A YANG Data Model for Flexi-Grid Optical Networks

A YANG Data Model for Flexi-Grid Media Channels

This document defines a YANG module for managing flexi-grid optical networks. The model defined in this document specifies a flexi-grid traffic engineering database that is used to describe the topology of a flexi-grid network. It is based on and augments existing YANG models that describe network and traffic engineering topologies.

The YANG data model defined in this document conforms to the Network Management Datastore Architecture (NMDA).

https://github.com/ietf-ccamp-wg/draft-ietf-ccamp-flexigrid-yang

https://github.com/ietf-ccamp-wg/draft-ietf-ccamp-flexigrid-media-channel-yang
A YANG Data Model for Flexi-Grid Optical Topologies

• Used to describe the flexi-grid optical topology
  • draft-ietf-ccamp-flexigrid-yang
  • Current version is draft-ietf-ccamp-flexigrid-yang-11
  • New version in progress, and includes fixes for:
    • Addressed YANG Dr Early Review Comments
    • Tom’s Last Call comments
    • Adrian’s Last Call comments
    • Reverted to original code using relative paths, instead of “ancestor” function, more on this later
    • Update to Security section based on recent RFC Editor best practice
  • New version (v12) will be posted shortly after IETF 113

IETF 113 (Hybrid) – CCAMP
Working Group – March 2022
A YANG Data Model for Flexi-Grid Media Channels

• Used to describe the flexi-grid optical media channel
  • draft-ietf-ccamp-flexigrid-media-channel-yang
  • Current version of the I-D is draft-ietf-ccamp-flexigrid-tunnel-yang-00
  • Several ongoing activities with the I-D
    • #49 Align with RFC9093-bis
    • #47 Relationship between OTSiG and tunnel identifiers
    • #46 WDM technology-specific constraints
    • #42 Improve the model overview

• For the full list of open issues see:
  • https://github.com/ietf-ccamp-wg/draft-ietf-ccamp-flexigrid-media-channel-yang/issues

• Resuming Flexi-Grid Tunnel Calls after IETF 113
  • Thursdays at 14:00 CEST
    • https://us06web.zoom.us/j/82073911629?pwd=aXhYZnM0OVJMQ2IrZkNxAQ1duZVdJUT09
A moment for our YANG Doctors

- Many, many YANG modules from CCAMP have numerous augmentations, many 10s, and in some cases more than a 100, almost all controlled by “WHEN”
- The “WHEN” statement are almost all performing the same test for a presence container for the network type but because the tree is often many levels deep
- The augments take place at different levels and the “WHEN” use the relative form of the XPATH statement.
- There is a solution! See next slide.
Use of WHEN statements in I-D

• Augmentation uses “when” statement and relative path
  • In the Flexi-grid YANG code it is used more than 40 times and depending on the augmentation several levels are required
  • This makes life a little hard for a human reading/reviewing the YANG code

```yang
augment "/nw/networks/nw:network/nw:node/tet:te/"
  + "tet:node-attributes/tet:connectivity-matrices/"
  + "tet:label-restrictions/tet:label-restriction"
when "/nw/networks/nw:network/nw:node/tet:te/"
  + "flexi-grid-topology"
description
  "Augmentation parameters apply only for networks with flexi-grid topology type."

uses 10-types:flexi-grid-label-range-info;
```
XML Axis Constructs

• Introducing “Ancestor” function
• Augmentation uses “ancestor” statement, instead of requiring the relative path.

```xml
augment "/nw:networks/nw:network/nw:node/tet:te/"
  + "tet:node-attributes/tet:connectivity-matrices/"
  + "tet:label-restrictions/tet:label-restriction" { when "ancestor::nw:network/nw:network-types/tet:te-topology/"
    + "flexgt:flexi-grid-topology" {
      description
      "Augmentation parameters apply only for networks with flexi-grid topology type."
    }
    description
    "Augment TE label range information for the TE node connectivity matrices.";
    uses 10-types:flexi-grid-label-range-info;
  }
```

• This makes the code far easier to check, versus:

```xml
augment "/nw:networks/nw:network/nw:node/tet:te/"
  + "tet:node-attributes/tet:connectivity-matrices/"
  + "tet:label-restrictions/tet:label-restriction" { when "../../../../nw:network-types/tet:te-topology/"
    + "flexgt:flexi-grid-topology" {
```
XML Axis Constructs

• Yes, but... The Flexi-Grid YANG code failed yanglint when we used the feature:


  • However, yanglint uses its own XPath implementation, which unfortunately does not support axes, hence the error.
  • So, for now we reverted to the previous code and no longer use the Ancestor function.

• This issue was raised in NETMOD
  • [https://mailarchive.ietf.org/arch/msg/netmod/HgEW08KZ1VCj2hmabeSfuVCFSPI/](https://mailarchive.ietf.org/arch/msg/netmod/HgEW08KZ1VCj2hmabeSfuVCFSPI/)

• What does the Working Group think?
  • Should be proceed with the I-D using the original code?
  • Request a tools update to fix the axes deficiency?
  • Another option?