A Yang Data Model for WSON Optical Networks

draft-ietf-ccamp-wson-yang-09.txt

Abstract

This document provides a YANG data model for the routing and wavelength assignment (RWA) TE topology in wavelength switched optical networks (WSONs).

Status of this Memo

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1. Introduction

This document provides a YANG data model for the routing and wavelength assignment (RWA) Traffic Engineering (TE) topology in wavelength switched optical networks (WSONs). The YANG model described in this document is a WSON technology-specific Yang model based on the information model developed in [RFC7446] and the two
encoding documents [RFC7581] and [RFC7579] that developed protocol independent encodings based on [RFC7446]. This document augments the the generic TE topology draft [TE-TOPO].

What is not in scope of this document is both impairment-aware WSON and flex-grid.

This document defines two YANG models: ietf-wson-topology (Section 3) and ietf-te-wson-types (Section 4).

2. YANG Model (Tree Structure)

module: ietf-wson-topology
augment /nd:networks/nd:network/nd:network-types/tet:te-topology:
  +--rw wson-topology!
  +--rw wavelength-availability-range? te-wson-types:wavelength-range-type
augment /nd:networks/nd:network/lnk:link/tet:te/tet:te-link-attributes:
  +--rw channel-num? int32
  +--rw first-channel-frequency? decimal64
  +--rw channel-spacing?  decimal64
  +--rw available-wavelength-info* [priority]
    +--rw priority uint8
    +--rw wavelength-availability-range? te-wson-types:wavelength-range-type
  +--rw wson-node
    +--rw node-type? identityref
augment /nd:networks/nd:network/nd:node/tet:te/tet:tunnel-termination-point:
  +--rw available-operational-mode* te-wson-types:operational-mode
  +--rw operational-mode? te-wson-types:operational-mode
3. IETF-WSON-Topology YANG Model

<CODE BEGINS> file "ietf-wson-topology@2017-10-09.yang"

module ietf-wson-topology {
  //TODO: FIXME
  //yang-version 1.1;

  namespace "urn:ietf:params:xml:ns:yang:ietf-wson-topology";

  prefix "wson";

  import ietf-network {
    prefix "nd";
  }

  import ietf-network-topology {
    prefix "lnk";
  }

  import ietf-inet-types {
    prefix "inet";
  }

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

  import ietf-te-wson-types { //Modified
    prefix "te-wson-types";
  }

  //NOT NEEDED
  /*import ietf-transport-types {
    prefix "tran-types";
  } */

  organization
    "IETF CCAMP Working Group";

  contact
    "Editor: Young Lee <leeyoung@huawei.com>";

  description
    "This module contains a collection of YANG definitions"
for

RWA WSON.

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revision 2017-10-09 {
  description
    "version 8."
  reference
    "RFC XXX: A Yang Data Model for WSON Optical
    Networks ";
}

typedef wson-topology-id {
  type inet:uri;
  description
    "The WSON Topology ID"
}

grouping wson-topology-type {
  description "wson-topology type"
  container wson-topology {
    presence "indicates a topology of wson"
    description
      "Container to identify wson topology type"
  }
}

grouping wson-node-attributes {
  description "WSON node attributes"
  container wson-node {
    description "WSON node attributes";
  }
}
leaf node-type {
  type identityref {
    base te-wson-types:wson-node-type;
  }
  description "WSON node type.";
}

grouping wson-wavelength-availability-range{
  description "wavelength availability range";
  leaf wavelength-availability-range{
    type te-wson-types:wavelength-range-type;
    description "range that indicates if a wavelength is available or not on each channel at specified priority level.";
  }
}

grouping wson-link-attributes {
  description "WSON link attributes";
  leaf channel-num {
    type int32;
    description "Number of OCh channels available";
  }
  leaf first-channel-frequency {
    type decimal64 {
      fraction-digits 5;
    }
    units THz;
    description "First channel frequency in the grid";
  }
  leaf channel-spacing {
    type decimal64 {
      fraction-digits 5;
    }
    units GHz;
    description "This is fixed channel spacing for WSON, e.g., 12.5, 25, 50, 100, ..";
  }

  list available-wavelength-info{
    key "priority";
  }
}
max-elements "8";

description
    "List of available wavelength channels on this link";

leaf priority {
    type uint8 {
        range "0..7";
        description "priority";
    }
    uses wson-wavelength-availability-range;
}

grouping wson-tp-attributes {
    description "wson-tp-attributes";

    leaf client-facing {
        type empty;
        description
            "if present, it means this tp is a client-facing tp.
            adding/dropping client signal flow.";
    }

    /*
    //can it be fully covered by interface-switching-capability of base
    TE model?
    leaf-list supported-client-signals {
        type identityref {
            base tran-types:client-signal;
        }
        description
            "Supported client signals at this TP";
    }
    */

    grouping wson-ttp-attributes {
        description "WSON tunnel termination point (e.g.
        tranponder) attributes";
        leaf-list available-operational-mode {
            type te-wson-types:operational-mode;
            description "List of all vendor-specific supported
            operating-mode";
        }
    }
}
mode identifiers";
}

leaf operational-mode {
  type te-wson-types:operational-mode;
  description "Vendor-specific mode identifier";
}
}

