

LF Edge Akraino Project Annual Review to LF Edge TAC

January 13th, 2021

Ike Alisson



LF EDGE TAC Akraino Annual Review Agenda

1. Akraino Project R3 Overview
2. Akraino Technology Information flow
3. Akraino 2021 API related activities



1. Akraino Project R3 Overview - 1

- 18 Blueprints (BPs), 4 BPs Proposals & 10 Development Projects

- set of Open Infrastructures & Application Blueprints (BPs)

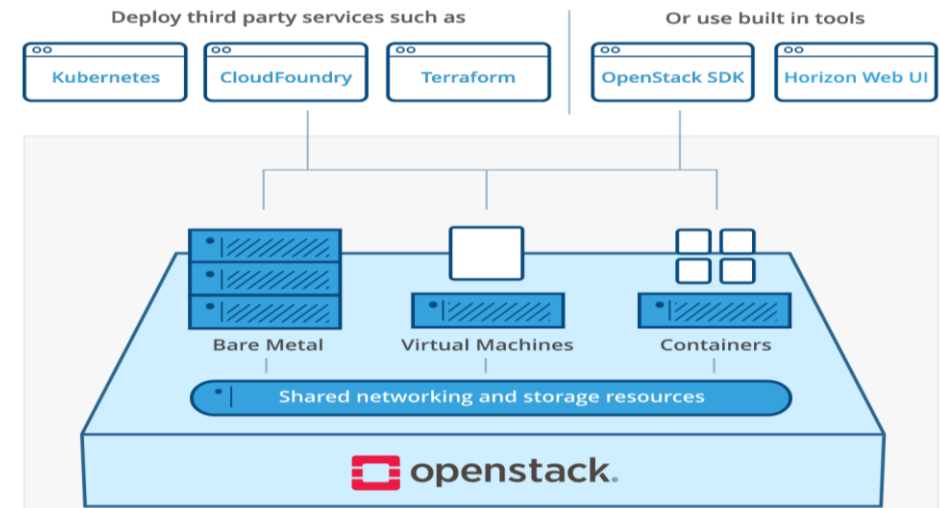
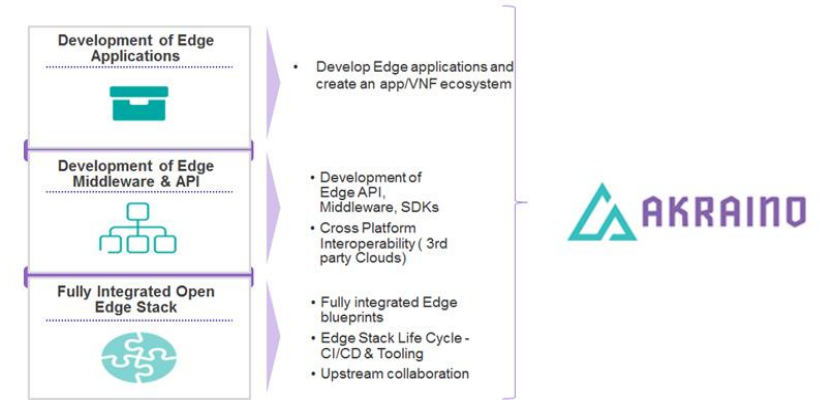
- Coordination & Co-operation with Multiple Upstream Open Source Communities/SDOs as:

