VCO Demo 2.0 Home

Demo Description Document

Read the draft here and add questions and comments in the doc.

Summary: The objective of the VCO 2.0 project is to continue the work started in the VCO 1.0 project, with the specific focus on the virtualized Mobile Network use case. Initially, this work will be focused on the implementation of the all elements of vRAN for the LTE RAN as well as the virtualized mobile packet core elements (vEPC), which represents a minimum viable mobile access network configuration. Supplementary service related elements will be included with the goal to demonstrate the vRAN and vEPC, and may specifically include instantiation of MEC environment and applications in addition to IP network access & applications.

Demo Slide Presentation

Read the draft here and direct any questions/comment to Pasi Vaananen <pvaanane@redhat.com>

C-RAN Project Proposal

Read the project description on the Wiki and add questions in the comments.

Communications:

We are using mailman for group communications. You can sign up and manage your subscription here: https://lists.opnfv.org/mailman/listinfo/opnfv-vco

Slack workspace

Join the Slack workspace from any device

Ping Hanen Garcia Gamardo <hgarciag@redhat.com> for an invitation

Call Bridge

Join from PC, Mac, Linux, iOS or Android: https://zoom.us/j/478835574

Or iPhone one-tap :
US: +16465588656,,478835574# or +16699006833,,478835574#
Or Telephone:
Dial(for higher quality, dial a number based on your current location):
US: +1 646 558 8656 or +1 669 900 6833 or +1 855 880 1246 (Toll Free) or +1 877 369 0926 (Toll Free)
Meeting ID: 478 835 574
International numbers available: https://zoom.us/zoomconference?m=8zZDk4Fem8Fx5-TFgGFmVhHIPOFU4E0y

Notes Archive

- 10/26 Call
- 11/16 Call
- 11/30 Call
- 12/7 Call
- 1/4 Call
- 1/11 Call
- 1/18 Call
- 1/25 Call
- 2/1 Call
- 2/8 Call
- 3/7 Call
- 3/14 Call
- 4/25 Call
- 5/2 Call
- 5/30 Call
- 6/6 Call
- 6/27 Call
- 7/5 Call
- 8/15 Call
- 8/22 Call

Summary:

The community has now begun work on the next version of the demo (VCO Demo 2.0). This is the planning page where we identify desired components, HW/SW resources, Lab resources, participating companies, and the volunteers needed to pull the demo together.

Goal:

A compelling demo using open source projects (OPNFV/ODL/OCP/OpenStack) and comprised primarily of open source components that goes beyond what was shown in Demo 1.0 to be highlighted at 2018 events.

Resources:

New HW/SW/Lab/Volunteer resources are required. ***Please fill in the form below if you have volunteering any of these or additional components.***

Milestones:

- Demo Direction / Technical Description: Ongoing
- Participant Contribution Commitment: 6/15
- Cumulus HW Shipped / Received as Needed: 6/22
- Cumulus HW/SW Stack Assembled /Tested: 6/29
- Penguin HW Shipped / Received as Needed: Week of 7/9
- Penguin HW/SW Stack Assembled /Tested: Week of 7/15
- Demo Assets Complete (Video, Slides, Script): TBD
- Final Onsite Testing: TBD
- Demo Showcase: Big Communications Event (May 15-17, Austin) TBD
- **Demo Showcase: ONS Europe (Sept 25-27, Amsterdam)**
- **Demo Showcase: OCP Summit (October 1-2, Amsterdam) (potential)**

VCO Demo 2.0 Goals (DRAFT TO BE UPDATED):

- Integrate open source components (e.g. ODL, OpenStack) into deployable NFV solution stacks (a.k.a. scenarios)
- Pre-test the function and performance of these NFV solution stacks and OPNFV platform compliance to improve interoperability in ecosystem
- Interoperability with mixed hardware, independent installer, independent/open stack NFV solution stack, independent VNF and VNFM, all interoperate to deploy VCO services
- NFV values as demonstrated through the VCO demo: rapid on-boarding, agile service-on-demand, and analytics driven operation automation, and survice assurance
- Continue the work started in the VCO 1.0 project with the specific focus on the virtualized Mobile Network use case
- Focus on implementation of all elements of vRAN for the LTE RAN as well as the virtualized mobile packet core elements (vEPC), which represents a minimum viable mobile access network configuration
- Supplementary service related elements will be included with the goal to demonstrate the vRAN and vEPC, and may specifically include instantiation of MEC environment and applications in addition to IP network access & applications

Open Source Project Involvement: OPNFV, OpenDaylight, ONAP, OpenStack, OpenAirInterface, Open Compute Project.

