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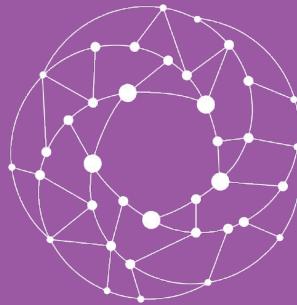
ETSI NFV-SOL006 Adoption & Descriptors
Translation
Alejandro García (WhiteStack)

SOL006: A standard for NFV descriptors



- Network Functions are modelled in VNFD and NSD packages.
- Descriptor files are defined in YAML or JSON formats.
- Since latest Release NINE, OSM is aligned with ETSI NFV-SOL006 standard.

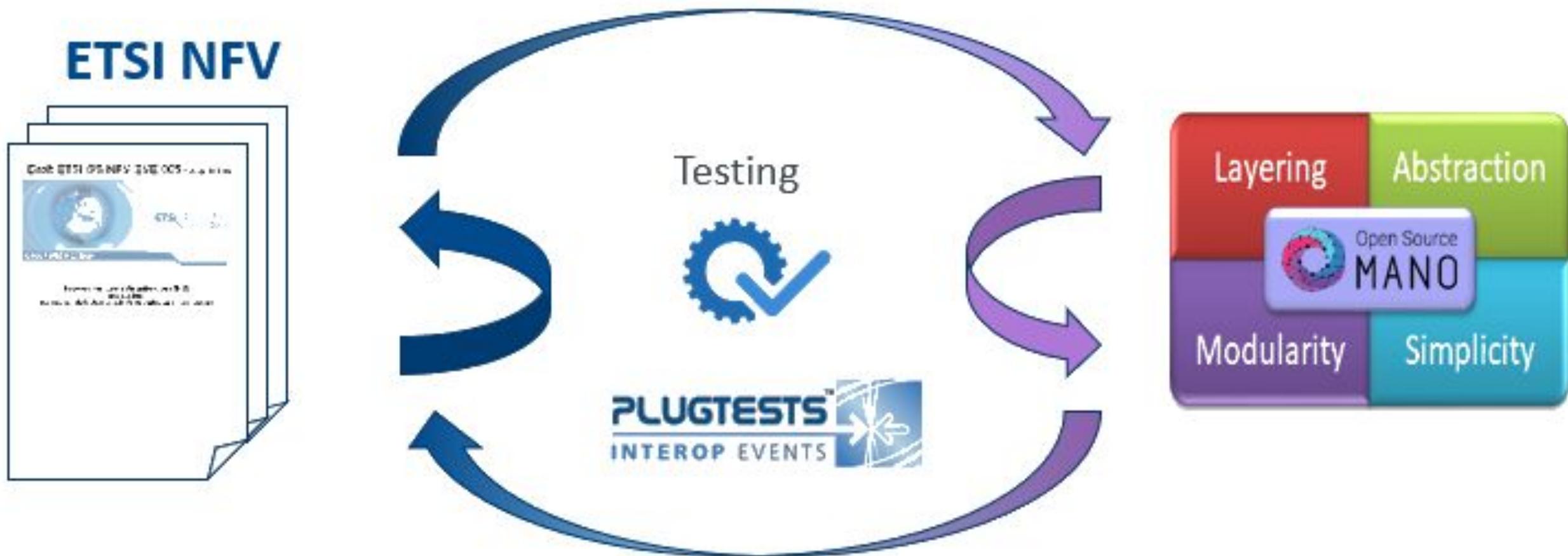
```
1  vnfd:  
2    description: A basic VNF descriptor w/ one VDU and quota EPA  
3    df:  
4      - id: default-df  
5        instantiation-level:  
6          - id: default-instantiation-level  
7            vdu-level:  
8              - number-of-instances: 1  
9                vdu-id: epa_quota-VM  
10               vdu-profile:  
11                 - id: epa_quota-VM  
12                   min-number-of-instances: 1  
13               ext-cpd:  
14                 - id: vnf-cp0-ext  
15                   int-cpd:  
16                     cpd: vdu-eth0-int  
17                     vdu-id: epa_quota-VM  
18                     id: epa_quota-vnf  
19                     mgmt-cp: vnf-cp0-ext
```