- Airship,
- OpenStack,
- ONAP,
- ETSI MEC,
- GSMA,
- TIP,
- CNCF
- O-RAN

Objective: To deliver a fully integrated stack



What is Akraino? Everything About Edge – Akraino is the Edge Project



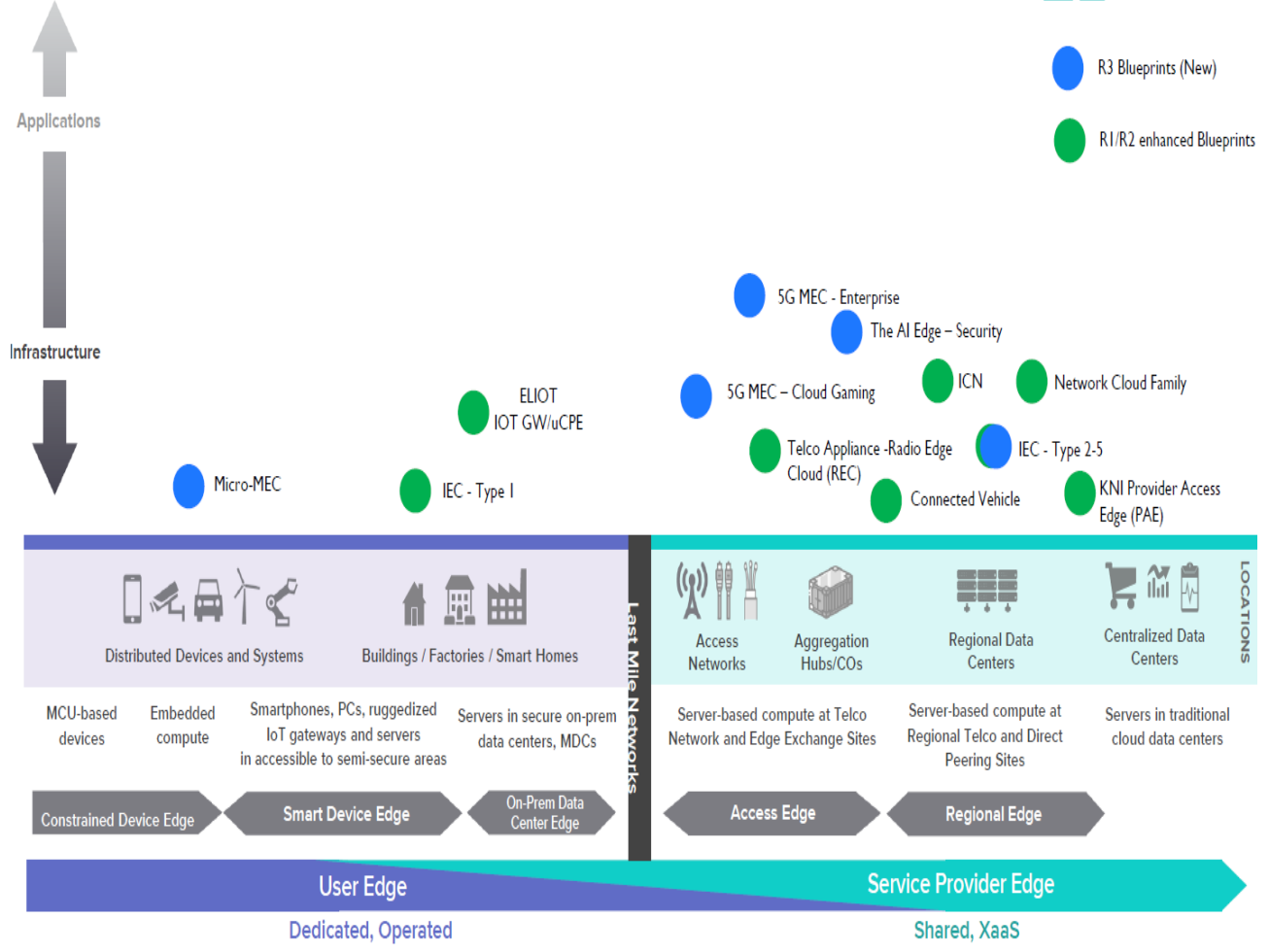
1. Akraino Project R3 Overview - 2

- Akraino Release 3 (R3) - approved in August 2020
- Akraino Release 3 (R3) included 6 new Blueprints:
 1. 5G MEC/Slice System to Support Cloud Gaming, HD Video and Live Broadcasting Blueprint
 2. The AI Edge: Education Video Security Monitoring;
 3. Micro-MEC
 4. IEC Type 3: Android Cloud Native Applications on Arm servers on the Edge
 5. IEC Type 5: SmartNIC for Integrated Edge Cloud
 6. Enterprise Applications on Lightweight 5G Telco Edge

