

A network diagram background consisting of numerous yellow circular nodes connected by thin blue lines, set against a dark blue gradient background.

LF Edge TAC Technical Advisory Council

10 March 2021

 THE **LINUX** FOUNDATION

 **LF** EDGE

Meeting Details

- › March 10, 2021 (@ 7:00am PST)
- › Meeting Info:
 - › Meeting URL: <https://zoom.us/j/94796108342?pwd=VjlaMTBxcXFOQ3pVcU85NTJvWkxaZz09>
 - › Calendar Subscription: <https://lists.lfedge.org/g/TAC/calendar>

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LF Edge TAC

Project/Member	Representative	Named Alternate	Project/Member	Representative	Named Alternate
Altran	Shamik Mishra	Nilanjan Samajdar	HP Inc.	Henry Lau	
Arm	Reed Hinkel	Tina Tsou	Huawei	JianGuo Zeng	Gabriel Yuyang
AT&T	Kaustubh Joshi (KJ)		IBM	Joseph Pearson	Ryan Anderson
Baidu	Leding Li		Intel	Jim St. Leger (TAC Chair)	Sharad Mishra
Charter	Jeffrey Saelens	Mohammad Zebetian	Nokia	Tapio Tallgren	
Dell	David Lake	Trevor Conn	NTT	Takeshi Kuwahara	
Dianomic	Mark Riddoch	Tom Arthur	OSIsoft	Daniel Lazaro	
Equinix	Justin Dustzadeh		Radisys	Adnan Saleem	Prakash Siva
Ericsson	Torbjörn Keisu	Andrew Wilkinson	Red Hat	Anil Vishnoi	Thomas Nadeau
Fujitsu	Toshimichi Fukuda	Hatsumi Iino	Samsung	MyeongGi Jeong	Chi-Hyun Cho
Futurewei	Chaker Al-Hakim	Deepak Vij	Tencent	Yachen Wang	Wei Chen

LF Edge TAC

Project/ Member	Representative	Named Alternate	Project/ Member	Representative	Named Alternate
Western Digital	Jorge Campello De Souza		Akraino	Tina Tsou	Oleg Berzin
Wipro	Subhas Mondal		EdgeX Foundry	Henry Lau	
ZEDEDA	Erik Nordmark	Roman Shaposhnik			

Topics

1. Home Edge [CII Best Practice Badge](#)
2. Akraino R4 Overview
3. Akraino Blueprints
 - a. Re-introduction to include BP requirements (e.g. all open source; commercial hardware components, etc?)
4. Upcoming Events / Next Meeting

Home Edge CII Best Practice Badge

Taras Drozdovskyi

CII Best Practices **passing** (achievement)

CII Best Practices 100% [Projects](#) [Sign Up](#) [Login](#)



Home Edge Project in LF Edge (edge-home-orchestration-go)

[Expand panels](#) [Hide all details](#) [Hide met & N/A](#)

Projects that follow the best practices below can voluntarily self-certify and show that they've achieved a Core Infrastructure Initiative (CII) badge. [Show details](#)

If this is your project, please show your badge status on your project page! The badge status looks like this: `cii best practices passing` Here is how to embed it: [Show details](#)

These are the `passing` level criteria. You can also view the `silver` or `gold` level criteria.

Basics	12/12
Change Control	9/9
Reporting	8/8
Quality	13/13
Security	16/16
Analysis	8/8

Thanks to everyone who took part in achieving



Peter Moonki Hong • 1st

Staff Engineer in Samsung Research Open Source Group (Samsung Electronics)

1w • Edited • 



We are happy to announce that we have passed the required criteria for the CII Best Practice badge process. This cannot be done without all your passionate and diligent contributions and supports, and we promise that this is not the end. We will consistently make our community much healthier, more secure and attractive for the developers of our community members.

Thank the committers of [#HomeEdge](#), [Taras Drozdovskyi](#), [Taewan Kim](#), [MyeongGi Jeong](#), [Sunchit Sharma](#), [Dwarkaprasad Dayama](#), and our community advocate, [Suresh L C](#) to make this happen, and also specifically appreciate [Arpit Joshipura](#), [Brett Preston](#), [Eric Ball](#), and [Jill Jensen Lovato](#) from LF and [Jim White](#) [#EdgeXFoundry](#) in [#LFEde](#) for your great advises and helps. Plus, we would also like to thank [SOMANG PARK](#) for her professional compliance recommendation and guidance in releasing our codes with satisfying the guideline from the OSI standard.

What is CII Best Practices badge?



“The [Linux Foundation \(LF\) Core Infrastructure Initiative \(CII\)](https://bestpractices.coreinfrastructure.org/en) Best Practices badge is a way for Free/Libre and Open Source Software (FLOSS) projects to show that they follow best practices.”

“Projects can voluntarily self-certify, at no cost, by using this web application to explain how they follow each best practice.”

“To earn a badge, all **MUST** and **MUST NOT** criteria must be met, all **SHOULD** criteria must be met **OR** be unmet with justification, *and* all **SUGGESTED** criteria must be met **OR** unmet (we want them considered at least).”

<https://bestpractices.coreinfrastructure.org/en>

Some badge earners



CII Best Practices structure

Basics

- Identification
- Basic project website content
- FLOSS license
- Documentation
- Other

Quality

- Working build system
- Automated test suite
- New functionality testing
- Warning flags

Change Control

- Public version-controlled source repository
- Unique version numbering
- Release notes

Security

- Secure development knowledge
- Use basic good cryptographic practices
- Secured delivery against man-in-the-middle (MITM) attacks
- Publicly known vulnerabilities fixed
- Other security issues

Reporting

- Bug-reporting process
- Vulnerability report process

Analysis

- Static code analysis
- Dynamic code analysis

CII Best Practices' benefits

Benefits achieved on the way to getting the CII Best Practices **passing** badge:

- ❑ Improved documentation:
 - Security and Testing policy
 - How to Contributing Guide
 - Descriptions External APIs
- ❑ Improved the build and testing system
 - CI infrastructures: **Github->Actions - 20 checks**
 - Integrated of external software tools for analysis code:
 - **gofmt** - 92%;
 - **go_vet** - 100%;
 - **golint** – 76%;
 - **SonarCloud**: Security Hotspots – 37 -> 0; Code Smells – 253 -> 50; Duplications – 7.8% -> 2.3%
- ❑ Improved security analysis:
 - Integrated **CodeQL Analysis, LGTM** services: 17 -> 0 Security Alerts

We are sure that these are not final estimates!

Recommendations for achieving the badge



The main thing is to start

Determine the basic content of the project site, license, documentation

Determine versioning and ways of interaction with external developers

Set up a build system and automated testing

Set up a build system and automated testing

Apply systems to improve code and fix bugs

Maintain links and compliance with stated claims

Next steps



Further improving the [Edge-Home-Orchestration](#) project and achieving “*silver*” and “*gold*” badges

Implementation of [OpenSSF](https://openssf.org/) (<https://openssf.org/>) protected code development practices into [Edge-Home-Orchestration](#)



Special attention should be paid to the **Secure Scorecards** project for automated analysis

<https://github.com/ossf/scorecard>

The following checks are all run against the target project:

Name	Description
Security-Policy	Does the project contain a security policy ?
Contributors	Does the project have contributors from at least two different organizations?
Frozen-Deps	Does the project declare and freeze dependencies ?
Signed-Releases	Does the project cryptographically sign releases ?
Signed-Tags	Does the project cryptographically sign release tags?
CI-Tests	Does the project run tests in CI, e.g. GitHub Actions , Prow ?
Code-Review	Does the project require code review before code is merged?
CI-Best-Practices	Does the project have a CI Best Practices Badge ?
Pull-Requests	Does the project use Pull Requests for all code changes?
Fuzzing	Does the project use fuzzing tools, e.g. OSS-Fuzz ?
SAST	Does the project use static code analysis tools, e.g. CodeQL , SonarCloud ?
Active	Did the project get any commits in the last 90 days?
Branch-Protection	Does the project use Branch Protection ?
Packaging	Does the project build and publish official packages from CI/CD, e.g. GitHub Publishing ?

CII Best Practices Badge

- › Identifies a set of best practices for OSS projects, focusing on security
- › Provides a mechanism for projects to self-certify that they meet these criteria
 - › Automation helps & prevents some false answers
- › Full presentation here:
 - › <https://github.com/coreinfrastructure/best-practices-badge/blob/master/doc/cii-bp-badge-intro.pptx>
- › Website where projects can receive a badge here:
 - › <https://bestpractices.coreinfrastructure.org>
- › EdgeX Foundry, Home Edge and Open Horizon badging already in progress!
 - › <https://bestpractices.coreinfrastructure.org/en/projects/1226>
 - › <https://bestpractices.coreinfrastructure.org/en/projects/4336>
 - › <https://bestpractices.coreinfrastructure.org/en/projects/4300>
- › LF Edge Wiki tracks badge progress here: <https://wiki.lfedge.org/>
- › Proposal: All LF Edge projects be encouraged to get a CII Best Practices badge

