This Communication is part of a project that has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N°101069732

aerOS
EUROPEAN IOT-EDGE-CLOUD

Enablers and use cases in aerOS

Workshop - A Glimpse of Europe Innovation

May 28th 2024, Helsinki

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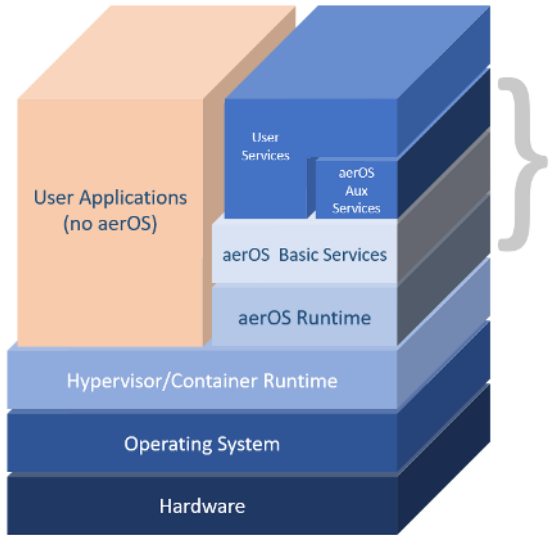
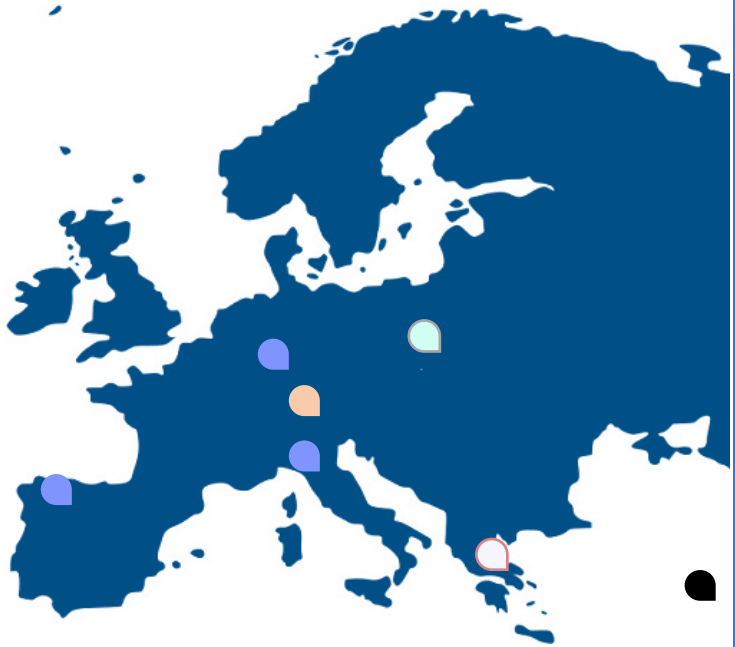
Universitat Politècnica de València (UPV)

GOAL, ARCHITECTURE AND USE CASES



- …using context-awareness to distribute software task (application) execution requests
- …supporting intelligence as close to the events as possible
- …supporting execution of services using "abstract resources" (e.g., virtual machines, containers) connected through a smart network infrastructure
- …allocating and orchestrating abstract resources, responsible for executing service chain(s)
- …supporting scalable data autonomy

aerOS overarching goal is to design and build a virtualised, platform-agnostic **meta operating system for the IoT edge-cloud continuum.** As a solution, to be executed on any Infrastructure Element within the IoT edge-cloud continuum – hence, independent from underlying hardware and operating system(s)



Manufacturing: Data-Driven Cognitive Production Lines (Manufacturing Autonomy Level 4 – MAL4)

Renewable energy: Containerised Edge Computing near Renewable Energy Sources

Machinery: High Performance Computing Platform for Connected and Cooperative Agricultural Mobile Machinery to Enable CO2 Neutral Farming (HPCP-F

