#HorizonEU

**WORLD LEADING DATA AND COMPUTING TECHNOLOGIES 2023**

**From Cloud to Edge to IoT**
*HORIZON-CL4-2023-DATA-01-04*
Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (RIA)
*HORIZON-CL4-2023-DATA-01-06*
Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (CSA)
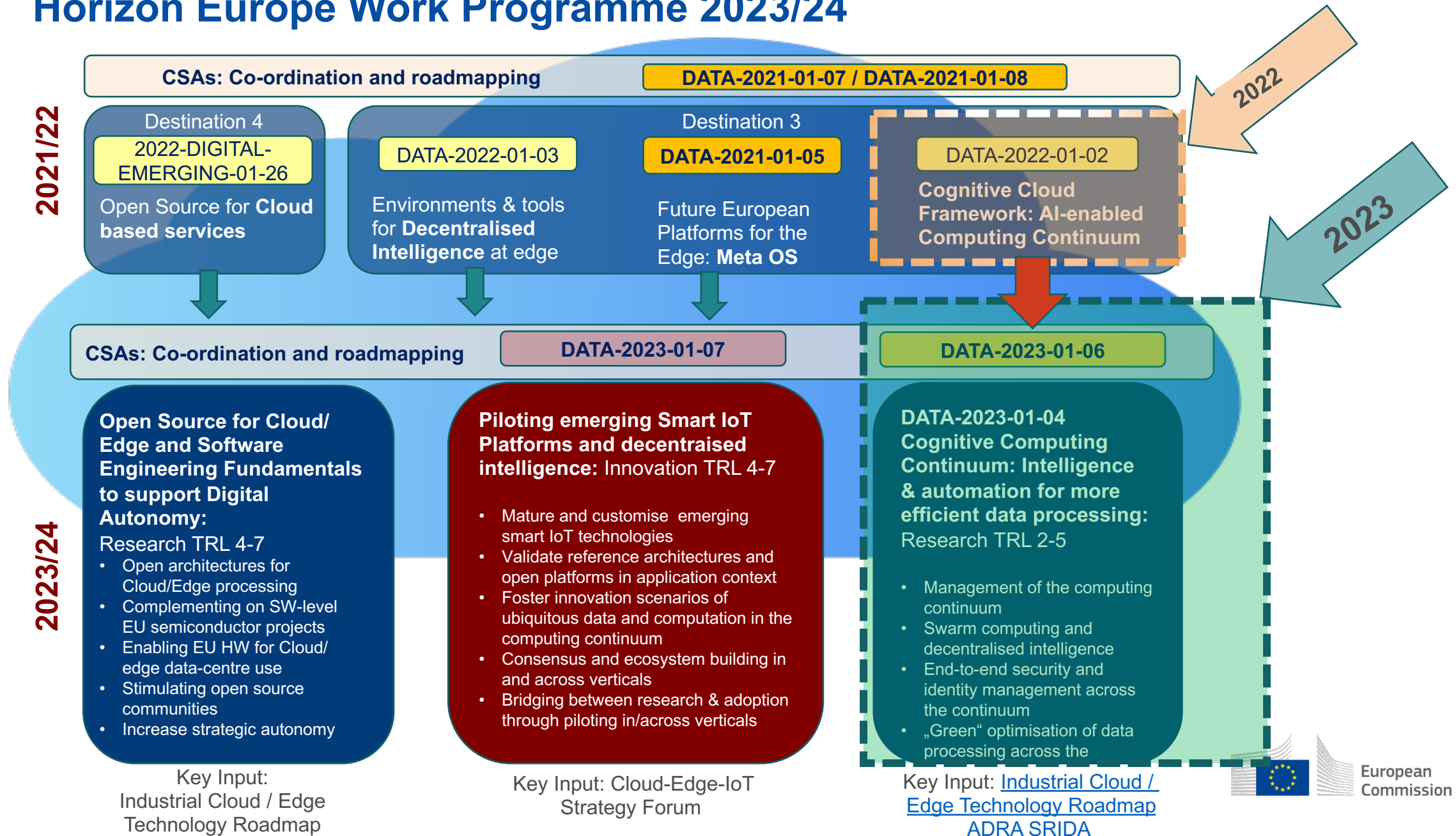
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European Commission

Research and Innovation

# From Cloud to Edge to IoT for European Data Horizon Europe Work Programme 2023/24

# Cognitive Cloud project portfolio

## HORIZON-CL4-2022-DATA-01-02 Cognitive Cloud Framework: AI-enabled Computing Continuum

DATA-2022-01-02

**Cognitive Cloud Framework: AI-enabled Computing Continuum**

- CloudSkin
- COGNIFOG
- CODECO
- DECICE
- MLSysOps
- EDGELESS
- AC3
- ACES
- SovereignEdge.Cognit

