CCAMP Working Group
Internet-Draft
Intended status: Standards Track
Expires: 15 October 2026

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13 April 2026

# A YANG Data Model for Ethernet TE Topology
# draft-ietf-ccamp-eth-client-te-topo-yang-11

## Abstract

This document describes a YANG data model for Ethernet networks when used either as a client-layer network of an underlay transport network (e.g., an Optical Transport Network (OTN)) or as a transport network itself.

## About This Document

This note is to be removed before publishing as an RFC.

The latest revision of this draft can be found at https://ietf-ccamp-wg.github.io/draft-ietf-ccamp-eth-client-te-topo-yang/draft-ietf-ccamp-eth-client-te-topo-yang.html. Status information for this document may be found at https://datatracker.ietf.org/doc/draft-ietf-ccamp-eth-client-te-topo-yang/.

Discussion of this document takes place on the Common Control and Measurement Plane Working Group mailing list (mailto:ccamp@ietf.org), which is archived at https://mailarchive.ietf.org/arch/browse/ccamp/. Subscribe at https://www.ietf.org/mailman/listinfo/ccamp/.

Source for this draft and an issue tracker can be found at https://github.com/ietf-ccamp-wg/draft-ietf-ccamp-eth-client-te-topo-yang.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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Table of Contents

# 1. Introduction

A transport network is a server-layer network designed to provide connectivity services for a client-layer network to carry the client traffic transparently across the server-layer network resources.

A transport network typically utilizes several different transport technologies such as the Optical Transport Networks (OTN) or packet transport such as provided by the MPLS-Transport Profile (MPLS-TP).

An Ethernet network can be either a client-layer network of an underlay transport network or a transport network itself.

This document describes a YANG data model for Ethernet networks when used as a client-layer network of an underlay transport network (e.g., an Optical Transport Network (OTN)) or as a transport network technology.

The YANG model defined in this document augments from the TE topology YANG model defined in [RFC8795], and imports from the generic Ethernet types defined in [I-D.ietf-ccamp-client-signal-yang].

The YANG data model in this document conforms to the Network Management Datastore Architecture defined in [RFC8342].

## 1.1. Terminology and Notations

The following terms are defined in [RFC7950] and are not redefined here:

* client
* server
* augment
* data model
* data node

The following terms are defined in [RFC6241] and are not redefined here:

* configuration data

* state data

The terminology for describing YANG data models is found in [RFC7950].

## 1.2. Tree Diagram

A simplified graphical representation of the data model is used in Section 3 of this document. The meaning of the symbols in these diagrams is defined in [RFC8340].

## 1.3. Prefix in Data Node Names

In this document, the names of data nodes and other data model objects are prefixed using the standard prefix associated with the corresponding YANG imported modules, as shown in Table 1.

In this document, names of data nodes and other data model objects are prefixed using the standard prefix associated with the corresponding YANG imported modules, as shown in Table 1.

| Prefix | YANG module | Reference |
|---|---|---|
| yang | ietf-yang-types | [RFC6991] |
| etht-types | ietf-eth-tran-types | [RFCYYYY] |
| nw | ietf-network | [RFC8345] |
| nt | ietf-network-topology | [RFC8345] |
| tet | ietf-te-topology | [RFC8795] |
| etht | ietf-eth-te-topology | RFCXXXX |

Table 1: Prefixes and corresponding YANG modules

RFC Editor Note: Please replace YYYY and XXXX with the number assigned to the RFC once this draft becomes an RFC.

# 2. Ethernet Topology Model Overview

This document aims to describe the data model for Ethernet topology.

As a classic Traffic-engineering (TE) technology, Ethernet can provide packet switching in transport network [ITU_G.8021].

Therefore, the YANG module presented in this document augments from a more generic Traffic Engineered (TE) network topology data model, i.e., the ietf- te-topology, as specified in [RFC8795]. In section 6 of [RFC8795], the guideline for augmenting TE topology model was provided, and in this draft, we augment the TE topology model to describe the topology in Ethernet network. Common types, identities and groupings defined in [I-D.ietf-ccamp-client-signal-yang] is reused in this document. [RFC8345] describes a network topology model and provides the fundamental model for [RFC8795]. However, this work is not directly augmenting [RFC8345]. Figure 1 shows the augmentation relationship.

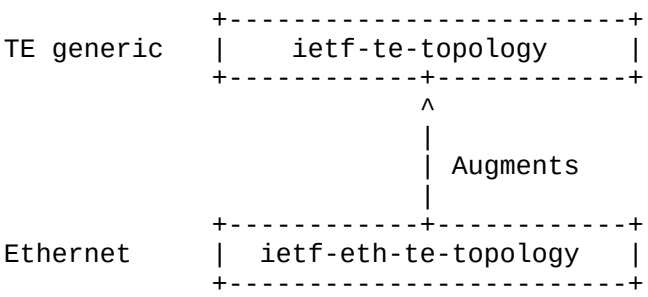


Figure 1: Relationship between Ethernet and TE topology models

The entities and TE attributes, such as node, termination points and links, are still applicable for describing an Ethernet topology and the model presented in this document only specifies technology-specific attributes/information.

## 2.1. Attributes Augmentation

Given the guidance for augmentation in [RFC8795], the following technology-specific augmentations need to be provided:

* A network-type to indicate that the TE topology is an Ethernet Topology, as follow:

```
augment /nw:networks/nw:network/nw:network-types/tet:te-topology:
  +--rw eth-tran-topology!
```

* TE Bandwidth Augmentations as described in Section 2.2.

* TE Label Augmentations as described in Section 2.3.

### 2.2. TE Bandwidth Augmentations

Following the guidelines in [RFC8795], the model augments all the occurrences of the te-bandwidth container with the Ethernet technology specific attributes using the eth-bandwidth grouping defined in [I-D.ietf-ccamp-client-signal-yang].

### 2.3. TE Label Augmentations

The model augments all the occurrences of the label-restriction list with Ethernet technology specific attributes using the eth-label-restriction grouping defined in [I-D.ietf-ccamp-client-signal-yang].

Moreover, following the guidelines in [RFC8795], the model augments all the occurrences of the te-label container with the Ethernet technology specific attributes using the eth-label and eth-label-step groupings defined in [I-D.ietf-ccamp-client-signal-yang].