Maritime ports: Smart edge services for the Port Continuum

Smart Buildings: Energy Efficient, Health Safe & Sustainable Smart Buildings

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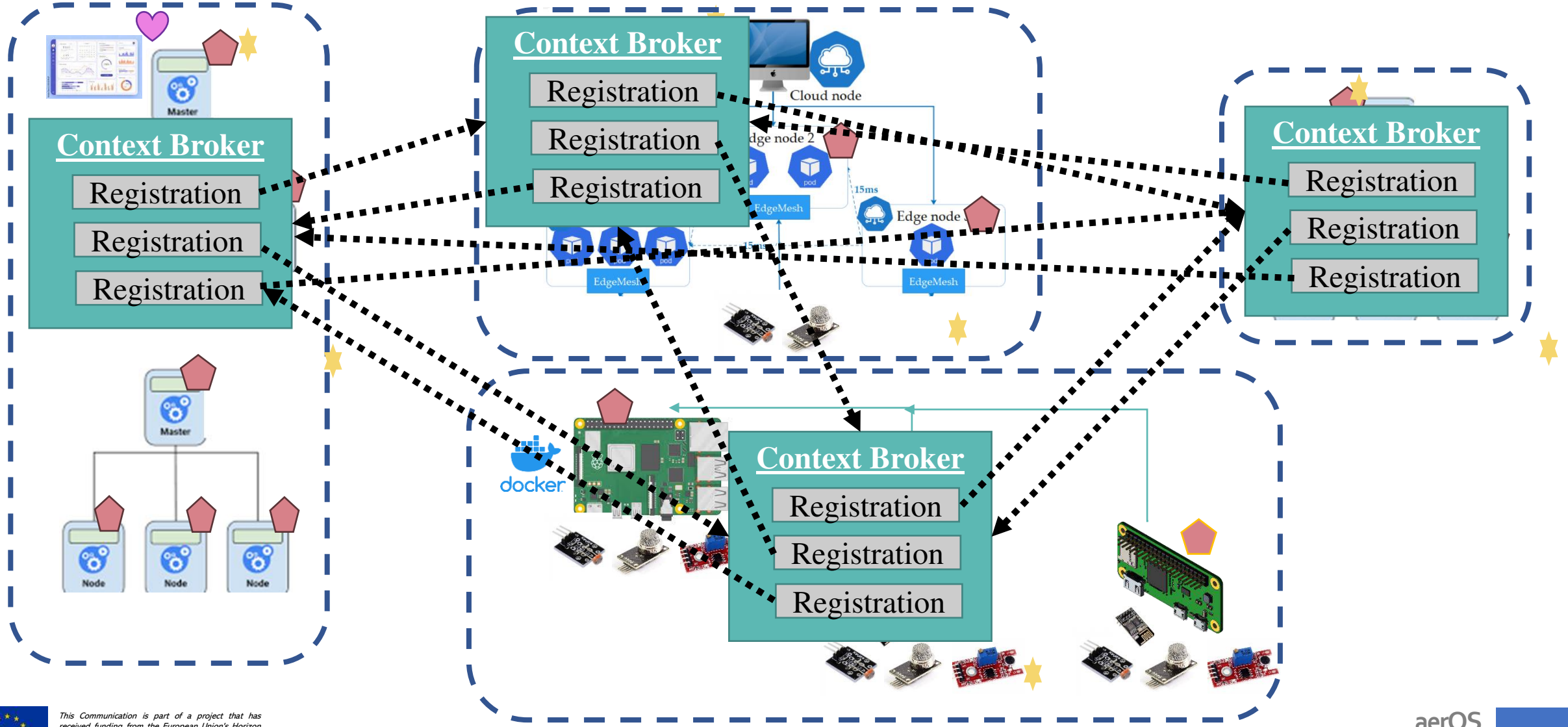
Distributed state repository for domains federation



