Orchestration of 5G CNFs using Multicloud K8s plugin

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Sandeep Sharma
Aarna Networks
ssharma@aarnanetworks.com

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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
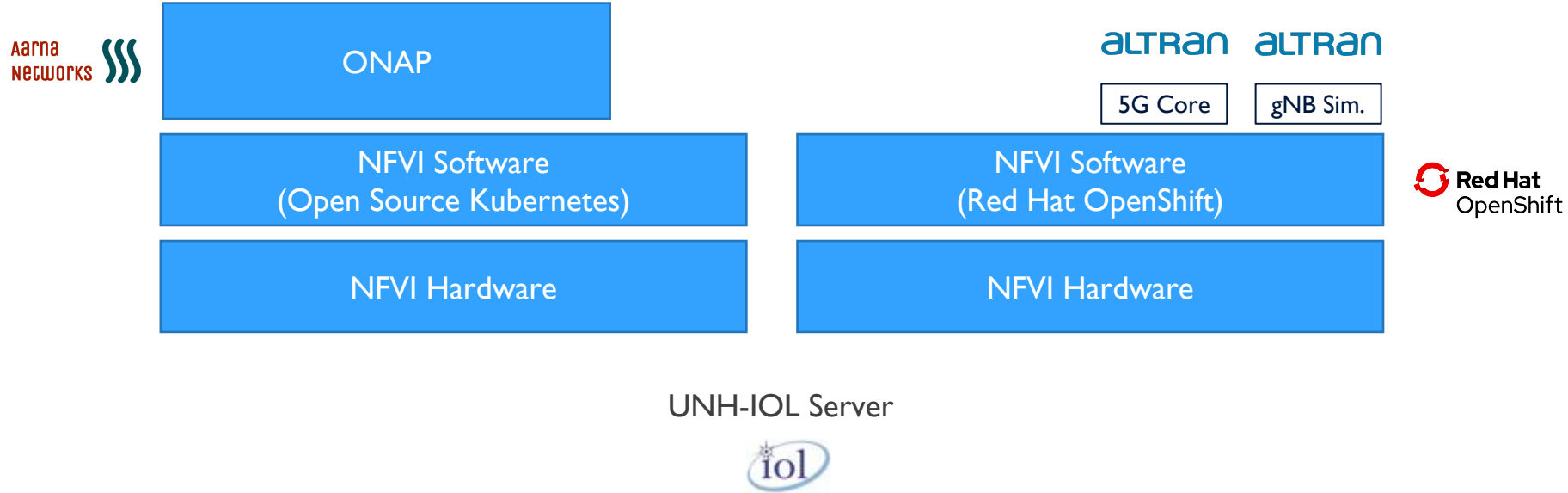
5G Cloud Native Networks + ONAP Overview
Focus: Automation

› 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

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ONAP

**NFVI Software
(Open Source Kubernetes)**

NFVI Hardware

ALTRAN ALTRAN

5G Core   gNB Sim.

**NFVI Software
(Red Hat OpenShift)**

Red Hat OpenShift

**NFVI Hardware**

UNH-IOL Server

iol

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
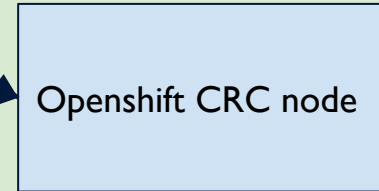

Bare Metal Server

ONAP node 1

ONAP node 2
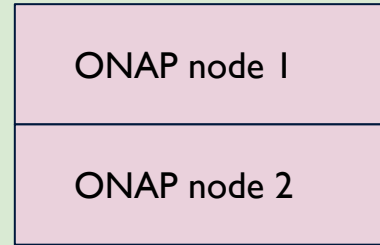
Two node ONAP cluster
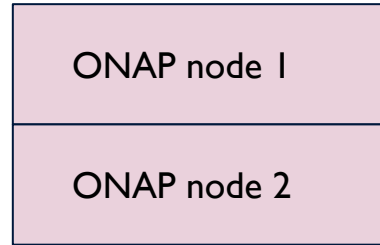(OOM master)
64G RAM, 32 Cores

gNB emulator

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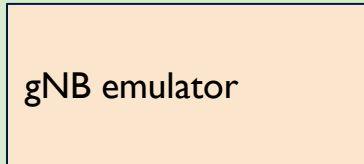
gNB emulator VM to test
the NGC deployment
8G RAM, 4 cores

