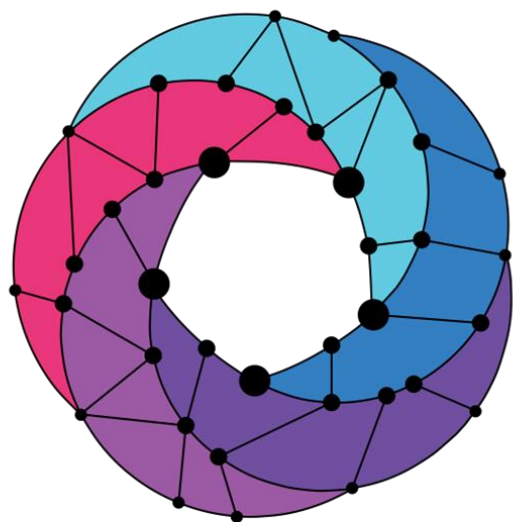


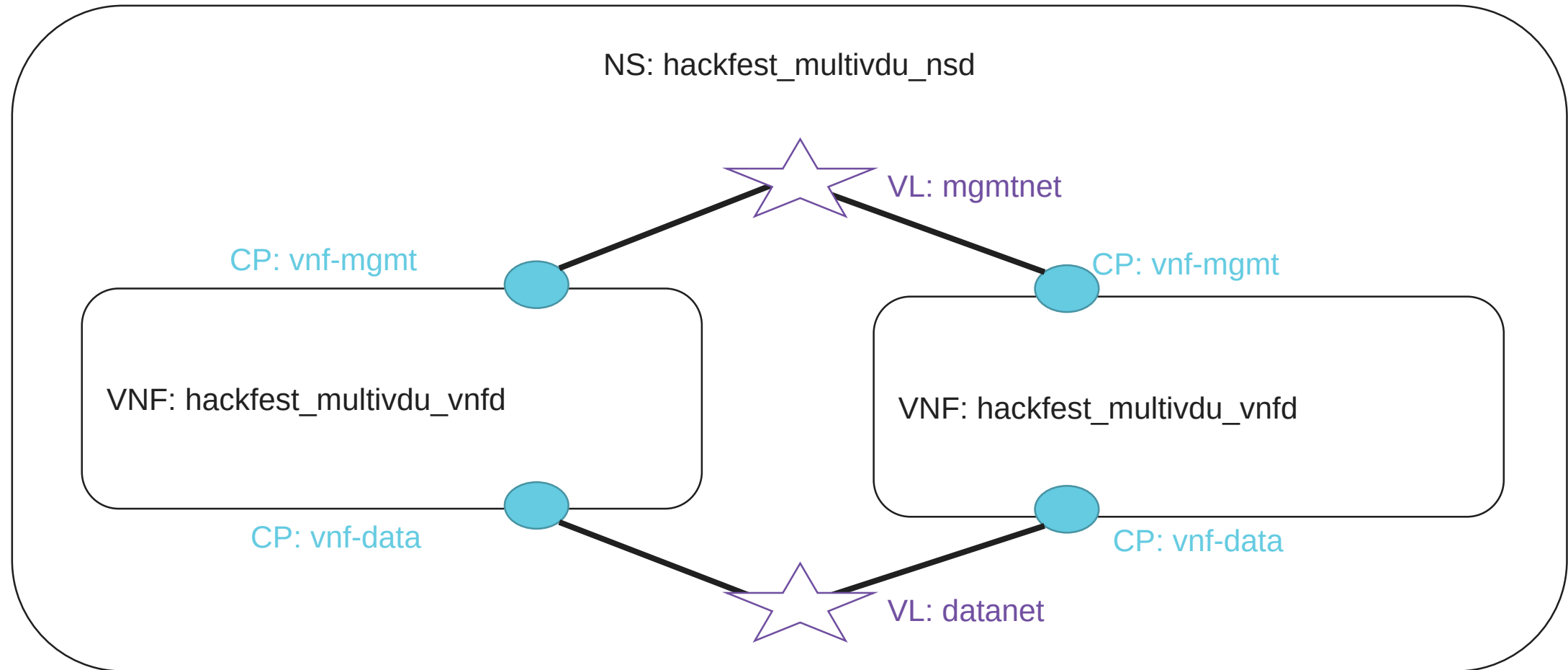


Open Source
MANO

OSM Hackfest – Session 3 Modeling multi-VDU VNF

Eduardo Sousa (Canonical)
Guillermo Calviño (Altran)

