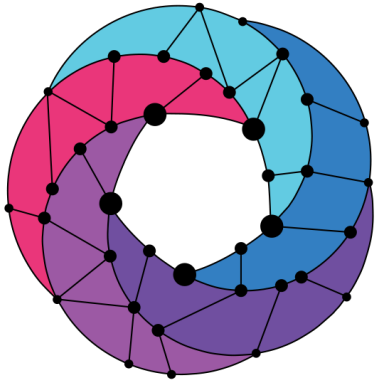


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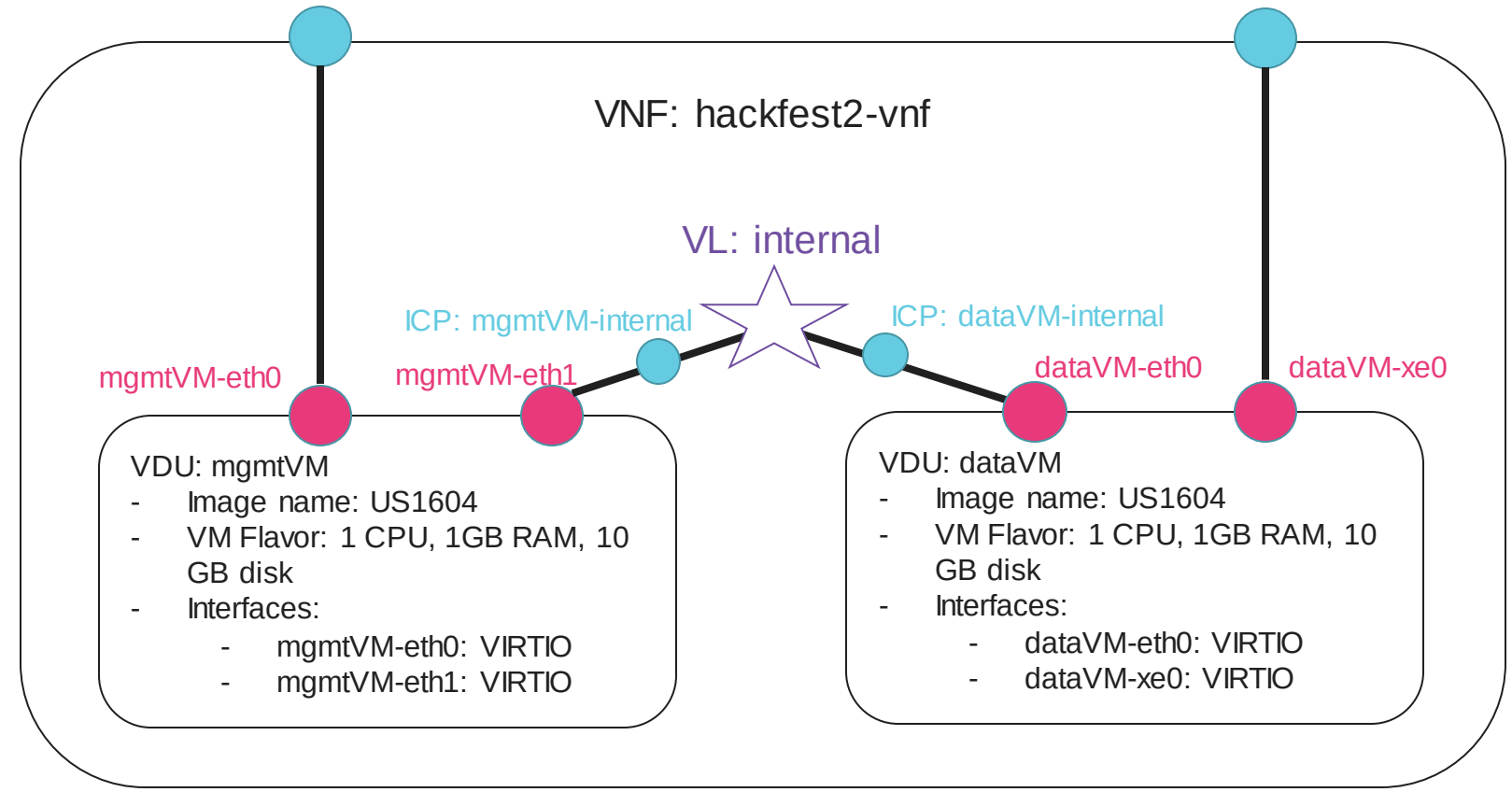
OSM Hackfest – Session 3
Modeling multi-VDU VNF

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VNF diagram



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Creating the new multi-VDU VNF (1/3)

Use the tool to create a new VNFD for a VNF called: "hackfest2-vnf"

```
/usr/share/osm-devops/descriptor-packages/tools/generate_descriptor_pkg.sh -t vnfd --image US1604 -c hackfest2-vnf
```