## 3. YANG Tree for Ethernet Topology

```
module: ietf-eth-te-topology

  augment /nw:networks/nw:network/nw:network-types/tet:te-topology:
    +--rw eth-tran-topology!
  augment /nw:networks/nw:network/nw:node/tet:te
            /tet:te-node-attributes:
    +--rw eth-node!
  augment /nw:networks/nw:network/nt:link:
    +--rw eth-svc!
  augment /nw:networks/nw:network/nw:node/nt:termination-point:
    +--rw eth-svc!
    |  +--rw supported-classification
    |  |  +--rw port-classification?   boolean
    |  |  +--rw vlan-classification
    |  |     +--rw vlan-tag-classification?   boolean
    |  |     +--rw outer-tag
    |  |     |  +--rw supported-tag-types*
    |  |     |  |       etht-types:eth-tag-classify
    |  |     |  +--rw vlan-bundling?         boolean
    |  |     |  +--rw vlan-range?
    |  |     |          etht-types:vid-range-type
    |  |     +--rw second-tag
    |  |        +--rw second-tag-classification?   boolean
    |  |        +--rw supported-tag-types*
    |  |        |       etht-types:eth-tag-classify
    |  |        +--rw vlan-bundling?               boolean
    |  |        +--rw vlan-range?
    |  |                etht-types:vid-range-type
```

```
|  +--rw supported-vlan-operations
|     +--rw asymmetrical-operations?       boolean
|     +--rw transparent-vlan-operations?   boolean
|     +--rw vlan-pop
|     |  +--rw vlan-pop-operations?   boolean
|     |  +--rw max-pop-tags?          uint8
|     +--rw vlan-push
|        +--rw vlan-push-operation?   boolean
|        +--rw outer-tag
|        |  +--rw supported-tag-types*   etht-types:eth-tag-type
|        |  +--rw vlan-range?
|        |          etht-types:vid-range-type
|        +--rw second-tag
|           +--rw push-second-tag?       boolean
|           +--rw supported-tag-types*   etht-types:eth-tag-type
|           +--rw vlan-range?
|                   etht-types:vid-range-type
|
+--rw eth-link-tp
   +--rw ltp-mac-address?
   |       yang:mac-address
   +--rw port-vlan-id?
   |       etht-types:vlanid
   +--rw maximum-frame-size?                      uint16
   +--rw (direction)?
      +--:(symmetrical)
      |  +--rw ingress-egress-bandwidth-profile
      |     +--rw bandwidth-profile-type?
      |     |       etht-types:bandwidth-profile-type
      |     +--rw CIR?                      uint64
      |     +--rw CBS?                      uint64
      |     +--rw EIR?                      uint64
      |     +--rw EBS?                      uint64
      |     +--rw color-aware?              boolean
      |     +--rw coupling-flag?            boolean
      +--:(asymmetrical)
         +--rw ingress-bandwidth-profile
         |  +--rw bandwidth-profile-type?
         |  |       etht-types:bandwidth-profile-type
         |  +--rw CIR?                      uint64
         |  +--rw CBS?                      uint64
         |  +--rw EIR?                      uint64
         |  +--rw EBS?                      uint64
         |  +--rw color-aware?              boolean
         |  +--rw coupling-flag?            boolean
         +--rw egress-bandwidth-profile
            +--rw bandwidth-profile-type?
            |       etht-types:bandwidth-profile-type
            +--rw CIR?                      uint64
```

```
                +--rw CBS?                      uint64
                +--rw EIR?                      uint64
                +--rw EBS?                      uint64
                +--rw color-aware?              boolean
                +--rw coupling-flag?            boolean
    augment /nw:networks/nw:network/nw:node/nt:termination-point/tet:te
              /tet:interface-switching-capability/tet:max-lsp-bandwidth
              /tet:te-bandwidth/tet:technology:
      +--:(eth)
         +--rw eth-bandwidth?   uint64
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:path-constraints/tet:te-bandwidth/tet:technology:
      +--:(eth)
         +--rw eth-bandwidth?   uint64
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:connectivity-matrix/tet:path-constraints
              /tet:te-bandwidth/tet:technology:
      +--:(eth)
         +--rw eth-bandwidth?   uint64
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:path-constraints/tet:te-bandwidth/tet:technology:
      +--:(eth)
         +--ro eth-bandwidth?   uint64
    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:
      +--:(eth)
         +--ro eth-bandwidth?   uint64
    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:
      +--:(eth)
         +--rw eth-bandwidth?   uint64
    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:
      +--:(eth)
         +--rw eth-bandwidth?   uint64
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:tunnel-termination-point
              /tet:local-link-connectivities
              /tet:local-link-connectivity/tet:path-constraints
```

```
              /tet:te-bandwidth/tet:technology:
        +--:(eth)
           +--rw eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:te-link-attributes
              /tet:interface-switching-capability/tet:max-lsp-bandwidth
              /tet:te-bandwidth/tet:technology:
        +--:(eth)
           +--rw eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:te-link-attributes/tet:max-link-bandwidth
              /tet:te-bandwidth:
        +--rw eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:te-link-attributes/tet:max-resv-link-bandwidth
              /tet:te-bandwidth:
        +--rw eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:te-link-attributes/tet:unreserved-bandwidth
              /tet:te-bandwidth:
        +--rw eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:information-source-entry
              /tet:interface-switching-capability/tet:max-lsp-bandwidth
              /tet:te-bandwidth/tet:technology:
        +--:(eth)
           +--ro eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:information-source-entry/tet:max-link-bandwidth
              /tet:te-bandwidth:
        +--ro eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:information-source-entry/tet:max-resv-link-bandwidth
              /tet:te-bandwidth:
        +--ro eth-bandwidth?   uint64
      augment /nw:networks/nw:network/nt:link/tet:te
              /tet:information-source-entry/tet:unreserved-bandwidth
              /tet:te-bandwidth:
        +--ro eth-bandwidth?   uint64
      augment /nw:networks/tet:te/tet:templates/tet:link-template
              /tet:te-link-attributes
              /tet:interface-switching-capability/tet:max-lsp-bandwidth
              /tet:te-bandwidth/tet:technology:
        +--:(eth)
           +--rw eth-bandwidth?   uint64
      augment /nw:networks/tet:te/tet:templates/tet:link-template
              /tet:te-link-attributes/tet:max-link-bandwidth
              /tet:te-bandwidth:
```

```
      +--rw eth-bandwidth?   uint64
    augment /nw:networks/tet:te/tet:templates/tet:link-template
              /tet:te-link-attributes/tet:max-resv-link-bandwidth
              /tet:te-bandwidth:
      +--rw eth-bandwidth?   uint64
    augment /nw:networks/tet:te/tet:templates/tet:link-template
              /tet:te-link-attributes/tet:unreserved-bandwidth
              /tet:te-bandwidth:
      +--rw eth-bandwidth?   uint64
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:label-restrictions/tet:label-restriction:
      +--rw ethernet-label-range!
         +--rw tag-type?   etht-types:eth-tag-type
         +--rw priority?   uint8
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:connectivity-matrix/tet:from/tet:label-restrictions
              /tet:label-restriction:
      +--rw ethernet-label-range!
         +--rw tag-type?   etht-types:eth-tag-type
         +--rw priority?   uint8
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:connectivity-matrix/tet:to/tet:label-restrictions
              /tet:label-restriction:
      +--rw ethernet-label-range!
         +--rw tag-type?   etht-types:eth-tag-type
         +--rw priority?   uint8
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:label-restrictions/tet:label-restriction:
      +--ro ethernet-label-range!
         +--ro tag-type?   etht-types:eth-tag-type
         +--ro priority?   uint8
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:connectivity-matrix/tet:from/tet:label-restrictions
              /tet:label-restriction:
      +--ro ethernet-label-range!
         +--ro tag-type?   etht-types:eth-tag-type
         +--ro priority?   uint8
    augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:connectivity-matrix/tet:to/tet:label-restrictions
              /tet:label-restriction:
      +--ro ethernet-label-range!
         +--ro tag-type?   etht-types:eth-tag-type
```

```
        +--ro priority?   uint8
     augment /nw:networks/nw:network/nw:node/tet:te
               /tet:tunnel-termination-point
               /tet:local-link-connectivities/tet:label-restrictions
               /tet:label-restriction:
       +--rw ethernet-label-range!
          +--rw tag-type?   etht-types:eth-tag-type
          +--rw priority?   uint8
     augment /nw:networks/nw:network/nw:node/tet:te
               /tet:tunnel-termination-point
               /tet:local-link-connectivities
               /tet:local-link-connectivity/tet:label-restrictions
               /tet:label-restriction:
       +--rw ethernet-label-range!
          +--rw tag-type?   etht-types:eth-tag-type
          +--rw priority?   uint8
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction:
       +--rw ethernet-label-range!
          +--rw tag-type?   etht-types:eth-tag-type
          +--rw priority?   uint8
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:information-source-entry/tet:label-restrictions
               /tet:label-restriction:
       +--ro ethernet-label-range!
          +--ro tag-type?   etht-types:eth-tag-type
          +--ro priority?   uint8
     augment /nw:networks/tet:te/tet:templates/tet:link-template
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction:
       +--rw ethernet-label-range!
          +--rw tag-type?   etht-types:eth-tag-type
          +--rw priority?   uint8
     augment /nw:networks/nw:network/nw:node/tet:te
               /tet:te-node-attributes/tet:connectivity-matrices
               /tet:label-restrictions/tet:label-restriction
               /tet:label-start/tet:te-label/tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nw:node/tet:te
               /tet:te-node-attributes/tet:connectivity-matrices
               /tet:label-restrictions/tet:label-restriction
               /tet:label-end/tet:te-label/tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nw:node/tet:te
               /tet:te-node-attributes/tet:connectivity-matrices
```

```
            /tet:label-restrictions/tet:label-restriction
            /tet:label-step/tet:technology:
      +--:(eth)
         +--rw eth-step?   uint16
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:te-node-attributes/tet:connectivity-matrices
            /tet:underlay/tet:primary-path/tet:path-element/tet:type
            /tet:label/tet:label-hop/tet:te-label/tet:technology:
      +--:(eth)
         +--rw vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:te-node-attributes/tet:connectivity-matrices
            /tet:underlay/tet:backup-path/tet:path-element/tet:type
            /tet:label/tet:label-hop/tet:te-label/tet:technology:
      +--:(eth)
         +--rw vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:te-node-attributes/tet:connectivity-matrices
            /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:
      +--:(eth)
         +--rw vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:te-node-attributes/tet:connectivity-matrices
            /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:
      +--:(eth)
         +--rw vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:te-node-attributes/tet:connectivity-matrices
            /tet:path-properties/tet:path-route-objects
            /tet:path-route-object/tet:type/tet:label/tet:label-hop
            /tet:te-label/tet:technology:
      +--:(eth)
         +--ro vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:te-node-attributes/tet:connectivity-matrices
            /tet:connectivity-matrix/tet:from/tet:label-restrictions
            /tet:label-restriction/tet:label-start/tet:te-label
            /tet:technology:
      +--:(eth)
         +--rw vlanid?   etht-types:vlanid
```

```
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:te-node-attributes/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:from/tet:label-restrictions
          /tet:label-restriction/tet:label-end/tet:te-label
