

A Yang Data Model for Optical Impairment-aware Topology

[draft-ietf-ccamp-optical-impairment-topology-yang-02](#)

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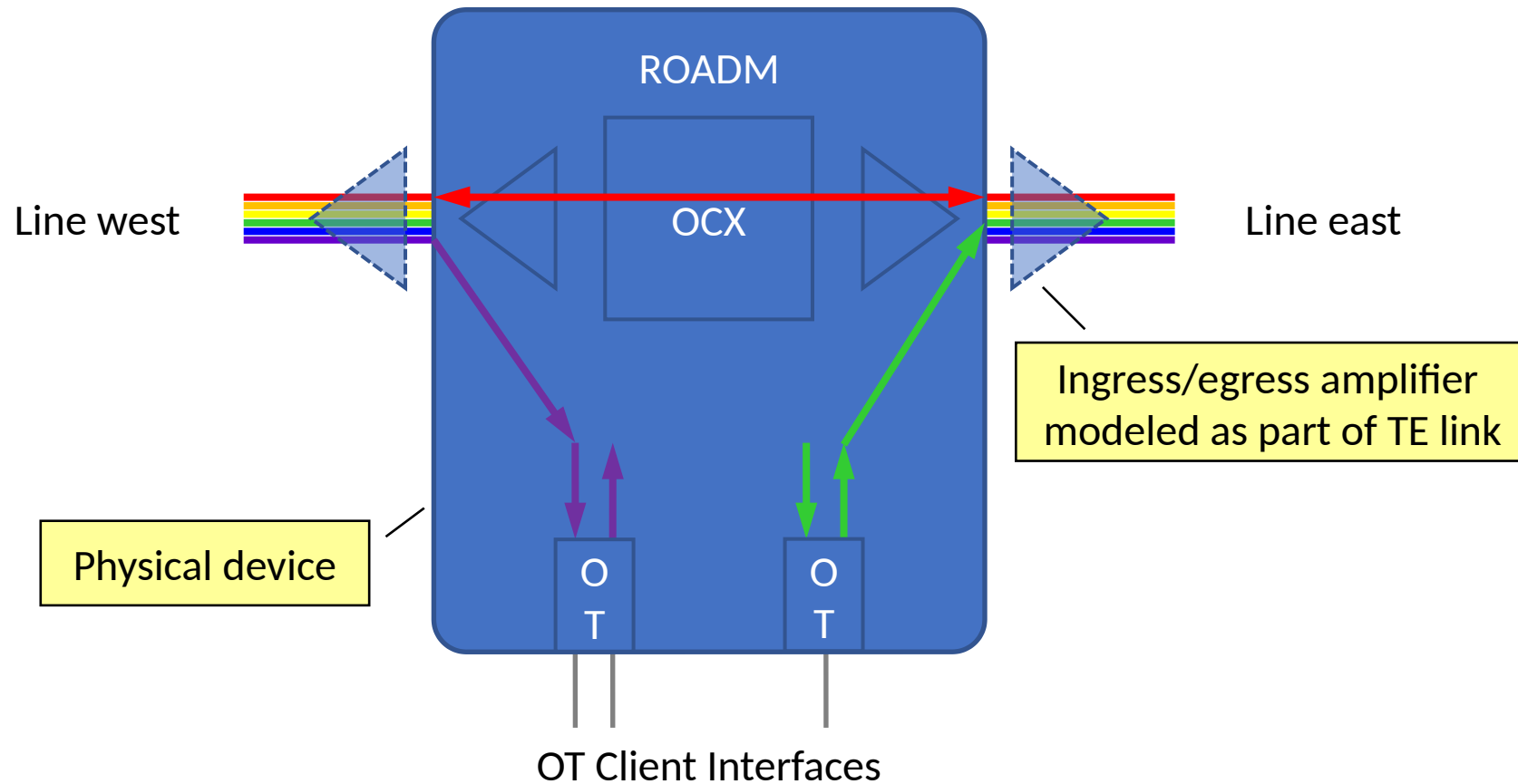
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Major Activities since IETF 105

- 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 ROADMs – 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

