



EUCloudEdgeIoT.eu

META-OS CLUSTER

IGNACIO LACALLE (UPV), aerOS COORDINATION TEAM
GOLBOO POURABDOLLAHIAN (IDC), UNLOCK-CEI COORDINATOR

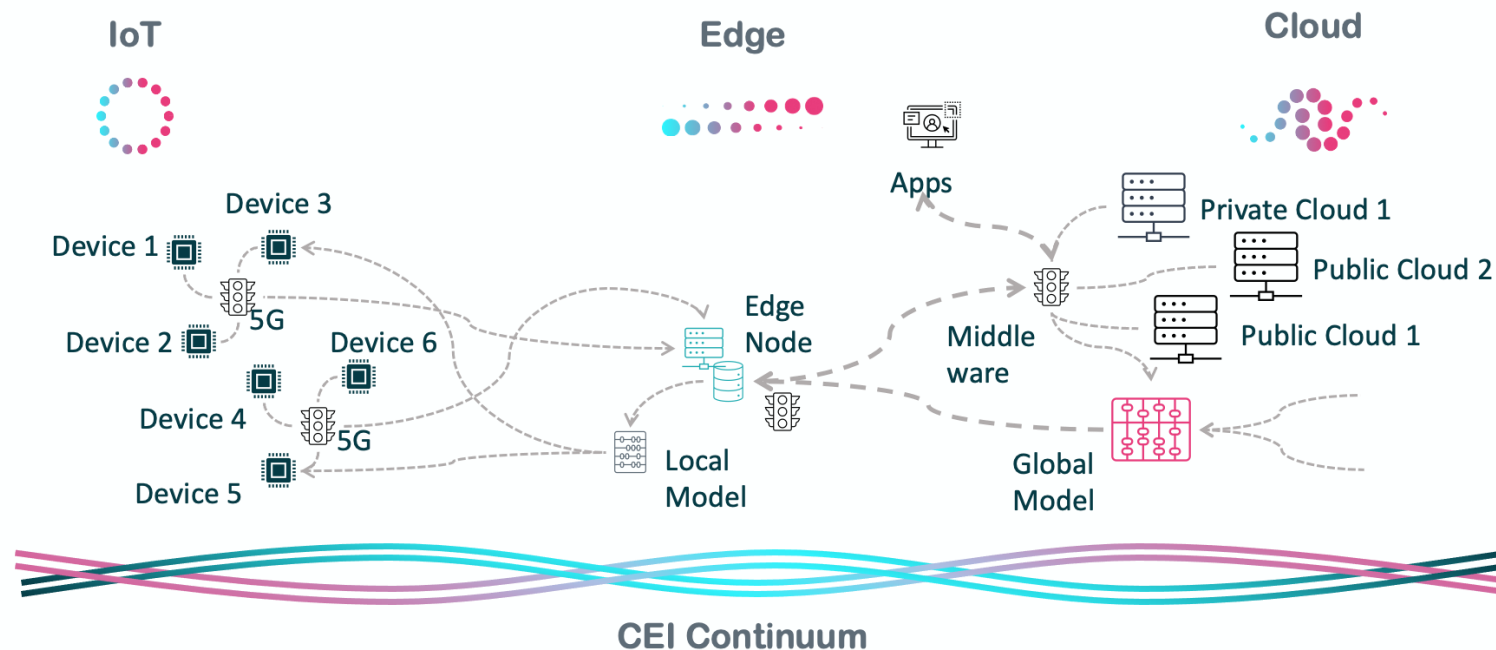
5 September 2024

CLOUD-EDGE-IOT CONTINUUM OVERVIEW



Technological Scope

- Creation of the CEI paradigm as a result of the convergence across the whole digital spectrum driven by the advancement in technologies
- Changing landscape due to the development within the Edge Computing ecosystem, increase in intelligent devices, processing needs and data produced