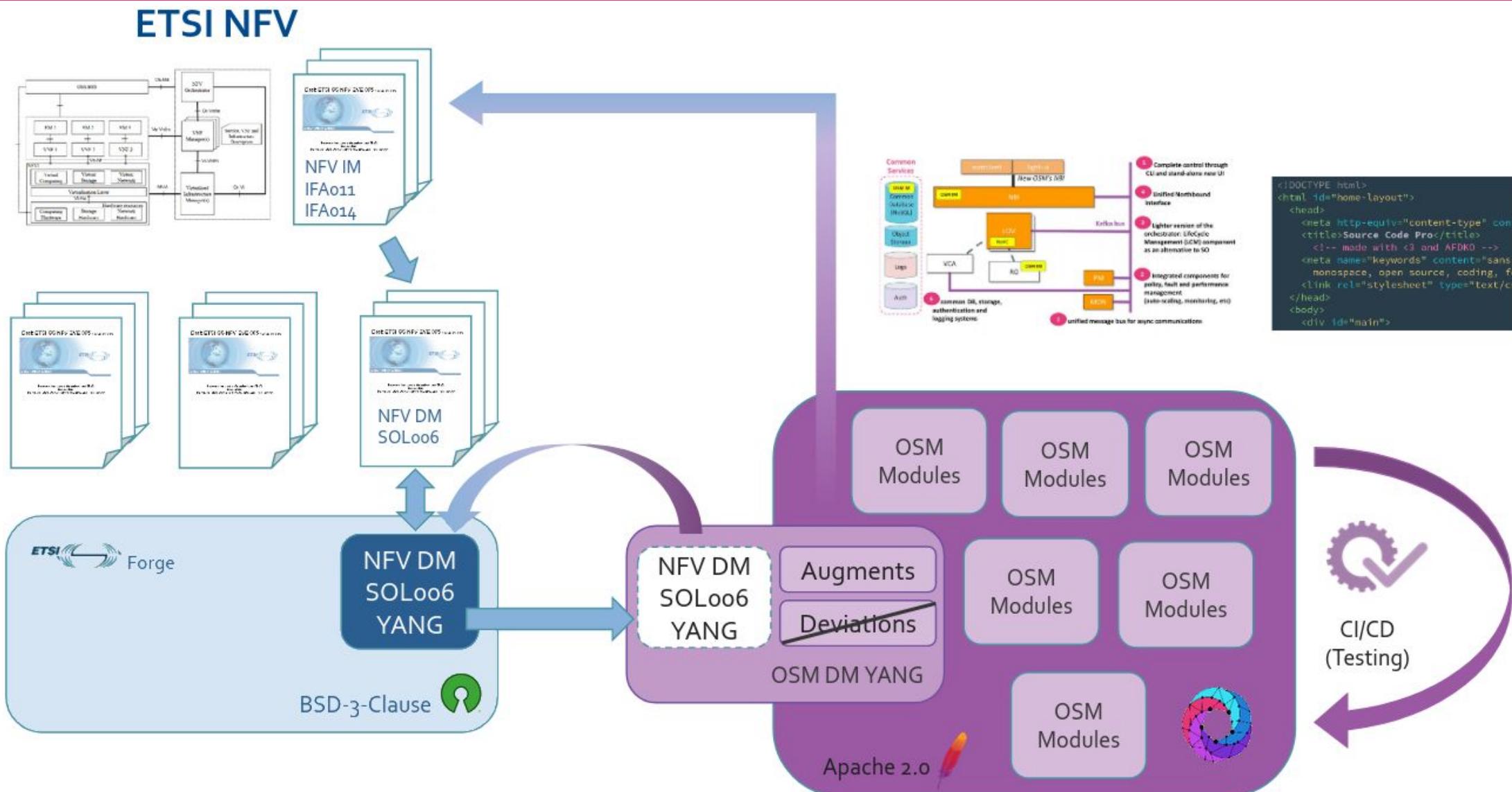
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ETSI NFV standards and OSM

