Blueprint Proposal:
Public Cloud Edge Interface (PCEI)

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Blueprint Proposal:

Use Case Details

Attributes	Description
Type	New
Industry Sector	Public Cloud, Telco
Business driver	Public Cloud Service Providers are deploying Edge instances to better serve their end users and applications, A multitude of these applications require close inter-working with Telco Edge deployments to provide predictable latency & throughput, reliability and other telco-grade requirements. The purpose of this blueprint family is to specify a standard set of APIs to expose towards Public Cloud Service Provider instances at the Edge.
Business use cases	Telco Edge deployments can provide APIs to support capabilities such as the following • UPF shunting capability -- routing the traffic to desired applications and network functions • Local breakout – video traffic offload • Wireless air-port status • Location service -- location of a specific UE, or identification of UEs within a geographical area • QoS acceleration – provide low latency, high throughput for OTT applications • Slicing scheduling management -- offering dedicated resources specifically tailored for application needs • Authentication – provided as service enablement (e.g., two-factor authentication) used by most OTT service providers • Security – provided as service enablement (e.g., firewall service insertion)
Business Cost - Initial Build Cost Target Objective	The API platform (Gateway, SDK) will be deployed as cloud native containerized technology using Kubernetes.
Business Cost – Target Operational Objective	The APIs will be exposed and published to external public cloud service providers and application developers in a secure, controllable, traceable, scalable, and measurable way.
Security need	Northbound API platform (Gateway) will provide AAA, ACL, Policy enforcement functions. Southbound APIs that are used to call the core network functions of Telco will follow all the security requirements of 5G/4G core.
Regulations	N/A
Other restrictions	N/A
Additional details	N/A