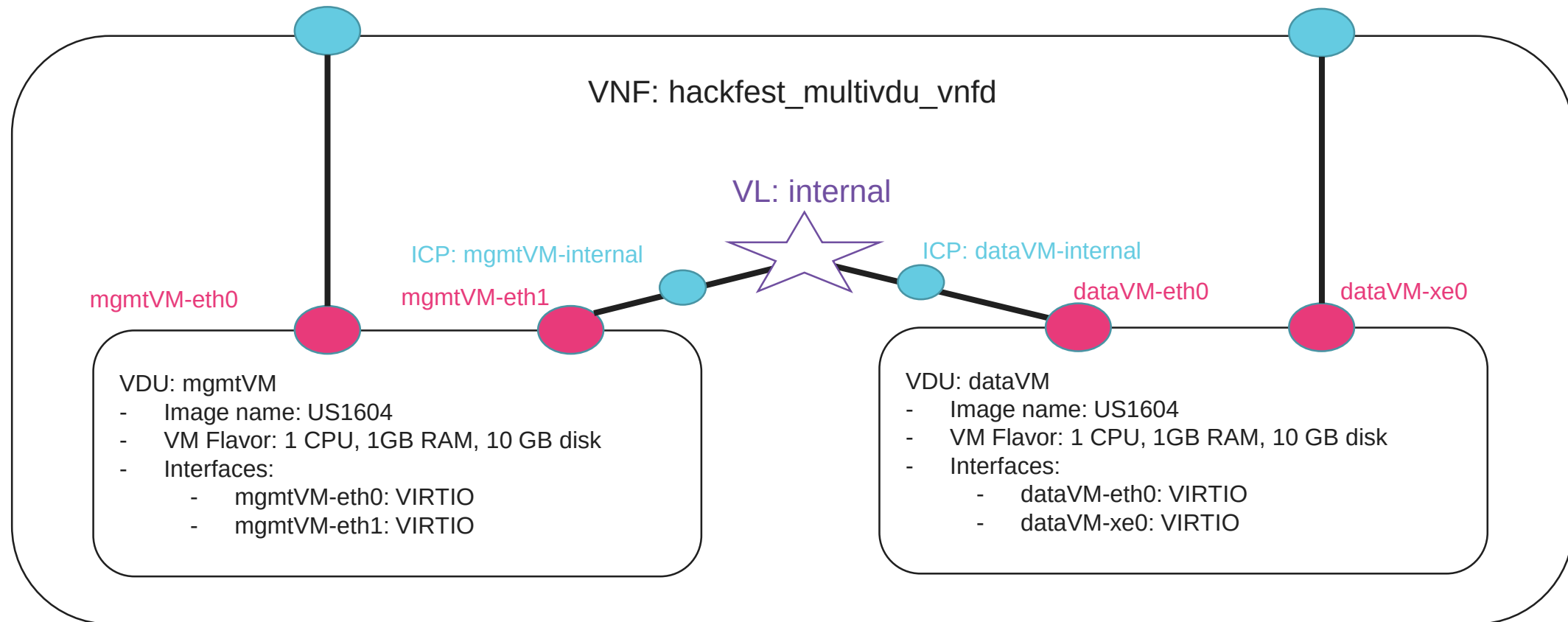
NS diagram



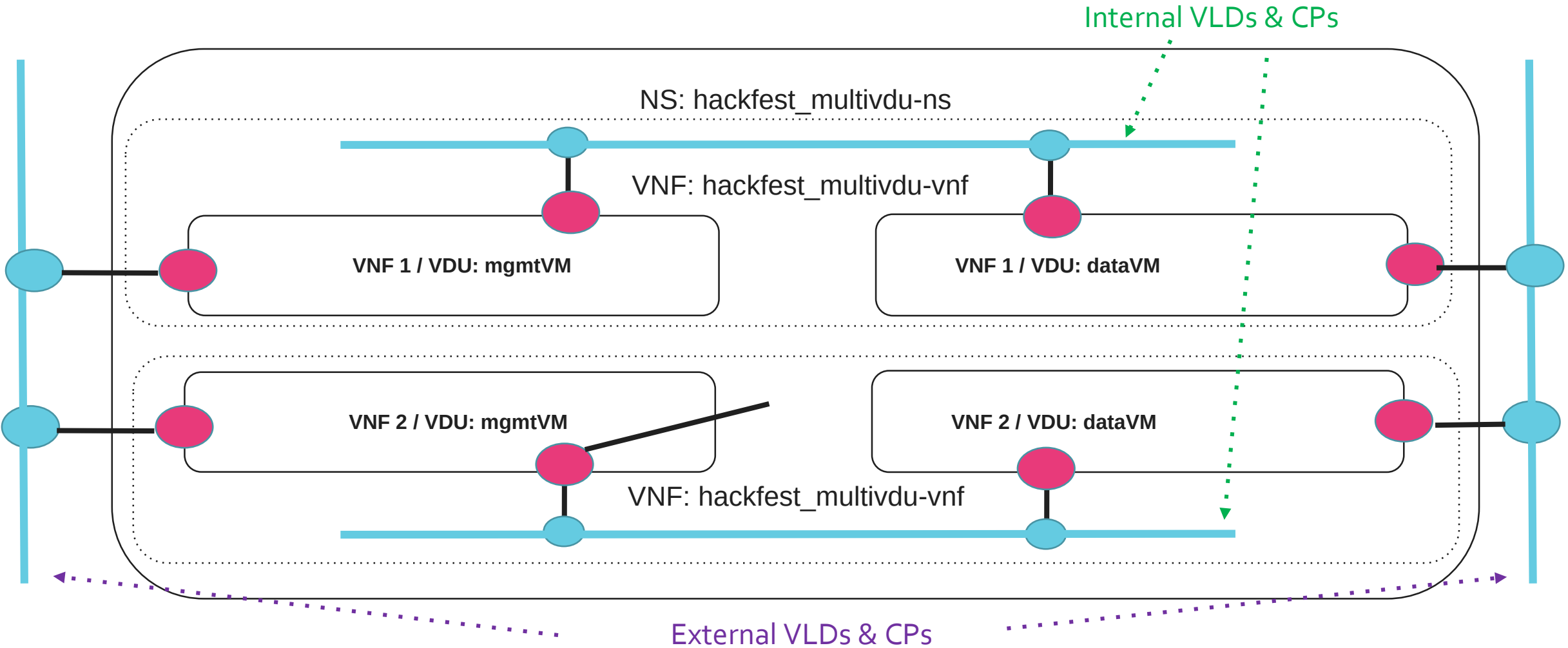
VNF diagram

External Connection point: vnf-mgmt

External Connection point: vnf-data