          /tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:te-node-attributes/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:from/tet:label-restrictions
          /tet:label-restriction/tet:label-step/tet:technology:
  +--:(eth)
     +--rw eth-step?   uint16
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:te-node-attributes/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:to/tet:label-restrictions
          /tet:label-restriction/tet:label-start/tet:te-label
          /tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:te-node-attributes/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:to/tet:label-restrictions
          /tet:label-restriction/tet:label-end/tet:te-label
          /tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:te-node-attributes/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:to/tet:label-restrictions
          /tet:label-restriction/tet:label-step/tet:technology:
  +--:(eth)
     +--rw eth-step?   uint16
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:te-node-attributes/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:underlay/tet:primary-path
          /tet:path-element/tet:type/tet:label/tet:label-hop
          /tet:te-label/tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:te-node-attributes/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:underlay/tet:backup-path
          /tet:path-element/tet:type/tet:label/tet:label-hop
          /tet:te-label/tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
```

```
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:connectivity-matrix/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:
    +--:(eth)
       +--rw vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:connectivity-matrix/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:
    +--:(eth)
       +--rw vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:te-node-attributes/tet:connectivity-matrices
              /tet:connectivity-matrix/tet:path-properties
              /tet:path-route-objects/tet:path-route-object/tet:type
              /tet:label/tet:label-hop/tet:te-label/tet:technology:
    +--:(eth)
       +--ro vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:label-restrictions/tet:label-restriction
              /tet:label-start/tet:te-label/tet:technology:
    +--:(eth)
       +--ro vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:label-restrictions/tet:label-restriction
              /tet:label-end/tet:te-label/tet:technology:
    +--:(eth)
       +--ro vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:label-restrictions/tet:label-restriction
              /tet:label-step/tet:technology:
    +--:(eth)
       +--ro eth-step?   uint16
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:underlay/tet:primary-path/tet:path-element/tet:type
              /tet:label/tet:label-hop/tet:te-label/tet:technology:
    +--:(eth)
       +--ro vlanid?   etht-types:vlanid
```

```
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:information-source-entry/tet:connectivity-matrices
          /tet:underlay/tet:backup-path/tet:path-element/tet:type
          /tet:label/tet:label-hop/tet:te-label/tet:technology:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:information-source-entry/tet:connectivity-matrices
          /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:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:information-source-entry/tet:connectivity-matrices
          /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:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:information-source-entry/tet:connectivity-matrices
          /tet:path-properties/tet:path-route-objects
          /tet:path-route-object/tet:type/tet:label/tet:label-hop
          /tet:te-label/tet:technology:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:information-source-entry/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:from/tet:label-restrictions
          /tet:label-restriction/tet:label-start/tet:te-label
          /tet:technology:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:information-source-entry/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:from/tet:label-restrictions
          /tet:label-restriction/tet:label-end/tet:te-label
          /tet:technology:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:information-source-entry/tet:connectivity-matrices
          /tet:connectivity-matrix/tet:from/tet:label-restrictions
```

```
            /tet:label-restriction/tet:label-step/tet:technology:
      +--:(eth)
         +--ro eth-step?   uint16
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:information-source-entry/tet:connectivity-matrices
            /tet:connectivity-matrix/tet:to/tet:label-restrictions
            /tet:label-restriction/tet:label-start/tet:te-label
            /tet:technology:
      +--:(eth)
         +--ro vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:information-source-entry/tet:connectivity-matrices
            /tet:connectivity-matrix/tet:to/tet:label-restrictions
            /tet:label-restriction/tet:label-end/tet:te-label
            /tet:technology:
      +--:(eth)
         +--ro vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:information-source-entry/tet:connectivity-matrices
            /tet:connectivity-matrix/tet:to/tet:label-restrictions
            /tet:label-restriction/tet:label-step/tet:technology:
      +--:(eth)
         +--ro eth-step?   uint16
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:information-source-entry/tet:connectivity-matrices
            /tet:connectivity-matrix/tet:underlay/tet:primary-path
            /tet:path-element/tet:type/tet:label/tet:label-hop
            /tet:te-label/tet:technology:
      +--:(eth)
         +--ro vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:information-source-entry/tet:connectivity-matrices
            /tet:connectivity-matrix/tet:underlay/tet:backup-path
            /tet:path-element/tet:type/tet:label/tet:label-hop
            /tet:te-label/tet:technology:
      +--:(eth)
         +--ro vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:information-source-entry/tet:connectivity-matrices
            /tet:connectivity-matrix/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:
      +--:(eth)
         +--ro vlanid?   etht-types:vlanid
    augment /nw:networks/nw:network/nw:node/tet:te
            /tet:information-source-entry/tet:connectivity-matrices
```

```
              /tet:connectivity-matrix/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:
    +--:(eth)
       +--ro vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:information-source-entry/tet:connectivity-matrices
              /tet:connectivity-matrix/tet:path-properties
              /tet:path-route-objects/tet:path-route-object/tet:type
              /tet:label/tet:label-hop/tet:te-label/tet:technology:
    +--:(eth)
       +--ro vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:tunnel-termination-point
              /tet:local-link-connectivities/tet:label-restrictions
              /tet:label-restriction/tet:label-start/tet:te-label
              /tet:technology:
    +--:(eth)
       +--rw vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:tunnel-termination-point
              /tet:local-link-connectivities/tet:label-restrictions
              /tet:label-restriction/tet:label-end/tet:te-label
              /tet:technology:
    +--:(eth)
       +--rw vlanid?   etht-types:vlanid
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:tunnel-termination-point
              /tet:local-link-connectivities/tet:label-restrictions
              /tet:label-restriction/tet:label-step/tet:technology:
    +--:(eth)
       +--rw eth-step?   uint16
  augment /nw:networks/nw:network/nw:node/tet:te
              /tet:tunnel-termination-point
              /tet:local-link-connectivities/tet:underlay
              /tet:primary-path/tet:path-element/tet:type/tet:label
              /tet:label-hop/tet:te-label/tet:technology:
    +--:(eth)
       +--rw vlanid?   etht-types:vlanid
  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:
    +--:(eth)
       +--rw vlanid?   etht-types:vlanid
```

```
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:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
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:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
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:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/tet:label-restrictions
          /tet:label-restriction/tet:label-start/tet:te-label
          /tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/tet:label-restrictions
          /tet:label-restriction/tet:label-end/tet:te-label
          /tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/tet:label-restrictions
          /tet:label-restriction/tet:label-step/tet:technology:
  +--:(eth)
     +--rw eth-step?   uint16
```

```
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/tet:underlay
          /tet:primary-path/tet:path-element/tet:type/tet:label
          /tet:label-hop/tet:te-label/tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/tet:underlay/tet:backup-path
          /tet:path-element/tet:type/tet:label/tet:label-hop
          /tet:te-label/tet:technology:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/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:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/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:
  +--:(eth)
     +--rw vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nw:node/tet:te
          /tet:tunnel-termination-point
          /tet:local-link-connectivities
          /tet:local-link-connectivity/tet:path-properties
          /tet:path-route-objects/tet:path-route-object/tet:type
          /tet:label/tet:label-hop/tet:te-label/tet:technology:
  +--:(eth)
     +--ro vlanid?   etht-types:vlanid
augment /nw:networks/nw:network/nt:link/tet:te
          /tet:te-link-attributes/tet:underlay/tet:primary-path
          /tet:path-element/tet:type/tet:label/tet:label-hop
          /tet:te-label/tet:technology:
```

```
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:te-link-attributes/tet:underlay/tet:backup-path
               /tet:path-element/tet:type/tet:label/tet:label-hop
               /tet:te-label/tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction/tet:label-start/tet:te-label
               /tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction/tet:label-end/tet:te-label
               /tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction/tet:label-step/tet:technology:
       +--:(eth)
          +--rw eth-step?   uint16
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:information-source-entry/tet:label-restrictions
               /tet:label-restriction/tet:label-start/tet:te-label
               /tet:technology:
       +--:(eth)
          +--ro vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:information-source-entry/tet:label-restrictions
               /tet:label-restriction/tet:label-end/tet:te-label
               /tet:technology:
       +--:(eth)
          +--ro vlanid?   etht-types:vlanid
     augment /nw:networks/nw:network/nt:link/tet:te
               /tet:information-source-entry/tet:label-restrictions
               /tet:label-restriction/tet:label-step/tet:technology:
       +--:(eth)
          +--ro eth-step?   uint16
     augment /nw:networks/tet:te/tet:templates/tet:link-template
               /tet:te-link-attributes/tet:underlay/tet:primary-path
               /tet:path-element/tet:type/tet:label/tet:label-hop
               /tet:te-label/tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
```

```
     augment /nw:networks/tet:te/tet:templates/tet:link-template
               /tet:te-link-attributes/tet:underlay/tet:backup-path
               /tet:path-element/tet:type/tet:label/tet:label-hop
               /tet:te-label/tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/tet:te/tet:templates/tet:link-template
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction/tet:label-start/tet:te-label
               /tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/tet:te/tet:templates/tet:link-template
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction/tet:label-end/tet:te-label
               /tet:technology:
       +--:(eth)
          +--rw vlanid?   etht-types:vlanid
     augment /nw:networks/tet:te/tet:templates/tet:link-template
               /tet:te-link-attributes/tet:label-restrictions
               /tet:label-restriction/tet:label-step/tet:technology:
       +--:(eth)
          +--rw eth-step?   uint16
```

