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YANG data model for Flexi-Grid Optical Networks
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Abstract

This document defines a YANG module for managing flexi-grid optical networks. The model defined in this document specifies a flexi-grid traffic engineering database that is used to describe the topology of a flexi-grid network. It is based on and augments existing YANG models that describe network and traffic engineering topologies.

A partner document defines a second YANG module for flexi-grid media channels, i.e., the paths from source to destination through a number of intermediate nodes.

Table of Contents

1. Introduction

The flexible grid (flexi-grid) optical network technology defined by the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) and documented in Recommendation G.694.1 [G.694.1] and G.872 [G.872] provides an enhanced Dense Wavelength Division Multiplexing (DWDM) grid by defining a set of nominal central frequencies, channel spacings, and the concept of the "frequency slot". In such an environment, a data-plane connection is switched based on allocated, variable-sized frequency ranges within

the optical spectrum, creating what is known as a flexible grid (flexi-grid). This technology increases both transport network scalability and flexibility, allowing the optimization of bandwidth usage.

[RFC7698] provides a framework GMPLS-Based control of flexi-grid DWDM networks while [RFC7699] defines generalized labels for the use in flexi-grid in GMPLS networks.

This document presents a YANG [RFC7950] model for flexi-grid objects in the dynamic optical network, including the nodes, transponders and links between them, as well as how such links interconnect nodes and transponders.

The YANG model for flexi-grid networks allows the representation of the flexi-grid optical layer of a network, combined with the underlying physical layer.

This document identifies the flexi-grid components, parameters and their values, characterizes the features and the performances of the flexi-grid elements. An application example is provided towards the end of the document to better understand their utility.

A partner document defines a second YANG module that described flexi-grid media channels, i.e., the paths from source to destination through a number of intermediate nodes [I-D.draft-ietf-ccamp-flexigrid-media-channel-yang].

2. Conventions used in this document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

2.1. Terminology

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

o data node

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

o configuration data
o state data

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

2.2. Tree Diagram

A simplified graphical representation of the data model is used in Section 5 of this this document. The meaning of the symbols in these diagrams is defined in [RFC8340].

2.3. Prefixes 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 Table 1.

Prefix	YANG module	Reference
l0-types	ietf-layer0-types	[Layer0-Types]
flexi-grid	ietf-flexi-grid-topology	[RFCXXXX]
nw	ietf-network	[RFC8345]
nt	ietf-network-topology	[RFC8345]
tet	ietf-te-topology	[TE-TOPO]

Table 1: Prefixes and corresponding YANG modules

RFC Editor Note: Please replace XXXX with the RFC number assigned to this document when it is published. Please remove this note.

3. Main building Blocks of the Flexi-grid Topology

This section describes the YANG module. It is specified in Section 5.

The description of the three main components, flexi-grid-node, flexi-grid-transponder and flexi-grid-link is provided below. flexi-grid-sliceable-transponders are also defined.

The syntax specification below uses the augmented Backus-Naur

Form (BNF) as described in [RFC5234].

```
   <flexi-grid-node> ::= <config> <state>

       <flexi-grid-node>: This element designates a node in the
       network.

       <config> ::= <flexi-grid-node-attributes-config>

           <config>: Contains the configuration of a node.

           <flexi-grid-node-attributes-config> ::= <list-interface>
                                                   <connectivity_matrix>

               <flexi-grid-node-attributes-config>: Contains all the
               attributes related to the node configuration, such as
               its interfaces or its management addresses.
                   <list-interface> ::= <name> <port-number>
                   <input-port> <output-port> <description>
                   <interface-type>
                   [<numbered-interface> / <unnumbered-interface>]

                       <list-interface>: The list containing all the
                       information of the interfaces.

                       <name>: Determines the interface name.

                       <port-number>: Port number of the interface.

                       <input-port>: Boolean value that defines
                       whether the interface is input or not.

                       <output-port>: Boolean value that defines
                       whether the interface is output or not.

                       <description>: Description of the usage of
                       the interface.

                       <interface-type>: Determines if the interface
                       is numbered or unnumbered.

                       <numbered-interface> ::= <n-i-ip-address>
                           <numbered-interface>: An interface with
                           its own IP address.

                           <n-i-ip-address>: Only available if
                           <interface-type> is "numbered-interface".
                           Determines the IP address of the interface.

                       <unnumbered-interface> ::= <u-i-ip-address>
                       <label>
```

<unnumbered-interface>: An interface that needs a label to be unique.

<u-i-ip-address>: Only available if <interface-type> is "numbered-interface". Determines the node IP address, which with the label defines the interface.

<label>: Label that determines the interface, joint with the node IP address.

<connectivity-matrix> ::= <connections>

<connectivity-matrix>: Determines whether a connection port in/port out exists.

<connections> ::= <input-port-id> <output-port-id>

<flexi-grid-transponder> ::= <transponder-type> <config> <state>

<flexi-grid-transponder>: This item designates a transponder of a node.

<config> ::= <flexi-grid-transponder-attributes-config>

<config>: Contains the configuration of a transponder.