Akraino R4 Overview

Tina Tsou

Oleg Berzin

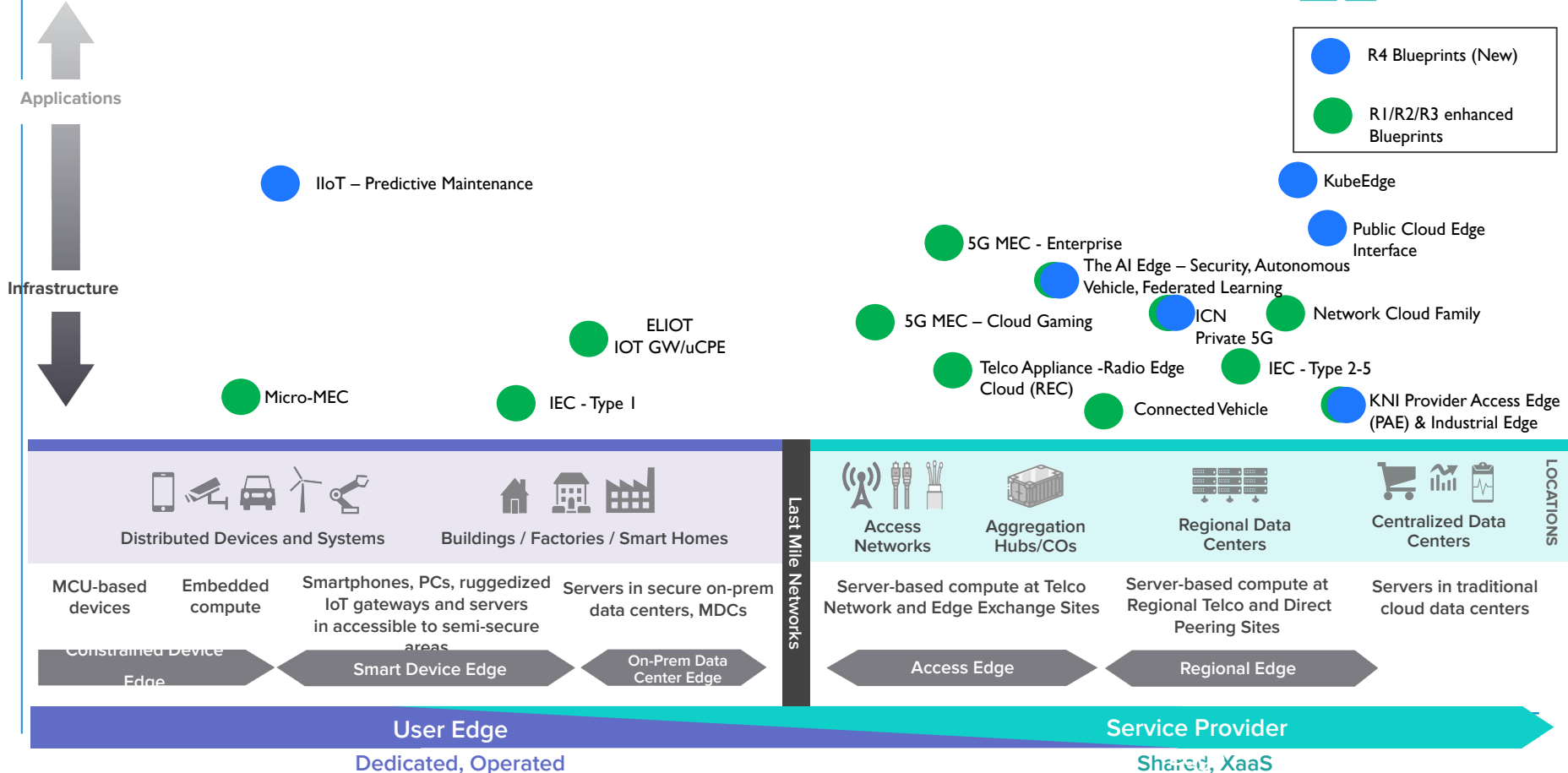
Akraino Release 4: Now available

Akraino Release 4 Enables Kubernetes Across Multiple Edges, Integrates across O-RAN, Magma, and More

- *7 New Akraino R4 Blueprints (total of 25+)*
- *Akraino is Kubernetes-ready with K8s- enabled blueprints across 4 different edge segments (Industrial IOT, ML, Telco, and Public Cloud)*
- *New and updated blueprints also target ML, Connected Car, Telco Edge, Enterprise, AI, and more*

SAN FRANCISCO – February 25, 2021 – [LF Edge](#), an umbrella organization within the [Linux Foundation](#) that creates an open, interoperable framework for edge computing independent of hardware, silicon, cloud, or operating system, today announced the availability of [Akraino](#) Release 4 (“Akraino R4”). Akraino’s fourth release enables additional blueprints that support various deployments of Kubernetes across the edge, from Industrial IoT, to Public Cloud, Telco, and Machine Learning (ML).

Akraino R4 Blueprints



03/01/2021 - 03/03/2021 Akraino Technical Meetings - Spring

<https://wiki.akraino.org/pages/viewpage.action?pageId=28976760> for all the presentation and meeting recordings.

The screenshot shows a web browser window with the following elements:

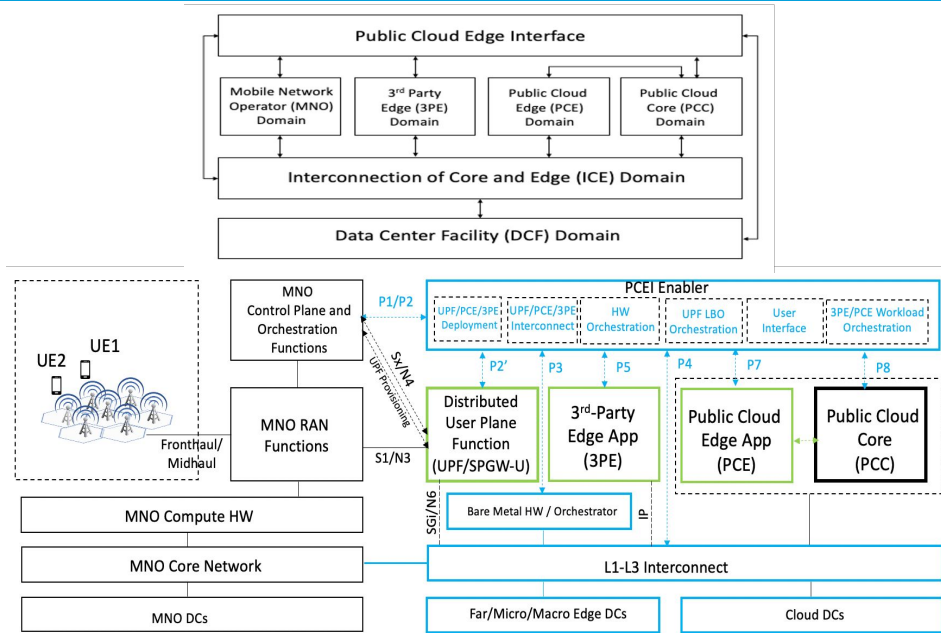
- Browser Tabs:** SuccessFactors Log in, 03/01/2021 - 03/03/2021 Akraino, LF Edge TAC 03.10.2021 - Googl...
- Address Bar:** wiki.akraino.org/pages/viewpage.action?pageId=28976760
- Navigation:** Dashboard / ... / 2021
- Session List:**
 - 7:45 am - 8:15 am:** AWS Wavelength and Outpost by @ Matt Lehwess, AWS. Includes a link to an AWS stream output.
 - 8:15 am - 8:45 am:** Google's Edge Strategy: Use Cases, Platform, Road Ahead by @ Prajakta Joshi, Google.
 - 8:45 am - 9:05 am:** Q&A for above sessions.
- Right Sidebar:** A video thumbnail titled "IEC Type 4 AR/VR - @ Bart Dong, Tencent" with a subtitle "Akraino Technical Meetings: Spring IEC Type 4 AR/VR Blueprint".

R4 Details: New Blueprints

Public Cloud Edge Interface (PCEI)



BP Family: Public Cloud Edge Interface



Purpose/Features:

The purpose of Public Cloud Edge Interface (PCEI) Blueprint is to specify a set of open APIs and orchestration functionalities for enabling Multi-Domain Inter-working across functional domains that provide Edge capabilities/applications and require close cooperation between the Mobile Edge, the Public Cloud Core and Edge, the 3rd-Party Edge functions as well as the underlying infrastructure such as Data Centers, Compute hardware and Networks

Use cases & Applications

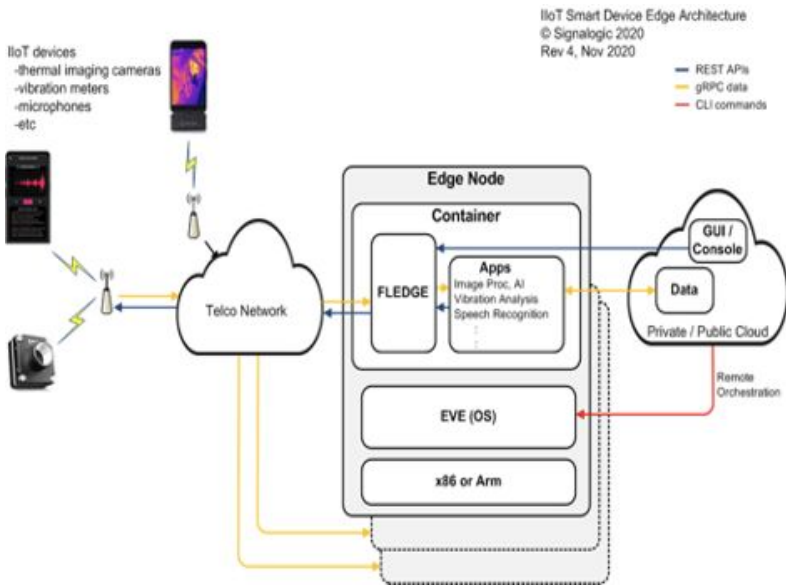
- Edge Multi-Cloud Orchestrator (EMCO) - PCEI Enabler
- Deployment of Azure IoT Edge Cloud Native PCE App
 - Using Azure IoT Edge Helm Charts provided by Microsoft
- Deployment of AWS Green Grass Core PCE App
 - Using AWS GGC Helm Charts provided by Akraino PCEI BP
- Deployment of PCEI Location API App
 - Using PCEI Location API Helm Charts provided by Akraino PCEI BP
- PCEI Location API Implementation based on ETSI MEC Location API Spec
- Simulated IoT Client Code for end-to-end validation of Azure IoT Edge
- Azure IoT Edge Custom Software Module Code for end-to-end validation of Azure IoT Edge

Target Industry: IoT, Developers, Operators, Clouds, DCs, Interconnection

Predictive Maintenance with a Thermal Imaging Camera, vibration sensors, etc.

