Internet
Internet-Draft
Intended status: Informational
Expires: July 1, 2018

D. Yeung
Arrcus
Y. Qu
Huawei
J. Zhang
Juniper Networks
I. Chen
Jabil Circuit
A. Lindem
Cisco Systems

December 28, 2017

Yang Data Model for OSPF SR (Segment Routing) Protocol
draft-ietf-ospf-sr-yang-03

Abstract

This document defines a YANG data model that can be used to configure and manage OSPF Segment Routing.

Status of This Memo

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1. Overview

YANG [RFC6020] [RFC7950] is a data definition language used to define the contents of a conceptual data store that allows networked devices to be managed using NETCONF [RFC6241]. YANG is proving relevant beyond its initial confines, as bindings to other interfaces (e.g., ReST) and encodings other than XML (e.g., JSON) are being defined. Furthermore, YANG data models can be used as the basis for implementation of other interfaces, such as CLI and programmatic APIs.

This document defines a YANG data model that can be used to configure and manage OSPF Segment Routing and it is an augmentation to the OSPF YANG data model.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

2. OSPF Segment Routing

This document defines a model for OSPF Segment Routing feature. It is an augmentation of the OSPF base model.

The OSPF SR YANG module requires support for the base segment routing module [I-D.ietf-spring-sr-yang], which defines the global segment routing configuration independent of any specific routing protocol