<flexi-grid-transponder-attributes-config> ::= <available-operational-mode> <operational-mode>

<flexi-grid-transponder-attributes>: Contains all the attributes related to the transponder.

<available-operational-mode>: It provides a list of the operational modes available at this transponder.

<operational-mode>: Determines the type of operational mode in use.

<state> ::= <flexi-grid-transponder-attributes-config> <flexi-grid-transponder-attributes-state>

<state>: Contains the state of a transponder.

<flexi-grid-transponder-attributes-config>: See above.

<flexi-grid-transponder-attributes-state>: Contains the state of a transponder.

<flexi-grid-link> ::= <config> <state>

<flexi-grid-link>: This element describes all the information of a link.

<config> ::= <flexi-grid-link-attributes-config>

<config>: Contains the configuration of a link.

<flexi-grid-link-attributes-config> ::= <technology-type>
<available-label-flexi-grid> <N-max> <base-frequency>
<nominal-central-frequency-granularity>
<slot-width-granularity>

<flexi-grid-link-attributes>: Contains all the attributes related to the link, such as its unique id, its N value, its latency, etc.

<link-id>: Unique id of the link.

<available-label-flexi-grid>: Array of bits that determines, with each bit, the availability of each interface for flexi-grid technology.

<N-max>: The max value of N in this link, being N the number of slots.

<base-frequency>: The default central frequency used in the link.

<nominal-central-frequency-granularity>: It is the spacing between allowed nominal central frequencies and it is set to 6.25 GHz (note: sometimes referred to as 0.00625 THz).

<slot-width-granularity>: 12.5 GHz, as defined in G.694.1.

<state> ::= <flexi-grid-link-attributes-config>
<flexi-grid-link-attributes-state>

<state>: Contains the state of a link.

<flexi-grid-link-attributes-config>: See above.

<flexi-grid-link-attributes-state>: Contains all the the information related to the state of a link.

4. Example of Use

In order to explain how this model is used, we provide the following example. An optical network usually has multiple transponders, switches (nodes) and links between them. Figure 1 shows a simple topology, where two physical paths interconnect two optical transponders.

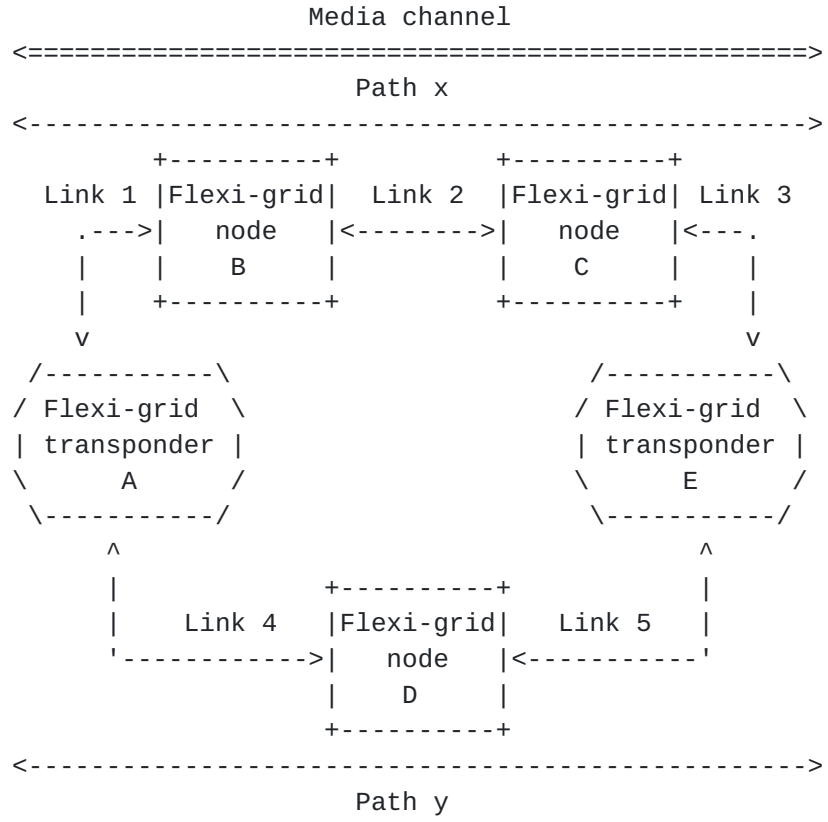

Figure 1. Topology example.

In order to configure a media channel to interconnect transponders A and E, first of all we have to populate the flexi-grid topology YANG model with all elements in the network:

1. We define the transponders A and E, including their FEC type, if enabled, and modulation type. We also provide node identifiers and addresses for the transponders, as well as interfaces included in the transponders. Sliceable transponders can also be defined if needed.

2. We do the same for the nodes B, C and D, providing their identifiers, addresses and interfaces, as well as the internal connectivity matrix between interfaces.

3. Then, we also define the links 1 to 5 that interconnect nodes and

transponders, indicating which flexi-grid labels are available.

Other information, such as the slot frequency and granularity are also provided.