Source: UNLOCK-CEI D4.1, Technology scoping paper

EU-CEI COMMUNITY



Cloud Computing

Next Generation IoT

META-Operating Systems

Cognitive Cloud

Swarm Intelligence

Open Source for Cloud Services

Software Technologies

& More

Initiatives

META-OS CLUSTER OVERVIEW



6

Research & Innovation Actions

Initiatives

60

Million Euros Investment

123

Participants

Sectors targeted by RIAs



Agriculture



Manufacturing



Energy and Utilities



Healthcare



Transportation and Logistics



Environment



Smart City



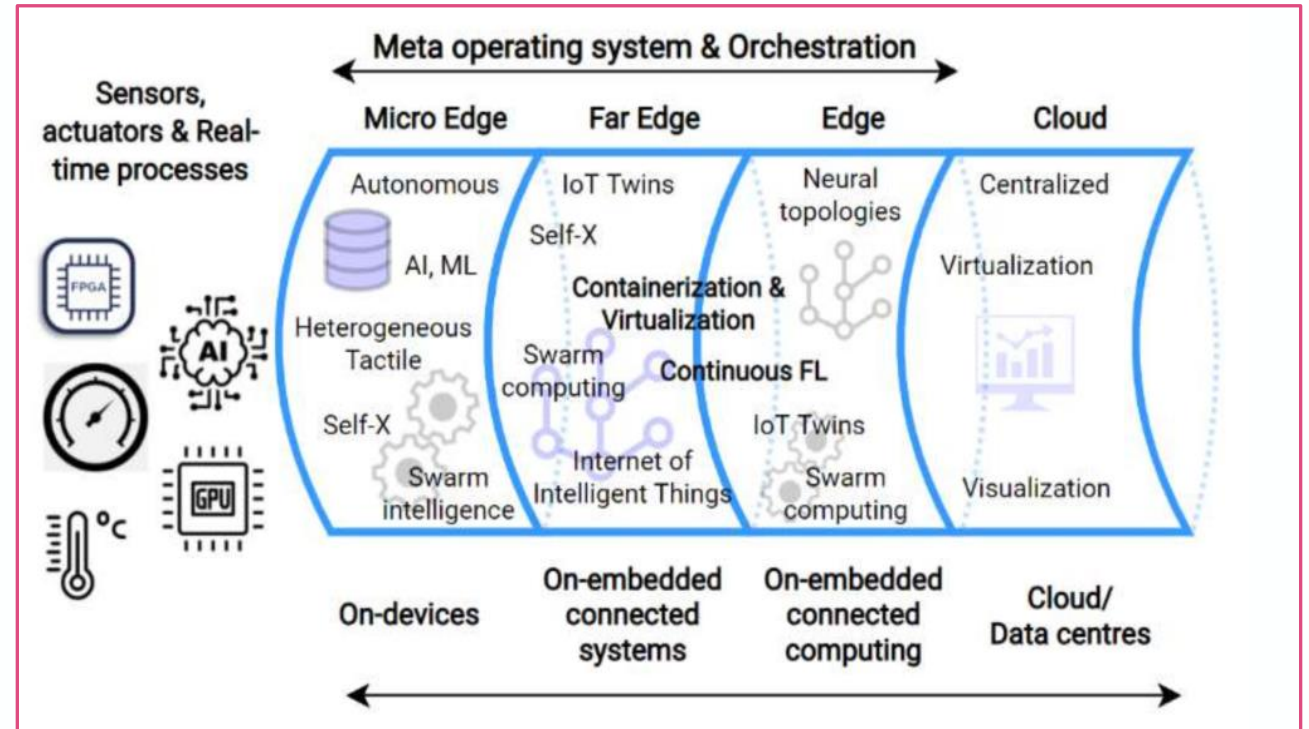
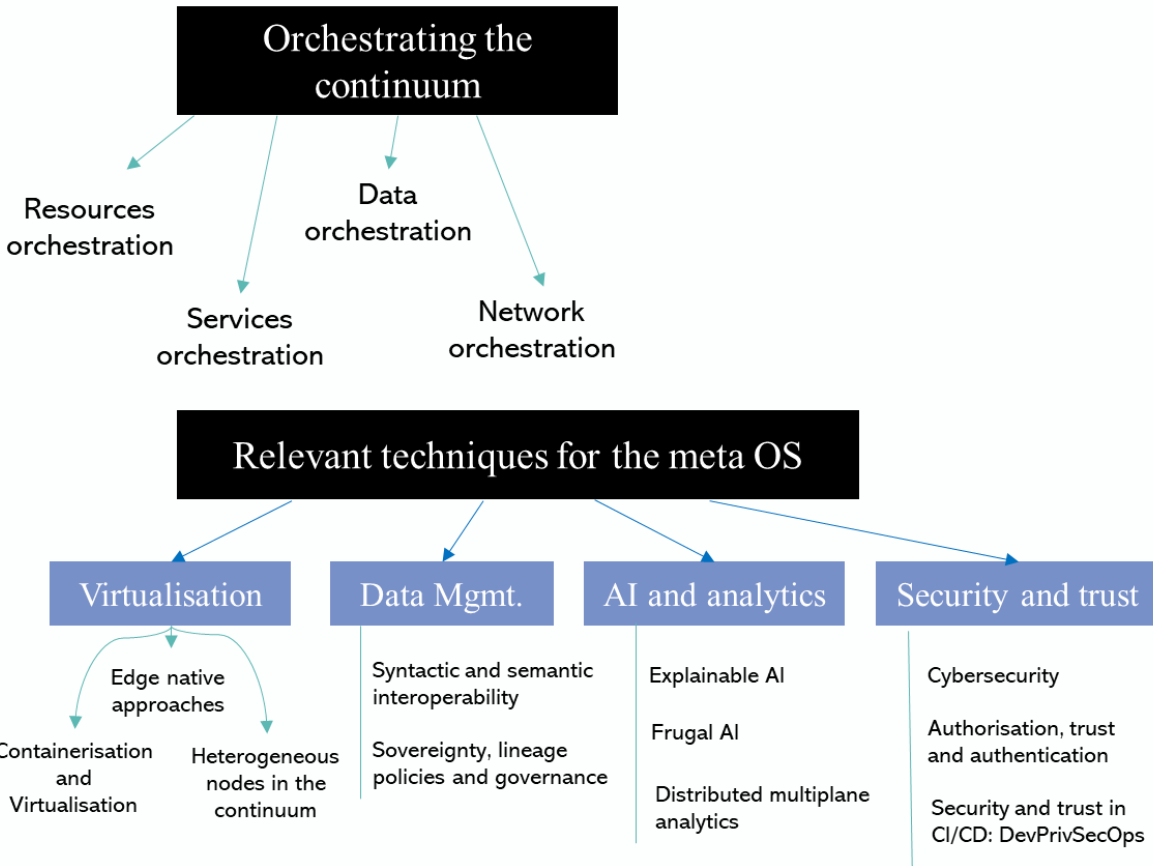
Tech & Entertainment