Service Providers Involvement: If you're with a service provider and would like to get involved with the demo, please indicate your interest below:

Service Provder	Contact Person	Details

China Mobile	Ren Rongwei (renrongwei@chinamobile.com)	Read the Project Description on the Wiki here. Summary: The C-RAN project is mobile communication network integration and testing project based on NFV architecture. Establish an NFV cloud platform that supports mobile network VNFs. C-RAN means Cloud Radio Access Network or Centralized Radio Access Network. The basic concept is to consolidate compute resources to run some radio access functions in a datacenter, rather than in a base station. Some of the functions which can be centralized may include centralized eNodeB processing (virtual baseband unit (vBBU) or Radio Cloud Center (RCC)), virtualized Mobility Management Entity (vMME), and virtualized Signalling/Processing Gateway (virtual S /GW or P/GW). Several of these virtual functions impose strict timing or performance requirements for signal processing to be compliant with RAN standards. The goal of this project is to document the requirements of these virtual functions, and propose a reference architecture for a complete C-RAN implementation which can be deployed on OPNFV infrastructure. C-RAN will also analyze and research demand for hardware acceleration for the mobile network, for features like encryption and compression in protocols including PDCP (Packet Data Convergence Protocol) and RLC (Radio Link Control). The project will also improve the data processing ability of the NFVI for mobile, and enable the utilization of hardware acceleration in OpenStack. Finally, C-RAN will also consider the design and architecture of a shared platform for MEC and C-RAN use-cases, including network orchestration of the mobile and virtual network.

Cumulus Lab:

Lab Owner	Contact Person	Lab Details
Cumulus	JR Rivers (jrrivers@cumulusnetworks.com)	Pre-built - 3 "racks" each with 2 dual connected servers and two leaf switches. two spines for aggregation, either 10G/40G or 25G/100G connectivity, out-of-band network, console access to everything, and smart power
Mailing Address	JR Rivers (jrrivers@cumulusnetworks.com)	Cumulus Networks c/o JR Rivers 650 Castro Street suite 120-245 Mountain View, CA 94041
Remote Connectivity	JR Rivers (jrrivers@cumulusnetworks.com)	Email JR Directly
OpenStack Questions	Dave Cain (dcain@redhat.com)	Please communicate via the OPNFV VCO Slack Channel #general, or your own respective #onboarding-COMPANY channel.

Onboarding	Hanen Garcia & Dave Cain
	
	Tenants
	
	Script you MUST run!
		`# Clear any old environment that may conflict.`
		`for key in $( set | awk '{FS="="}  /^OS_/ {print $1}' ); do unset $key ; done`
		`export OS_USERNAME=<**YOUR-NAME**>`
		`export OS_TENANT_NAME=<**YOUR-NAME**>`
		`export OS_PASSWORD=<**YOUR-NAME**>`
		`export OS_PROJECT_NAME=<**YOUR-NAME**>`
		`export NOVA_VERSION=1.1`
		`export OS_NO_CACHE=True`
		`export COMPUTE_API_VERSION=1.1`
		`export no_proxy=,172.21.25.158,192.168.66.27,172.21.25.155,192.168.66.23`
		`export OS_CLOUDNAME=vco2`
		`export OS_AUTH_URL=http://172.21.25.154:5000/v2.0`
		`export PYTHONWARNINGS="ignore:Certificate has no, ignore:A true SSLContext object is not available"`