Next, we can configure the media channel from the information we have stored in the flexi-grid TED, by querying which elements are available, and planning the resources that have to be provided on each situation. Note that every element in the flexi-grid TED has a reference, and this is the way in which they are called in the media channel. We refer to [I-D.draft-ietf-ccamp-flexigrid-media-channel-yang] to complete this example.

5. Flexi-grid Topology YANG Model

5.1. Yang Model - Tree Structure

```
module: ietf-flexi-grid-topology

  augment /nw:networks/nw:network/nw:network-types/tet:te-topology:
    +--rw flexi-grid-topology!

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:te-link-attributes:

  augment /nw:networks/nw:network/nw:node/nt:termination-point/tet:te:
    +--rw supported-payload-types* [index]
    |  +--rw index           uint16
    |  +--rw payload-type?   string
    +--rw client-facing?             boolean

  augment /nw:networks/nw:network/nw:node/tet:te/tet:te-node-attributes:
    +--rw flexi-grid-node
       +--rw node-type?   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:tunnel-termination-point:
    +--rw supported-operational-modes*    l0-types:operational-mode
    +--rw configured-operational-modes?   l0-types:operational-mode
    +--rw supported-fec-types*            identityref
    +--rw supported-termination-types*    identityref
    +--rw supports-bit-stuffing?          boolean
    +--rw is-tunable?                     boolean
    +--rw max-subcarrier-channel-num?     uint8
    +--rw supports-flexi-grid?            boolean

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

```
    +--:(flexi-grid)
       +--rw bandwidth-type?   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/tet:te-node-attributes/
    tet:connectivity-matrices/tet:path-constraints/tet:te-bandwidth/
    tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/tet:te-node-attributes/
    tet:connectivity-matrices/tet:connectivity-matrix/
    tet:path-constraints/tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:information-source-entry/tet:connectivity-matrices/
    tet:path-constraints/tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--ro supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:information-source-entry/tet:connectivity-matrices/
    tet:connectivity-matrix/tet:path-constraints/tet:te-bandwidth/
    tet:technology:
    +--:(flexi-grid)
       +--ro supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:tunnel-termination-point/tet:client-layer-adaptation/
    tet:switching-capability/tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:tunnel-termination-point/tet:local-link-connectivities/
    tet:path-constraints/tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:tunnel-termination-point/tet:local-link-connectivities/
    tet:local-link-connectivity/tet:path-constraints/
    tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:te-link-attributes/tet:interface-switching-capability/
```

```
    tet:max-lsp-bandwidth/tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw bandwidth-type?   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:te-link-attributes/tet:max-link-bandwidth/tet:te-bandwidth/
    tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:te-link-attributes/tet:max-resv-link-bandwidth/
    tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:te-link-attributes/tet:unreserved-bandwidth/
    tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:information-source-entry/tet:interface-switching-capability/
    tet:max-lsp-bandwidth/tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--ro bandwidth-type?   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:information-source-entry/tet:max-link-bandwidth/
    tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--ro supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:information-source-entry/tet:max-resv-link-bandwidth/
    tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--ro supported-bandwidth-list*   identityref

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:information-source-entry/tet:unreserved-bandwidth/
    tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--ro supported-bandwidth-list*   identityref

  augment /nw:networks/tet:te/tet:templates/tet:link-template/
    tet:te-link-attributes/tet:interface-switching-capability/
    tet:max-lsp-bandwidth/tet:te-bandwidth/tet:technology:
```

```
    +--:(flexi-grid)
       +--rw bandwidth-type?   identityref

  augment /nw:networks/tet:te/tet:templates/tet:link-template/
    tet:te-link-attributes/tet:max-link-bandwidth/tet:te-bandwidth/
    tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/tet:te/tet:templates/tet:link-template/
    tet:te-link-attributes/tet:max-resv-link-bandwidth/
    tet:te-bandwidth/tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  augment /nw:networks/tet:te/tet:templates/tet:link-template/
    tet:te-link-attributes/tet:unreserved-bandwidth/tet:te-bandwidth/
    tet:technology:
    +--:(flexi-grid)
       +--rw supported-bandwidth-list*   identityref