Akraino R3 Blueprints

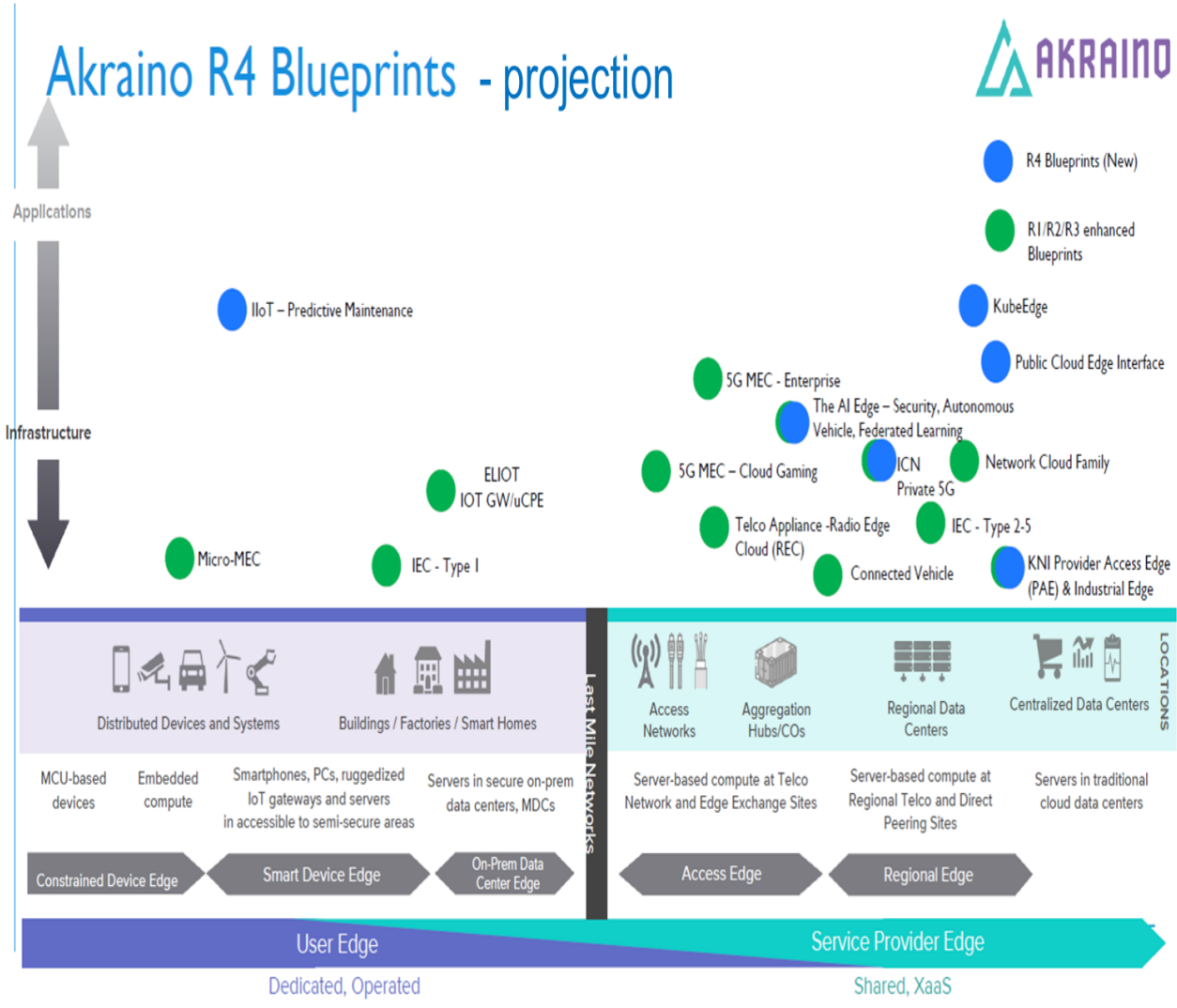


- R3 Blueprints (New)
- R1/R2 enhanced Blueprints



1. Akraino Project R3 Overview - 3

- Akraino Release 4 (R4) - projected early Q1 2021
 - Connected Vehicle,
 - AR/VR oriented Edge Stack for Integrated Edge Cloud (IEC),
 - Radio Edge Cloud (REC),
 - The AI Edge: Intelligent Vehicle-Infrastructure Cooperation System(I-VICS),
 - 5G MEC/Slice System to Support Cloud Gaming,
 - HD Video and Live Broadcasting,
 - IEC Type 3: Android Cloud Native Applications on Arm Servers in Edge for Integrated Edge Cloud (IEC),
 - Enterprise Applications on Lightweight 5G Telco Edge, Public
 - Public Cloud Edge Interface (PCEI),
 - The AI Edge: Federated ML Application at Edge,
 - Private LTE/5G ICN
 - IoT Workloads at the Smart Device Edge - Predictive Maintenance (with a Thermal Imaging Camera, Vibration Sensors).



2. Akraino Technology Information flow - 1



ETSI MEC: An Introduction

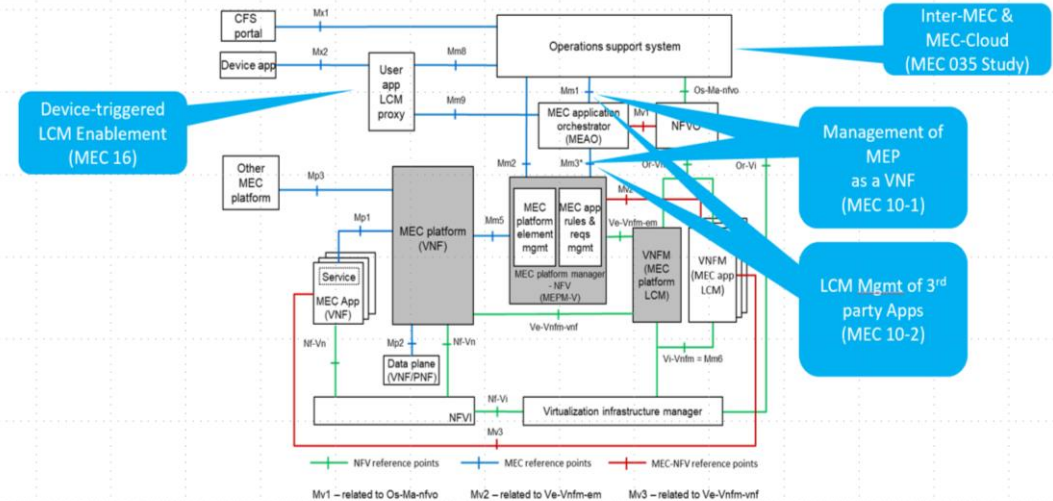
(almost) everything you want to know about ETSI MEC