Purpose of alignment

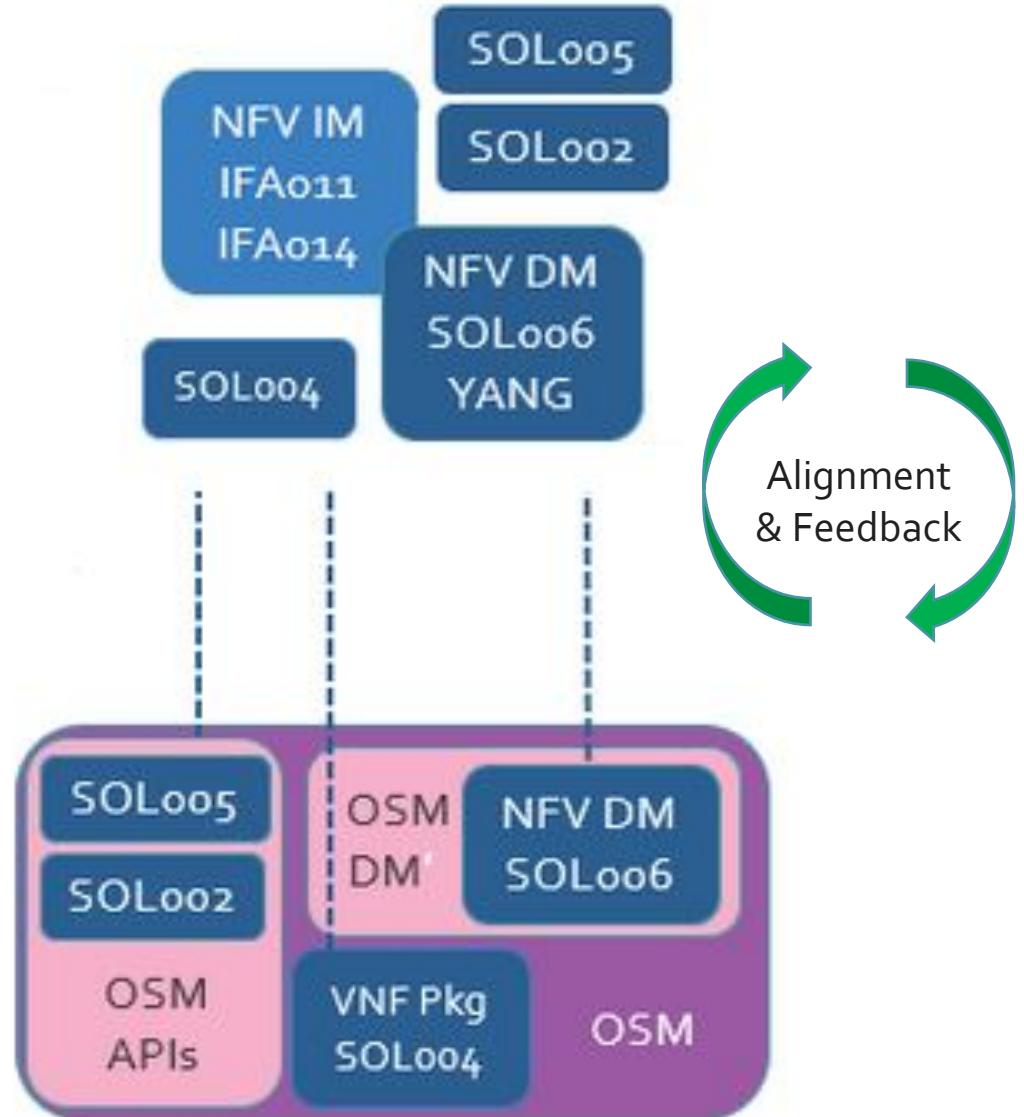


Purpose of alignment



Benefits

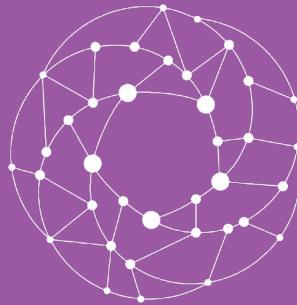
- Establishes quality and consistency for development and maintenance of VNF packages.
- Enhances interoperability.
- Improves management and design.
- Boosts OSM's ecosystem growth.
- Provides valuable feedback from a practical perspective.



Takeaways from IM alignment

To wrap it up...

- Standards alignment is at the heart of the OSM project vision
- The relationship between OSM and ETSI NFV ISG ensures standards and software maturity
- Packages and tools developed are continuously getting validated on ETSI NFV&MEC Plugtests and OSM Hackfests



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Overview of SOL006 descriptors

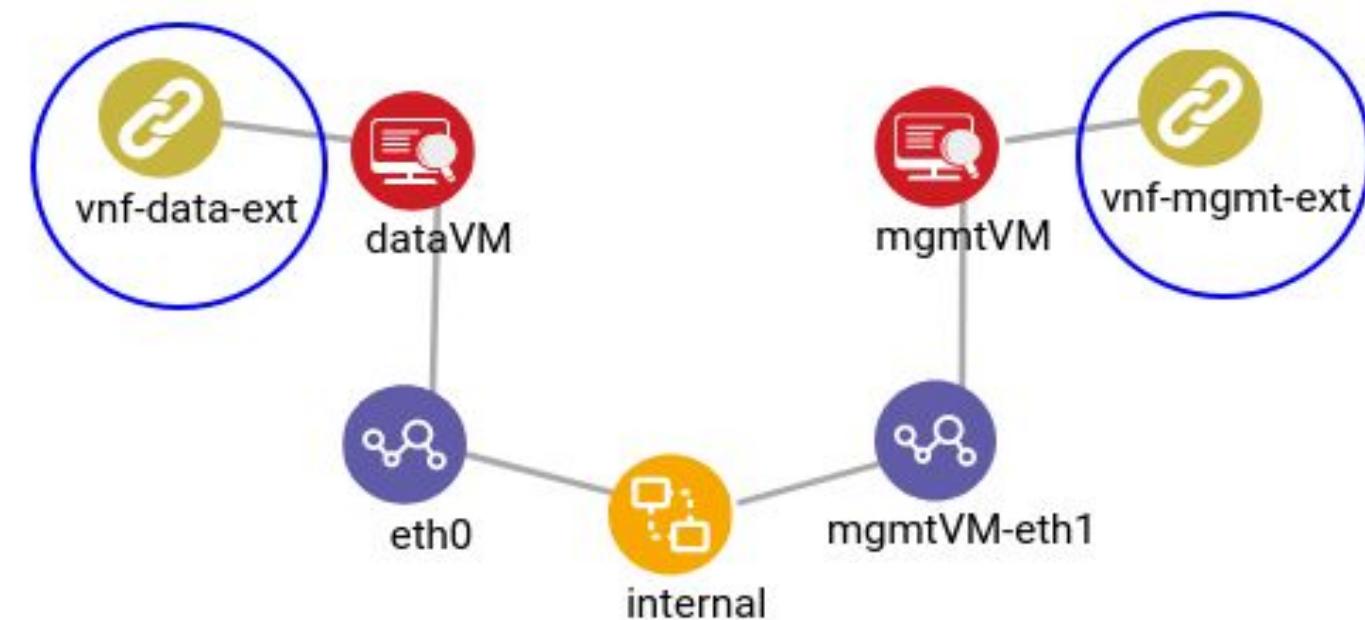
SOL006 VNFD modeling

```

1 vnf:
2   id: hackfest_epasriov-vnf
3   product-name: hackfest_epasriov-vnf
4   description: A VNF consisting of 2 VDUs with EPA capabilities
5   version: '1.0'
6   mgmt-cp: vnf-mgmt-ext

7
8   ext-cpd:
9     - id: vnf-mgmt-ext
10    int-cpd:
11      cpd: mgmtVM-eth0-int
12      vdu-id: mgmtVM
13    - id: vnf-data-ext
14      int-cpd:
15        cpd: xe0-int
16        vdu-id: dataVM
17
18      int-virtual-link-desc:
19        - id: internal