- Add 2 Connection Points (external):
  - CONNECTION POINT 1:
    - name: vnf-mgmt
  - CONNECTION POINT 2:
    - name: vnf-data
- Add new VLD 'internal' to the VNF:
  - Name: internal
  - TYPE: ELAN
  - Refer to internal CPs we will define later

Internal VLD example

```
...
      mgmt-interface:
        cp: vnf-mgmt
      internal-vld:
      -  id: internal
         name: internal
         short-name:  internal
         type: ELAN
         internal-connection-point:
         -  id-ref: mgmtVM-internal
         -  id-ref: dataVM-internal
...
```

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

- Add VDU1 in the VNF
  - Name: mgmtVM
  - Image: US1604
  - VM Flavor:
    - VCPU COUNT: 1
    - MEMORY MB: 1024
    - STORAGE GB: 10
  - Add 1 internal connection point:
    - ID: mgmtVM-internal
    - Name: mgmtVM-internal
    - Type: VPORT
  - Add 2 interfaces to the VDU:
    - Interface 1:
      - Name: mgmtVM-eth0
      - Position: 1
      - Connection-point-type: EXTERNAL
      - EXTERNAL-CONNECTION-POINT-REF: vnf-mgmt
      - Virtual-interface:
        - Type: VIRTIO

```
...
      interface:
      - name: mgmtVM-etho
        position: '1'
        type: EXTERNAL
        virtual-interface:
          type: VIRTIO
        external-connection-point-ref: vnf-mgmt
      - name: mgmtVM-eth1
        position: '2'
        type: INTERNAL
        virtual-interface:
          type: VIRTIO
        internal-connection-point-ref: mgmtVM-internal
      internal-connection-point:
      - id: mgmtVM-internal
        name: mgmtVM-internal
        short-name: mgmtVM-internal
        type: VPORT
...
```

    - Interface 2:
      - Name: mgmtVM-eth1
      - Position: 2
      - Connection-point-type: INTERNAL
      - INTERNAL-CONNECTION-POINT-REF: mgmtVM-internal
      - Virtual-interface:
        - Type: VIRTIO

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



- Add VDU2 in the VNF
  - Name: dataVM
  - Image: US1604
  - VM Flavor:
    - VCPU COUNT: 1
    - MEMORY MB: 1024
    - STORAGE GB: 10
  - Add 1 internal connection point:
    - ID: dataVM-internal
    - Name: dataVM-internal
    - Type:VPORT
  - Add 2 interfaces to the VDU:
    - Interface 1:
      - Name: dataVM-eth0
      - Position: 1
      - Connection-point-type: INTERNAL
      - INTERNAL-CONNECTION-POINT-REF: dataVM-internal
      - Virtual-interface:
        - Type: VIRTIO
    - Interface 2:
      - Name: dataVM-xe0
      - Position: 2
      - Connection-point-type: EXTERNAL
      - EXTERNAL-CONNECTION-POINT-REF: vnf-data
      - Virtual-interface:
        - Type: VIRTIO

```
...
      interface:
      - name: dataVM-etho
        position: '1'
        type: INTERNAL
        virtual-interface:
          type: VIRTIO
        internal-connection-point-ref: dataVM-internal
      - name: dataVM-xeo
        position: '2'
        type: EXTERNAL
        virtual-interface:
          type: VIRTIO
        external-connection-point-ref: vnf-data
      internal-connection-point:
      - id: dataVM-internal
        name: dataVM-internal
        short-name: dataVM-internal
        type: VPORT
...
```

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



- Validate your descriptor using the tool:

