A lightweight software stack and synergetic metaorchestration framework for the next generation compute continuum

The NEPHELE project aims to introduce two core innovations, namely:

1. **Virtual Object Stack (VOStack)**
   - **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)
   - **Interoperability, Security and IoT Device Management** (Protocol bindings, Semantic Interoperability, Registration of resources, Security, IoT Device Multi-tenancy)

2. **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.

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.