# The view from the Edge

the relevance of edge computing to the web developer community

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Basic idea of Edge Computing(short background)

- For decades the distributed application architecture has been based on a client-server model:
- The functionality split has been swinging back and forth:
    1. Terminal - Mainframe (dumb client, powerful server)
    2. PC – Server (powerful client, shared server)
    3. Browser – Web Server (dumb client serving static HTML, powerful server rendering and processing)
    4. HTML5/ Native Apps – Restful Server
- The location of the server transitioned from:
    - LAN
    - WAN
    - Cloud
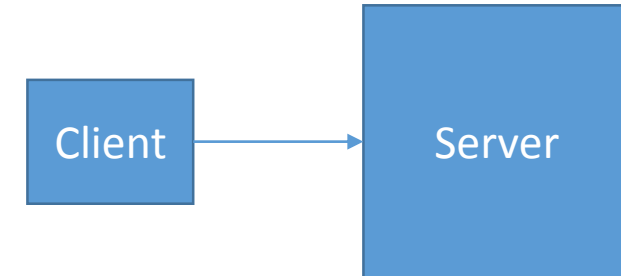
Client → Server

Edge Computing

- Edge Computing breaks the client server architecture by introducing a third element in the middle

- Not a new concept:
  - Proxy servers can be considered a form of edge
  - CDNs

- Both an architectural and a deployment paradigm shift
  - Applications are edge aware
  - Applications are edge location agnostic