Presented by: **Alex Reznik, ISG Chair**
ETSI MEC Leadership Team

For: **Public consumption**
Akraino TSC
Sept 23-24, 2020



A key part of ETSI Network Automation Standards



ZSM: overall approach → NFV, OSM: managing telco clouds → MEC: managing edge telco clouds



ETSI Forge OpenAPI repository

The screenshot shows the ETSI Forge OpenAPI repository interface. A list of APIs is displayed, with several highlighted in a blue circle:

- Mobile Edge Platform Application Enablement API - GS 011
- Radio Network Information API - GS 012
- Location API - GS 013
- UE Identity API - GS 014
- Bandwidth Management API - GS 015
- UE Application Interface API - GS 016

Summary of the initiative:

- Motivation:** Validation; Accessibility; Feedback
- Targeting:** 3rd party developer
- API descriptions:** all publicly available
 - Electronic form (machine readable)
 - Compliant to the OpenAPI Specification
 - Automated compliance checking
- OAS offers:**
 - Interactive documentation
 - Auto client/server communication stub generation
 - Multiple language support, e.g. Node.js, Java, Go

<https://forge.etsi.org>

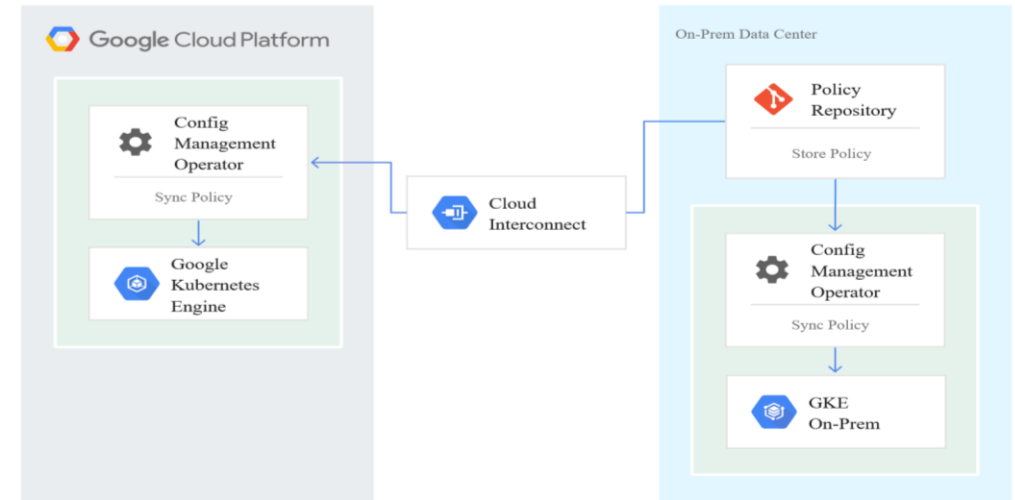
2. Akraino Technology Information flow - 2 Centralized config management

Google Anthos

by

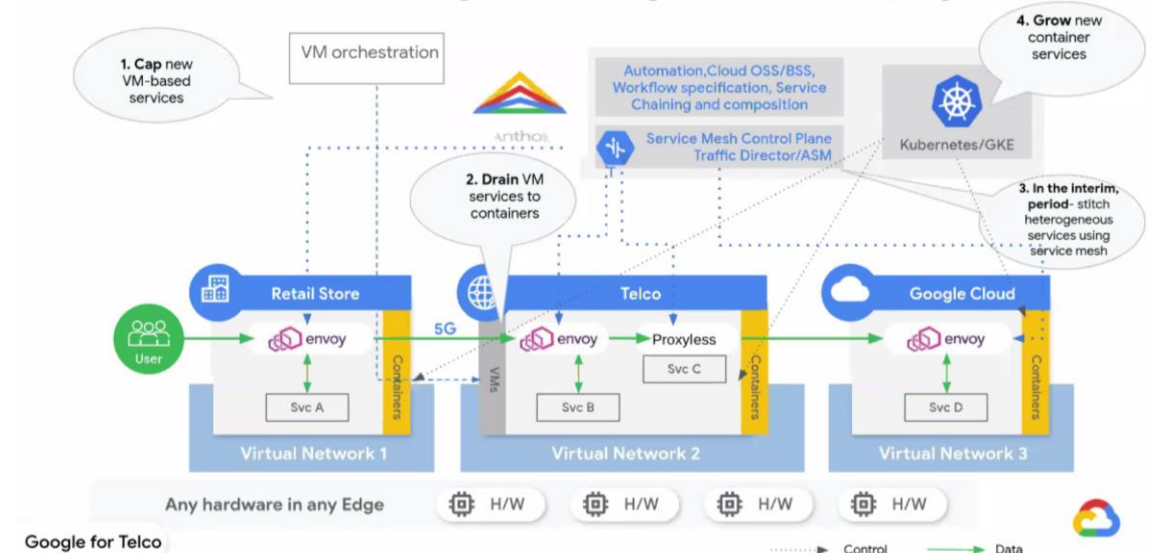
Prajakta Joshi

Akraino TSC
2020-10-06



Anthos Config Management architecture (click to enlarge)