OS node where NGC
will be deployed
64G RAM, 16 Cores

Register OpenShift with ONAP

ONAP node 1

ONAP node 2

Two node ONAP cluster
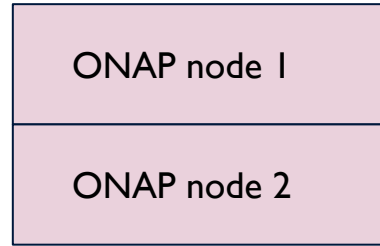(OOM master)
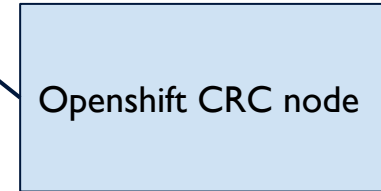
Openshift CRC node

OS node where NGC
will be deployed

1. Call the ONAP K8s Plugin API for registering the Openshift Cluster.

Design and Distribute NGC

ONAP node 1

ONAP node 2

Two node ONAP cluster
(OOM master)

Openshift CRC node

OS node where NGC
will be deployed

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.
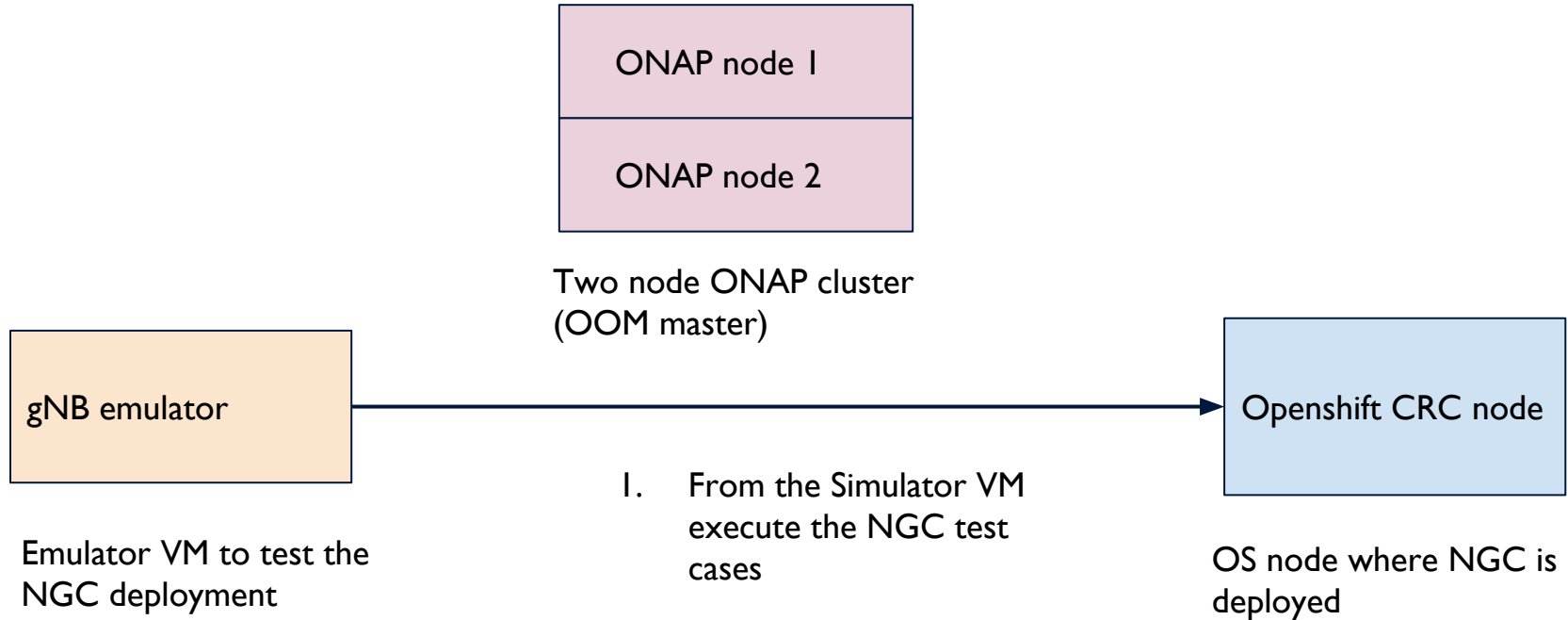
Instantiate NGC