BP Family: IoT Workloads at the Smart Device Edge

NEW!



Features:

- LF Edge's Project EVE-OS to provide remote management, Zero Trust security (physical and software)
- LF Edge's Fledge as an IIoT framework for sensors, historians, DCS, PLC's, and SCADA systems and connectivity to public or private clouds
- Remote monitoring and updating of applications, without bricking the device
- AI Models, real time data capture, and cleansing at the device edge
- Sample application that can be customized to meet many different Use Cases

Use cases & Applications

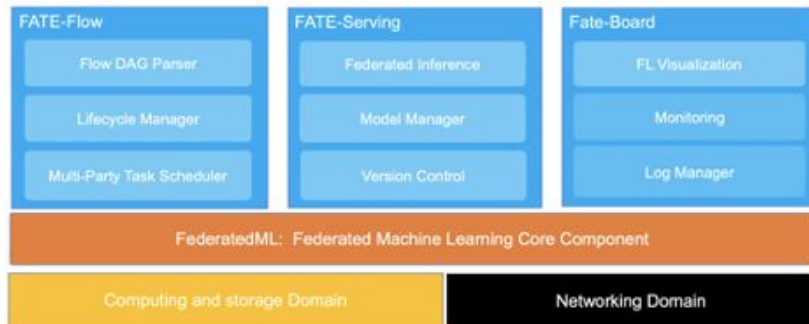
- Predictive Maintenance
- Hazards monitoring (People detection in hazardous area)

Target Industry: Manufacturing, Industrial Shop Floor

The AI Edge: Federated ML Application at Edge

BP Family: AI Edge

NEW!



Target Industry: Driverless cars, Warehouse

Purpose

To provide a Federated Learning Platform that trains Machine Learning algorithm across edge devices without them sharing the data that make up the models.

Features

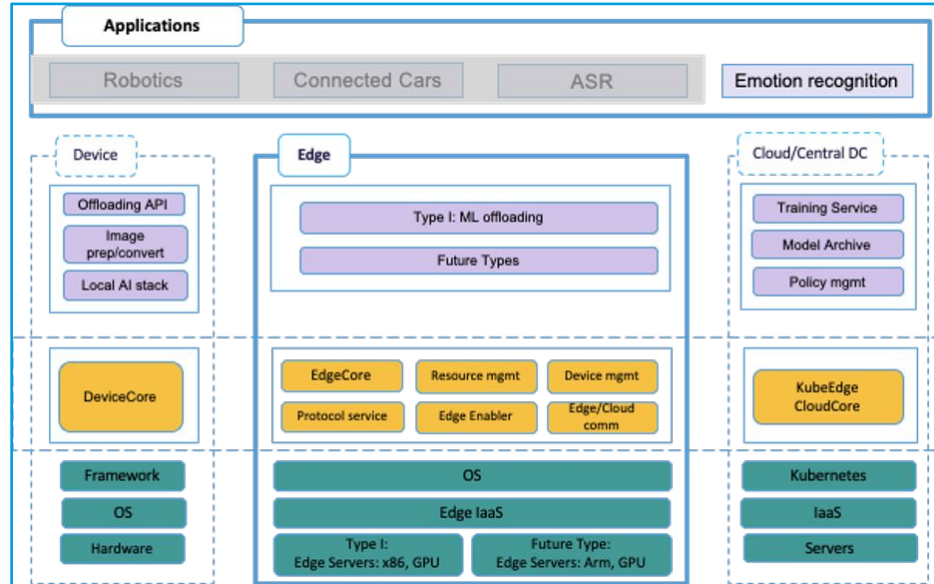
- FATE first unsupervised learning algorithm: Hetero KMeans
- Add Data Split module: splitting data into train, validate, and test sets inside FATE modeling workflow
- Add Data Statistic module: compute min/max, mean, median, skewness, kurtosis, coefficient of variance, percentile, etc.
- Add PSI module for computing population stability index

[Landing Applications of The AI Edge: Federated ML application at edge](#)

KubeEdge Edge Service



BP Family: KubeEdge



Purpose:

- First Release will focus on the ML inference offloading Use Case

Features:

- KubeEdge managed Application deployment and life cycle management
- ML offloading to Edge server
- Cloud(training), Edge (Inference), Device collaboration
-

Target Industry: Smart road, Cold chain logistics, Smart building, etc.

Kubernetes Native Infrastructure for Industrial Edge



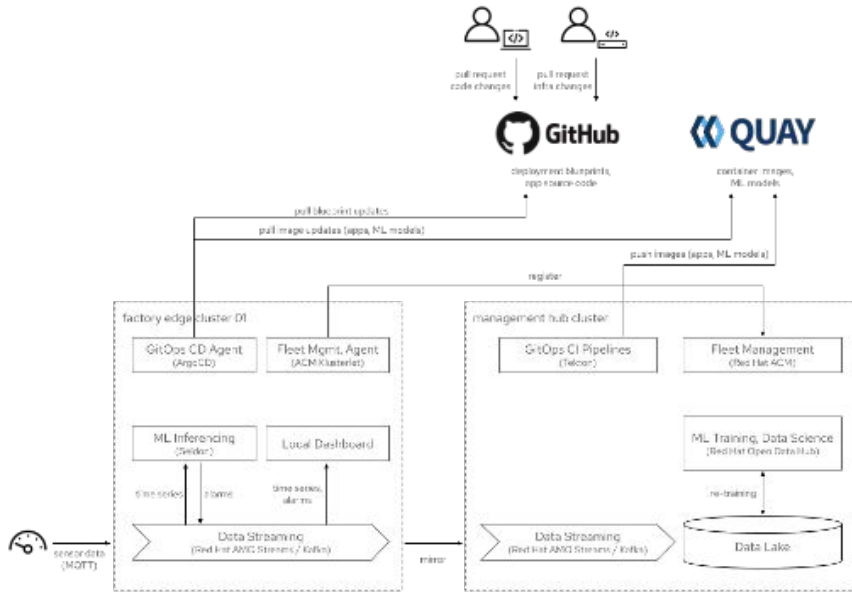
BP Family: KNI

Purpose/Features:

- Managing edge computing clusters from a central management hub by using Advanced Cluster Manager
- GitOps based application deployment with ArgoCD
- Cloud Native CI/CD Pipelines with Tekton
- Event streaming from edge to core with Kafka AMQ Streams and Mirror Maker
- Machine learning as a data scientist with Jupyter Notebook.

Use cases & Applications

- Machine inference-based anomaly detection



Target Industry: Manufacturing

The AI Edge: Intelligent Vehicle-Infrastructure Cooperation System(I-VICS)

BP Family: AI Edge

NEW!



Target Industry: Autonomous Vehicles

Purpose/Features:

- Autonomous Valet Parking

Use cases & Applications

- Starting and testing the behavior planner
- Starting and testing the global planner
- Initializing the NDT localizer
- Running the EKF filter for localization
- Trajectory Following

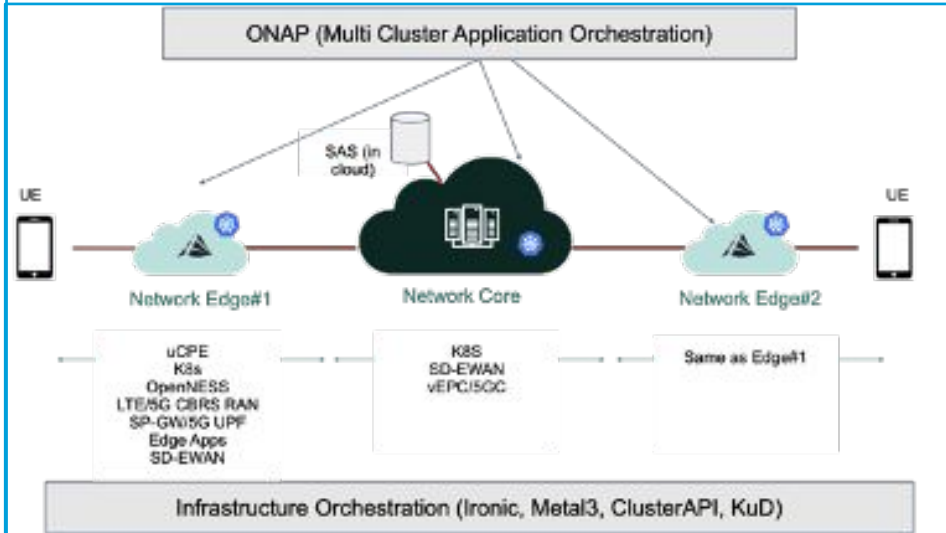
Private LTE/5G ICN

BP Family: ICN



Purpose/Features:

Creating a EPC/5G “in a box” to enable enterprises and operators to deploy LTE/5G
 Uses OSS such as free5GC/Magma



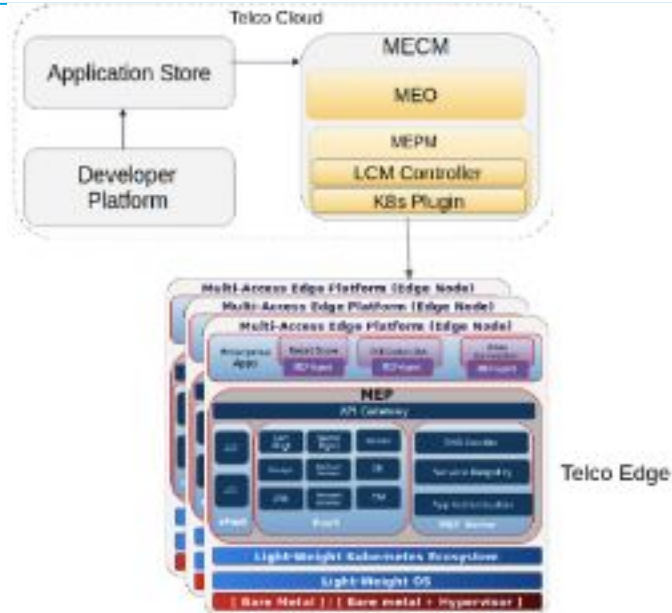
Target Industry: Manufacturing, Retail, Farming, Mining

Existing (R1, R2, & R3) Blueprints

Enterprise Application on Light weight 5G Telco Edge (EALTEdge)



BP Family: 5G MEC/Slice



Target Industry: Telco operators

Purpose/Features:

Provides a complete ecosystem for enterprise applications on light weight 5G Telco Edge. Can be leveraged by Telco operators to provide edge computing capability to it's enterprise users. Overall objective of this blueprint is to provide the following main features.

