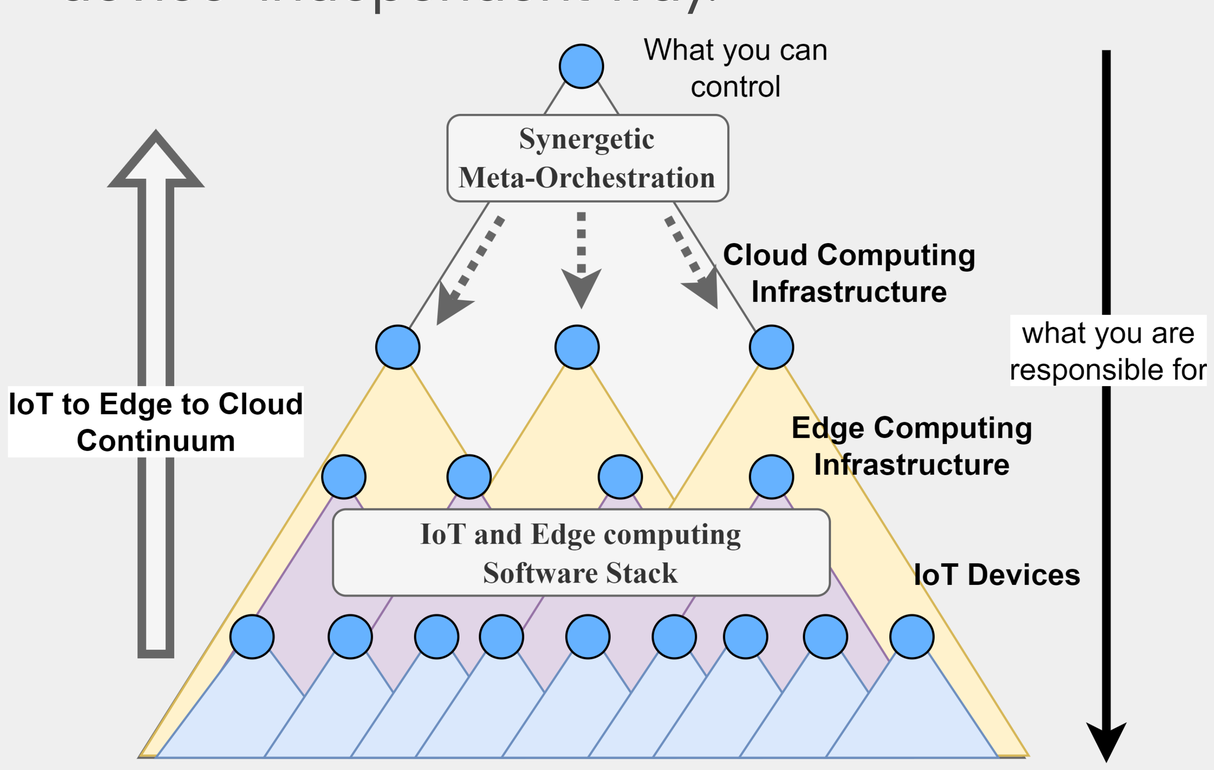
nephele

A lightweight software stack and synergetic meta-orchestration 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)	**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)
Physical Convergence (IoT Device Oriented)	**Autonomicity and Ad-hoc Networking** (Bootstrapping, Self-configuration, Self-healing, Ad-hoc networking, Energy-efficiency)
	Interoperability, Security and IoT Device Management (Protocol bindings, Semantic Interoperability, Registration of resources, Security, IoT Device multi-tenancy)

VO Storage Space

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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