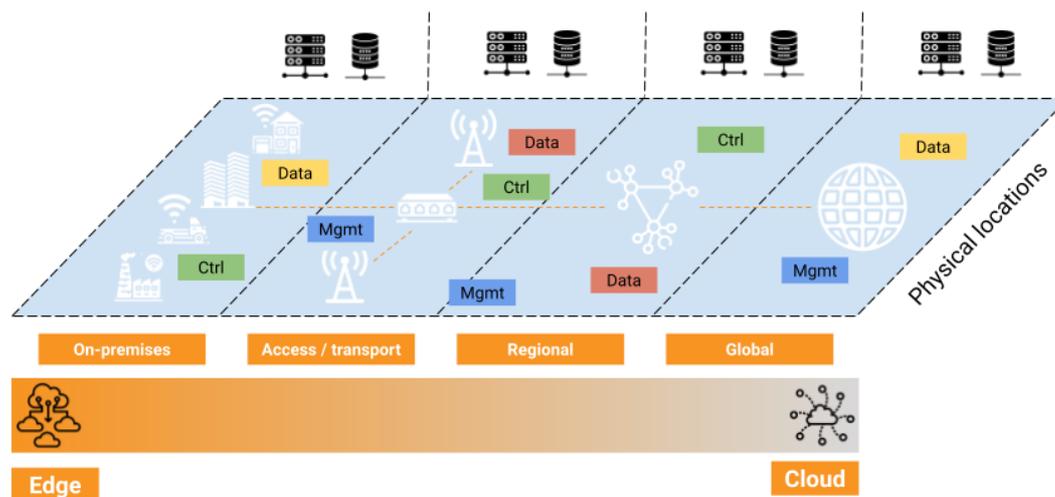


Thesis proposals on Eclipse zenoh

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.

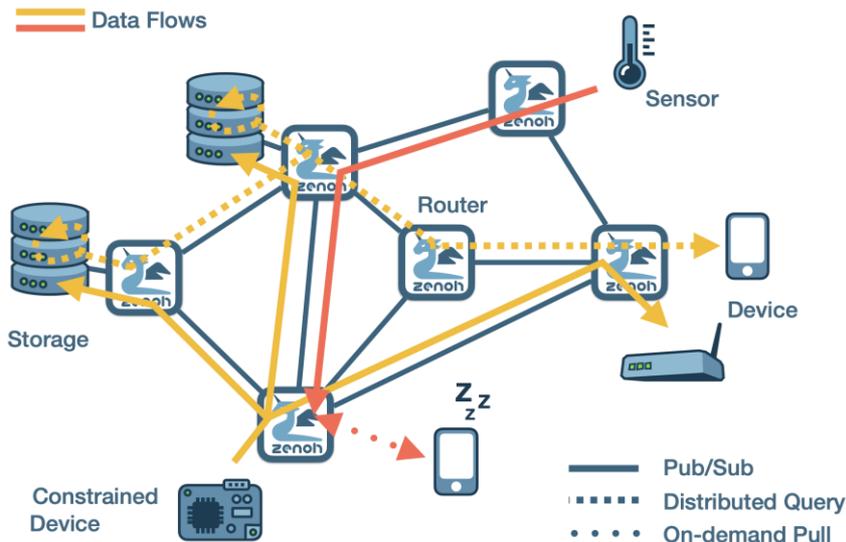


There are some fundamental differences between the cloud and the edge, specifically the architecture, principles, and primitives. An edge compute platform takes advantage of core edge attributes such as location, network topology and latency, and disparate hardware.

Overview of the project

Eclipse zenoh is an open source project hosted under the Eclipse Edge Native Working Group. It provides a unified data management along the edge-to-cloud continuum. Particularly, Eclipse zenoh provides a stack designed to (1) minimize network overhead, (2) support extremely constrained devices, (3) supports devices with low duty-cycle by allowing the negotiation of data exchange modes and schedules, (4) provide a rich set of abstraction for distributing, querying and storing data along the entire system, and (5) provide extremely low latency and high throughput.

In short, Eclipse zenoh unifies **data in motion**, **data in-use**, **data at rest** and **computations**. It carefully blends traditional pub/sub with geo-distributed storages, queries and computations, while retaining a level of time and space efficiency that is well beyond any of the mainstream stacks. An example of communication based on Zenoh is illustrated in the figure below.



Some useful pointers are:

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

Potential topics

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

- Dynamic robotics and vehicular communications
- Distributed processing for IoT
- Real-time framework for mission-critical applications
- Decentralized web infrastructure
- Elastic content delivery network from the edge to the cloud
- Multi-domain routing based on Named-Data-Networking principles
- Performance evaluation and resilience
- Session continuity in high-mobility scenarios
- Storage consistency in decentralized and partition-prone environments

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 heat of Eclipse Cyclone DDS, Eclipse zenoh, and Eclipse fog05, are conducted in this office. ATO R&D lab also offers paid internship opportunities.