R4 Improvements

- Leverage EdgeGallery to add application/MEC Edge Orchestrator, Dev Platform, Dev and Tenant Portals
- Built a sample ROBO

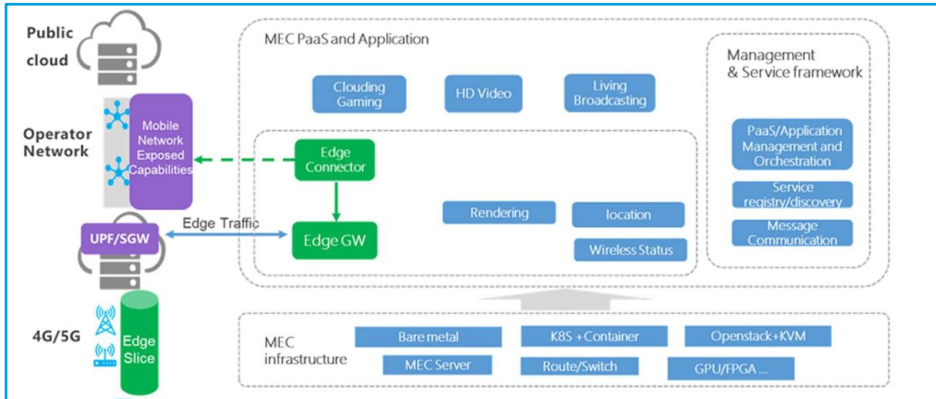
Use cases:

ROBO (Remote office Branch office): Due to limited resource and disaster prone of ROBO sites, edge native storage, Backup and restore on lightweight telco edge is supported. Smart retail with automatic shelf management on ROBO sites is developed and integrated.

Machine Vision on Campus Networks: Centralized processing using wireless cameras, real-time response for detection/feedback; provide shared GPU

5G/MEC Slice System to Support Cloud Gaming, HD Video & Live Broadcast

BP Family: 5G MEC/Slice



Target Industry: Gaming, Video, Broadcast

Purpose/Features:

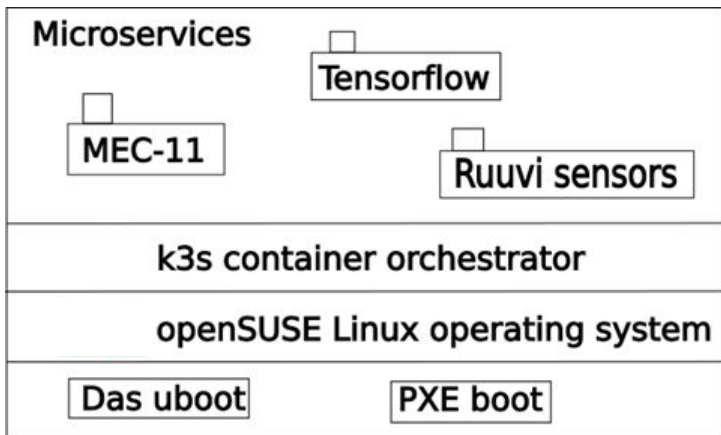
The 5G MEC BP consists of two network elements. One is the edge connector which is deployed in the cloud to enable traffic offloading, subscribe edge slice and implement application lifecycle management etc. The other is the edge gateway which is deployed close to the 4G/5G network to perform traffic steering, Local DNS service and traffic management etc.

Use cases & Applications

- Cloud Gaming
- HD Video
- Live Broadcasting
- Small deployment targeting MEC in access sites or enterprise
- Medium deployment targeting MEC in central offices

Micro Multi-access Edge Computing (MEC)

BP Family: uMEC



Target Industry: Telco Networks

Purpose/Features:

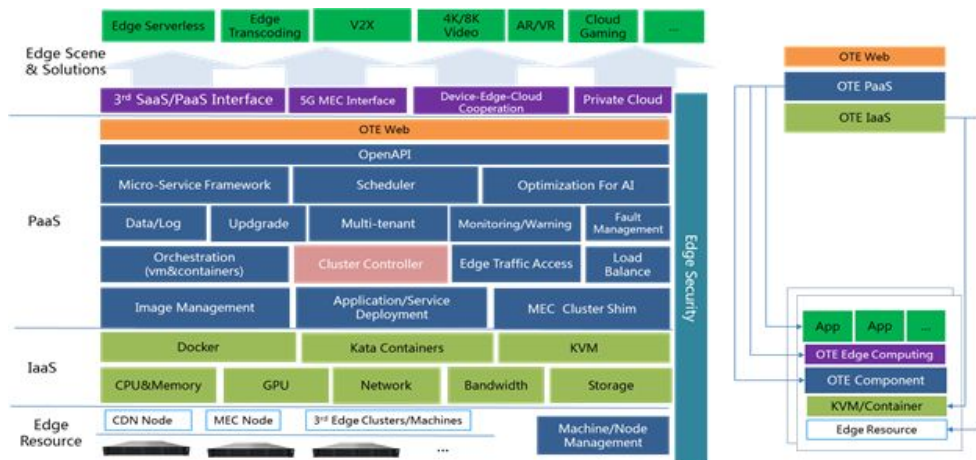
Enables new functionalities & business models on network edge. Benefits include better latencies for end users; less load on network, since more data can be processed locally; and better security and privacy, since sensitive data need not be transferred to a centralized location.

Use cases:

- Fixed installation as part of 5G NR base stations; enables new services that leverage especially low latency, such as AR/VR
- As an extension of the previous, the “Smart City” deployments have additional functions such as weather stations, cameras, displays, or drone charging stations. The control software for these functions would run on the uMEC
- In an Industry 4.0 use case set, the uMEC is deployed as part of a 5G network and would provide a platform for running services for the factory floor
- In a train, the uMEC can collect and store surveillance camera data for later uploading

AI Edge: School/Education Video Security Monitoring

BP Family: AI Edge



Purpose/Features:

Focuses on establishing an open source MEC platform combined with AI capacities at the Edge; can be used for safety, security, and surveillance sectors as well as Intelligent Vehicle-Infrastructure Cooperation Systems.

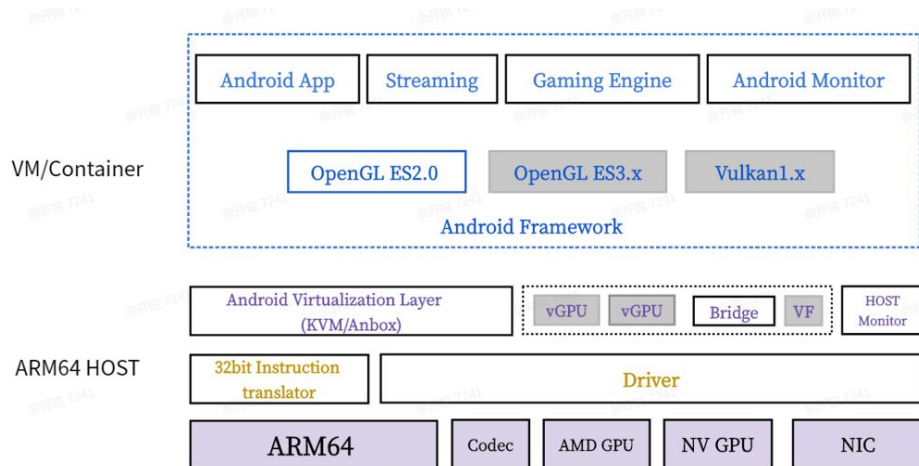
Use cases:

- Hierarchical cluster management
- Duplex channel between cloud center and edge cluster
- Kubernetes native support
- Accurate routing of messages between clusters
- Support both x86 and arm64

Target Industry: Education, Home

IEC Type 3: Arm-Enabled Android Cloud Applications

BP Family: IEC



Target Industry: Entertainment

Purpose/Features:

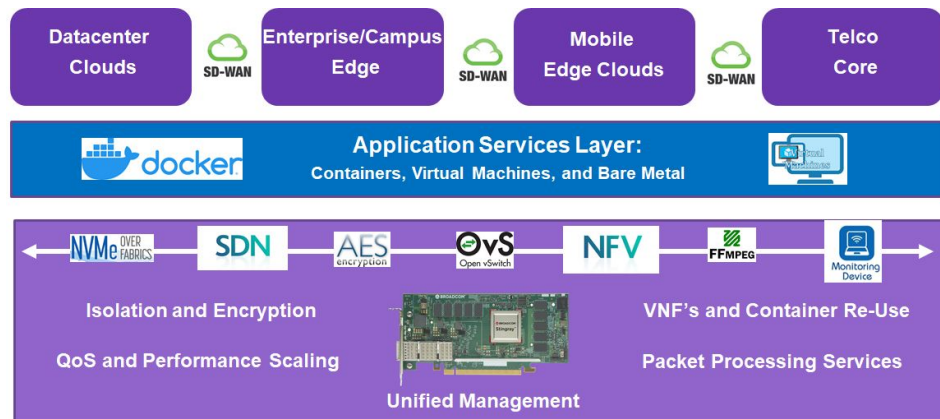
Supports Android applications and services running on Arm-enabled cloud architectures with GPU EC management. Arm-based- cloud games need basic “cloud” features, such as flexibility and broad availability, which is the blueprint’s poropose. IN R4, Android application environment is based on Robox and adding GPU Support.