  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
    +--rw flexi-grid
       +--rw nominal-central-frequency-granularity?   identityref
       +--rw slot-width-granularity?                  identityref
       +--rw min-slot-width-factor?                   uint16
       +--rw max-slot-width-factor?                   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi?   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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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
    +--rw flexi-grid
       +--rw nominal-central-frequency-granularity?   identityref
       +--rw slot-width-granularity?                  identityref
       +--rw min-slot-width-factor?                   uint16
       +--rw max-slot-width-factor?                   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi?   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:
    +--rw grid-type?    identityref
    +--rw priority?     uint8
    +--rw flexi-grid
       +--rw nominal-central-frequency-granularity?   identityref
       +--rw slot-width-granularity?                  identityref
       +--rw min-slot-width-factor?                   uint16
       +--rw max-slot-width-factor?                   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:te-node-attributes/tet:connectivity-matrices/
    tet:connectivity-matrix/tet:to/tet:label-restrictions/
    tet:label-restriction/tet:label-start/tet:te-label/tet:technology:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:te-node-attributes/tet:connectivity-matrices/
    tet:connectivity-matrix/tet:to/tet:label-restrictions/
    tet:label-restriction/tet:label-end/tet:te-label/tet:technology:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:te-node-attributes/tet:connectivity-matrices/
    tet:connectivity-matrix/tet:to/tet:label-restrictions/
    tet:label-restriction/tet:label-step/tet:technology:
    +--:(flexi-grid)
       +--rw flexi?   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:

```
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

 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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
```

```
       +--rw (single-or-super-channel)?
```

```
         +--:(single)
         |  +--rw flexi-n?             uint16
         |  +--rw flexi-m?             uint16
         +--:(super)
            +--rw subcarrier-flexi-n* [flexi-n]
               +--rw flexi-n    uint16
               +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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
    +--ro flexi-grid
       +--ro nominal-central-frequency-granularity?   identityref
       +--ro slot-width-granularity?                  identityref
       +--ro min-slot-width-factor?                   uint16
       +--ro max-slot-width-factor?                   uint16

  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:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16
```

```
  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:
    +--:(flexi-grid)
       +--ro flexi?   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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16
```

```
  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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
    +--ro flexi-grid
       +--ro nominal-central-frequency-granularity?   identityref
       +--ro slot-width-granularity?                  identityref
       +--ro min-slot-width-factor?                   uint16
       +--ro max-slot-width-factor?                   uint16

  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:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16
```

```
  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:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--ro flexi?   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:
    +--ro grid-type?    identityref
    +--ro priority?     uint8
    +--ro flexi-grid
       +--ro nominal-central-frequency-granularity?   identityref
       +--ro slot-width-granularity?                  identityref
       +--ro min-slot-width-factor?                   uint16
       +--ro max-slot-width-factor?                   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:information-source-entry/tet:connectivity-matrices/
    tet:connectivity-matrix/tet:to/tet:label-restrictions/
    tet:label-restriction/tet:label-start/tet:te-label/tet:technology:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:information-source-entry/tet:connectivity-matrices/
    tet:connectivity-matrix/tet:to/tet:label-restrictions/
    tet:label-restriction/tet:label-end/tet:te-label/tet:technology:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:information-source-entry/tet:connectivity-matrices/
    tet:connectivity-matrix/tet:to/tet:label-restrictions/
    tet:label-restriction/tet:label-step/tet:technology:
    +--:(flexi-grid)
       +--ro flexi?   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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16
```

```
  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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
    +--rw flexi-grid
       +--rw nominal-central-frequency-granularity?   identityref
       +--rw slot-width-granularity?                  identityref
       +--rw min-slot-width-factor?                   uint16
       +--rw max-slot-width-factor?                   uint16

  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:
    +--:(flexi-grid)
```

```
       +--rw flexi-n?   uint16
```

```
  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi?   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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?              uint16
          |  +--rw flexi-m?              uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:tunnel-termination-point/tet:local-link-connectivities/
    tet:underlay/tet:backup-path/tet:path-element/tet:type/tet:label/
    tet:label-hop/tet:te-label/tet:technology:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?              uint16
          |  +--rw flexi-m?              uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
```

```
    +--:(flexi-grid)
```

```
      +--rw (single-or-super-channel)?
         +--:(single)
         |  +--rw flexi-n?             uint16
         |  +--rw flexi-m?             uint16
         +--:(super)
            +--rw subcarrier-flexi-n* [flexi-n]
               +--rw flexi-n    uint16
               +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?             uint16
          |  +--ro flexi-m?             uint16
          +--:(super)
             +--ro subcarrier-flexi-n* [flexi-n]
                +--ro flexi-n    uint16
                +--ro flexi-m?   uint16

  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
    +--rw flexi-grid
       +--rw nominal-central-frequency-granularity?   identityref
       +--rw slot-width-granularity?                  identityref
```

```
      +--rw min-slot-width-factor?                  uint16
      +--rw max-slot-width-factor?                  uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi?   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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  augment /nw:networks/nw:network/nw:node/tet:te/
    tet:tunnel-termination-point/tet:local-link-connectivities/
    tet:local-link-connectivity/tet:underlay/tet:backup-path/
    tet:path-element/tet:type/tet:label/tet:label-hop/tet:te-label/
    tet:technology:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
```

```
          |  +--rw flexi-m?              uint16
```

```
         +--:(super)
            +--rw subcarrier-flexi-n* [flexi-n]
               +--rw flexi-n    uint16
               +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?              uint16
          |  +--rw flexi-m?              uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?              uint16
          |  +--rw flexi-m?              uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--ro (single-or-super-channel)?
          +--:(single)
          |  +--ro flexi-n?              uint16
```

```
          |  +--ro flexi-m?              uint16
```

```
        +--:(super)
            +--ro subcarrier-flexi-n* [flexi-n]
               +--ro flexi-n    uint16
               +--ro flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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
    +--rw flexi-grid
       +--rw nominal-central-frequency-granularity?   identityref
       +--rw slot-width-granularity?                  identityref
       +--rw min-slot-width-factor?                   uint16
       +--rw max-slot-width-factor?                   uint16

  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:
    +--:(flexi-grid)
```

```
       +--rw flexi-n?   uint16
```

```
  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:te-link-attributes/tet:label-restrictions/
    tet:label-restriction/tet:label-step/tet:technology:
    +--:(flexi-grid)
       +--rw flexi?   identityref

  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
    +--ro flexi-grid
       +--ro nominal-central-frequency-granularity?   identityref
       +--ro slot-width-granularity?                  identityref
       +--ro min-slot-width-factor?                   uint16
       +--ro max-slot-width-factor?                   uint16

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:information-source-entry/tet:label-restrictions/
    tet:label-restriction/tet:label-start/tet:te-label/tet:technology:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--ro flexi-n?   uint16

  augment /nw:networks/nw:network/nt:link/tet:te/
    tet:information-source-entry/tet:label-restrictions/
    tet:label-restriction/tet:label-step/tet:technology:
    +--:(flexi-grid)
       +--ro flexi?   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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
```

```
          |  +--rw flexi-n?              uint16
```

```
         |  +--rw flexi-m?             uint16
         +--:(super)
            +--rw subcarrier-flexi-n* [flexi-n]
               +--rw flexi-n    uint16
               +--rw flexi-m?   uint16

  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:
    +--:(flexi-grid)
       +--rw (single-or-super-channel)?
          +--:(single)
          |  +--rw flexi-n?             uint16
          |  +--rw flexi-m?             uint16
          +--:(super)
             +--rw subcarrier-flexi-n* [flexi-n]
                +--rw flexi-n    uint16
                +--rw flexi-m?   uint16

  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
    +--rw flexi-grid
       +--rw nominal-central-frequency-granularity?   identityref
       +--rw slot-width-granularity?                  identityref
       +--rw min-slot-width-factor?                   uint16
       +--rw max-slot-width-factor?                   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi-n?   uint16

  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:
    +--:(flexi-grid)
       +--rw flexi?   identityref
```