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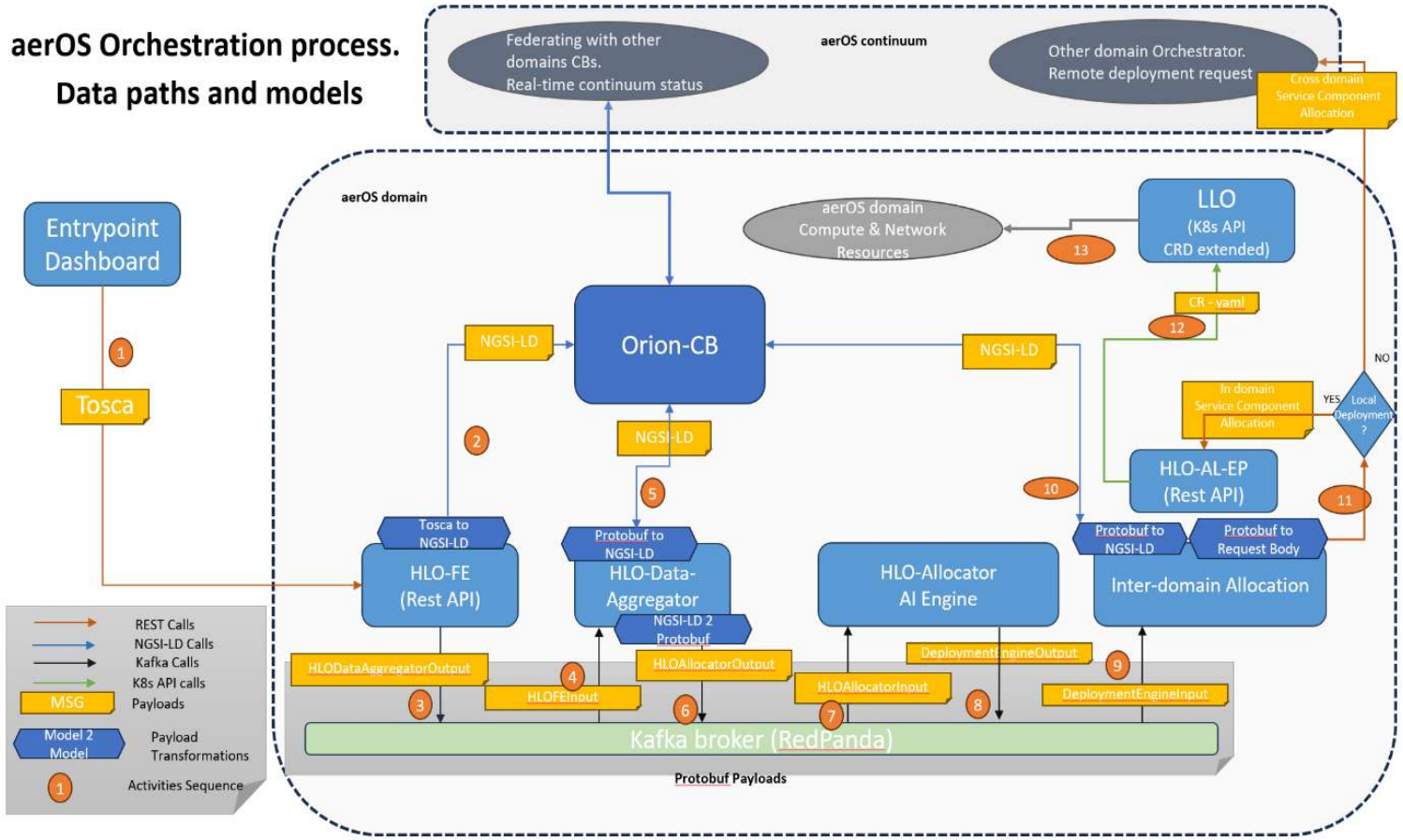
Two-layer service orchestration



- Homogeneous description of services
  - Custom TOSCA model
- Indication of SLA and requirements via user-friendly portal (UI)
- Supports heterogeneous container management frameworks for workload deployment:
  - K8s, Docker, containerd
- Lightweight messaging
  - Redpanda
- Decentralization BOTH in **decision** and in **deployment**

