

OSM Hackfest – Session 3 Modeling multi-VDU VNF Eduardo Sousa (Canonical) Guillermo Calviño (Altran) Felipe Vicens (ATOS)



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NS diagram





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VNF diagram





Final Multi-VDU Picture





VNF/NS Compose



• Compose a VNF or NS graphically.



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VNF diagram





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User Interface



 Steps: 			COMPOSE A NEW VNF
Compose	a new VNF		
	CO MANO	=	🗈 admin 👻 😝 ad
	MAIN NAVIDATION	VNF Packages	Home Projects admin vnf Pack
	PROJECT	Show 10 * entries	Search:
VNF PACKAGES	■ Packages 🗸	Short Name 1 Identifier 11 Type * Description 11 Vendor 11 Version 11 Actions	
	VNF Packages	No data available in table	Previous Next

• Create new Package

Create new Packa	age	×
Package name *	MultiVDU_vnfd	
Cancel		Create

VNFD Composer

• Steps VNFD Composer

VNFD Composer

∓ 🗹 i VDU Select Element CP VDU IntVL CP intCP IntVL Keyboard shortcuts



description

version

Id

Name

1.0

MultiVDU_vnfd

MultiVDU_vnfd

🖀 Home 🚿 🚠 VNFD Composer

Open Source ΜĄ

Keyboard shortcuts

- . Create edge: Select the first vertex by clicking on it. Shift + left-click on another vertex (different than the selected one).
- · Delete edge: Select the vertex by clicking on it. right-click + Delete

Creating the new multi-VDU VNF (1/4)



Create VDI	Js _{mgmtVM} data∨M (D)rag and drop)		8	YAML JSON
VDU	SAVE	VDU	SAVE		<pre>2 vhlu: 3 - connection-point: [] 4 description: '' 5 id: MultiVDU_vnfd 6 internal-vld: [] 7 mmteinterface:</pre>
count	1	count	1		<pre>% mgmt=interface: % cp: '' 9 name: MultiVDU_vnfd 10 short-name: MultiVDU_vnfd</pre>
description		description			11 vdu: 12 - count: '1' 13 description: ''
Name	mgmtVM	Name	dataVM		14 13: mgmtvM 15 image: cirros034 16 interface: [] 17 internal-connection-point
image	cirros034	image	cirros034		10 Internal connection point 18 monitoring-param: [] 19 name: mgmtVM 20 vm-flavor: {}
Id	mgmtVM	ld	dataVM		21 count: '1' 22 description: '' 23 id: dataVM
• Edit the	e descriptor 📧 to a	dd the flavor:	abe 11 years		<pre>24 image: cirros034 25 interface: [] 26 internal-connection-point 27 monitoring-param: [] 28 name: dataVM 29 vm-flavor: {} 30 version: '1.0'</pre>

Creating the new multi-VDU VNF (2/4)





• Link CPs with VDUs (Shift + Left Click)



Creating the new multi-VDU VNF (3/4)



• Steps • Create	e Internal	VL:	(Drag and drop)
Virtual Link	c E	SAVE	
short-name	internal		
Name	internal		
ip-profile-ref			
Туре	ELAN		
Id	internal		
• Link in	iternal VL	with VD)Us (Shift + Left (

ink internal VL with VDUs (Shift + Left Click)
 VNFD composer automatically create the internal connection points:

mgmtVM-internal dataVM-internal

• Edit the descriptor 📧 to add the CP in mgmt-interface

-		
1	vnfd:v	mfd-catalog:
2	vr	ifd:
3		connection-point:
4		- name: vnf-mgmt
5		type: VPORT
6		 name: vnf-data
7		type: VPORT
8		description: "
9		id: MultiVDU_vnfd
10		internal-vld:
11		- id: internal
12		internal-connection-point
13		 id-ref: intcp_j5j9
14		- id-ref: intcp_ih6y
15		ip-profile-ref: ''
16		name: internal
17		short-name: internal
18		type: ELAN
19		mgmt-interface:
20		cp: 'vnf-mgmt'

Edit VNED Descriptor

Creating the new multi-VDU VNF (4/4)



Final Scenario multiVDU_vnfd



And finally, this is the sample file of Hackfest Multi VDU VNF Descriptor <u>https://osm-download.etsi.org/ftp/osm-6.0-six/7th-hackfest/packages/hackfest_multivdu_vnf.tar.gz</u>

NS diagram





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• Compose a new NS MANO = 😂 admin 🔻 **e** a NS Packages Home Projects admin ns Pac # Home / Compose a new NS NS PACKAGES Show 10 + entries Search: Overview Short Name 11 Identifier Description Vendor 11 Version 11 Actions Packages No data available in table NS Packages WNF Packages Showing 0 to 0 of 0 entries Previous Next NetSlice Templates

• Create new Package

Create new Packa	age	x
Package name *	MultiVDU_nsd	
Cancel		Create

User Interface

• Steps:



COMPOSE A NEW NS

NSD Composer





Creating the NSD (1/3)