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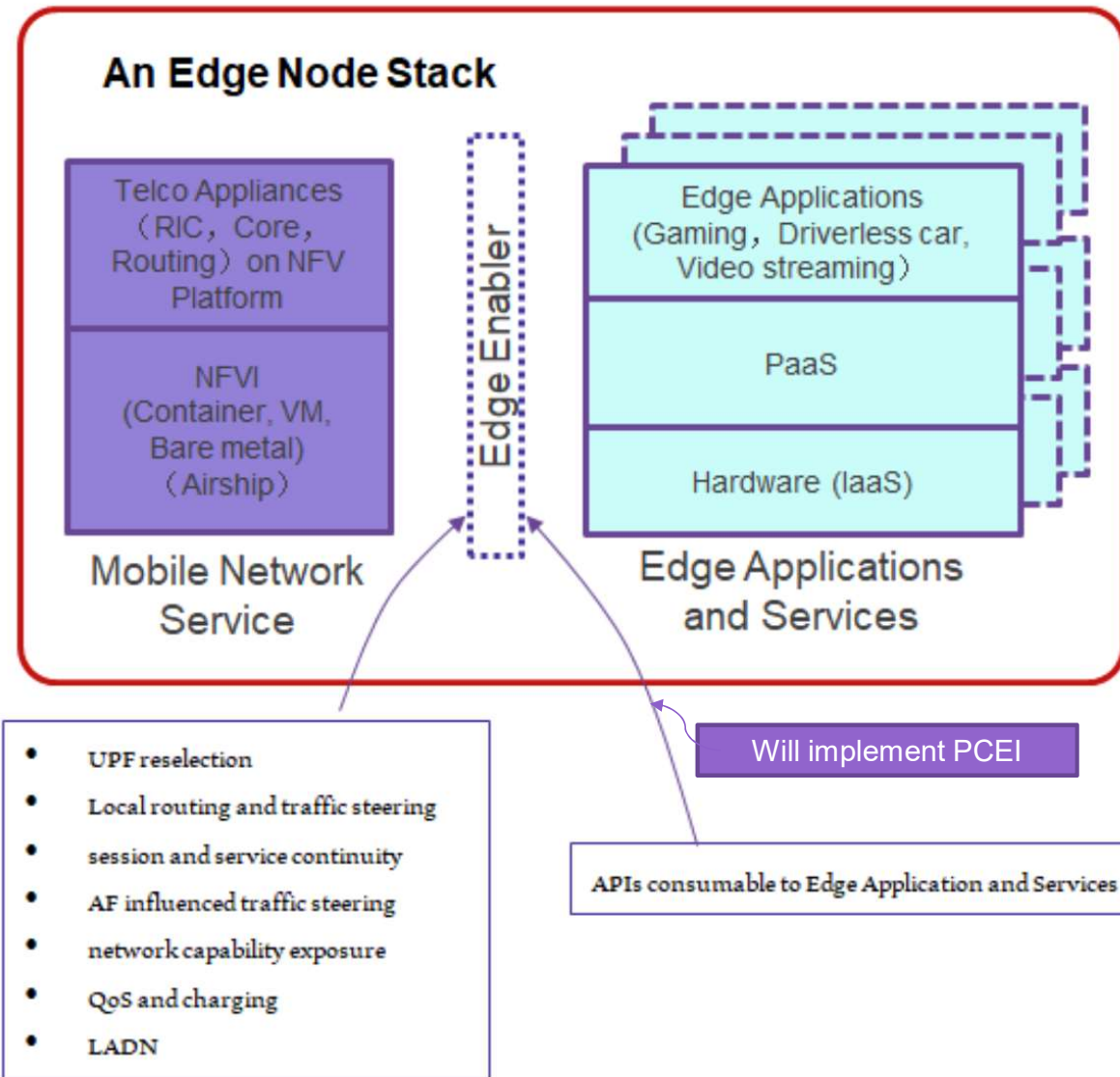| Case Attributes	Description
Type	New
Blueprint Family - Proposed Name	Public Cloud Edge Interface (PCEI) Blueprint Family
Use Case	Telco Edge deployments can provide APIs to support capabilities such as the following • UPF shunting capability -- routing the traffic to desired applications and network functions • Local breakout – video traffic offload • Wireless air-port status • Location service -- location of a specific UE, or identification of UEs within a geographical area • QoS acceleration – provide low latency, high throughput for OTT applications • Slicing scheduling management -- offering dedicated resources specifically tailored for application needs • Authentication – provided as service enablement (e.g., two-factor authentication) used by most OTT service providers • Security – provided as service enablement (e.g., firewall service insertion)
Blueprint proposed Name	Public Cloud Edge API Gateway
Initial POD Cost (capex)	1 x86/Arm server, 4G/5G radio, switch
Scale & Type	x86/Arm servers + FPGA acceleration
Applications	Value-added capabilities of operators to open up, e.g. • Portability • Location capabilities • Wireless network information capabilities Different applications will trigger different APIs.
Power Restrictions	N/A
Infrastructure orchestration	OS : Ubuntu 16.x, Centos7 VM: Airship, ONAP Containers: K8s
SDN	OVS-DPDK, SR-IOV
Workload Type	VMs, Containers
Additional Details	Need 4G/5G radio environment for POD

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Motivation(I)

› From telco side: public cloud is an important client for telco edge, but challenges are:

  o How to combine the public cloud management interface with telco orchestration interface?

  o How to open more telco abilities to public cloud and support the DevOps?

  o How to manage and monitor these different APIs in an efficient ways?

  o How to guarantee security such as avoid the DDOS or SQL injection attack to telco core network?

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Motivation(II)

› From public cloud side: telco edge cloud is an important client for public edge cloud, but challenges are:

  o How best to leverage network capabilities to provide value added services

  o Can public cloud use the same APIs towards multiple telco cloud edge instances

  o How to combine the public cloud management interface with telco orchestration interface?

