An Approach to Expose 'Device Models'-as-'Network Models'

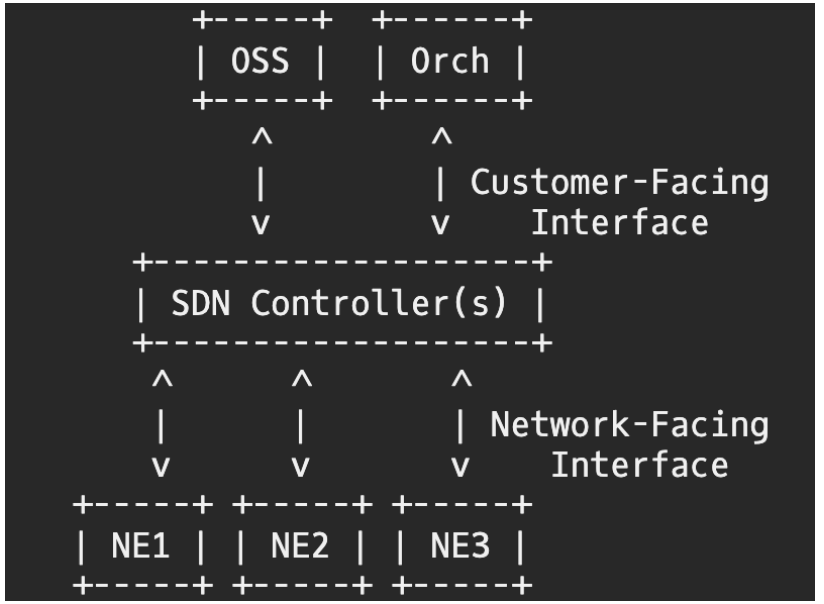
draft-ovmd-netmod-dmanm-00

O. Gonzalez de Dios (Telefonica), V. Lopez (Nokia). M. Boucadair (Orange) D. Ceccarelli (Cisco)

IETF 120 Vancouver

Motivation

- IETF has undertaken an important effort to define YANG device models to manage the network element capabilities.
- SDN controllers / network management systems use the capabilities of underlaying-network elements and offer (more or less) abstracted capabilities towards higher layers
- There are scenarios where it would be useful to reuse the device models in the application or customer-facing interface of SDN controllers to ease the invocation of IETF device models.
  - Examples: "ietf-routing-policy" [RFC8349], "ietf-bgp-policy" [I-D.ietf-idr-bgp-model], "ietf-access-list" [RFC8519], "ietf-nat" [RFC8512].
- Ease service integration



Use cases

- **"Device Config"-as-a-Service:** Use of device models by an OSS to manage network elements through an SDN controller.
  - The “Intent” will follow the same lifecycle as any other network service
- **Profiling:** Network operators can design profiles that represent specific configurations that are optimized for specific network function, protocols, or services.
  - **An Example**: Security ACLs are reused among multiple nodes and handled by a different team through the controller.
- Both use cases can be applied in **one or several network elements**.

Device Models as Service Models

Lightweitgh Proposal

YANG Structure for Extending the Models:

- An import of the device model.
- A container named **deployment** that includes:
  - A list called "ntw-element" with the following elements:
    - A leaf named "ne-id" of type string that serves as the network element identifier (which is the key).
  - A leaf named "devmod-alias" of type string that serves as the device module alias for the deployment.
  - A list called "grp-ntw-elements" with the following elements:
    - A leaf named "grp-ne-id" of type string that serves as the network element identifier (which is the key).
    - A leaf named "devmod-alias" of type string that serves as the device module alias for the deployment.

Usage Example for 'foo' Module

```
module: foo-ntwdev
  +--rw devmod-list* [devmod-name]
     +--rw devmod-name    string
     +--rw foo?           -> /foo:foo
     +--rw deployment
        +--rw ntw-elements* [ne-id]
        |  +--rw ne-id           string
        |  +--rw devmod-alias?   string
        +--rw grp-ntw-elements* [grp-ne-id]
           +--rw grp-ne-id       string
           +--rw devmod-alias?   string
```

Groups of network elements

- **Groups of Network Elements.** This document defines a module called "ietf-grp-ntw-elements", which provides a structured approach to represent and manage groups of network elements, enabling efficient network management.

```
module: ietf-grp-ntw-elements
  +--rw grp-ntw-elements* [grp-ne-id]
     +--rw grp-ne-id        string
     +--rw ntw-element* [ne-id]
        +--rw ne-id    string
```

- ***Open question***: alignment of ne-id with inventory

Next steps and open questions

- Are the use cases common to other network operators?
  - Feedback from operators is appreciated
- Is the work interesting to be carried out in netmod?
- Next steps:
  - Collect feedback
  - Refine the draft
  - Assess alternative methods: YANG Full Embed - draft-jouqui-netmod-yang-full-include
- Feedback and suggestions are welcome