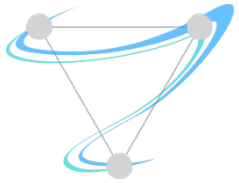


High-level VNF Descriptors using NEMO

draft-aranda-nfvrg-recursive-vnf-03

Pedro A. Aranda paranda@it.uc3m.es
Diego López diego.r.lopez@telefonica.com
Stefano Salsano stefano.salsano@uniroma2.it
Elena Batanero elena.batanerogarcia@telefonica.com

Rationale

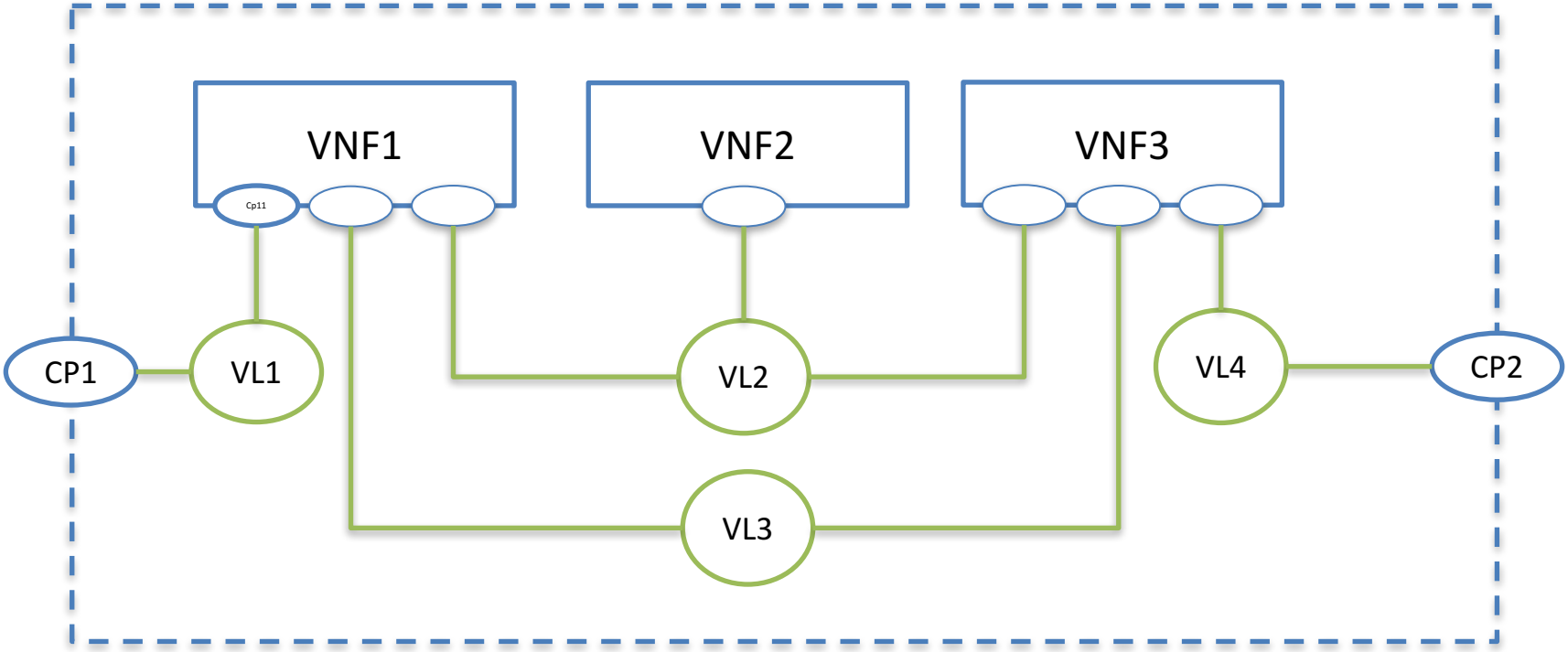
- No one in a clean state of mind can read VNFDs or NSDs easily
  - And less relate them to general network definitions (or policies, or…)
- There is no simple way of reusing tested VNFs to build more elaborate VNFs
  - Current descriptors are most focused on deployment and resource management aspects
- What is right in terms of orchestration goals
  - But goes against one of the goodies of software design/production: RE-USABILITY
- Bridge the gap between network definition and NFV (and SDN) orchestration
  - And this is when intent starts to play

How Would this Work?

