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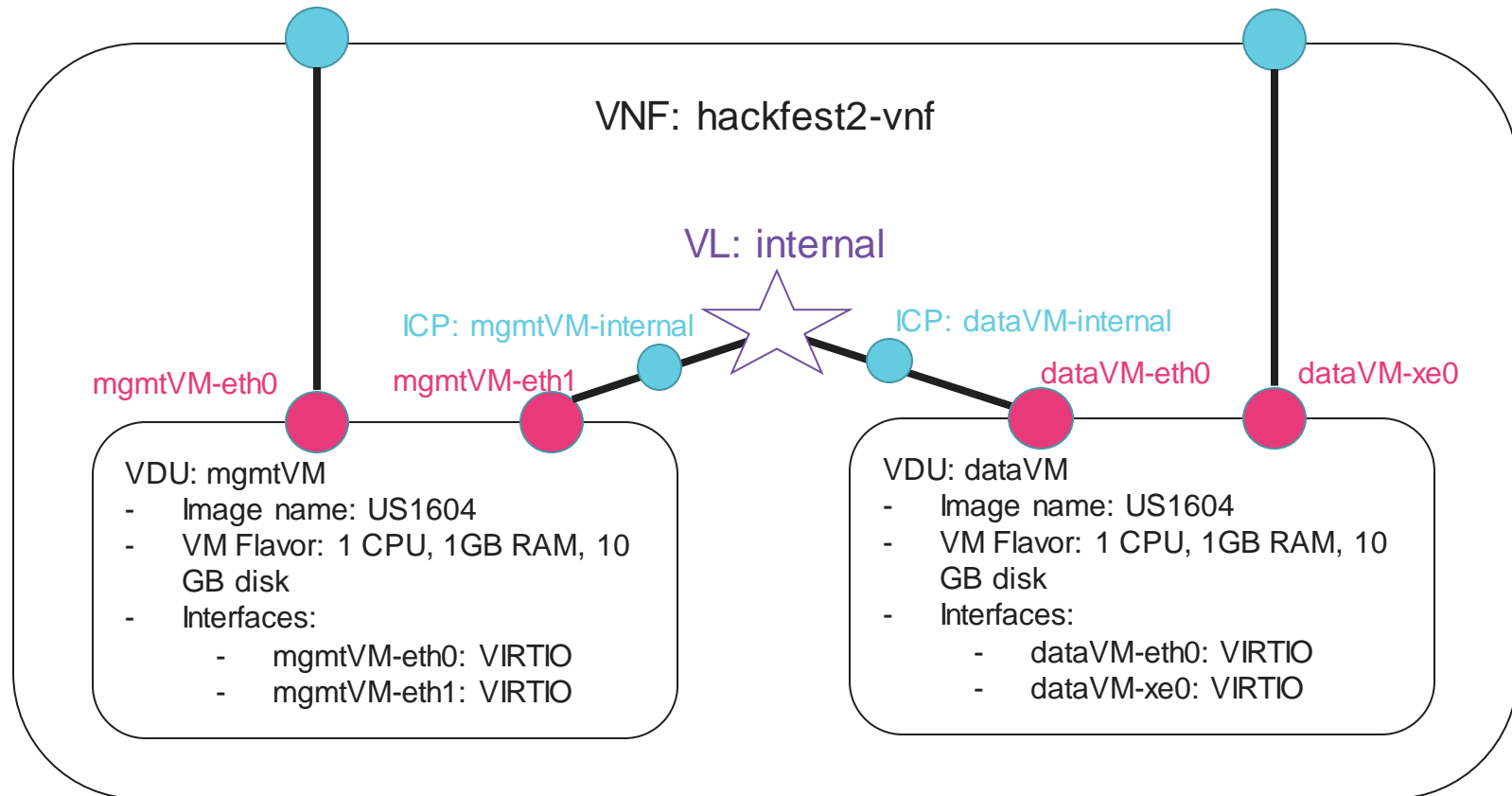
OSM Hackfest – Session 3 Modeling multi-VDU VNF

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VNF diagram

External Connection point: vnf-mgmt

External Connection point: vnf-data



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  
...
```

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

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:
- 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
...
```

- Interface 2:

- Name: dataVM-xe0
- Position: 2
- Connection-point-type: EXTERNAL
- EXTERNAL-CONNECTION-POINT-REF: vnf-data
- Virtual-interface:
 - Type: VIRTIO