Figure 2: Ethernet topology YANG tree

## 4. Ethernet Topology YANG Code

```
<CODE BEGINS> file "ietf-eth-te-topology@2023-09-08.yang"
module ietf-eth-te-topology {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-eth-te-topology";
  prefix "etht";

  import ietf-network {
    prefix "nw";
    reference
      "RFC 8345: A YANG Data Model for Network Topologies";
  }

  import ietf-network-topology {
    prefix "nt";
    reference
      "RFC 8345: A YANG Data Model for Network Topologies";
  }

  import ietf-te-topology {
    prefix "tet";
```

```
    reference
      "RFC 8795: YANG Data Model for Traffic Engineering
       (TE) Topologies";
  }

  import ietf-yang-types {
    prefix "yang";
    reference
     "RFC 6991: Common YANG Data Types";
  }

  import ietf-eth-tran-types {
    prefix "etht-types";
    reference
     "RFC YYYY: A YANG Data Model for Transport Network Client
     Signals";
  }
  // RFC Ed.: replace YYYY with actual RFC number, update date
  // information and remove this note

  organization
    "IETF CCAMP Working Group";
  contact
    "WG Web: <https://datatracker.ietf.org/wg/ccamp/>
     WG List: <mailto:ccamp@ietf.org>

     Editor: Haomian Zheng
       <mailto:zhenghaomian@huawei.com>

     Editor: Italo Busi
       <mailto:italo.busi@huawei.com>

     Editor: Aihua Guo
       <mailto:aihuaguo.ietf@gmail.com>

     Editor: Yunbin Xu
       <mailto:xuyunbin@caict.ac.cn>

     Editor: Yang Zhao
       <mailto:zhaoyangyjy@chinamobile.com>

     Editor: Xufeng Liu
       <mailto:xufeng.liu.ietf@gmail.com>";

  description
    "This module defines a YANG data model for describing
     layer-2 Ethernet transport topologies. The model fully
     conforms to the Network Management Datastore
```

```
        Architecture (NMDA).

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        as authors of the code.  All rights reserved.

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        without modification, is permitted pursuant to, and subject
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        (https://trustee.ietf.org/license-info).

        This version of this YANG module is part of RFC XXXX; see
        the RFC itself for full legal notices.

        The key words 'MUST', 'MUST NOT', 'REQUIRED', 'SHALL', 'SHALL
        NOT', 'SHOULD', 'SHOULD NOT', 'RECOMMENDED', 'NOT RECOMMENDED',
        'MAY', and 'OPTIONAL' in this document are to be interpreted as
        described in BCP 14 (RFC 2119) (RFC 8174) when, and only when,
        they appear in all capitals, as shown here.";

    revision 2023-09-28 {
      description
        "Initial Revision";
      reference
        "RFC XXXX: A YANG Data Model for Ethernet TE Topology";
      // RFC Ed.: replace XXXX with actual RFC number, update date
      // information and remove this note
    }

    /*
     * Groupings
     */

    grouping label-range-info {
      description
        "Ethernet technology-specific label range related
        information with a presence container indicating that the
        label range is an Ethernet technology-specific label range.

        This grouping SHOULD be used together with the
        eth-label and eth-label-step groupings to provide Ethernet
        technology-specific label information to the models which
        use the label-restriction-info grouping defined in the module
        ietf-te-types.";

      container ethernet-label-range {
        presence
```

```
          "Indicates the label range is an Ethernet label range.

          This container must not be present if there are other
          presence containers or attributes indicating another type
          of label range.";
        description
          "Ethernet-specific label range related information.";

        uses etht-types:eth-label-restriction;
      }
    }

    grouping eth-tran-topology-type {
      description
        "Identifies the Ethernet Transport topology type";

      container eth-tran-topology {
        presence "indicates a topology type of
                  Ethernet Transport Network.";
        description "Eth transport topology type";
      }
    }

    grouping ltp-bandwidth-profiles {
      description
        "A grouping which represents the bandwidth profile(s)
        for the ETH LTP.";

      choice direction {
        description
          "Whether the bandwidth profiles are symmetrical or
           asymmetrical";
        case symmetrical {
          description
            "The same bandwidth profile is used to describe the ingress
             and the egress bandwidth profile.";

          container ingress-egress-bandwidth-profile {
            description
              "The bandwith profile used in the ingress and egress
               direction.";
            uses etht-types:etht-bandwidth-profiles;
          }
        }
        case asymmetrical {
          description
            "Different ingress and egress bandwidth profiles
             can be specified.";
```

```
          container ingress-bandwidth-profile {
            description
              "The bandwidth profile used in the ingress direction.";
            uses etht-types:etht-bandwidth-profiles;
          }
          container egress-bandwidth-profile {
            description
              "The bandwidth profile used in the egress direction.";
            uses etht-types:etht-bandwidth-profiles;
          }
        }
      }
    }

    grouping eth-ltp-attributes {
      description
        "Ethernet transport Link Termination Point (LTP) attributes";

      leaf ltp-mac-address {
        type yang:mac-address;
        description
          "The MAC address of the Ethernet LTP.";
      }
      leaf port-vlan-id {
        type etht-types:vlanid;
        description
          "The Port VLAN ID of the Ethernet LTP.";
        reference
          "IEEE 802.1Q: Virtual Bridged Local Area Networks";
      }
      leaf maximum-frame-size {
        type uint16 {
          range "64 .. 65535";
        }
        description
          "Maximum frame size";
        reference
          "IEEE 802.1Q: Virtual Bridged Local Area Networks";
      }
        uses ltp-bandwidth-profiles;
    }

    grouping svc-vlan-classification {
      description
        "Grouping defining the capabilities for VLAN classification.";

      leaf-list supported-tag-types {
        type etht-types:eth-tag-classify;
```

```
        description
          "List of VLAN tag types that can be used for the VLAN
           classification. In case VLAN classification is not
           supported, the list is empty.";
      }
      leaf vlan-bundling {
        type boolean;
        description
          "In case VLAN classification is supported, indicates whether
          VLAN bundling classification is also supported.";
        reference
          "MEF 10.3: Ethernet Services Attributes Phase 3";
      }
      leaf vlan-range {
        type etht-types:vid-range-type;
        description
          "In case VLAN classification is supported, indicates the
          of available VLAN ID values.";
      }
    }

    grouping svc-vlan-push {
      description
        "Grouping defining the capabilities for VLAN push or swap
         operations.";

      leaf-list supported-tag-types {
        type etht-types:eth-tag-type;
        description
          "List of VLAN tag types that can be used to push or swap a
           VLAN tag. In case VLAN push/swap is not supported, the list
           is empty.";
        reference
          "IEEE 802.1Q: Virtual Bridged Local Area Networks";
      }
      leaf vlan-range {
        type etht-types:vid-range-type;
        description
          "In case VLAN push/swap operation is supported, the range
          of available VLAN ID values.";
      }
    }

    grouping eth-svc-attributes {
      description
        "Ethernet Link Termination Point (LTP) service attributes.";

      container supported-classification {
```

```
        description
          "Service classification capability supported by the
          Ethernet Link Termination Point (LTP).";

        leaf port-classification {
          type boolean;
          description
            "Indicates that the ETH LTP support port-based service
            classification.";
        }
        container vlan-classification {
          description
            "Service classification capabilities based on the VLAN
             tag(s) supported by the ETH LTP.";

          leaf vlan-tag-classification {
            type boolean;
            description
              "Indicates that the ETH LTP supports VLAN service
              classification.";
          }
          container outer-tag {
            description
              "Service classification capabilities based on the outer
               VLAN tag, supported by the ETH LTP.";
            uses svc-vlan-classification;
          }
          container second-tag {
            description
              "Service classification capabilities based on the second
               VLAN tag, supported by the ETH LTP.";
            leaf second-tag-classification {
              type boolean;
              must ". = 'false' or "
                 + "../../vlan-tag-classification = 'true'" {
                description
                  "VLAN service classification based on the second
                  VLAN tag can be supported only when VLAN service
                  classification";
              }
              description
                "Indicates that the ETH LTP support  VLAN service
                 classification based on the second VLAN tag.";
            }
            uses svc-vlan-classification;
          }
        }
      }
```

```
       container supported-vlan-operations {
         description
           "Reports the VLAN operations supported by the ETH LTP.";

         leaf asymmetrical-operations {
           type boolean;
           description
             "Indicates whether the ETH LTP supports also asymmetrical
              VLAN operations.It is assumed that symmetrical VLAN
              operations are alwyas supported.";
         }
         leaf transparent-vlan-operations {
           type boolean;
           description
             "Indicates that the ETH LTP supports transparent
             operations.";
         }
         container vlan-pop {
           description
             "Indicates VLAN pop or swap operations capabilities.";

           leaf vlan-pop-operations {
             type boolean;
             description
               "Indicates that the ETH LTP supports VLAN pop or
                swap operations.";
           }
           leaf max-pop-tags {
             type uint8 {
               range "1..2";
             }
             description
               "Indicates the maximum number of tags that can be
                popped/swapped.";
           }
         }
         container vlan-push {
           description
             "Indicates VLAN push or swap operations capabilities.";

           leaf vlan-push-operation {
             type boolean;
             description
               "Indicates that the ETH LTP supports VLAN push or
                swap operations.";
           }
           container outer-tag {
             description
```

```
              "Indicates the supported VLAN operation capabilities
               on the outer VLAN tag.";
            uses svc-vlan-push;
          }
          container second-tag {
