Design and deployment of the Affirmed Networks vEPC using ONAP

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Objectives

Demonstrate the onboarding of Affirmed vEPC (aka Mobile Content Cloud – MCC) onto ONAP (based on Beijing release):

- Onboarding the Affirmed vEPC VNFs & NS onto MANO software (ONAP)
- Deploying the NS using ONAP, onto OPNFV scenario (using Aarna’s ANOD distribution)
Affirmed Distributed vEPC Architecture
Distributed Functions Scale Independently

VM Cluster appears as single VNF
✓ Single set of loopback IPs per VNF
✓ (e.g. single S1u, S11, Gx, etc.)

Production ready vEPC services:
✓ S-GW
✓ P-GW
✓ GGSN
✓ MME (similar distr. VM Arch)
✓ WAG/ePDG
✓ Gi LAN VAS

Deployment Efficiency

MCM – Management Control Module
▪ OA&M, CLI, NETCONF, etc.

CCM – Centralized Control Module (Control Plane)
▪ Dynamic Routing, Session mgmt., Diameter

DCM – Distributed Control Module (Control Plane)
▪ GTP-C, call control, RADIUS clients, IKE v1/v2

IOM – Input Output Module
▪ Logical IP interface termination, IPSEC

WSM – Workflow Services Module (Data Plane)
▪ Subscriber/APN tunnel termination
▪ QoS, Charging, NAT/Firewall, Policy Routing, DPI
▪ IPSEC (per-subscriber – ePDG)

ASM – Advanced Services Module (Data Plane)
▪ GiLAN services (Web/Video optimization, Proxy, etc.)

CSM – Centralized Services Module (Control Plane)
▪ Combination of the CCM, DCM, and ASM

SSM – Subscriber Services Module (Data Plane)
▪ Combination of the WSM and IOM

The diagram illustrates the architecture with various components and their roles:
- **MCM**: Management Control Module
- **CCM**: Centralized Control Module
- **DCM**: Distributed Control Module
- **IOM**: Input Output Module
- **WSM**: Workflow Services Module
- **ASM**: Advanced Services Module
- **CSM**: Centralized Services Module
- **SSM**: Subscriber Services Module

Each module has specific functions and interfaces as described in the text.
Use Case Assumptions

- The use case will use APP-C for VNF instantiation

- The APP-C will interact directly with the OpenStack VIM (no need for a Specific VNFM)
  - In the Affirmed lab setup Red Hat OpenStack Platform 10 (RHOSP10) was used; RHOSP10 is based on OpenStack Newton Release

- The VNFD will be HEAT based
vEPC Onboarding onto ONAP

- Create Openstack Cloud image with required software
- Create required resources on Openstack (Flavor, Networks/Subnets)
- Create HEAT templates and environment files
  - Create 3 VSP’s
    - MCM (Management Control Module)
    - CSM (Content Services Module)
    - SSM (Subscriber Services Module)
  - Create 1 Network Service (MCC_Service)
- Add the required scripts in cloud-init section of VNF’s YAML files
  - Onboard the ZIP files in SDC and create VSP’s & NS
- Test the Vendor Software Products (VSP)
  - MCM, CSM and SSM respectively
vEPC Deployment using ONAP

- Create Service Instance for MCC_Service
- Add VNFs (MCM, CSM & SSM) to the service instance
- Run SDN-C Preload scripts that set the required parameters in SDN-C
- Instantiate VNF Module MCM, which creates the VM
- Instantiate VNF Module CSM, which creates the VM
- Instantiate VNF Module SSM, which creates the VM
- Post-installation configuration (not automated yet via ONAP)
Thank You!!!