CODECO

Cognitive Decentralised
Edge Cloud Orchestration

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PROJECT INFORMATION

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CODECO Website

CODECO Eclipse Research Lab

OVERVIEW

CODECO aims at assisting in supporting the Edge-Cloud continuum via the development of a **cognitive, decentralised Edge-Cloud framework**.

Main Challenges

- 5G/6G smart services, Dense environments
- Mobility, High portability
- Far Edge to Cloud

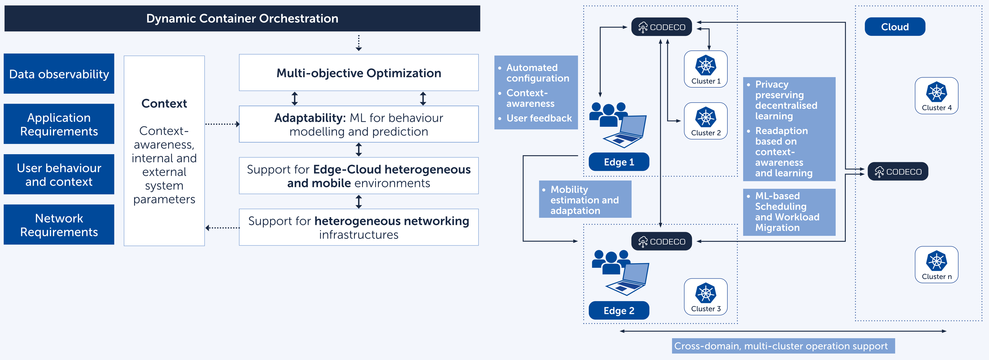
Vision

Highly adaptive Edge-Cloud management framework (TRL4-5) that integrates a unique, smart, and cross-layer orchestration between the **decentralised data flow**, **computation**, and **networking services**

OBJECTIVES

Simplification & Automation	**O1:** Reduce Edge-Cloud Setup and Management Time
Data-compute-network Orchestration	**O2:** Optimize Edge-Cloud Operation via a privacy-preserving data-compute-network orchestration
Security & Privacy Preservation	**O3:** Provide automated, privacy preserving secure management for multi-clusters
Openness & Greenness	**O4:** Support multi-domain Edge Cloud operations integrating openness and greenness
Broad Impact	**O5:** Build a consolidated ecosystem appealing to the different CODECO stakeholder groups

CONCEPT



KERs (Key Exploitable results)

- **A1** **Open, cognitive toolkits and smart Apps**, integrating the elastic and advanced concepts to manage, in a smart and flexible way, containerized applications across Edge and Cloud (dynamic-cluster and multi-cluster environment).
- **A2** **A developer-oriented Eclipse open-source software repository**, to be available in an early stage of the project, thus allowing for early exploitation of initial, advanced results and a better adaptation throughout the project lifetime.
- **A3** **Training tools and events**, to support the development of services based on the CODECO framework.
- **A4** **6 Use-cases across 4 domains (Smart Cities, Energy, Manufacturing, Smart Buildings)**, to be deployed in operational environments.
- **A5** **Open Calls and multiple community events**, based on the different use-cases and including different CODECO stakeholders.
- **A6** **CODECO framework integration into the large-scale EdgeNet** experimental infrastructure, to assist in the building of experimentation and novel concepts by the research community.

USE CASES

P1 Smart Monitoring of the Public Infrastructure (Smart Cities)
- Goal: Smart monitoring of e.g., road status, traffic congestion
- Value-proposition: Improved Quality of Experience of the citizen

P2 Vehicular Digital Twin for Safe Urban Mobility (Mobility)
- Goal: vehicular digital twin for safe urban mobility
- Value-proposition: Increased road safety

P3 Media Delivery Streaming across Decentralized Edge Use-case (Smart Cities)
- Goal: Resource-efficient usage via context-aware selection of MDS points
- Value-proposition: Optimized Edge-Cloud and networking for MDS

P4 Collective Demand Side Management in Decentralized Grids (Energy)
- Goal: Smart monitoring of the energy generation, consumption, storing and availability
- Value-proposition: Improved energy management based on Edge computing

P5 Decentralized, Wireless AGV Control for Flexible Factories (Manufacturing)
- Goal: Decentralized ML/AI to assist energy reduction based on network adaptation
- Value-proposition: Increased AGV autonomy and scalability via decentralized wireless control

P6 Smart Buildings (Energy)
- Goals: Smart management of Crownstone meshes and their distributed applications
- Value-proposition: flexible far Edge to Cloud data processing

PARTICIPANTS

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