A Yang Data Model for Optical Impairment-aware Topology

draft-ietf-ccamp-optical-impairment-topology-yang-02

Co-authors (editors):

• Young Lee (SKKU)
• Victor Lopez (Telefonica)
• Gabriele Galimberti (Cisco)
• Jean Luc Auge (Orange)
• Dieter Beller (Nokia)

Co-authors/contributors:

• Haomian Zheng (Huawei)
• Italo Busi (Huawei)
• Nicola Sambo (Scuola superior S.Anna)
• Julien Meuric (Orange)
• Esther Le Rouzic (Orange)
• Sergio Belotti (Nokia)
• Enrico Griseri (Nokia)
• Gert Grammel (Juniper)
• Jonas Martenson (RISE)
• Aihua Guo (Huawei)
Major Activities since IETF 105

- Weekly CCAMP WebEx meetings (Thu, 4-5pm CET)

Topics addressed:
- ROADM model:
  - ROADM architectures discussed – outcome: new sections in version 02
  - Modeling of optical impairments for ROADM – starting with simple approach:
    - Homogenous architecture
    - 3 paths identified: express path (pass-through), add path, and drop path
- 3R regenerators – discussion started
  - Two 3R regenerator realizations discussed
    - Two back-to-back transponders
    - Two transponders each providing uni-directional 3R regeneration
ROADM modeling: express (through) path, add path, drop path

Ingress/egress amplifier modeled as part of TE link
ROADM modeling

• Ingress and egress amplifiers modeled as part of the TE link like in-line amplifiers (ILAs)

• Agreed express, add, drop path impairment parameters (read-only):
  • Chromatic dispersion (CD)
  • Polarization mode dispersion (PMD)
  • Polarization dependent loss (PDL)

• Other impairment parameters still under discussion:
  • Cross-talk due to imperfect optical isolation of components
  • Filtering impacts – how to characterize and model filtering impacts
Integrated ROADM architecture with integrated optical transponders (OTs) providing client interfaces
Integrated ROADMs with integrated OTs and single channel add/drop interfaces for remote OTs
Disaggregated ROADM that are subdivided into degree, add/drop, and optical transponder subsystems.
2 Optical Transponders (OTs) used as 3R regenerator
Option 1: bi-directional back-to-back configuration

CCAMP WG Session @ IETF 106, Singapore
2 Optical Transponders used as 3R regenerators
Option 2: uni-dir 3R configuration (internal loop)

Client Interface
Major Changes since IETF 105

- Text/figures added describing the ROADM architectures

- YANG model remained unchanged – agreements still to be reached how to model optical impairments for ROADM5s before the YANG model can be updated (TE topology augmentations for layer 0).
YANG model and draft on GitHub

• The authors/contributors are using GitHub:
  https://github.com/younglee-ietf/ietf-optical-impairment-yang

• This is not a CCAMP WG “organization” GitHub account but it can still be used for the time being.

• As suggested by the authors/contributors, the CCAMP chairs agreed to create a CCAMP WG “organization” account as defined in:
<table>
<thead>
<tr>
<th>Issue</th>
<th>Assigned To</th>
<th>Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminology: being explicit about ROADM</td>
<td>gggrammal</td>
<td>5</td>
</tr>
<tr>
<td>OTSI terminology alignment with G.807</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Model alignment with 400G-ZR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modelling of 3R Regenerators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redundancy in OMS-elements list: type vs. choice statement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>have automatic tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available OTSI capabilities and configured property</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmonization of compound &quot;variable&quot; names in the YANG files</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modeling of optical impairments for ROADM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Modulation format</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why are OTSI attributes in a separate transponder-list sub-tree?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Open Issues - listed on GitHub

https://github.com/younglee-ietf/ietf-optical-impairment-yang/issues

CCAMP WG Session @ IETF 106, Singapore
Next Steps

• Conclude on how to model the optical impairments for ROADM:
  • Cross-talk contributions to signal degradation (OSNR degradation)
  • Identify the TE node entities (containers) in the TE topology YANG suitable for optical impairment augmentations (scalability!)
  • Define the YANG model augmentations in the YANG module
  • Study filtering impacts on signal quality and how to model those

• Modeling of 3R regenerators

• Address the other open issues on GitHub
Thank You!