

Internet Engineering Task Force (IETF)
Request for Comments: 9094
Category: Standards Track
ISSN: 2070-1721

好棉 (H. Zheng)
技术有限公司 (Huawei Technologies)

Y. Lee
Samsung
A. Guo
Futurewei
V. Lopez
Nokia
D. King
University of Lancaster
August 2021

A YANG Data Model for Wavelength Switched Optical Networks (WSONs)

Abstract

This document provides a YANG data model for the routing and wavelength assignment (RWA) TE topology in Wavelength Switched Optical Networks (WSONs). The YANG data model defined in this document conforms to the Network Management Datastore Architecture (NMDA).

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 7841.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at <https://www.rfc-editor.org/info/rfc9094>.

Copyright Notice

Copyright (c) 2021 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1. Introduction
 - 1.1. Terminology and Notations
 - 1.2. Tree Diagram
 - 1.3. Prefix in Data Node Names
2. YANG Data Model (Tree Structure) for WSON Topology
3. YANG Module for WSON Topology
4. Security Considerations
5. IANA Considerations

6. References

6.1. Normative References

6.2. Informative References

Contributors

Authors' Addresses

1. Introduction

This document provides a YANG data model for the routing and wavelength assignment (RWA) Traffic Engineering (TE) topology in transparent Wavelength Switched Optical Networks (WSONs). The YANG data model described in this document is a WSON technology-specific YANG data model based on the information model developed in [RFC7446] and the two encoding documents ([RFC7581] and [RFC7579]) that developed protocol-independent encodings based on [RFC7446].

[ITU-Tg6982] defines amplified multichannel dense wavelength division multiplexing applications with single-channel optical interfaces. The YANG data model defined in this document refers to the standard application mode defined in [ITU-Tg6982].

Neither impairment-aware optical networks nor flexi-grid are in scope for this document. Refer to [OPT-IMPAIR-AWARE-YANG] for the impairment-aware optical network topology model and [FLEXI-GRID-YANG] for the flexi-grid optical network topology model.

Additionally, neither transponder models nor resource block models (e.g., 3R) are in scope for this document.

This document defines one YANG module: "ietf-wson-topology" (Section 3). This document augments the generic TE topology specification [RFC8795].

There are multiple applications for the YANG data model defined in this document. For example, nodes within the network can use the data model to capture their understanding of the overall WSON topology and expose it to a controller. A controller can further propagate the topology to other controllers. The YANG data model is used by NETCONF [RFC6020] [RFC8341] or a RESTCONF [RFC8040] protocol. The YANG data model defined in this document conforms to the Network Management Datastore Architecture [RFC8342].

1.1. Terminology and Notations

Refer to [RFC7446] and [RFC7581] for the key terms used in this document. 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 2 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, 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 the following table.

Prefix	YANG module	Reference
l0-types	ietf-layer0-types	[RFC9093]
wsont	ietf-wson-topology	RFC 9094
nw	ietf-network	[RFC8345]
nt	ietf-network-topology	[RFC8345]
tet	ietf-te-topology	[RFC8795]

Table 1: Data Node Names

2. YANG Data Model (Tree Structure) for WSON Topology

```
module: ietf-wson-topology
  augment /nw:networks/nw:network/nw:network-types/tet:te-topology:
    +--rw wson-topology!
  augment /nw:networks/nw:network/nw:node/tet:te
    /tet:te-node-attributes:
      +--rw wson-node!
        +--rw is-reconfigurable-node?  boolean
  augment /nw:networks/nw:network/nw:node/tet:te
    /tet:te-node-attributes/tet:connectivity-matrices
    /tet:label-restrictions/tet:label-restriction:
      +--rw grid-type?  identityref
      +--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 grid-type?  identityref
      +--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 grid-type?  identityref
      +--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 grid-type?  identityref
      +--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 grid-type?  identityref
```

```

    +--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 grid-type?    identityref
    +--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 grid-type?    identityref
    +--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 grid-type?    identityref
    +--rw priority?     uint8
augment /nw:networks/nw:network/nt:link/tet:te
    /tet:te-link-attributes/tet:label-restrictions
    /tet:label-restriction:
    +--rw grid-type?    identityref
    +--rw priority?     uint8
augment /nw:networks/nw:network/nt:link/tet:te
    /tet:information-source-entry/tet:label-restrictions
    /tet:label-restriction:
    +--ro grid-type?    identityref
    +--ro priority?     uint8
augment /nw:networks/tet:te/tet:templates/tet:link-template
    /tet:te-link-attributes/tet:label-restrictions
    /tet:label-restriction:
    +--rw grid-type?    identityref
    +--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:
    +--:(wson)
        +--rw (grid-type)?
            +--:(dwdm)
                | +--rw dwdm-n?    10-types:dwdm-n
            +--:(cwdm)
                +--rw cwdm-n?    10-types:cwdm-n
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:
    +--:(wson)
        +--rw (grid-type)?
            +--:(dwdm)
                | +--rw dwdm-n?    10-types:dwdm-n
            +--:(cwdm)
                +--rw cwdm-n?    10-types:cwdm-n
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:
    +--:(wson)
        +--rw (l0-grid-type)?
            +--:(dwdm)
                | +--rw wson-dwdm-channel-spacing?    identityref
            +--:(cwdm)
                +--rw wson-cwdm-channel-spacing?    identityref
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw (single-or-super-channel)?
      |   +--:(single)
      |     | +--rw dwdm-n?                  10-types:dwdm-n
      |     +--:(super)
      |       +--rw subcarrier-dwdm-n*      10-types:dwdm-n
    +--:(cwdm)
      +--rw cwdm-n?                        10-types:cwdm-n
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw (single-or-super-channel)?
      |   +--:(single)
      |     | +--rw dwdm-n?                  10-types:dwdm-n
      |     +--:(super)
      |       +--rw subcarrier-dwdm-n*      10-types:dwdm-n
    +--:(cwdm)
      +--rw cwdm-n?                        10-types:cwdm-n
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw (single-or-super-channel)?
      |   +--:(single)
      |     | +--rw dwdm-n?                  10-types:dwdm-n
      |     +--:(super)
      |       +--rw subcarrier-dwdm-n*      10-types:dwdm-n
    +--:(cwdm)
      +--rw cwdm-n?                        10-types:cwdm-n
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw (single-or-super-channel)?
      |   +--:(single)
      |     | +--rw dwdm-n?                  10-types:dwdm-n
      |     +--:(super)
      |       +--rw subcarrier-dwdm-n*      10-types:dwdm-n
    +--:(cwdm)
      +--rw cwdm-n?                        10-types:cwdm-n
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:

```

```

+---:(wson)
  +---ro (grid-type)?
    +---:(dwdm)
      | +---ro (single-or-super-channel)?
      |   +---:(single)
      |     | +---ro dwdm-n? 10-types:dwdm-n
      |     +---:(super)
      |       +---ro subcarrier-dwdm-n* 10-types:dwdm-n
    +---:(cwdm)
      +---ro cwdm-n? 10-types:cwdm-n
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:
+---:(wson)
  +---rw (grid-type)?
    +---:(dwdm)
      | +---rw dwdm-n? 10-types:dwdm-n
    +---:(cwdm)
      +---rw cwdm-n? 10-types:cwdm-n
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:
+---:(wson)
  +---rw (grid-type)?
    +---:(dwdm)
      | +---rw dwdm-n? 10-types:dwdm-n
    +---:(cwdm)
      +---rw cwdm-n? 10-types:cwdm-n
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:
+---:(wson)
  +---rw (l0-grid-type)?
    +---:(dwdm)
      | +---rw wson-dwdm-channel-spacing? identityref
    +---:(cwdm)
      +---rw wson-cwdm-channel-spacing? identityref
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:
+---:(wson)
  +---rw (grid-type)?
    +---:(dwdm)
      | +---rw dwdm-n? 10-types:dwdm-n
    +---:(cwdm)
      +---rw cwdm-n? 10-types:cwdm-n
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:
+---:(wson)
  +---rw (grid-type)?
    +---:(dwdm)
      | +---rw dwdm-n? 10-types:dwdm-n
    +---:(cwdm)
      +---rw cwdm-n? 10-types:cwdm-n
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:
+---:(wson)
    +---rw (l0-grid-type)?
        +---:(dwdm)
            |   +---rw wson-dwdm-channel-spacing?    identityref
        +---:(cwdm)
            +---rw wson-cwdm-channel-spacing?    identityref
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:
+---:(wson)
    +---rw (grid-type)?
        +---:(dwdm)
            |   +---rw (single-or-super-channel)?
            |       +---:(single)
            |           |   +---rw dwdm-n?                10-types:dwdm-n
            |           +---:(super)
            |               +---rw subcarrier-dwdm-n*    10-types:dwdm-n
        +---:(cwdm)
            +---rw cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
        +---:(dwdm)
            |   +---rw (single-or-super-channel)?
            |       +---:(single)
            |           |   +---rw dwdm-n?                10-types:dwdm-n
            |           +---:(super)
            |               +---rw subcarrier-dwdm-n*    10-types:dwdm-n
        +---:(cwdm)
            +---rw cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
        +---:(dwdm)
            |   +---rw (single-or-super-channel)?
            |       +---:(single)
            |           |   +---rw dwdm-n?                10-types:dwdm-n
            |           +---:(super)
            |               +---rw subcarrier-dwdm-n*    10-types:dwdm-n
        +---:(cwdm)
            +---rw cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
        +---:(dwdm)
            |   +---rw (single-or-super-channel)?