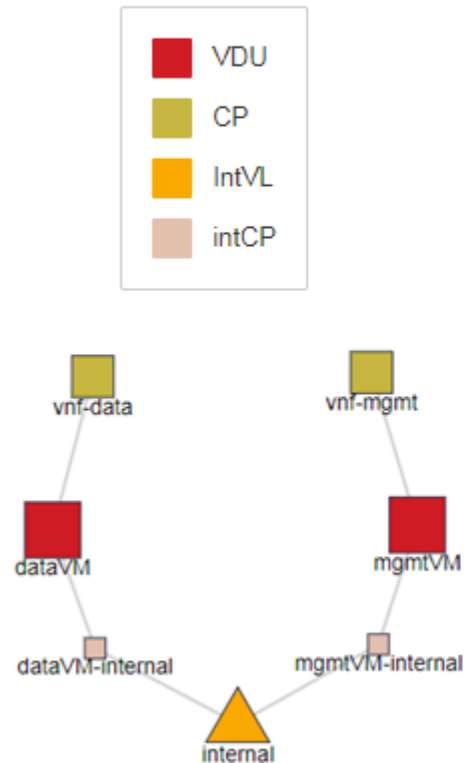
Final Multi-VDU Picture



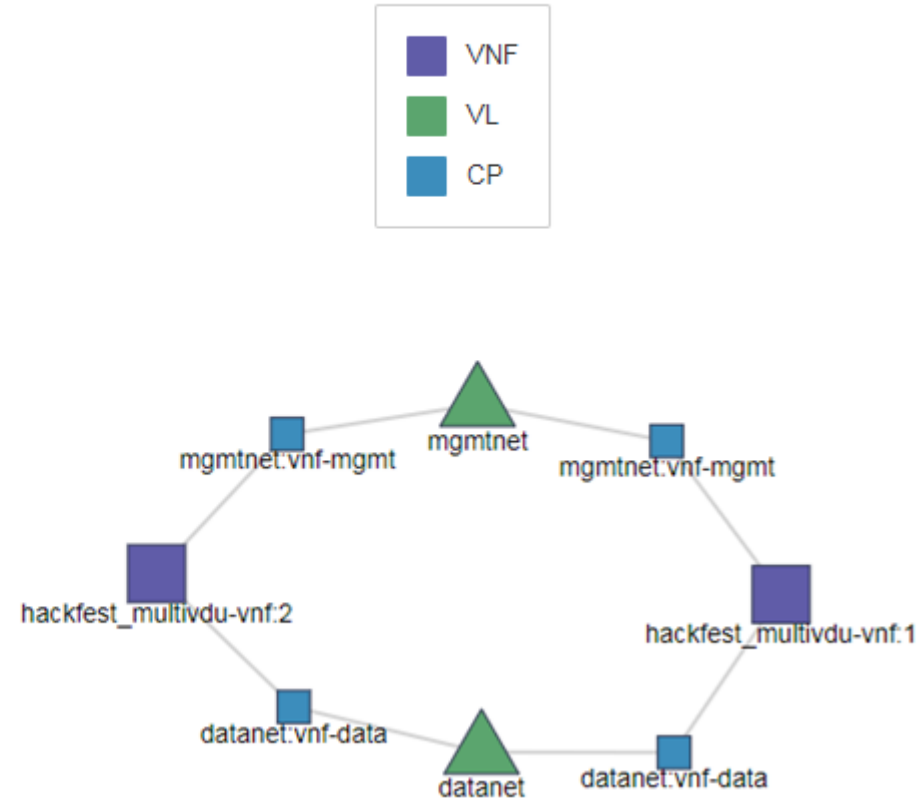
VNF/NS Compose

- Compose a VNF or NS graphically.