configuration, and support of OSPF base model[I-D.ietf-ospf-yang] which defines basic OSPF configuration and state.

```
module: ietf-ospf-sr
  augment /rt:routing/rt:control-plane-protocols
          /rt:control-plane-protocol/ospf:ospf/ospf:instance:
    +--rw segment-routing
    |  +--rw enabled?    boolean
    |  +--rw bindings
    |     +--rw advertise
    |     |  +--rw policies*   string
    |     +--rw receive?     boolean
    +--rw protocol-srgb {sr:protocol-srgb}?
       +--rw srgb* [lower-bound upper-bound]
          +--rw lower-bound    uint32
          +--rw upper-bound    uint32
  augment /rt:routing/rt:control-plane-protocols
          /rt:control-plane-protocol/ospf:ospf/ospf:instance
          /ospf:areas/ospf:area/ospf:interfaces/ospf:interface:
    +--rw segment-routing
       +--rw adjacency-sid
          +--rw advertise-adj-group-sid* [group-id]
          |  +--rw group-id    uint32
          +--rw advertise-protection?      enumeration
  augment /rt:routing/rt:control-plane-protocols
          /rt:control-plane-protocol/ospf:ospf/ospf:instance
          /ospf:areas/ospf:area/ospf:interfaces/ospf:interface
          /ospf:fast-reroute:
    +--rw ti-lfa {ti-lfa}?
       +--rw enable?   boolean
  augment /rt:routing/rt:control-plane-protocols
          /rt:control-plane-protocol/ospf:ospf/ospf:instance
          /ospf:areas/ospf:area/ospf:interfaces/ospf:interface
          /ospf:database/ospf:link-scope-lsa-type/ospf:link-scope-lsas
          /ospf:link-scope-lsa/ospf:version/ospf:ospfv2/ospf:ospfv2
          /ospf:body/ospf:opaque/ospf:extended-prefix-tlvs
          /ospf:extended-prefix-tlv:
    +--ro perfix-sid-sub-tlvs
       +--ro prefix-sid-sub-tlv*
          +--ro flags?       bits
          +--ro mt-id?       uint8
          +--ro algorithm?   uint8
          +--ro sid?         uint32
  augment /rt:routing/rt:control-plane-protocols
          /rt:control-plane-protocol/ospf:ospf/ospf:instance
          /ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type
          /ospf:area-scope-lsas/ospf:area-scope-lsa/ospf:version
          /ospf:ospfv2/ospf:ospfv2/ospf:body/ospf:opaque
```

```
            /ospf:extended-prefix-tlvs/ospf:extended-prefix-tlv:
      +--ro perfix-sid-sub-tlvs
         +--ro prefix-sid-sub-tlv*
            +--ro flags?       bits
            +--ro mt-id?       uint8
            +--ro algorithm?   uint8
            +--ro sid?         uint32
    augment /rt:routing/rt:control-plane-protocols
            /rt:control-plane-protocol/ospf:ospf/ospf:instance
            /ospf:database/ospf:as-scope-lsa-type/ospf:as-scope-lsas
            /ospf:as-scope-lsa/ospf:version/ospf:ospfv2/ospf:ospfv2
            /ospf:body/ospf:opaque/ospf:extended-prefix-tlvs
            /ospf:extended-prefix-tlv:
      +--ro perfix-sid-sub-tlvs
         +--ro prefix-sid-sub-tlv*
            +--ro flags?       bits
            +--ro mt-id?       uint8
            +--ro algorithm?   uint8
            +--ro sid?         uint32
    augment /rt:routing/rt:control-plane-protocols
            /rt:control-plane-protocol/ospf:ospf/ospf:instance
            /ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type
            /ospf:area-scope-lsas/ospf:area-scope-lsa/ospf:version
            /ospf:ospfv2/ospf:ospfv2/ospf:body/ospf:opaque
            /ospf:extended-link-tlvs/ospf:extended-link-tlv:
      +--ro adj-sid-sub-tlvs
      |  +--ro adj-sid-sub-tlv*
      |     +--ro flags?    bits
      |     +--ro mt-id?    uint8
      |     +--ro weight?   uint8
      |     +--ro sid?      uint32
      +--ro lan-adj-sid-sub-tlvs
         +--ro lan-adj-sid-sub-tlv*
            +--ro flags?                bits
            +--ro mt-id?                uint8
            +--ro weight?               uint8
            +--ro neighbor-router-id?   yang:dotted-quad
            +--ro sid?                  uint32
    augment /rt:routing/rt:control-plane-protocols
            /rt:control-plane-protocol/ospf:ospf/ospf:instance
            /ospf:areas/ospf:area/ospf:interfaces/ospf:interface
            /ospf:database/ospf:link-scope-lsa-type/ospf:link-scope-lsas