Service Mesh: Manage heterogeneity + Cap-grow-drain



2. Akraino Technology Information flow - 2

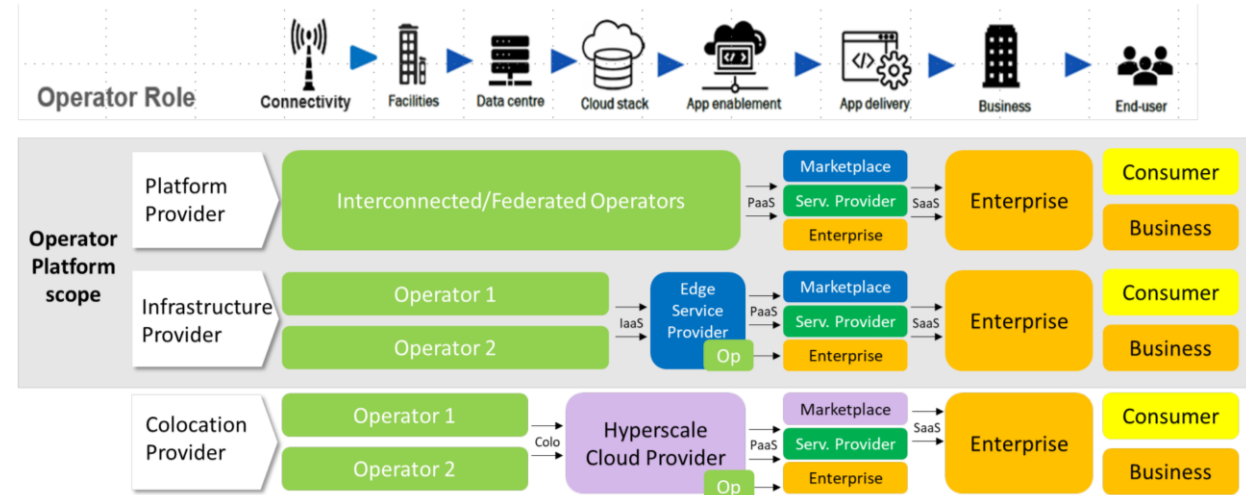
Telefonica

Telco Edge Cloud Goals and Enablers

Diego R. López
Telefonica

Akraino TSC
2020 - 11 - 06

The Value Chain



#RECONNECTA

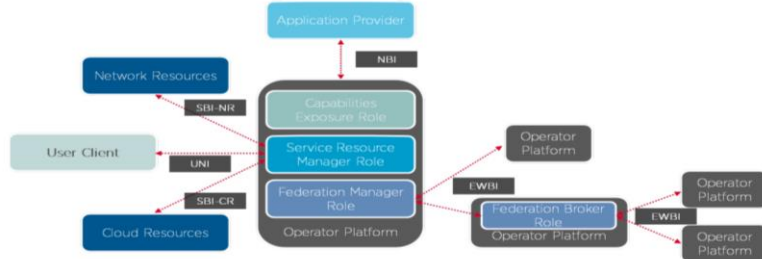
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The Unified Edge Theory

- The edge environment has to work as a single cloud provider
 - Consistent APIs for developers: *Build once, run anywhere*
 - Support for different deployment styles
 - Multi-dimensional openness
- The Ultimate Goal: In-Network Computing
 - A service continuum based on
 - Programmable network devices
 - Languages and abstractions to implement network functions
 - Data-plane abstractions and new network protocols to efficiently federate decentralized computing
 - Decentralized security and discovery mechanisms
 - End-to-end orchestration of all kind of resources and functionalities

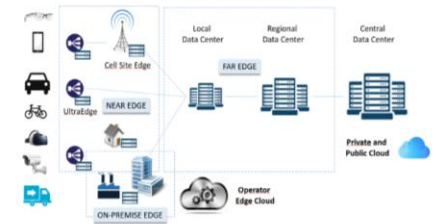
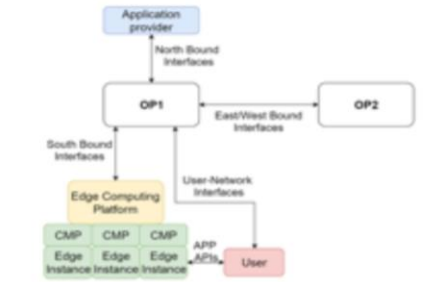
The Framework



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2. Akraino Technology Information flow - 3

