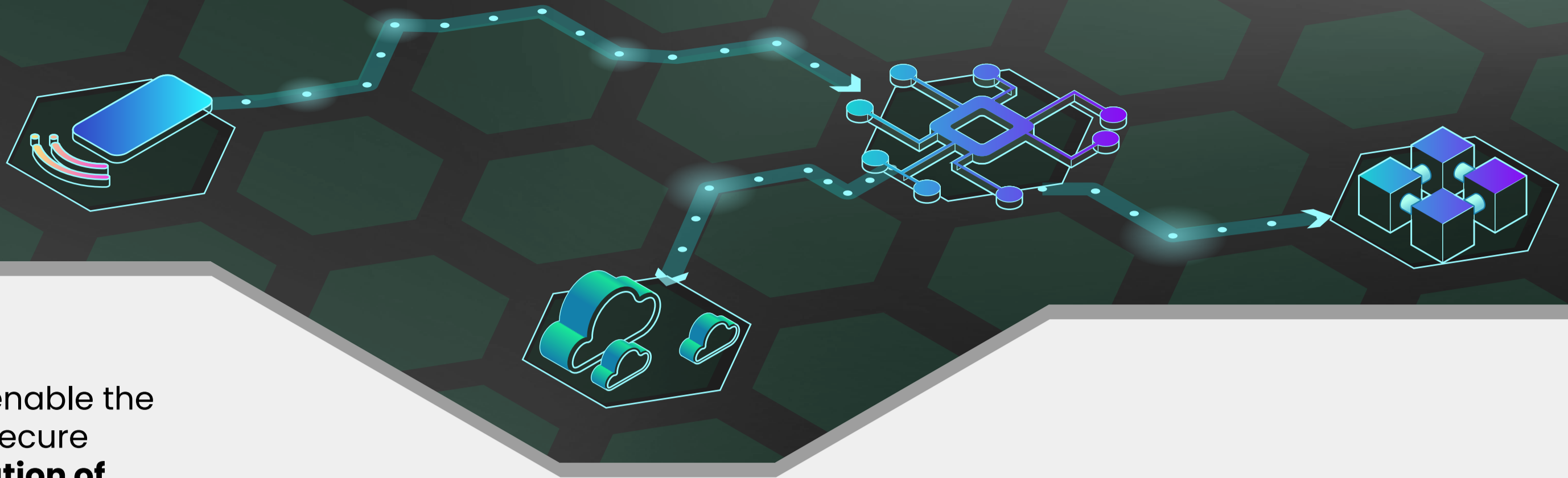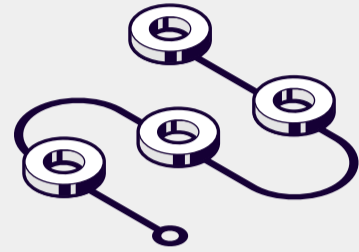# nephele
Part of **EUCloudEdgeIoT**.eu