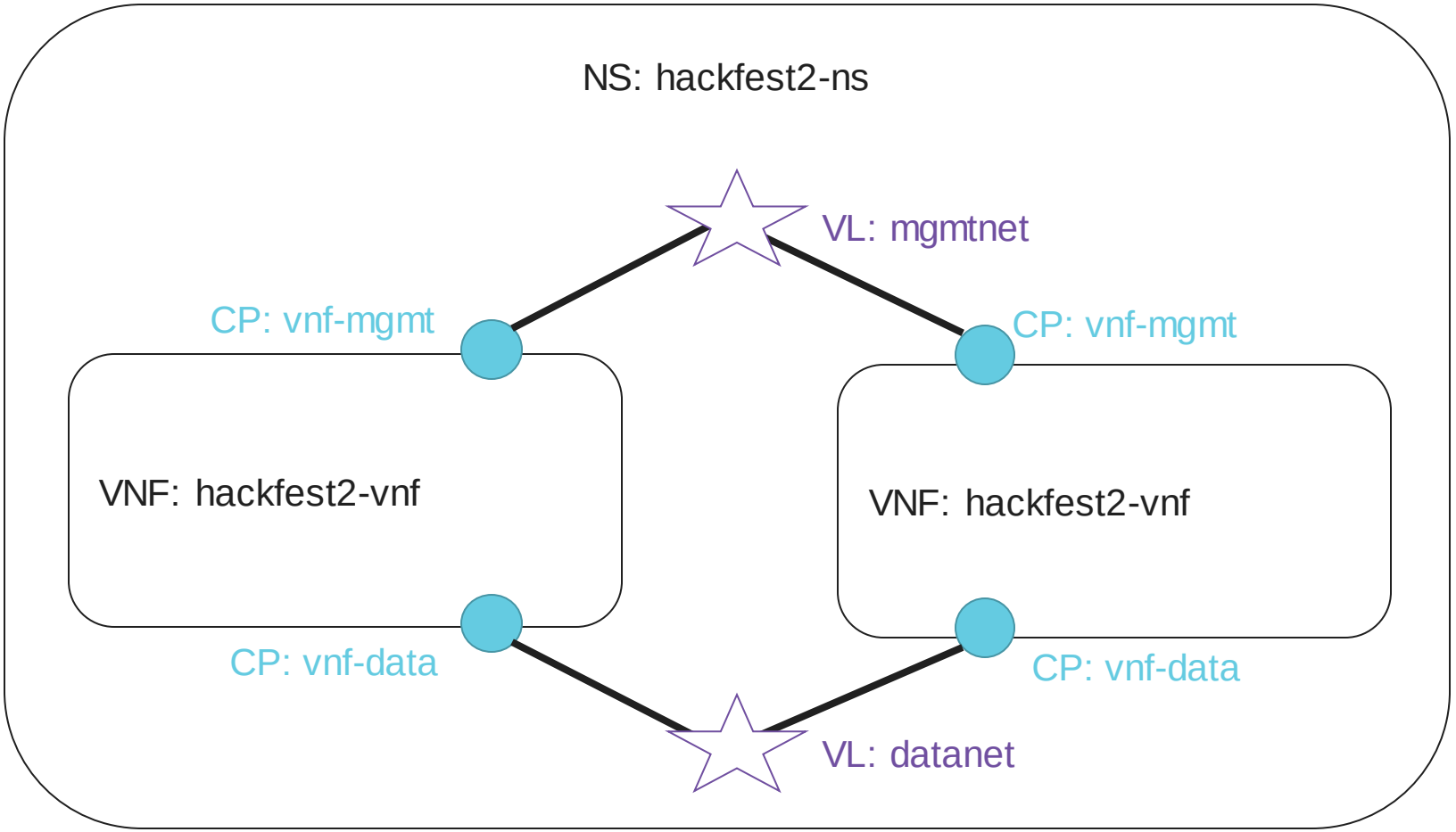
  /usr/share/osm-devops/descriptor-packages/tools/validate_descriptor.py [yaml file]

- And finally, against the sample file:

  Hackfest 2 VNF Descriptor - https://osm-download.etsi.org/ftp/osm-4.0-four/3rd-hackfest/packages/hackfest_2_vnfd.tar.gz

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NS diagram



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Creating the NSD (1/3)

Use the tool to create a new NSD for a NS called: "hackfest2-ns"

Add NSD

- Name: hackfest2-ns
- Specify constituent VNFs (hackfest2-vnf)
- Add first VLD:
  - VLD1:
    - name (optional): mgmtnet
    - TYPE: ELAN
    - MGMT NETWORK: True
    - INIT PARAMS
      - vim-network-ref
        - VIM NETWORK NAME: mgmt **<- This is to have a default mapped VIM network**

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Creating the NSD (2/3)

- Add second VLD:
  - VLD2:
    - name (optional): datanet
    - TYPE:ELAN
    - MGMT NETWORK: False (default)
- Refer VNF Connection Points to the VLs:
  - vnf-mgmt → VL:mgmtnet
  - vnf-data → VL:datanet

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Creating the NSD (3/3)

- Validate your descriptor using the tool:

  /usr/share/osm-devops/descriptor-packages/tools/validate_descriptor.py [yaml file]

- And finally, against the sample file:

  Hackfest 2 NS Descriptor - https://osm-download.etsi.org/ftp/osm-4.0-four/3rd-hackfest/packages/hackfest_2_nsd.tar.gz