Mapping ETSI MEC Architecture to MEF LSO Architecture

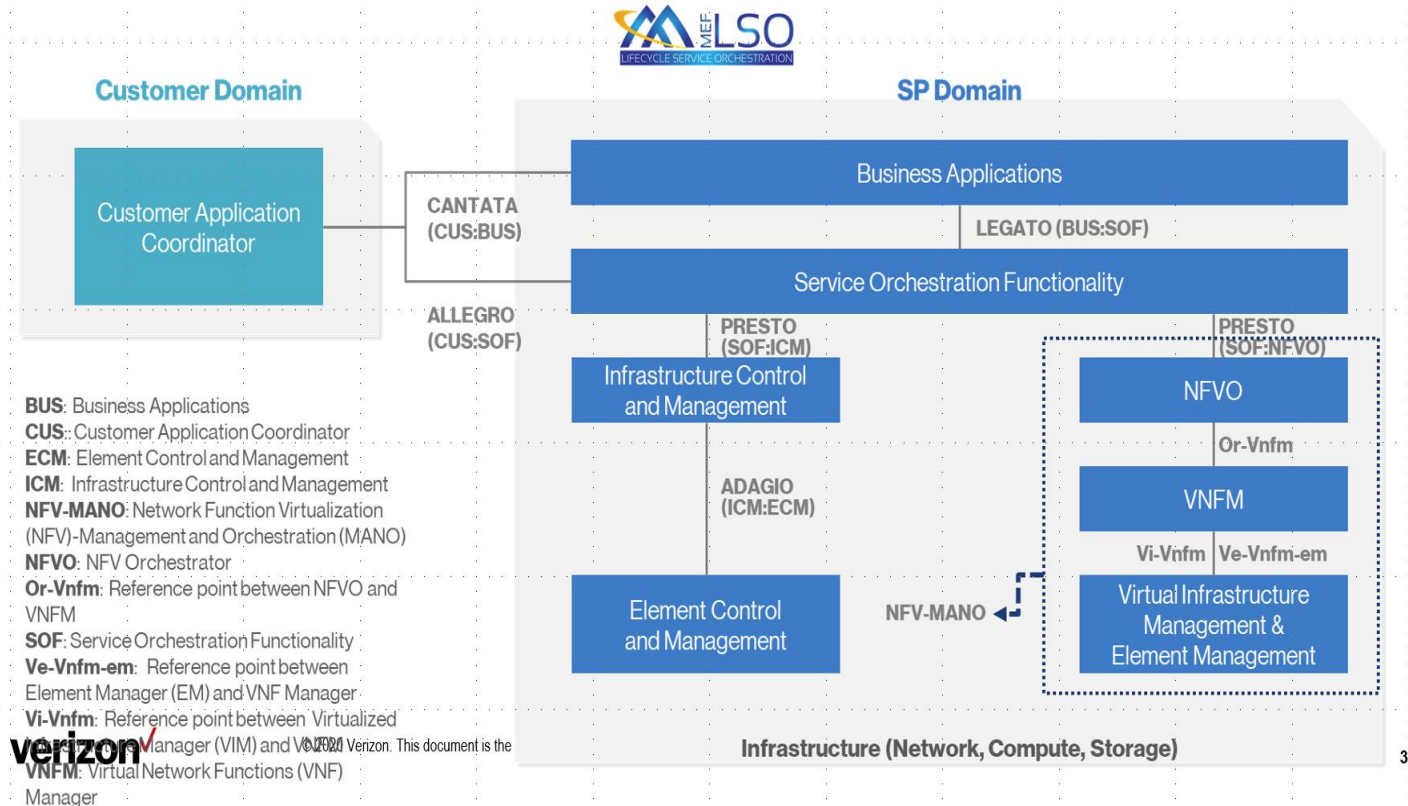
Mehmet Toy, Ph.D
 Ass. Fellow
 Verizon

December 2020



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Lifecycle Orchestration of MEC Services [MEF 55.1]




2. Akraino Technology Information flow - 4

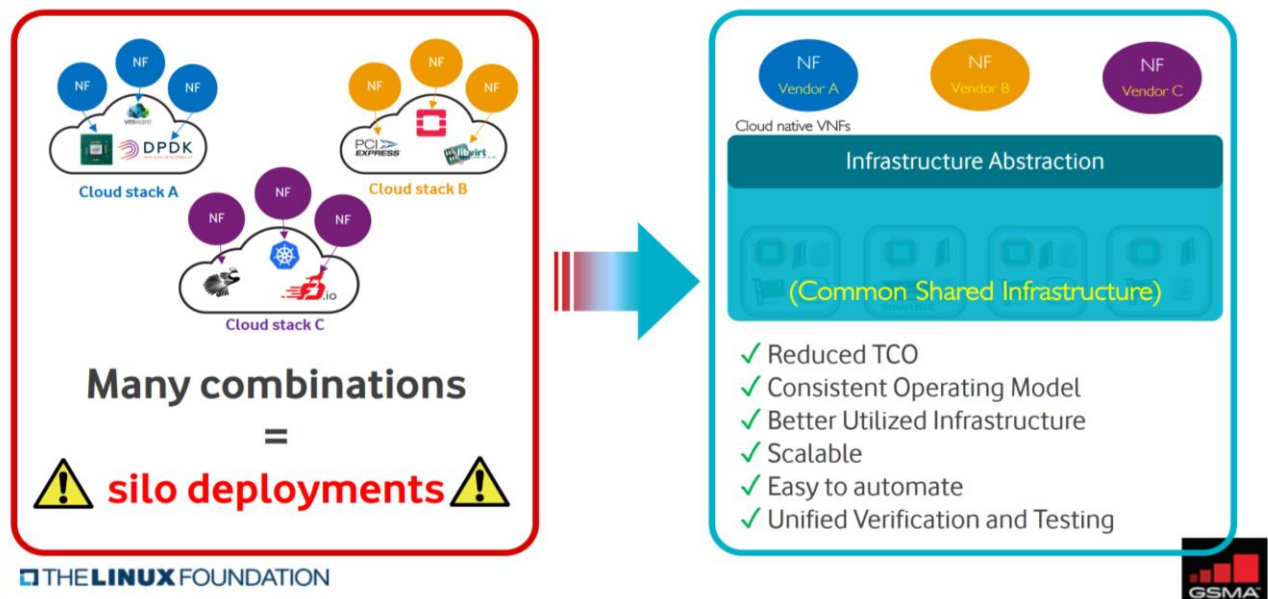
Anuket – Telecom Reference Infrastructure for SDN Functions