            /ospf:link-scope-lsa/ospf:version/ospf:ospfv2/ospf:ospfv2
            /ospf:body/ospf:opaque:
      +--ro extended-prefix-range-tlvs
      |  +--ro extended-prefix-range-tlv*
      |     +--ro range-size?            uint16
      |     +--ro flags?                 bits
```

```
      |     +--ro prefix?                inet:ip-prefix
      |     +--ro perfix-sid-sub-tlvs
      |     |  +--ro prefix-sid-sub-tlv*
      |     |     +--ro flags?       bits
      |     |     +--ro mt-id?       uint8
      |     |     +--ro algorithm?   uint8
      |     |     +--ro sid?         uint32
      |     +--ro unknown-tlvs
      |        +--ro unknown-tlv*
      |           +--ro type?     uint16
      |           +--ro length?   uint16
      |           +--ro value?    yang:hex-string
      +--ro sr-algorithm-tlv
      |  +--ro sr-algorithm*   uint8
      +--ro sid-range-tlvs
      |  +--ro sid-range-tlv*
      |     +--ro range-size?    ospf:uint24
      |     +--ro sid-sub-tlv
      |        +--ro sid?   uint32
      +--ro local-block-tlvs
      |  +--ro local-block-tlv*
      |     +--ro range-size?    ospf:uint24
      |     +--ro sid-sub-tlv
      |        +--ro sid?   uint32
      +--ro srms-preference-tlv
         +--ro preference?   uint8
    augment /rt:routing/rt:control-plane-protocols
            /rt:control-plane-protocol/ospf:ospf/ospf:instance
            /ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type
            /ospf:area-scope-lsas/ospf:area-scope-lsa/ospf:version
            /ospf:ospfv2/ospf:ospfv2/ospf:body/ospf:opaque:
      +--ro extended-prefix-range-tlvs
      |  +--ro extended-prefix-range-tlv*
      |     +--ro range-size?            uint16
      |     +--ro flags?                 bits
      |     +--ro prefix?                inet:ip-prefix
      |     +--ro perfix-sid-sub-tlvs
      |     |  +--ro prefix-sid-sub-tlv*
      |     |     +--ro flags?       bits
      |     |     +--ro mt-id?       uint8
      |     |     +--ro algorithm?   uint8
      |     |     +--ro sid?         uint32
      |     +--ro unknown-tlvs
      |        +--ro unknown-tlv*
      |           +--ro type?     uint16
      |           +--ro length?   uint16
      |           +--ro value?    yang:hex-string
      +--ro sr-algorithm-tlv
```

```
      |  +--ro sr-algorithm*   uint8
      +--ro sid-range-tlvs
      |  +--ro sid-range-tlv*
      |     +--ro range-size?    ospf:uint24
      |     +--ro sid-sub-tlv
      |        +--ro sid?   uint32
      +--ro local-block-tlvs
      |  +--ro local-block-tlv*
      |     +--ro range-size?    ospf:uint24
      |     +--ro sid-sub-tlv
      |        +--ro sid?   uint32
      +--ro srms-preference-tlv
         +--ro preference?   uint8
    augment /rt:routing/rt:control-plane-protocols
            /rt:control-plane-protocol/ospf:ospf/ospf:instance
            /ospf:database/ospf:as-scope-lsa-type/ospf:as-scope-lsas
            /ospf:as-scope-lsa/ospf:version/ospf:ospfv2/ospf:ospfv2
            /ospf:body/ospf:opaque:
      +--ro extended-prefix-range-tlvs
      |  +--ro extended-prefix-range-tlv*
      |     +--ro range-size?            uint16
      |     +--ro flags?                 bits
      |     +--ro prefix?                inet:ip-prefix
      |     +--ro perfix-sid-sub-tlvs
      |     |  +--ro prefix-sid-sub-tlv*
      |     |     +--ro flags?       bits
      |     |     +--ro mt-id?       uint8
      |     |     +--ro algorithm?   uint8
      |     |     +--ro sid?         uint32
      |     +--ro unknown-tlvs
      |        +--ro unknown-tlv*
      |           +--ro type?     uint16
      |           +--ro length?   uint16
      |           +--ro value?    yang:hex-string
      +--ro sr-algorithm-tlv
      |  +--ro sr-algorithm*   uint8
      +--ro sid-range-tlvs
      |  +--ro sid-range-tlv*
      |     +--ro range-size?    ospf:uint24
      |     +--ro sid-sub-tlv
      |        +--ro sid?   uint32
      +--ro local-block-tlvs
      |  +--ro local-block-tlv*
      |     +--ro range-size?    ospf:uint24
      |     +--ro sid-sub-tlv
      |        +--ro sid?   uint32
      +--ro srms-preference-tlv
         +--ro preference?   uint8
```

