Tencent 腾讯

Connected Vehicle Blueprint

Sponsored by Tencent, Arm, Intel, Nokia

Tencent CSIG Future Network Lab
2018.03.29

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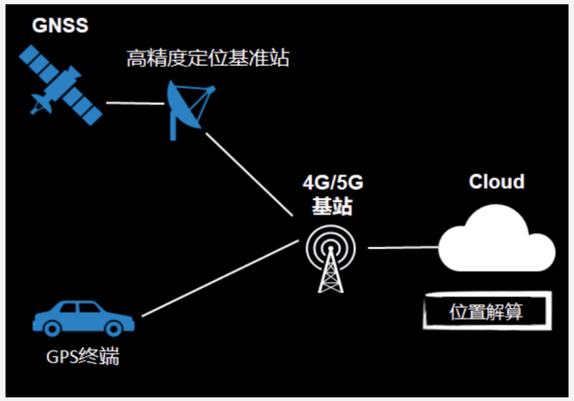
1 General Blueprint Introduction

- Connected Vehicle Blueprint focuses on establishing an open source MEC platform, which is the backbone for V2X Application.
- Connected Vehicle Blueprint was established in the Akraino Community on March 14th, 2019. The first release is targeted for NOV 30, 2019.
- Connected Vehicle Blueprint is sponsored by Tencent, Arm , Intel , Nokia.
- Contact: Robert.Qiu (robertqiu@tencent.com)
- Refer to: https://wiki.akraino.org/display/AK/Connected+Vehicle+Blueprint

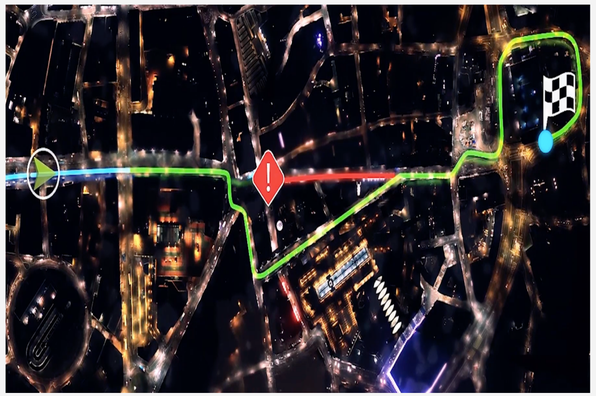
2 Blueprint Use Cases

Use Cases	Value Proposition
Accurate Location	Accuracy of location improved by over 10 times than today's GPS system. Today's GPS system is around 5-10 meters away from your real location, <1 meter is possible with help of edge compute.
Smarter Navigation	Real-time traffic information update, reduce the latency from minutes to seconds, figure out the most efficient way for drivers.
Safe Drive Improvement	Figure out the potential risks which can NOT be seen by the driver. See below.
Reduce traffic violation	Let the driver understand the traffic rule in some specific area. For instance, change the line prior to narrow street, avoiding opposite way drive in the one way road, avoiding carpool lane when single driver etc.