	User and Project Listing	`[dcain@opnfv-demo ~]$ openstack project list`
		`+----------------------------------+---------------+`
		`| ID | Name |`
		`+----------------------------------+---------------+`
		`| 37eb5419f46b4489b9f222999c6e5442 | redhat-tenant |`
		`| 3f73432631c1486a98a1db6a68022d3e | admin |`
		`| 42da225225674df182934b9173b7b1db | oam |`
		`| 5cb97945dc4f4625b7fcd1296bf91411 | quortus-ims |`
		`| 7522c92bd2d24517b71df28b28f2dfac | gi-lan |`
		`| 90ff5fe07e554524b037c89fcf9b7b85 | service |`
		`| 9c9128769bc24aaabb91ca29a8bfc034 | quortus-epc |`
		`+----------------------------------+---------------+`

Wiring and Configuration, VM, Baremetal and Machines requirements spreadsheet, Lab information : https://docs.google.com/spreadsheets/d/1-TUAg-XnoY0DFycbngD-1tHEgaFxTXYBZ34gf-GU5Vo/edit#gid=0

Topology Information : https://drive.google.com/open?id=1zE8d9yF2NdUDVYjuw4eJHUwBSyL6BkTkhY64KdRtRac

Hardware and software components: If your organization is willing to volunteer the following components, please indicate that below. Please re-configure chart as necessary.

Item	Description	Vendor	Confirmed	Comments
Jump Server	(1) VM	Red Hat / Cumulus	Yes	
Leaf Switches	(6) 16x100G	Mellanox	Yes	SN2100
Spine Switches	(2) 16x100	Mellanox	Yes	SN2100
Switch Software	Cumulus Linux	Cumulus	Yes	

Compute	(14) CS1000	Cumulus (Dell)	Yes	Quad core L5520 @2.27GHz (4c8t/cpu) 8G/1TB (four have 3TB)
Penguin Computing Tundra Rack	Open Compute Project	Penguin Computing	TBD	Minimum Requirements: 12-18 Dual-socket, 12-core/socket servers with 256GB memory per compute node.
Base Compute OS	RHEL 7.4	Red Hat	Yes	OAI-DU Instances need to be installed in Real-Time support capable nodes
OpenStack	RHOSP 10	Red Hat	Yes	
SDN Controller	OpenDayLight	Red Hat	Yes	
vRAN VNFs: • Software platform (VNF) for vRAN	OAI	OAI	Yes	Details will fill for next meeting. We have a coordination meeting with Changming's team and BUPT and Raymond from OAI in Beijing. After this meeting we shall know more about the timeframe for the availability of the CU/DU split. The indication today is that there are no major hurdles here for the March demo date. Changming and OAI will jointly report here at next VCO Demo planning meeting.
Service Assurance VNFs • vStream • nG1	• vStream VNF – 8 vCPUs, 8GB RAM, 100GB storage • nG1 VNF – 4 vCPUs, 16GB RAM, 500GB storage	Netscout	Yes	Netscout nGenius analytics, powered by smart data, provides pervasive application and service layer visibility for virtualized central office, stripping away the unknown and giving the insight necessary for assessing, optimizing, monitoring and troubleshooting critical business services. nGenius reduces the complexity in virtualized environments by: • Discovering service dependencies across application, compute, and network workloads • Ensuring the delivery of applications and services with high-quality experiences • Using actionable insight to quickly triage root cause and repair service issues