5.2. YANG Model - Code

RFC Editor Note: Please replace the string "ZZZZ" in the YANG model definition below with the RFC number assigned to draft-ietf-ccamp-wson-yang when it is published as an RFC. Please replace the string "YYYY" in the YANG model definition below with the RFC number assigned to draft-ietf-teas-yang-te-topo when it is published as an RFC. Please also remove this note.

```
<CODE BEGINS>file "ietf-flexi-grid-topology@2020-07-12.yang"
module ietf-flexi-grid-topology {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-flexi-grid-topology";

prefix "flexi-grid-topology";

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 YYYY: YANG Data Model for
     Traffic Engineering (TE) Topologies";
}

import ietf-layer0-types {
  prefix "layer0-types";
  reference
    "RFC ZZZZ: A YANG Data Model for WSON
     (Wavelength Switched Optical Networks)";
}

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

```
       Editor: Jorge E. Lopez de Vergara
         <mailtojorge.lopez_vergara@uam.es>

       Editor: Daniel Perdices
         <mailto:daniel.perdices@naudit.es>

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

       Editor: Daniel King
         <mailto:d.king@lancaster.ac.uk>";

       Editor: Young Lee
         <mailto:younglee.tx@gmail.com>

    description
      "This module defines a model for flexi-grid topology

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    as authors of the code.  All rights reserved.

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    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
    (http://trustee.ietf.org/license-info).";

  revision 2020-07-12 {
    description
      "Initial Version";

    reference
      "RFC ZZZZ: A Yang Data Model for flexi-grid Optical Networks ";
  }

  /*
   * Groupings
   */
  grouping flexi-grid-node-attributes {
    description "flexi-grid node attributes.";

    container flexi-grid-node {
      description "flexi-grid node attrtibutes.";
      leaf node-type {
        type identityref {
          base l0-types:layer0-node-type;
        }
```

```
        description "flexi-grid node type.";
      }
    }
  }

  grouping flexi-grid-link-attributes {
    description
     "Future flexi-grid link attributes extensions";
  }
  grouping flexi-grid-tp-attributes {
    description "flexi-grid-tp-attributes";

    list supported-payload-types {
      key "index";
      description
        "Supported payload types of a TP. The payload type is defined
         as the generalized PIDs in GMPLS.";
      leaf index {
        type uint16;
        description "payload type index";
      }
      leaf payload-type {
        type string;
        description "the payload type supported by this client tp";
        reference
          "http://www.iana.org/assignments/gmpls-sig-parameters
           /gmpls-sig-parameters.xhtml";
      }
    }
    leaf client-facing {
      type boolean;
      default 'false';
      description
        "Indicating if it is a client-facing TP.";
    }
  }

  grouping flexi-grid-ttp-attributes {
    description
     "flexi-grid tunnel termination point (e.g.tranponder)
       attributes";
    leaf-list supported-operational-modes {
      type l0-types:operational-mode;
      description
        "List of all supported vendor-specific
         mode identifiers";
    }
    leaf configured-operational-modes {
```