Large Data Center

Large Data Center

User Devices

Distributed DC
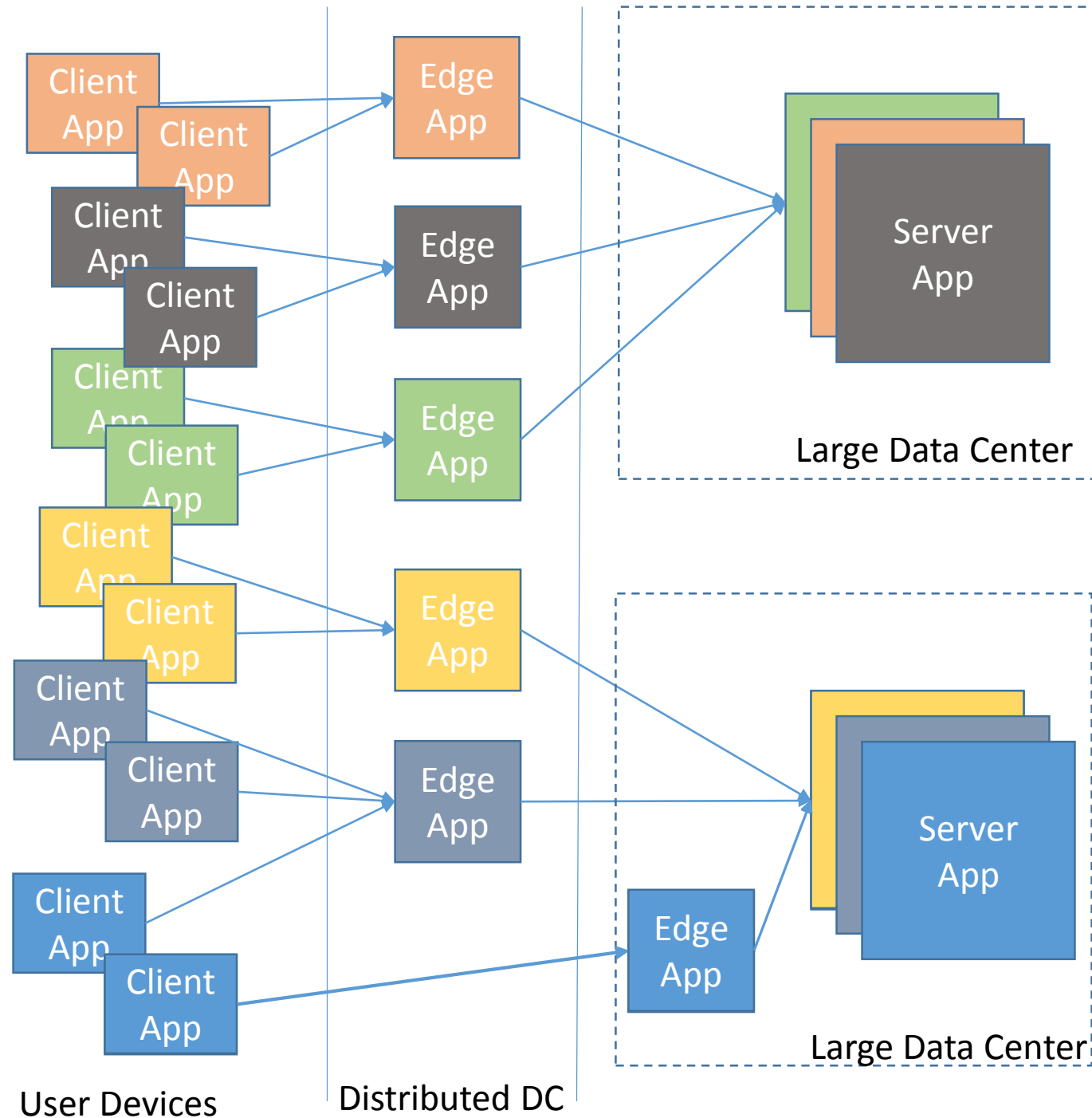
What is Edge

- From an application developer perspective edge is a server
- From a deployment perspective Edge is:
  - Where the administrative boundary ends/begins
  - Strictly associated with the network and data center topology

- Edge Computing has become very relevant in the industry and particularly in the telecom space for two major reasons:
  - Virtualization and automated orchestration
  - Migration to all IP networks opened up real estate closer to the last mile termination points

Use cases – a three dimensional approach to understanding Edge Computing

- by functional requirements:

  - Latency sensitive applications
    - CDN, AR/VR
  - Compute intense workload
    - AR/VR
  - Integration with Network APIs

- by control and management:

  - Internal Operator services
    - RAN,
  - Edge Applications as a Service (operator controlled and managed)
  - CDN
 - Edge Platform as a Service

- by network location placement:

  - On customer premise
    - vCPE (enterprise), set top box (consumer)
  - Access Network
    - RAN (cell site), Metro Ethernet
  - Core

Edge Computing at the intersection of other technology trends

- 5G – high bandwidth and low latency requirements along with the RAN disaggregation

- Network Slicing – Managed e2e network insolation can benefit from controlled QoS/QoE node deployment that are congestion aware

- Edge Cloud – Cloud providers working on hybrid cloud, managed cloud and building up infrastructure across the globe

