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YANG Data Model for SR Policy Group
draft-gong-spring-sr-policy-group-yang-02

Abstract

This document defines YANG data models for Segment Routing (SR) Policy group that can be used for configuring, instantiating, and managing SR Policy groups. The model is generic and apply equally to the MPLS and SRv6 instantiations of SR policy groups.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on December 20, 2025.

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1. Introduction

The Network Configuration Protocol (NETCONF) [RFC6241] defines mechanisms to manage network devices. YANG [RFC6020] is a modular language that represents data structures in an XML tree format, and is used as a data modeling language for the NETCONF.

[I-D.cheng-spring-sr-policy-group] describes SR policy Group in MPLS and IPv6 environments. It illustrates some use cases for parent SR policy and SR Policy Group to provide best practice cases for operators.

[I-D.ietf-spring-sr-policy-yang] defines a YANG data model for SR Policy that can be used for configuring, instantiating, and managing SR policies.

This document defines YANG data models for SR Policy group that can be used for configuring, instantiating, and managing SR Policy groups. The model is generic and apply equally to the MPLS and SRv6 instantiations of SR policy groups.

1.1. Terminology

The terminology for describing YANG data models is found in [RFC6020] and [RFC7950], including:

- augment
- data model
- data node
- identity
- module

The definitions of the basic terms are identical to those found in Segment Routing Architecture [RFC8402], Segment Routing Policy Architecture [RFC9256], and Segment Routing Policy group [I-D.cheng-spring-sr-policy-group].

1.2. 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.

1.3. Tree Diagrams

Tree diagrams used in this document follow the notation defined in [RFC8340].

1.4. Prefixes in Data Node Names

In this document, names of data nodes, actions, and other data model objects are often used without a prefix, as long as it is clear from the context in which YANG module each name is defined. Otherwise, names are prefixed using the standard prefix associated with the corresponding YANG module, as shown in Table 1.

Prefix	YANG module	Reference
rt	ietf-routing	[RFC8349]

Table 1

2. Model Overview

SR Policy group YANG data model are defined in this document.

The ietf-sr-policy-group.yang data model provides the methods for configuring and managing SR Policy group. It includes:

* Configuration of SR Policy group: Container that defines list of policy groups with their attributes, such as service identification methods, mapping relationship between DSCP and color, mapping relationship between service class and color etc.

* The operational state of SR Policy group, such as the state related to configuration items.

3. SR Policy Group YANG Module

3.1. Tree View

Following diagram depicts high level yang organization and hierarchy for an SR policy group specification:

```
       Segment-routing
          Traffic-engineering
          + attributes
          |   + ......
          + policies
          |    policy* [color endpoint]
          |       ......
          + sr-policy-groups
              group* [group-color]
                + name
                + description
                + forward-based-dscp
                |  + best-effort-dscp-list
                |  + dscp-mismatch-drop-v4
                |  + dscp-mismatch-drop-v6
                |  + dscp-color-mapping-entries
                |       mapping-entry* [policy-color dataplane]
                |          dscp-list
                |          ......
                + forward-based-dot1q
                |  + best-effort-dot1q-list
                |  + dot1q-mismatch-drop
                |  + dot1q-color-mapping-entries
                |       mapping-entry* [policy-color]
                |          dot1q-list
                |          ......
                + forward-based-serviceclass
                   + best-effort-classlist
                   + class-mismatch-drop
                   + class-color-mapping-entries
                        mapping-entry* [policy-color]
                           class-list
                           ......
```

SR Policy group YANG data model augments "/rt:routing" specified in [RFC8349] and specifies the configuration and operational state to manage the SR Policy groups.