 Compose a new VNF



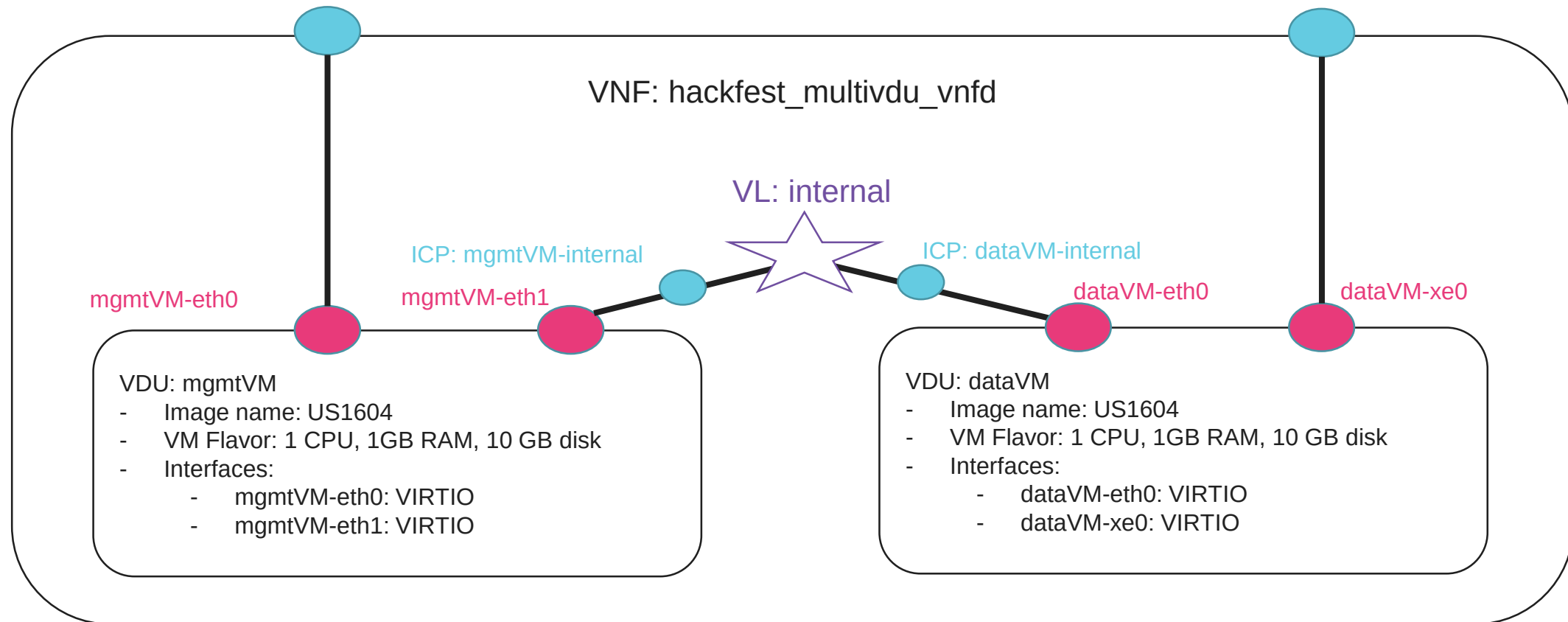
 Compose a new NS



VNF diagram

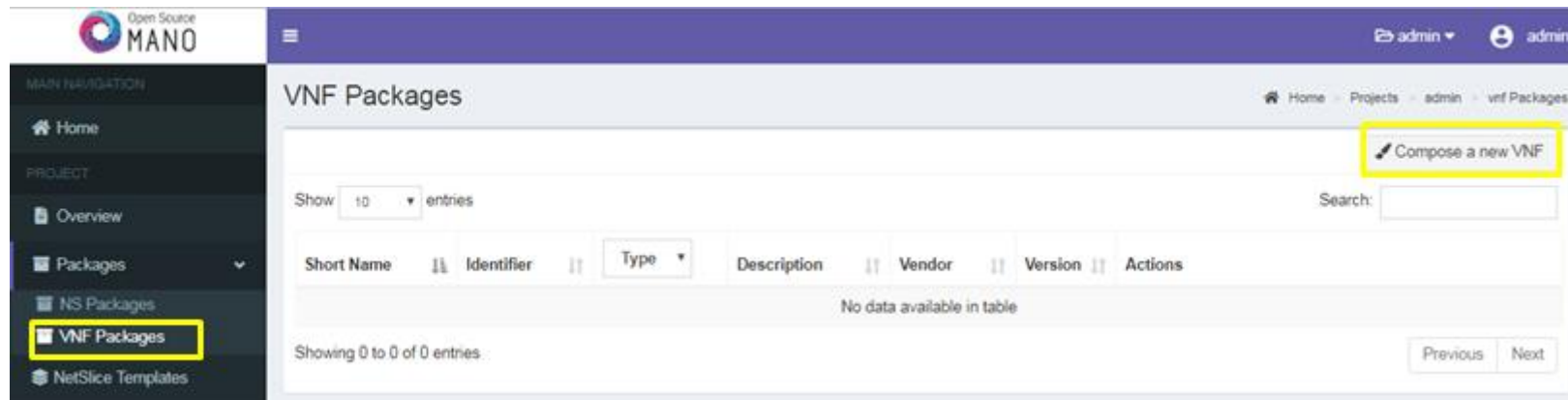
External Connection point: vnf-mgmt

External Connection point: vnf-data

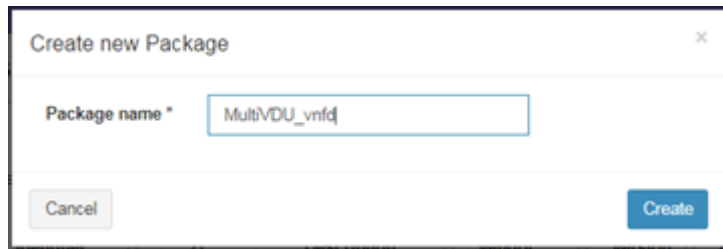


User Interface

- Steps:
 - Compose a new VNF



- Create new Package



The 'Create new Package' dialog box is shown. It has a title bar with a close button. The 'Package name *' field contains the text 'MultiVDU_vnf'. At the bottom, there are 'Cancel' and 'Create' buttons.

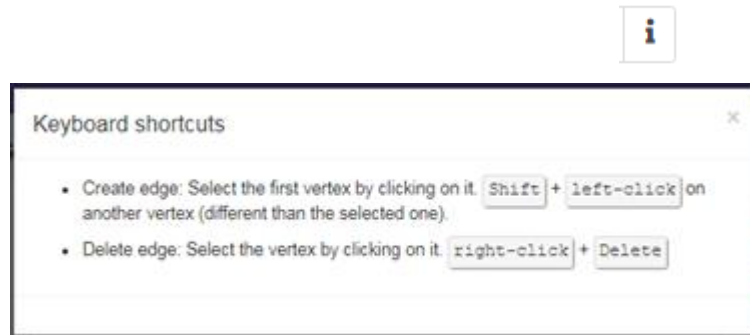
VNFD Composer

- Steps

- VNFD Composer



- Keyboard shortcuts



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

•Steps

- Create VDUs



(Drag and drop)

VDU	SAVE	VDU	SAVE
count	1	count	1
description		description	
image	US1604	image	US1604
cloud-init-file		cloud-init-file	
Id	mgmtVM	Id	dataVM
Name	mgmtVM	Name	dataVM

- Edit the descriptor

to add the flavor:

- vm-flavor: {memory-mb: '1024', storage-gb: '10', vcpu-count: '1'}



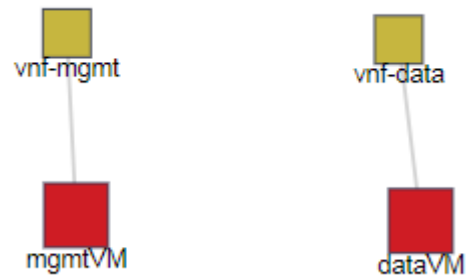
Creating the new multi-VDU VNF (2/4)

- Steps

- Create Connection Points   (Drag and drop)

Connection Point		SAVE	Connection Point		SAVE
Type	VPORT		Type	VPORT	
Name	vnf-mgmt		Name	vnf-data	

- Link CPs with VDUs (Shift + Left Click)



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

•Steps

- Create Internal VL:  (Drag and drop)

Virtual Link SAVE

short-name	internal
Name	internal
ip-profile-ref	
Type	ELAN
Id	internal

- Link internal VL with vDUs (Shift + Left Click)
 - VNFD composer automatically create the internal connection points:

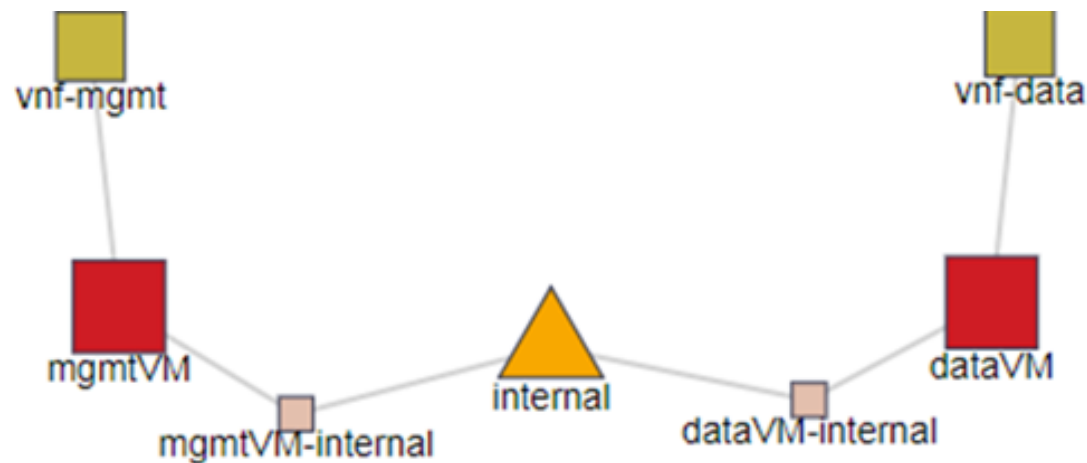
- Edit the des   nt-interface-->
mgmtVM-internal dataVM-internal



```
mgmt-interface:  
cp: vnf-mgmt
```

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

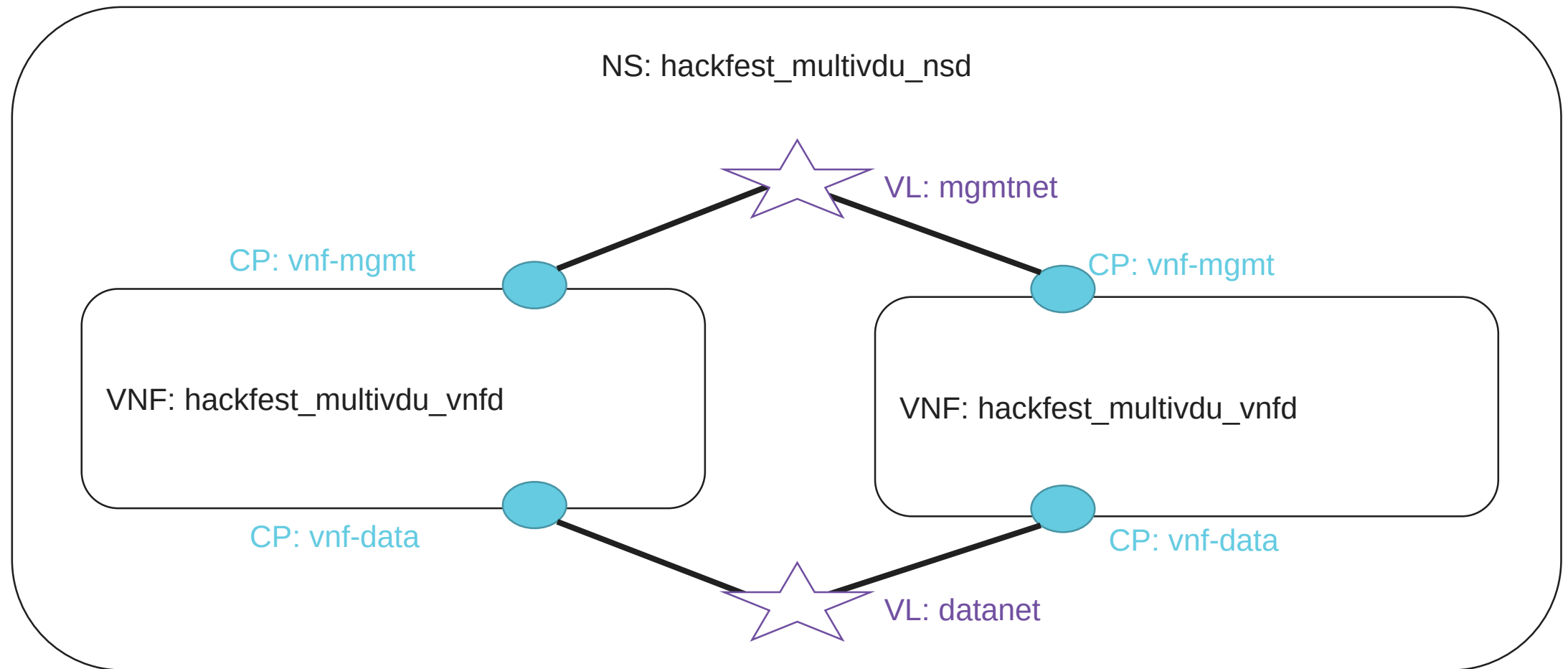
- Final Scenario multiVDU_vnfd



And finally, this is the sample file:

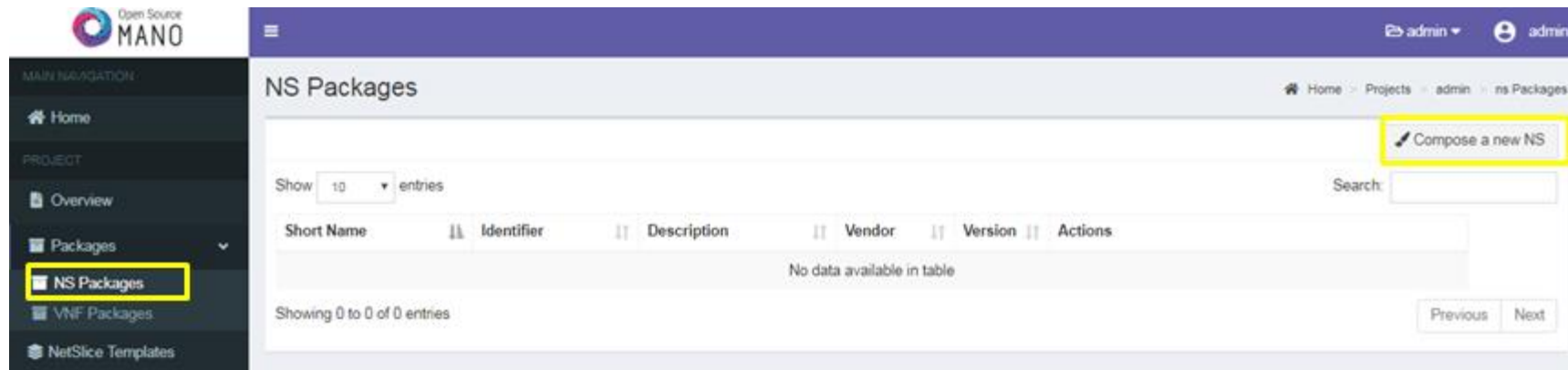
Hackfest Multi VDU VNF Descriptor - https://osm-download.etsi.org/ftp/osm-5.0-five/5th-hackfest/packages/hackfest_multivdu_vnf.tar.gz

NS diagram

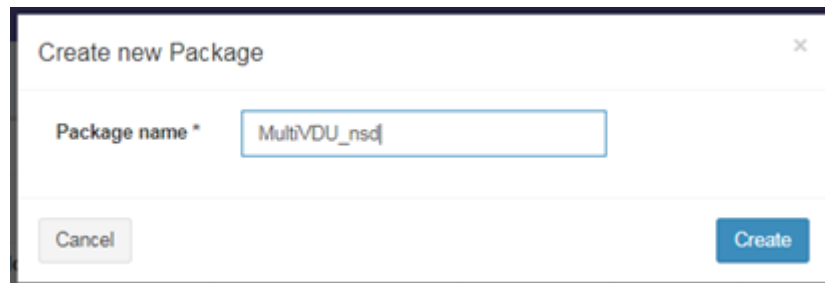


User Interface

- Steps:
 - Compose a new NS



- Create new Package

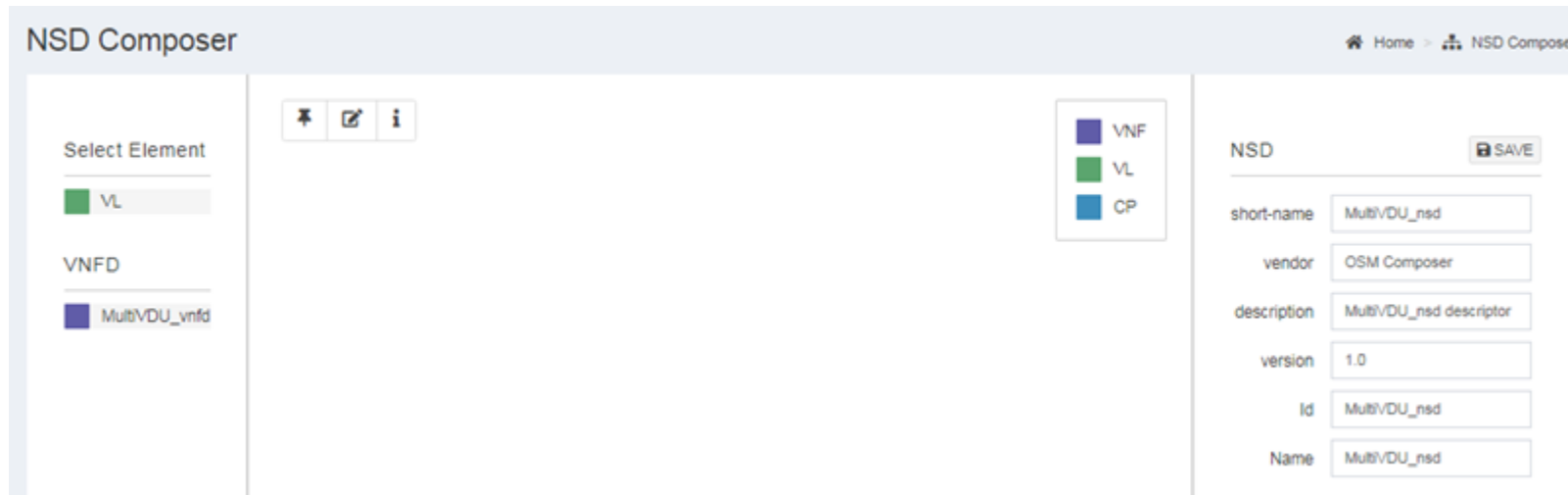


The 'Create new Package' dialog box is shown. It has a title bar with a close button. The main form contains a label 'Package name *' followed by a text input field containing the text 'MultiVDU_nsd'. At the bottom, there are two buttons: 'Cancel' and 'Create'.