3. OSPF Segment Routing Yang Module

```
<CODE BEGINS> file "ietf-ospf-sr@2017-12-28.yang"
module ietf-ospf-sr {
  namespace "urn:ietf:params:xml:ns:yang:ietf-ospf-sr";

  prefix ospf-sr;

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

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

  import ietf-routing {
    prefix "rt";
  }
  import ietf-segment-routing-common {
    prefix "sr-cmn";
  }
  import ietf-segment-routing {
    prefix "sr";
  }
  import ietf-ospf {
    prefix "ospf";
  }

  organization
    "IETF OSPF - OSPF Working Group";

  contact
     "WG Web:   <http://tools.ietf.org/wg/ospf/>
      WG List:  <mailto:ospf@ietf.org>

      Editor:   Derek Yeung
                <mailto:derek@arrcus.com>
      Author:   Derek Yeung
                <mailto:derek@arrcus.com>
      Author:   Yingzhen Qu
                <mailto:yingzhen.qu@huawei.com>
      Author:   Acee Lindem
                <mailto:acee@cisco.com>
      Author:   Jeffrey Zhang
                <mailto:zzhang@juniper.net>
      Author:   Ing-Wher Chen
                <mailto:ing-wher_chen@jabil.com>
```

```
         Author:   Greg Hankins
                   <mailto:greg.hankins@alcatel-lucent.com>";

     description
       "This YANG module defines the generic configuration
        and operational state for OSPF Segment Routing, which is
        common across all of the vendor implementations. It is
        intended that the module will be extended by vendors to
        define vendor-specific OSPF Segment Routing configuration
        and operational parameters and policies.

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        Relating to IETF Documents
        (http://trustee.ietf.org/license-info).

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

     reference "RFC XXXX";

     revision 2017-12-28 {
       description
         "";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     revision 2017-07-02 {
       description
         "* Implement NMDA model.
          * Add local-block-tlvs and srms-preference-tlv.
          * Remove sid-binding-sub-tlvs.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     revision 2017-03-12 {
       description
         "* Add p-flag in adj-sid sub-tlv.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }
```

```
     revision 2016-10-31 {
       description
         "* Update authors information.
          * Add import of ietf-segment-routing-common module.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     revision 2016-07-07 {
       description
         "* Change routing-protocol to control-plane-protocol.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     revision 2016-03-20 {
       description
         "* Remove routing-instance.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     revision 2015-10-19 {
       description
         "* Add per-protocol SRGB support.
          * Editorial changes.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     revision 2015-09-02 {
       description
         "* Author list update.
          * Editorial changes.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     revision 2015-07-06 {
       description
         "Initial revision.";
       reference
         "RFC XXXX: A YANG Data Model for OSPF Segment Routing.";
     }

     feature ti-lfa {
       description
         "Topology-Independent Loop-Free Alternate (TI-LFA)
```

```
           computation using segment routing.";
     }

     /* Groupings */
     grouping sid-sub-tlv {
       description "SID/Label sub-TLV grouping.";
       container sid-sub-tlv {
         description
           "Used to advertise the SID/Label associated with a
            prefix or adjacency.";
         leaf sid {
           type uint32;
           description
             "Segment Identifier (SID) - A 20 bit label or
              32 bit SID.";
         }
       }
     }

     grouping prefix-sid-sub-tlvs {
       description "Prefix Segment ID (SID) sub-TLVs.";
       container perfix-sid-sub-tlvs{
         description "Prefix SID sub-TLV.";
         list prefix-sid-sub-tlv {
           description "Prefix SID sub-TLV.";
           leaf flags {
             type bits {
               bit NP {
                 position 1;
                 description
                   "No-PHP flag.";
               }
               bit M {
                 position 2;
                 description
                   "Mapping server flag.";
               }
               bit E {
                 position 3;
                 description
                   "Explicit-NULL flag.";
               }
               bit V {
                 position 4;
                 description
                   "Value/Index flag.";
               }
               bit L {
```

```
                 position 5;
                 description
                   "Local flag.";
               }
             }
             description "Segment Identifier (SID) Flags.";
           }
           leaf mt-id {
             type uint8;
             description "Multi-topology ID.";
           }
           leaf algorithm {
             type uint8;
             description
               "The algorithm associated with the prefix-SID.";
           }
           leaf sid {
             type uint32;
             description "An index or label.";
           }
         }
       }
     }

     grouping extended-prefix-range-tlvs {
       description "Extended prefix range TLV grouping.";

       container extended-prefix-range-tlvs {
         description "The list of range of prefixes.";
         list extended-prefix-range-tlv {    //type=2?
           description "The range of prefixes.";
           leaf range-size {
             type uint16;
             description "The number of prefixes covered by the
                          advertisement.";
           }
           leaf flags {
             type bits {
               bit IA {
                 position 0;
                 description
                   "Inter-Area flag.";
               }
             }
             description "Flags.";
           }
           leaf prefix {