```

```

|         +---:(single)
|         |   +---rw dwdm-n?           10-types:dwdm-n
|         +---:(super)
|         |   +---rw subcarrier-dwdm-n* 10-types:dwdm-n
+---:(cwdm)
|         +---rw cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
|         +---ro (grid-type)?
|         +---:(dwdm)
|         |   +---ro (single-or-super-channel)?
|         |   |   +---:(single)
|         |   |   |   +---ro dwdm-n?           10-types:dwdm-n
|         |   |   +---:(super)
|         |   |   |   +---ro subcarrier-dwdm-n* 10-types:dwdm-n
|         +---:(cwdm)
|         |   +---ro cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
|         +---ro (grid-type)?
|         +---:(dwdm)
|         |   +---ro dwdm-n?   10-types:dwdm-n
|         +---:(cwdm)
|         |   +---ro cwdm-n?   10-types:cwdm-n
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:
+---:(wson)
|         +---ro (grid-type)?
|         +---:(dwdm)
|         |   +---ro dwdm-n?   10-types:dwdm-n
|         +---:(cwdm)
|         |   +---ro cwdm-n?   10-types:cwdm-n
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:
+---:(wson)
|         +---ro (l0-grid-type)?
|         +---:(dwdm)
|         |   +---ro wson-dwdm-channel-spacing?  identityref
|         +---:(cwdm)
|         |   +---ro wson-cwdm-channel-spacing?  identityref
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:
+---:(wson)
|         +---ro (grid-type)?
|         +---:(dwdm)
|         |   +---ro (single-or-super-channel)?
|         |   |   +---:(single)
|         |   |   |   +---ro dwdm-n?           10-types:dwdm-n
|         |   |   +---:(super)
|         |   |   |   +---ro subcarrier-dwdm-n* 10-types:dwdm-n
|         +---:(cwdm)
|         |   +---ro cwdm-n?           10-types:cwdm-n
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:
+--:(wson)
  +--ro (grid-type)?
    +--:(dwdm)
      | +--ro (single-or-super-channel)?
      |   +--:(single)
      |     | +--ro dwdm-n?                10-types:dwdm-n
      |     +--:(super)
      |       +--ro subcarrier-dwdm-n*    10-types:dwdm-n
    +--:(cwdm)
      +--ro cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
  +--ro (grid-type)?
    +--:(dwdm)
      | +--ro (single-or-super-channel)?
      |   +--:(single)
      |     | +--ro dwdm-n?                10-types:dwdm-n
      |     +--:(super)
      |       +--ro subcarrier-dwdm-n*    10-types:dwdm-n
    +--:(cwdm)
      +--ro cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
  +--ro (grid-type)?
    +--:(dwdm)
      | +--ro (single-or-super-channel)?
      |   +--:(single)
      |     | +--ro dwdm-n?                10-types:dwdm-n
      |     +--:(super)
      |       +--ro subcarrier-dwdm-n*    10-types:dwdm-n
    +--:(cwdm)
      +--ro cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
  +--ro (grid-type)?
    +--:(dwdm)
      | +--ro (single-or-super-channel)?
      |   +--:(single)
      |     | +--ro dwdm-n?                10-types:dwdm-n
      |     +--:(super)
      |       +--ro subcarrier-dwdm-n*    10-types:dwdm-n
    +--:(cwdm)
      +--ro cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
        +---:(dwdm)
            | +---ro dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---ro cwdm-n?    10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
        +---:(dwdm)
            | +---ro dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---ro cwdm-n?    10-types:cwdm-n
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:
+---:(wson)
    +---ro (l0-grid-type)?
        +---:(dwdm)
            | +---ro wson-dwdm-channel-spacing?    identityref
        +---:(cwdm)
            +---ro wson-cwdm-channel-spacing?    identityref
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:
+---:(wson)
    +---ro (grid-type)?
        +---:(dwdm)
            | +---ro dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---ro cwdm-n?    10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
        +---:(dwdm)
            | +---ro dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---ro cwdm-n?    10-types:cwdm-n
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:
+---:(wson)
    +---ro (l0-grid-type)?
        +---:(dwdm)
            | +---ro wson-dwdm-channel-spacing?    identityref
        +---:(cwdm)
            +---ro wson-cwdm-channel-spacing?    identityref
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:
+---:(wson)

```

```

    +---ro (grid-type)?
    +---:(dwdm)
    |   +---ro (single-or-super-channel)?
    |   |   +---:(single)
    |   |   |   +---ro dwdm-n?           10-types:dwdm-n
    |   |   +---:(super)
    |   |   |   +---ro subcarrier-dwdm-n* 10-types:dwdm-n
    |   +---:(cwdm)
    |   +---ro cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
    +---:(dwdm)
    |   +---ro (single-or-super-channel)?
    |   |   +---:(single)
    |   |   |   +---ro dwdm-n?           10-types:dwdm-n
    |   |   +---:(super)
    |   |   |   +---ro subcarrier-dwdm-n* 10-types:dwdm-n
    |   +---:(cwdm)
    |   +---ro cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
    +---:(dwdm)
    |   +---ro (single-or-super-channel)?
    |   |   +---:(single)
    |   |   |   +---ro dwdm-n?           10-types:dwdm-n
    |   |   +---:(super)
    |   |   |   +---ro subcarrier-dwdm-n* 10-types:dwdm-n
    |   +---:(cwdm)
    |   +---ro cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
    +---:(dwdm)
    |   +---ro (single-or-super-channel)?
    |   |   +---:(single)
    |   |   |   +---ro dwdm-n?           10-types:dwdm-n
    |   |   +---:(super)
    |   |   |   +---ro subcarrier-dwdm-n* 10-types:dwdm-n
    |   +---:(cwdm)
    |   +---ro cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
    +---:(dwdm)

```

```

|   +---ro (single-or-super-channel)?
|       +---:(single)
|           |   +---ro dwdm-n?           10-types:dwdm-n
|           +---:(super)
|               +---ro subcarrier-dwdm-n* 10-types:dwdm-n
+---:(cwdm)
    +---ro cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
    +---:(dwdm)
    |   +---rw dwdm-n?  10-types:dwdm-n
    +---:(cwdm)
    +---rw cwdm-n?  10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
    +---:(dwdm)
    |   +---rw dwdm-n?  10-types:dwdm-n
    +---:(cwdm)
    +---rw cwdm-n?  10-types:cwdm-n
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:
+---:(wson)
    +---rw (l0-grid-type)?
    +---:(dwdm)
    |   +---rw wson-dwdm-channel-spacing?  identityref
    +---:(cwdm)
    +---rw wson-cwdm-channel-spacing?  identityref
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:
+---:(wson)
    +---rw (grid-type)?
    +---:(dwdm)
    |   +---rw (single-or-super-channel)?
    |       +---:(single)
    |           |   +---rw dwdm-n?           10-types:dwdm-n
    |           +---:(super)
    |               +---rw subcarrier-dwdm-n* 10-types:dwdm-n
    +---:(cwdm)
    +---rw cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
    +---:(dwdm)
    |   +---rw (single-or-super-channel)?
    |       +---:(single)
    |           |   +---rw dwdm-n?           10-types:dwdm-n
    |           +---:(super)