ONAP node 1

ONAP node 2

Two node ONAP cluster
(OOM master)

Openshift CRC node
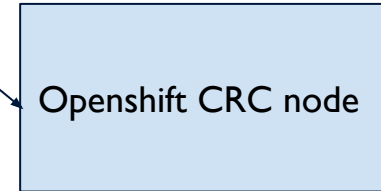
OS node where NGC
will be deployed
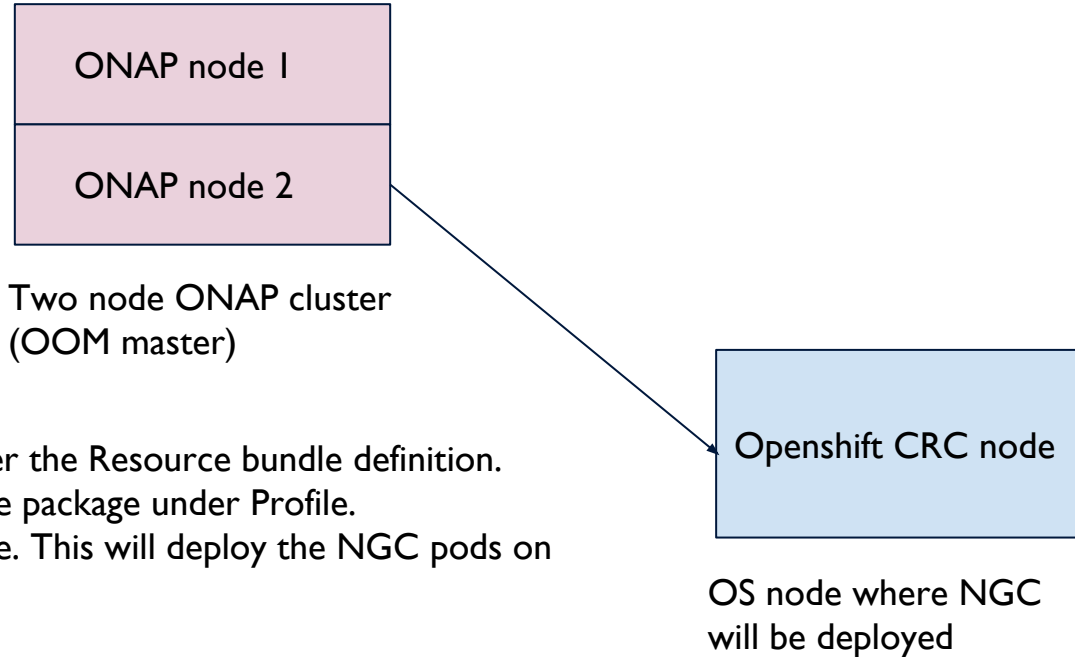
1. Call API to create a Profile under the Resource bundle definition.
2. Upload a dummy overrides value package under Profile.
3. Call API to instantiate the profile. This will deploy the NGC pods on Openshift.

Test NGC using Emulator

ONAP node 1

ONAP node 2

Two node ONAP cluster
(OOM master)

gNB emulator

Openshift CRC node

Emulator VM to test the
NGC deployment

1. From the Simulator VM
execute the NGC test
cases

OS node where NGC is
deployed

Thank you

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