Akraino “Enterprise Applications on Light weight 5G Telco Edge” Blueprint Proposal

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Motivations and Benefits of BP

Provide MEP along with mec app developers tools to enable MEC app be easily onboard or migrate to MEC ecosystem.

- ❏ Lightweight MEC solution
- ❏ Self managed Edge sites (MEP)
- ❏ Unified Portal for platform management and for App developers
- ❏ Sandbox with SDKs and tools chains for MEC app developers
- ❏ Heterogeneous deployment on multiarch

Blueprint Proposal: Enterprise Applications on Light weight 5G Telco Edge Blueprint

Case Attributes	Description	Informational
Type	New	
Blueprint Family -	5G MEC/Slice system Blueprint Family	
Use Case	Lightweight MEC platform, enable real time enterprise applications on 5G telco edge	
Blueprint proposed Name	Enterprise Applications on Light weight 5G Telco Edge	
Initial POD Cost (capex)	MEC platform: minimum 2 Servers(ARM or X86)	
Scale & Type	Up to several Arm/x86 servers	
Applications	Diverse types of applications in various sectors, not limited to below: ● Gaming Applications, VR Live broadcasting ● Industrial park, Campus office etc. ● Video Orchestration and Optimization ● Latency Senstive Application for Enterprise scenarios Etc.	
Power Restrictions	Varies	
Infrastructure orchestration	The cloud/network infrastructure: Containers, lightweight Kubernetes K3s, Kubernetes ecosystem Operating systems: Linux (CentOS, OpenEuler) Container runtime Docker, KubeVirt for VMs	
Workload Type	Containers/VMs	
SDN	Flannel for container networking	
Additional Details	NA	

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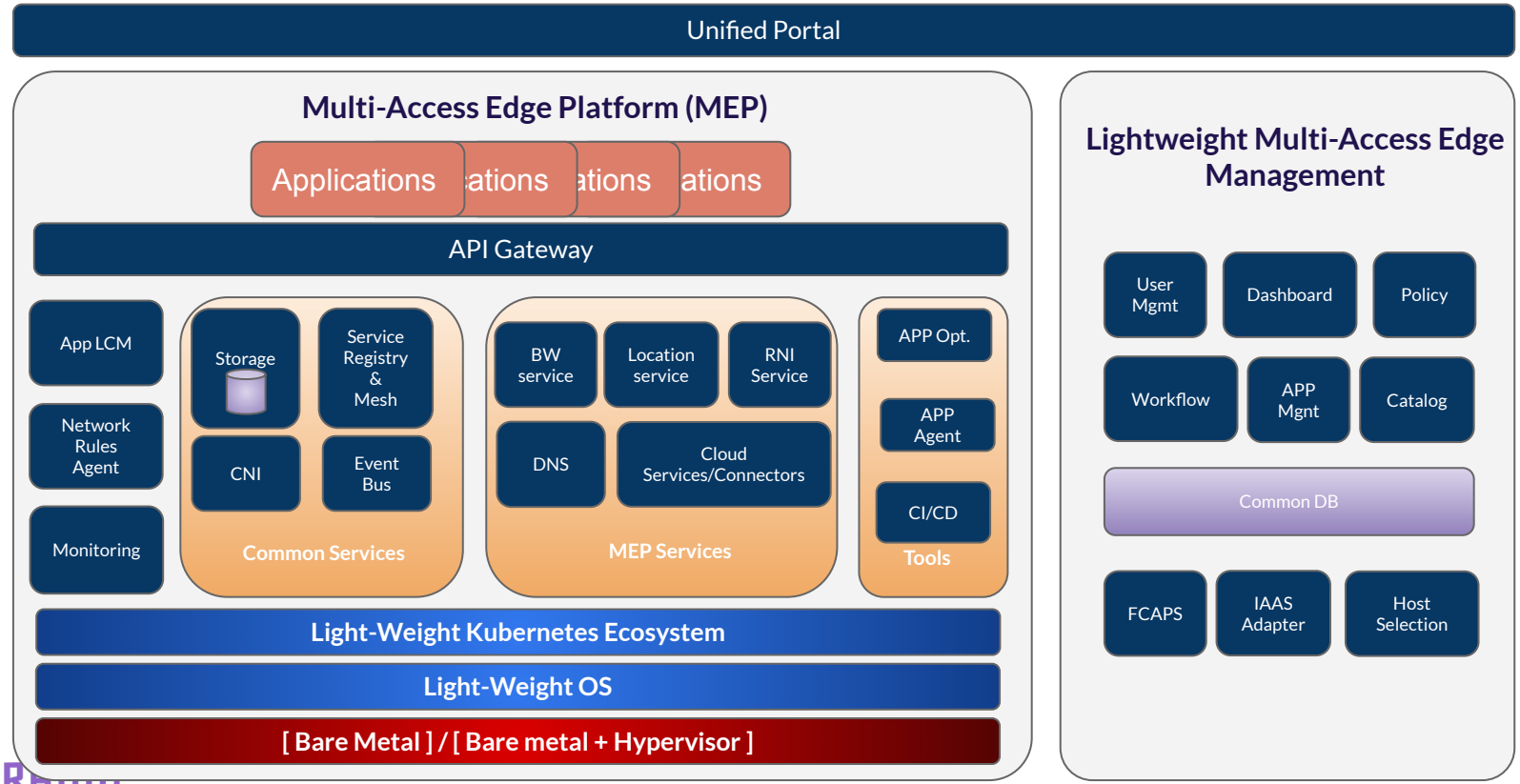
Architecture Overview