```

```

|          +---rw subcarrier-dwdm-n*    10-types:dwdm-n
+---:(cwdm)
|          +---rw cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
|          +---rw (grid-type)?
|          +---:(dwdm)
|          |          +---rw (single-or-super-channel)?
|          |          +---:(single)
|          |          |          +---rw dwdm-n?                10-types:dwdm-n
|          |          +---:(super)
|          |          +---rw subcarrier-dwdm-n*    10-types:dwdm-n
|          +---:(cwdm)
|          +---rw cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
|          +---rw (grid-type)?
|          +---:(dwdm)
|          |          +---rw (single-or-super-channel)?
|          |          +---:(single)
|          |          |          +---rw dwdm-n?                10-types:dwdm-n
|          |          +---:(super)
|          |          +---rw subcarrier-dwdm-n*    10-types:dwdm-n
|          +---:(cwdm)
|          +---rw cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
|          +---ro (grid-type)?
|          +---:(dwdm)
|          |          +---ro (single-or-super-channel)?
|          |          +---:(single)
|          |          |          +---ro dwdm-n?                10-types:dwdm-n
|          |          +---:(super)
|          |          +---ro subcarrier-dwdm-n*    10-types:dwdm-n
|          +---:(cwdm)
|          +---ro cwdm-n?                10-types:cwdm-n
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:
+---:(wson)
|          +---rw (grid-type)?
|          +---:(dwdm)
|          |          +---rw dwdm-n?    10-types:dwdm-n
|          +---:(cwdm)
|          +---rw cwdm-n?    10-types:cwdm-n
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw dwdm-n?    10-types:dwdm-n
    +--:(cwdm)
      +--rw cwdm-n?    10-types:cwdm-n
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:
+--:(wson)
  +--rw (l0-grid-type)?
    +--:(dwdm)
      | +--rw wson-dwdm-channel-spacing?  identityref
    +--:(cwdm)
      +--rw wson-cwdm-channel-spacing?  identityref
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw (single-or-super-channel)?
      |   +--:(single)
      |     | +--rw dwdm-n?                10-types:dwdm-n
      |     +--:(super)
      |       +--rw subcarrier-dwdm-n*    10-types:dwdm-n
    +--:(cwdm)
      +--rw cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw (single-or-super-channel)?
      |   +--:(single)
      |     | +--rw dwdm-n?                10-types:dwdm-n
      |     +--:(super)
      |       +--rw subcarrier-dwdm-n*    10-types:dwdm-n
    +--:(cwdm)
      +--rw cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
  +--rw (grid-type)?
    +--:(dwdm)
      | +--rw (single-or-super-channel)?
      |   +--:(single)

```

```

|         |   +--rw dwdm-n?                10-types:dwdm-n
|         |   +--:(super)
|         |   +--rw subcarrier-dwdm-n*    10-types:dwdm-n
+--:(cwdm)
|         |   +--rw cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
|         |   +--rw (grid-type)?
|         |   |   +--:(dwdm)
|         |   |   |   +--rw (single-or-super-channel)?
|         |   |   |   |   +--:(single)
|         |   |   |   |   |   +--rw dwdm-n?                10-types:dwdm-n
|         |   |   |   |   |   +--:(super)
|         |   |   |   |   |   +--rw subcarrier-dwdm-n*    10-types:dwdm-n
|         |   |   |   +--:(cwdm)
|         |   |   |   +--rw cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
|         |   +--ro (grid-type)?
|         |   |   +--:(dwdm)
|         |   |   |   +--ro (single-or-super-channel)?
|         |   |   |   |   +--:(single)
|         |   |   |   |   |   +--ro dwdm-n?                10-types:dwdm-n
|         |   |   |   |   |   +--:(super)
|         |   |   |   |   |   +--ro subcarrier-dwdm-n*    10-types:dwdm-n
|         |   |   |   +--:(cwdm)
|         |   |   |   +--ro cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
|         |   +--rw (grid-type)?
|         |   |   +--:(dwdm)
|         |   |   |   +--rw (single-or-super-channel)?
|         |   |   |   |   +--:(single)
|         |   |   |   |   |   +--rw dwdm-n?                10-types:dwdm-n
|         |   |   |   |   |   +--:(super)
|         |   |   |   |   |   +--rw subcarrier-dwdm-n*    10-types:dwdm-n
|         |   |   |   +--:(cwdm)
|         |   |   |   +--rw cwdm-n?                10-types:cwdm-n
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:
+--:(wson)
|         |   +--rw (grid-type)?
|         |   |   +--:(dwdm)
|         |   |   |   +--rw (single-or-super-channel)?
|         |   |   |   |   +--:(single)
|         |   |   |   |   |   +--rw dwdm-n?                10-types:dwdm-n
|         |   |   |   |   |   +--:(super)
|         |   |   |   |   |   +--rw subcarrier-dwdm-n*    10-types:dwdm-n
|         |   |   |   +--:(cwdm)

```

```

        +---rw cwdm-n?                                10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
        +---:(dwdm)
        |   +---rw dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---rw cwdm-n?    10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
        +---:(dwdm)
        |   +---rw dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---rw cwdm-n?    10-types:cwdm-n
augment /nw:networks/nw:network/nt:link/tet:te
    /tet:te-link-attributes/tet:label-restrictions
    /tet:label-restriction/tet:label-step/tet:technology:
+---:(wson)
    +---rw (l0-grid-type)?
        +---:(dwdm)
        |   +---rw wson-dwdm-channel-spacing?    identityref
        +---:(cwdm)
            +---rw wson-cwdm-channel-spacing?    identityref
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:
+---:(wson)
    +---ro (grid-type)?
        +---:(dwdm)
        |   +---ro dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---ro cwdm-n?    10-types:cwdm-n
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:
+---:(wson)
    +---ro (grid-type)?
        +---:(dwdm)
        |   +---ro dwdm-n?    10-types:dwdm-n
        +---:(cwdm)
            +---ro cwdm-n?    10-types:cwdm-n
augment /nw:networks/nw:network/nt:link/tet:te
    /tet:information-source-entry/tet:label-restrictions
    /tet:label-restriction/tet:label-step/tet:technology:
+---:(wson)
    +---ro (l0-grid-type)?
        +---:(dwdm)
        |   +---ro wson-dwdm-channel-spacing?    identityref
        +---:(cwdm)
            +---ro wson-cwdm-channel-spacing?    identityref
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:
+---:(wson)
    +---rw (grid-type)?
        +---:(dwdm)