**9 RIA projects started in January 2023**

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**From Cloud to Edge to IoT for European Data –**
**HORIZON-CL4-2023-DATA-01-04: Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (RIA)**
**28 Million EUR (LUMP SUM)**
**TRL2-5, 4-6 mil. EUR per project**

**Scope:**

➢ **AI-enabled Management of the whole computing continuum** enabled by Swarm computing and decentralized intelligence. This will allow services and data to be seamlessly processed across various providers, connectivity types and network zones.

➢ **Novel automated management tools, programming models, learning and decision-making methods, and approaches** able to cope with end-to-end security and identity management, resources heterogeneity, extreme scale and fault-tolerance together with elasticity to flexibly allocate resources and tasks.

➢ **Intelligent compute, data and code orchestration mechanisms** to allow efficient value extraction from the huge volumes of generated data while supporting resource dynamicity and scalability across the compute continuum.

➢ **Optimization of energy efficiency** and ecological sustainability taking into account end-to- end data processing across the continuum.

# From Cloud to Edge to IoT for European Data - HORIZON-CL4-2023-DATA-01-04: Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (RIA)

### 28 Million EUR (LUMP SUM)
### TRL2-5, 4-6 mil. EUR per project

## Expected Outcome:

➢ **Enhanced openness and strategic autonomy in the evolving data and AI economies across the computing continuum** including adapted system integration at the edge and at device level, validation of key sectors and nurturing European value chains to accelerate and steer the digital and green transitions.

➢ **Paving the way to strategic industrial cooperation in data processing** required to support future hyper-distributed applications by **building open platforms, underpinning an emerging industrial open edge ecosystem** critical to establishing a mature European supply chain.

➢ **Establishment of adaptive hybrid computing, cognitive clouds and edge intelligence** beyond today's investments on data infrastructure.

➢ **Better international collaboration with trusted partner regions**, guaranteeing a minimum level of interoperability, portability thereby fostering competition in the Cloud/Edge services market for the European cloud/edge and software industry and facilitate European access to foreign markets.

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# From Cloud to Edge to IoT for European Data - HORIZON-CL4-2023-DATA-01-04: Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (RIA)

### 28 Million EUR(LUMP SUM)
### TRL2-5, 4-6 mil. EUR per project

## Other Important aspects:

RIAs:

- **For security and identity management**, proposals are expected to apply state-of-the-art technologies, develop synergies and relate to activities and outcomes in *Cluster 3 (namely, HORIZON-CL3-2023-CS-01-01: Secure distributed platforms (IoT, Edge, Cloud, Dataspaces) and HORIZON-CL3-2023-CS-01-02: Privacy-preserving and identity technologies*).

- Projects are expected to **develop synergies** and **relate to activities** and outcomes of the Digital Europe Programme (DEP) *(topics 2.1.1, 2.1.2 and 2.1.3*) and any existing or emerging Important Projects of Common European Interest (IPCEI) initiative, IPCEI on Next Generation Cloud Infrastructure and Services.

- Interoperability approaches (based on open standards, interoperability models and open platforms) should be considered where appropriate.

RIAs and CSAs:
- **International cooperation** is encouraged, especially with **Japan and S. Korea**.
  - NO FUNDING by the EU for international entities!
  They need to secure their own funding!

# HORIZON-CL4-2023-DATA-01-04:
# Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (RIA)

**What are we looking for?**

➢ Development of **generic and advanced AI-enabled Cloud/Edge technologies, mechanisms, techniques, etc. covering the whole continuum.**

**Research on cloud/edge technologies! not in AI**

▪ For example: hyper-distributed computing approaches encompassing resources from IoT and far-edge constrained devices, to federated fog/edge computing nodes to central cloud computing centres and hybrid cloud models which exploit Artificial Intelligence techniques

➢ **Beyond State-of-the-art**, **not incremental type of research** →cutting-edge novel approaches, TRL 2-5.

➢ The proposals should **demonstrate the applicability and viability of the proposed technological solutions** across multiple application domains.

**What do we NOT want?**

○ Using existing Cloud/Edge technologies as an enabler for research in other domains (e.g., AI, IoT, BigData, 5G, etc.)