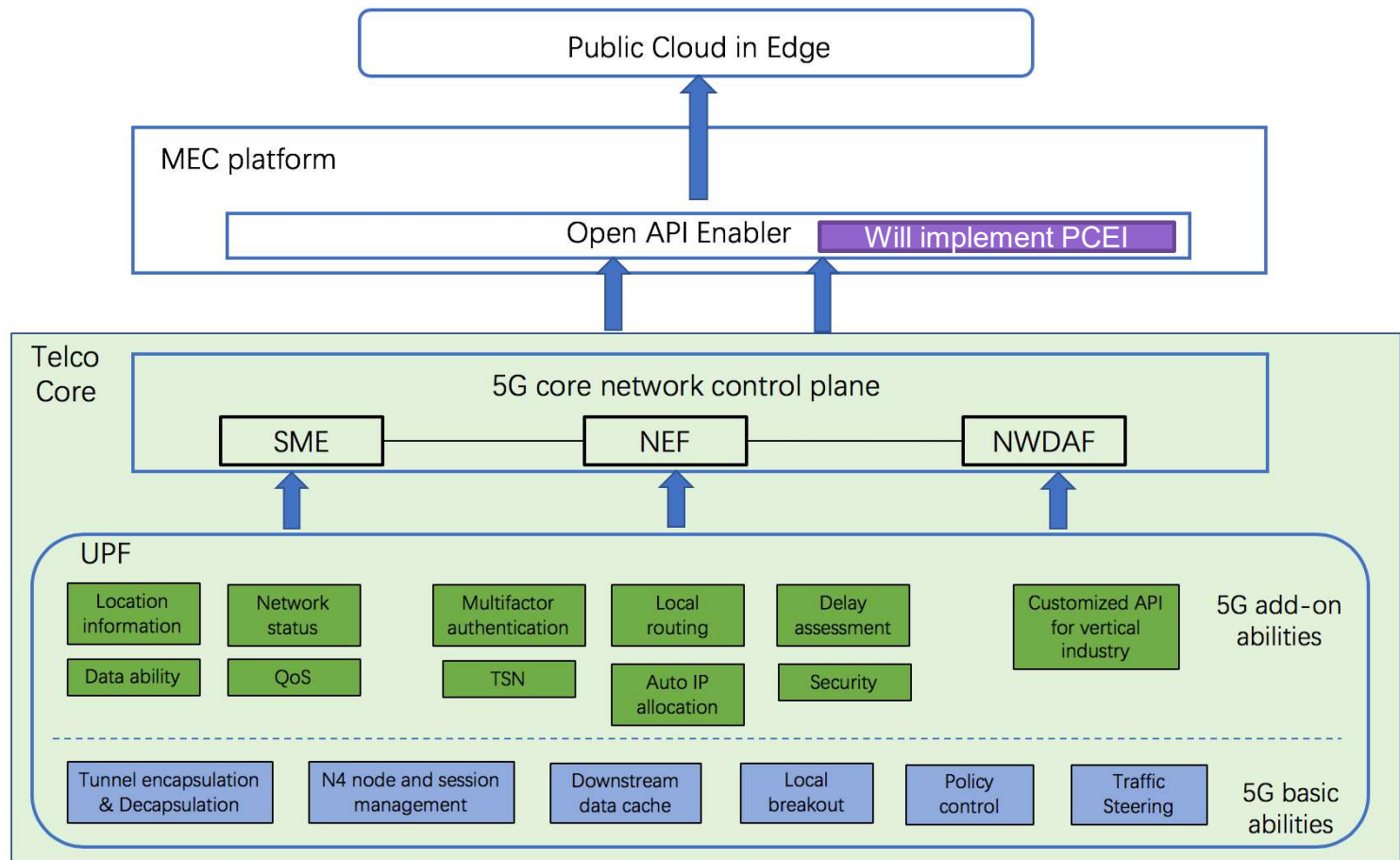 o How to manage and monitor these different APIs in an efficient ways?

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Use Cases

An Edge Node Stack

Telco Appliances
（RIC， Core,
Routing） on NFV
Platform

NFVI
(Container, VM,
Bare metal)
（Airship）

Mobile Network Service

Edge Enabler

Edge Applications
(Gaming， Driverless car,
Video streaming）

PaaS

Hardware (IaaS)

Edge Applications and Services

- UPF reselection
- Local routing and traffic steering
- session and service continuity
- AF influenced traffic steering
- network capability exposure
- QoS and charging
- LADN

