YANG Model for OTN Topology

CCAMP WG, IETF 102, Montreal, Canada

draft-ietf-ccamp-otn-topo-yang-03

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Summary of Changes (with -02)

- Text Changes:

    - Highlight the augmentation needed for OTN technology-specific model

- YANG model Changes:

    - Augment to the latest TE-topology model;

        – OTN specific attributes augmenting to TE topology models;

        – OTN specific TE bandwidth augmented to te-bandwidth;

        – OTN specific TE label augmented to te-label;

YANG Augmentation Motivation

Attributes Augmentation

```
module: ietf-otn-topology
  augment /nw:networks/nw:network/nw:network-types/tet:te-topology:
    +--rw otn-topology!
  augment /nw:networks/nw:network/nt:link/tet:te/tet:te-link-attributes:
    +--rw tsg?          identityref
    +--rw distance?     uint32
  augment /nw:networks/nw:network/nw:node/nt:termination-point/tet:te:
    +--rw supported-payload-types* [index]
    |  +--rw index              uint16
    |  +--rw payload-type?       string
    +--rw client-facing?                boolean
```

Bandwidth Augmentation

```
+--:(otn)
  +--rw odulist* [odu-type]
    +--rw odu-type      identityref
    +--rw number?       uint16
```

Label Augmentation

For label-start/label-end;

```
+--:(otn)
  +--rw (otn-label-type)?
    +--:(tributary-port)
    |  +--rw tpn?    uint16
    +--:(tributary-slot)
      +--rw ts?      uint16
```

For label-hop;

```
+--:(otn)
  +--ro tpn?       uint16
  +--ro tsg?       identityref
  +--ro ts-list?   string
```

For label-restriction;

```
+--ro range-type?    identityref
+--ro tsg?           identityref
+--ro priority?      uint8
```

YANG Augmentation in the draft

- ➢ Attributes Augmentation is fine;
- ➢ Concerns with too many entries in te-bandwidth and te-label augmentation;

```
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:information-source-entry/tet:connectivity-matrices
        /tet:connectivity-matrix/tet:path-constraints
        /tet:te-bandwidth/tet:technology:
  +--: (otn)
     +--ro odulist* [odu-type]
        +--ro odu-type      identityref
        +--ro number?       uint16
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:tunnel-termination-point/tet:client-layer-adaptation
        /tet:switching-capability/tet:te-bandwidth/tet:technology:
  +--: (otn)
     +--rw odulist* [odu-type]
        +--rw odu-type      identityref
        +--rw number?       uint16
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:tunnel-termination-point/tet:local-link-connectivities
        /tet:path-constraints/tet:te-bandwidth/tet:technology:
  +--: (otn)
     +--rw odulist* [odu-type]
        +--rw odu-type      identityref
        +--rw number?       uint16
```

```
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:tunnel-termination-point/tet:local-link-connectivities
        /tet:underlay/tet:backup-path/tet:path-element/tet:type
        /tet:label/tet:label-hop/tet:te-label/tet:technology:
  +--: (otn)
     +--rw tpn?       uint16
     +--rw tsg?       identityref
     +--rw ts-list?   string
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:tunnel-termination-point/tet:local-link-connectivities
        /tet:optimizations/tet:algorithm/tet:metric
        /tet:optimization-metric/tet:explicit-route-exclude-objects
        /tet:route-object-exclude-object/tet:type/tet:label
        /tet:label-hop/tet:te-label/tet:technology:
  +--: (otn)
     +--rw tpn?       uint16
     +--rw tsg?       identityref
     +--rw ts-list?   string
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:tunnel-termination-point/tet:local-link-connectivities
        /tet:optimizations/tet:algorithm/tet:metric
        /tet:optimization-metric/tet:explicit-route-include-objects
        /tet:route-object-include-object/tet:type/tet:label
        /tet:label-hop/tet:te-label/tet:technology:
  +--: (otn)
     +--rw tpn?       uint16
     +--rw tsg?       identityref
     +--rw ts-list?   string
augment /nw:networks/nw:network/nw:node/tet:te
        /tet:tunnel-termination-point/tet:local-link-connectivities
        /tet:path-properties/tet:path-route-objects
        /tet:path-route-object/tet:type/tet:label/tet:label-hop
        /tet:te-label/tet:technology:
  +--: (otn)
     +--ro tpn?       uint16
     +--ro tsg?       identityref
     +--ro ts-list?   string
```

- ➢ The issue has been pro-actively discussed with netmod;
  - ➢ This draft is aligned with the outcome of that discussion;
- ➢ This is consistent with the guidance in Section 6 of TE topology draft;

Next Step

- This work is technically stable;
  - Readability problem need to be discussed;

- Request for WG LC/YANG Doctor Review;

- Model available at:
  https://github.com/haomianzheng/IETF-ACTN-YANG-Model/tree/master/YANG/ccamp/otn-topology

YANG Model for OTN Tunnel

CCAMP WG, IETF 102, Montreal, Canada

draft-ietf-ccamp-otn-tunnel-model-03

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Summary of Changes (with -01)