Use cases:

- **Android Cloud Games:** compress the rendering of game scenes into video and audio streams on the edge Android platform. Then edge cloud server transmits the compressed game pictures to the players' game terminals through a 5G network, and obtains the players' input instructions to realize interaction. End to end latency better =< 20ms.

IEC Type 5: SmartNIC

BP Family: IEC



Target Industry: Telco and other carriers

Purpose/Features:

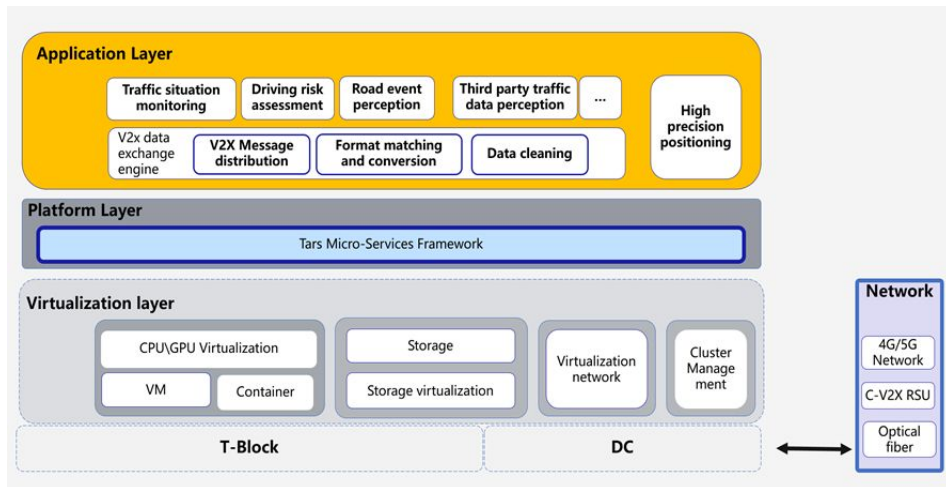
IEC Type 5 is focused on SmartNIC, which can accelerate network performance and provide more management convenience. In general, the architecture consists of two layers: IaaS (IEC), SmartNIC layer. But in R4, we have two simple layers: Host Layer, SmartNIC Layer.

Use cases:

- **CT based OVS-DPDK offload into SmartNic:** accelerates network performance, saves computing resources and providing security managements.
- **Part of the UPF and VPC functions,** like load balancing, forwarding, dpi, etc offloaded into SmartNIC to enhance the performance of UPF that will be deployed in carrier's edge cloud datacenters

Akraino R4 Connected Vehicle Blueprint

Connected Vehicle



Target Industry: Transportation, Auto, Enterprise, IOT, Telecom

Purpose/Features:

Establish OSS edge MEC platform for customized v2x application development. Tested on BM, VM and containers.

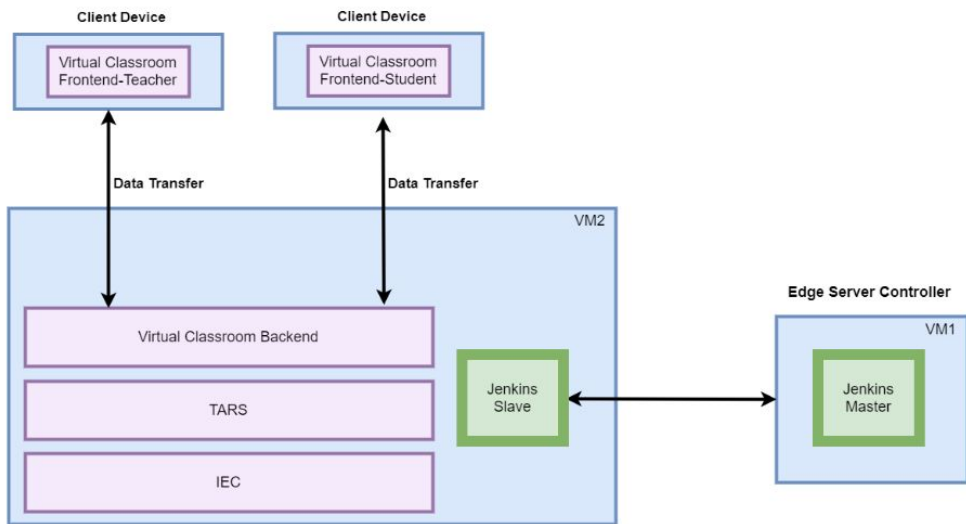
Use cases:

- **Smarter Navigation:** Real-time traffic info, reduced latency - minutes to seconds.
- **Reduce traffic violation:** Alerts drivers to local traffic laws.
- **Cooperative vehicle and infrastructure system:** Identifies potential risks not be seen by driver.

Akraino R2 Integrated Edge Cloud

IEC Type 4: AR/VR Oriented Edge Stack

Updated



Purpose/Features:

- Architecture consists of three layers: IaaS(IEC), PaaS(Tars), SaaS(AR/VR Application)

Use cases:

- (now available) **Virtual classroom:** Simulates virtual classroom, improves online education experiences
- (in progress) **Operation Guidance:** Predicts next step for operations (e.g., assembling Lego blocks, cooking sandwiches, etc)
- (in progress) **Sports Live:** Augments/ simulate sports live, providing immersive watching experience
- (in Progress) **Gaming:** Augments/ simulates game scenario, provides immersive game world

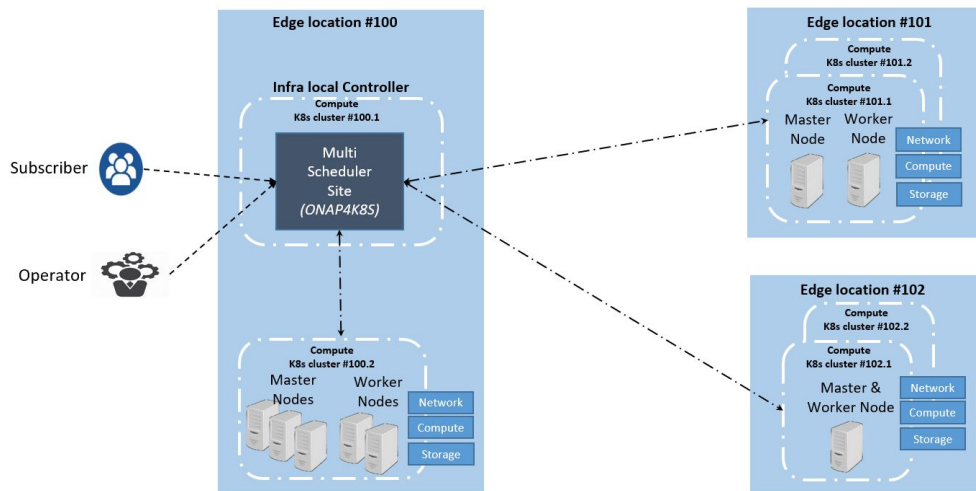
Target Industry : Entertainment, Gaming, Cloud

Akraino R4 Integrated Cloud Native

Integrated Cloud Native (ICN)

Updated

ICN Infrastructure



Target Industry: Telco, Cloud, Enterprise, IOT

Purpose/Features:

- Addresses overall challenges of edge deployments

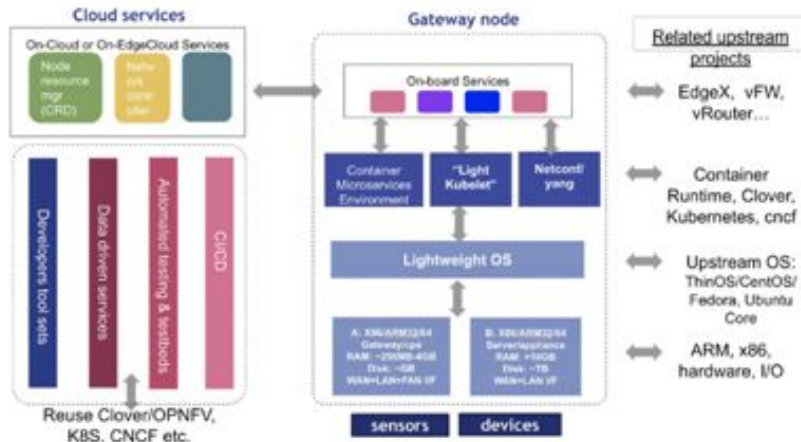
Use cases:

- Zero Touch provisioning (ZTP) using BPA (Metal3, Ironic), BM provider (BMdeployment) and libvirt provider (KVM)
- Kubernetes Deployer (KuD) is being containerized - single solution deploys Multus, OVN, Flannel, accelerator plugins (SRIOV & QAT), NFD, OVN4NFV, EMCO; applications such as Edgex Foundary (IoT Framework), Containerized Firewall (cFW), and SDEWAN
- Enables nested k8s: K8s used to manage both under cloud (BM provider) & over cloud (k8s inside VM)

Akraino R2 Blueprint IOT & Far Edge

Edge Lightweight & IoT (ELIOT) - Gateway & uCPE Blueprints

Updated



Akraino lightweight blueprint - ELIOT - for Edge Lightweight and IoT

Target Industry: IoT, Enterprise, Telco

Purpose/Features:

- Addresses IOT & Universal CPE use case
- Targets IOT Appliances
- Very thin OS and Orchestration
- Full CI/CD deployment ready and verified
- Platform is ready to support different IOT Gateway use cases for Edge computing. Video Analytics is one of use case verified on this platform.