Will implement PCEI

APIs consumable to Edge Application and Services
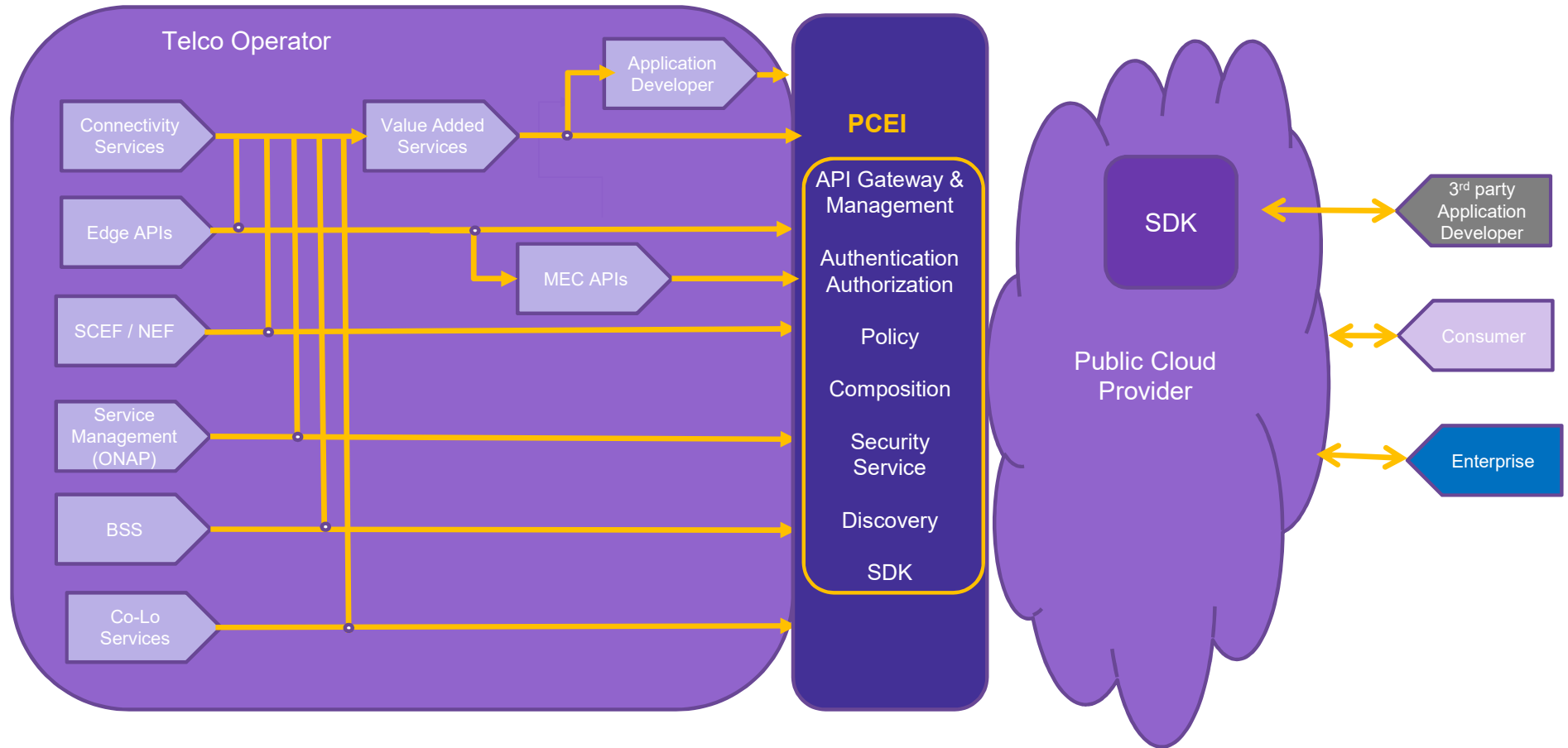
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Architecture/Interface suggestion

Note: the MEC platform here can be provided by telco or third party such as public cloud.

The API is RESTFUL.

High Level View of PCEI in Overall Context

Telco Operator

Connectivity Services

Value Added Services

Application Developer

Edge APIs

MEC APIs

SCEF / NEF

Service Management (ONAP)

BSS

Co-Lo Services

PCEI

API Gateway & Management

Authentication Authorization

Policy

Composition

Security Service

Discovery

SDK

Public Cloud Provider

SDK

3rd party Application Developer

Consumer

Enterprise

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Summary

> The purpose of this blueprint family is to specify a standard set of APIs for Telco Edge Blueprints to expose towards Cloud Service Provider instances at the Edge

> It will address all aspects of API interoperability to include API definition, API gateway functions (AAA, policy, security) so as to offer a secure, controllable, traceable, scalable and measurable way for accessing APIs by public cloud service providers

> With such APIs on top of the Telco Edge deployments it offers many opportunities for collaboration by exposing carriers' network capabilities to provide value added services for both Consumers, Enterprise and Vertical Industry end-user segments

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Thank you!