

Transport NBI Design Team Update

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Transport NBI DT

- IETF is developing a set of YANG Models that could be used for Transport NBI
 - How existing IETF YANG Models can be used for transport networks?
 - Are there any gaps in the existing IETF YANG Models?
- TNBI DT is currently looking at
 - Use Cases
 - Analysis of how existing IETF YANG models can be used to support these Use Cases
- Working method
 - Mailing list
 - Weekly conference calls on Wednesday at 3:00pm CET
 - GitHub: <https://github.com/danielkinguk/transport-nbi>

Use Cases Description

- Use Case Description I-D updated:
 - <https://tools.ietf.org/html/draft-tnbidt-ccamp-transport-nbi-use-cases-02>
- Added
 - Protection scenarios for Use Case 1: Single-domain with single-layer
- Next steps
 - Use Case 3: Multi-domain with single-layer
 - Complete Use Case 1
 - Use Case 2: Single-domain with multi-layer
 - Use Case 4: Multi-domain and multi-layer

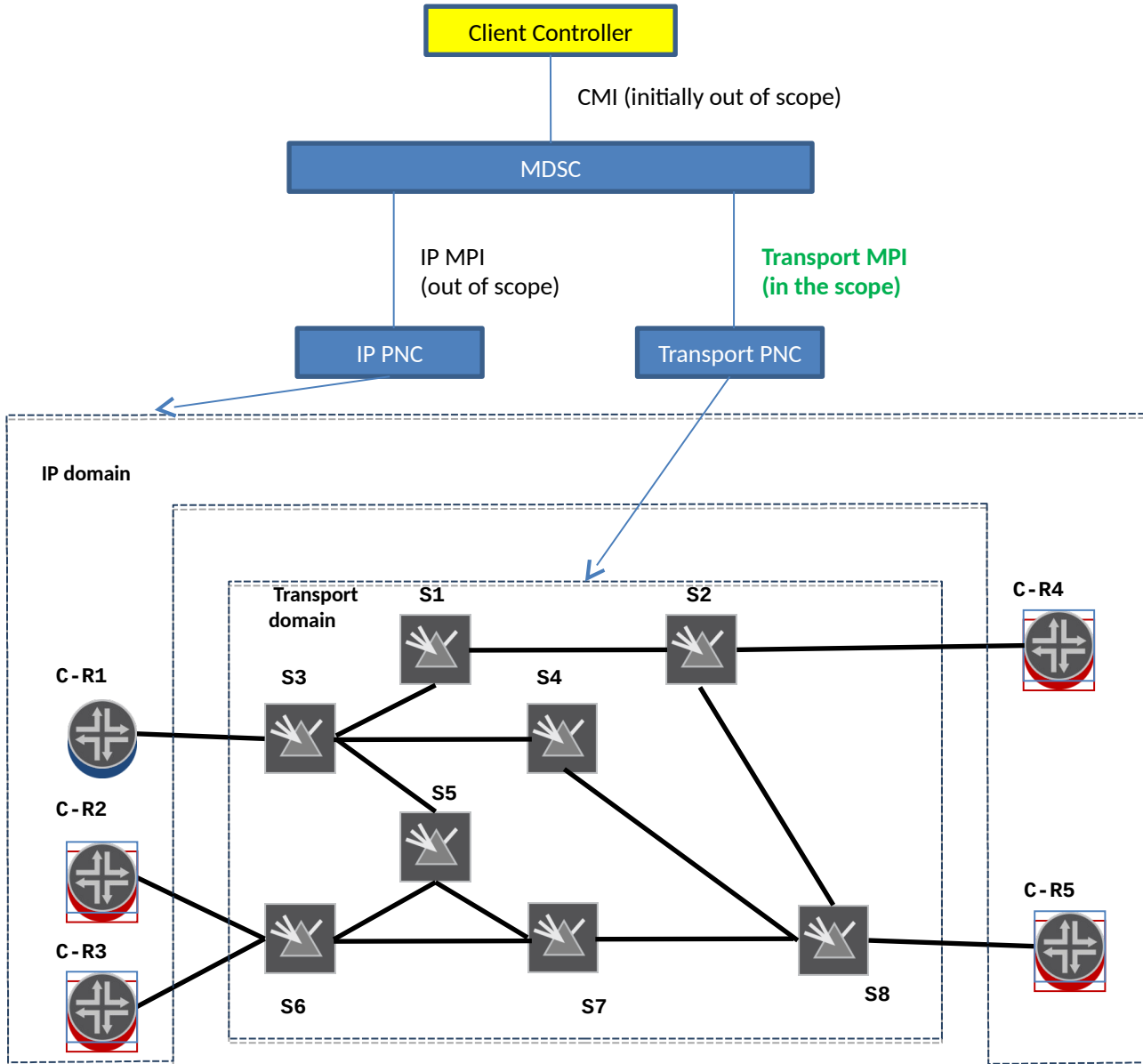
Analysis – Use Case 1

- Analysis I-D for Use Case 1 published:
 - <https://tools.ietf.org/html/draft-tnbidt-ccamp-transport-nbi-analysis-uc1-00>
