aerOS: Autonomous, scalable, trustworthy, intelligent European meta Operating System for the IoT edge-cloud continuum

**aerOS description**

aerOS overarching goal is to design and build a virtualised, platform-agnostic meta operating system for the IoT edge-cloud continuum.

- Delivers common virtualised services to enable orchestration, virtual communication, and efficient support for frugal, explainable AI and creation of distributed data-driven applications;
- Exposes an API to be available anywhere and anytime, flexible, resilient and platform agnostic;
- Includes a set of infrastructural services and features addressing cybersecurity, trustworthiness and manageability.

**Key Concepts**

- **EDGE Cloud**
  - Design, implementation and validation for optimal orchestration

- **Internet of Things**
  - Foundation for IoT-cloud continuum

- **Artificial Intelligence**
  - Design, implementation and validation for optimal orchestration

- **Security, Privacy, Trust**
  - Holistic cross-layer solution for cybersecurity, with federated & distributed data governance

**Particularly, aerOS:**

- aerOS will be implemented as virtualised modules, executed on top of any operating system (e.g., Linux-based, Android, ROS, etc.) of an Infrastructure Element (IE) of the IoT edge-cloud continuum, e.g., a smart device, IoT gateway, edge node or network component.

  - Each aerOS IE deployment will consist of the following key modules:
    - (i) services and API;
    - (ii) virtualisation, abstraction and container runtime;
    - (iii) core aerOS modules;
    - (iv) supporting aerOS features;
    - (v) orchestration;
    - (vi) security, privacy and trust; and
    - (vii) management framework.

**Five industry-driven heterogeneous use cases will demonstrate the value of aerOS**

- **Data-Driven Cognitive Production Lines**
  - Manufacturing Autonomy Level 4 (MAL4) in 4 public-private Pilot Linux

- **Edge Computing near Renewable Energy Sources**
  - EDDE Data Centers connected to smart infrastructure providing Cloud continuity

- **CO² Intelligent Neutral Farming**
  - Precision Agriculture, maximising yields and quality of goods

- **Smart EDGE services for the Port Continuum**
  - Predictive maintenance of Container Handling Equipment & Risk prevention via computer vision

- **Energy Efficient, Health Safe & Sustainable Smart Buildings**
  - Occupational safety & health, Cybersecurity and data privacy in building automation

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**Project’s site:**
https://aeros-project.eu/

**Consortium:**
https://aeros-project.eu/consortium/

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