Orchestration of 5G CNFs using Multicloud K8s plugin

23 June, 2020

Sandeep Sharma
Aarna Networks
ssharma@aarnanetworks.com
Agenda

› Overview of the Cloud Native 5G + ONAP Demo
› Hardware Configuration
› Design and Instantiation of 5GC CNFs on OpenShift
5G Cloud Native Network + ONAP

› The demo shown at KubeCon + CloudNativeCon NA 2019 was deployed manually

› For this reason, the community decided to incorporate the Open Network Automation Platform (ONAP) project for automation
5G Cloud Native Networks + ONAP Overview

Focus: Automation

› Additions
  › ONAP added for automation
  › ONAP hosted on UNH IOL servers

› Simplifications
  › Reduced to just one NFVI location (UNH IOL Lab)
  › Reduced to just 5GC; replaced 5G RAN with a gNB emulator

› Goals
  › Show onboarding of Altran 5GC
  › Demonstrate deployment of 5GC onto OpenShift
Cloud Native 5G Network + ONAP Software Stack

ONAP

NFVI Software
(Open Source Kubernetes)

NFVI Hardware

NFVI Software
(Red Hat OpenShift)

NFVI Hardware

UNH-IOL Server
Configuration Details

› Minimal ONAP deployed on a single UNH IOL server (2 VM cluster)
› OpenShift CRC deployed on the same server (as a single VM)
› Altran 5GC CNF onboarded onto ONAP using the Service Design & Creation (SDC) project
› 5GC Network Service created in ONAP using SDC
› 5GC Network Service deployed on to OpenShift by using the ONAP Kubernetes (onap4k8s) adapter in Multicloud
   › REST APIs used for runtime operations
› 5G Network Service tested via a gNB emulator
Configuration

Bare Metal Server

ONAP node 1

ONAP node 2

Two node ONAP cluster (OOM master)
64G RAM, 32 Cores

gNB emulator

gNB emulator VM to test the NGC deployment
8G RAM, 4 cores

Openshift CRC node

OS node where NGC will be deployed
64G RAM, 16 Cores
Register OpenShift with ONAP

1. Call the ONAP K8s Plugin API for registering the OpenShift Cluster.
Design and Distribute NGC

1. On the ONAP SDC create a VSP and upload the NGC helm package in the VSP.
2. Create a network service and add the NGC VSP during the service composition.
3. Distribute the NGC service from SDC.
4. The distribution from the SDC will create a Resource bundle definition inside the K8s plugin.
1. Call API to create a Profile under the Resource bundle definition.
2. Upload a dummy overrides value package under Profile.
3. Call API to instantiate the profile. This will deploy the NGC pods on Openshift.
Test NGC using Emulator

1. From the Simulator VM execute the NGC test cases

**gNB emulator**

Emulator VM to test the NGC deployment

**ONAP node 1**

**ONAP node 2**

Two node ONAP cluster (OOM master)

**Openshift CRC node**

OS node where NGC is deployed
Thank you