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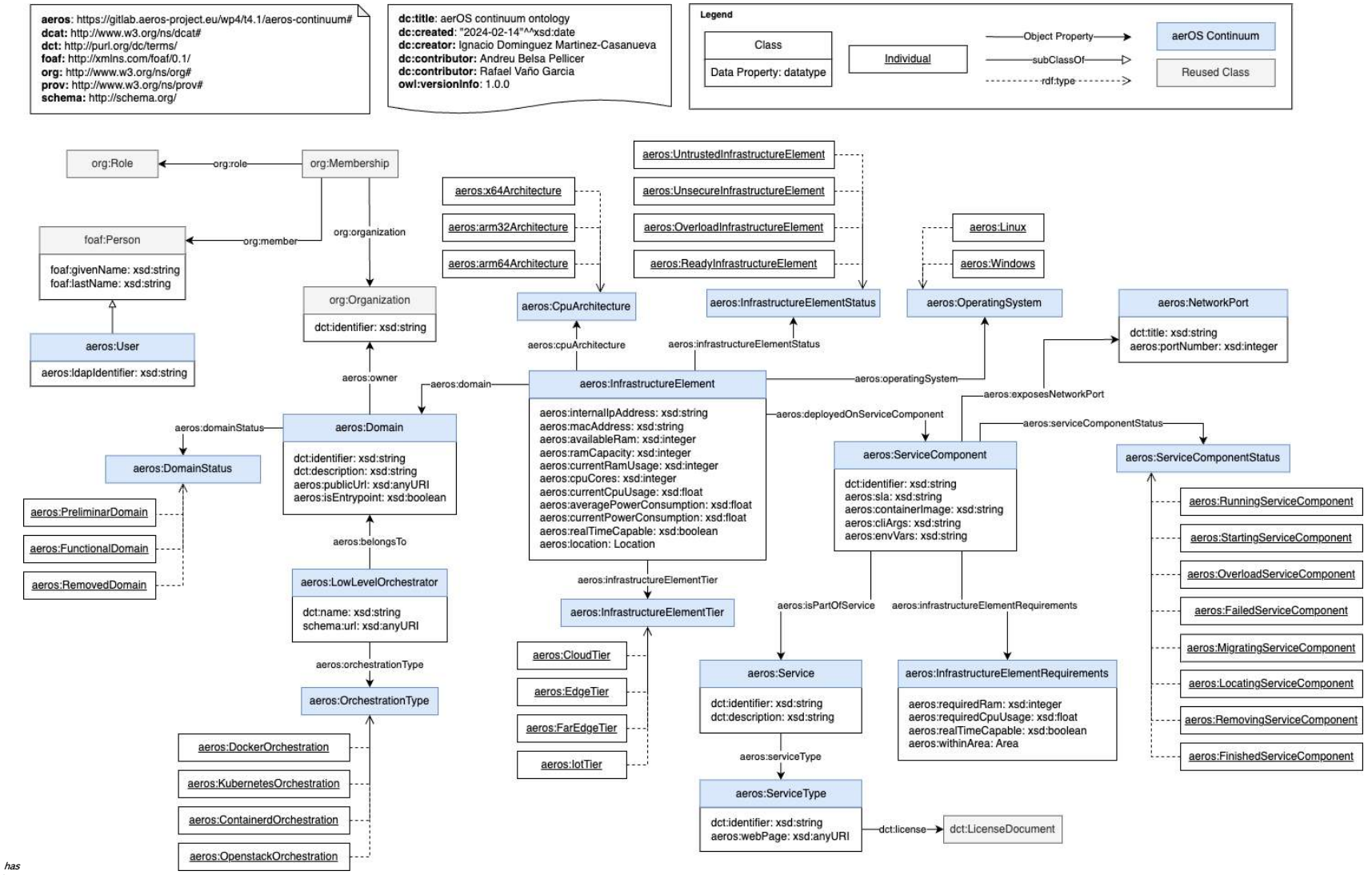
aerOS ontology for IoT-Edge-Cloud continuum