```

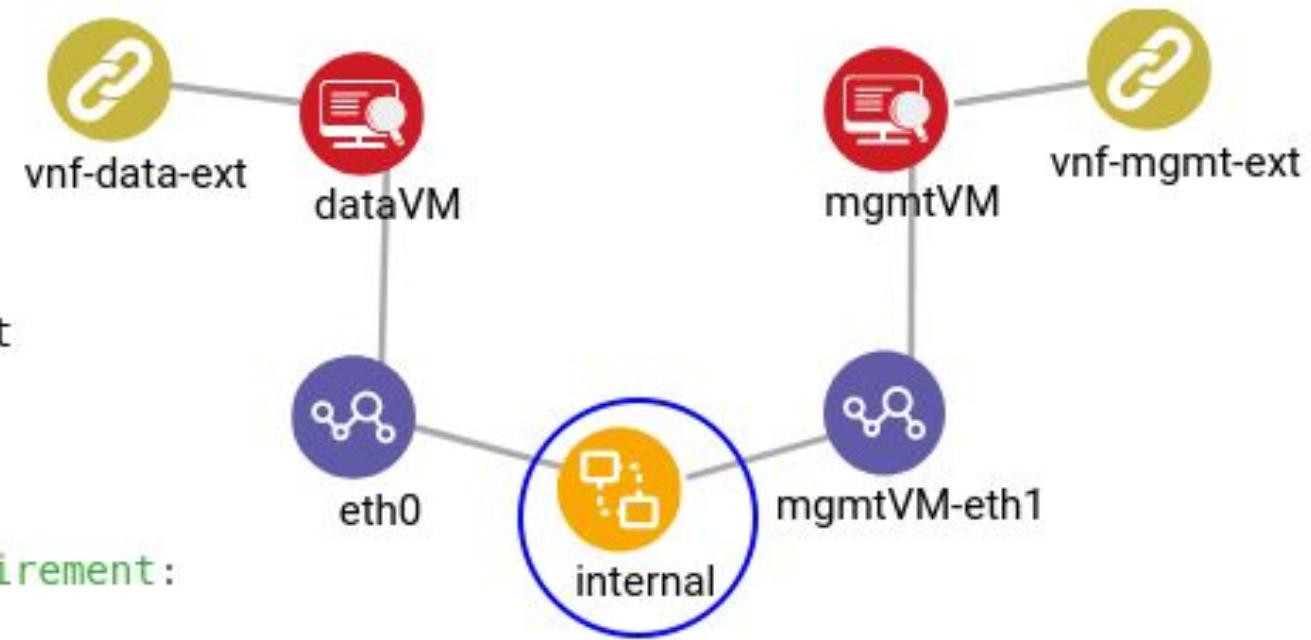


SOL006 VNFD modeling

```

 9   - id: vnf-mgmt-ext
10     int-cpd:
11       cpd: mgmtVM-eth0-int
12       vdu-id: mgmtVM
13   - id: vnf-data-ext
14     int-cpd:
15       cpd: xe0-int
16       vdu-id: dataVM
17     int-virtual-link-desc:
18       - id: internal
19
20   vdu:
21     - cloud-init-file: cloud-config.txt
22       id: mgmtVM
23       int-cpd:
24         - id: mgmtVM-eth0-int
25         virtual-network-interface-requirement:
26           - name: mgmtVM-eth0
27             position: 1