             type inet:ip-prefix;
```

```
            description "Address prefix.";
          }
          uses prefix-sid-sub-tlvs;
          uses ospf:unknown-tlvs;
        }
      }
    }

    grouping sr-algorithm-tlv {
      description "SR algorithm TLV grouping.";
      container sr-algorithm-tlv {
        description "All SR algorithm TLVs.";
        leaf-list sr-algorithm {
          type uint8;
          description
            "The Segment Routing (SR) algorithms that the router is
             currently using.";
        }
      }
    }

    grouping sid-range-tlvs {
      description "SID Range TLV grouping.";
      container sid-range-tlvs {
        description "List of SID range TLVs.";
        list sid-range-tlv {
          description "SID range TLV.";
          leaf range-size {
            type ospf:uint24;
            description "The SID range.";
          }
          uses sid-sub-tlv;
        }
      }
    }

    grouping local-block-tlvs {
      description "The SR local block TLV contains the
                   range of labels reserved for local SIDs.";
      container local-block-tlvs {
        description "List of SRLB TLVs.";
        list local-block-tlv {
          description "SRLB TLV.";
          leaf range-size {
            type ospf:uint24;
            description "The SID range.";
          }
          uses sid-sub-tlv;
```

```
        }
      }
    }

    grouping srms-preference-tlv {
      description "The SRMS preference TLV is used to advertise
                   a preference associated with the node that acts
                   as an SR Mapping Server.";
      container srms-preference-tlv {
        description "SRMS Preference TLV.";
        leaf preference {
          type uint8 {
            range "0 .. 255";
          }
          description "SRMS preference TLV, vlaue from 0 to 255.";
        }
      }
    }

    /* Configuration */
    augment "/rt:routing/rt:control-plane-protocols"
          + "/rt:control-plane-protocol/ospf:ospf/ospf:instance" {
      when "../../rt:type = 'ospf:ospfv2' or "
         + "../../rt:type = 'ospf:ospfv3'" {
        description
          "This augments the OSPF routing protocol when used.";
      }
      description
        "This augments the OSPF protocol configuration
         with segment routing.";
      uses sr:controlplane-cfg;
      container protocol-srgb {
        if-feature sr:protocol-srgb;
        uses sr-cmn:srgb-cfg;
        description
          "Per-protocol SRGB.";
      }
    }

    augment "/rt:routing/rt:control-plane-protocols/"
          + "rt:control-plane-protocol/ospf:ospf/ospf:instance/"
          + "ospf:areas/ospf:area/ospf:interfaces/ospf:interface" {
      when "../../../../../../rt:type = 'ospf:ospfv2' or "
         + "../../../../../../rt:type = 'ospf:ospfv3'" {
        description
          "This augments the OSPF interface configuration
           when used.";
      }
```

```
       description
         "This augments the OSPF protocol interface
          configuration with segment routing.";

       uses sr:igp-interface-cfg;
     }

     augment "/rt:routing/rt:control-plane-protocols/"
           + "rt:control-plane-protocol/ospf:ospf/ospf:instance/"
           + "ospf:areas/ospf:area/ospf:interfaces/ospf:interface/"
           + "ospf:fast-reroute" {
       when "../../../../../../../rt:type = 'ospf:ospfv2' or "
           + "../../../../../../../rt:type = 'ospf:ospfv3'" {
         description
           "This augments the OSPF routing protocol when used.";
       }
       description
         "This augments the OSPF protocol IP-FRR with TI-LFA.";

       container ti-lfa {
         if-feature ti-lfa;
         leaf enable {
           type boolean;
           description
            "Enables TI-LFA computation.";
         }
         description
           "Topology Independent Loop Free Alternate
            (TI-LFA) support.";
       }
     }

     /* Database */
     augment "/rt:routing/"
           + "rt:control-plane-protocols/rt:control-plane-protocol/"
           + "ospf:ospf/ospf:instance/ospf:areas/ospf:area/"
           + "ospf:interfaces/ospf:interface/ospf:database/"
           + "ospf:link-scope-lsa-type/ospf:link-scope-lsas/"
           + "ospf:link-scope-lsa/ospf:version/ospf:ospfv2/"
           + "ospf:ospfv2/ospf:body/ospf:opaque/"
           + "ospf:extended-prefix-tlvs/ospf:extended-prefix-tlv" {
       when "../../../../../../../../../../../../../../../../"
           + "rt:type = 'ospf:ospfv2'" {
         description
           "This augmentation is only valid for OSPFv2.";
       }
       description
         "SR specific TLVs for OSPFv2 extended prefix TLV
```

```
          in type 9 opaque LSA.";
       uses prefix-sid-sub-tlvs;
     }

     augment "/rt:routing/"
           + "rt:control-plane-protocols/rt:control-plane-protocol/"
           + "ospf:ospf/ospf:instance/ospf:areas/"
           + "ospf:area/ospf:database/"
           + "ospf:area-scope-lsa-type/ospf:area-scope-lsas/"
           + "ospf:area-scope-lsa/ospf:version/ospf:ospfv2/"
           + "ospf:ospfv2/ospf:body/ospf:opaque/"
           + "ospf:extended-prefix-tlvs/ospf:extended-prefix-tlv" {
       when "../../../../../../../../../../../../../"
          + "rt:type = 'ospf:ospfv2'" {
         description
           "This augmentation is only valid for OSPFv2.";
       }
       description
         "SR specific TLVs for OSPFv2 extended prefix TLV
          in type 10 opaque LSA.";
       uses prefix-sid-sub-tlvs;
     }

     augment "/rt:routing/"
           + "rt:control-plane-protocols/rt:control-plane-protocol/"
           + "ospf:ospf/ospf:instance/ospf:database/"
           + "ospf:as-scope-lsa-type/ospf:as-scope-lsas/"
           + "ospf:as-scope-lsa/ospf:version/ospf:ospfv2/"
           + "ospf:ospfv2/ospf:body/ospf:opaque/"
           + "ospf:extended-prefix-tlvs/ospf:extended-prefix-tlv" {
       when "../../../../../../../../../../../../../"
          + "rt:type = 'ospf:ospfv2'" {
         description
           "This augmentation is only valid for OSPFv2.";
       }
       description
