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A YANG Data Model for Ethernet TE Topology
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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

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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]
eth-types	ietf-eth-tran-types	[RFCYYYY]
nw	ietf-network	[RFC8345]
nt	ietf-network-topology	[RFC8345]
tet	ietf-te-topology	[RFC8795]
eth	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.

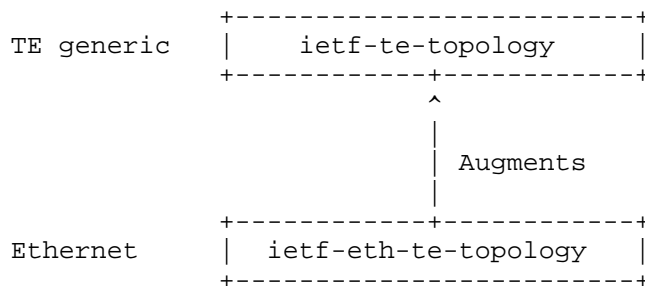


Figure 1: Relationship between Ethernet and TE topology models

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.


```

|   +--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?    eth-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?    eth-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?    eth-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?    eth-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?    eth-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?    eth-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 "eth-t-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
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  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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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 bandwidth 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 eth-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 eth-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 eth-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 always 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 network";

    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/"
        + "eth: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/"
  + "eth: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/"
    + "eth: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/"
  + "eth: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 eth-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/"
  + "eth: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 eth-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/"
  + "eth: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 eth-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/"
  + "eth: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 eth-types:eth-bandwidth;
}
}

augment "/nw:networks/nw:network/nw:node/tet:te/"
  + "tet:information-source-entry/tet:connectivity-matrices/"
  + "connectivity-matrix/"
  + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
when "../../../../../../../nw:network-types/tet:te-topology/"
  + "eth: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 eth-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/"
  + "eth: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/"
        + "eth: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/"
        + "eth: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/"
```

```
    + "eth: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 eth-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/"
    + "eth: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 eth-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 eth-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 eth-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/"
  + "eth: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/"
  + "eth: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/"
  + "eth: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/"
  + "eth: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/"
  + "eth: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/"
  + "eth: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/"
    + "eth: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/"
    + "eth: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/"
  + "eth: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 eth-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/"
  + "eth: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 eth-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/"
  + "eth: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/"
  + "eth: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 eth-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/"
  + "eth: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 eth-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/"
  + "eth: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 eth-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/"
  + "eth: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 eth-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/"
    + "eth: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 eth-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/"
    + "eth: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 eth-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/"
    + "eth: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/"
+ "eth: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 eth: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/"
+ "eth: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 eth: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/"
    + "eth: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 eth:eth-tran-topology-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/"
    + "eth: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 eth:eth-tran-topology-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/"

```



```

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

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- [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>>.

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