/IoT Device

Provisioning Engine

COGNITIVE CLOUD-EDGE MODULE

Cloud-Edge Manager

AI-Enabled Orchestrator

Serverless Runtime | Serverless Runtime | Serverless Runtime | Serverless Runtime

Images

Host | Host | Host

Networking

Edge Cluster

On-Premise / Near-Edge Location

Public Cloud Location

Datacenter Location

Distributed Cloud-Edge Continuum

COGNIT Project Use Cases

Joan Iglesias

Kaja Swat

Nikolaos Matskanis

1 Smart Cities
Coordinated by ACISA

2 Wildfire Detection
Coordinated by Nature 4.0

3 Energy
Coordinated by Phoenix Systems & Atende Industries

4 Cybersecurity
Coordinated by CETIC and SUSE

UC3: Phoenix Systems

Speaker: Kaja Swat

The main goal is to turn electricity meter into **Energy Assistant**. It should manage energetically important appliances in accordance to user preferences to **balance energy production and consumption**.

To achieve that there is a need for the meter to be powered by AI capabilities. It allows for developing solution which is highly flexible, that could react to dynamic needs of end-user.

User Apps

Photovoltaic

Heating system

Energy Storage

EV charger
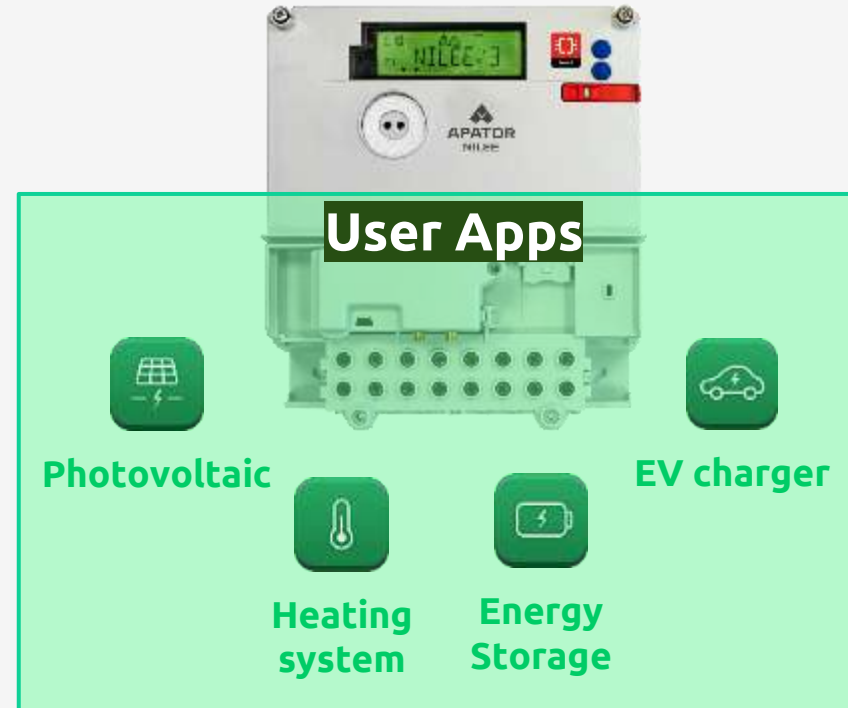
# UC4: Smart Mobility - Anomaly Detection and Remediation

Speaker: Nikolaos Matskanis - CETIC

Scenario :

- Rover Data Collection
- Data Transfer
- Anomaly Detection and remediation
- Migration Management

COGNIT Benefits :