# APIs and relevance for the Web (example)
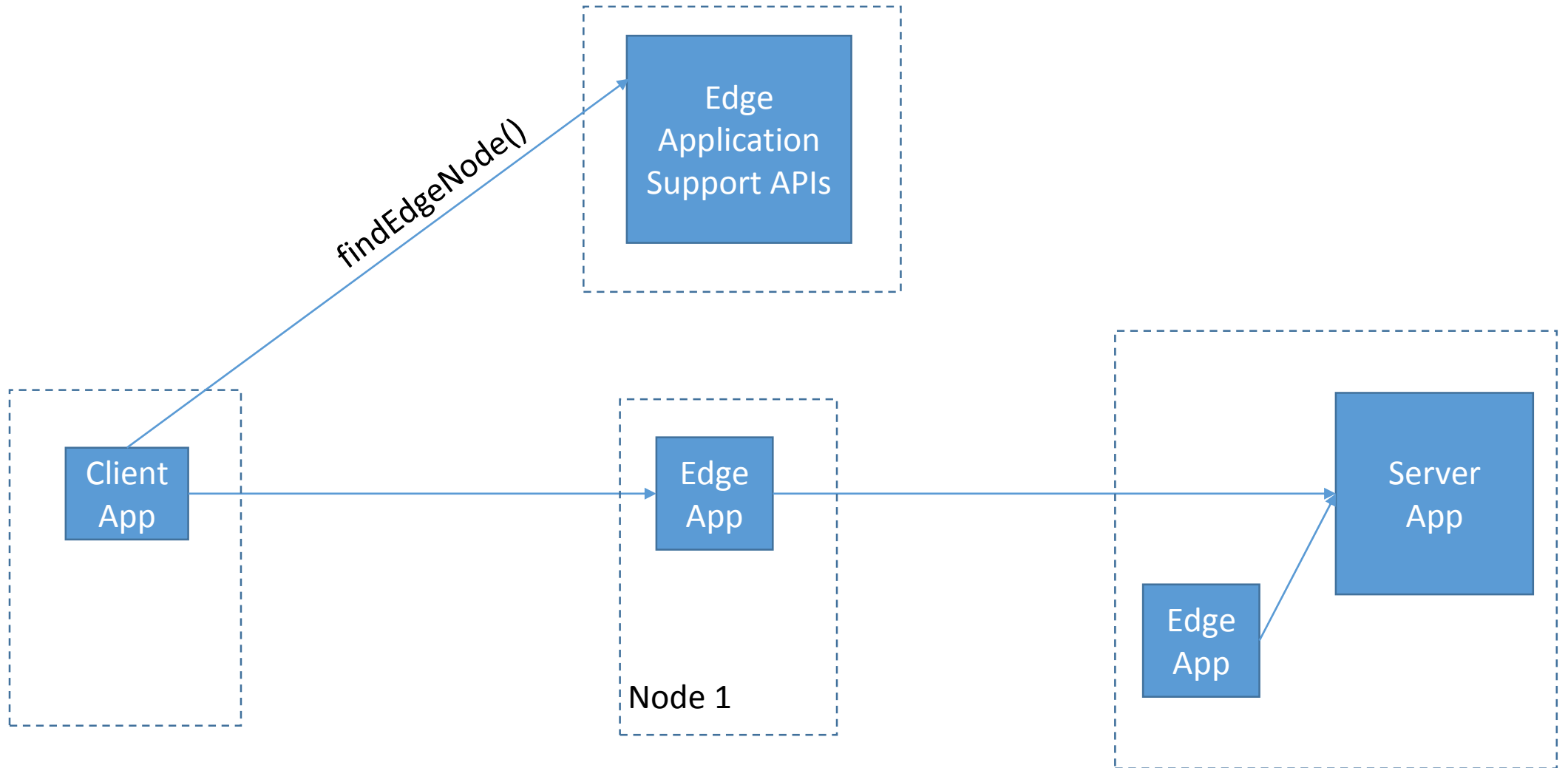
ETSI Multi-Access Edge Computing (MEC)

- ETSI Industry Specification Group (ISG) MEC (Multi-access Edge Computing) focuses on enabling edge computing at the access network (mobile or otherwise), thus bringing edge computing as close as possible to the user without it being in the user device.

- The group was established in September 2014 to standardize APIs that will enable application and content providers to utilize computing capabilities present at the edge of the network.

- Overview Presentation

- White Papers

In Scope:
- Operator Services (APIs)
- Application Enablement
- MEC Platform Management and Orchestration

