OpenAirInterface End User Story - Running 5G on KNI Provider Access Edge Blueprint

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OpenAirInterface End User Case Study – Running 5G on Akraino's KNI Provider Access Edge Blueprint

By LF EdgeAugust 4, 2020

Overview

Blueprints in the Kubernetes-Native Infrastructure (KNI) Blueprint Family leverage the best-practices and tools from the Kubernetes community to declaratively manage edge computing stacks at scale and with a consistent, uniform user experience from the infrastructure up to the services and from developer environments to production environments on bare metal or on public cloud.

One of the many use cases that the KNI blueprint family covers is the Provider Access Edge (PAE). The need for deploying mobile application on the edge is growing in latest times. Providing a platform that is capable of supporting deployment of mobile applications, using Kubernetes, and based on kubernetes tooling and declarative configuration from end to end is needed.

The OpenAirInterface project fosters a community of industrial as well as research contributors for software and hardware development for the core network (EPC) and access network and user equipment (EUTRAN) of 3GPP cellular networks. The OpenAirInterface alliance, has chosen the Akraino KNI PAE blueprint as the reference platform to develop, test and deploy its 4G and 5G open source mobile networks.

Key features on the Provider Access Edge blueprint

Telco / 5G network functions are among the more exigent Kubernetes workloads, but they are not unique: customers from high performance computing, high frequency trading, industrial control, et al. are asking for pretty much similar sets of capabilities.

This blueprint targets small footprint deployments able to host NFV (in particular vRAN) and MEC (e.g. AR/VR, machine learning, etc.) workloads. Its key features are:

- 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 multiple networks using Multus.
- Support for high throughput interfaces using the SRIOV operator.
- Support for real-time workloads.
- Support for Stream Control Transmission Protocol (SCTP).

OpenAirInterface network deployment

The OpenAirInterface alliance has made a great effort on moving all the components that form a 4G/5G mobile network to the Kubernetes world. Building all the container images and writing the corresponding manifests to match a specific deployment model has been a tremendous work.

To support the 5G network in a production-like deployment, we configured the OpenShift based KNI PAE blueprint to segregate real-time and non-real-time compute workloads as well as management, control, and data plane traffic according to the following logical deployment architecture:

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Conclusion

5G is designed to bring to the enterprise world as well as to the regular consumer, high throughput and low latency bandwidth that will enable the use cases of the future like IoT, autonomous cars, and many other applications deployed at the edge of the networks. The Akraino Kubernetes Native Infrastructure blueprint family allows to run these very demanding workloads on top, and OpenAirInterface has chosen us as the reference platform.

References

https://www.openairinterface.org/docs/workshop/8_Fall2019Workshop-Beijing/Talks/2019-12-05-DEFOSSEUX.pdf