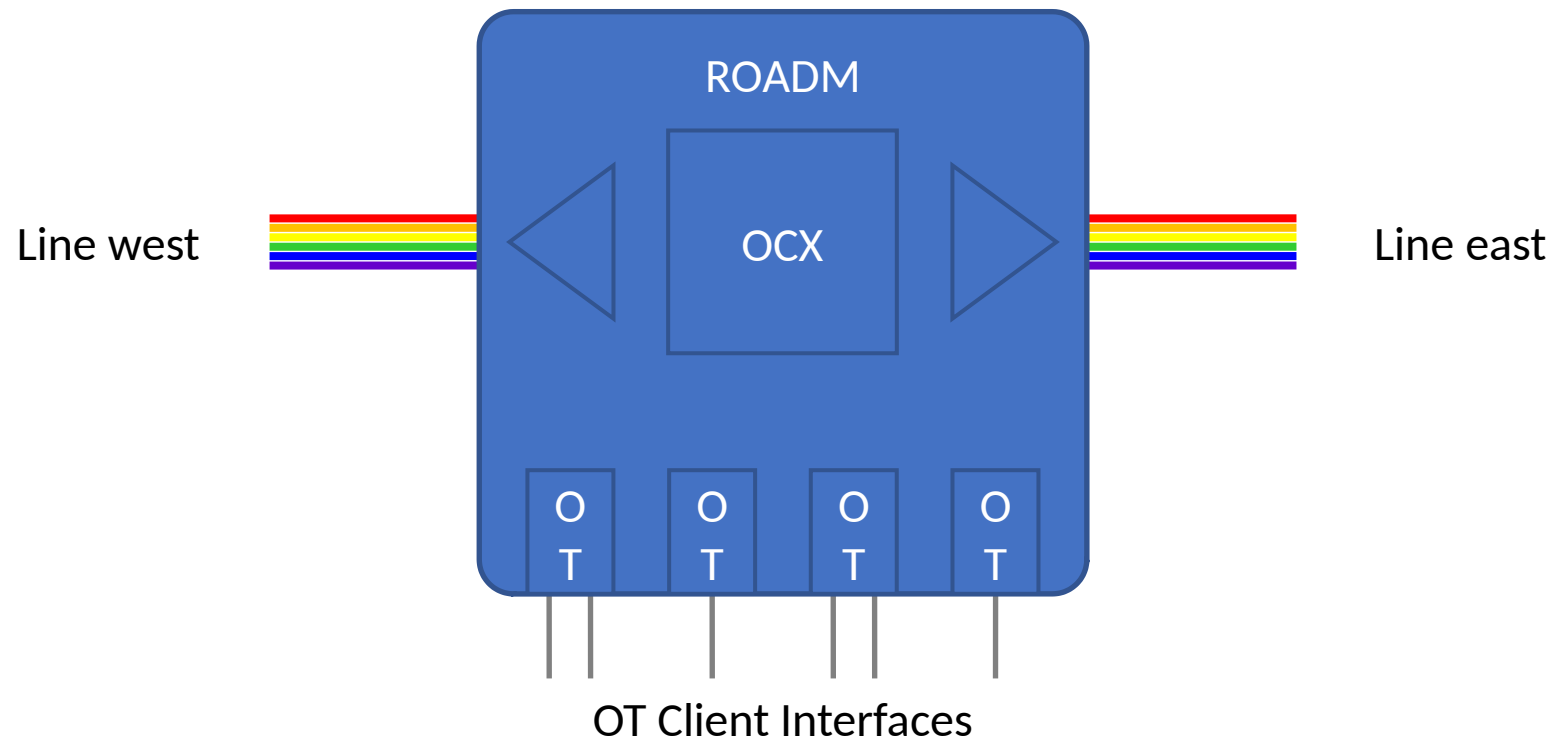
ROADM modeling: express (through) path, add path, drop path