Not in Scope:
- Infrastructure – OpenStack to play a role
- Implementation of the actual network APIs – 3GPP to be reused
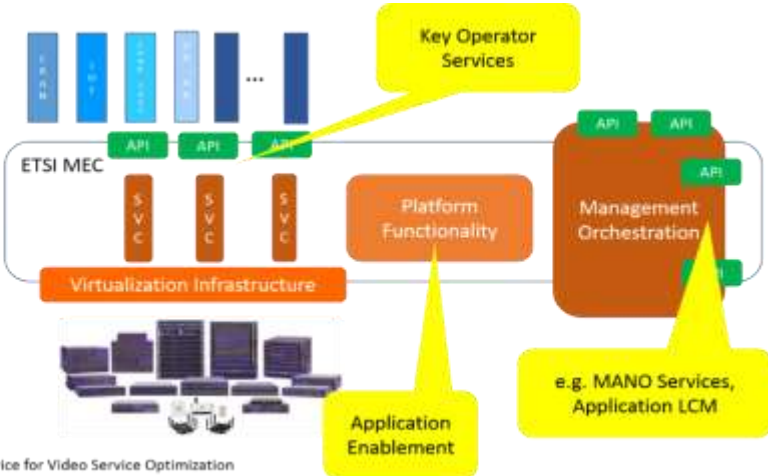
Example: Edge deployment Network Info Service for Video Service Optimization
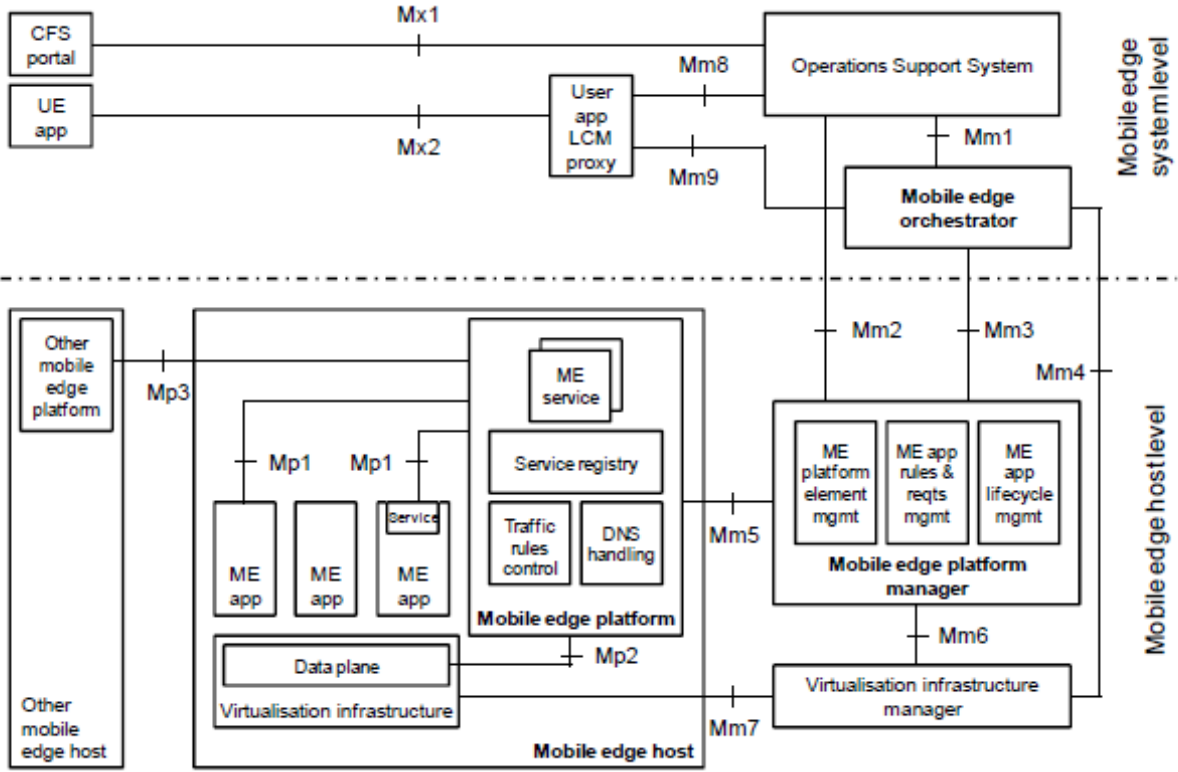
Linux Foundation Akraino Edge Stack project

- Integration project under LF

- Focused on end to end use cases for edge computing

- Defines specific blueprints fulfilling the individual use cases

- Blueprints cover full stack (h/w, s/w)

- Overview documentation

- Relevant work for developer centric APIs:
  - MEC APIs Framework Blueprint
  - API's sub-committee

Akraino Network Cloud Blueprint – Unicycle & Rover