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



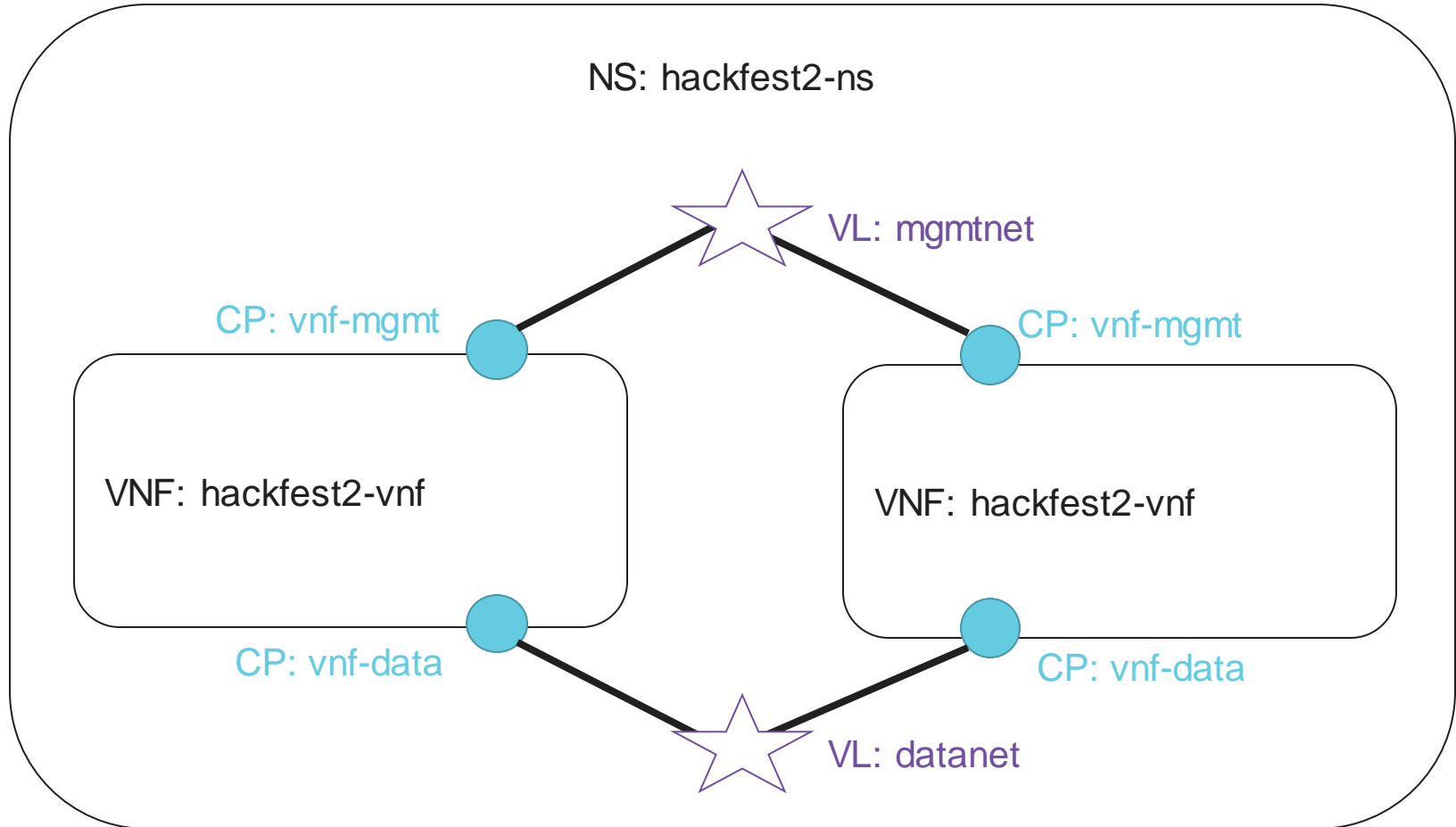
- Validate your descriptor using the tool:

`/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

NS diagram



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**

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

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:

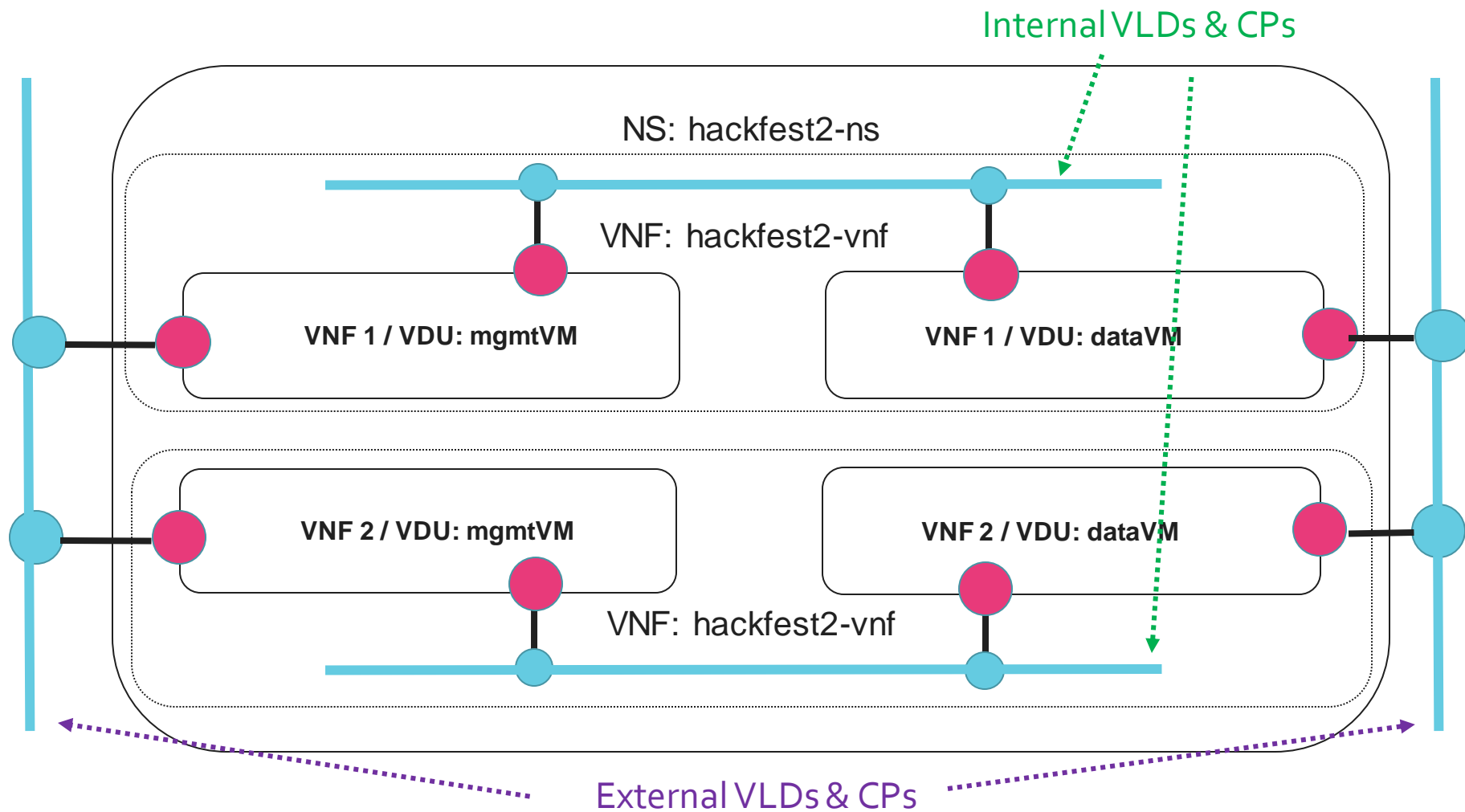
Hackfest 2 NS Descriptor - https://osm-download.etsi.org/ftp/osm-4.0-four/3rd-hackfest/packages/hackfest_2_nsd.tar.gz

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)`

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
```

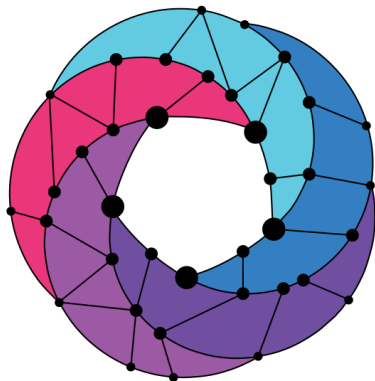
Network modelling with MACs

- 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!



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