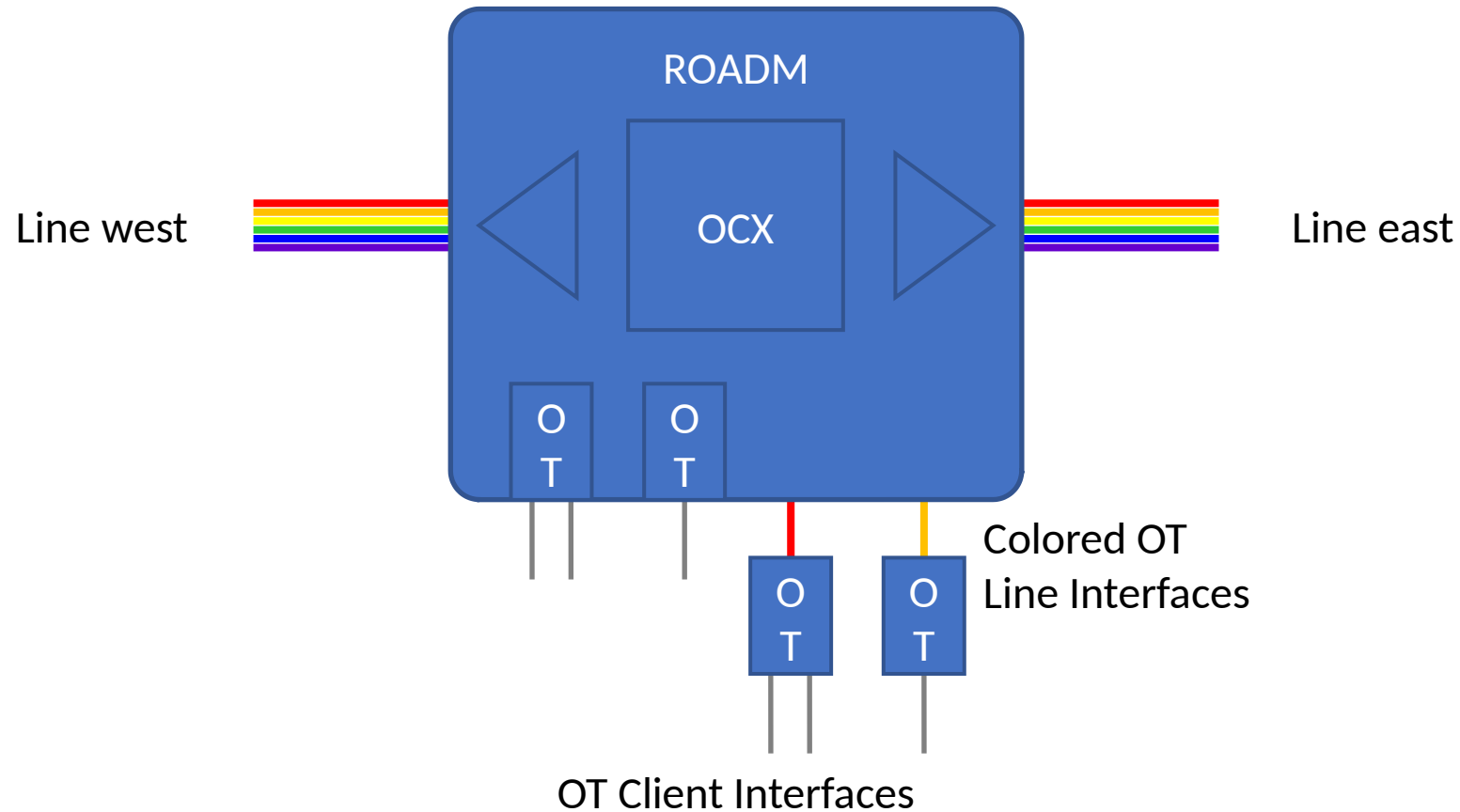
ROADM modeling

- 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

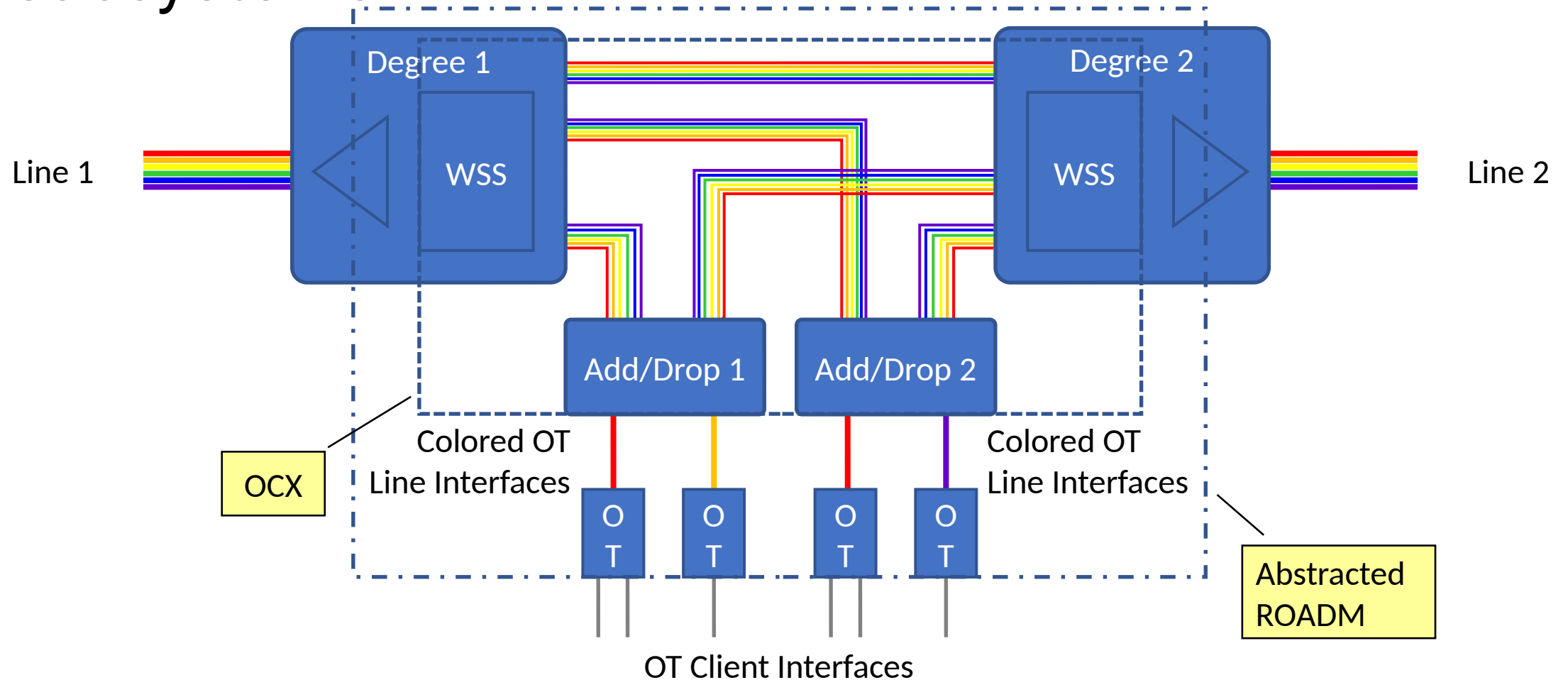
Integrated ROADMs architecture with integrated optical transponders (OTs) providing client interfaces



Integrated ROADMs with integrated OTs and single channel add/drop interfaces for remote OTs