            description
              "Indicates the supported VLAN operation capabilities
               on the second VLAN tag.";
            leaf push-second-tag {
              type boolean;
              description
                "Indicates that the ETH LTP supports VLAN push or swap
                 operations for the second VLAN tag.";
            }
            uses svc-vlan-push;
          }
        }
      }
    }

    /*
     * Data nodes
     */

    augment "/nw:networks/nw:network/nw:network-types/"
          + "tet:te-topology" {
      description
        "Augment network types to include ETH transport newtork";

      uses eth-tran-topology-type;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te"
          + "/tet:te-node-attributes" {
      when "../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description "Augment only for Ethernet transport network.";
      }
      description "Augment TE node attributes.";
      container eth-node {
        presence "The TE node is an Ethernet node.";
        description
          "Presence container used only to indicate that the TE node
          is an Ethernet node.";
      }
    }

    augment "/nw:networks/nw:network/nt:link" {
```

```
      when "../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description "Augment only for Ethernet transport network.";
      }
      description "Augment link configuration";

      container eth-svc {
        presence
          "When present, indicates that the Link supports Ethernet
          client signals.";
        description
          "Presence container used only to indicate that the link
          supports Ethernet client signals.";
      }
    }

    augment "/nw:networks/nw:network/nw:node/nt:termination-point" {
      when "../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description "Augment only for Ethernet transport network.";
      }
      description
        "Augment ETH LTP attributes";

      container eth-svc {
        presence
          "When present, indicates that the Link Termination Point
          (LTP) supports Ethernet client signals.";
        description
          "ETH LTP Service attributes.";

        uses eth-svc-attributes;
      }
      container eth-link-tp {
        description
          "Attributes of the Ethernet Link Termination Point (LTP).";
        uses eth-ltp-attributes;
      }
    }

    /*
     * Augment TE bandwidth
     */

    augment "/nw:networks/nw:network/nw:node/nt:termination-point/"
          + "tet:te/"
          + "tet:interface-switching-capability/tet:max-lsp-bandwidth/"
          + "tet:te-bandwidth/tet:technology" {
```

```
        when "../../../../../../nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment maximum LSP TE bandwidth for the link termination
           point (LTP).";
        case eth {
          uses etht-types:eth-bandwidth;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:te-node-attributes/tet:connectivity-matrices/"
            + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
        when "../../../../../../nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE bandwidth path constraints of the TE node
           connectivity matrices.";
        case eth {
          uses etht-types:eth-bandwidth;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:te-node-attributes/tet:connectivity-matrices/"
            + "tet:connectivity-matrix/"
            + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
        when "../../../../../../../nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE bandwidth path constraints of the
           connectivity matrix entry.";
        case eth {
          uses etht-types:eth-bandwidth;
        }
      }
```

```
    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
      when "../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE bandwidth path constraints of the TE node
         connectivity matrices information source.";
      case eth {
        uses etht-types:eth-bandwidth;
      }
    }

    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" {
      when "../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE bandwidth path constraints of the
         connectivity matrix entry information source";
      case eth {
        uses etht-types:eth-bandwidth;
      }
    }

    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" {
      when "../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment client TE bandwidth of the tunnel termination point
         (TTP)";
```

```
        case eth {
          uses etht-types:eth-bandwidth;
        }
      }

      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" {
        when "../../../../../../nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
            Ethernet topology type.";
        }
        description
          "Augment TE bandwidth path constraints for the TTP
           Local Link Connectivities.";
        case eth {
          uses etht-types:eth-bandwidth;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:tunnel-termination-point/"
            + "tet:local-link-connectivities/"
            + "tet:local-link-connectivity/tet:path-constraints/"
            + "tet:te-bandwidth/tet:technology" {
        when "../../../../../../../nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
            Ethernet topology type.";
        }
        description
          "Augment TE bandwidth path constraints for the TTP
           Local Link Connectivity entry.";
        case eth {
          uses etht-types:eth-bandwidth;
        }
      }

      augment "/nw:networks/nw:network/nt:link/tet:te/"
            + "tet:te-link-attributes/"
            + "tet:interface-switching-capability/tet:max-lsp-bandwidth/"
            + "tet:te-bandwidth/tet:technology" {
        when "../../../../../../nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
```

```
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment maximum LSP TE bandwidth for the TE link.";
      case eth {
        uses etht-types:eth-bandwidth;
      }
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:te-link-attributes/"
          + "tet:max-link-bandwidth/"
          + "tet:te-bandwidth" {
      when "../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment maximum TE bandwidth for the TE link";
      uses etht-types:eth-bandwidth;
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:te-link-attributes/"
          + "tet:max-resv-link-bandwidth/"
          + "tet:te-bandwidth" {
      when "../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment maximum reservable TE bandwidth for the TE link";
      uses etht-types:eth-bandwidth;
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:te-link-attributes/"
          + "tet:unreserved-bandwidth/"
          + "tet:te-bandwidth" {
      when "../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
```

```
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment unreserved TE bandwidth for the TE Link";
      uses etht-types:eth-bandwidth;
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:interface-switching-capability/"
          + "tet:max-lsp-bandwidth/"
          + "tet:te-bandwidth/tet:technology" {
      when "../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment maximum LSP TE bandwidth for the TE link
         information source";
      case eth {
        uses etht-types:eth-bandwidth;
      }
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:max-link-bandwidth/"
          + "tet:te-bandwidth" {
      when "../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment maximum TE bandwidth for the TE link
         information source";
      uses etht-types:eth-bandwidth;
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:max-resv-link-bandwidth/"
          + "tet:te-bandwidth" {
      when "../../../../../nw:network-types/tet:te-topology/"
```

```
          + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment maximum reservable TE bandwidth for the TE link
         information-source";
      uses etht-types:eth-bandwidth;
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:unreserved-bandwidth/"
          + "tet:te-bandwidth" {
      when "../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment unreserved TE bandwidth of the TE link
         information source";
      uses etht-types:eth-bandwidth;
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:interface-switching-capability/"
          + "tet:max-lsp-bandwidth/"
          + "tet:te-bandwidth/tet:technology" {
      description
        "Augment maximum LSP TE bandwidth of the TE link
         template";
      case eth {
        uses etht-types:eth-bandwidth;
      }
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:max-link-bandwidth/"
          + "tet:te-bandwidth" {
      description
        "Augment maximum TE bandwidth the TE link template";
      uses etht-types:eth-bandwidth;
    }
```

```
    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:max-resv-link-bandwidth/"
          + "tet:te-bandwidth" {
      description
        "Augment maximum reservable TE bandwidth for the TE link
         template.";
      uses etht-types:eth-bandwidth;
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:unreserved-bandwidth/"
          + "tet:te-bandwidth" {
      description
        "Augment unreserved TE bandwidth the TE link template";
      uses etht-types:eth-bandwidth;
    }

    /*
     * Augment TE label range information
     */

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:label-restrictions/tet:label-restriction" {
      when "../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE label range information for the TE node
         connectivity matrices.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/tet:from/"
          + "tet:label-restrictions/tet:label-restriction" {
      when "../../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
```

```
      description
        "Augment TE label range information for the source LTP
         of the connectivity matrix entry.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/tet:to/"
          + "tet:label-restrictions/tet:label-restriction" {
      when "../../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE label range information for the destination LTP
         of the connectivity matrix entry.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/"
          + "tet:connectivity-matrices/tet:label-restrictions/"
          + "tet:label-restriction" {
      when "../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE label range information for the TE node
         connectivity matrices information source.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:from/tet:label-restrictions/tet:label-restriction" {
      when "../../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
```

```
      description
        "Augment TE label range information for the source LTP
         of the connectivity matrix entry information source.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:to/tet:label-restrictions/tet:label-restriction" {
      when "../../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE label range information for the destination LTP
         of the connectivity matrix entry information source.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:label-restrictions/tet:label-restriction" {
      when "../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE label range information for the TTP