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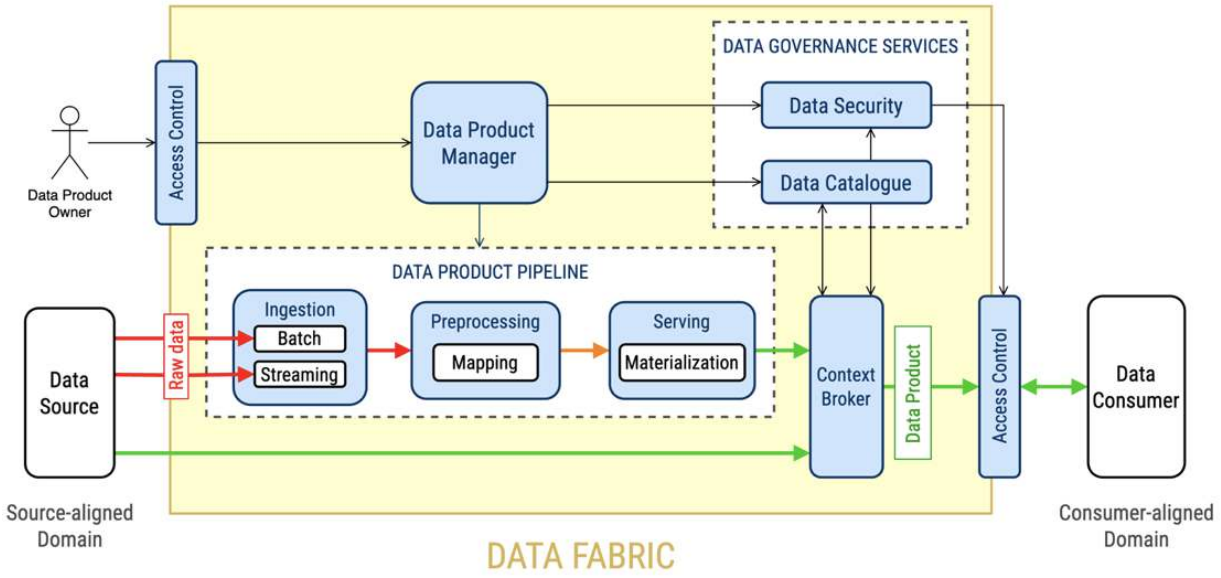
Data Fabric & supporting technologies



- Data products → Batch data sources enabled. Several extensions to Morph-KGC tool
- Data security → Validated basic role-based authentication and authorization using Keycloak + OpenLDAP
- Data catalog → aerOS user metadata (from LDAP) integrated in the knowledge graph

Key open source technologies leveraged:

KubeEdge, cilium, HELM, krakenD, OPENAPI, KEYCLOAK, NGSI LD, orion, morph, Redpanda, Zenoh, IOTA