Radio Equipment HW		OAI, Ettus, Red Hat	Ettus - Yes UEs - Yes SIMs - Yes (Quortus) Duplexer - Yes (OAI) Faraday Cag - Yes (Pasi)	ETTUS https://www.ettus.com/product/details/X310-KIT has agreed to loan out a radio and will be shipping it to the Cumulus lab. It will work with Ethernet link between vBBU (on one server) and Radio board connected to another server (RRU) . There may be need to acquire some of these as per demo needs (unfortunately we don't have any we work with the B series that works with USB 3.0). Note that this setup will have commercial UE's connected OVER-THE-AIR to X310 which means you need permission to transmit or use Faraday's cages where UE's will be stocked during the demo. 12 Feb: Ettus config is X310 (or X311 - diff seems to be FPGA size) with CBX daughterboards. Target operation at Band 7. **Faraday Cage**: Jan 31 - Pasi bought one and will make it available (Willtek 4921 box), need only 1x RF & 2x USB feed throughs. Antenna coupler (4916) should work ok as in-box antenna for SDR. 12'Feb, on hand, USB feedthrough holes made, awaiting USB shielded adapters. • Willtek 4921: http://www.testmart.com/webdata/mfr_pdfs/WILTEK/willtek_4921_ds339_0806_en.pdf • Willtek 4916 (if required): http://www.testmart.com/webdata/mfr_pdfs/WILTEK/willtek_4916_ds333_0707_en.pdf **UEs:** • 12Feb'18- update: target Band 7, i.e. all UEs, irrespective make/model need to support LTE band 7 • UE type 1 / Dongle: Netgear AC341u – see here: http://www.orbit-lab.org/wiki/Tutorials/g0WmLTE/Tutorial3 & http://www.orbit-lab.org/wiki/Tutorials/g0WmLTE/Tutorial4-OAI/Tutorial1 • UE type 2 / phone (Android): Pasi has 2x Samsung Galaxy S7s for this. **Also need the following:** • https://open-cells.com/index.php/sim-cards/ - Quortus will supply SIMs (for up to 4 UE's) • Duplexer is required, band 7; OAI has promised to loan / supply
MEC Software		Quortus	Yes	Quortus will be supplying the MEC (instantiation in initial demo expected to be Local traffic breakout, which allows any application to be placed "close" after the vRAN chain). Details needed.
vEPC		Quortus	Yes	Quortus will be supplying the EPC + OAI RAN. Intel may also have an EPC option. Details needed.
vIMS/VoLTE		Quortus	Yes	Quortus IMS/VoLTE for March demo. ~~MetaSwitch Clearwater.~~ Need Confirmation & Details.

Orchestration: • Ansible/Tacker (Simple) • ONAP (Advanced)	Ansible	Ansible- Red Hat Tacker -? ONAP- ?	Ansible - Yes	Ansible - Red Hat can support OAI Team can help with the management of the lifecycle of the OAI in Ansible/Tacker. We have done this in the past with another solution and should be able to do the same. OAI Team (Navid) needs to know the time-frame for this. We shall follow the discussion Brandon started with the ONAP team and respond as further information becomes available. Some other OAI members may also engage for this. Update: due to time constraints for initial demo & resource requirements for setting up ONAP, current plan is to postpone ONAP integration work to later time (i.e. will not be in initial demo in the ONS).
RU - DU - CU split vBBU SW (4G –> 5G NR)	Split RAN SW stack	CMCC	OAI for LTE	China Mobile/OAI have offered based on an OAI stack (4G LTE right now, moving towards 5G). **Details needed.**

Penguin Lab

Hardware and software components: If your organization is willing to volunteer the following components, please indicate that below. Please re-configure chart as neccessary.

Configuration
Penguin Tundra: 15x compute servers, 6x storage servers, 1x JBOD (45x6TB drives), 2x 10GbE switches (6x QSFP/40Gb + 48x SFP+ /10Gb ports), 1x 1Gb switch, rack (48x RJ45 ports), 3000W rectifier, 208V/30A/3PH power shelf with 2x L1-30 plugs, Open Frame Rack (87.4"x23.6"x31.32").

Base Configurations: As base configurations are determined, we'll add them here.

- Intel Select Solution for NFVI with RHEL 7.3, QAT, DPDK. OpenStack (RHOSP 12), etc.
- For reference for potential collaboration with ONAP - ONAP r2 5G use case wiki page: https://wiki.onap.org/display/DW/Use+case+proposal%3A+5G-+RAN+deployment%2C+Slicing%2C+SON
- Guidelines for NFV compute node configurations from Intel (note that we do not expect to require quickassist unless specific VNFCIs require/support it): https://builders.intel.com/docs/networkbuilders/intel-select-solutions-for-nfvi-red-hat-configurations.pdf

Other Demo Directions to be considered in Future: To be developed as space, sources, and managment becomes available.

- VCO Residential - VCO 1.0 + OLT (partners needed)
  - vOLT - Need Partner
  - (vCMTS)/vCCAP - Need Partner(s)
- VCO Enterprise - VCO 1.0 + PBX (partner needed)
  - SD-WAN -
  - PBX Partner - Hosted Collaboration?