```

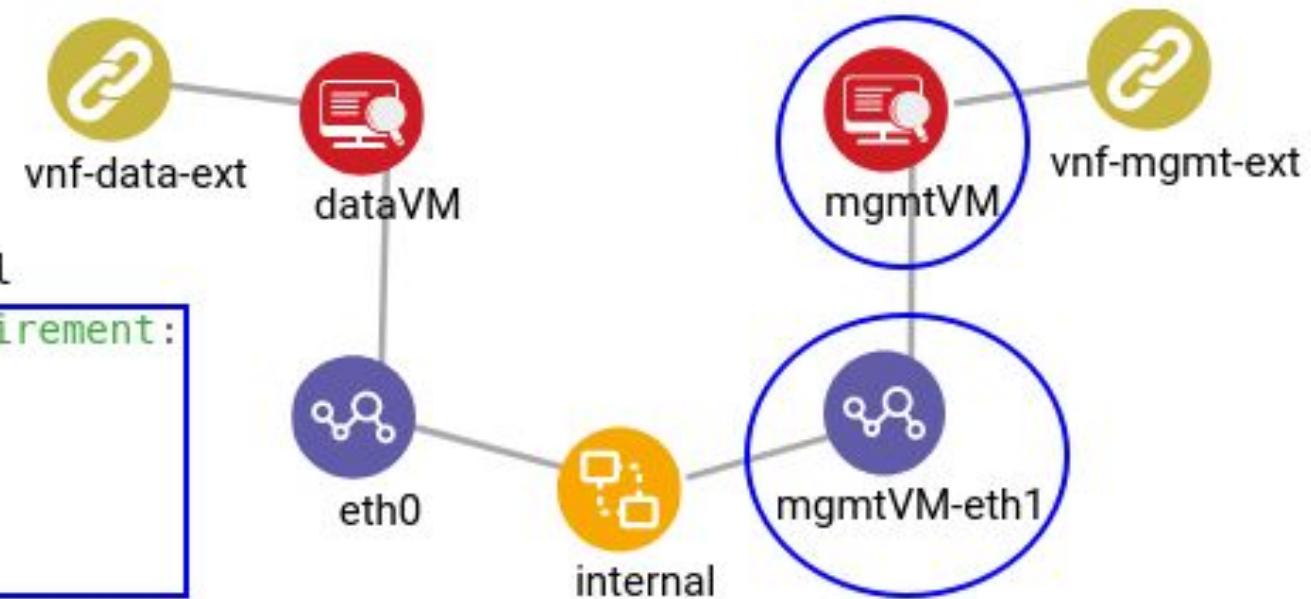


SOL006 VNFD modeling

```

20  vdu:
21    - id: mgmtVM
22      name: mgmtVM
23      int-cpd:
24        - id: mgmtVM-eth0-int
25          virtual-network-interface-requirement:
26            - name: mgmtVM-eth0
27              position: 1
28              virtual-interface:
29                type: PARAVIRT
30    - id: mgmtVM-eth1-int
31      int-virtual-link-desc: internal
32      virtual-network-interface-requirement:
33        - name: mgmtVM-eth1
34          position: 2
35          virtual-interface:
36            type: PARAVIRT
37          cloud-init-file: cloud-config.txt
38          os-image-desc: ubuntu18.04

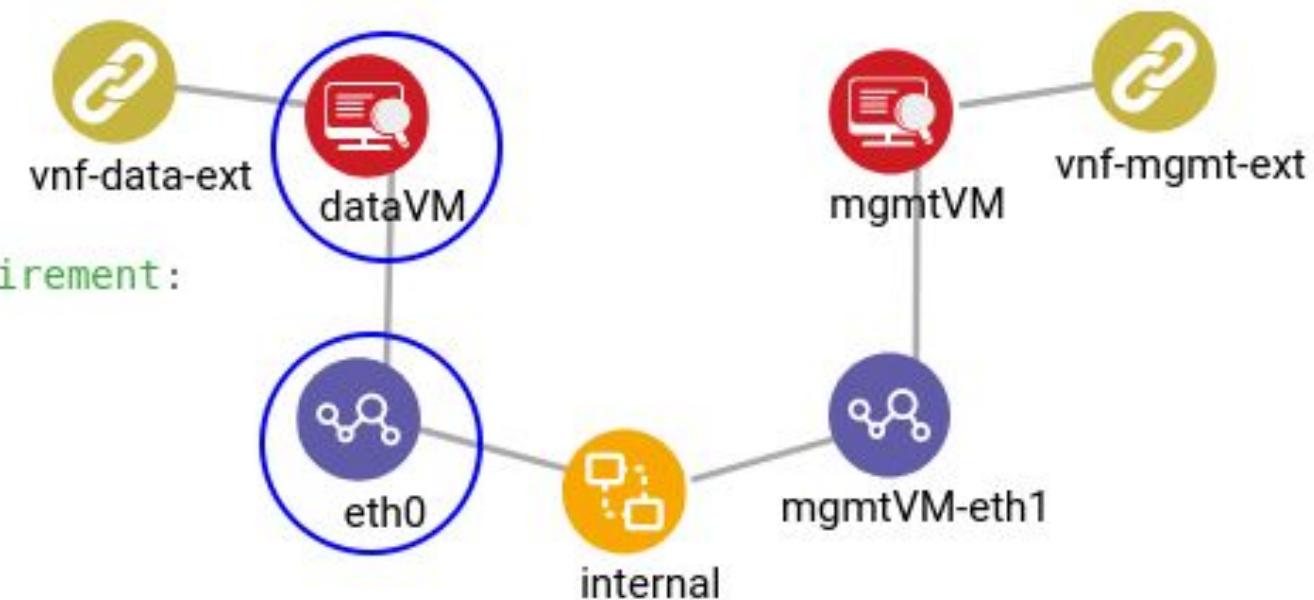
```



SOL006 VNFD modeling

```

42   - id: dataVM
43     name: dataVM
44     int-cpd:
45       - id: eth0-int
46         int-virtual-link-desc: internal
47         virtual-network-interface-requirement:
48           - name: eth0
49             position: 1
50             virtual-interface:
51               type: PARAVIRT
52       - id: xe0-int
53         virtual-network-interface-requirement:
54           - name: xe0
55             position: 2
56             virtual-interface:
57               type: SR-IOV
58             sw-image-desc: hackfest-pktgen
59             virtual-compute-desc: dataVM-compute
60             virtual-storage-desc:
  