```



```

|   +---rw (single-or-super-channel)?
|       +---:(single)
|           |   +---rw dwdm-n?           10-types:dwdm-n
|           +---:(super)
|               +---rw subcarrier-dwdm-n* 10-types:dwdm-n
+---:(cwdm)
    +---rw cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
    +---:(dwdm)
        |   +---rw (single-or-super-channel)?
        |       +---:(single)
        |           |   +---rw dwdm-n?           10-types:dwdm-n
        |           +---:(super)
        |               +---rw subcarrier-dwdm-n* 10-types:dwdm-n
    +---:(cwdm)
        +---rw cwdm-n?           10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
    +---:(dwdm)
        |   +---rw dwdm-n?  10-types:dwdm-n
    +---:(cwdm)
        +---rw cwdm-n?  10-types:cwdm-n
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:
+---:(wson)
    +---rw (grid-type)?
    +---:(dwdm)
        |   +---rw dwdm-n?  10-types:dwdm-n
    +---:(cwdm)
        +---rw cwdm-n?  10-types:cwdm-n
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:
+---:(wson)
    +---rw (l0-grid-type)?
    +---:(dwdm)
        |   +---rw wson-dwdm-channel-spacing?  identityref
    +---:(cwdm)
        +---rw wson-cwdm-channel-spacing?  identityref

```

3. YANG Module for WSON Topology

```

<CODE BEGINS> file "ietf-wson-topology@2021-08-13.yang"
module ietf-wson-topology {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-wson-topology";
  prefix wsont;

  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-layer0-types {
    prefix l0-types;
    reference
        "RFC 9093: A YANG Data Model for Layer 0 Types";
}

organization
    "IETF CCAMP Working Group";

contact
    "WG Web: <https://datatracker.ietf.org/wg/ccamp/>
    WG List: <mailto:ccamp@ietf.org>

    Editor:  Haomian Zheng  <zhenghaomian@huawei.com>
    Editor:  Young Lee  <younglee.tx@gmail.com>
    Editor:  Aihua Guo  <aihuaguo.ietf@gmail.com>
    Editor:  Victor Lopez <victor.lopez@nokia.com>
    Editor:  Daniel King  <d.king@lancaster.ac.uk>";

description
    "This module provides a YANG data model for the routing and
    wavelength assignment (RWA) Traffic Engineering (TE)
    topology in Wavelength Switched Optical Networks (WSONs).
    The YANG data model described in this document is a WSON
    technology-specific YANG data model augmenting the generic TE
    topology module (ietf-te-topology) based on the information
    model developed in RFC 7446 and the two encoding documents
    RFC 7579 and RFC 7581.

    Copyright (c) 2021 IETF Trust and the persons identified
    as authors of the code.  All rights reserved.

    Redistribution and use in source and binary forms, with
    or without modification, is permitted pursuant to, and
    subject to the license terms contained in, the Simplified
    BSD License set forth in Section 4.c of the IETF Trust's
    Legal Provisions Relating to IETF Documents
    (https://trustee.ietf.org/license-info).

    This version of this YANG module is part of RFC 9094; see
    the RFC itself for full legal notices.";

revision 2021-08-13 {
    description
        "Initial version";

    reference
        "RFC 9094: A YANG Data Model for Wavelength Switched
        Optical Networks (WSONs)";
}

/*
 * Data nodes
 */

```

```

augment "/nw:networks/nw:network/nw:network-types"
+ "/tet:te-topology" {
  description
  "Augment network types to define the WSON topology type.";
  container wson-topology {
    presence "Its presence identifies the WSON topology type.";
    description
    "Introduce a new network type for WSON topology.";
  }
}

augment "/nw:networks/nw:network/nw:node/tet:te"
+ "/tet:te-node-attributes" {
  when '/nw:networks/nw:network/nw:network-types'
  + '/tet:te-topology/wson:topology' {
    description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
  }
  description
  "Augment TE node attributes.";
  container wson-node {
    presence "The TE node is a WSON node.";
    description
    "WSON node attributes";
    leaf is-reconfigurable-node {
      type boolean;
      default "true";
      description
      "Indicates whether the WSON node is reconfigurable:
      - true: the node is reconfigurable, i.e.,
        it is representing a Reconfigurable Optical
        Add/Drop Multiplexer (ROADM) node;
      - false: the node is not reconfigurable, i.e.,
        it is representing a Fixed Optical Add/Drop
        Multiplexer (FOADM) node.";
    }
  }
}

/*
* 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/'
  + 'wson:topology' {
    description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
  }
  description
  "Augment TE label range information for the TE node
  connectivity matrices.";
  uses l0-types:l0-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/'
  + 'wson:topology' {

```

```

        description
            "Augmentation parameters apply only for networks with
              WSON topology type.";
    }
    description
        "Augment TE label range information for the source LTP
          of the connectivity matrix entry.";
    uses l0-types:l0-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/'
    + 'wsont:wson-topology' {
    description
        "Augmentation parameters apply only for networks with
          WSON topology type.";
    }
    description
        "Augment TE label range information for the destination LTP
          of the connectivity matrix entry.";
    uses l0-types:l0-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/'
    + 'wsont:wson-topology' {
    description
        "Augmentation parameters apply only for networks with
          WSON topology type.";
    }
    description
        "Augment TE label range information for the TE node
          connectivity matrices information source.";
    uses l0-types:l0-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/'
    + 'wsont:wson-topology' {
    description
        "Augmentation parameters apply only for networks with
          WSON topology type.";
    }
    description
        "Augment TE label range information for the source LTP
          of the connectivity matrix entry information source.";
    uses l0-types:l0-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/'
    + 'wsont:wson-topology' {
    description
        "Augmentation parameters apply only for networks with