         Local Link Connectivities.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:local-link-connectivity/"
          + "tet:label-restrictions/tet:label-restriction" {
      when "../../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
```

```
      }
      description
        "Augment TE label range information for the TTP
         Local Link Connectivity entry.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:te-link-attributes/"
          + "tet:label-restrictions/tet:label-restriction" {
      when "../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE label range information for the TE link.";
      uses label-range-info;
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:label-restrictions/tet:label-restriction" {
      when "../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
          Ethernet topology type.";
      }
      description
        "Augment TE label range information for the TE link
         information source.";
      uses label-range-info;
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:label-restrictions/tet:label-restriction" {
      description
        "Augment TE label range information for the TE link template.";
      uses label-range-info;
    }

    /*
     * Augment TE label.
     */
```

```
    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-start/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range start for the TE node
         connectivity matrices";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:label-restrictions/"
          + "tet:label-restriction/tet:label-end/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range end for the TE node
         connectivity matrices";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:label-restrictions/"
          + "tet:label-restriction/tet:label-step/"
          + "tet:technology" {
      when "../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
```

```
      }
      description
        "Augment TE label range step for the TE node
         connectivity matrices";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:underlay/tet:primary-path/tet:path-element/"
          + "tet:type/tet:label/tet:label-hop/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay primary path of the
         TE node connectivity matrices";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:underlay/tet:backup-path/tet:path-element/"
          + "tet:type/tet:label/tet:label-hop/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay backup path of the
         TE node connectivity matrices";
      case eth {
        uses etht-types:eth-label;
      }
    }
```

```
    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "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" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects excluded
         by the path computation of the TE node connectivity
         matrices";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "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" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects included
         by the path computation of the TE node connectivity
         matrices";
      case eth {
        uses etht-types:eth-label;
      }
    }
```

```
    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:path-properties/tet:path-route-objects/"
          + "tet:path-route-object/tet:type/tet:label/tet:label-hop/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the computed path route objects
         of the TE node connectivity matrices";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/tet:from/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-start/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range start for the source LTP
         of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/tet:from/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-end/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
```

```
          + "nw:network-types/tet:te-topology/"
          + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range end for the source LTP
         of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/tet:from/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-step/"
          + "tet:technology" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range step for the source LTP
         of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/tet:to/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-start/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
```

```
        description
          "Augment TE label range start for the destination LTP
           of the connectivity matrix entry.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:te-node-attributes/tet:connectivity-matrices/"
            + "tet:connectivity-matrix/tet:to/"
            + "tet:label-restrictions/tet:label-restriction/"
            + "tet:label-end/"
            + "tet:te-label/tet:technology" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label range end for the destination LTP
           of the connectivity matrix entry.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:te-node-attributes/tet:connectivity-matrices/"
            + "tet:connectivity-matrix/tet:to/"
            + "tet:label-restrictions/tet:label-restriction/"
            + "tet:label-step/"
            + "tet:technology" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label range step for the destination LTP
           of the connectivity matrix entry.";
        case eth {
          uses etht-types:eth-label-step;
        }
```

```
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:underlay/tet:primary-path/tet:path-element/"
          + "tet:type/tet:label/tet:label-hop/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay primary path
         of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:underlay/tet:backup-path/tet:path-element/"
          + "tet:type/tet:label/tet:label-hop/"
          + "tet:te-label/tet:technology" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay backup path
         of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/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" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects excluded
         by the path computation of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/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" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects included
         by the path computation of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:te-node-attributes/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:path-properties/tet:path-route-objects/"
          + "tet:path-route-object/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
```

```
          + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the computed path route objects
         of the connectivity matrix entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/"
          + "tet:connectivity-matrices/tet:label-restrictions/"
          + "tet:label-restriction/"
          + "tet:label-start/tet:te-label/tet:technology" {
      when "../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range start for the TE node connectivity
         matrices information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/"
          + "tet:connectivity-matrices/tet:label-restrictions/"
          + "tet:label-restriction/"
          + "tet:label-end/tet:te-label/tet:technology" {
      when "../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range end for the TE node connectivity
         matrices information source.";
```

```
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/"
          + "tet:connectivity-matrices/tet:label-restrictions/"
          + "tet:label-restriction/"
          + "tet:label-step/tet:technology" {
      when "../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range step for the TE node connectivity
         matrices information source.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:underlay/tet:primary-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay primary path
         of the TE node connectivity matrices of the information
         source entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:underlay/tet:backup-path/tet:path-element/tet:type/"
```

```
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label hop for the underlay backup path
           of the TE node connectivity matrices of the information
           source entry.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:information-source-entry/tet:connectivity-matrices/"
            + "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" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label hop for the explicit route objects excluded
           by the path computation of the TE node connectivity matrices
           information source.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:information-source-entry/tet:connectivity-matrices/"
            + "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" {
        when "../../../../../../../../../../"
```

```
          + "nw:network-types/tet:te-topology/"
          + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects included
         by the path computation of the TE node connectivity matrices
         information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:path-properties/tet:path-route-objects/"
          + "tet:path-route-object/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the computed path route objects
         of the TE node connectivity matrices information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:from/tet:label-restrictions/"
          + "tet:label-restriction/"
          + "tet:label-start/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
```

```
        description
          "Augment TE label range start for the source LTP
           of the connectivity matrix entry information source.";
        case eth {
          uses etht-types:eth-label;
        }
      }
      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:information-source-entry/tet:connectivity-matrices/"
            + "tet:connectivity-matrix/"
            + "tet:from/tet:label-restrictions/"
            + "tet:label-restriction/"
            + "tet:label-end/tet:te-label/tet:technology" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label range end for the source LTP
           of the connectivity matrix entry information source.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:information-source-entry/tet:connectivity-matrices/"
            + "tet:connectivity-matrix/"
            + "tet:from/tet:label-restrictions/"
            + "tet:label-restriction/"
            + "tet:label-step/tet:technology" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label range step for the source LTP
           of the connectivity matrix entry information source.";
        case eth {
          uses etht-types:eth-label-step;
        }
      }
```

```
    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:to/tet:label-restrictions/tet:label-restriction/"
          + "tet:label-start/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range start for the destination LTP
         of the connectivity matrix entry information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:to/tet:label-restrictions/tet:label-restriction/"
          + "tet:label-end/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range end for the destination LTP