```

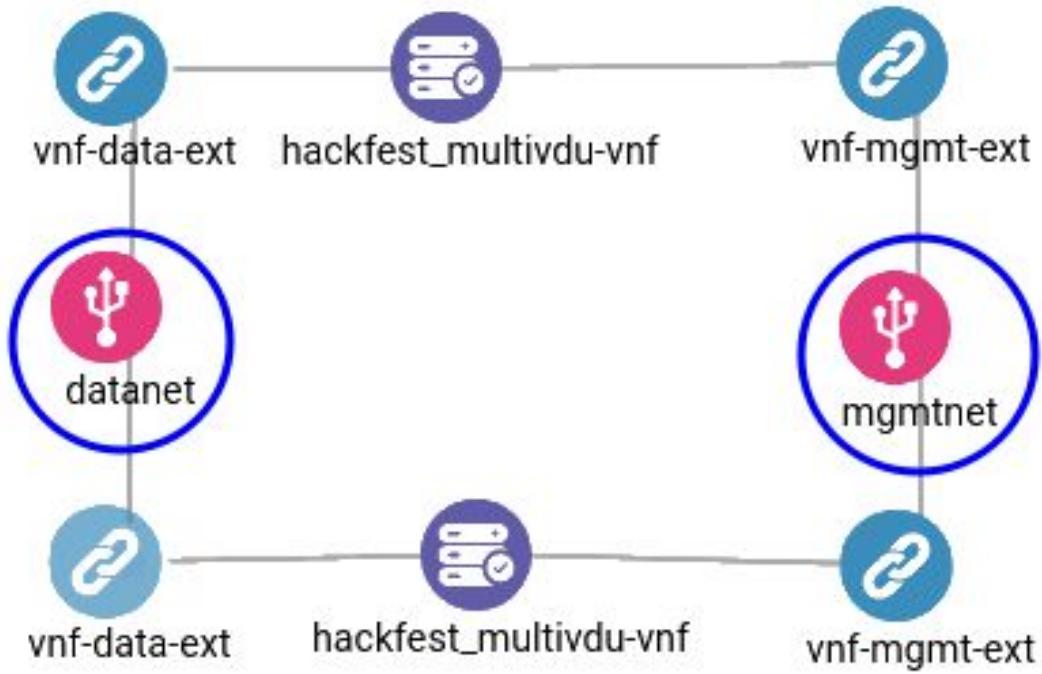


SOL006 NSD modeling

```

1 nsd:
2   nsd:
3     - id: hackfest_multivdu-ns
4       description: NS with 2 VNFs connected by datanet and mgmtnet VLs
5       name: hackfest_multivdu-ns
6       version: '1.0'
7
8       virtual-link-desc:
9         - id: mgmtnet
10        mgmt-network: true
11        - id: datanet
12
13       vnf-id:
14         - hackfest_multivdu-vnf
15
16       df:
17         - id: default-df
18
19         vnf-profile:
20           - id: '1'
21
22           virtual-link-connectivity:

```

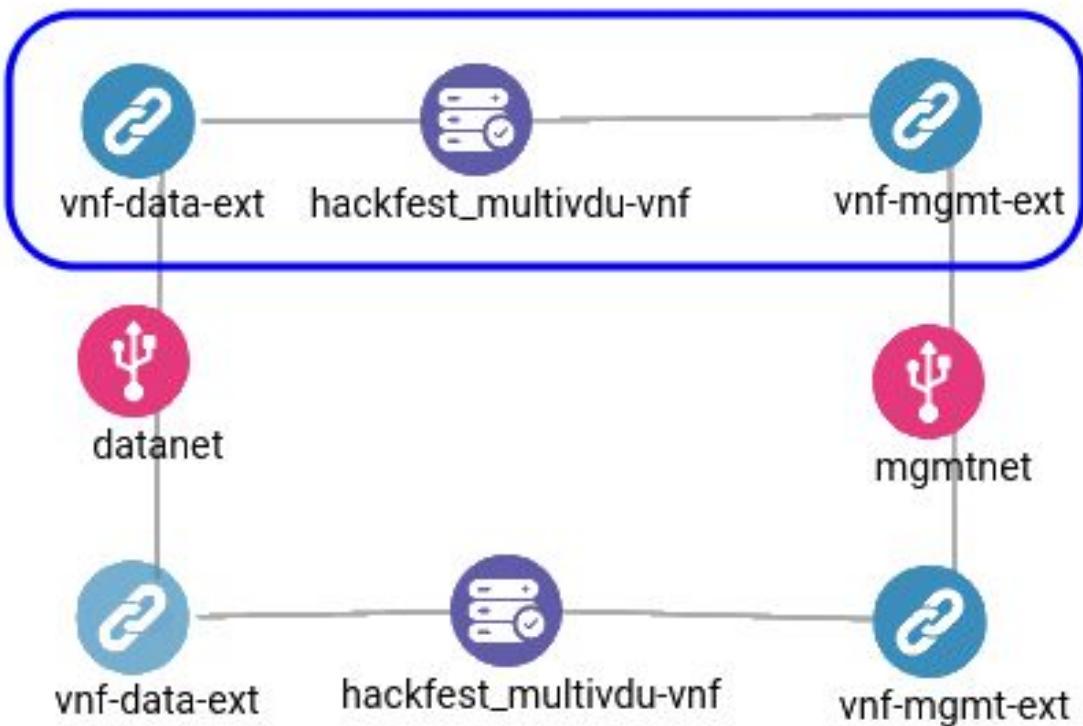


SOL006 NSD modeling

```

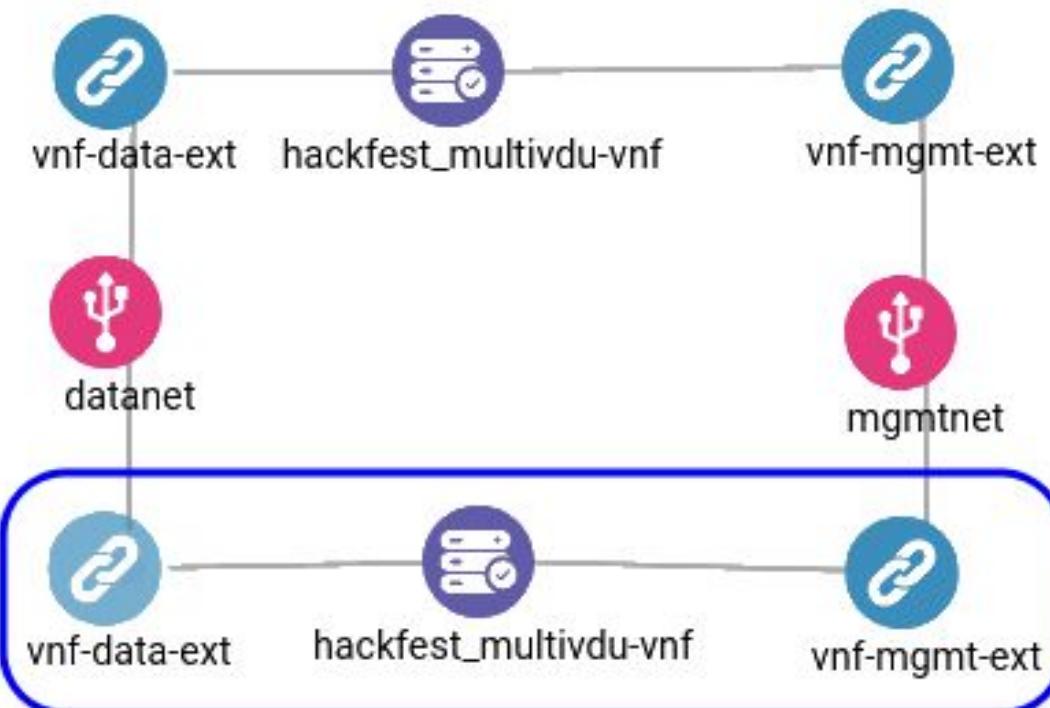
2   vnf-id:
3     - hackfest_multivdu-vnf
4
5   df:
6     - id: default-df
7
8   vnf-profile:
9     - id: '1'
10    virtual-link-connectivity:
11      - constituent-cpd-id:
12        - constituent-base-element-id: '1'
13          constituent-cpd-id: vnf-mgmt-ext
14          virtual-link-profile-id: mgmtnet
15      - constituent-cpd-id:
16        - constituent-base-element-id: '1'
17          constituent-cpd-id: vnf-data-ext
18          virtual-link-profile-id: dataonet
19    vnf-id: hackfest_multivdu-vnf
20
21    - id: '2'
22      virtual-link-connectivity:

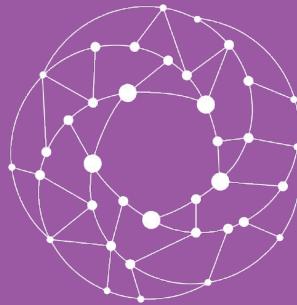
```



SOL006 NSD modeling

```
1     - constituent-base-element-id: '1'
2         constituent-cpd-id: vnf-mgmt-ext
3         virtual-link-profile-id: mgmtnet
4     - constituent-cpd-id:
5         - constituent-base-element-id: '1'
6             constituent-cpd-id: vnf-data-ext
7             virtual-link-profile-id: datanet
8     vnf-id: hackfest_multivdu-vnf
9
10    - id: '2'
11        virtual-link-connectivity:
12            - constituent-cpd-id:
13                - constituent-base-element-id: '2'
14                    constituent-cpd-id: vnf-mgmt-ext
15                    virtual-link-profile-id: mgmtnet
16            - constituent-cpd-id:
17                - constituent-base-element-id: '2'
18                    constituent-cpd-id: vnf-data-ext
19                    virtual-link-profile-id: datanet
20
21     vnf-id: hackfest multivdu-vnf
```





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Portability from Release EIGHT

Portability from older descriptors



- A translator CLI tool is available as part of osmclient.
- All previously available descriptors at OSM VNF Onboarding repo have already been adapted.

```
ubuntu@osm-rel9:~$ # Let's translate
ubuntu@osm-rel9:~$ osm package-translate translation-tests
Base directory: translation-tests
8 Descriptors found to validate
```

| CURRENT TYPE | NEW TYPE | PATH | VALID | TRANSLATED |
|---------------|---------------|--|-------|------------|
| etsi_nfv_ns | etsi_nfv_ns | translation-tests/sol006/hackfest_basic_metrics_ns/hackfest_basic_nsd.yaml | OK | N/A |
| etsi_nfv_ns | etsi_nfv_ns | translation-tests/sol006/hackfest_basic_ns/hackfest_basic_nsd.yaml | OK | N/A |
| etsi_nfv_vnfd | etsi_nfv_vnfd | translation-tests/sol006/hackfest_basic_metrics_vnf/hackfest_basic_metrics_vnfd.yaml | OK | N/A |
| etsi_nfv_vnfd | etsi_nfv_vnfd | translation-tests/sol006/hackfest_basic_vnf/hackfest_basic_vnfd.yaml | OK | N/A |
| nsd | etsi_nfv_ns | translation-tests/osm-im/hackfest_basic_metrics_ns/hackfest_basic_nsd.yaml | OK | OK |
| nsd | etsi_nfv_ns | translation-tests/osm-im/hackfest_basic_ns/hackfest_basic_nsd.yaml | OK | OK |
| vnfd | etsi_nfv_vnfd | translation-tests/osm-im/hackfest_basic_metrics_vnf/hackfest_basic_metrics_vnfd.yaml | OK | OK |
| vnfd | etsi_nfv_vnfd | translation-tests/osm-im/hackfest_basic_vnf/hackfest_basic_vnfd.yaml | OK | OK |

<https://osm.etsi.org/gitlab/vnf-onboarding/>

A screenshot of a GitLab repository page titled "OSM Packages". The page shows a summary of the repository, including 11 commits, 2 branches, 0 topics, and 6.8 MB files. Below this is a commit history table with 28 entries, showing commits from "Renamed magma vnf and ns folders" to "generate-packages.sh script to build packages". The commits are dated from 1 day ago to 1 week ago.