Project Update

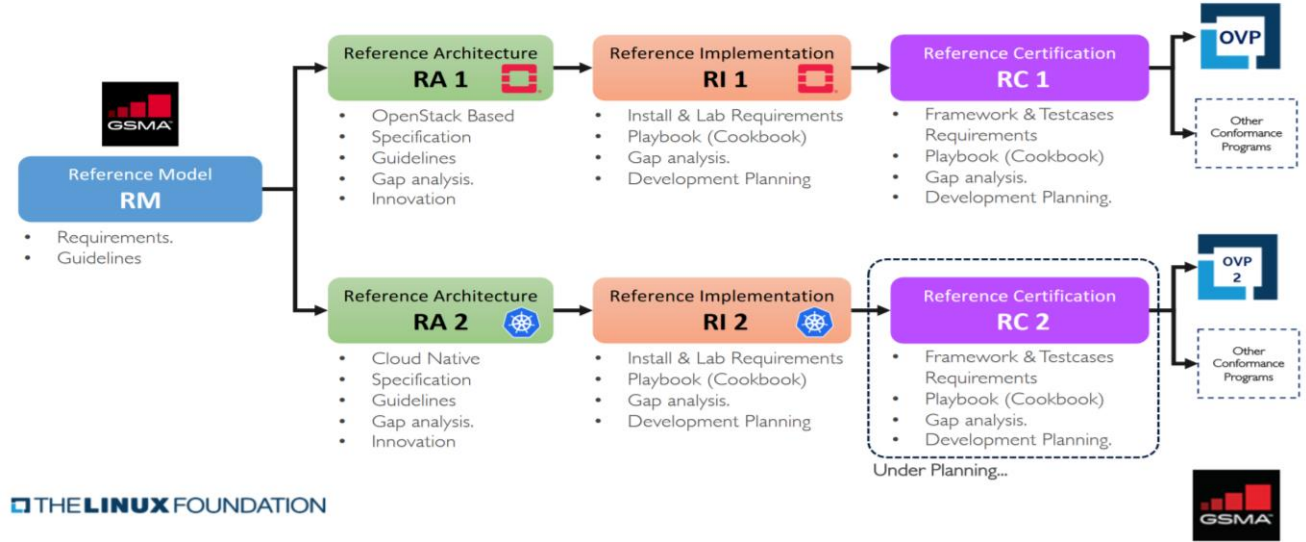
Sukhdev Kapur, Distinguished Engineer, Juniper Networks
 Beth Cohen, Verizon
 December 17, 2020



Anuket | Problem Statement



Anuket | Workstreams (WS)



3. Akraino 2021 API related activities - 1

Akraino API Sub-committee TSC Mission:
Chair: [Jeff Brower](#) Co-Chair: [Jane Shen](#)

Develop an API Plan for the Akraino BPs Collaboration + Development.

The TSC has asked the API subcommittee to identify commonality between APIs, and possibly identify a “base” set of Akraino Edge Computing APIs.

This is future work, under discussion.