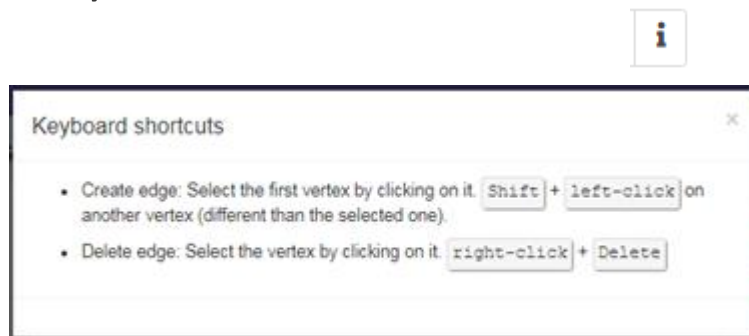
NSD Composer

• Steps

- NSD Composer



- Keyboard shortcuts



Creating the NSD (1/3)

- Select VNFs:   (Drag and drop)

VNF

member-vnf-index 1
vnfd-id-ref MultiVDU_vnfd

VNF

member-vnf-index 2
vnfd-id-ref MultiVDU_vnfd

- Create VLs:   (Drag and drop)

Virtual Link

SAVE

Vim network name PUBLIC
Name mgmtnet
Mgmt network true
Type ELAN
Id mgmtnet

Virtual Link

SAVE

Vim network name
Name datanet
Mgmt network false
Type ELAN
Id datanet

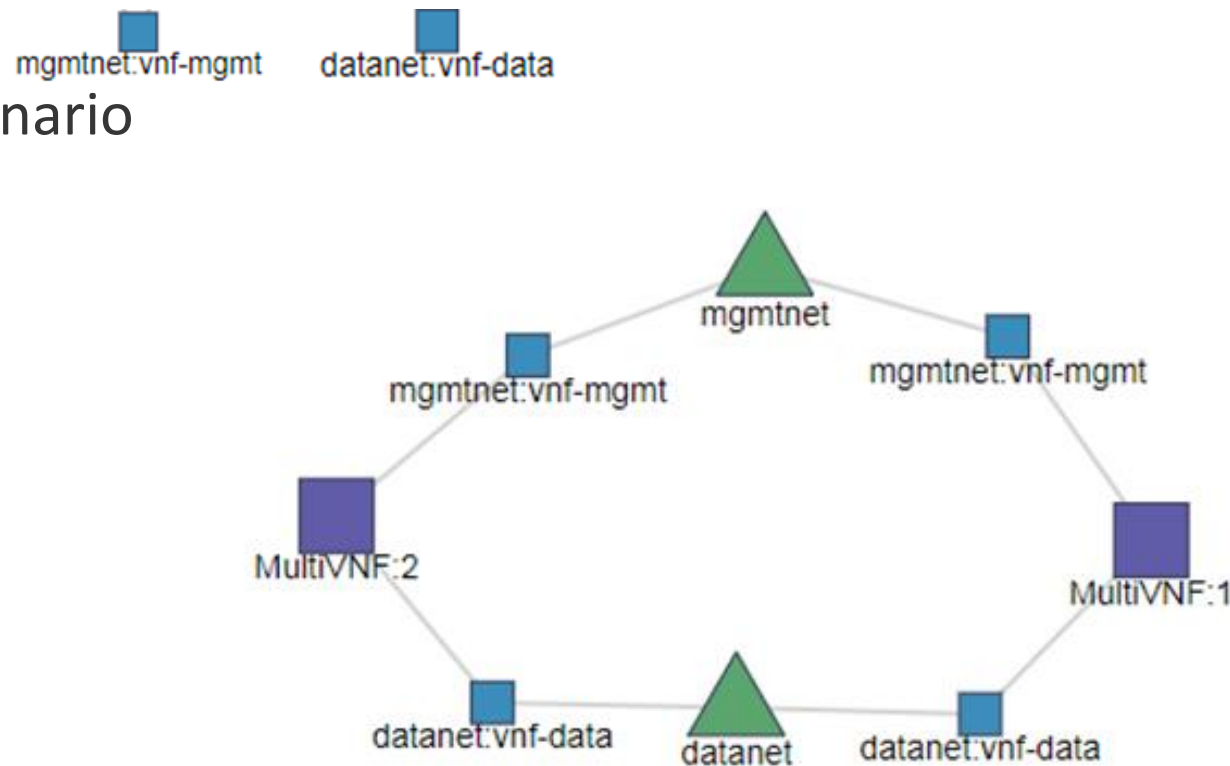
Creating the NSD (2/3)

- Steps

- Link VLs with VNFs (Shift + Left Click)

- You need to know the name for the CPs (vnf-data and vnf-mgmt)