         "SR specific TLVs for OSPFv2 extended prefix TLV
          in type 11 opaque LSA.";
       uses prefix-sid-sub-tlvs;
     }

     augment "/rt:routing/"
           + "rt:control-plane-protocols/rt:control-plane-protocol/"
           + "ospf:ospf/ospf:instance/ospf:areas/"
           + "ospf:area/ospf:database/"
           + "ospf:area-scope-lsa-type/ospf:area-scope-lsas/"
           + "ospf:area-scope-lsa/ospf:version/ospf:ospfv2/"
           + "ospf:ospfv2/ospf:body/ospf:opaque/"
```

```
            + "ospf:extended-link-tlvs/ospf:extended-link-tlv" {
        when "../../../../../../../../../../../../../"
           + "rt:type = 'ospf:ospfv2'" {
          description
            "This augmentation is only valid for OSPFv2.";
        }
        description
          "SR specific TLVs for OSPFv2 extended link TLV
           in type 10 opaque LSA.";

        container adj-sid-sub-tlvs {
          description "Adjacency SID optional sub-TLVs.";
          list adj-sid-sub-tlv {
            description "List of Adjacency SID sub-TLVs.";
            leaf flags {
              type bits {
                bit B {
                  position 0;
                  description
                    "Backup flag.";
                }
                bit V {
                  position 1;
                  description
                    "Value/Index flag.";
                }
                bit L {
                  position 2;
                  description
                    "Local/Global flag.";
                }
                bit G {
                  position 3;
                  description
                    "Group flag.";
                }
                bit P {
                  position 4;
                  description
                    "Persistent flag.";
                }
              }
              description "Flags.";
            }
            leaf mt-id {
              type uint8;
              description "Multi-topology ID.";
            }
```

```
            leaf weight {
              type uint8;
              description "Weight used for load-balancing.";
            }
            leaf sid {
              type uint32;
              description "Segment Identifier (SID) index/label.";
            }
          }
        }

        container lan-adj-sid-sub-tlvs {
          description "LAN Adjacency SID optional sub-TLVs.";
          list lan-adj-sid-sub-tlv {
            description "List of LAN adjacency SID sub-TLVs.";
            leaf flags {
              type bits {
                bit B {
                  position 0;
                  description
                    "Backup flag.";
                }
                bit V {
                  position 1;
                  description
                    "Value/Index flag.";
                }
                bit L {
                  position 2;
                  description
                    "Local/Global flag.";
                }
                bit G {
                  position 3;
                  description
                    "Group flag.";
                }
                bit P {
                  position 4;
                  description
                    "Persistent flag.";
                }
              }
              description "Flags.";
            }
            leaf mt-id {
              type uint8;
              description "Multi-topology ID.";
```

```
          }
          leaf weight {
            type uint8;
            description "Weight used for load-balancing.";
          }
          leaf neighbor-router-id {
            type yang:dotted-quad;
            description "Neighbor router ID.";
          }
          leaf sid {
            type uint32;
            description "Segment Identifier (SID) index/label.";
          }
        }
      }
    }

    augment "/rt:routing/"
          + "rt:control-plane-protocols/rt:control-plane-protocol/"
          + "ospf:ospf/ospf:instance/ospf:areas/ospf:area/"
          + "ospf:interfaces/ospf:interface/ospf:database/"
          + "ospf:link-scope-lsa-type/ospf:link-scope-lsas/"
          + "ospf:link-scope-lsa/ospf:version/ospf:ospfv2/"
          + "ospf:ospfv2/ospf:body/ospf:opaque" {
      when "../../../../../../../../../../../../../../"
         + "rt:type = 'ospf:ospfv2'" {
        description
          "This augmentation is only valid for OSPFv2.";
      }

      description
        "SR specific TLVs for OSPFv2 type 9 opaque LSA.";

      uses extended-prefix-range-tlvs;
      uses sr-algorithm-tlv;
      uses sid-range-tlvs;
      uses local-block-tlvs;
      uses srms-preference-tlv;
    }

    augment "/rt:routing/"
          + "rt:control-plane-protocols/rt:control-plane-protocol/"
          + "ospf:ospf/ospf:instance/ospf:areas/"
          + "ospf:area/ospf:database/"
          + "ospf:area-scope-lsa-type/ospf:area-scope-lsas/"
          + "ospf:area-scope-lsa/ospf:version/ospf:ospfv2/"
          + "ospf:ospfv2/ospf:body/ospf:opaque" {
      when "../../../../../../../../../../../../../"
```

```
          + "rt:type = 'ospf:ospfv2'" {
        description
          "This augmentation is only valid for OSPFv2.";
      }

      description
        "SR specific TLVs for OSPFv2 type 10 opaque LSA.";

      uses extended-prefix-range-tlvs;
      uses sr-algorithm-tlv;
      uses sid-range-tlvs;
      uses local-block-tlvs;
      uses srms-preference-tlv;
    }

    augment "/rt:routing/"
          + "rt:control-plane-protocols/rt:control-plane-protocol/"
          + "ospf:ospf/ospf:instance/ospf:database/"
          + "ospf:as-scope-lsa-type/ospf:as-scope-lsas/"
          + "ospf:as-scope-lsa/ospf:version/ospf:ospfv2/"
          + "ospf:ospfv2/ospf:body/ospf:opaque" {
      when "../../../../../../../../../../"
          + "rt:type = 'ospf:ospfv2'" {
        description
          "This augmentation is only valid for OSPFv2.";
      }
      description
        "SR specific TLVs for OSPFv2 type 11 opaque LSA.";

      uses extended-prefix-range-tlvs;
      uses sr-algorithm-tlv;
      uses sid-range-tlvs;
      uses local-block-tlvs;
      uses srms-preference-tlv;
    }
  }
  <CODE ENDS>
```

