CVB Architecture Document for R2

Connected Vehicle Blueprint(CVB) is an Akraino approved blueprint and part of Akraino Edge Stack. The project is completely focused on Connected Vehicle Application run on Edge Computing.

Use Case

The use cases for the Connected Vehicle Blueprint are itemized below. For R2, we release the Microservice Platform Tars, which supports the multiple connected vehicle application deployment/management/orchestration/monitor.

UseCases	value proposition
Accurate Location	The accuracy of location improved by over 10 times than today's system. Today's GPS system is around 5-10meters away from your re allocation, <1 meter is possible with the help of edge computing.
Smarter Navigation	Real-time traffic information update, reduces the latency from minutes to seconds, figure out the most efficient way for drivers.
Safe DriveIm provement	Figure out the potential risks which can NOT be seen by the driver. See below.
Reduce traffic violation	Let the driverunderstand the traffic rule in some specific area. For instance, change the line prior to a narrow street, avoiding the opposite way drive in the one-way road, avoiding carpool lane when a single driver and so on.

Overall Architecture

The following picture depicts the architecture of the Connect Vehicle Blueprint, which consists of the following key components:

- Commodity Hardware, Arm/X86 Physical Server.
- IaaS Software, like Openstack, IaaS and so on
- Tars Microservice Platform
- Connected Vehicle Applications
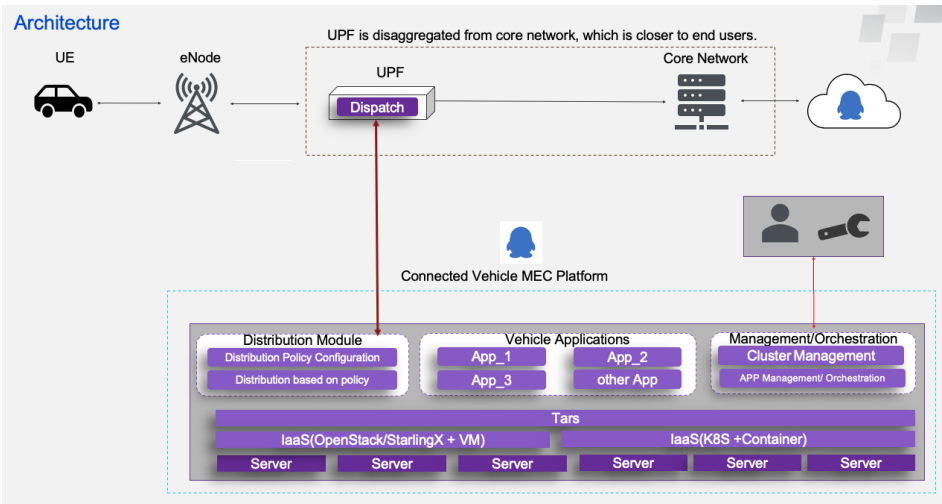
The combination of Commodity Hardware and IaaS Software provides flexible deployments, like Bare Metal, Virtual Machine as well as Container.

Tars is a microservice framework that can manage/monitor/deploy the connected vehicle applications in the edge and data center. Tars can be flexibly deployed in Bare Metal, Virtual Machine as well as Container.

Connected Vehicle Applications are some different applications that fulfill Accurate Location, Smarter Navigation, Safe Drive Improvement and Reduce traffic violations.

The following is the general architecture of Tars, which is a major component in R2.
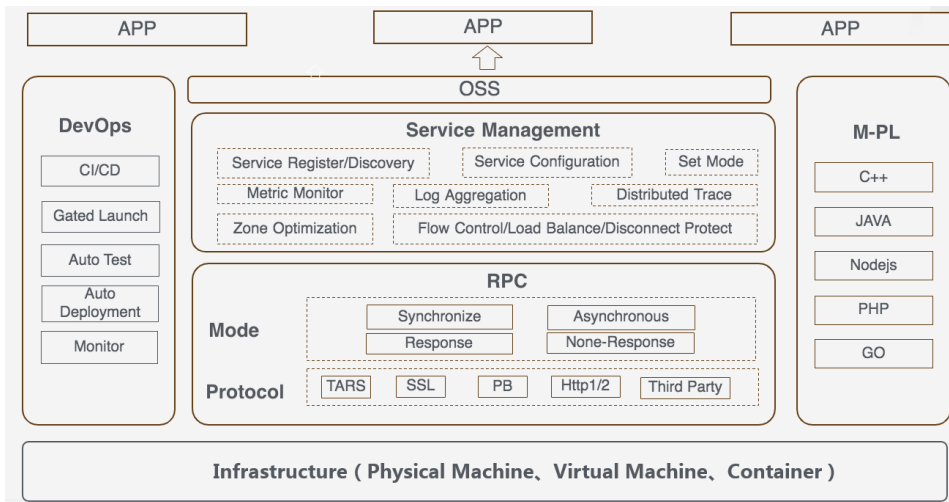
Refer to the enclosed PDF document for the detail Tars introduction.

TARS_Introduct...n_20191205.pdf

Main Progresses for Release 2

Release 2 is the first release for Connected Vehicle Blueprint. So everything is new.

Build Of Materials (BOM) / Hardware requirements

Connected Vehicle Blueprint can be flexibly deployed in Bare Metal, Virtual Machine as well as the container.

For R2, we deploy it in Amazon Web Service for Release. The detailed hardware is itemized below:

CPU+Memory	Drive	Deployment
8Core * 16G	15G	Jenkins Master
8Core * 16G	10+50G	TarsFramework
8Core * 16G	10G +20G	TarsNode + Application

Beyond of AWS, we deploy it in Ampere POD 1 in CI Lab as well.

Notes

Tars is an edge compute microservice platform with low latency, high quality.