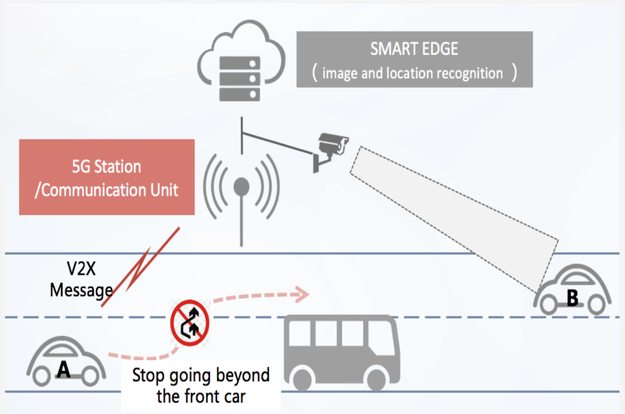
Location Accuracy



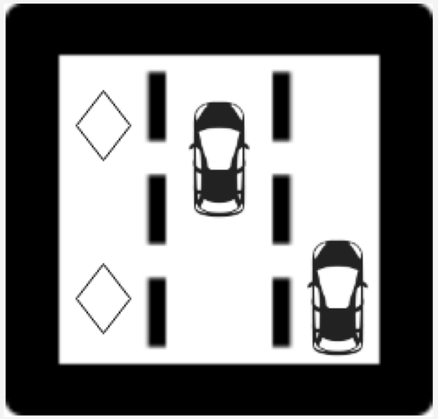
Smarter Navigation



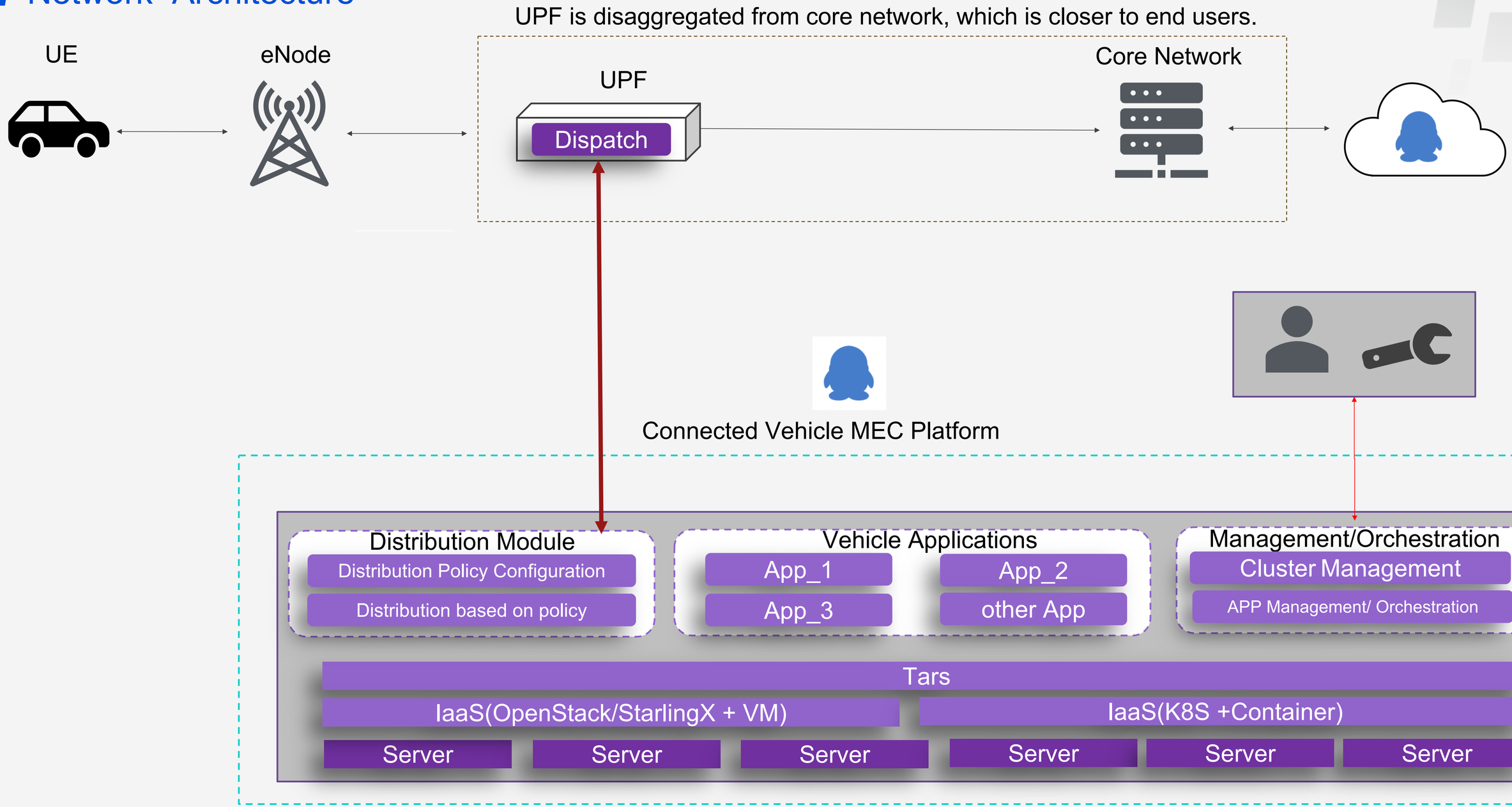
Safe Drive Improvement



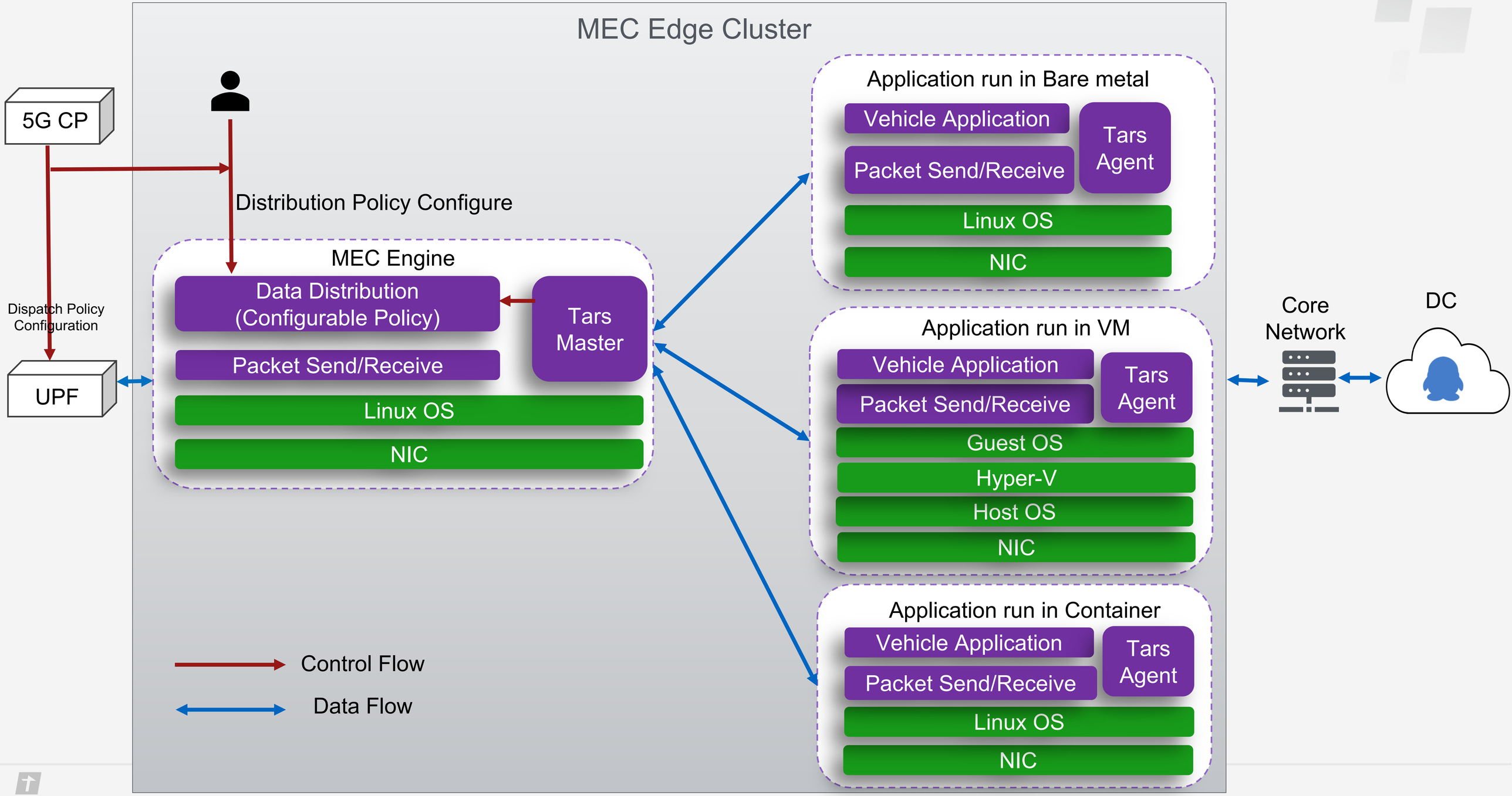
Reduce traffic violation



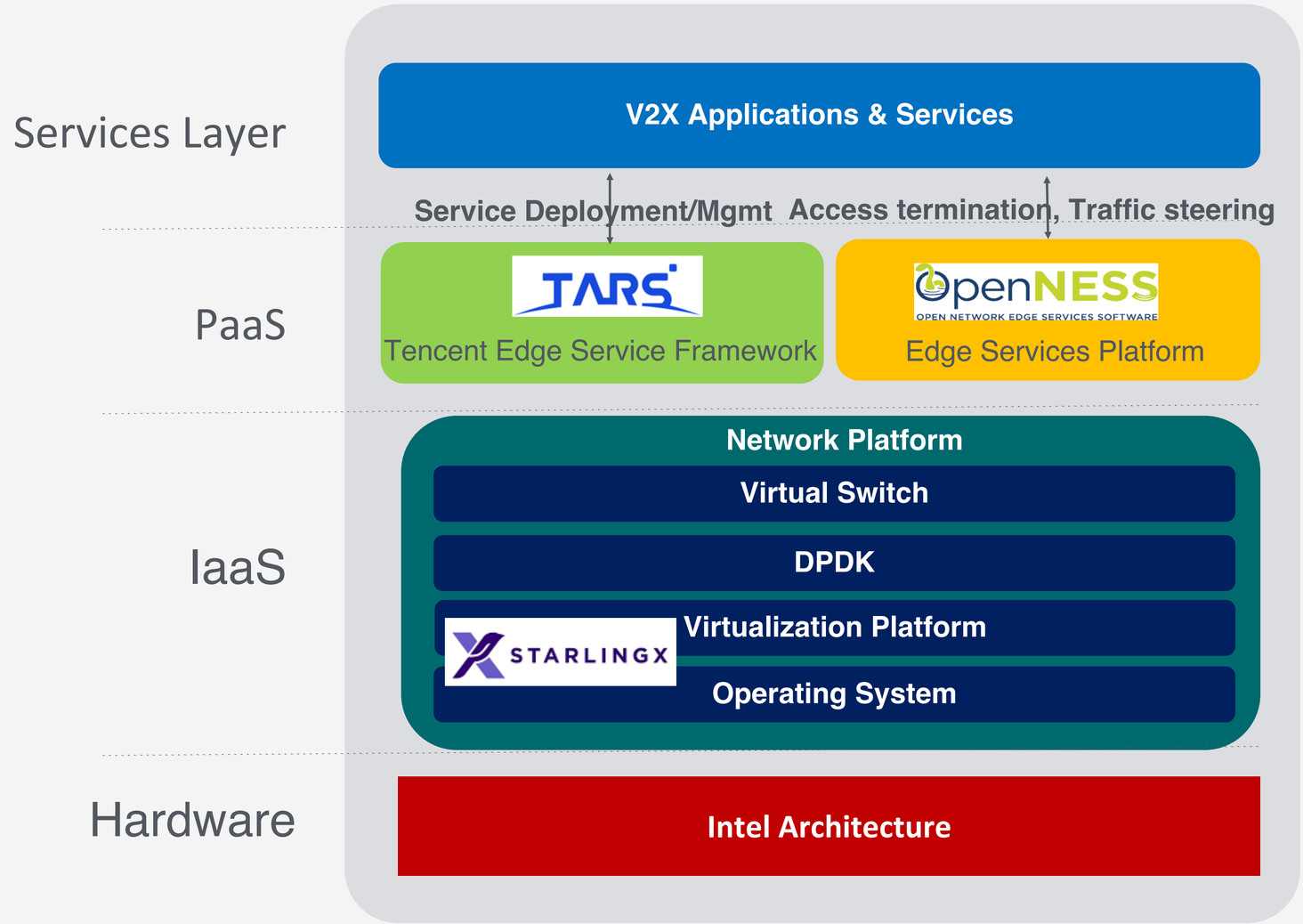
3 Network Architecture