- Use NEMO as declarative network definition language
  - Intent declarations
  - https://wiki.opendaylight.org/view/NEMO:Main
- VNFDs like those in OSM are used as low level blocks
- NEMO allows us to describe how VNFs are used to build a network service
  - Caveat emptor: Service has many meanings here!
- Forwarding graphs become more clear using the Connection concept
  - And suitable for parameterization by matching them to VNF interfaces
- Reuse models
  - Opening the door to recursiveness

What We Want

- Find a way to describe VNFs as close as possible to this graph



- And be able to translate this definition into an appropriate orchestration script

Bringing a VNFD into NEMO

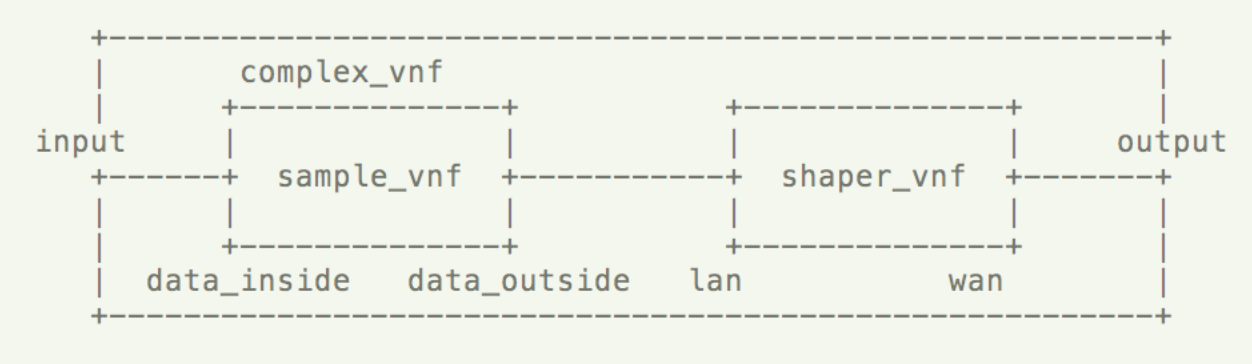
- Reference the descriptor URI
  - VNF producers are required to provide them to orchestrators
- Reference the VNF interfaces relevant for the NodeModel
  - Identifying them by the ConnectionPoint construct

```
CREATE NodeModel sample_vnf VNFD
https://github.com/nfvlabs
/openmano.git/openmano/vnfs/examples/dataplaneVNF1.yaml;
       ConnectionPoint data_inside at VNFD:ge0;
       ConnectionPoint data_outside at VNFD:ge1;
```

Making It Recursive

- Use the imported NodeModel to build more complex functionality
- The Connection construct is used to define the service graph
  - Referencing connection points in the composed VNFs
- And this becomes an NS (in ETSI terms) or a composed VNF, or…
  - Recursion at any level you see fit

```
CREATE NodeModel complex_vnf;
        Node input_vnf Type sample_vnf;
        Node output_vnf Type shaper_vnf;
        ConnectionPoint input;
        ConnectionPoint output
        Connection icon Type p2p Endnodes input, input_vnf:data_inside;
        Connection ocon Type p2p Endnodes output, output_vnf:wan;
        Connection intn Type p2p input_vnf:data_outside, output_vnf:lan;
```



The Current Status

- Changes to the NEMO syntax already implemented
  - OpenDaylight Beryllium release
- Extended parser with the necessary constructs
  - `NodeModel` reference to VNFD (as a URI)
  - `ConnectionPoint` construct referring to VNFD interfaces
  - `Connection` able to use `ConnectionPoint` references
- (Partial) support for recursion
  - For `NodeModel` with VNFD
  - Arbitrary `NodeModel` composition being considered
- Working in the translation to OSM descriptors
  - Full recursion would imply OSM plus ODL => SDN/NFV convergence
- We plan a demo for Prague

SUPERFLUIDITY

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