The complete tree of the ietf-sr-policy-group.yang data model is represented as following. See [RFC8340] for an explanation of the symbols used.

```
module: ietf-sr-policy-group
  augment /rt:routing:
    +--rw sr-policy-groups
       +--rw group* [group-color]
          +--rw group-color                   uint32
          +--rw name?                         string
          +--rw description?                  string
          +--rw service-distinguish-method    enumeration
          +--rw forward-based-dscp
          |  +--rw best-effort-dscp-list-v4   string
          |  +--rw best-effort-dscp-list-v6   string
          |  +--rw dscp-mismatch-drop         Boolean
          |  +--rw dscp-color-mapping-entries
          |  |  +--rw mapping-entry* [policy-color dataplane]
          |  |  |  +--rw policy-color         uint32
          |  |  |  +--rw dataplane            dataplane-type
          |  |  |  +--rw dscp-list            string
          |  |  |  +--rw is-as-default?       Boolean
          +--rw forward-based-dot1q
          |  +--rw best-effort-dot1q          string
          |  +--rw dot1q-mismatch-drop        Boolean
          |  +--rw dot1q-color-mapping-entries
          |  |  +--rw mapping-entry* [policy-color]
          |  |  |  +--rw policy-color         uint32
          |  |  |  +--rw dot1q-list           string
          |  |  |  +--rw is-as-default?       Boolean
          +--rw forward-based-serviceclass
             +--rw best-effort-classlist      string
             +--rw class-mismatch-drop        Boolean
             +--rw class-color-mapping-entries
                +--rw mapping-entry* [policy-color]
                   +--rw policy-color         uint32
                   +--rw class-list           string
                   +--rw is-as-default?       Boolean
```