         of the connectivity matrix entry information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:to/tet:label-restrictions/tet:label-restriction/"
          + "tet:label-step/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
```

```
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range step for the destination LTP
         of the connectivity matrix entry information source.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:underlay/tet:primary-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay primary path
         of the connectivity matrix entry information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:underlay/tet:backup-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay backup path
         of the connectivity matrix entry information source.";
      case eth {
```

```
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "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" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects excluded
         by the path computation of the connectivity matrix entry
         information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "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" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects included
         by the path computation of the connectivity matrix entry
         information source.";
      case eth {
```

```
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:information-source-entry/tet:connectivity-matrices/"
          + "tet:connectivity-matrix/"
          + "tet:path-properties/tet:path-route-objects/"
          + "tet:path-route-object/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the computed path route objects
         of the connectivity matrix entry information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:tunnel-termination-point/"
        + "tet:local-link-connectivities/"
        + "tet:label-restrictions/tet:label-restriction/"
        + "tet:label-start/"
        + "tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range start for the TTP
         Local Link Connectivities.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
```

```
          + "tet:local-link-connectivities/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-end/"
          + "tet:te-label/tet:technology"{
      when "../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range end for the TTP
         Local Link Connectivities.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-step/"
          + "tet:technology"{
      when "../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range step for the TTP
         Local Link Connectivities.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:underlay/tet:primary-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
```

```
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay primary path
         of the TTP Local Link Connectivities.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    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" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay backup path
         of the TTP Local Link Connectivities.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    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" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
```

```
          "Augment TE label hop for the explicit route objects excluded
           by the path computation of the TTP Local Link
           Connectivities.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      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" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label hop for the explicit route objects included
           by the path computation of the TTP Local Link
           Connectivities.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      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" {
        when "../../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label hop for the computed path route objects
           of the TTP Local Link Connectivities.";
```

```
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:tunnel-termination-point/"
            + "tet:local-link-connectivities/"
            + "tet:local-link-connectivity/"
            + "tet:label-restrictions/tet:label-restriction/"
            + "tet:label-start/tet:te-label/tet:technology" {
        when "../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label range start for the TTP
           Local Link Connectivity entry.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
            + "tet:tunnel-termination-point/"
            + "tet:local-link-connectivities/"
            + "tet:local-link-connectivity/"
            + "tet:label-restrictions/tet:label-restriction/"
            + "tet:label-end/tet:te-label/tet:technology" {
        when "../../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label range end for the TTP
           Local Link Connectivity entry.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nw:node/tet:te/"
```

```
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:local-link-connectivity/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-step/tet:technology" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range step for the TTP
         Local Link Connectivity entry.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:local-link-connectivity/"
          + "tet:underlay/tet:primary-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay primary path
         of the TTP Local Link Connectivity entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:local-link-connectivity/"
          + "tet:underlay/tet:backup-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../../../"
```

```
          + "nw:network-types/tet:te-topology/"
          + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the underlay backup path
         of the TTP Local Link Connectivity entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:local-link-connectivity/"
          + "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" {
      when "../../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects excluded
         by the path computation of the TTP Local Link
         Connectivity entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:local-link-connectivity/"
          + "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" {
```

```
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the explicit route objects included
         by the path computation of the TTP Local Link
         Connectivity entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nw:node/tet:te/"
          + "tet:tunnel-termination-point/"
          + "tet:local-link-connectivities/"
          + "tet:local-link-connectivity/"
          + "tet:path-properties/tet:path-route-objects/"
          + "tet:path-route-object/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label hop for the computed path route objects
         of the TTP Local Link Connectivity entry.";
      case eth {
        uses etht-types:eth-label;
      }
    }
    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:te-link-attributes/"
          + "tet:underlay/tet:primary-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      when "../../../../../../../../../"
         + "nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
```

```
        description
          "Augment TE label hop for the underlay primary path
           of the TE link.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nt:link/tet:te/"
            + "tet:te-link-attributes/"
            + "tet:underlay/tet:backup-path/tet:path-element/tet:type/"
            + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
        when "../../../../../../../../"
           + "nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label hop for the underlay backup path
           of the TE link.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nt:link/tet:te/"
            + "tet:te-link-attributes/"
            + "tet:label-restrictions/tet:label-restriction/"
            + "tet:label-start/tet:te-label/tet:technology" {
        when "../../../../../../../nw:network-types/tet:te-topology/"
           + "etht:eth-tran-topology" {
          description
            "Augmentation parameters apply only for networks with
             Ethernet topology type.";
        }
        description
          "Augment TE label range start for the TE link.";
        case eth {
          uses etht-types:eth-label;
        }
      }

      augment "/nw:networks/nw:network/nt:link/tet:te/"
            + "tet:te-link-attributes/"
            + "tet:label-restrictions/tet:label-restriction/"
            + "tet:label-end/tet:te-label/tet:technology" {
```

```
      when "../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range end for the TE link.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:te-link-attributes/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-step/tet:technology" {
      when "../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range step for the TE link.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-start/tet:te-label/tet:technology" {
      when "../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range start for the TE link
         information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }
```

```
    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-end/tet:te-label/tet:technology" {
      when "../../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range end for the TE link
         information source.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/nw:network/nt:link/tet:te/"
          + "tet:information-source-entry/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-step/tet:technology" {
      when "../../../../../../nw:network-types/tet:te-topology/"
         + "etht:eth-tran-topology" {
        description
          "Augmentation parameters apply only for networks with
           Ethernet topology type.";
      }
      description
        "Augment TE label range step for the TE link
         information source.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:underlay/tet:primary-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      description
        "Augment TE label hop for the underlay primary path
         of the TE link template.";
      case eth {
        uses etht-types:eth-label;
      }
    }
```

```
    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:underlay/tet:backup-path/tet:path-element/tet:type/"
          + "tet:label/tet:label-hop/tet:te-label/tet:technology" {
      description
        "Augment TE label hop for the underlay backup path
         of the TE link template.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-start/tet:te-label/tet:technology" {
      description
        "Augment TE label range start for the TE link template.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-end/tet:te-label/tet:technology" {
      description
        "Augment TE label range end for the TE link template.";
      case eth {
        uses etht-types:eth-label;
      }
    }

    augment "/nw:networks/tet:te/tet:templates/"
          + "tet:link-template/tet:te-link-attributes/"
          + "tet:label-restrictions/tet:label-restriction/"
          + "tet:label-step/tet:technology" {
      description
        "Augment TE label range step for the TE link template.";
      case eth {
        uses etht-types:eth-label-step;
      }
    }

  }
  <CODE ENDS>
```