Updates in R2:

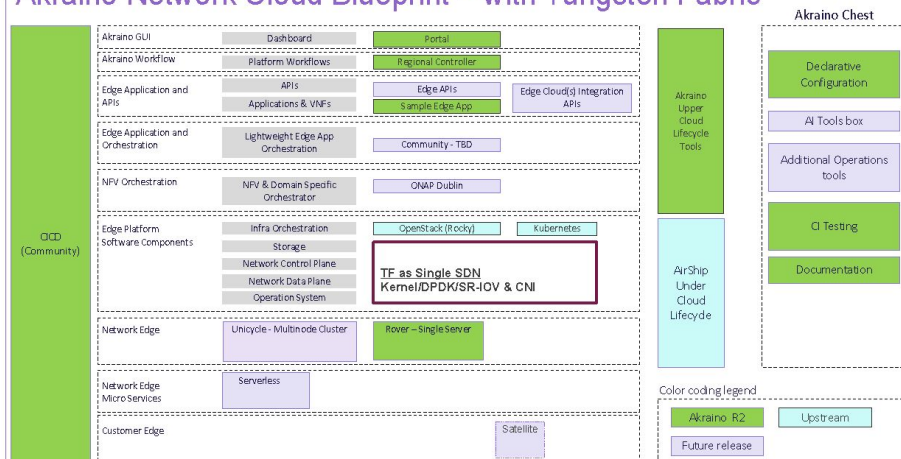
- Integrated EdgeX framework for IIOT
- Supported/verified on Tailored OS, Ubuntu and CentOS
- Single- click installation
- Portal for IOTgateway or uCPE with enabled features like application and platform management
- Enables community validation testing in CI for Hardware, OS and K8s layers.
- OPC-UA test enabled on ELIOT platform.

Akraino R2 Network Cloud & Tungsten Fabric

Network Cloud Powered by Tungsten Fabric

Updated

Akraino Network Cloud Blueprint – with Tungsten Fabric



Target Industry: Telco, Cloud, Enterprise

Purpose/Features:

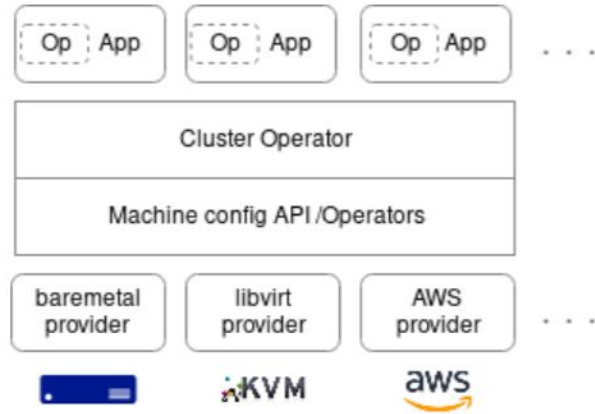
- Implements the Network Cloud with Tungsten Fabric as an SDN Controller, supports CNI for K8s & Neutron plugin for OpenStack
- Enables telco operators to take control of infrastructure

Use cases:

- Supports telco grade applications and a wide variety of VNFs & CNFs
- Offers advanced networking features supported by Tungsten Fabric, such as service chaining, network policies, security, VRRP, route advertisement, flow management, etc.
- Enables deployment of multiple remote edge sites from a single regional controller
- Consolidates settings into a single input file that defines the edge site configuration

Kubernetes Native Infrastructure (KNI)

Updated



Purpose/Features:

- Leverage the best-practices and tools from the Kubernetes community to declaratively and consistently manage edge computing stacks from the infrastructure up to the workloads.
- Supports both containerized and VM-based applications

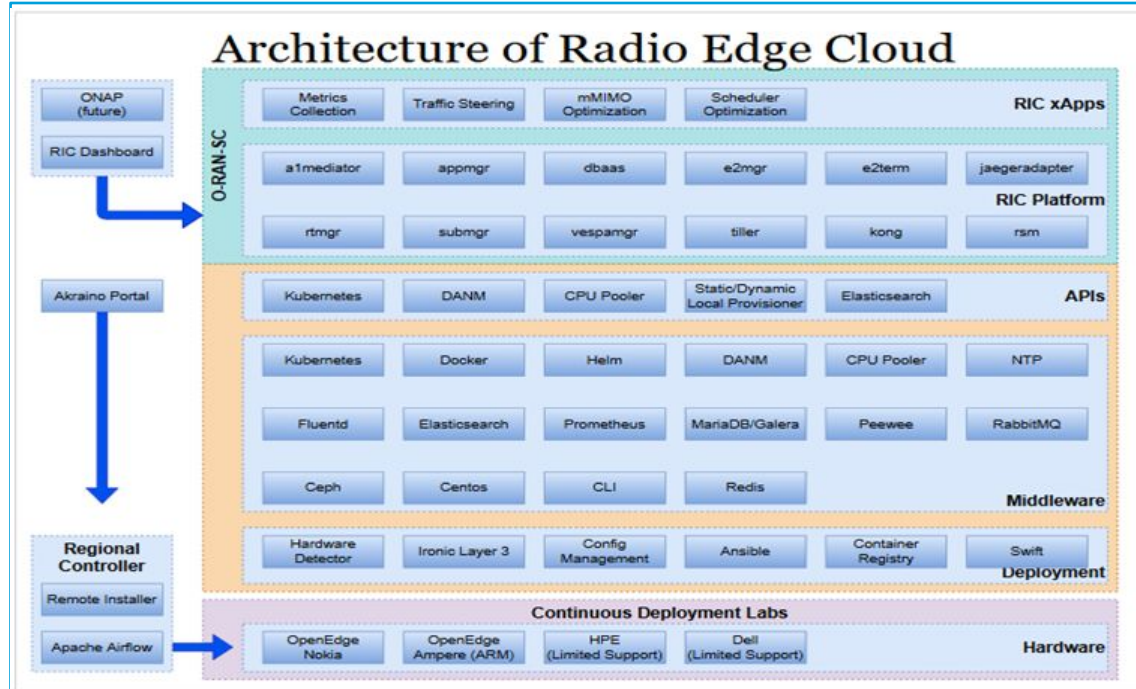
Use Cases/Key Features for R2:

- Lightweight, self-managing clusters based on CoreOS and Kubernetes (OKD distro)
- Support for VMs (via KubeVirt) and containers on a common infrastructure
- Application lifecycle management using the Operator Framework
- Support for real-time workloads using CentOS-rt

Target Industry: Enterprise, IoT

Akraino 5G RAN Telecom Access Use Cases

Updated

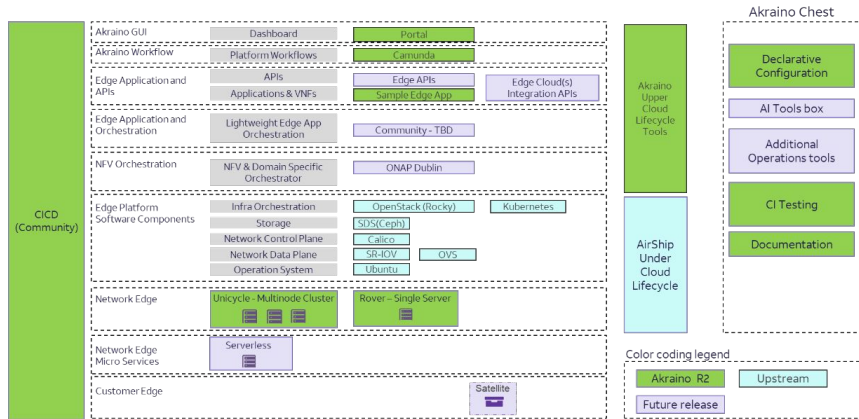


Target Industry: Telecom 5G, Enterprise

Purpose/Features:

- Telco- grade edge cloud platform for near-real time container workloads.
- open-source RAN Intelligent Controller (RIC)
- RIC enables telcos to deploy customizations, in the form of apps, that tailor cell network for specialized needs of customers' own industries
- Automated CD pipeline testing the full software stack
- Integrated with Regional Controller (Akraino Feature Project) for “zero touch” deployment of REC to edge sites

Network Cloud Blueprints: Unicycle with Rover & SR-IOV

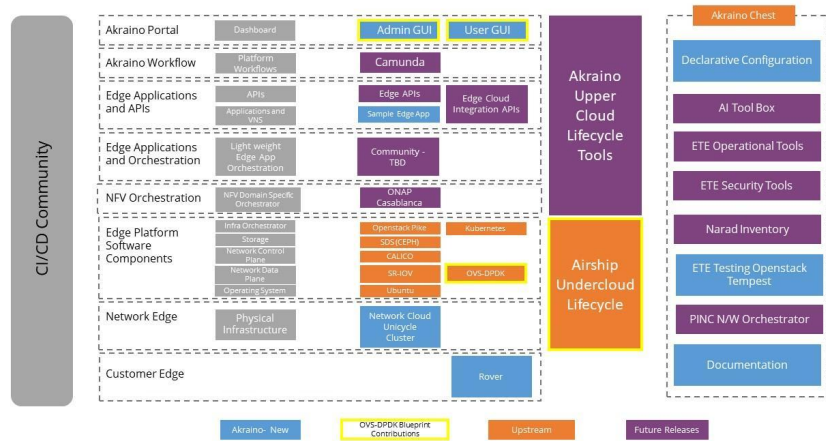


Purpose/Features in R2:

- enables hardware configuration and automated deployment of multiple edge sites from a remote Regional Controller
- Supports telco-grade applications and a wide variety Virtual Network Functions (VNFs)
- Enables deployment of multiple remote edge sites from a single Regional Controller
- Consolidates settings into a single input file that defines the edge site configuration
- Supports single server (Rover) and multi-server (Unicycle) deployments
- Deploys Openstack using Airship Treasuremap release v1.3