4. Security Considerations

The data model defined does not create any security implications.

This draft does not change any underlying security issues inherent in [I-D.ietf-netmod-routing-cfg].

5. Acknowledgements

The authors wish to thank Yi Yang, Alexander Clemm, Gaurav Gupta, Ladislav Lhotka, Stephane Litkowski, Greg Hankins, Manish Gupta and Alan Davey for their thorough reviews and helpful comments.

This document was produced using Marshall Rose's xml2rfc tool.

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Appendix A. Contributors' Addreses

Dean Bogdanovic
Volta Networks, Inc.

EMail: dean@voltanet.io

Kiran Koushik Agrahara Sreenivasa
Cisco Systems
12515 Research Blvd, Bldg 4
Austin, TX 78681
USA

EMail: kkoushik@cisco.com

Authors' Addresses

Derek Yeung
Arrcus

EMail: derek@arrcus.com

Yingzhen Qu
Huawei
2330 Central Expressway
Santa Clara, CA 95050
USA

EMail: yingzhen.qu@huawei.com

Jeffrey Zhang
Juniper Networks
10 Technology Park Drive
Westford, MA 01886
USA

EMail: zzhang@juniper.net

Ing-Wher Chen
Jabil Circuit

EMail: Ing-Wher_chen@jabil.com

Acee Lindem
Cisco Systems
301 Midenhall Way
Cary, NC 27513

EMail: acee@cisco.com