A Yang Data Model for WSON Optical Networks

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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.

2. YANG Model (Tree Structure)

module: ietf-wson-topology
    augment /nd:networks/nd:network/nd:network-types:
        +--rw wson-topology!
    augment /nd:networks/nd:network/nd:node/tet:te/tet:te-node-
        attributes/tet:connectivity-matrices/tet:connectivity-matrix:
            +--rw matrix-interface* [in-port-id]
                +--rw in-port-id     wson-interface-ref
                +--rw out-port-id?   wson-interface-ref
    augment /nd:networks/nd:network/lnk:link/tet:te/tet:te-link-attributes:
        +--rw channel-max?                   int32
        +--rw default-frequency?             decimal64
        +--rw channel-spacing?               decimal64
        +--rw wavelength-available-bitmap*   binary
        +--rw wson-node
            |  +--rw device-type?   devicetype
            |  +--rw dir?           directionality
            |  +--rw interfaces* [name]
            |      +--rw name           string
            |      +--rw port-number?   uint32
            |      +--rw input-port?    boolean
            |      +--rw output-port?   boolean
            |      +--rw description?   string
            +--rw resource-pool* [resource-pool-id]
                +--rw resource-pool-id   uint32
                +--rw pool-state?        boolean
                +--rw matrix-interface* [in-port-id]
                    +--rw in-port-id   wson-interface-ref
                    +--rw out-port-id?  wson-interface-ref
3. WSON-RWA YANG Model

<CODE BEGINS> file "ietf-wson-topology@2017-07-03.yang"

module ietf-wson-topology {
  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";
  }

  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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      authors of the code. All rights reserved.

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      without modification, is permitted pursuant to, and subject
to the license terms contained in, the Simplified BSD
typedef wson-topology-id {
    type inet:uri;
    description
    "The WSON Topology ID";
}

typedef wson-node-id {
    type inet:ip-address;
    description
    "The WSON Node ID";
}

typedef devicetype {
    type enumeration {
        enum adm {
            value 1;
            description
            "Device is ADM";
        }
        enum roadm {
            value 2;
            description
            "Device is ROADM/OXC";
        }
    }
    description
    "device type: fixed (ADM) or switched (ROADM/OXC)";
}

typedef directionality {
    type enumeration {
        enum bidir {
            value 0;
            description
            "bi-directional";
    
enum input {
  value 1;
  description
    "input direction";
}
enum output {
  value 2;
  description
    "output direction";
}
description
  "The directionality of link set";

typedef wson-interface-ref {
  type leafref {
    path "/nd:networks/nd:node/tet:te/
      + "tet:te-node-attributes/wson:wson-node/"
      + "wson:interfaces/wson:name";
    description
      "This type is used by data models that need to
       reference WSON interface.";
  }
}
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 device-type {
      type devicetype;
      description
        "device type: fixed (ADM) or switched
         (ROADM/OXC)";
    }
    leaf dir {
      type directionality;
      description
        "bi-directionality or input or output";
of link set;

list interfaces {
key "name";
unique "port-number"; // TODO Puerto y TP ID
description "List of interfaces contained in the node";
uses node-interface;
}

}

grouping node-interface {
description "node interface definition";
leaf name {
type string;
description "Interface name";
}
leaf port-number {
type uint32;
description "Number of the port used by the interface";
}
leaf input-port {
type boolean;
description "Determines if the port is an input port";
}
leaf output-port {
type boolean;
description "Determines if the port is an output port";
}
leaf description {
type string;
description "Description of the interface";
}
}

}

grouping available-wavelength {
description "describe available wavelengths";
leaf-list wavelength-available-bitmap {
type binary;
description "array of bits (i.e., bitmap) that indicates if a wavelength is available or not on each channel.";
}
}

}


grouping wson-link-attributes {
description "Set of WSON link attributes";
leaf channel-max {
    type int32;
    description "Maximum Number of OCh channels available by the node";
}
leaf default-frequency {
    type decimal64 {
        fraction-digits 5;
    }
    units THz;
    default 193.1;
    description "Default Central Frequency";
}
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, ..";
}
}

grouping wson-connectivity-matrix {
    description "wson connectivity matrix";
    list matrix-interface {
        key "in-port-id";
        description "matrix-interface describes input-ports and out-ports around a connectivity matrix";
        leaf in-port-id {
            type wson-interface-ref;
            description "The reference to in-port";
        }
        leaf out-port-id {
            type wson-interface-ref;
            description "The reference to out-port";
        }
    }
}

grouping resource-pool-attributes {
    description "resource pool describes regeneration or wave converter";
list resource-pool {
    key "resource-pool-id";
    description "The resource pool list";

    leaf resource-pool-id {
        type uint32;
        description "The resource pool ID";
    }

    leaf pool-state {
        type boolean;
        description "TRUE is state UP; FALSE is state down";
    }

    uses wson-connectivity-matrix;
}

augment "/nd:nets/nd:network/nd:network-types" {
    description "wson-topology augmented";
    uses wson-topology-type;
}

augment "/nd:nets/nd:network/nd:node/tet:te"
    + "/tet:te-node-attributes/tet:connectivity-matrices"
    + "/tet:connectivity-matrix" {
    when "/nd:nets/nd:network/nd:network-types"
        +"/wson-topology" {
        description "This augment is only valid for WSON connectivity matrix.";
    }
    description "WSON connectivity matrix state augmentation";
    uses wson-connectivity-matrix;
}

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

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

}<CODE ENDS>

4. Security Considerations

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5. IANA Considerations

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6. Acknowledgments

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

7.1. Normative References


7.2. Informative References


8. Contributors

Authors’ Addresses

Young Lee (ed.)
Huawei Technologies
5340 Legacy Drive, Building 3
Plano, TX 75023
USA

Phone: (469) 277-5838
Email: leeyoung@huawei.com

Dhruv Dhody
Huawei Technologies India Pvt. Ltd,
Near EPIP Industrial Area, Kundalahalli Village, Whitefield,
Bangalore – 560 037 [H1-2A-245]