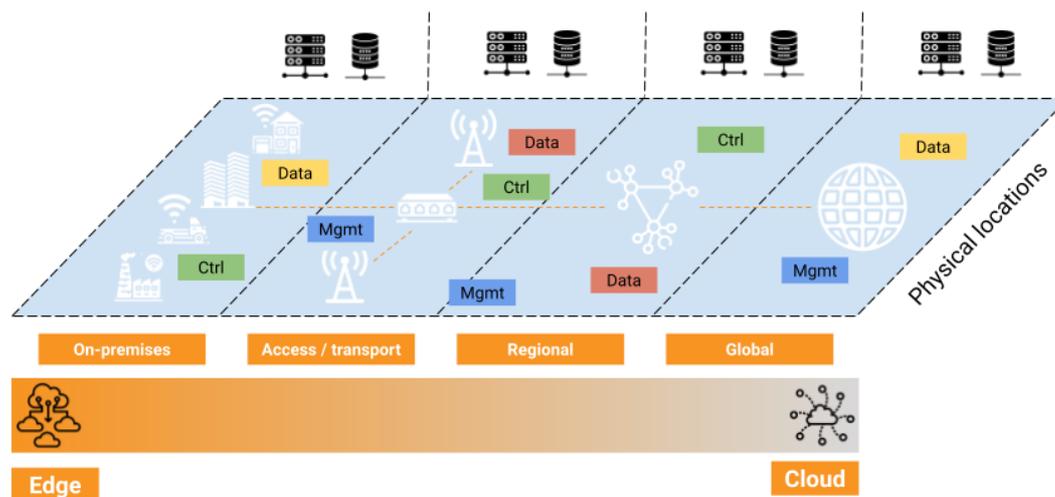


Thesis proposals on Eclipse fog05

Context

Edge Computing provides the ability to run applications on distributed infrastructure whether it be decentralized colocation, on premises, in factories, retail stores, telecommunications infrastructure, gateways, or on connected Things themselves. It is essential to remember that there is no single “edge”. The edge is anywhere and everywhere outside of traditional clouds and IT environments. We call this **edge-to-cloud continuum** as illustrated in the figure below.

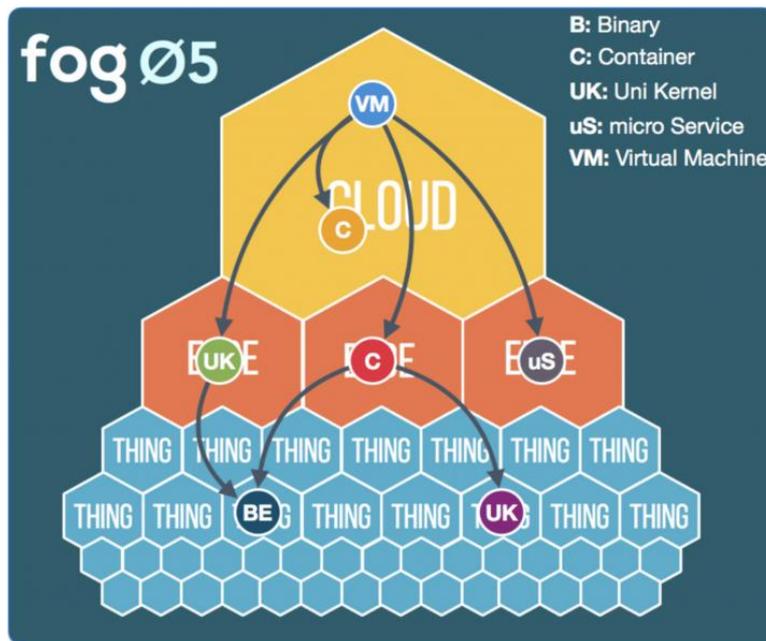


There are some fundamental differences between the cloud and the edge, specifically the architecture, principles, and primitives. An edge compute platform takes advantage of core edge attributes such as location, network topology and latency, and disparate hardware.

Overview of the project

Eclipse fog05 is an open source project hosted under the Eclipse Edge Native Working Group. It aims at providing a decentralised infrastructure for provisioning and managing compute, storage, communication and I/O resources available anywhere across the network. Eclipse fog05 addresses highly heterogeneous systems even those with extremely resource-constrained nodes. It supports heterogeneous runtimes, hypervisors and networking to deploy heterogeneous applications composed by VMs, containers, ROS2, and native applications as illustrated in the figure below. Because Eclipse fog05 uses Eclipse zenoh for location-transparency state access and management, it can be deployed on resource constrained devices and leverage other nodes for state management.

In short, Eclipse fog05 provides a common API and information model for infrastructure management. It allows you to define your application in a single descriptor regardless the number and heterogeneity of components.



Some useful pointers are:

- Eclipse fog05 website: <https://fog05.io/>
- Eclipse fog05 GitHub: <https://github.com/eclipse-fog05/fog05>
- Eclipse Edge Native Working Group website: <https://edgenative.eclipse.org/>

Potential topics

Multiple topics are available to work on Eclipse fog05. Some examples of interest are:

- Decentralized placement algorithm
- Autonomous robotics and vehicular fleet provisioning
- Performance evaluation and resiliency
- Volatile infrastructure management in wireless environments
- Scalable and low-footprint monitoring in the edge-to-cloud continuum
- Support of additional hypervisors and overlay networks
- Security mechanisms for decentralized infrastructure in public environments
- Decentralized API and management tools

Other topics are also available and can be discussed or identified upon interest.

ADLINK Technology

ADLINK Technology Inc. designs and manufactures products for embedded computing, test & measurement, and automation applications. ADLINK's product line includes computer-on-modules, industrial motherboards, data acquisition modules and complete systems. Headquartered in Taiwan, ADLINK has operations in Beijing, Mannheim, Paris, San José, Seoul, Shanghai, Shenzhen, Singapore, and Tokio.

Paris office is the Advanced Technology Office (ATO) lead by ADLINK's Chief Technology Officer (CTO). R&D activities related to distributed systems and mission-critical applications, like the ones that can be found at the heart of Eclipse Cyclone DDS, Eclipse zenoh, and Eclipse fog05, are conducted in this office. ATO R&D lab offers paid internship opportunities.