- Continuous Data Collection
- Peripheral processing for near-instantaneous detection of anomalies
- Secure transmission to the cloud for in-depth analysis
- Dynamic migration of execution environments
- Acceptable response latency
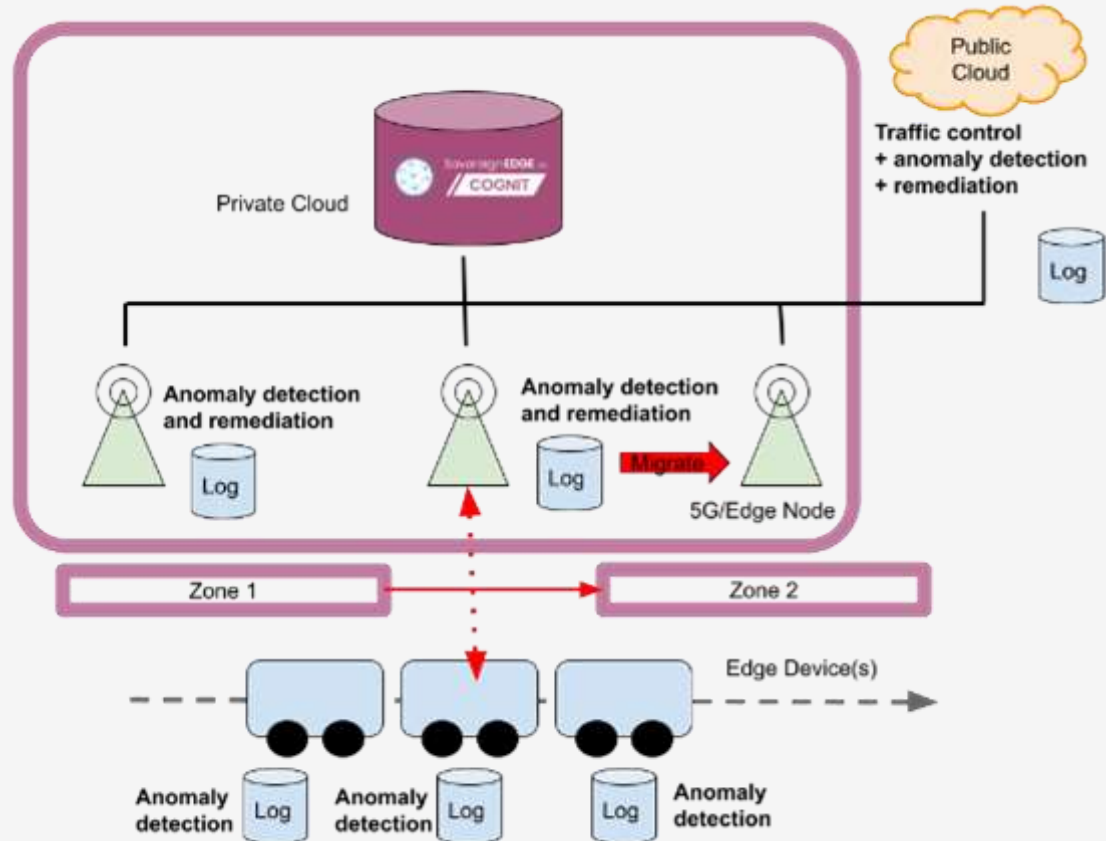
Questions Discussion Panel

Subtitle **Subtitle**

Question #1

- How critical do you think enabling Cognitive Cloud would be for applications running in varied environments (e.g.: mobile phone, microcontroller based platform, Linux based Edge node, with regular OS, with RTOS, without any OS)?

Question #2

- From a Cognitive Cloud user point of view which are the latency related considerations?

Question #3

- Which are the top three most impactful cybersecurity threats nowadays in a multi provider Data Center-Cloud Edge Continuum environment?

Questions Discussion Panel

Subtitle **Subtitle**

Question #4

- Which are the main challenges in a Cognitive Cloud nowadays in terms of scalability of solutions, from a user standpoint?

Question #5

- Which are the top three most impactful cybersecurity threats nowadays in a multi provider Data Center-Cloud Edge Continuum environment?

Question #6

- How do you foresee data management will evolve in the coming years for a Cognitive Cloud solution, from privacy point of view?

Questions Discussion Panel

Subtitle **Subtitle**

Question #7

- What Cognitive Cloud brings to the Edge-IoT devices?

Question #8

- How useful could it be for a user being able to combine data generated in a device as well as data from third party sources, as a data-fusion like solution?

Keywords Discussion Panel

Subtitle **Subtitle**

Keywords to foster further discussion on:

#Data sovereignty

#On premises vs. public cloud-like solutions

#Confidential computing

COGNIT Summary

More Information & Get Involved

Project Homepage

Github

COGNIT Architecture (next phase)