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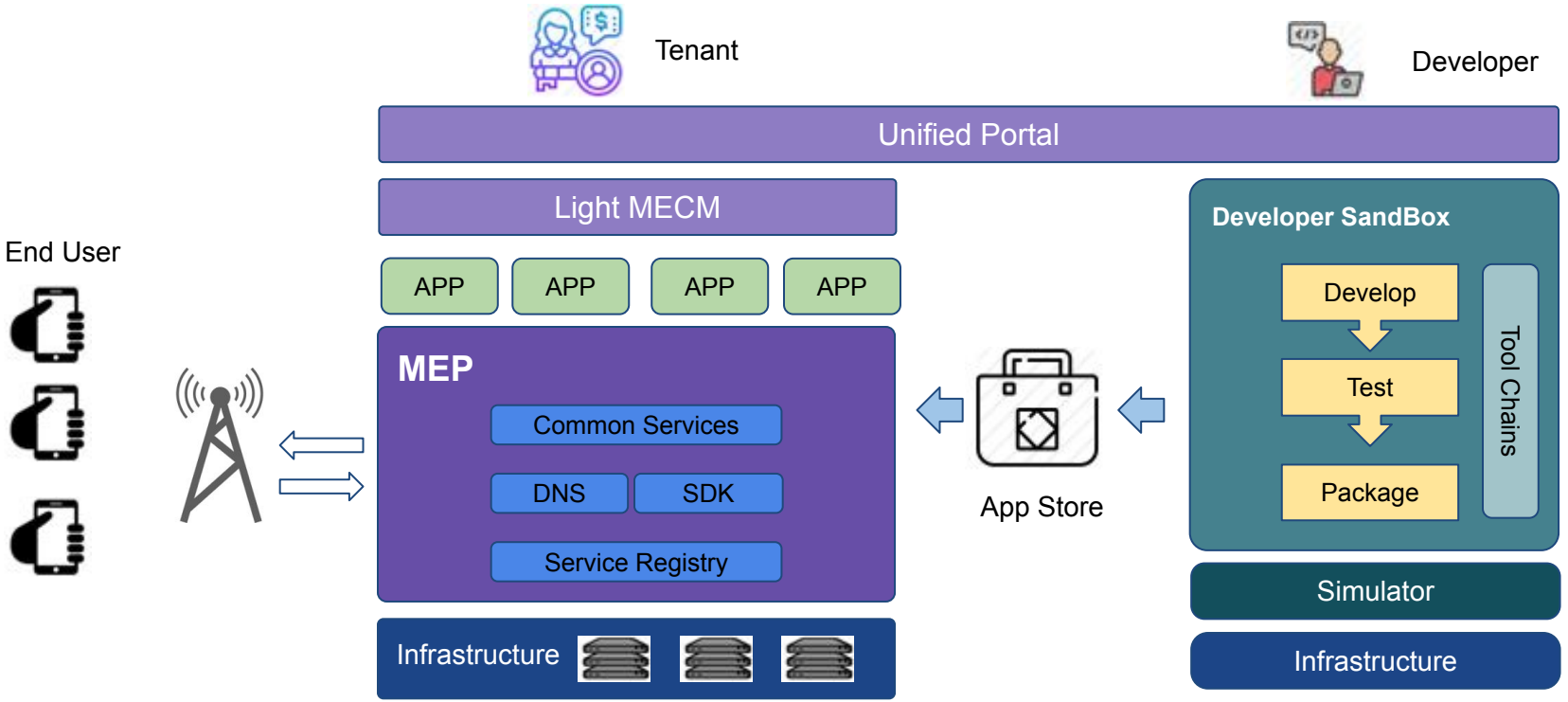
Functional overview