Target Industry : Telco, Enterprise

Network Cloud Blueprints: Unicycle with OVS-DPDK



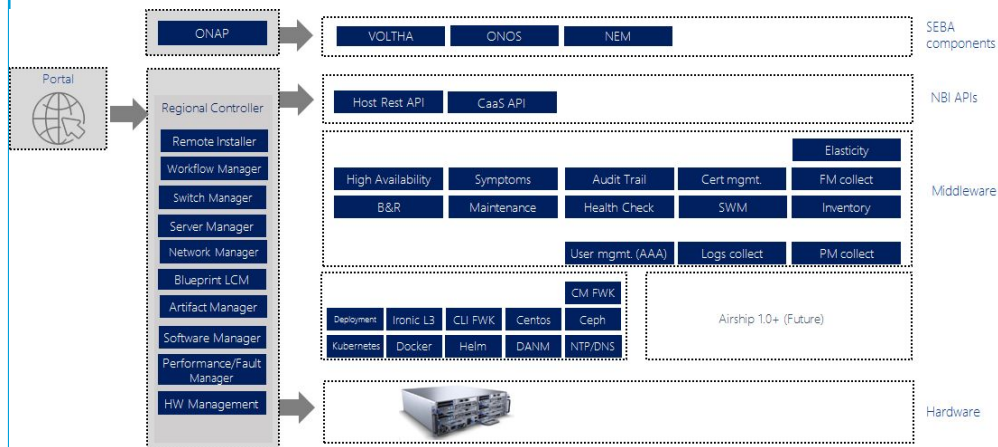
Purpose/Features in R2:

- OVS-DPDK support into existing Network Cloud Unicycle Blueprint Family
- Joint community effort by Ericsson and AT&T
- Integration with Akraiho feature project to add OVS-DPDK support to Airship distribution
- Based on Dell PowerEdge R740XD Servers to deploy kubernetes (undercloud) and containerized Openstack platform (overcloud) using Airship
- Network Cloud Edge use cases to support vRAN & 5G core Telco grade applications

Target Industry : Telco, Enterprise

Akraino R2 SEBA for Telco Appliance

SDN-Enabled Broadband Access (SEBA)



Purpose/Features:

- Provides an appliance tuned to support the [ONE SDN-enabled Broadband Access](#) (SEBA) platform.

Use cases:

Utilizes a reusable set of modules introduced by the [Radio Edge Cloud \(REC\)](#), from Akraino R1:

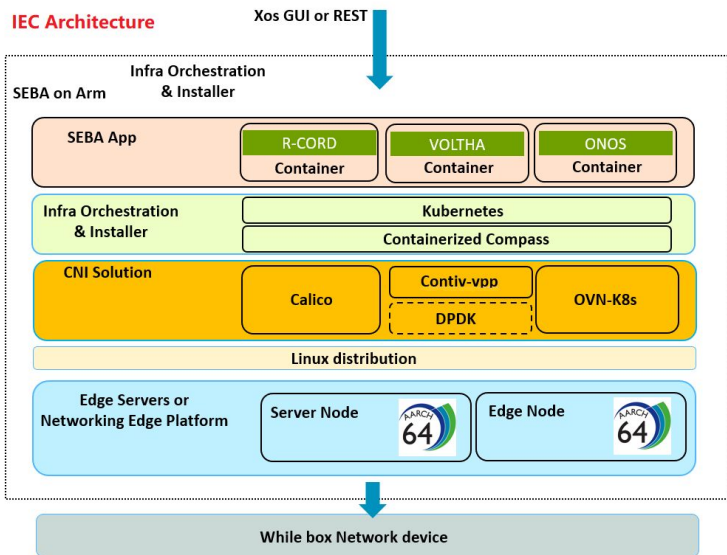
- Installation of host OS
- Configuration of network
- Installation/setup of Kubernetes cluster
- Installation/validation for SEBA components
- Utilization of reusable components of the “Telco Appliance” blueprint family
- Automated Continuous Deployment pipeline testing the software stack (bottom to top, from firmware up to but not including application)
- Integration with Regional Controller (Akraino Feature Project) for “zero touch” deployment of SEBA to edge sites

Target Industry: Telco

Akraino R2 Blueprint IOT & Remote Edge Use Cases



Integrated Edge Cloud Types 1 & 2



Target Industry: Telco, IoT, Enterprise

Purpose/ Features:

- Addresses IOT use cases
- Targets telco edge applications & medium edge cloud deployments with Arm
- Based on Kubernetes and Calico
- Automated installation, integrated with SDN-Enabled Broadband Access (SEBA) use case

Updates in R2:

- Supports both single node deployment and a 3-node deployment
- Deployment is automated in CI
- The SEBA (on Arm) use-case is integrated with the IEC platform
- Uses project [Calico](#) as main container networking solution
- Running environment deployment with multiple VMs
- PONSIm installation support
- SEBA-charts submodule update, multi-arch etcd yaml files, etc.

Akraino Blueprints

Tina Tsou

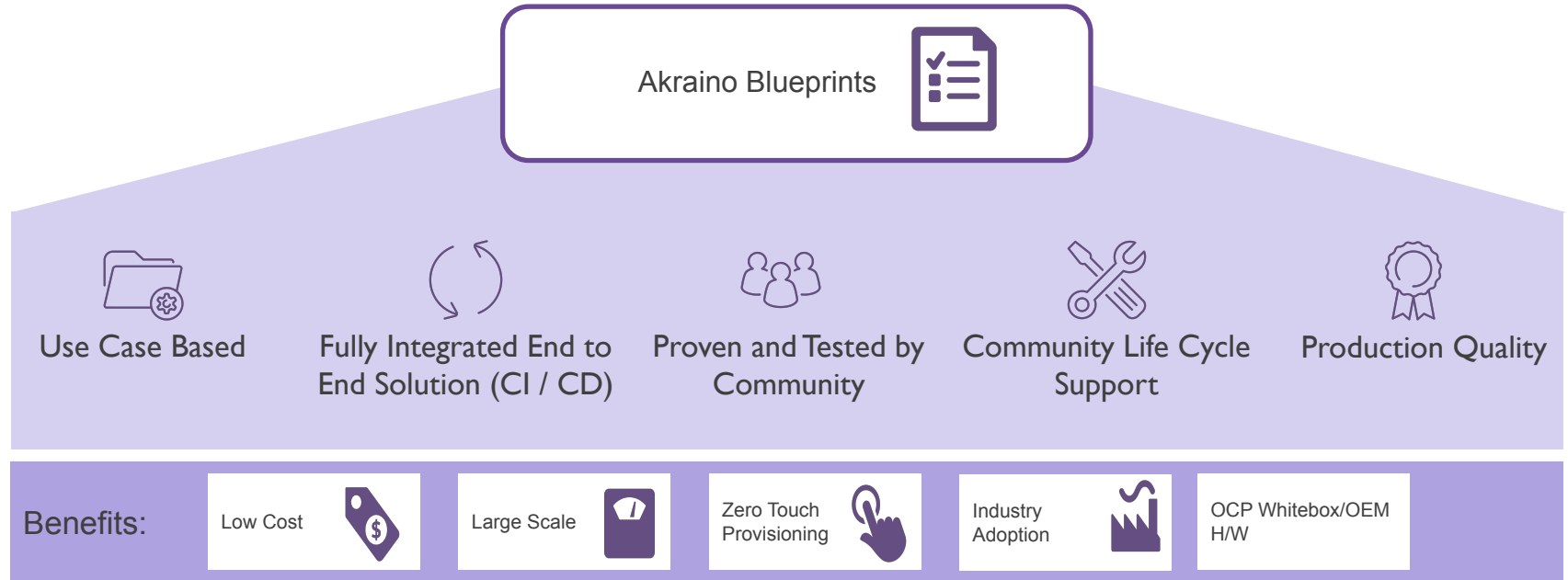
Oleg Berzin

 THE **LINUX** FOUNDATION

 **LF** EDGE

What is an Akraino Blueprint?

Community Integrated, tested, deployable, end to end Edge Stack



Since launch in 2018, Akraino continues to gain community support for collaboration and validation with 30+ blueprints

Upcoming Events

Upcoming External Events

- › [Open Networking & Edge Executive Forum](#): 10-12 March, 2021 - Virtual
 - › Complimentary registration for LF Edge members. Email [Brett](#) for the discount code.
 - › [Embedded IoT World](#): 28-29 April, 2021 - Virtual
 - › [Kubernetes on Edge Day](#): 4 May, 2021 - Virtual
 - › [Open Source Summit Europe](#) / [Embedded Linux Conference](#): 28 Sept - 1 Oct, 2021 - Dublin, Ireland
 - › [CFP](#) Deadline: 13 June, 2021
 - › [OSPOCon](#): 29 Sep - 1 Oct, 2021 - Dublin, Ireland
 - › [CFP](#) Deadline: 13 June, 2021
 - › [IoT Solutions World Congress](#): 5-7 October, 2021 - Barcelona, Spain
 - › [CFP](#) is now open
 - › [Call for Testbeds](#) is now open
 - › [Open Networking & Edge Summit North America](#): 11-12 October, 2021 - Los Angeles, CA
-
- › Discussions around upcoming events occur in the LF Edge Outreach Committee
 - › Members may subscribe at: <https://lists.lfedge.org/g/outreach-committee>