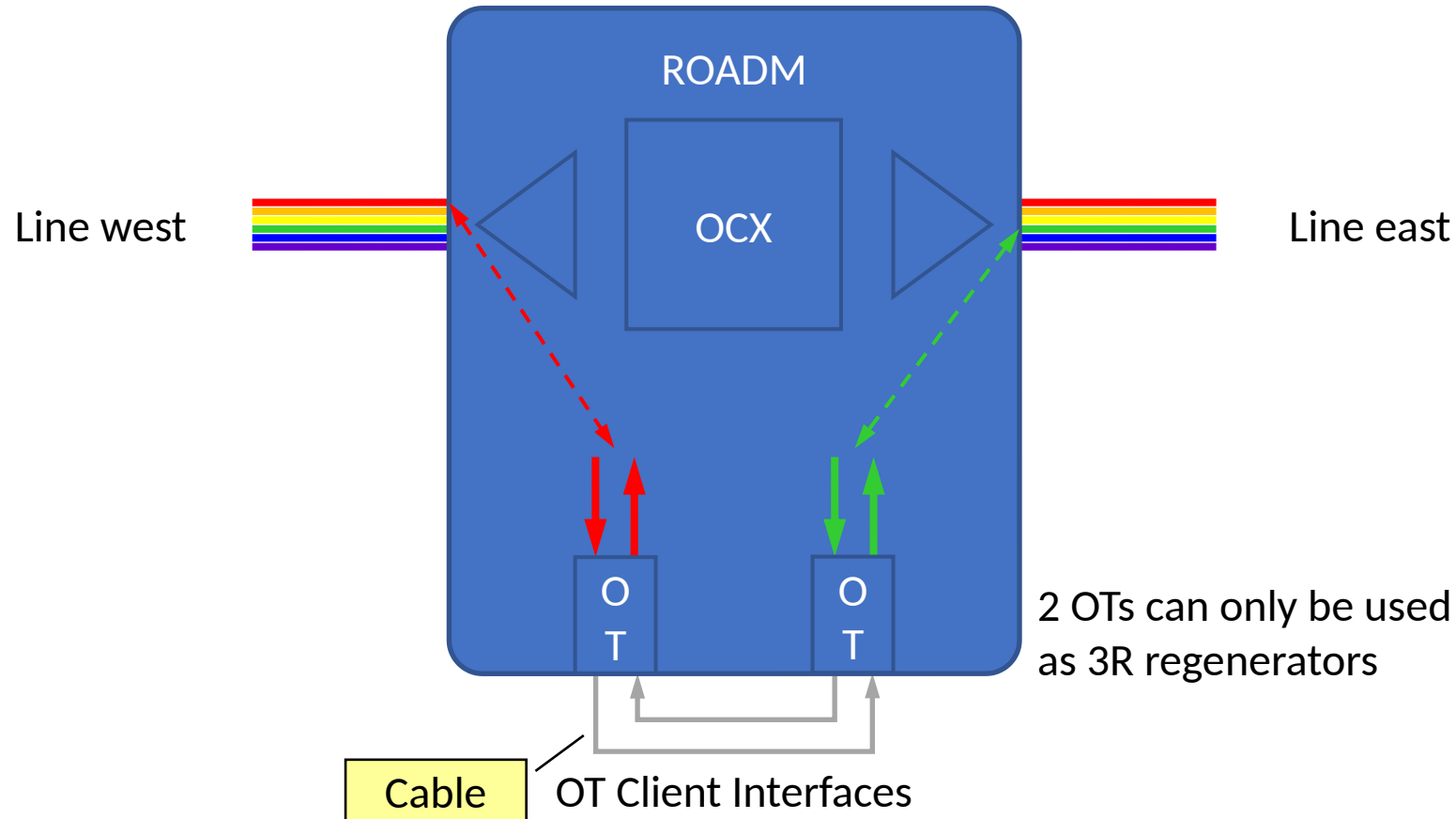


Disaggregated ROADMs that are subdivided into degree, add/drop, and optical transponder subsystems



