High-level VNF Descriptors using NEMO

draft-aranda-nfvrg-recursive-vnf-03

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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
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