- Currently Covers
 - ODU Abstract Topology example (white topology)
 - ODU Transit Service example
 - Detailed JSON code examples – validated against YANG models
- Next Steps
 - Reformat JSON code to fit into IETF I-D template
 - Align JSON code examples to latest YANG models
 - Complete analysis of Use Case 1
 - Analysis of protection scenarios
 - Start analysis of Use Case 3

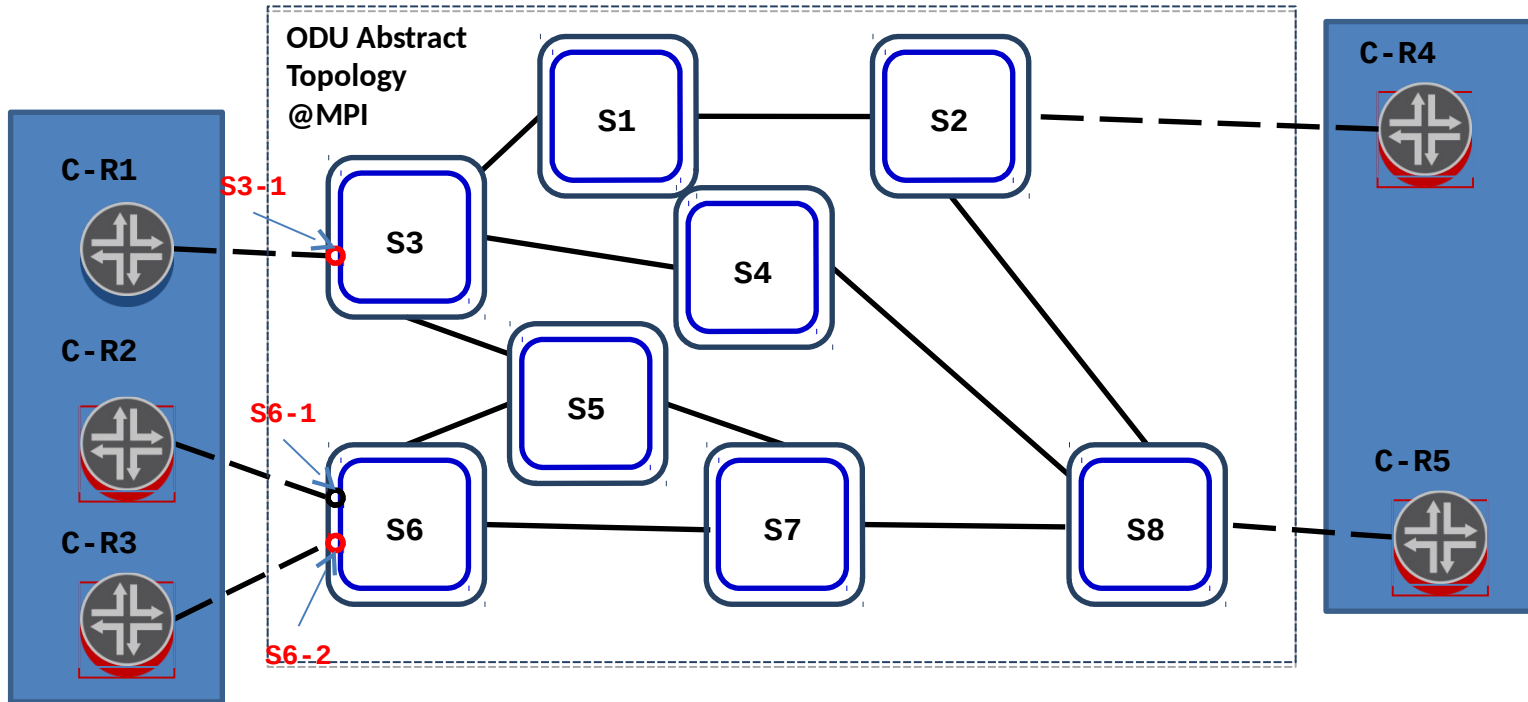
Feedback to IETF WGs

- Assumptions to be validated by TEAS WG
 - Applicability of TEAS YANG models to ACTN MPI interface
 - Use of the TE Tunnel model to setup Tunnel Segments
 - MDSC configures the labels (TSs) on the access link based on the label set information it can get by the PNC TE Topology
- Feedback to TEAS WG
 - How to use the TE Tunnel model to configure Tunnel Segments – on-going discussion
 - Use of node-id and link-tp-id in case of unnumbered explicit-route-object in TE Tunnel model
 - Add information about the label set in TE Topology and TE Tunnel models
 - Detailed syntax fixes as identified during the validation of the example JSON code against YANG models
- Feedback to CCAMP WG
 - *Discussed in later slides*