| Name | Last commit | Last update |
|---------------------------|--|-------------|
| hackfest-basic-metrics_ns | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-basic_ns | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-basic_vnf | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-cloudinit_ns | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-cloudinit_vnf | Fix epciov_vnf, multivdu_vnf, cloudinit_vnf added ... | 1 day ago |
| hackfest-epciov_ns | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-gateway_vnf | Fix epciov_vnf, multivdu_vnf, cloudinit_vnf added ... | 1 day ago |
| hackfest-gateway_ns | Adding Magma, ns1 and Vnfd GW | 4 days ago |
| hackfest-imagine-vnfd_ns | Renamed magma vnf and ns folders | 1 day ago |
| hackfest-imagine-vnfd_vnf | Renamed magma vnf and ns folders | 1 day ago |
| hackfest-multivdu_ns | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-multivdu_vnf | Fix epciov_vnf, multivdu_vnf, cloudinit_vnf added ... | 1 day ago |
| hackfest-proxynam_ns | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-proxynam_vnf | added VNF and NS packages basic, multivdu, cloud... | 1 week ago |
| hackfest-vyos_ns | Adding vyos packages | 5 days ago |
| hackfest-vyos_vnf | Adding vyos packages | 5 days ago |
| glpiignore | Added glpiignore | 1 week ago |
| RPAIMF.yaml | Added RPAIMF.yaml | 1 week ago |
| generate-packages.sh | Added generate-packages.sh script to build packages... | 1 week ago |

Package validation

```
~$ osm package-validate -h
```

```
Usage: osm package-validate [OPTIONS] [BASE_DIRECTORY]
```

Validate descriptors given a base directory.

BASE_DIRECTORY: Base folder for NS, VNF or NST package.

Options:

--recursive / --no-recursive The activated recursive option will validate the yaml files within the indicated directory and in its subdirectories

--old
OSM format (pre SOL006) Validates also the descriptors using the previous

-h, --help Show this message and exit.

Package translation

```
~$ osm package-translate -h
```

```
Usage: osm package-translate [OPTIONS] [BASE_DIRECTORY]
```

Translate descriptors given a base directory.

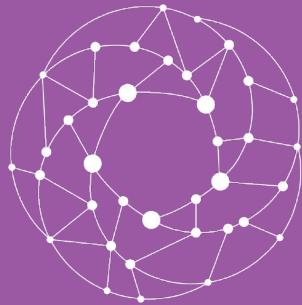
BASE_DIRECTORY: Stub folder for NS, VNF or NST package.

Options:

--recursive / --no-recursive The activated recursive option will translate the yaml files within the indicated directory and in its subdirectories

--dryrun
translation Do not translate yet, only make a dry-run to test

-h, --help Show this message and exit.



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Translation demo!

Step 1: Get an older descriptor

You can use any descriptor from branch v8.0 of osm-packages. For example:

```
~$ curl  
https://osm.etsi.org/gitlab/vnf-onboarding/osm-packages/-/raw/v8.0/hackfest_multivdu_  
vnf/hackfest_multivdu_vnfd.yaml > multivdu_vnfd.yaml  
% Total % Received % Xferd Average Speed Time Time Time Current  
Dload Upload Total Spent Left Speed  
100 2123 100 2123 0 0 13522 0 --:--:-- --:--:-- --:--:-- 13522  
~$ head -n 5 multivdu_vnfd.yaml  
vnfd-catalog:  
vnfd:  
- id: hackfest_multivdu-vnf  
  name: hackfest_multivdu-vnf  
  short-name: hackfest_multivdu-vnf
```

Step 2: Validate older descriptor

Validation without the *--old* flag should fail:

```
~$ osm package-validate .
Base directory: .
1 Descriptors found to validate
OSM descriptor './multivdu_vnfd.yaml' written in an unsupported format. Please update to
ETSI SOL006 format
Package validation skipped. It can still be done with 'osm package-validate --old'
Package build can still be done with 'osm package-build --skip-validation'
+-----+-----+-----+
| TYPE | PATH           | VALID | ERROR          |
+-----+-----+-----+
| vnfd | ./multivdu_vnfd.yaml | ERROR | Not SOL006 format |
+-----+-----+-----+
```

Step 3: Translate the descriptor

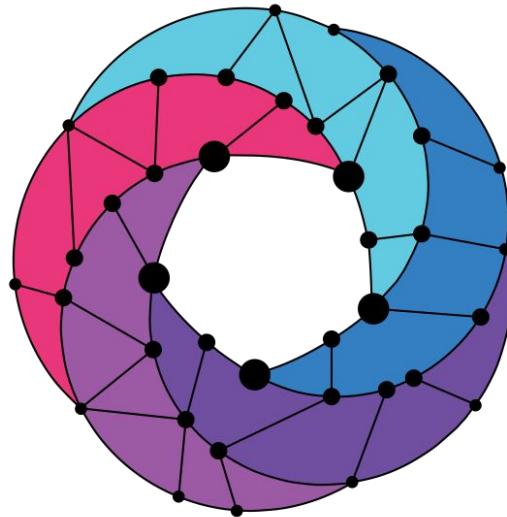
Translation should be straight forward. You can provide a --recursive flag if you have several descriptors in several folders:

```
~$ osm package-translate .
Base directory: .
1 Descriptors found to validate
+-----+-----+-----+-----+-----+
| CURRENT TYPE | NEW TYPE | PATH | VALID | TRANSLATED | ERROR |
+-----+-----+-----+-----+-----+
| vnfd | etsi_nfv_vnfd | ./multivdu_vnfd.yaml | OK | OK | - |
+-----+-----+-----+-----+-----+
```

Step 4: Validate new translated descriptor

Validation should now work without the *--old* flag:

```
~$ osm package-validate .
Base directory: .
1 Descriptors found to validate
+-----+-----+-----+
| TYPE | PATH | VALID | ERROR |
+-----+-----+-----+
| etsi_nfv_vnfd | ./multivdu_vnfd.yaml | OK | - |
+-----+-----+-----+
```



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Thank you

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