5G Multi-site deployment using OSM

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Agenda

• Introduction
• Architecture of 5G network deployment
• Demo
• Next steps
• Questions
Introduction

- OAI has several years of experience working with wireless cellular Radio Access Network (RAN) and Core Network (CN) technologies.
- OAI has an active community working on delivering new functionalities all the time (e.g. Open RAN, network slicing, etc)
- Whitestack has deployed the full 5G OAI core:
  - AMF
  - SMF
  - UPF
  - UDR
  - UDM
  - NRF
- Whitestack’s trying to deploy OAI from OSM in an automatic way with primitives to allow users to perform operations from day-1 and day-2.
Architecture of 5G network deployment
We’ll deploy the 5G OAI Core KNF, access gnbsim and external server VNFs (with primitives) using one NS package.
• We’re using helm-based Execution Environment (EE) to define primitives for day-1 and day-2 in the VNF.

  • Day-1: For gnbsim and external server we install *docker components* and *copy configuration files* in the NF as part as the instantiation.

  • Day-2: For gnbsim and external server we’ve defined *primitives to start/stop the application service at any time*. In addition, we can send any command to the bash of the NF using ssh.

• Helm-based EE allows us to interact with the NF via ssh/netconf/REST

• Helm-based is one of the alternatives we have available for primitives for Execution Environments.
• Run the ns-create command to create the KNF and both VNFs in different VIMs:

```bash
osm ns-create --ns_name 5g --nsd_name 5gcore-ns --vim_account whitecloud --config '{"ssh_keys": ["$SSH_KEY"],"k8s-namespace": "oai", vnf: [{member-vnf-index: gnbsim, vimAccountId: b0fe741c-37d9-4f42-bce7-b163122a9790},{member-vnf-index: ext-server, vimAccountId: 74c9e008-28ce-45c4-9634-9aec3177fb76}]}'
```

• Examine the descriptors and primitives created for this deployment
• Wait for the NS to be ready in the OSM environment and in the cluster to see 5G Core creation
• Log into OSM to use the primitives for:
  
  Start the gnbsim service
  Start the ext-server service
• SSH to ext-server and start iperf3 as a server
  `docker exec -ti oai-ext-dn iperf3 -s`
• SSH to the gnbsim and start iperf3 as a client
  `docker exec -it gnbsim iperf3 -c 192.168.70.135 -B 12.1.1.2`
Next steps

• Deploy the router as a PNF using VyOS Router
• Divide the 5G Core in multiple KDUs per each NF
• Create primitives for 5G Core KNF
• Test additional access NFs (VNF and/or CNF)
• Create UPF in a edge site
Thank you!