Use Case 1



Abstract White Topology @MPI

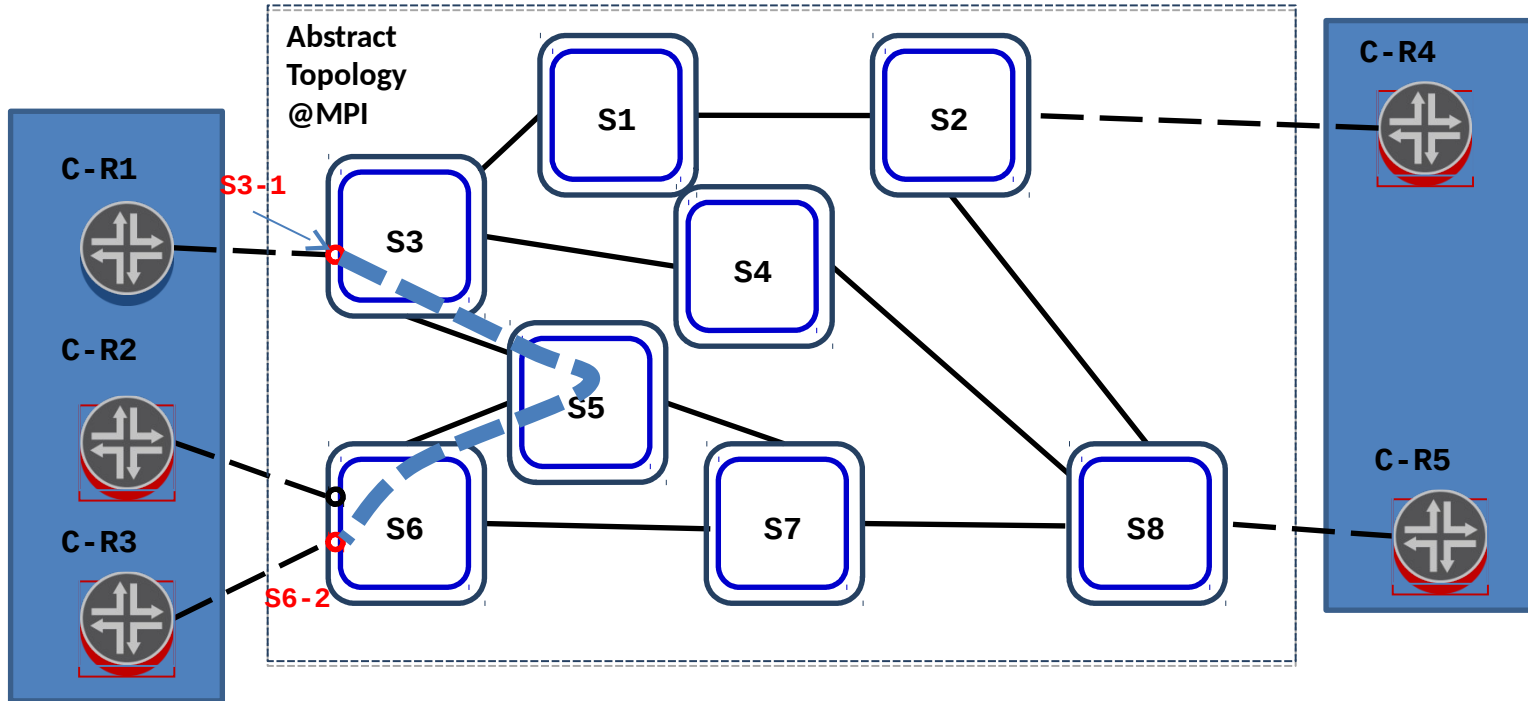


PNC exports as abstract topology at MPI: TE nodes (since the white topology abstraction is used, they represent physical nodes), TE links (between TE nodes), access-links (facing transport border nodes), transport border nodes and link termination points (LTPs) (e.g. S3-1 and S6-2)

The IP domain (reported here in the blue rectangle) is not part of the topology exported. They are included in this picture just to show the end points of the access links.