```
      type l0-types:operational-mode;
```

```
      description
       "Vendor-specific mode identifier configured
         on the TTP.";
    }

    leaf-list supported-fec-types {
      type identityref {
        base l0-types:fec-type;
      }
       description
        "List of all supported FEC types by this TTP.";
    }

    leaf-list supported-termination-types {
      type identityref {
        base l0-types:term-type;
      }
        description
         "List of all supported termination types by this TTP.";
    }

    leaf supports-bit-stuffing {
       type boolean;
       description
         "Indicate whether bit stuffing is supported by this TTP.";
    }

    leaf is-tunable {
      type boolean;
      description
        "Indicates if the TTP, or transponder, is tunable. Tunable
         transponders are assumed to be fully tunable to any of the
         96 channels within DWDM C-band.";
    }

    leaf max-subcarrier-channel-num {
      type uint8 {
     range "1..max";
      }
      default 1;
      description
        "Indicate the maximum number of subcarrier channels for
          super-channel transponders. When the value equals 1 it
          represents regular single-channel transponder.";
    }
    leaf supports-flexi-grid {
      type boolean;
      description
```

```
        "Indicates if the TTP, or transponder, supports flex grid.";
```

```
    }
  }

  /*
   * Data nodes
   */

  augment "/nw:networks/nw:network/nw:network-types"
   + "/tet:te-topology" {
      description "flexi-grid-topology augmented";
      container flexi-grid-topology {
        presence "indicates a topology of Flex Grid";
        description
          "Container to identify flexi-grid topology type";
      }
  }

  augment "/nw:networks/nw:network/nt:link/tet:te"
        + "/tet:te-link-attributes"   {
    when "/nw:networks/nw:network/nw:network-types"
        +"/tet:te-topology/flexi-grid:flexi-grid-topology" {
       description "This augment is only valid for flexi-grid.";
    }
    description "flexi-grid Link augmentation.";
    uses flexi-grid-link-attributes;
  }

  augment "/nw:networks/nw:network/nw:node/nt:termination-point/"
        + "tet:te" {
    when "/nw:networks/nw:network/nw:network-types"
        +"/tet:te-topology/flexi-grid:flexi-grid-topology" {
       description "This augment is only valid for flexi-grid.";
    }
    description "flexi-grid TP attributes.";
    uses flexi-grid-tp-attributes;
  }

  augment "/nw:networks/nw:network/nw:node/tet:te"
        + "/tet:te-node-attributes" {
    when "/nw:networks/nw:network/nw:network-types"
       +"/tet:te-topology/flexi-grid:flexi-grid-topology" {
       description "This augment is only valid for flexi-grid.";
    }
    description "flexi-grid Node augmentation.";
    uses flexi-grid-node-attributes;
  }
  augment "/nw:networks/nw:network/nw:node/tet:te"
        + "/tet:tunnel-termination-point" {
```

```
    when "/nw:networks/nw:network/nw:network-types"
```

```
       +"/tet:te-topology/flexi-grid:flexi-grid-topology" {
      description "This augment is only valid for flexi-grid.";
    }
    description "flexi-grid tunnel termination point augmentation.";
    uses flexi-grid-ttp-attributes;
  }

  /*
   * Augment TE bandwidth
   */

  /* Augment maximum LSP bandwidth of link terminationpoint (LTP) */
  augment "/nw:networks/nw:network/nw:node/nt:termination-point/"
        + "tet:te/"
        + "tet:interface-switching-capability/tet:max-lsp-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-bandwidth;
    }
  }


  /* Augment bandwidth path constraints of connectivity-matrices */
  augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:te-node-attributes/tet:connectivity-matrices/"
        + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }
  /* Augment bandwidth path constraints of connectivity-matrix */
  augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:te-node-attributes/tet:connectivity-matrices/"
        + "tet:connectivity-matrix/"
        + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
    when "../../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
```

```
    }
```

```
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }


  /* Augment bandwidth path constraints of connectivity-matrices
     information-source */
  augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:information-source-entry/tet:connectivity-matrices/"
        + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }


  /* Augment bandwidth path constraints of connectivity-matrix
     information-source */
  augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:information-source-entry/tet:connectivity-matrices/"
        + "tet:connectivity-matrix/"
        + "tet:path-constraints/tet:te-bandwidth/tet:technology" {
    when "../../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }
  /* Augment client bandwidth of tunnel termination point (TTP) */
  augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:tunnel-termination-point/"
        + "tet:client-layer-adaptation/tet:switching-capability/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
    }
    description "flexi-grid bandwidth.";
```

```
    case flexi-grid {
```

```
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }

  /* Augment bandwidth path constraints of local-link-connectivities */
  augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:tunnel-termination-point/"
        + "tet:local-link-connectivities/tet:path-constraints/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }

  /* Augment bandwidth path constraints of local-link-connectivity
     (LLC) */
  augment "/nw:networks/nw:network/nw:node/tet:te/"
        + "tet:tunnel-termination-point/"
        + "tet:local-link-connectivities/"
        + "tet:local-link-connectivity/tet:path-constraints/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE bandwidth";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }
  /* Augment maximum LSP bandwidth of TE link */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:te-link-attributes/"
        + "tet:interface-switching-capability/tet:max-lsp-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
```