/* AUGMENTS */

  description "wson-topology augmented";
  uses wson-topology-type;
}

//FIXING NMDA
    description "This augment is only valid for WSON connectivity matrix.";
  }
  description "WSON connectivity matrix config augmentation";
  uses wson-wavelength-availability-range;
}

//REMOVING
/*
    description "This augment is only valid for WSON connectivity matrix.";
  }
}
description "WSON connectivity matrix state augmentation";
uses wson-wavelength-availability-range;
}/*

//FIXING NMDA
augment "/nd:networks/nd:network/lnk:link/tet:te"
    + "/tet:te-link-attributes" {
    when "/nd:networks/nd:network/nd:network-types"
        + "/tet:te-topology/wson:wson-topology" {
    description
        "This augment is only valid for WSON.";
    }
    description "WSON Link augmentation.";
}
uses wson-link-attributes;
}

//REMOVING
/*
    + "/tet:te-link-attributes" {
    when "/nd:networks/nd:network/nd:network-types"
        + "/tet:te-topology/wson:wson-topology" {
    description
        "This augment is only valid for WSON.";
    }
    description "WSON Link augmentation.";
}
uses wson-link-attributes;
}*/

//FIXING NMDA
augment "/nd:networks/nd:network/nd:node/tet:te"
    + "/tet:te-node-attributes" {
    when "/nd:networks/nd:network/nd:network-types"
        + "/tet:te-topology/wson:wson-topology" {
    description
        "This augment is only valid for WSON.";
    }
    description "WSON Node augmentation.";
}
uses wson-node-attributes;
}

//REMOVING

/**
    + "/tet:te-node-attributes" {
    when "/nd:networks/nd:network/nd:network-types"
      +"/tet:te-topology/wson:wson-topology" {
      description
        "This augment is only valid for WSON.";
    }
  description "WSON Node augmentation.";
  uses wson-node-attributes;
}/**

//FIXING NMDA
augment "/nd:networks/nd:network/nd:node/tet:te"
  + "/tet:tunnel-termination-point" {
  when "/nd:networks/nd:network/nd:network-types"
    +"/tet:te-topology/wson:wson-topology" {
    description
      "This augment is only valid for WSON.";
  }
  description "WSON tunnel termination point augmentation.";
  uses wson-ttp-attributes;
}

//removing
/*augment "/nd:networks/nd:network/nd:node/tet:te"
  + "/tet:tunnel-termination-point/tet:state" {
  when "/nd:networks/nd:network/nd:network-types"
    +"/tet:te-topology/wson:wson-topology" {
    description
      "This augment is only valid for WSON.";
  }
  description "WSON tunnel termination point augmentation.";
  uses wson-ttp-attributes;
}*/

</CODE ENDS>
4. IETF-TE-WSON-Types YANG Model

```xml
<CODE BEGINS> file "ietf-te-wson-types@2017-10-09.yang"

module ietf-te-wson-types {
    prefix "te-wson-types";

    organization
        "IETF CCAMP Working Group";
    contact
        "WG Web: <http://tools.ietf.org/wg/ccamp/>
        WG List: <mailto:ccamp@ietf.org>
        Editor: Aihua Guo
        <mailto:aihuaguo@huawei.com>
        Editor: Young Lee
        <mailto:leeyoung@huawei.com>";

    description
        "This module defines WSON types.";

    revision "2017-10-09" {
        description
            "Revision 0.1";
        reference "TBD";
    }

    typedef operational-mode {
        type string;
        description
            "Vendor-specific mode that guarantees interoperability.
             It must be an string with the following format:
             B-DScW-ytz(v) where all these attributes are conformant
to the ITU-T recomendation";
        reference "ITU-T G.698.2 (11/2009) Section 5.3";
    }

    identity wson-node-type {
        description
```
typedef wavelength-range-type {
  type string {
    pattern "([1-9][0-9]{0,3}(-[1-9][0-9]{0,3})?" +
    ",([1-9][0-9]{0,3}(-[1-9][0-9]{0,3})?)*)";
  }
  description
  "A list of WDM channel numbers (starting at 1) in ascending order. For example: 1,12-20,40,50-80";
}

identity wavelength-assignment {
  description "Wavelength selection base";
}

identity unspecified-wavelength-assignment {
  base wavelength-assignment;
  description "No method specified";
}

identity first-fit-wavelength-assignment {
    base wavelength-assignment;
    description "All the available wavelengths are numbered, and this WA method chooses the available wavelength with the lowest index.";
}

identity random-wavelength-assignment {
    base wavelength-assignment;
    description "This WA method chooses an available wavelength randomly.";
}

identity least-loaded-wavelength-assignment {
    base wavelength-assignment;
    description "This WA method selects the wavelength that has the largest residual capacity on the most loaded link along the route (in multi-fiber networks).";
}

5. Security Considerations
   TDB

6. IANA Considerations
   TDB
7. Acknowledgments

This document was prepared using 2-Word-v2.0.template.dot.
8. References

8.1. Normative References


8.2. Informative References


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