

Akraino Blueprints

Connected Vehicle & AR/VR

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Contents

- ▶ **Akraino Community**
- ▶ **Introduction on CVB R3**
- ▶ **Planning of CVB R4**
- ▶ **Introduction on AR/VR R3**
- ▶ **Planning of AR/VR R4**



Akraino Community

Akraino Edge Stack is an open source software stack that improves the state of edge cloud infrastructure for carrier, provider, and IoT networks.

- Enable line speed processing
- Enable high throughput
- Reduce latency
- Improve availability
- Lower operational overhead
- Provide scalability
- Address security needs
- Improve fault management

Connected Vehicle Blueprint

Link: <https://www.lfedge.org/projects/release-3/r3connected-vehicle-blueprint/>

Connected Vehicle Blueprint Overview

The Connected Vehicle Blueprint (CVB) focuses on establishing an open source MEC platform, which is the backbone for V2X application.

CVB has been tested and validated on :

- Bare Metal
- Virtual Machine
- Container

Use Cases in CVB

The following use cases have been tested within the community, with additional use cases to come:

- Transportation efficiency improvement:
 - Real-time traffic information updates;
 - figures out the most efficient route for drivers
- Safe Drive Improvement:
 - Figures out potential risks which cannot be seen by the driver.
- Reduces traffic violations:
 - Conveys traffic rules of some specific area.
 - For instance
 - change the lane prior to a narrow street
 - avoid opposite way driving on a one-way road
 - avoiding the carpool lane when single driver, etc

Technology Architecture

From a technology architecture perspective, the blueprint consists of four major layers:

Hardware Layer: Connected Vehicle Blueprint runs on top of community hardware. Both Arm and x86 servers are well supported.

IaaS Layer: Connected Vehicle Blueprint can be deployed in a virtual environment as well. Virtual Machine, Containers, as well as other IaaS mainstream software like OpenStack, Kubernetes et al) are supported.

PaaS Layer: TARS is the microservice framework of Connected Vehicle Blueprint. TARS can provide high performance RPC calls, deploys microservices in larger scale-out scenarios efficiently, and provides easy-to-understand service monitor features.

Summary of CVB R3

- Tars based micro-service platform is established as the MEC platform to deploy the Connected vichele application
 - ✓ High Performance RPC Call
 - ✓ Service Governance
 - ✓ Web Config/Monitor Platform
 - ✓ Multi Program Languages
 - ✓ Orchestration between Edge Nodes
- BluVal Testing and Lynis Testing are done to consolidate the software environment.
 - ✓ Inwinstack
<https://nexus.akraino.org/content/sites/logs/inwinstack/R3/logs/cvb/>
 - ✓ UNH
<https://nexus.akraino.org/content/sites/logs/parserlabs/job/R3/cvb/>

Planning of CVB R4

- CVB applications will be deployed on the Tars-based MEC platform.
- Lifecycle management of CVB applications will be controlled with Tars-based MEC platform.
- The security of the whole software environment will be consolidated with Blueval and Lynis.

AR/VR Blueprint

Link: <https://www.lfedge.org/projects/release-3/r3-iec-type-4-ar-vr/>

Overview

IEC Type 4 focuses on AR VR applications running on edge. In general, the architecture consists of three layers: IaaS(IEC), PaaS(Tars), SaaS(AR/VR Application).

Use Cases

There are multiple use cases for AR VR itemized below. For Release 3, we focus on building the infrastructure and virtual classroom application (Highlighted).

Use Cases	Value Proposition
Operation Guidance	Predict the next step for the operations (like assembling Lego blocks, cooking sandwiches, etc) and help people to achieve a goal.
Virtual Classroom	Simulating a virtual classroom, which improves online education experiences for the teachers and students.
Sports Live	Augment and simulate the sports live, which gives the audiences an amazing immersive watching experience.
Gaming	Augment and simulate the game scenario, let players enjoy an immersive game world.

Summary of AR/VR R3

- Focus on building the infrastructure and virtual classroom application.
- Deploy in two environments: Inwinstack lab and Parserlabs.
- Use Jenkins to make CI/CD available.
- Pass the security check and the validation lab check.
- Preparing maturity review: working on fixing vuls and lynis problem.

Planning of AR/VR R4

- Focus on opensource AR/VR applications.
- Make the virtual classroom application ready to use.
- Try another opensource AR/VR application.



Thanks and Welcome to Join Akraino!