PowerTOP, DCAT, Kopf

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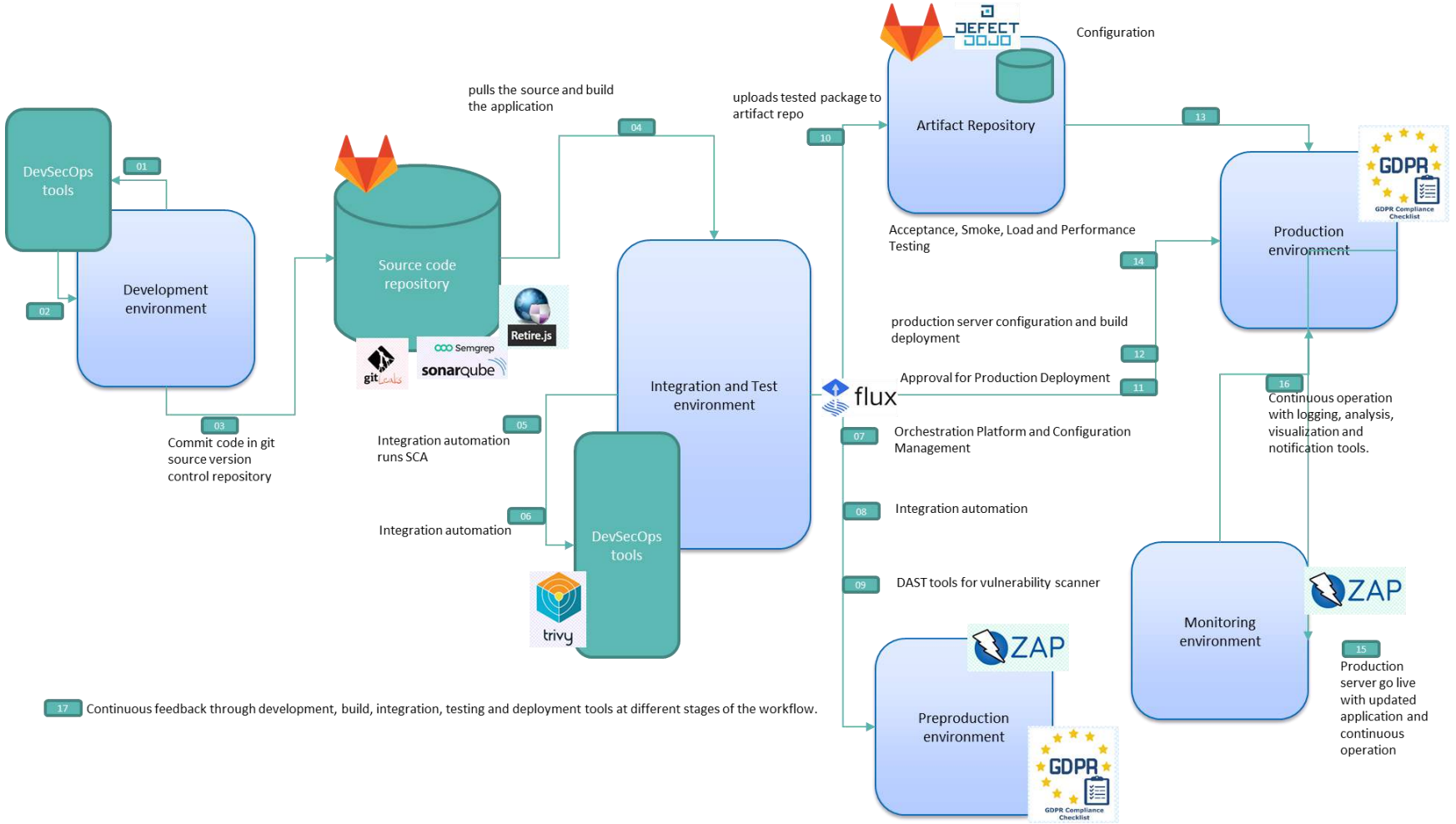
Automating the continuum: scripting and DevPrivSecOps

- Inclusion of security and privacy tests in the software development lifecycle
- Guaranteed security and privacy in the deployment of components in aerOS and beyond
- Will be made available for all projects to follow the process



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aerOS Open Calls

- **Two** open calls to be conducted

	1st Open Call Schedule		2nd Open Call Schedule		
Sept-23	Announcement	M13	Announcement	M20	Apr-24
Oct-23 to Jan-24	Submission Phase	M14-M17	Submission Phase	M21-M24	May-24 to Aug.-24
Feb-24 to Mar-24	Evaluation Phase	M18-M19	Evaluation Ph	M25-M26	Sep-24 to Oct-24
Apr-24	Start Participation	M20		27	Nov-24
Nov-24	End Participation			M34	Jun-25

- A total of **900k€** will be distributed t
- Expected ~15 contributio
- Each open call will be funded with a
- Each open call funded proposal will have to **of the ree pilots**.

Round #2 will open son
Stay tuned!!

Focus of each round:

Round #1

(1) extension of functionalities delivered by aerOS, (2) expansion of application of aerOS in the five use case verticals considered in the project

Round #2

(3) application of aerOS to verticals outside of these considered in the project

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THANK YOU!

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