- Final Scenario



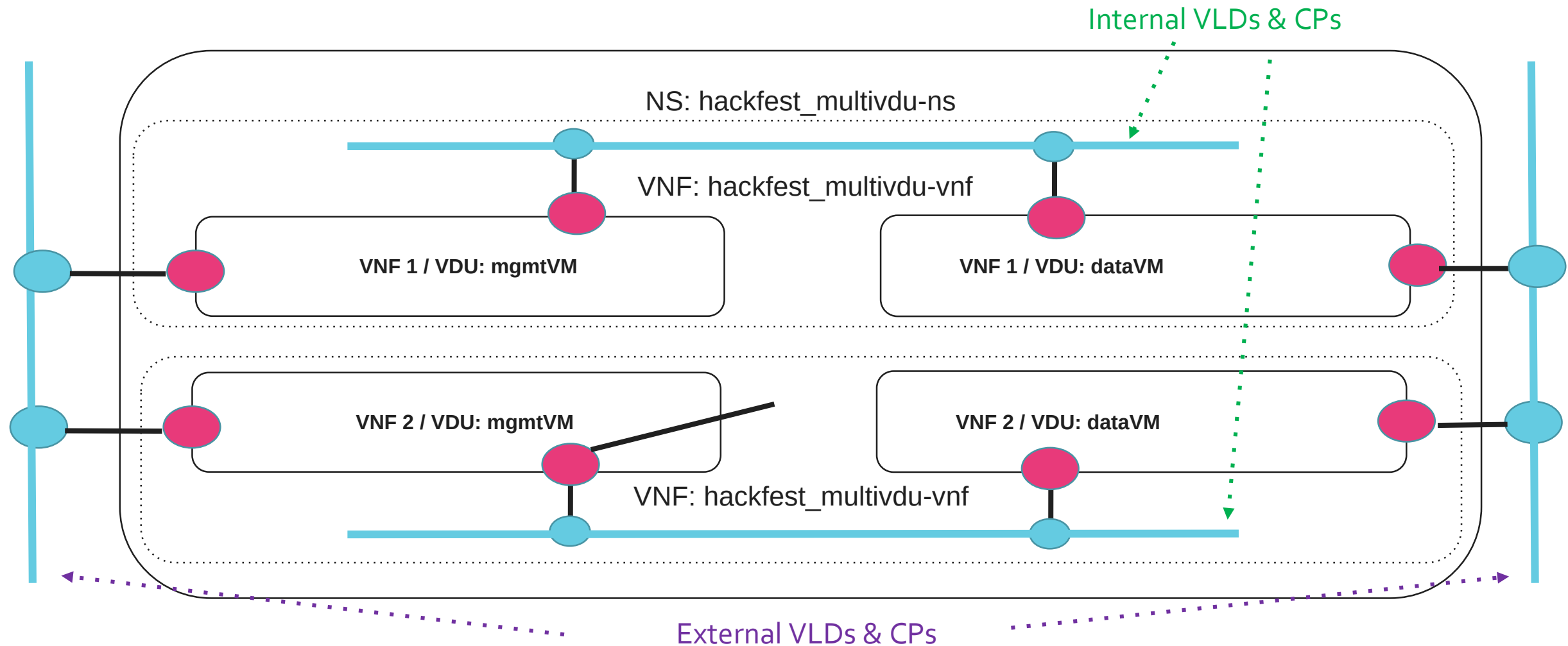
Creating the NSD (3/3)

- And finally, against the sample file:
Hackfest MultiVDU NS Descriptor - https://osm-download.etsi.org/ftp/osm-5.0-five/5th-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: PUBLIC}]}`
- Click the info button to see the mgmt IP address of each VNF
- Connect to each VNF:
 - `ssh osm@<IP> (pwd: osm4u)`

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: NS1-nsd
  ...
  ip-profiles:
    - name: profile_external1
      description: external network
      ip-profile-params:
        ip-version: ipv4
        dns-server: 8.8.8.8
        gateway-address:
        subnet-address: 192.168.17.0/24
        dhcp-params:
          enabled: true
      vld:
        - id: external1
          ip-profile-ref: profile_external1
      ...
```

Internal VLD with IP Profile (VNFD level)

```
...
- id: VNF1-vnfd
  ...
  ip-profiles:
    - name: p1
      description: p1
      ip-profile-params:
        ip-version: ipv4
        dns-server:
        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
      ...
```

Note: attributes with no values are informational only, they can be removed.

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: NS1-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: external1
    ip-profile-ref: profile_external1
    ...
    vnfd-connection-point-ref:
    - ...
      ip-address: 192.168.17.100
```

Internal VLD with IP Profile (VNFD level)

```
...
- id: VNF1-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
```

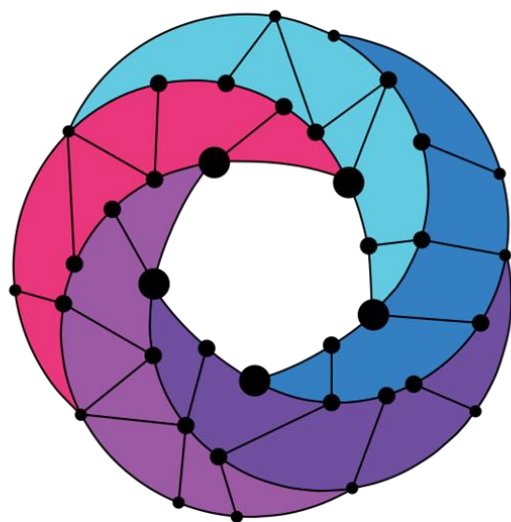
Network modelling with MACs

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

Changing MAC (VNFD level)

```
...
  interface:
  - name: mgmtVM-eth0
    position: '1'
    type: EXTERNAL
    virtual-interface:
      type: VIRTIO
    external-connection-point-ref: vnf-mgmt
    mac-address: '01:02:03:01:02:03'
  - name: mgmtVM-eth1
    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!



Open Source MANO

Find us at:

osm.etsi.org
osm.etsi.org/wikipub