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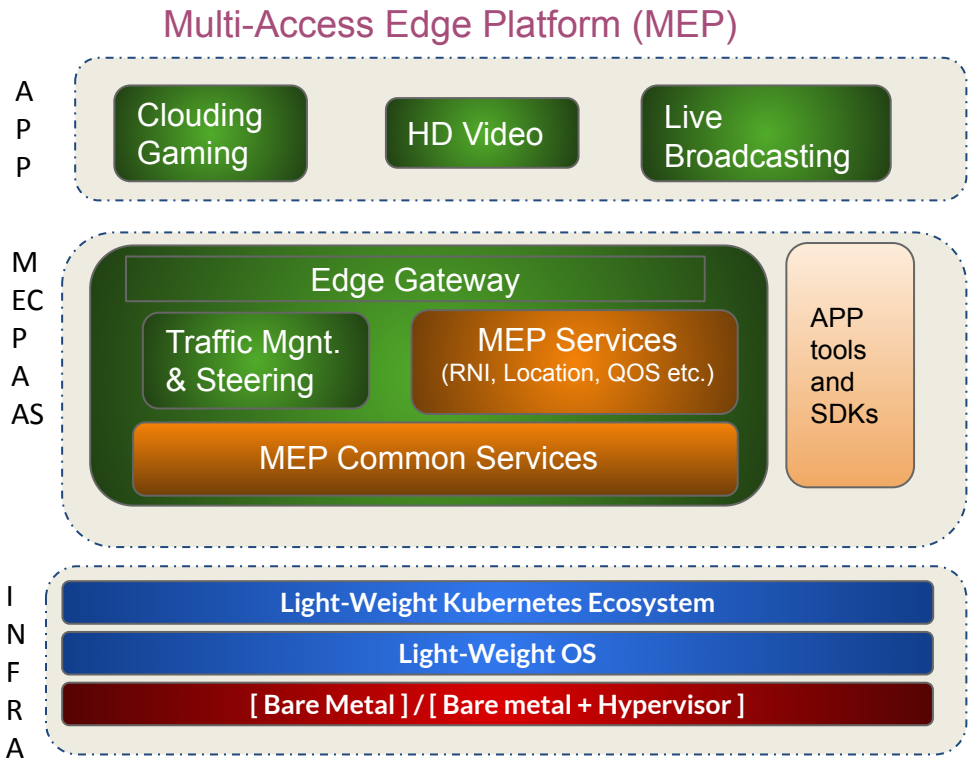
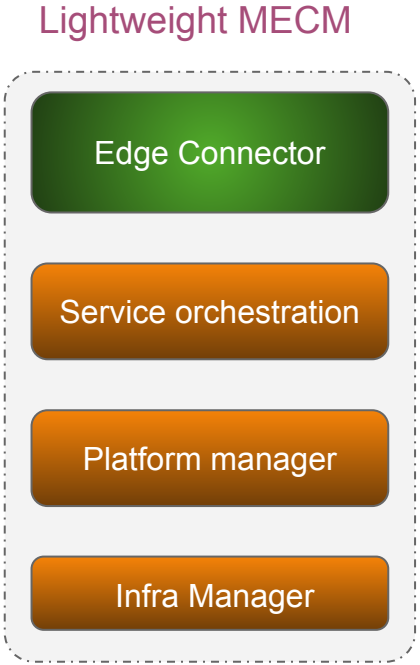
5G MEC system for HD video, gaming BP Cooperation