The topology model provides «external-domain» container that allows the MDSC to glue together the different domains to create E2E abstract multi-domain topology.

ODU2 Tunnel Setup



MDSC should request Transport PNC to setup an ODU2 Tunnel (Segment) between S3-1 and S6-2
Ingress and egress points are indicated in the explicit-route-objects of the primary path:

- First element of the explicit-route-objects refers to S3-1 LTP
- Last element of the explicit-route-objects refers to S6-2 LTP

The tunnel to be setup is a segment tunnel, source and destination of the E2E tunnel information is belonging to customer side.

ODU2 Connection: TEAS Tunnel Model Instantiation

```
"tunnels": {
  "tunnel": [
    {
      "name": "odu2-service",
      "// identifier": "ODU2-SERVICE-ID",
      "identifier": 1,
      "config": {
        "// src-tp-id": "None: transit tunnel segment",
        "// dst-tp-id": "None: transit tunnel segment",
        "bidirectional": {
          "association": {
            "type": "ietf-te-types:bidir-assoc-corouted"
          }
        },
        "// comment": "augmentation from draft-sharma-ccamp-ietf-otn-tunnel-model-02",
        "ietf-otn-tunnel:payload-treatment": "switching",
        "ietf-otn-tunnel:src-client-signal": "ietf-transport-types:client-signal-ODU2",
        "ietf-otn-tunnel:src-tpn": 1,
        "ietf-otn-tunnel:src-tsg": "ietf-transport-types:tsg-1.25G",
        "ietf-otn-tunnel:src-tributary-slot-count": 8,
        "ietf-otn-tunnel:src-tributary-slots": {
          "values": [
            0, 1, 2, 3, 4, 6, 7 ]
        },
      },
    },
  ],
}
```

<...>

ODU2 Connection: TEAS Tunnel Model Instantiation

```
{
  "ietf-te:te": {
    "globals": {
      "named-explicit-paths": {
        "named-explicit-path": [
          {
            "name": "odu2-service-named-explicit-path",
            "config": {
              "explicit-route-objects": {
                "explicit-route-object": [
                  {
                    "index": 0,
                    "// comment": "ingress interface on S3 node",
                    "explicit-route-usage": "ietf-te-types:route-include-ero",
                    "config": {
                      "index": 0,
                      "unnumbered-hop": {
                        "// router-id: S3-NODE-ID",
                        "router-id": "10.0.0.3",
                        "// interface-id: S3-1-LTP-ID",
                        "interface-id": 1,
                        "hop-type": "STRICT"
                      }
                    }
                  }
                ]
              }
            }
          }
        ]
      }
    }
  }
}
```

<...>

Current Status

- Original T-NBI Goals and Deliverables:
 - **Use cases and Gap analysis:** identify a set of technologies use cases and providing a gap analysis against existing models
 - **Missing YANG models:** Document requirements for new models or, where possible, as augmentation of existing IETF models. Coordinate requirements with appropriate WGs, e.g., TEAS, RTGWG and CCAMP itself.
 - **Guidelines:** Providing guidelines in terms of how all the related models can be used in a step-wise manner, using a couple of well identified transport network use cases
- What have we published?
 - Transport Northbound Interface Use Cases
 - <http://tools.ietf.org/html/draft-tnbidt-ccamp-transport-nbi-use-cases>
 - Analysis of Transport North Bound Interface Use Case 1
 - <https://tools.ietf.org/html/draft-tnbidt-ccamp-transport-nbi-analysis-uc1>

Current Status

- What is working
 - Gathering use cases from other SDOs
 - Develop/validating tooling for sanity checking JSON and YANG code
 - Leading to better quality code
- What could work better
 - Obtaining more feedback from other SDOs, especially on solution work
 - Improve speed of publishing Analysis I-Ds (initial hard-work has been done)

Next Steps

- Create a new Use Case I-D for Use Case 3 “Multi-domain with single-layer”
- Investigating extensions to the Path Computation Protocol (PCEP) to provide available labels on in/out segments to/from path computation domain
- Some discussion on T-NBI work to Network Slicing
 - It might be worth exploring the applicability of Transport NBI work to network slicing
 - Reminder that we have documented applicable use cases/scenarios, do our existing use cases apply to network slicing?
 - Or do we need a *new* UC.
 - Overlay scenario (no self-management)
 - Partitioned scenario (provides self-management by the consumer)
- Socialise I-Ds outside of IETF at other SDOs, these include:
 - ONF
 - MEF