Next Meeting

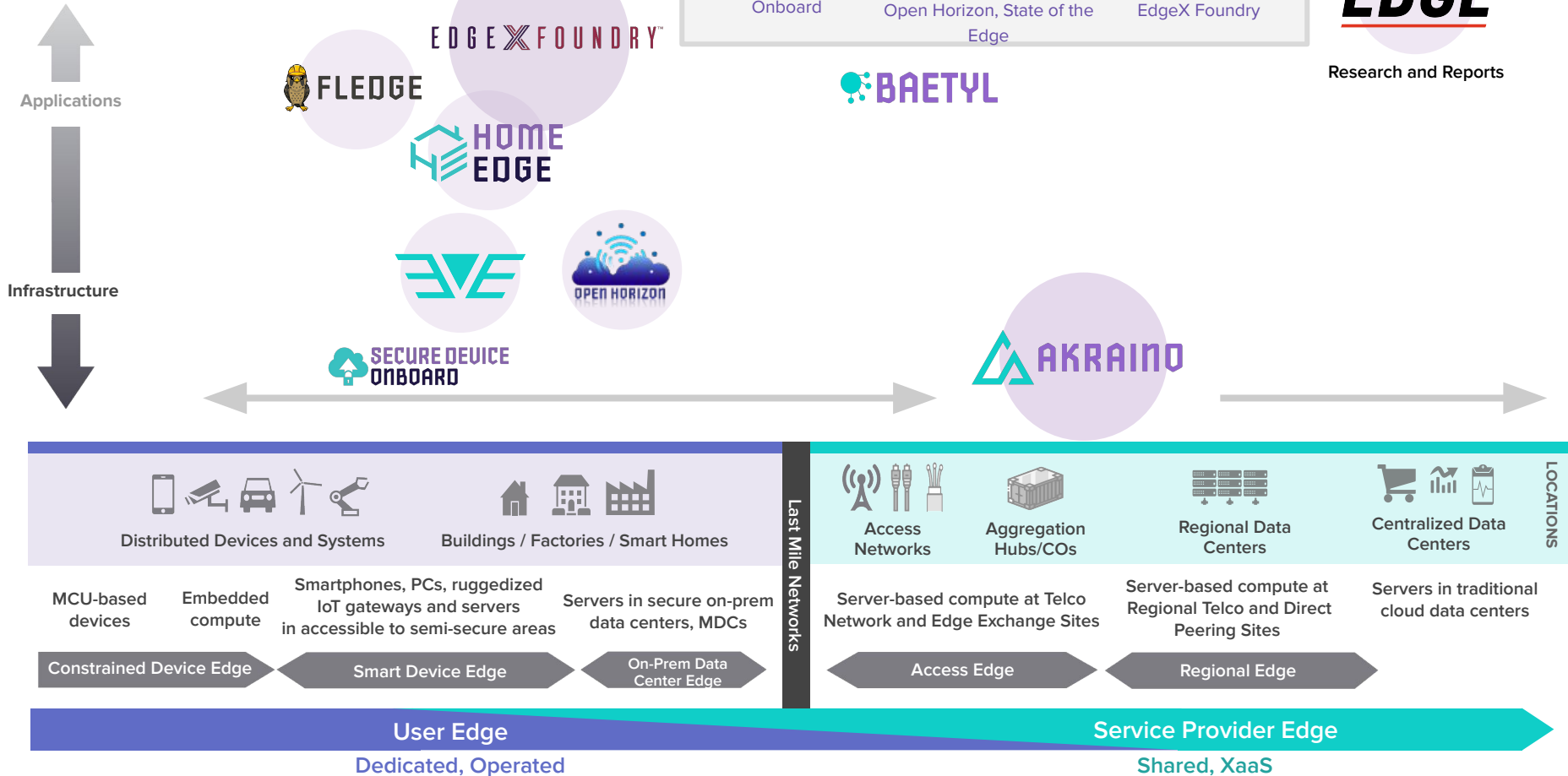
Next Meeting

- › Next Meeting: Wednesday, March 24 @ 7am PT
 - › Topics
 - › Shared Community Lab - Wiki tour (Resource walk-through)
 - › End User Solutions Groups
 - › Digital Twin Consortium
 - › Future Topics
 - › EdgeX Ready
 - › EdgeX Ireland Release

Thank You

Backup/Resources

LF Edge Projects



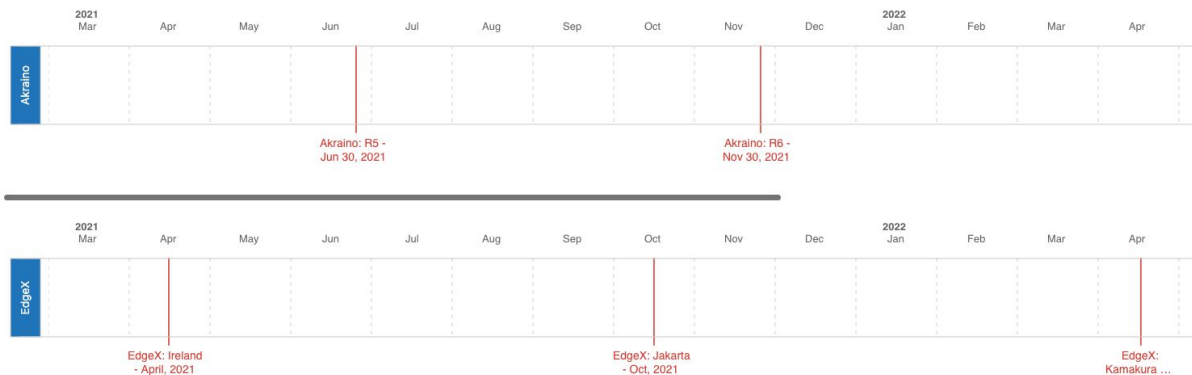
Upcoming Release Calendar

- › Reminder to Projects to please review and update as needed
- › <https://wiki.lfedge.org/display/LE/Upcoming+Release+Calendar>

Release dates are subject to change.

For the latest information on each Project's upcoming releases, or access to prior releases, please visit:

- Akraino - <https://wiki.akraino.org/display/AK/Releases>
- Baetyl - <https://github.com/baetyl/baetyl/releases>
- EdgeX Foundry - <https://wiki.edgexfoundry.org/display/FA/Releases> / <https://wiki.edgexfoundry.org/display/FA/Roadmap>
- EVE - <https://github.com/ff-edge/eve/releases> > waterfall release model
- Fledge - <https://github.com/ff-edge/ff-edge-iot/ffedge/releases>
- Home Edge - <https://wiki.lfedge.org/display/HOME/Roadmap+and+Release+Notes>
- Open Horizon - <https://github.com/open-horizon/anax/releases>
- Secure Device Onboard - <https://github.com/secure-device-onboard/release/releases>
- State of the Edge - <https://github.com/ff-edge/glossary/blob/master/edge-glossary.md>



TAC - Focus Areas for 2020 (what to emphasize / de-emphasize in 2021?)

Target areas identified for the TAC to direct focus, beyond PLD/Project Review

- 1. Architecture (Tech > LF Edge) - Output: TBD (White paper?)**
2. APIs Document, Align and Publish
3. SDO/Consortiums expansion
- 4. Forcing function - Use Case or Deployment > Demo across all projects**
5. Technical overlap/unification
6. Cross Project Collaboration
7. IT Efficiencies

Out of Scope for the TAC (for now)

1. Vertical Solutions (End User / SIG Program)
 - a. At Board/SPC level

LF Edge TAC - Focus Areas for 2021: Continued Discussion

- › One idea raised was for deeper (technical) solution briefs around Use Cases and Deployments
 - › Would require commitment (volunteers) from the TAC, Projects, as well as the SPC
- › (from prior discussion) White Papers
 - › LF Edge level or Project level?
 - › General (2020 introduced taxonomy/Projects) or Specific? (e.g. Security, Telemetry)
 - › Who would be the audience?
 - › Post publishing, vehicle for feedback? Success metrics?
- › Other initiatives?
 - › Open Edge Services Catalog - creation and cross-project support
 - › Common way to document APIs for all the projects

LF Edge Webinar Series - 2020 Recordings

- › Akraino Edge Stack
 - › Held Thursday, April 2 - [Your Path to Edge Computing with Akraino Edge Stack](#)
 - › On-demand recording available at: https://zoom.us/webinar/register/WN_Zjdo4-5fTOSlqH7pL8iHrO
- › EdgeX Foundry
 - › Held Thursday, April 23 - [EdgeX Foundry 101: Intro, Roadmap and Use Cases](#)
 - › On-demand recording available at: https://zoom.us/webinar/register/4515850788014/WN_xCd6YPjEOrcwLiFhBWPkug
- › Project EVE
 - › Held Friday, May 29 - [Building the “Android of the IoT Edge”](#)
 - › On-demand recording available at: https://zoom.us/webinar/register/6415888722675/WN_35oZl3hrOE69snMailUTPg
- › White Paper
 - › Held Thursday, July 9 - [Demystifying the Edge with the new LF Edge Taxonomy and Framework](#)
 - › On-demand recording available at: https://zoom.us/webinar/register/WN_icv5h6wFTcuw9O0xvMpgLw
- › Fledge
 - › Held Thursday, August 13 - [How Google, OSIssoft, FLIR and Dianomic use Fledge to implement Industrial 4.0](#)
 - › Recording available at: <https://www.youtube.com/watch?v=6lXNv3AIWog>
- › State of the Edge
 - › Held Thursday, September 17 - [State of the Edge: Exploring the Intersection of IoT, AI, 5G and Edge Computing](#)
 - › On-demand recording available at: https://zoom.us/webinar/register/8115959695936/WN_4rt-MmP1RI6Vkn3ULpiAA
- › Home Edge
 - › Held Thursday, October 15 - [Home Edge: How Your Home Devices Get Deployed in An Edge Computing Services Ecosystem](#)
 - › On-demand recording available at: https://zoom.us/webinar/register/WN_uSlgb-R5O4etkDhxoSXISO
- › Open Horizon
 - › Held Thursday, November 19 - [Secure Application Management for Machine Learning & Constrained Devices](#)
 - › On-demand recording available at: https://zoom.us/webinar/register/WN_tYli1lZ1RWq1pml8FuPRPw

- › More to follow...

Linux Foundation edX and Training Courses

- › Business Considerations for Edge Computing:
<https://www.edx.org/course/business-considerations-for-edge-computing>
- › Getting Started with EdgeX Foundry (LFD213):
<https://training.linuxfoundation.org/training/getting-started-with-edgex-foundry-lfd213/>
- › Full list of courses available at <https://training.linuxfoundation.org/>

Pushed to Next Meeting