```

```

        WSON topology type.";
    }
    description
        "Augment TE label range information for the destination LTP
        of the connectivity matrix entry information source.";
    uses l0-types:l0-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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
    }
    description
        "Augment TE label range information for the Tunnel
        Termination Point (TTP) Local Link Connectivities.";
    uses l0-types:l0-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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
    }
    description
        "Augment TE label range information for the TTP
        Local Link Connectivity entry.";
    uses l0-types:l0-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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
    }
    description
        "Augment TE label range information for the TE link.";
    uses l0-types:l0-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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
    }
    description
        "Augment TE label range information for the TE link

```

```

        information source.";
    uses l0-types:l0-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 l0-types:l0-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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
    }
    description
        "Augment TE label range start for the TE node
        connectivity matrices.";
    case wson {
        uses l0-types:wson-label-start-end;
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
    }
    description
        "Augment TE label range end for the TE node
        connectivity matrices.";
    case wson {
        uses l0-types:wson-label-start-end;
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
    }
    description

```

```

    "Augment TE label range step for the TE node
    connectivity matrices.";
case wson {
    uses l0-types:wson-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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the underlay primary path of the
    TE node connectivity matrices.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the underlay backup path of the
    TE node connectivity matrices.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the explicit route objects excluded
    by the path computation of the TE node connectivity
    matrices.";
}

```

```

    case wson {
      uses l0-types:wson-label-hop;
    }
  }

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/'
  + 'wsont:wson-topology' {
    description
      "Augmentation parameters apply only for networks with
      WSON topology type.";
  }
  description
    "Augment TE label hop for the explicit route objects included
    by the path computation of the TE node connectivity
    matrices.";
  case wson {
    uses l0-types:wson-label-hop;
  }
}

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/'
  + 'wsont:wson-topology' {
    description
      "Augmentation parameters apply only for networks with
      WSON topology type.";
  }
  description
    "Augment TE label hop for the computed path route objects
    of the TE node connectivity matrices.";
  case wson {
    uses l0-types:wson-label-hop;
  }
}

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/'
  + 'wsont:wson-topology' {
    description
      "Augmentation parameters apply only for networks with
      WSON topology type.";
  }
  description
    "Augment TE label range start for the source LTP
    of the connectivity matrix entry.";
  case wson {

```



```

    uses l0-types:wson-label-start-end;
  }
}

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
  "Augment TE label range end for the source LTP
    of the connectivity matrix entry.";
case wson {
  uses l0-types:wson-label-start-end;
}
}

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
  "Augment TE label range step for the source LTP
    of the connectivity matrix entry.";
case wson {
  uses l0-types:wson-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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
  "Augment TE label range start for the destination LTP
    of the connectivity matrix entry.";
case wson {
  uses l0-types:wson-label-start-end;
}
}

```

```

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
  WSON topology type.";
}
description
  "Augment TE label range end for the destination LTP
  of the connectivity matrix entry.";
case wson {
  uses l0-types:wson-label-start-end;
}
}

```

```

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
  WSON topology type.";
}
description
  "Augment TE label range step for the destination LTP
  of the connectivity matrix entry.";
case wson {
  uses l0-types:wson-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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
  WSON topology type.";
}
description
  "Augment TE label hop for the underlay primary path
  of the connectivity matrix entry.";
case wson {
  uses l0-types:wson-label-hop;
}
}

```

```

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the underlay backup path
    of the connectivity matrix entry.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the explicit route objects excluded
    by the path computation of the connectivity matrix entry.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the explicit route objects included
    by the path computation of the connectivity matrix entry.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the computed path route objects
    of the connectivity matrix entry.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range start for the TE node connectivity
    matrices information source.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range end for the TE node connectivity
    matrices information source.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

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/'
    + 'wsont:wson-topology' {

```

```

        description
            "Augmentation parameters apply only for networks with
              WSON topology type.";
    }
    description
        "Augment TE label range step for the TE node connectivity
          matrices information source.";
    case wson {
        uses l0-types:wson-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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
              WSON topology type.";
    }
    description
        "Augment TE label hop for the underlay primary path
          of the TE node connectivity matrices of the information
          source entry.";
    case wson {
        uses l0-types:wson-label-hop;
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
              WSON topology type.";
    }
    description
        "Augment TE label hop for the underlay backup path
          of the TE node connectivity matrices of the information
          source entry.";
    case wson {
        uses l0-types:wson-label-hop;
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
              WSON 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 wson {
    uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON 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 wson {
    uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the computed path route objects
    of the TE node connectivity matrices information source.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description

```

```

        "Augment TE label range start for the source LTP
        of the connectivity matrix entry information source.";
    case wson {
        uses l0-types:wson-label-start-end;
    }
}
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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range end for the source LTP
    of the connectivity matrix entry information source.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range step for the source LTP
    of the connectivity matrix entry information source.";
case wson {
    uses l0-types:wson-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/'
+ 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range start for the destination LTP
    of the connectivity matrix entry information source.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

```

```

}

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
  WSON topology type.";
}
description
  "Augment TE label range end for the destination LTP
  of the connectivity matrix entry information source.";
case wson {
  uses l0-types:wson-label-start-end;
}
}

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
  WSON topology type.";
}
description
  "Augment TE label range step for the destination LTP
  of the connectivity matrix entry information source.";
case wson {
  uses l0-types:wson-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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
  WSON topology type.";
}
description
  "Augment TE label hop for the underlay primary path
  of the connectivity matrix entry information source.";
case wson {
  uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
    }
description
    "Augment TE label hop for the underlay backup path
    of the connectivity matrix entry information source.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON 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 wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON 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 wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label hop for the computed path route objects
    of the connectivity matrix entry information source.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range start for the TTP
    Local Link Connectivities.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range end for the TTP
    Local Link Connectivities.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
    }
description
    "Augment TE label range step for the TTP
    Local Link Connectivities.";
case wson {
    uses l0-types:wson-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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
    }
description
    "Augment TE label hop for the underlay primary path
    of the TTP Local Link Connectivities.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
    }
description
    "Augment TE label hop for the underlay backup path
    of the TTP Local Link Connectivities.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'