```
      uses l0-types:flexi-grid-path-bandwidth;
```

```
    }
  }


  /* Augment maximum bandwidth of TE link */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:te-link-attributes/"
        + "tet:max-link-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }


  /* Augment maximum reservable bandwidth of TE link */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:te-link-attributes/"
        + "tet:max-resv-link-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }
  /* Augment unreserved bandwidth of TE Link */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:te-link-attributes/"
        + "tet:unreserved-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }
```

```
  /* Augment maximum LSP bandwidth of TE link information-source */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:information-source-entry/"
        + "tet:interface-switching-capability/"
        + "tet:max-lsp-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-bandwidth;
    }
  }


  /* Augment maximum bandwidth of TE link information-source */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:information-source-entry/"
        + "tet:max-link-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }
  /* Augment maximum reservable bandwidth of TE link information-source
   */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:information-source-entry/"
        + "tet:max-resv-link-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }
```

```
  /* Augment unreserved bandwidth of TE link information-source */
  augment "/nw:networks/nw:network/nt:link/tet:te/"
        + "tet:information-source-entry/"
        + "tet:unreserved-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
    when "../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }


  /* Augment maximum LSP bandwidth of TE link template */
  augment "/nw:networks/tet:te/tet:templates/"
        + "tet:link-template/tet:te-link-attributes/"
        + "tet:interface-switching-capability/"
        + "tet:max-lsp-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
/*
    when "../../../../../../nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
*/
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-bandwidth;
    }
  }
  /* Augment maximum bandwidth of TE link template */
  augment "/nw:networks/tet:te/tet:templates/"
        + "tet:link-template/tet:te-link-attributes/"
        + "tet:max-link-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
/*
    when "../../../../../nw:network-types/tet:te-topology/"
        + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
*/
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
```

```
  }
```

```
  /* Augment maximum reservable bandwidth of TE link template */
  augment "/nw:networks/tet:te/tet:templates/"
        + "tet:link-template/tet:te-link-attributes/"
        + "tet:max-resv-link-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
/*
    when "../../../../../nw:network-types/tet:te-topology/"
        + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
*/
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }

  /* Augment unreserved bandwidth of TE link template */
  augment "/nw:networks/tet:te/tet:templates/"
        + "tet:link-template/tet:te-link-attributes/"
        + "tet:unreserved-bandwidth/"
        + "tet:te-bandwidth/tet:technology" {
/*
    when "../../../../../../nw:network-types/tet:te-topology/"
        + "flexi-grid:flexi-grid-topology" {
      description "flexi-grid TE bandwidth.";
    }
*/
    description "flexi-grid bandwidth.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-bandwidth;
    }
  }

  /*
   * Augment TE label.
   */

  /* Augment label restrictions of connectivity-matrices */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
```

```
  }
```

```
  /* Augment label restrictions start of connectivity-matrices */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions end of connectivity-matrices */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }


  /* Augment label restrictions step of connectivity-matrices */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label step.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
```

```
  }
```

```
  /* Augment label hop of underlay primary path of connectivity-matrices
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of underlay backup path of connectivity-matrices
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of route-exclude of connectivity-matrices */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
```

```
    description "flexi-grid label.";
```

```
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of route-include of connectivity-matrices (added)
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of path-route of connectivity-matrices */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }

  /* Augment ingress label restrictions of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }


  /* Augment ingress label restrictions start of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment ingress label restrictions end of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment ingress label restrictions step of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }


  /* Augment egress label restrictions of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }

  /* Augment egress label restrictions start of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment egress label restrictions end of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }


  /* Augment egress label restrictions step of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }
  /* Augment label hop of underlay primary path of connectivity-matrix
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
```

```
  }
```

```
  /* Augment label hop of underlay backup path of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of route-exclude of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of route-include of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
```

```
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of path-route of connectivity-matrix */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label restrictions of connectivity-matrices
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }

  /* Augment label restrictions start of connectivity-matrices
     information-source */
  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/"
```

```
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions end of connectivity-matrices
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }


  /* Augment label restrictions step of connectivity-matrices
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }

  /* Augment label hop of underlay primary path of connectivity-matrices
information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }

  /* Augment label hop of underlay backup path of connectivity-matrices
information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of route-exclude of connectivity-matrices
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
```

```
    }
  }
```

```
  /* Augment label hop of route-include of connectivity-matrices
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of path-route of connectivity-matrices
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }

  /* Augment ingress label restrictions of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
```

```
      description "Augment flexi-grid TE label";
```

```
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }

  /* Augment ingress label restrictions start of connectivity-matrix
information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }


  /* Augment ingress label restrictions end of connectivity-matrix
information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment ingress label restrictions step of connectivity-matrix
information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }
  /* Augment egress label restrictions of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }


  /* Augment egress label restrictions start of connectivity-matrix
information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment egress label restrictions end of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }

  /* Augment egress label restrictions step of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }


  /* Augment label hop of underlay primary path of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
```