MEC Software Architecture



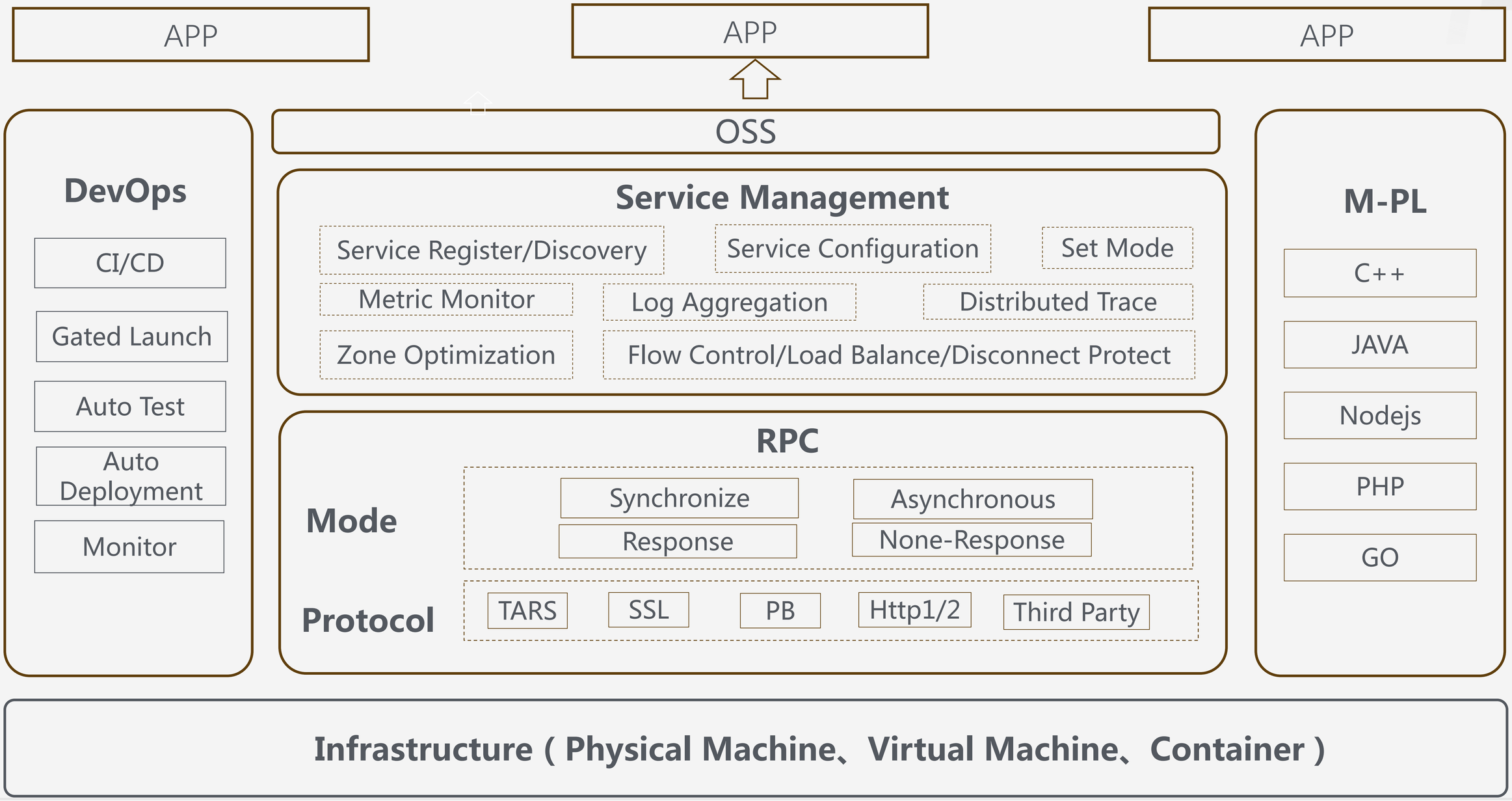
OpenNESS & HOW it fits into AKRAINO Connected Vehicle Blueprint



OpenNESS is an open source reference toolkit to develop, securely on-board and manage new edge services on Network Edge & On-Premise.
More details @ https://www.openness.org/