- **Green blocks for Edge connector, Edge Gateway & APPs** are components from 5G MEC/Slicing for HD Video, Gaming, live broadcasting BP and will be develop by that BP.
- These components integrate on OpenMEP

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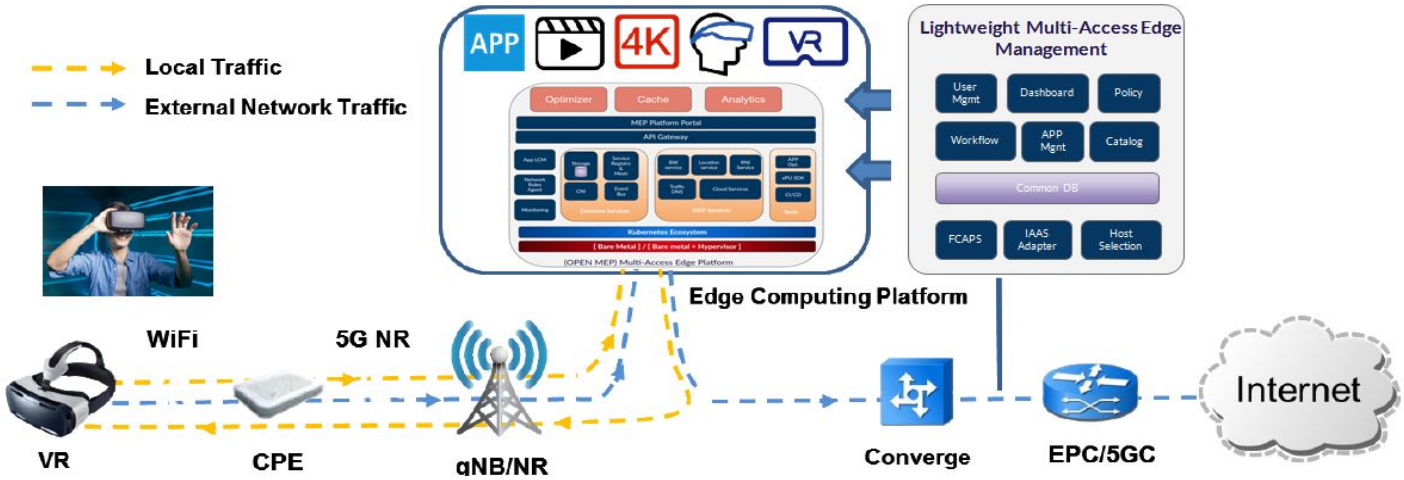
Edge Connector:Slice managements, traffic offloading services
Edge Gateway: 5G SA/NSA termination, LDNS and traffic steering & management

Use Case 1: Streaming media optimization Overview

	Central Cloud based streaming	5G Telco edge based streaming
User QOE	Not so good user experience for latency sensitive streaming applications like AR	Improved user experience with reduced latency
CAPEX	High traffic on Enterprise WAN link leaving to Cloud	Minimizes the amount of streaming media that has to leave the enterprise boundaries
System Requirement	End device needs to be capable enough of handling computational needs	Offloads the computation from end devices to edge.



