Akraino Private LTE/5G ICN - Release 5

Prem Sankar Gopannan (Cohere Technologies), PTL
Sukhdev Kapur (Juniper Networks)

Supported by: Shah Rahman (Facebook Connectivity)
Akraino Private LTE/5G - Overview
High Level Diagram

Network Edge#1

UE

K8S
OpenNESS
LTE/5G CBRS RAN
SP-GW/5G UPF
Edge Apps
SD-EWAN

SAS (in cloud)

Network Core

K8S
SD-EWAN
evEPC/5GC
ONAP
Infra Orch
Private LTE/5G ICN Stack

Upstream communities: ONAP, OPNFV, Many CNCF projects, EdgeXFoundry, FD.IO, DPDK, Linux, Openstack Ironic, OVS, Many ASF projects, OpenNESS, Intel Open Source, Tungsten Fabric

Centralized Infra Controller
(Leverage Cluster API + Workflow manager such as Argo/Tekton)

Infrastructure Provisioning & Configuration

- KUD
- BPA RestAPIAgent controller
- BPA controller
- Metal3
Partners

End Users:

- Airbus
- Globe
- Orange
- Tata Communications
- T-Mobile
- US Navy
- Verizon

Vendors:

- Aarna Networks
- ATS Systems
- Intel
- NetNumber
- Juniper Networks
- Polaris
- Rebaca Technologies
- Wavelabs
- FreedomFi
Goal

- Package and provide well tested Private LTE/5G stack over ICN BP

Completed

- Integrate components needed for Private LTE/5G with Akraino ICN family
  1. Integrated with Free5GC - Helm chart creation of UPF, SMF and AMF
  2. Integration of EMCO Orchestrator for CNF orchestration - In progress (Dev complete)
  3. Underlay network for hosting NF needed for UPF, SMF and AMF
  4. Helm chart for other 5GC NF
  5. Tested with gNBSIM and UESIM

Show local breakout to edge computing

- Continue to support MICN apps: 360° video, EdgeXFoundry, AI/ML edge analytics
- Tungsten Fabric for K8s networking needed for UPF and breakout
Enterprise Private 5G Usecase

EMCO (CNF Orchestrator)

K8s cluster 1

Orchestrate free5g in Cluster 2

UESim

192.168.2.2

N1

N2

gNBSim

192.168.2.3

N11

AMF

192.168.2.xx Created by TF

TF-K8s cluster 2

192.168.2.10

N4

N5

N6

UPF

DN

SMF

192.168.2.xx

N11

K8s cluster 2

Created by TF
Akraino Private LTE/5G - Planned for R5

Scope for R5 release

- Integrate components needed for Private LTE/5G with Akraino ICN family
  - i. Integration with Facebook Magma
  - ii. Multi-cluster support for free5GC
  - iii. Multi-tenant support
  - iv. Tighter integration with EMCO
  - v. API definition for Private 5G
  - vi. Testing with Radio
  - vii. PCEI Blueprint support

- Show local breakout to edge computing
  - Continue to support MICN apps: 360° video, EdgeXFoundry, AI/ML edge analytics
Thank you