Check MetaOS Cluster Booklet
<https://zenodo.org/records/7941594>

Check MetaOS use-case Catalogue
<https://zenodo.org/records/10390848>

WHAT META-OS PROJECTS COVER



This is a swarm that is viewed as a single, unique endpoint for the user (replicating an OS perspective)

SYNERGIES WITH SWARM CLUSTER



- **Decentralization and Distributed Management:** Leveraging swarm computing's decentralized nature to **enhance the management and orchestration of distributed resources and** optimizing tasks like load balancing.
- **Dynamic Resource Allocation:** Swarm-based algorithms and Meta operating systems can be integrated to **improve real-time resource allocation**, enabling the system to adapt quickly and efficiently to changing conditions without the need for centralized control.
- **Scalability and Flexibility:** Swarm computing and MetaOS can synergically contribute to **manage large-scale, distributed environments more effectively and flexibly**. Swarm principles can guide how resources are discovered, utilized, and scaled across the MetaOS.
- **Robustness and Fault Tolerance:** ensuring that even with multiple node failures, the **system can still operate effectively** through the collective behavior of remaining nodes.
- **Optimisation and efficiency:** Enabling distributed decision-making, **enhancing the optimization of resource allocation, task scheduling, and energy efficiency** across the system.

Lessons that we can handoff

- Relying on open source components – (Customized developments and integrations)
- Impact-oriented use cases, respecting
 - As lightweight as possible (Avoiding heavy packages as we want to support the CloudEdgeIoT)
 - **Decentralization** is at the heart of every outcome!
 - Compatibility, observing underlying diversity in:
 - Container management frameworks
 - Processing architecture (x86, arm64, arm32...)
 - Data formats (semantic annotation on-the-fly, etc.)

