

# A Yang Data Model for Optical Impairment-aware Topology

**draft-ietf-ccamp-optical-impairment-topology-yang-10**

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## Contributors

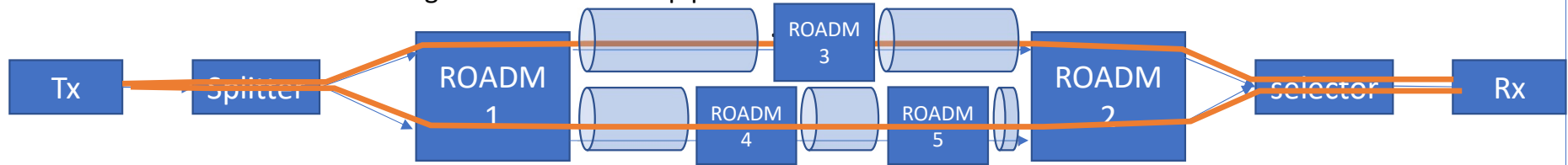
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# Major Activities since IETF 113 Meeting

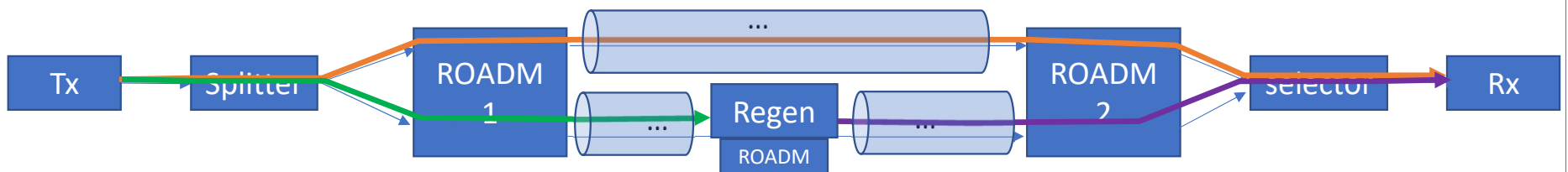
- There is an official weekly CCAMP WebEx meetings (Tue, 2-3pm CET) on the subject
- Draft text update
  - General refinement of the text to partially address “OTSi terminology alignment with G.807 ([#25](#))
  - Text added in sections 2.3.1 and 2.3.2 to clarify the relationship between OTSiG and OTSi in the view of OTSi global unique identification. (issue [#88](#))
    - hierarchical approach where the otsi-group-id (string) uniquely identifies the OTSiG in the network and where the contained otsi-carrier-id (uint16) are identified within the scope of the otsi-group-id.
  - Adding a paragraph for uni-directional 3R regenerators
    - You can change carrier frequency but you cannot change transceiver mode
  - Adding new section for protection architecture (issue [#107](#) )
- YANG model update
  - fixing 2 issues ([#38](#), [#109](#))
  - Introduced modification for protection modeling (on going )
  - Other issues ([#49](#), [#50](#)) are fixed with YANG updates in ietf-layer0-types module in RFC9093-bis

# Problem statement for optical protection switching representation

- In case of OTSi optical protection switching ,
  - At the splitter the signal is optically duplicated before entering the add ports of a ROADM,
  - At the selector 1 of the 2 signals from the 2 drop ports of the ROADM is selected



- If one of the path is regenerated, there is no more an end2end OTSi

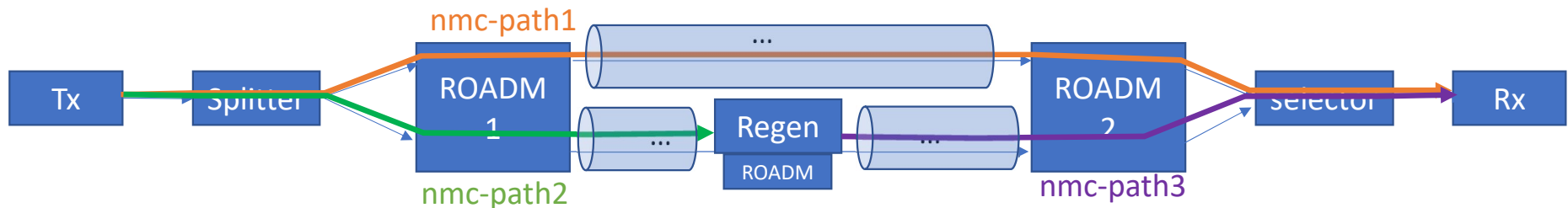


# Problem statement : what we need to do in the topology model?

- Path computation need to know the existing OTSi for each OMS link in the topology, to determine the OI impact of the existing OTSi on the optical feasibility of a new OTSi and viceversa .
- How to represent the existing OTSi already there in the network in case of protection?
  - The 2 Optical signals at the input of the selector may have different OI impacts due to different paths
  - Optical path feasibility shall be checked independently from which of the 2 optical signal is selected to avoid that optical protection switching actions impact the optical feasibility of other existing OTSis.

