

Framework and Data Model for OTN Network Slicing

[draft-zheng-ccamp-yang-otn-slicing-03](#)

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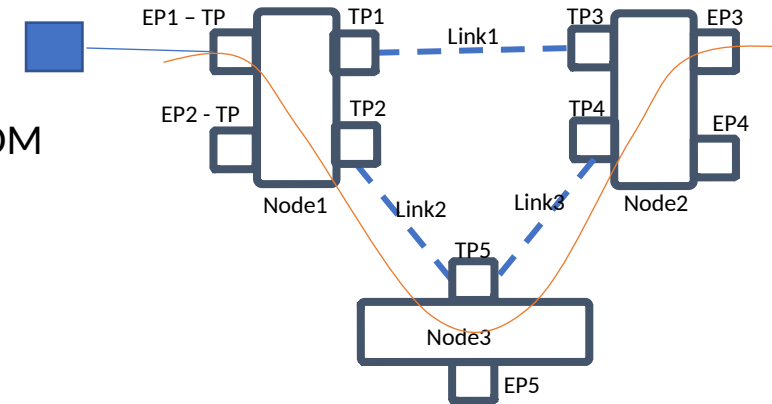
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Major Updates Since IETF 111

- Expanded list of authors and contributors
- Continuous alignment with draft-ietf-teas-ietf-network-slices
 - Endpoints, connectivity matrix
- Added text describing the design of NBI YANG modeling
- Included an initial revision of the NBI YANG model
 - Common model for transport network slicing
- Minor updates to MPI YANG model

OTN-SC NBI Modeling

- Building on a common model which is technology-agnostic and supports both connectivity-based slices and resource-based slices. The common model allows customer to
 - Use connectivity matrix to express intended connectivity between endpoints
 - Use topology to reserve resources for the slice and express detailed path for each connection
 - Reserve the resources first and create connections later as needed
- The common model can be used to support slicing for any transport layer, e.g., OTN, WDM (WSON/Flex-grid), MPLS-TP
 - OTN-SC NBI = common model + augments
- Reusing concepts and model definitions from existing drafts
 - draft-liu-teas-transport-network-slice-yang
 - Network topology for resource-based slicing and technology-agnostic SLOs
 - draft-ietf-teas-actn-vn-yang
 - CMI model that supports both type 1 (connectivity-based) and type 2(resource-based) VN
 - Entangled with ACTN and TE topology
 - draft-ietf-teas-ietf-network-slice-nbi-yang
 - Common definition for endpoints, SLOs etc.
 - Supports only connectivity-based slicing
 - IP technology specific, does not apply to transport



Proposed Common Model for Transport Network Slicing (TNS)

```
module: ietf-transport-network-slice
  +--rw network-slices
    +--rw network-slice* [ns-id]
      +--rw ns-id string
      | ...
    +--rw slo
      | ...
    +--rw endpoints
      | +--rw endpoint* [endpoint-id]
      |   +--rw endpoint-id string
    +--rw network-topologies
      | +--rw network-topology* [topology-id]
      |   +--rw topology-id string
      |   +--rw node* [node-id]
      |     +-- ...
      |     +--rw slo
      |       | +--...
      |       +--rw termination-point* [tp-id]
      +--rw link* [link-id]
      +--rw ...
    +--rw connectivity-matrices
      +--rw connectivity-matrix* [connectivity-matrix-id]
      +--rw connectivity-matrix-id uint32
      +--rw topology-id? leafref
      +--rw src-endpoint?
      |   -> ../../../../endpoints/endpoint/endpoint-id
      +--rw dst-endpoint?
      |   -> ../../../../endpoints/endpoint/endpoint-id
      +--rw slo
      +--rw explicit-path* [tp-id]
      +--rw tp-id leafref
```

Updates to MPI YANG Model

- Added option to color ODU resources in terms of number and type of ODU containers

```
module: ietf-otn-slice

augment /nw:networks/nw:network/nt:link/tet:te/tet:te-link-attributes:
  +--rw (otn-slice-granularity)?
  +--:(link)
  |   +--rw slice-id?    uint32
  +--:(link-resource)
  |   +--rw slices* [slice-id]
  |       +--rw slice-id                uint32
  |       +--rw (technology)?
  |           +--:(otn)
  |               +--rw (slice-bandwidth)?
  |                   +--:(containers)
  |                       |   +--rw odulist* [odu-type]
  |                           |   +--rw odu-type    identityref
  |                           |   +--rw number?    uint16
  |                       +--:(time-slots)
  |                           +--rw otn-ts-num?    uint32
  +--ro sliced-link-ref?    -> ../../../../../../../nt:link/link-id
```

Open Issues

- Whether schema mount can be used to import network topology definitions from draft-liu-teas-transport-network-slice-yang (which augments ietf-network/ietf-network-topology defined in RFC8345)
 - RFC8528 (<https://datatracker.ietf.org/doc/html/rfc8528>) defines schema mount as used for implementation and run-time mounting of models. Further investigation is needed for design-time schema mount
 - Need examples of schema mount for implementation time mounting
- Whether to model connectivity matrix as single-node topology or as a list of intended connections

Next Steps

- Develop OTN augmentation based on Transport Network Slice
- Address slicing for non-OTN external links (access and inter-domain)
- Address the open issues
- Address comments and reviews from the WG

- The authors believe the draft is ready for WG adoption
 - Consensus on definition & scope
 - Good interest within the WG and expanding list of participants
 - Developed models for NBI and MPI

- Weekly discussion
 - Meeting slot: Thu 10-11am EST
 - GitHub: <https://github.com/aguoietaf/ietf-ccamp-yang-otn-slicing>

Thank You!