A lightweight software stack and synergetic metaorchestration framework for the next generation compute continuum
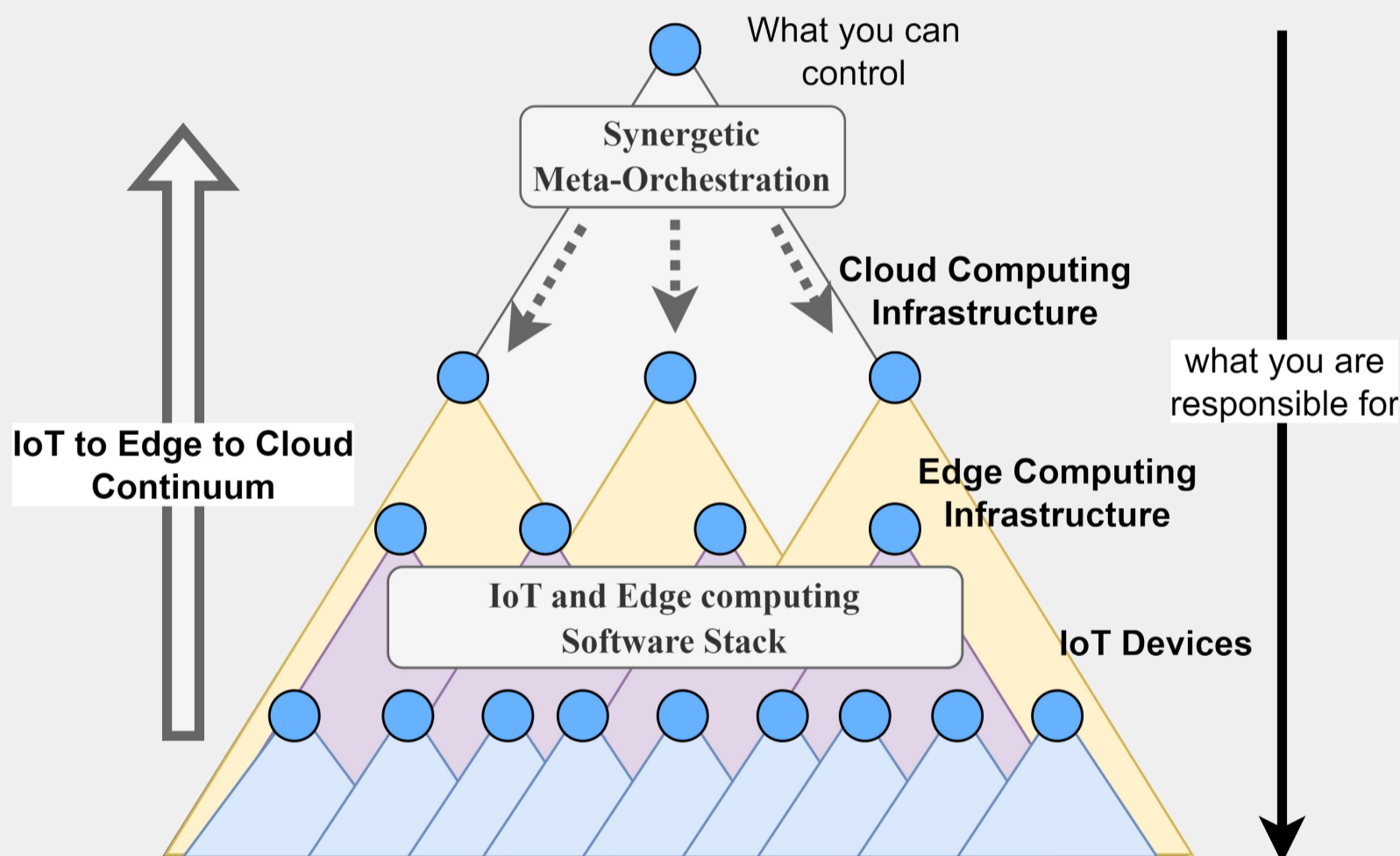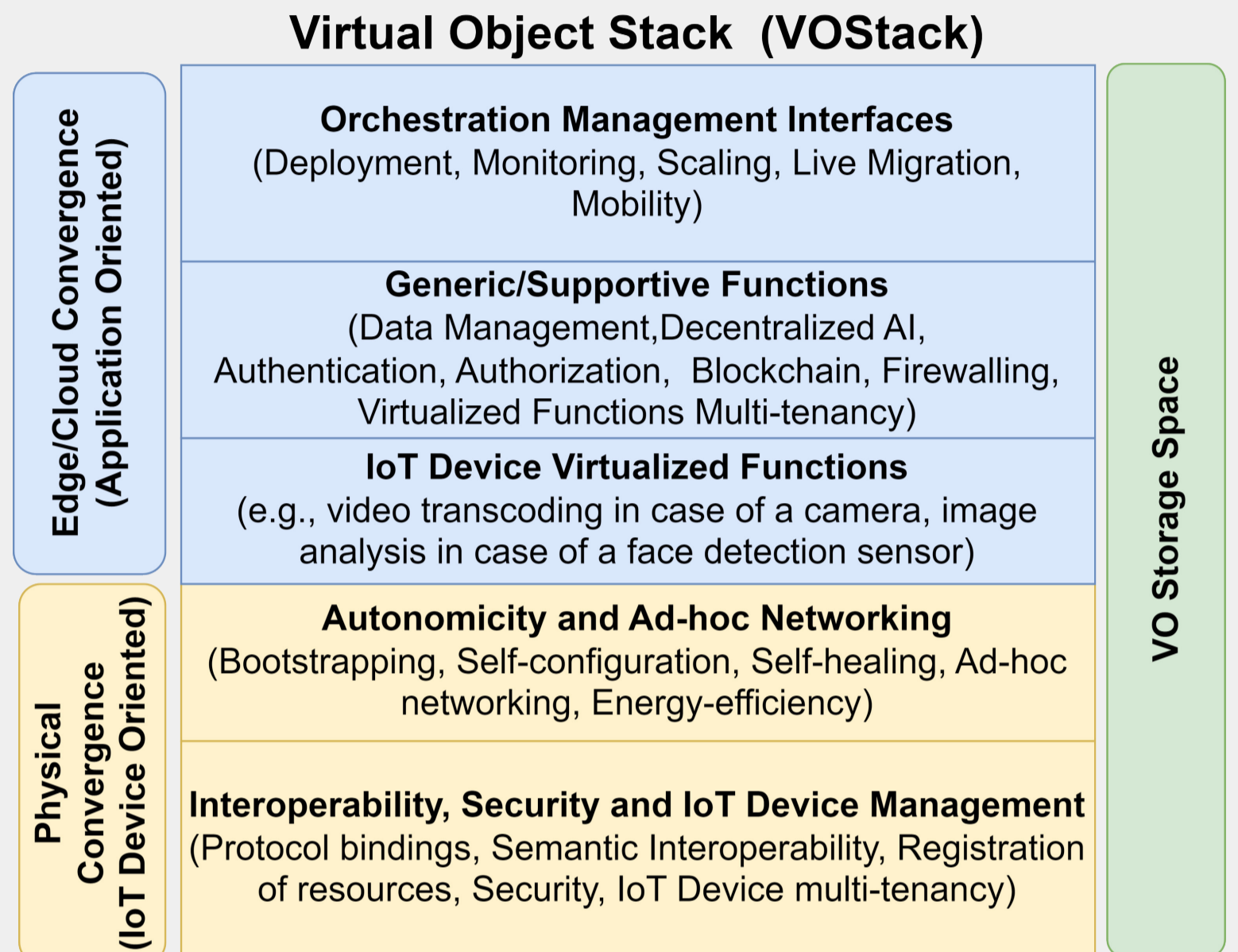
**NEPHELE's** vision is to enable the efficient, reliable and secure **end-to-end orchestration of distributed applications** over programmable infrastructure that is spanning across **the compute continuum from Cloud-to-Edge-to-IoT**, removing existing **openness** and **interoperability** barriers.