```
    }
  }
```

```
  /* Augment label hop of underlay backup path of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of route-exclude of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }

  /* Augment label hop of route-include of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of path-route of connectivity-matrix
     information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }

  /* Augment label restrictions of local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }

  /* Augment label restrictions start of local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }


  /* Augment label restrictions end of local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions step of local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
```

```
  }
```

```
  /* Augment label hop of underlay primary path of
     local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of underlay backup path of
     local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of route-exclude of local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
```

```
      description "Augment flexi-grid TE label";
```

```
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }


  /* Augment label hop of route-include of local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of path-route of local-link-connectivities */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label restrictions of local-link-connectivity (LLC) */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }


 /* Augment label restrictions start of local-link-connectivity (LLC)
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
 /* Augment label restrictions end of local-link-connectivity (LLC) */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions step of local-link-connectivity (LLC) */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }


  /* Augment label hop of underlay primary path of
     local-link-connectivity (LLC) */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of underlay backup path of
     local-link-connectivity (LLC) */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
```

```
      uses l0-types:flexi-grid-path-label;
```

```
    }
  }


  /* Augment label hop of route-exclude of local-link-connectivity (LLC)
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of route-include of local-link-connectivity (LLC)
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
```

```
  /* Augment label hop of path-route of local-link-connectivity (LLC)
   */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of underlay primary path of TE link */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of underlay backup path of TE link */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
```

```
  }
```

```
  /* Augment label restrictions of TE link */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }
  /* Augment label restrictions start of TE link */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions end of TE link */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions step of TE link */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
```

```
    description "flexi-grid label.";
```

```
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }


  /* Augment label restrictions of TE link information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }
  /* Augment label restrictions start of TE link information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions end of TE link information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions step of TE link information-source */
  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/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }

  /* Augment label hop of underlay primary path of TE link template */
  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" {
/*
    when "../../../../../../../../../"
       + "nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
          description "Augment flexi-grid TE label";
    }
*/
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label hop of underlay backup path of TE link template */
  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" {
/*
    when "../../../../../../../../../"
       + "nw:network-types/tet:te-topology/"
       + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
*/
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-path-label;
    }
  }
  /* Augment label restrictions of TE link template */
  augment "/nw:networks/tet:te/tet:templates/"
```

```
        + "tet:link-template/tet:te-link-attributes/"
```

```
       + "tet:label-restrictions/tet:label-restriction" {
/*
    when "../../../../../nw:network-types/tet:te-topology/"
        + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
*/
    description "flexi-grid label.";
    uses l0-types:flexi-grid-label-restriction;
  }


  /* Augment label restrictions start of TE link template */
  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" {
/*
    when "../../../../../../../nw:network-types/tet:te-topology/"
        + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
*/
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }
  /* Augment label restrictions end of TE link template */
  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" {
/*
    when "../../../../../../../nw:network-types/tet:te-topology/"
        + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
*/
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-link-label;
    }
  }

  /* Augment label restrictions step of TE link template */
  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" {
/*
    when "../../../../../../nw:network-types/tet:te-topology/"
        + "flexi-grid:flexi-grid-topology" {
      description "Augment flexi-grid TE label";
    }
*/
    description "flexi-grid label.";
    case flexi-grid {
      uses l0-types:flexi-grid-label-step;
    }
  }
}
```

<CODE ENDS>

6. 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 access control model [RFC8341] provides the means to restrict access for particular NETCONF users to a preconfigured subset of all available NETCONF protocol operations and content. The NETCONF Protocol over Secure Shell (SSH) [RFC6242] describes a method for invoking and running NETCONF within a Secure Shell (SSH) session as an SSH subsystem. The Network Configuration Access Control Model (NACM) [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.

A number of configuration data nodes defined in this document are writable/deletable (i.e., "config true"). These data nodes may be considered sensitive or vulnerable in some network environments.

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. These are the subtrees and data nodes and their sensitivity/vulnerability:

/nw:networks/nw:network/nw:network-types/tet:te-topology

/nw:networks/nw:network/nt:link/tet:te/tet:te-link-attributes

/nw:networks/nw:network/nw:node/nt:termination-point/tet:te

/nw:networks/nw:network/nw:node/tet:te/tet:te-node-attributes
/te-connectivity-matrices/te-connectivity-matrix/tet:path-
constraints/tet:te-bandwidth/tet:technology

/nw:networks/nw:network/nw:node/tet:te
/tet:tunnel-termination-point/tet:local-link-connectivities
/tet:label-restrictions/tet:label-restriction

7. IANA Considerations

IANA is requested to assigned a new URI from the "IETF XML Registry" [RFC3688] as follows:

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

IANA is requested to assign a new YANG module name in the "YANG Module Names" registry [RFC6020] as follows:

Name: ietf-flexi-grid-topology
Namespace: urn:ietf:params:xml:ns:yang:ietf-flexi-grid-topology
Prefix: flexi-grid-topology
Reference: [This.I-D]

8. References

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9. Contributors

The model presented in this paper was contributed to by more people than can be listed on the author list. Additional contributors include:

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