```

```

    + 'wsont:wson-topology' {
    description
        "Augmentation parameters apply only for networks with
        WSON topology type.";
    }
description
    "Augment TE label hop for the explicit route objects excluded
    by the path computation of the TTP Local Link
    Connectivities.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
    description
        "Augmentation parameters apply only for networks with
        WSON topology type.";
    }
description
    "Augment TE label hop for the explicit route objects included
    by the path computation of the TTP Local Link
    Connectivities.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
    description
        "Augmentation parameters apply only for networks with
        WSON topology type.";
    }
description
    "Augment TE label hop for the computed path route objects
    of the TTP Local Link Connectivities.";
case wson {
    uses l0-types:wson-label-hop;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range start for the TTP
    Local Link Connectivity entry.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range end for the TTP
    Local Link Connectivity entry.";
case wson {
    uses l0-types:wson-label-start-end;
}
}

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/'
    + 'wsont:wson-topology' {
description
    "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
    "Augment TE label range step for the TTP
    Local Link Connectivity entry.";
case wson {
    uses l0-types:wson-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/'
    + 'wsont:wson-topology' {
description

```

```

        "Augmentation parameters apply only for networks with
        WSON topology type.";
    }
    description
        "Augment TE label hop for the underlay primary path
        of the TTP Local Link Connectivity entry.";
    case wson {
        uses l0-types:wson-label-hop;
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON topology type.";
        }
        description
            "Augment TE label hop for the underlay backup path
            of the TTP Local Link Connectivity entry.";
        case wson {
            uses l0-types:wson-label-hop;
        }
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
            WSON 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 wson {
            uses l0-types:wson-label-hop;
        }
    }
}

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/'
+ 'wsont:wson-topology' {
description
"Augmentation parameters apply only for networks with
WSON 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 wson {
uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
"Augmentation parameters apply only for networks with
WSON topology type.";
}
description
"Augment TE label hop for the computed path route objects
of the TTP Local Link Connectivity entry.";
case wson {
uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
"Augmentation parameters apply only for networks with
WSON topology type.";
}
description
"Augment TE label hop for the underlay primary path
of the TE link.";
case wson {
uses l0-types:wson-label-hop;
}
}

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/'
+ 'wsont:wson-topology' {
description
"Augmentation parameters apply only for networks with
WSON topology type.";
}
}

```

```

    }
    description
      "Augment TE label hop for the underlay backup path
        of the TE link.";
    case wson {
      uses l0-types:wson-label-hop;
    }
  }
}

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
  "Augment TE label range start for the TE link.";
case wson {
  uses l0-types:wson-label-start-end;
}
}

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
  "Augment TE label range end for the TE link.";
case wson {
  uses l0-types:wson-label-start-end;
}
}

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/'
+ 'wsont:wson-topology' {
description
  "Augmentation parameters apply only for networks with
    WSON topology type.";
}
description
  "Augment TE label range step for the TE link.";
case wson {
  uses l0-types:wson-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/'
+ 'wsont:wson-topology' {

```



```

        description
            "Augmentation parameters apply only for networks with
              WSON topology type.";
    }
    description
        "Augment TE label range start for the TE link
          information source.";
    case wson {
        uses l0-types:wson-label-start-end;
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
              WSON topology type.";
    }
    description
        "Augment TE label range end for the TE link
          information source.";
    case wson {
        uses l0-types:wson-label-start-end;
    }
}

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/'
        + 'wsont:wson-topology' {
        description
            "Augmentation parameters apply only for networks with
              WSON topology type.";
    }
    description
        "Augment TE label range step for the TE link
          information source.";
    case wson {
        uses l0-types:wson-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 wson {
        uses l0-types:wson-label-hop;
    }
}

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 wson {
        uses 10-types:wson-label-hop;
    }
}

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 wson {
        uses 10-types:wson-label-start-end;
    }
}

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 wson {
        uses 10-types:wson-label-start-end;
    }
}

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 wson {
        uses 10-types:wson-label-step;
    }
}
}
<CODE ENDS>

```

4. Security Considerations

The YANG module specified in this document defines a schema for data that is designed to be accessed via network management protocols such as NETCONF [RFC6241] or RESTCONF [RFC8040]. The lowest NETCONF layer is the secure transport layer, and the mandatory-to-implement secure transport is Secure Shell (SSH) [RFC6242]. The lowest RESTCONF layer is HTTPS, and the mandatory-to-implement secure transport is TLS [RFC8446].

The NETCONF protocol over Secure Shell (SSH) specification [RFC6242] describes a method for invoking and running NETCONF within a Secure Shell (SSH) session as an SSH subsystem. The NETCONF access control model [RFC8341] provides the means to restrict access for particular NETCONF or RESTCONF users to a preconfigured subset of all available NETCONF or RESTCONF protocol operations and content.

There are a number of data nodes defined in this YANG module that 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., edit-config) to these data nodes without proper protection can have a negative effect on network operations. Considerations in Section 8 of [RFC8795] are also applicable to the module defined in this document.

Some of the readable data nodes in this YANG module may be considered sensitive or vulnerable in some network environments. It is thus important to control read access (e.g., via get, get-config, or notification) to these data nodes. Considerations in Section 8 of [RFC8795] are also applicable to the module defined in this document.

Finally, the YANG module described in this document augments the "ietf-network" YANG module [RFC8345] and the "ietf-te-topology" YANG module [RFC8795] by adding data nodes. The security considerations for the subtrees described in those RFCs apply equally to the new data nodes that this module adds.

5. IANA Considerations

IANA has assigned new URIs from the "IETF XML Registry" [RFC3688] as follows:

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

This document registers a YANG module in the "YANG Module Names" registry [RFC7950] [RFC6020].