3.2. Yang Module

```
<CODE BEGINS> file "ietf-sr-policy-group@2024-05-22.yang"
module ietf-sr-policy-group {
  yang-version "1.1";
  namespace "urn:ietf:params:xml:ns:yang:ietf-sr-policy-group";
  prefix "sr-policy-group";

  import ietf-routing {
    prefix rt;
    reference
      "RFC 8349, A YANG Data Model for Routing Management
       (NMDA Version).";
  }
```

```
     organization
       "IETF SPRING Working Group";

     contact
       "TBD";

     description
       "This module describes a YANG model for configuring and managing
        SR Policy Groups.

        This YANG model conforms to the Network Management
        Datastore Architecture (NMDA) as described in RFC 8342.

        Copyright (c) 2024 IETF Trust and the persons identified as
        authors of the code.  All rights reserved.

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

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

        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 (RFC 2119) (RFC 8174) when, and only when,
        they appear in all capitals, as shown here.";

     revision 2024-05-22 {
       description
         "Initial Version";
       reference
         "draft-ietf-spring-sr-policy-yang-02, YANG Data Model for
          Segment Routing Policy";
     }

     typedef dataplane-type {
       description "Dataplane type of segment routing";
       type enumeration {
         enum mpls {
           value 1;
             description "Segment-routing MPLS";
         }
         enum srv6 {
           value 2;
             description "Segment-routing v6";
```

```
        }
      }
    }

    augment "/rt:routing" {
      description
        "SR Policy Group augmentation to the segment routing traffic
         engineering model.";
      container sr-policy-groups {
        description
          "Configuration parameters of SR Policy Group.";
        list sr-policy-group {
          key "group-color";
          description
            "Each entry contains parameters for SR Policy Group
             identifiedby the 'color' key.";
          leaf group-color {
            type uint32 {
              range "1..4294967295";
            }
            mandatory true;
            description "Color associated with the policy group";
          }
          leaf name {
            type string {
              length "1..59";
            }
            description "SR Policy group name";
          }
          leaf description {
            type string;
            description "Description of the policy group";
          }
          leaf service-distinguish-method {
            type enumeration {
              enum DSCP-based {
                value 1;
                description "Distinguish service type based on DSCP
                  in the message";
              }
              enum dot1q-based {
                value 2;
                description "Distinguish service type based on dot1q";
              }
              enum ServiceClass-based {
                value 3;
                description "Distinguish service type based on service
                  class";
              }
              enum None {
```

```
                value 4;
                description "Not configure service type recognition
                  method";
              }
            }
            description "Service traffic steering methods within SR
              policy group";
          }
          container forward-based-dscp {
            description "parameters of DSCP based steering traffic
              for SR policy group";
            leaf best-effort-dscp-list-v4 {
              type string;
              description "DSCP values for IPv4 packets matching
                best-effort. It is a comma-separated list of DSCP
                values. Each item can be an individual DSCP value
                or a DSCP value range. Use a tilde (~) to separate
                the start and end DSCP values of a range.
                Example: 1,2,3,5~8.";
            }
            leaf best-effort-dscp-list-v6 {
              type string;
              description "DSCP values for IPv6 packets matching
                best-effort. It is a comma-separated list of DSCP
                values. Each item can be an individual DSCP value
                or a DSCP value range. Use a tilde (~) to separate
                the start and end DSCP values of a range.
                Example: 1,2,3,5~8.";
            }
            leaf dscp-mismatch-drop {
              type boolean;
              default "false";
              description "When all DSCP values configured for
                best effort forwarding and SR policy forwarding do
                not match, and no default forwarding path is
                specified, discard traffic.";
            }
            container dscp-color-mapping-entries {
              description "DSCP-color mapping table";
              list mapping-entry {
                key "policy-color dataplane";
                description "This table contains color-DSCP mappings
                  for an SRv6 policy group.";
                leaf policy-color {
                  type uint32 {
                    range "1..4294967295";
                  }
                  mandatory true;
                  description "Color associated with the policy
                    group";
```

```
                }
                leaf dataplane {
                  type dataplane-type;
                  mandatory true;
                  description "The data plane type of the mapping
                    relationship between DSCP and color";
                }
                leaf dscp-list {
                  type string;
                  description "DSCP values for packets matching.
                    It is a comma-separated list of DSCP values.
                    Each item can be an individual DSCP value or
                    a DSCP value range. Use a tilde (~) to separate
                    the start and end DSCP values of a range.
                   Example: 1,2,3,5~8.";
                }
                leaf is-as-default {
                  type boolean;
                  default false;
                  description "Whether to use the SRv6 policy
                    with this color as the default policy for
                    packets";
                }
              }
            }
          }
          container forward-based-dot1q {
            description "parameters of dot1q based steering
              traffic for SR policy group";
            leaf best-effort-dot1q-list {
              type string;
              description "Dot1q values for packets matching
                best-effort. It is a comma-separated list of
                dot1q values. Each item can be an individual
                dot1q value or a dot1q value range. Use a
                tilde (~) to separate the start and end dot1q
                values of a range. Example: 1,2,3,5~8.";
            }
            leaf dot1q-mismatch-drop {
              type boolean;
              default "false";
              description "When all dot1q values configured
                for best effort forwarding and SR policy
                forwarding do not match, and no default
                forwarding path is specified, discard traffic.";
            }
            container dot1q-color-mapping-entries {
              description "Dot1q-color mapping table";
              list mapping-entry {
                key "policy-color";
```

```
                description "This table contains color-dot1q
                  mappings for an SRv6 policy group.";
                leaf policy-color {
                  type uint32 {
                    range "1..4294967295";
                  }
                  mandatory true;
                  description "Color associated with the policy
                    group";
                }
                leaf dot1q-list {
                  type string;
                  description "Dot1q values for packets
                    matching. It is a comma-separated list of
                    dot1q values. Each item can be an individual
                    dot1q value or a dot1q value range. Use a tilde
                    (~) to separate the start and end dot1q values
                    of a range. Example: 1,2,3,5~8.";
                }
                leaf is-as-default {
                  type boolean;
                  default false;
                  description "Whether to use the SRv6 policy
                    with this color as the default policy for
                    packets";
                }
              }
            }
            container class-color-mapping-entries {
              description "Serviceclass-color mapping table";
              list mapping-entry {
                key "policy-color";
                description "This table contains color-serviceclass
                  mappings for an SRv6 policy group.";
                leaf policy-color {
                  type uint32 {
                    range "1..4294967295";
                  }
                  mandatory true;
                  description "Color associated with the policy
                    group";
                }
                leaf class-list {
                  type string;
                  description "Service class values for packets
                    matching. It is a comma-separated list of
                    service class values. Each item can be an
                    individual service class value or a service
                    class value range. Use a tilde (~) to separate
                    the start and end service class values of
```

```
                    a range. Example: 1,2,3,5~8.";
                }
                leaf is-as-default {
                  type boolean;
                  default false;
                  description "Whether to use the SRv6 policy
                    with this color as the default policy for
                    packets";
                }
              }
            }
          }
        }
      } // sr-policy-group
    } // augment
  }
  <CODE ENDS>
```

4. Security Considerations

TBD

5. IANA Considerations

TBD

6. References

6.1. Normative References

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6.2. Informative References

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