

Problem Statement: Information Sharing of Optical Impairments in Monitoring of Multi-Domain All-Optical Paths

draft-xu-ccamp-impairment-info-sharing-problem-00

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Background

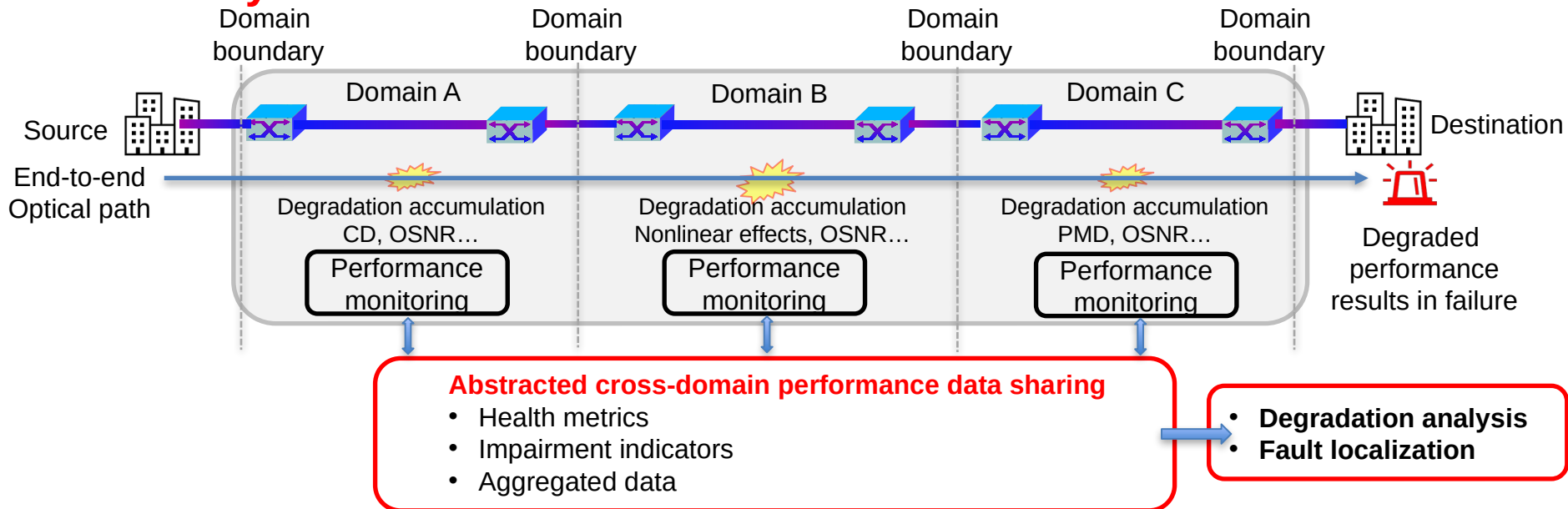
- Large-scale **multi-domain WSON** networks support end-to-end optical services
- Optical **impairments** accumulate across administrative domains
 - Examples: OSNR/GSNR degradation, nonlinear noise, dispersion, etc.
- Existing RFCs and I-Ds support impairment-aware **provisioning**
 - Impairment-aware path computation
 - Optical provisioning and validation
- **Gap: Cross-domain** impairment **monitoring** and degradation failure **analysis**



First needs cross-domain performance data sharing capability to offer information and facilitate cross-domain monitoring and analysis

Requirement for Cross-Domain Performance Data Sharing

- Degradation may originate in any traversed domain
- Receiver detects failure when thresholds are exceeded
- Operators must **identify which domain contributes most**, where the information at the receiving endpoint is insufficient
- **Need cross-domain performance data sharing to offer data for analysis**



Use Cases

1. Faster restoration

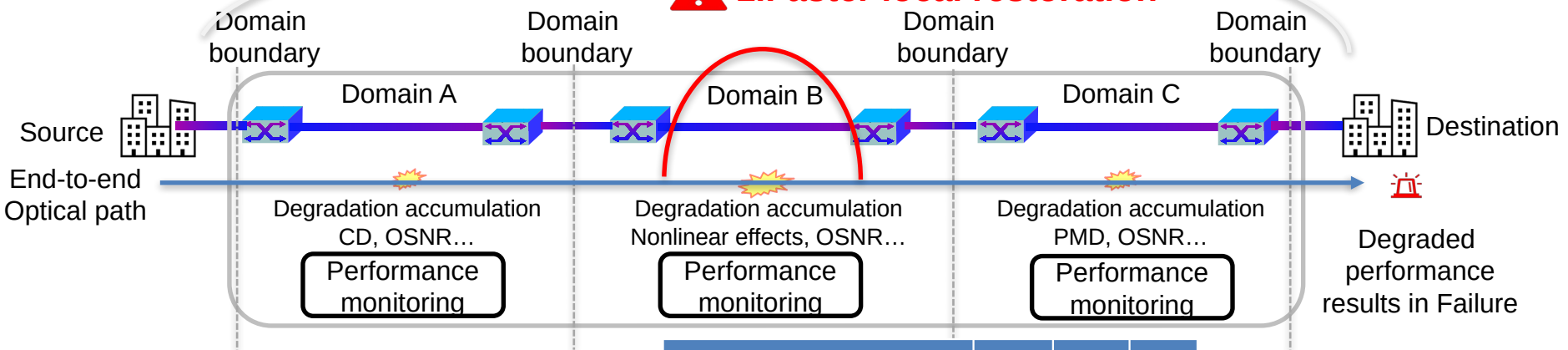
- Identify affected domain
- Perform local restoration between border nodes

2. SLA responsibility attribution

- Quantify degradation contributions
- Provide objective basis for SLA analysis

Higher cost in end-to-end restoration

! 1. Faster local restoration



! 2. SLA responsibility attribution

Domain	A	B	C
Impairment Indicator(s)	x	Y	z

Key Constraints

- Architectural **limited observability** at domain boundaries
 - Monitoring may rely on estimation with varying levels of accuracy
- **Confidentiality restrictions** on internal topology and metrics
 - Detailed cross-domain sharing must rely on abstraction and aggregation [RFC7926] as a generic guidance