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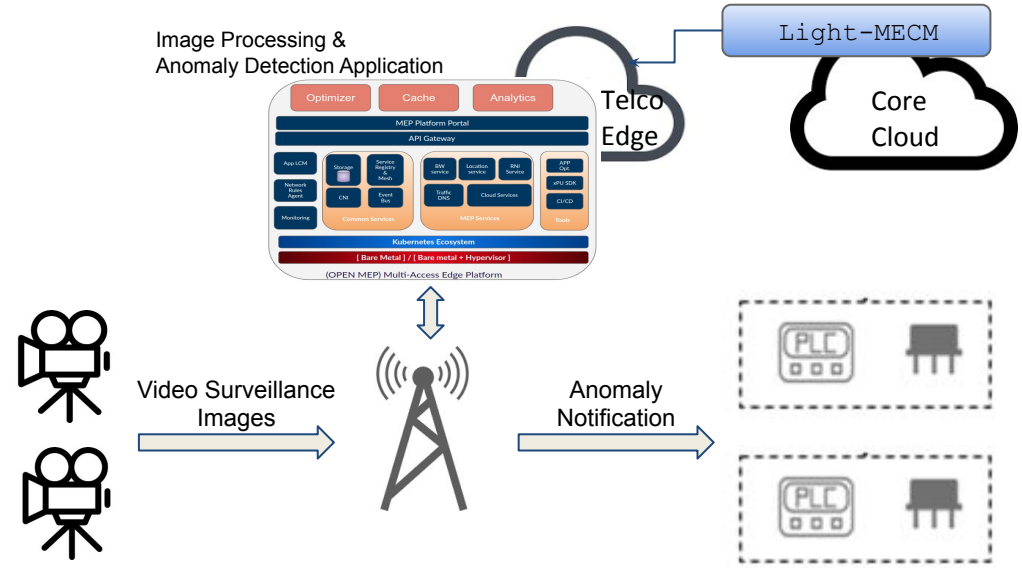
Use Case 2: Machine Vision in Campus Network

	Traditional Solution	5G Telco edge based streaming
Efficient production line space utilization	Distance between the camera of the machine vision system and the image analysis server is limited. Production line has dozens of machine vision servers at most, occupying much production line space	Centralized processing on Telco edge using wireless cameras on 5G network
Real time processing & feedback.	Cloud based solutions doesn't provide real time response for detection and quick feedback due to delay	Real time response for detection and quick feedback
System Requirement	Multiple dedicated servers for computation intensive image processing & anomaly detection algorithms	MEC can provide shared GPU based high end servers at centralized Telco edge.



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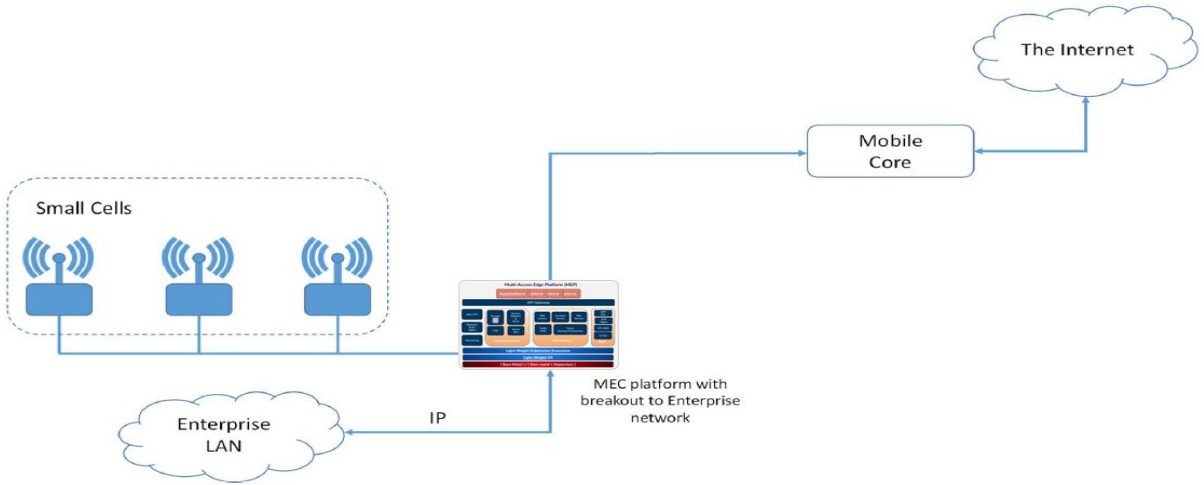
Use Case 3: Mobile office

