YANG data model for Flexi-Grid Optical Networks

draft-vergara-ccamp-flexigrid-yang-05
draft-vergara-ccamp-flexigrid-media-channel-yang-01

Jorge E. López de Vergara (jorge.lopez_vergara@uam.es)
Daniel Perdices (daniel.perdices@naudit.es)
Víctor López (victor.lopezalvarez@telefonica.com)
Óscar González de Dios (oscar.gonzalezdedios@telefonica.com)
Daniel King (d.king@lancaster.ac.uk)
Young Lee (leeyoung@huawei.com)
Gabriele Galimberti (ggalimbe@cisco.com)

Motivation

- Existing YANG models are either technology-agnostic or technology-specific
  - draft-ietf-i2rs-yang-network-topo and draft-ietf-teas-yang-te-topo are generic: they have to be extended for each specific technology
  - draft-ietf-ccamp-wson-yang is specific for WSON technology, extending draft-ietf-teas-yang-te-topo
- We propose a pair of YANG models related to a Flexi-Grid Traffic Engineering Database and Media Channel
  - Based on the ideas presented at RFC 7698: "Framework and Requirements for GMPLS-Based Control of Flexi-Grid Dense Wavelength Division Multiplexing (DWDM) Networks"
  - They also extend from existing generic YANG models

Main changes from prior version (I)

- From comments and requests at CCAMP WG
- Split in two drafts
  - draft-vergara-ccamp-flexigrid-yang-05 (Flexi-grid-TED)
    - Model has been updated to be compatible with last changes on TE Topology model.
    - Proprietary Transponder attributes are not longer part of this model. Operational modes are used instead. These modes are compliant with ITU-T G.698.2 (11/2009) (See section 5.3 of the recommendation).
    - Other minor changes in TED model have also been included (e.g. default slot width granularity).
    - More precise explanations in the example of use.

Main changes from prior version (II)

- Split in two drafts
  - draft-vergara-ccamp-flexigrid-media-channel-yang-00
    - Flexi-grid media-channels are now augmenting TE-Tunnel. Therefore, some attributes are not longer necessary, since TE-Tunnel model already contained them.
    - Link-channel (list of the concatenated elements of the media-channel) is now re-using LSP from TE-Tunnel.
    - More precise explanations in the example of use.

- NMDA Compliant!

Flexi-grid Topology Model

```
module: ietf-flexi-grid-topology
   augment /nd:networks/nd:network/nd:node/tet:te/tet:state/tet:te-node-attributes:
    +--ro interfaces* [name]
      +--ro name                    string
      +--ro port-number?            uint32
      +--ro input-port?             boolean
      +--ro output-port?            boolean
      +--ro description?            string
      +--ro type?                   interface-type
      +--ro numbered-interface
      |  +--ro n-i-ip-address?   inet:ip-address
      +--ro unnumbered-interface
         +--ro u-i-ip-address?   inet:ip-address
         +--ro label?            uint32
flexi-grid-connectivity-matrix-attributes
   augment /nd:networks/nd:network/nd:node/tet:te/tet:config/tet:te-node-attributes/tet:connectivity-matrices/tet:connectivity-
matrix:
    +--rw connections* [input-port-id]
      +--rw input-port-id     flexi-grid-node-port-ref
      +--rw output-port-id?   flexi-grid-node-port-ref
flexi-grid-connectivity-matrix-attributes
   augment /nd:networks/nd:network/nd:node/tet:te/tet:state/tet:te-node-attributes/tet:connectivity-matrices/tet:connectivity-
matrix:
    +--ro connections* [input-port-id]
      +--ro input-port-id     flexi-grid-node-port-ref
      +--ro output-port-id?   flexi-grid-node-port-ref
flexi-grid-transponder
   augment /nd:networks/nd:network/nd:node/tet:te/tet:tunnel-termination-point/tet:config:
    +--rw available-operational-mode*   operational-mode
    +--rw operational-mode?             operational-mode
flexi-grid-transponder
   augment /nd:networks/nd:network/nd:node/tet:te/tet:tunnel-termination-point/tet:state:
    +--ro available-operational-mode*   operational-mode
    +--ro operational-mode?             operational-mode
```

Flexi-grid Tunnel Model

```
module: ietf-flexi-grid-media-channel
  augment /te:te/te:tunnels/te:tunnel:
    +--rw source-port?          fg-ted:flexi-grid-node-port-ref
    +--rw destination-port?     fg-ted:flexi-grid-node-port-ref
    +--rw effective-freq-slot
       +--rw N?    int32
       +--rw M?    int32
  augment /te:te/te:tunnels/te:tunnel/te:state:
    +--ro source-port?          fg-ted:flexi-grid-node-port-ref
    +--ro destination-port?     fg-ted:flexi-grid-node-port-ref
    +--ro effective-freq-slot
       +--ro N?    int32
       +--ro M?    int32
  augment /te:te/te:lsps-state/te:lsp:
    +--ro N?                  int32
    +--ro M?                  int32
    +--ro source-port?        fg-ted:flexi-grid-node-port-ref
    +--ro destination-port?   fg-ted:flexi-grid-node-port-ref
    +--ro link?               fg-ted:flexi-grid-link-ref
    +--ro bidirectional?      boolean
```

Future work

- Adoption of these drafts as CCAMP WG documents
- draft-vergara-ccamp-flexigrid-yang
  - Study if ports should be LTP to be more coherent with the TE models.
- draft-vergara-ccamp-flexigrid-media-channel-yang
  - Discuss the terminology (e.g. media-channel, network media-channel, tunnel)
  - Study the use of LTP to model ports so that this model doesn't need to use transponder characteristics.

Thanks!
Any comments?