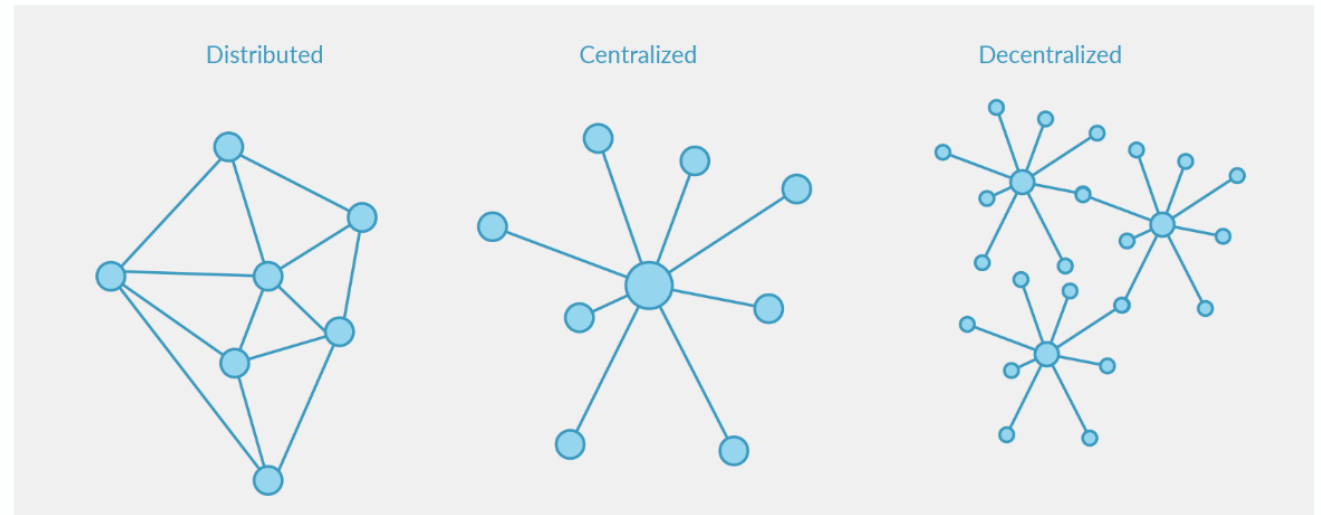
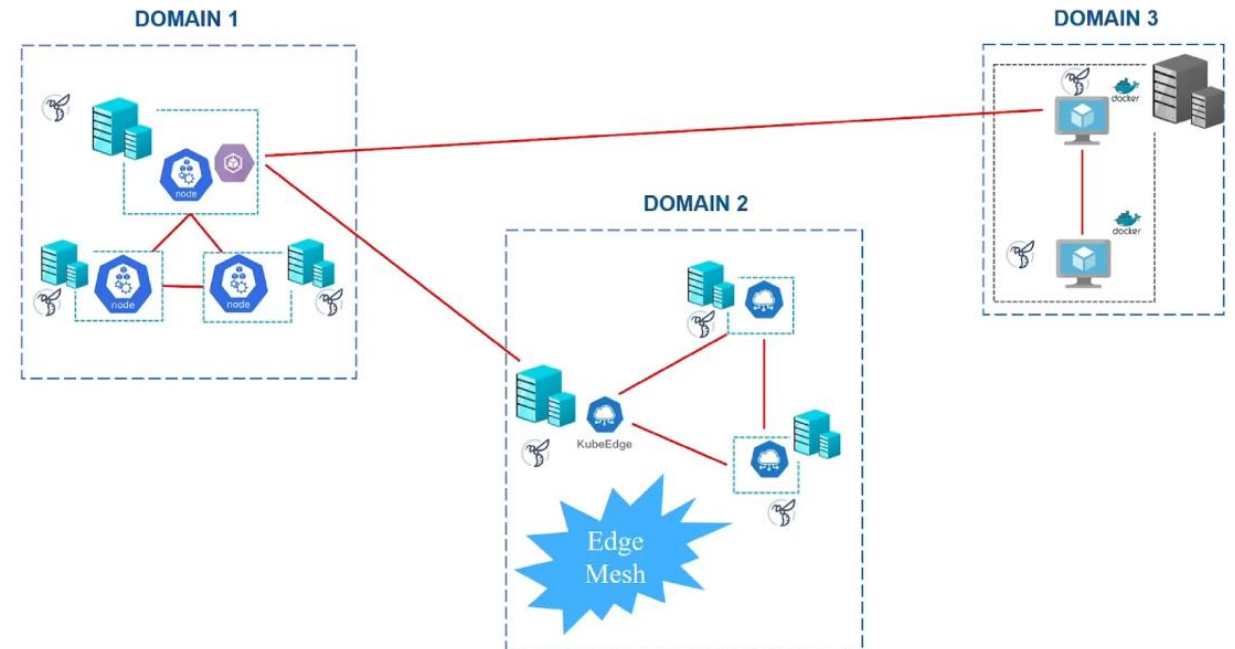


Image source: <https://www.plesk.com/blog/product-technology/hidden-blockchain-opportunities-3-decentralized-cloud-storage/>





EU**CloudEdgeIoT**.eu

THANK YOU!

For any questions or comments:

Ignacio Lacalle: iglaub@upv.es

José Enrique Álvarez: jealvarez@bluspecs.com

Zuzana Kušíková: zkusikova@bluspecs.com



EUCloudEdgeIoT.eu is supported by the Open Continuum and Unlock CEI and both received funding from the European Union's Horizon Europe Research and Innovation Programme under the Grant Agreement numbers 101070030 and 101070571.