* Other names and brands may be claimed as the property of others

Major Components - Tars Platform



Major Components - Tars Platform

2007 Incubation

2008 Product

- Scale-out Improvement
- Performance optimization
- HA optimization

2017

- JAVA
- C++

2018

- Linux Foundation Project

2017

- GitHub Release

https://github.com/TarsCloud/Tars

2018

- PHP
- NodeJS
- GO

2019

- .NET
- Python
- Service Mesh

Adopted by

Tencent、VIVO、 Iflytek 、 China Literature Limited et al

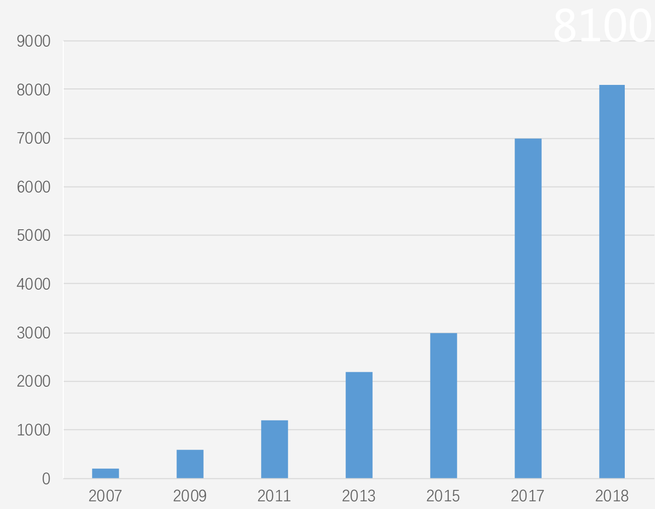
Use Cases

Access Business : 300+ ,
Access Service : 20 000 +
Server Number : 100 000+
Visitor per day : 1 Billion+