○ Any User Application development using existing Cloud/Edge/AI technologies

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Q & A

# From Cloud to Edge to IoT for European Data - HORIZON-CL4-2023-DATA-01-06:
## Coordination and Support of Cognitive Computing Continuum research and policy (CSA)
### 1 CSA 2 Mill. EUR

## Scope:

- To **support the European Commission** and the European computing constituency by providing to them **annually updated roadmaps for research and innovation.**

- Facilitate **awareness of stakeholders in research and policy matters** related to Cloud-Edge-IoT Computing continuum.

- **Coordinate stakeholders in the Cloud to Edge to IoT Computing Continuum** and act as support to R&D programmes/activities by disseminating project results and organising scientific and policy events, and addressing pre-standardisation initiatives.

- **Collaboration with other relevant initiatives** in the field, such as those related to the Important Project of Common European Interest on Cloud Infrastructure and Services (IPCEI CIS) and the European Alliance for Industrial Data, Edge and Cloud.

## Expected Outcome:

- **Support structure for the European Computing ecosystem**: networking events and vision workshops for the academic and industrial computing community.

- **Yearly updated roadmaps on the computing continuum** addressing the area from a broad perspective from edge device to edge cloud to cloud to HPC, from scientific to industrial to societal and research applications, and addressing all relevant aspects such as real-time, security, etc. Developments should complement the **Industrial Roadmap from the European Alliance for Industrial Data, Edge and Cloud** by offering a long-term research perspective which enables disruptive innovations.

- **Creation of a sustainable European forum** of stakeholders representing the **whole Cloud to Edge to IoT Computing** research, industry and users.

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# HORIZON-CL4-2023-DATA-01-04:
# Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (CSA)

## What are we looking for?

- ➤ **Coordination and Support Action** building on existing HE CSAs (UnlockCEI and OpenContinuum)
  - ➤ Seek for complementarity!
- ➤ Bring together **all stakeholders** in the Cloud-Edge continuum and **produce <u>annually updated</u> research** roadmaps involving on-going research projects, EU initiatives (DEP related projects, Cloud Alliance, AIOTI, NESSI, IPCEI, etc.)
  - ➤ Long-term, Forward looking perspectives!
  - ➤ Mapping research results with technological priorities presented by the various initiatives (e.g., Cloud Alliance, AIOTI, NESSI, etc.)
- ➤ **Scientific and policy related events** that provide input to the research roadmaps and policy and standardization initiatives

## What do we <u>NOT</u> want?

- o Business as usual… generic positions and not focused on the strategic vision of the cloud-edge-iot continuum

- o Static/boring web sites and difficult to find information
  - o CSAs are to be used by community stakeholders and citizens – should be easy to access information

European Commission

# Call opens:  8 December 2022
# Call closes: 29 March 2023

★ **HORIZON-CL4-2023-DATA-01-04:**
**Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (RIA)**

➤ **Technology Readiness:** Level Activities are expected to start at TRL 2 and achieve TRL 5 by the end of the project

| Budget: EUR 28 million (LUMP SUM) | EU contribution per project: EUR 4 – 6 million |
|---|---|

★ **HORIZON-CL4-2023-DATA-01-06:**
**Cognitive Computing Continuum: Intelligence and automation for more efficient data processing (CSA)**

| Budget: EUR 2 million | EU contribution per project: up to 2 million |
|---|---|

**Link to HE WP2023-24:https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-7-digital-industry-and-space_horizon-2023-2024_en.pdf**

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# HORIZON-CL4-2023-DATA-01-04 & 06

**Current Project Portfolio and Future Outlook**

- HE cloud-edge-iot projects https://eucloudedgeiot.eu/

- H2020 Cloud projects https://www.h-cloud.eu/projects/research-innovation/ and Funding and Tenders (F&T) portal: ICT-40 , ICT-15, ICT-16, HE projects on the F&T portal

- Roadmap published by the Alliance on Industrial Data and Cloud

- **White paper on future cloud research** https://www.h-cloud.eu/news/h-cloud-publishes-final-version-of-white-paper-cloud-computing-in-europe/

- Related videos on future research https://www.h-cloud.eu/videos/

- DEP and IPCEI on Next Generation Cloud Infrastructure and Services

- Lump Sum https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/horizon/lump-sum/guidance  and Link to the related training https://ec.europa.eu/research/participants/docs/h2020-funding-guide/other/event221020.htm

European Commission

# Thank you!

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https://eucloudedgeiot.eu/

# # HorizonEU

**http://ec.europa.eu/horizon-europe**
**https://digital-strategy.ec.europa.eu/en/policies/cloud-computing**

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