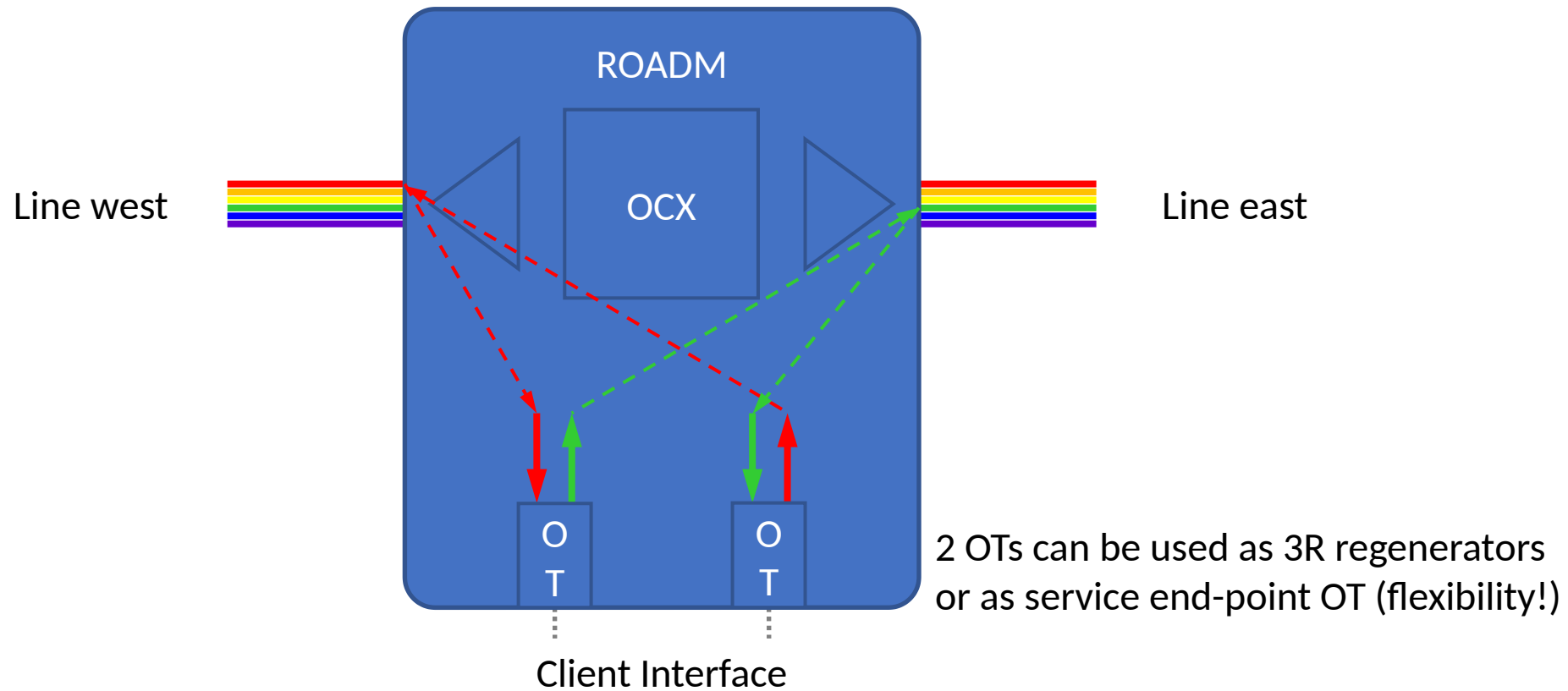
2 Optical Transponders (OTs) used as 3R regenerator

Option 1: bi-directional back-to-back configuration



2 Optical Transponders used as 3R regenerator

Option 2: uni-dir 3R configuration (internal loop)



Major Changes since IETF 105

- Text/figures added describing the ROADMs architectures
- YANG model remained unchanged – agreements still to be reached how to model optical impairments for ROADMs 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:
<https://tools.ietf.org/html/draft-ietf-git-github-wg-configuration-03>

Open Issues - listed on GitHub

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

<input type="checkbox"/>	11 Open <input checked="" type="checkbox"/> 4 Closed	Author	Labels	Projects	Milestones	Assignee	Sort
<input type="checkbox"/>	Terminology: being explicit about ROADM #26 opened 24 days ago by ggrammel						5
<input type="checkbox"/>	OTSi terminology alignment with G.807 #25 opened on Aug 2 by italobusi						3
<input type="checkbox"/>	Model alignment with 400G-ZR question #24 opened on Jul 24 by ggrammel						
<input type="checkbox"/>	Modelling of 3R Regenerators enhancement #23 opened on Jul 22 by dieterbeller						5
<input type="checkbox"/>	Redundancy in OMS-elements list: type vs. choice statement #21 opened on Jun 18 by jktjkt						2
<input type="checkbox"/>	have automatic tests enhancement #19 opened on Jun 6 by EstherLerouzic						1
<input type="checkbox"/>	Available OTSi capabilities and configured property bug enhancement #12 opened on May 27 by dieterbeller						5
<input type="checkbox"/>	Harmonization of compound "variable" names in the YANG files coding style #10 opened on May 26 by dieterbeller						1
<input type="checkbox"/>	Modeling of optical impairments for ROADMs enhancement #9 opened on May 23 by dieterbeller						9
<input type="checkbox"/>	Hybrid Modulation format enhancement #8 opened on May 23 by ggalimba56						
<input type="checkbox"/>	Why are OTSi attributes in a separate transponder-list sub-tree? question #5 opened on May 20 by dieterbeller						

Next Steps

- Conclude on how to model the optical impairments for ROADMs:
 - 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!