- Game
- Connected-Vehicle
- Finance
- Live Video

Developers

More than 8000 Developers



7 Future Plan

- The first demo will be rolled out in Tencent Cloud Innovation Conference, May 22, 2019.
- The first Akraino version will be released in NOV 30, 2019.
- More will come soon… Stay tuned!

Appendix: Connected Vehicle Blueprint Criteria

Case Attributes	Description	Informational
Type	New Blueprint for the Edge	
Blueprint Family - Proposed Name	It is a independent blueprint, NOT a blueprint family yet.	
Use Case	MEC platform used for Connected Vehicle.	
Blueprint proposed Name	Connected Vehicle Blueprint	
Initial POD Cost (capex)	The Minimum Configuration: 4 Servers in total MEC Platform(1 Server) + 1 App Server(1 Server)+ 2 Simulators(2 Server)	
Scale & Type	Up to 4 Arm/X86 server	
Applications	The MEC platform which can be used to connect vehicles, the general data flows are itemized below: 1) Grab the traffic/vehicle information 2) Dispatch the traffic/vehicle information to the corresponding edge process unit. Note well: The dispatch policy can be configurable. 3) Process the data in the Edge or Cloud and figure out the suggested action item for the vehicle driver 4) Send the suggested action items to the vehicle driver	
Power Restrictions	Less than 6KW. The Maximum Power consumption for each server is around 1500W, 1500 * 4 = 6000W	
Infrastructure orchestration	○Docker + K8s ○VM and OpenStack/StarlingX	
PaaS	Tars	
Network	OVS, DPDK, VPP	
Workload Type	Bare metal, VM, Container	
Additional Details	OpenNESS	

AKRAINO EDGE STACK

Appendix：Assessment Criteria

Criteria	Connected Vehicle Blueprint
Each initial blueprint is encouraged to take on at least two committers from different companies	Tencent, Arm, Intel, Nokia
Complete all templates outlined in this documents	Detailed in this slide
A lab with exact configuration required by the blueprint to connect with Akraino CI and demonstrate CD. User should demonstrate either an existing lab or the funding and commitment to build the needed configuration.	A test and simulation lab will be provided in Tencent Cloud Silicon Valley.
Blueprint is aligned with the Akraino Edge Stack Charter	All opensource, Edge use case, Aligned with the Akraino Charter
Blueprint code that will be developed and used with Akraino repository should use only open source software components either from upstream or Akraino projects.	Yes, all open source.
For new blueprints submission, the submitter should review existing blueprints and ensure it is not a duplicate blueprint and explain how the submission differs. The functional fit of an existing blueprint for a use case does not prevent an additional blueprint being submitted.	A edge platform for deploying connected vehicle application does not exist in Akraino yet.

Criteria	Connected Vehicle Blueprint
Name of the project is appropriate(no trademark issues etc.); Proposed repository name is all lower-case without any special characters.	Connected Vehicle Blueprint
Project contact name, company, and email are defined and documents	Robert Qiu, Tencent robertqiu@tencent.com
Description of the project goal and its purpose are defined.	Establishing an MEC edge platform for connected vehicle use cases.
Scope and project plan are well defined.	Target for Release2, 30 July,2019.
Resource committed and available	There is a team, resources and lab in place.
Contributors identified	Tencent, Arm, Intel, Nokia
Initial list of committers identified (elected/proposed by initial contributors)	Tencent, Arm, Intel, Nokia
Meets Akraino TSC policies	The project will operate in a transparent, open, collaborative, and ethical manner at all the times.
Proposal has been socialized with potentially interested or affected projects and/or parties	○Have already reached a consensus with sponsors. ○Talk with chair/co-char
Cross Project Dependencies.	OpenStack, K8s, Docker, DPDK, OpenNESS, OVS et al.

Thanks