# Our on going solution

- We have only 1 OTSi but with different associated paths (nmc-paths)



- In the model:
  - Any OTSi (if protected) is associated with a list of paths (nmc-path)
    - At the ingress (and egress) of a given splitter/selector the OTSi identifier is the same and NMC paths are different
  - Any OMS section will have a reference to all the OTSis and a reference to the related paths

# Related YANG modifications

```
augment /nw:networks/nw:network:
  +--ro otsi-group* [otsi-group-id]
  +--ro otsi-group-id string
  +--ro otsi* [otsi-carrier-id]
  +--ro otsi-carrier-id uint16
  +--ro otsi-carrier-frequency? union
  +--ro nmc-path-id* uint16
```

```
augment /nw:networks/nw:network/nt:link/tet:te
  /tet:te-link-attributes:
  +--ro OMS-attributes
  .....
  +--ro media-channel-group* [i]
    | +--ro i int16
    | +--ro media-channels* [flexi-n]
    |   +--ro flexi-n l0-types:flexi-n
    |   +--ro flexi-m? l0-types:flexi-m
    |   +--ro otsi-group-ref?
    |   | -> /nw:networks/network/otsi-group/otsi-group-id
    |   +--ro otsi-ref* []
    |   | +--ro otsi-carrier-ref? leafref
    |   | +--ro nmc-path-ref* leafref
    |   +--ro delta-power? l0-types:power-in-dbm-or-null
```

# Open issues

- Tracking Open Issues, discussions and resolutions linked to YANG model <https://github.com/ietf-ccamp-wg/draft-ietf-ccamp-optical-impairment-topology-yang/issues>:
- 6 issues closed since IETF-113
- Still 7 open issues
  - [#107](#) is on optical protection switching and it is work on going
  - [#108](#) : the model already support remote optical transponder connected to a WDM-node but we need to add an appendix describing how the model support different scenarios.
  - [#79](#): related to relative xpath in leafref needs clarification from NETMOD WG where the suggested solution using “ancestor” function of Xpath is still debated.
  - [#25](#): Review terminology has been partially addressed now for IETF-114. A general review of all the text in the draft is still needed before to close it.
  - [#95](#): “Boundary between Layer 0 and Layer 1” is on going. We need to add text description in the draft to clarify the boundary between what is in the scope (layer 0) and what is out of scope (layer 1)
    - E.g. inverse multiplexing and FEC are layer 1 functionality of the transponders which are in the scope of this document
  - [#71](#): YANG model development process improvement on github: would it be possible to issue tags to have read only states of the yang? revision date may not ensure several versions with the same date
  - [#110](#): YANG model possible issue: to analyze the usage of “container” as immediate parent of a “list” in the model.
- <https://github.com/ietf-ccamp-wg>

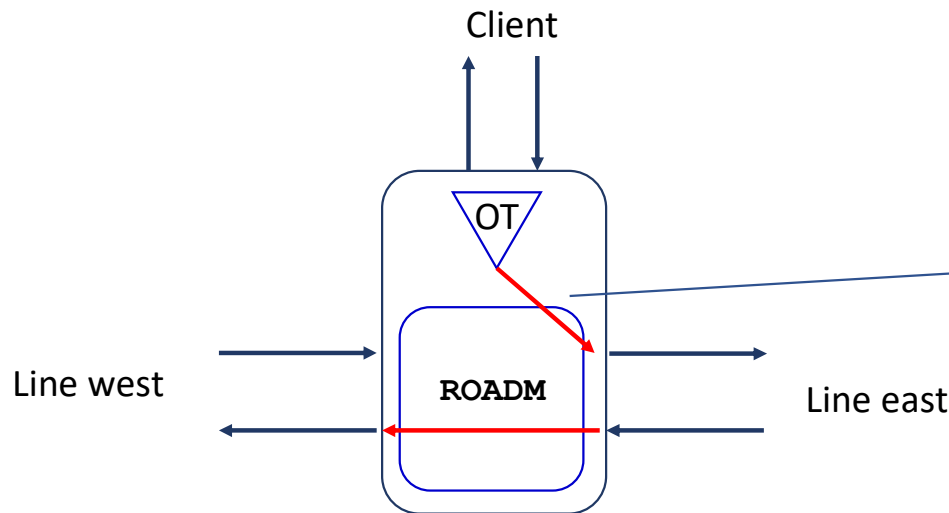
# Next Steps

- Complete the OTSi protection model
- Adding report optical protection capabilities (including also OMS protection)
- Addressing the issues still on the list
- Analyze possible enhancements covering new feature
- Stable version by end of the year (IETF-115)
- Be ready for YANG doctor review



# backup

# Impairments attributes on LLCL



TTP local link connectivity would provide the impairments of the ROADM add/drop paths towards the 3R.

```

• +--rw tunnel-termination-point* [tunnel-tp-id]
•   +--rw tunnel-tp-id                binary
•   .....
•   +--rw local-link-connectivities
•     | +--rw number-of-entries?      uint16
•     | .....
•     | +--rw is-allowed?              boolean
•     | .....
•     | +--ro path-properties
•     | | .....
•   /* ADD (Start) */
•     | +--ro add-path-impairments     leafref
•     | +--ro drop-path-impairments    leafref
•   /* ADD (End) */
•     | +--rw local-link-connectivity* [link-tp-ref]
•     | +--rw link-tp-ref
•     | | -> ../../../../nt:termination-point/tp-id
•     | .....
•     | +--rw is-allowed?              boolean
•     | .....
•     | +--ro path-properties
•     | | .....
•   /* ADD (Start) */
•     | +--ro add-path-impairments     leafref
•     | +--ro drop-path-impairments    leafref
•   /* ADD (End) */

```