The NEPHELE project aims to introduce **two core innovations**, namely:
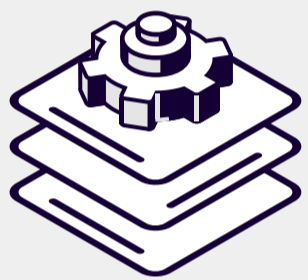
1. An IoT and edge computing software stack (VOStack) for leveraging virtualization of IoT devices at the edge and supporting openness and interoperability aspects in a device-independent way.

### Virtual Object Stack (VOStack)

| Edge/Cloud Convergence (Application Oriented) | | VO Storage Space |
|---|---|---|
| **Orchestration Management Interfaces** (Deployment, Monitoring, Scaling, Live Migration, Mobility) | | |
| **Generic/Supportive Functions** (Data Management, Decentralized AI, Authentication, Authorization, Blockchain, Firewalling, Virtualized Functions Multi-tenancy) | | |
| **IoT Device Virtualized Functions** (e.g., video transcoding in case of a camera, image analysis in case of a face detection sensor) | | |
| **Autonomicity and Ad-hoc Networking** (Bootstrapping, Self-configuration, Self-healing, Ad-hoc networking, Energy-efficiency) _(Physical Convergence – IoT Device Oriented)_ | | |
| **Interoperability, Security and IoT Device Management** (Protocol bindings, Semantic Interoperability, Registration of resources, Security, IoT Device multi-tenancy) | | |

What you can control

Synergetic Meta-Orchestration

Cloud Computing Infrastructure

IoT to Edge to Cloud Continuum

what you are responsible for

Edge Computing Infrastructure

IoT and Edge computing Software Stack

IoT Devices

2. A **synergetic meta-orchestration framework** for managing distributed applications in the **compute continuum** based on the adoption of a **"system of systems"** approach.
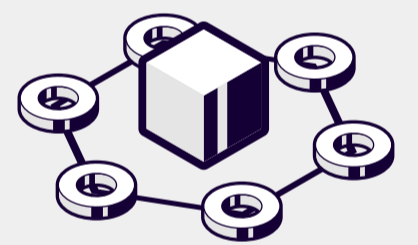
The NEPHELE outcomes are going to be demonstrated in **use cases** across various vertical industries, including areas such as **disaster management, logistic operations** in ports, **energy management** in smart buildings and **remote healthcare** services. Two successive **open calls** are planned.
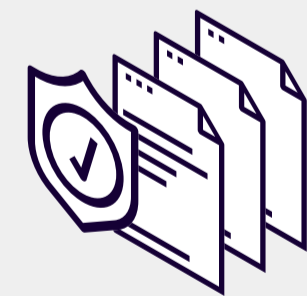
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