Figure 3: Ethernet topology YANG module

## 5. Manageability Considerations

TBD.

## 6. Security Considerations

The data following the model defined in this document is exchanged via, for example, the interface between an orchestrator and a transport network controller. The security concerns mentioned in [RFC8795] for using ietf-te-topology.yang model also applies to this document.

The YANG module defined in this document can be accessed via the RESTCONF protocol defined in [RFC8040], or maybe via the NETCONF protocol [RFC6241].

There are a number of data nodes defined in the YANG module which are writable/creatable/deletable (i.e., config true, which is the default). These data nodes may be considered sensitive or vulnerable in some network environments. Write operations (e.g., POST) to these data nodes without proper protection can have a negative effect on network operations.

Editors note: to list specific subtrees and data nodes and their sensitivity/vulnerability.

## 7. IANA Considerations

It is proposed that IANA should assign new URIs from the "IETF XML Registry" [RFC3688] as follows:

```
URI: urn:ietf:params:xml:ns:yang:ietf-eth-te-topology
Registrant Contact: The IESG.
XML: N/A, the requested URI is an XML namespace.
```

This document registers following YANG modules in the YANG Module Names registry [RFC7950].

```
name:      ietf-eth-te-topology
namespace: urn:ietf:params:xml:ns:yang:ietf-eth-te-topology
prefix:    etht
reference: RFC XXXX
```

RFC Editor: Please replace XXXX with the RFC number assigned to this document.

# 8. References

## 8.1. Normative References

[I-D.ietf-ccamp-client-signal-yang]
Zheng, H., Guo, A., Busi, I., Snitser, A., and C. Yu, "A YANG Data Model for Transport Network Client Signals", Work in Progress, Internet-Draft, draft-ietf-ccamp-client-signal-yang-17, 4 February 2026, <https://datatracker.ietf.org/doc/html/draft-ietf-ccamp-client-signal-yang-17>.

[ITU_G.8021]
ITU-T Recommendation G.8021, "Characteristics of Ethernet transport network equipment functional blocks", ITU-T G.8021 , April 2023.

[RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, DOI 10.17487/RFC3688, January 2004, <https://www.rfc-editor.org/rfc/rfc3688>.

[RFC6241] Enns, R., Ed., Bjorklund, M., Ed., Schoenwaelder, J., Ed., and A. Bierman, Ed., "Network Configuration Protocol (NETCONF)", RFC 6241, DOI 10.17487/RFC6241, June 2011, <https://www.rfc-editor.org/rfc/rfc6241>.

[RFC6991] Schoenwaelder, J., Ed., "Common YANG Data Types", RFC 6991, DOI 10.17487/RFC6991, July 2013, <https://www.rfc-editor.org/rfc/rfc6991>.

[RFC7950] Bjorklund, M., Ed., "The YANG 1.1 Data Modeling Language", RFC 7950, DOI 10.17487/RFC7950, August 2016, <https://www.rfc-editor.org/rfc/rfc7950>.

[RFC8040] Bierman, A., Bjorklund, M., and K. Watsen, "RESTCONF Protocol", RFC 8040, DOI 10.17487/RFC8040, January 2017, <https://www.rfc-editor.org/rfc/rfc8040>.

[RFC8342] Bjorklund, M., Schoenwaelder, J., Shafer, P., Watsen, K., and R. Wilton, "Network Management Datastore Architecture (NMDA)", RFC 8342, DOI 10.17487/RFC8342, March 2018, <https://www.rfc-editor.org/rfc/rfc8342>.

[RFC8345] Clemm, A., Medved, J., Varga, R., Bahadur, N., Ananthakrishnan, H., and X. Liu, "A YANG Data Model for Network Topologies", RFC 8345, DOI 10.17487/RFC8345, March 2018, <https://www.rfc-editor.org/rfc/rfc8345>.

[RFC8795] Liu, X., Bryskin, I., Beeram, V., Saad, T., Shah, H., and O. Gonzalez de Dios, "YANG Data Model for Traffic Engineering (TE) Topologies", RFC 8795, DOI 10.17487/RFC8795, August 2020, <https://www.rfc-editor.org/rfc/rfc8795>.

## 8.2. Informative References

[RFC8340] Bjorklund, M. and L. Berger, Ed., "YANG Tree Diagrams", BCP 215, RFC 8340, DOI 10.17487/RFC8340, March 2018, <https://www.rfc-editor.org/rfc/rfc8340>.

## Acknowledgments

We would like to thank Igor Bryskin and Daniel King for their comments and discussions.

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