Select VNFs	S: MultiVDU vnfd:1 MultiVDU	J_vnfd:2 (Drag	and c	lrop)	
VNF		VNF			
member-vnf-index vnfd-id-ref	1 Multi∨DU_vnfd	member-vnf-index vnfd-id-ref	2 Multi∨DU_	vnfd	
			\ \		
Create VLs:	mgmtnet datanet (D	rag and drop))		
Create VLs: Virtual Link	mgmtnet datanet (D	virtual) Link		SA
Create VLs: Virtual Link Vim network name	ngmtnet datanet (D SAVE osm-ext	virtual Virtual Vim netwo)) Link ork name		SA
Create VLs: Virtual Link Vim network name Name	ngmtnet datanet (D SAVE osm-ext mgmtnet	Virtual	D) Link ork name Name	datanet	SA
Create VLs: Virtual Link Vim network name Name Mgmt network	mgmtnet datanet (D SAVE osm-ext mgmtnet true	rag and drop Virtual Vim netw Mgm	D) Link ork name Name t network	datanet	SA
Create VLs: Virtual Link Vim network name Name Mgmt network Type	mgmtnet datanet (D SAVE osm-ext mgmtnet true ELAN	virtual Virtual Vim netw	D) Link ork name Name t network Type	datanet false ELAN	SA

Creating the NSD (2/3)



• Steps

- Link VLs with VNFs (Shift + Left Click)
 - You need to know the name for the CPs (vnf-data and vnf-mgmt)

Please insert the vnfd-connection-point-ref:	×	Please insert the vnfd-connection-point-ref:	×
vnf-mgmt		vnf-data	
	Cancel		Cancel

Creating the NSD (3/3)



Final Scenario multiVDU_nsd



And finally, this is the sample file of Hackfest Multi VDU VNF Descriptor https://osm-download.etsi.org/ftp/osm-6.0-six/7th-hackfest/packages/hackfest_multivdu_ns.tar.gz

Deploying NS in the UI



- Onboard VNFD and NSD to catalog using the UI
- Launch the NS from the UI
 - Depending on the VIM, specify a VIM network name to map mgmtnet
 - If you need to change the VIM, change the network name using config:

{vld: [{name: mgmtnet, vim-network-name: osm-ext}]}

- Click the info button to see the mgmt IP address of each VNF
- Connect to each VNF:
 - ssh cirros@<IP>
 - password: cubswin:)

Final Multi-VDU Picture





Network modelling with IP Profiles



- Using IP Profiles, we can configure the attributes of subnets that are created by OSM. We can do it for internal or external VLDs.
- Subnet's DHCP server will not deliver a default gateway if explicitly set to 0.0.0.0

```
External VLD with IP Profile (NSD level)
        id: MultiVDU nsd
         . . .
        ip-profiles:
            name: profile external1
            description: external network
            ip-profile-params:
                 ip-version: ipv4
                 dns-server: 8.8.8.8
                 gateway-address: 0.0.0.0
                 subnet-address: 192.168.17.0/24
                 dhcp-params:
                   enabled: true
        vld:
            id: datanet
             ip-profile-ref: profile external1
             . . .
```

```
Internal VLD with IP Profile (VNFD level)
        id: MultiVDU vnfd
         . . .
        ip-profiles:
            name: p1
            description: p1
            ip-profile-params:
                 ip-version: ipv4
                 dns-server: 0.0.0.0
                 gateway-address: 0.0.0.0
                 subnet-address: 192.168.100.0/24
                 dhcp-params:
                   enabled: true
        internal-vld:
            id: internal
              ip-profile-ref: p1
```

Network modelling with Static IPs



•We can also set static IP addresses, having IP Profile and DHCP enabled.

```
External VLD with IP Profile (NSD level)
• • •
        id: MultiVDU nsd
        ip-profiles:
            name: profile external1
            description: external network
            ip-profile-params:
                ip-version: ipv4
                 subnet-address: 192.168.17.0/24
                dhcp-params:
                   enabled: true
        vld:
            id: datanet
            ip-profile-ref: profile external1
            vnfd-connection-point-ref:
                 ip-address: 192.168.17.100
```

```
Internal VLD with IP Profile (VNFD level)
        id: MultiVDU vnfd
        ip-profiles:
            name: p1
            description: p1
             ip-profile-params:
                 ip-version: ipv4
                 subnet-address: 192.168.100.0/24
                 dhcp-params:
                   enabled: true
        internal-vld:
            id: internal
            ip-profile-ref: p1
            internal-connection-point:
                 id-ref: mgmtVM-internal
                 ip-address: 192.168.100.100
```

Network modelling with MACs



• We can set MAC addresses as well, just set them up at the VDU level.

Changing	Changing MAC (VNFD level)				
•••					
	interface:				
	<pre>- name: mgmtVM-eth0</pre>				
	position: '1'				
	type: EXTERNAL				
	virtual-interface:				
	type: VIRTIO				
	external-connection-point-ref: vnf-mgmt				
	mac-address: '01:02:03:01:02:03'				
	<pre>- name: mgmtVM-eth1</pre>				
	position: '2'				
	type: INTERNAL				
	virtual-interface:				
	type: VIRTIO				
	internal-connection-point-ref: mgmtVM-internal				
	mac-address: '03:02:01:03:02:01'				
•••					

--> Be careful about duplicated MACs!



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