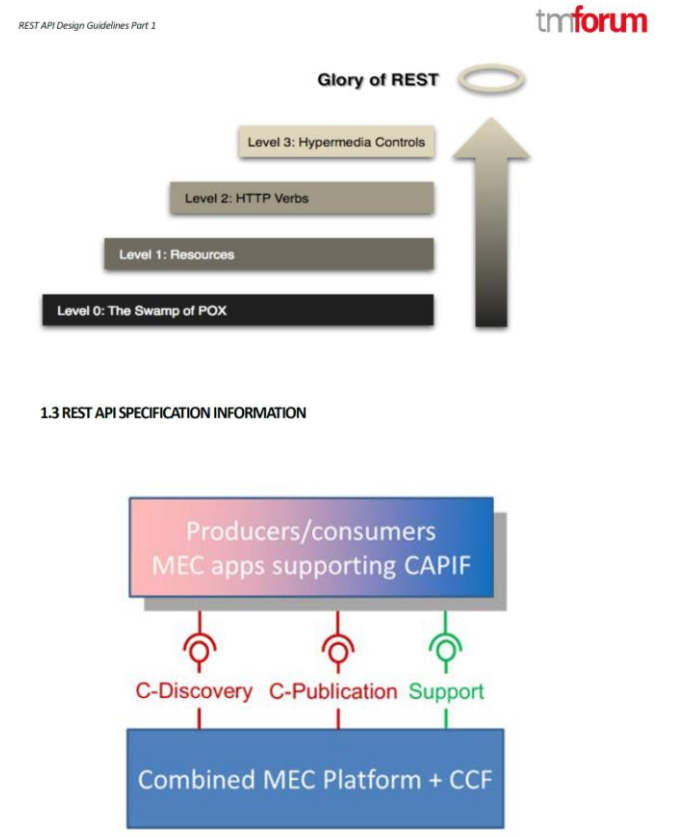


Figure 4.3.3-1: Fully-integrated hybrid deployment of CAPIF and MEC

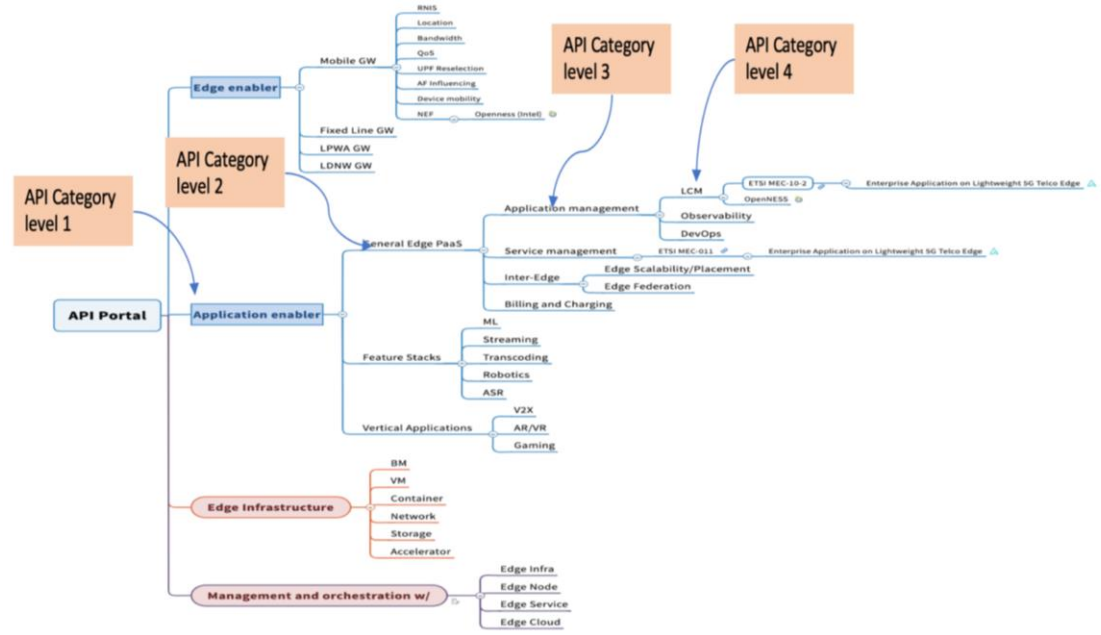
3. Akraio 2021 API related activities - 2

Akraio Blueprint Projects R4 API Reporting Requirements

- All R4 BPs Project APIs will be organized and published on the [API map](#) page of the Akraio [API Portal](#).
- The API Portal will include both:
 - API Map Navigation and
 - Search Capability
- In addition to BP Projects' mandatory baseline API info, optional information about:

- (a) Telco Network Interface APIs, and
- (b) Kubernetes Environment APIs Info will be collected.

- This will be used to support:
- One-stop API Presentation,
 - Analysis, Comparison, finding similar APIs, and
 - Sandbox/Sample Code.



1. After you enter a Project Name, drop down menus will become available

Akraio Blueprint Project API Information

APIs Offered by Your Project (Mandatory)											
Project Name	API Category Level 1	API Sub-category Level 2	API Sub-category Level 3	API Sub-category Level 4	API Document Link	Protocols	OpenAPI Compliance?	Swagger Available?	API Code Available?	Sample Code Available?	Sandboxes Available?
MyProject											
Comments:											

2. Select API categories and other info. These columns are mandatory

Mandatory!

3rd Party APIs Consumed in Your Project (Mandatory)			APIs in Kubernetes Environment (Optional)			Telco Network APIs (Optional)					
No.	API Category Level 1	API Sub-category Level 2	API Sub-category Level 3	API Sub-category Level 4	3rd Party API Link	API ResourceID	API Aggregator	Independent APIs	Network Category	Specifications/ Compliance	Targeted Developer Group
1											
2											

3. If your project is built on top of Kubernetes, let us know which APIs you consume or offer

4. If your project is offering or consuming telco network APIs, please fill in these fields





Questions?