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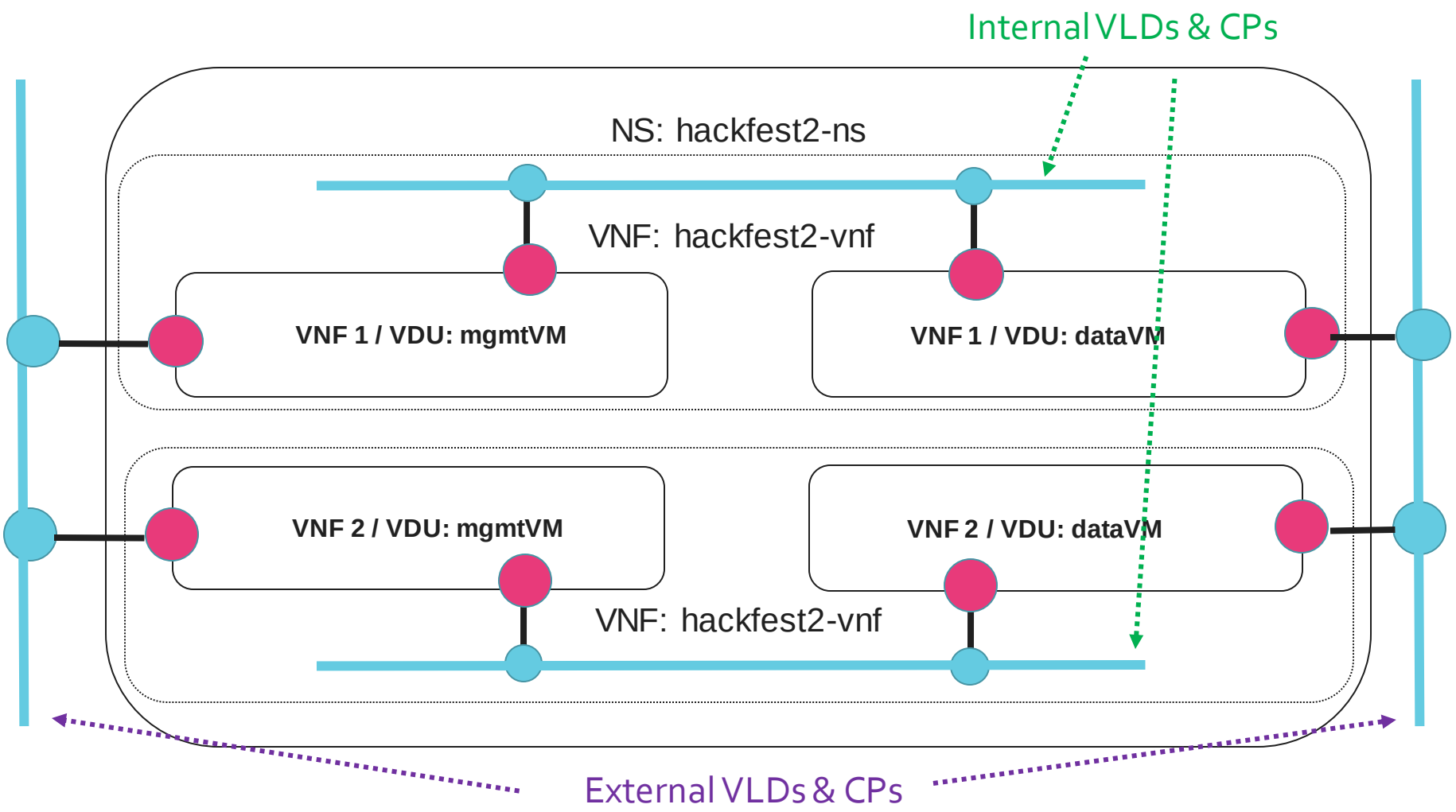
Deploying NS in the UI

- Using the corresponding tool, create your packages
  - /usr/share/osm-devops/descriptor-packages/tools/generate_descriptor_pkg.sh -t vnfd –N <VNF_NAME>_vnfd
  - /usr/share/osm-devops/descriptor-packages/tools/generate_descriptor_pkg.sh -t nsd –N <NS_NAME>_nsd
- 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: public1}]}
- Click the info button to see the mgmt IP address of each VNF
- Connect to each VNF:
  - ssh osm@<IP> (pwd: osm4u)

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Final Multi-VDU Picture



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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 explicitely 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.

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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
```

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Network modelling with MACs

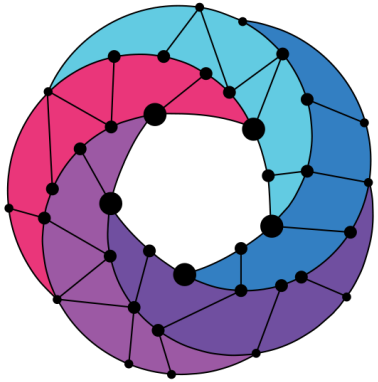
- We can set MAC addresses as well, just set them up at the VDU level.

Changing MAC (VNFD level)

```
...
        interface:
        -  name: mgmtVM-etho
           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!

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