Name: ietf-wson-topology
Namespace: urn:ietf:params:xml:ns:yang:ietf-wson-topology
Prefix: wsont
Reference: RFC 9094

6. References

6.1. Normative References

- [ITU-Tg6982]
ITU-T, "Amplified multichannel dense wavelength division multiplexing applications with single channel optical interfaces", ITU-T Recommendation G.698.2, November 2018.
- [RFC6020] Bjorklund, M., Ed., "YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)", RFC 6020, DOI 10.17487/RFC6020, October 2010, <<https://www.rfc-editor.org/info/rfc6020>>.
- [RFC6241] Enns, R., Ed., Bjorklund, M., Ed., Schoenwaelder, J., Ed., and A. Bierman, Ed., "Network Configuration Protocol (NETCONF)", RFC 6241, DOI 10.17487/RFC6241, June 2011, <<https://www.rfc-editor.org/info/rfc6241>>.
- [RFC6242] Wasserman, M., "Using the NETCONF Protocol over Secure Shell (SSH)", RFC 6242, DOI 10.17487/RFC6242, June 2011, <<https://www.rfc-editor.org/info/rfc6242>>.
- [RFC7579] Bernstein, G., Ed., Lee, Y., Ed., Li, D., Imajuku, W., and J. Han, "General Network Element Constraint Encoding for GMPLS-Controlled Networks", RFC 7579, DOI 10.17487/RFC7579, June 2015, <<https://www.rfc-editor.org/info/rfc7579>>.
- [RFC7581] Bernstein, G., Ed., Lee, Y., Ed., Li, D., Imajuku, W., and J. Han, "Routing and Wavelength Assignment Information Encoding for Wavelength Switched Optical Networks", RFC 7581, DOI 10.17487/RFC7581, June 2015, <<https://www.rfc-editor.org/info/rfc7581>>.
- [RFC7950] Bjorklund, M., Ed., "The YANG 1.1 Data Modeling Language", RFC 7950, DOI 10.17487/RFC7950, August 2016,

- <<https://www.rfc-editor.org/info/rfc7950>>.
- [RFC8040] Bierman, A., Bjorklund, M., and K. Watsen, "RESTCONF Protocol", RFC 8040, DOI 10.17487/RFC8040, January 2017, <<https://www.rfc-editor.org/info/rfc8040>>.
- [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/info/rfc8340>>.
- [RFC8341] Bierman, A. and M. Bjorklund, "Network Configuration Access Control Model", STD 91, RFC 8341, DOI 10.17487/RFC8341, March 2018, <<https://www.rfc-editor.org/info/rfc8341>>.
- [RFC8342] Bjorklund, M., Schoenwaelder, J., Shafer, P., Watsen, K., and R. Wilton, "Network Management Datastore Architecture (NMDA)", RFC 8342, DOI 10.17487/RFC8342, March 2018, <<https://www.rfc-editor.org/info/rfc8342>>.
- [RFC8345] Clemm, A., Medved, J., Varga, R., Bahadur, N., Ananthakrishnan, H., and X. Liu, "A YANG Data Model for Network Topologies", RFC 8345, DOI 10.17487/RFC8345, March 2018, <<https://www.rfc-editor.org/info/rfc8345>>.
- [RFC8446] Rescorla, E., "The Transport Layer Security (TLS) Protocol Version 1.3", RFC 8446, DOI 10.17487/RFC8446, August 2018, <<https://www.rfc-editor.org/info/rfc8446>>.
- [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/info/rfc8795>>.
- [RFC9093] Zheng, H., Lee, Y., Guo, A., Lopez, V., and D. King, "A YANG Data Model for Layer 0 Types", RFC 9093, DOI 10.17487/RFC9093, August 2021, <<https://www.rfc-editor.org/info/rfc9093>>.

6.2. Informative References

- [FLEXI-GRID-YANG]
Lopez de Vergara, J., Perdices Burrero, D., King, D., Lee, Y., and H. Zheng, "A YANG Data Model for Flexi-Grid Optical Networks", Work in Progress, Internet-Draft, draft-ietf-ccamp-flexigrid-yang-10, 12 July 2021, <<https://datatracker.ietf.org/doc/html/draft-ietf-ccamp-flexigrid-yang-10>>.
- [OPT-IMPAIR-AWARE-YANG]
Lee, Y., Le Rouzic, E., Lopez, V., Galimberti, G., and D. Beller, "A YANG Data Model for Optical Impairment-aware Topology", Work in Progress, Internet-Draft, draft-ietf-ccamp-optical-impairment-topology-yang-07, 8 July 2021, <<https://datatracker.ietf.org/doc/html/draft-ietf-ccamp-optical-impairment-topology-yang-07>>.
- [RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.
- [RFC7446] Lee, Y., Ed., Bernstein, G., Ed., Li, D., and W. Imajuku, "Routing and Wavelength Assignment Information Model for Wavelength Switched Optical Networks", RFC 7446, DOI 10.17487/RFC7446, February 2015,

<<https://www.rfc-editor.org/info/rfc7446>>.

Contributors

Dhruv Dhody
Huawei Technologies

Email: dhruv.ietf@gmail.com

Bin Yeong Yoon
ETRI

Email: byyun@etri.re.kr

Ricard Vilalta
CTTC

Email: vricard.vilalta@cttc.es

Italo Busi
Huawei Technologies

Email: Italo.Busi@huawei.com

Authors' Addresses

Haomian Zheng
Huawei Technologies
H1, Huawei Xiliu Beipo Village, Songshan Lake
Dongguan
Guangdong, 523808
China

Email: zhenghaomian@huawei.com

Additional contact information:

好棉
中国
523808
广 莞
松山湖溪流背坡村H1
技术有限公司

Young Lee
Samsung
South Korea

Email: younglee.tx@gmail.com

Aihua Guo
Futurewei

Email: aihuaguo.ietf@gmail.com

Victor Lopez
Nokia

Email: victor.lopez@nokia.com

Daniel King
University of Lancaster

Email: d.king@lancaster.ac.uk