	Traditional Solution	5G Telco edge based streaming
CAPEX & OPEX	- Networks are deployed and managed separately by the IT administrators in Enterprises. - Enterprises have to continuously upgrade their IT infrastructure.	- Telco infrastructure including 5G network & Telco Edge would reduce the administrative overhead for the Enterprises. - Service Providers will take care of upgrading their wireless infrastructure periodically
Coverage	Limited coverage specially for outdoor with current IT infrastructures which are based on WIFI	Can provide good outdoor coverage
Data privacy	Using cellular network + cloud will have following issues • Enterprise office data traffic is transmitted through the core network, and the delay cannot be guaranteed. • Enterprises' requirements that data cannot go out of the campus cannot be met.	With Telco edge enterprise data needn't leave enterprise boundary and delay can be guaranteed.



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BP Plan

- The first demo of Blueprint would be on Q2, 2020.
- The first Akraino version would be released on Q2, 2020.

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Appendix: Assessment Criteria

Criteria	Enterprise Applications on Light weight 5G Telco Edge BP
Each initial blueprint is encouraged to take on at least two committers from different companies	Huawei, CMCC, Tencent, ARM
Complete all templates outlined in this documents	Detailed in this slide
A lab with exact configuration required by the blueprint to connect with Akraino CI and demonstrate CD. User should demonstrate either an existing lab or the funding and commitment to build the needed configuration.	Validation Lab hosted by Huawei
Blue print is aligned with the Akraino Edge Stack Charter	All open source, Edge use case, Aligned with the Akraino Charter
Blueprint is code that will be developed and used with Akraino repository should use only open source software components either from upstream or Akraino projects.	Yes, all open source.
For new blueprints submission, the submitter should review existing blueprints and ensure it is not a duplicate blueprint and explain how the submission differs. The functional fit of an existing blueprint for a use case does not prevent an additional blueprint being submitted.	This BP alongwith lightweight platform, manager, provide SDKs, tool chain for APP developer.

Criteria	Enterprise Applications on Light weight 5G Telco Edge BP
Name of the project is appropriate(no trademark issues etc.); Proposed repository name is all lower-case without any special characters.	Enterprise Applications on Light weight 5G Telco Edge
Project contact name, company, and email are defined and documents	gaurav.agrawal@huawei.com
Description of the project goal and its purpose are defined	MEC platform for Real time applications on 5G Telco edge.
Scope and project plan are well defined	Targeted for R3 release
Resource committed and available	There is a team, resources and a lab in place.
Contributors identified	Huawei, CMCC, Tencent, ARM
Initial list of committers identified (elected/proposed by initial contributors)	Huawei, CMCC, Tencent, ARM
Meets Akraino TSC policies	The project will operate in a transparent, open, collaborative and ethical manner all the time.
Proposal has been socialized with potentially interested or affected projects and/or parties	Have already reached a consensus with sponsors.
Cross Project Dependencies	Containers, Kubernetes.

Thank You

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