- Text Changes:
  - Simplify the introduction/overview to align with latest model;
  - Highlight the OTN-specific tunnel attributes and RPC;
- YANG Model changes:
  - Augment to the latest TE Tunnel model;
    - OTN client signal types augmenting to TE tunnel models;
    - OTN specific ODU types augmented to te-bandwidth;
    - OTN specific TE label augmented to te-label;
  - Updating RPC according to models;
  - Adding comments in ietf-otn-types.yang, as open issue;

YANG Augmentation Motivation

Attributes Augmentation

```
module: ietf-otn-tunnel
   augment /te:te/te:tunnels/te:tunnel:
      +--rw src-client-signal?    identityref
      +--rw dst-client-signal?    identityref
```

Bandwidth Augmentation

```
+--:(otn)
   +--rw odu-type?    identityref
```

Label Augmentation

```
+--:(otn)
   +--rw (otn-label-type)?
      +--:(tributary-port)
      |   +--rw tpn?    uint16
      +--:(tributary-slot)
         +--rw ts?    uint16
```

For label-start & label-end;

```
+--rw range-type?    identityref
+--rw tsg?           identityref
+--rw priority?      uint8
```

For label-restriction;

```
+--:(otn)
   +--ro tpn?        uint16
   +--ro tsg?        identityref
   +--ro ts-list?    string
```

For label-hop in path-route-object

YANG Augmentation in the draft

➢ Attributes Augmentation is fine;
➢ Concerns with too many entries in te-bandwidth and te-label augmentation;

```
augment /te:te/te:globals/te:named-path-constraints
        /te:named-path-constraint/te:te-bandwidth/te:technology:
  +--: (otn)
     +--rw odu-type?    identityref
augment /te:te/te:tunnels/te:tunnel/te:te-bandwidth/te:technology:
  +--: (otn)
     +--rw odu-type?    identityref
augment /te:te/te:tunnels/te:tunnel/te:p2p-primary-paths
        /te:p2p-primary-path/te:te-bandwidth/te:technology:
  +--: (otn)
     +--rw odu-type?    identityref
augment /te:te/te:tunnels/te:tunnel/te:p2p-primary-paths
        /te:p2p-primary-path/te:p2p-reverse-primary-path
        /te:te-bandwidth/te:technology:
  +--: (otn)
     +--rw odu-type?    identityref
augment /te:te/te:tunnels/te:tunnel/te:p2p-secondary-paths
        /te:p2p-secondary-path/te:te-bandwidth/te:technology:
  +--: (otn)
     +--rw odu-type?    identityref
```

```
augment /te:te/te:tunnels/te:tunnel/te:p2p-secondary-paths
        /te:p2p-secondary-path/te:state/te:path-properties
        /te:path-route-objects/te:path-computed-route-object
        /te:state/te:type/te:label/te:label-hop/te:te-label
        /te:technology:
  +--: (otn)
     +--ro tpn?        uint16
     +--ro tsg?        identityref
     +--ro ts-list?    string
augment /te:te/te:tunnels/te:tunnel/te:p2p-secondary-paths
        /te:p2p-secondary-path/te:state/te:lsps/te:lsp
        /te:lsp-record-route-subobjects/te:record-route-subobject
        /te:type/te:label/te:label-hop/te:te-label/te:technology:
  +--: (otn)
     +--ro tpn?        uint16
     +--ro tsg?        identityref
     +--ro ts-list?    string
augment /te:te/te:tunnels/te:tunnel/te:p2p-secondary-paths
        /te:p2p-secondary-path/te:state/te:lsps/te:lsp
        /te:path-properties/te:path-route-objects
        /te:path-computed-route-object/te:state/te:type/te:label
        /te:label-hop/te:te-label/te:technology:
  +--: (otn)
     +--ro tpn?        uint16
     +--ro tsg?        identityref
     +--ro ts-list?    string
```

➢ The issue has been pro-actively discussed with netmod;
  ➢ This draft is aligned with the outcome of that discussion;
➢ Proposal: we wish to have same principle as te-topology for the tunnel augmentation;

Open Issue in ietf-otn-types.yang

- ## The authors agreed the following change:
  - Changing misleading term:
    - From 'tributary-protocol-type' to 'odu-type';

    ```
    identity tributary-protocol-type
        description
            "Base identity for protocol framing used by tributary signals";
    }
    ```

  - Reconsider the prefix 'prot-';
    - Remove all the 'prot-OTUx'
    - Keep all the 'prot-ODUx', replaced with 'ODUx';
    - Remove all the 'prot-xGbE'
  - Reconsider the prefix 'client-signal'
    - Rename to better align with other works? E.g., L1csm;
    - Example: 'client-sigal-OC3_STM1' changed to 'STM-1';

Next Step

- This work is technically stable;
  - May need further update per change of TE tunnel model;
  - Need to be further aligned with draft-ietf-teas-yang-path-computation;
  - Model available at: https://github.com/haomianzheng/IETF-ACTN-YANG-Model/tree/master/YANG/ccamp/otn-tunnel

- Request for Yang Doctor Review;
- Expected to request WG LC in next IETF;

Thank you!