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A YANG Data Model for MPLS Base
draft-saad-mpls-base-yang-00

Abstract

This document contains a specification of the the MPLS base YANG model. The MPLS base YANG module serves as a base framework for configuring and managing an MPLS switching subsystem. It is expected that other MPLS technology YANG models (e.g. MPLS LSP Static, LDP or RSVP-TE models) will augment the MPLS base YANG model.

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[1.](#) Introduction

A core routing data model is defined in [[I-D.ietf-netmod-routing-cfg](#)], and it provides a basis for the development of data models for routing protocols. The MPLS base model augments this model with additional data specific to MPLS switching [[RFC3031](#)]. The interface data model is defined in [[RFC7223](#)] and is used for referencing interface from the MPLS base model.

The MPLS base YANG module augments the "routing" read-write (rw) and "routing-state" read-only (ro) branches of the ietf-routing module. The approach described in [[I-D.openconfig-netmod-opstate](#)] is adopted to represent data pertaining to configuration intended, applied state and derived state data elements. Each container in the model holds a

"config" and "state" sub-container. The "config" sub-container contains the intended configuration data, and the state sub-container contains both the applied configuration and any derived state, such as counters or statistical information.

This document defines the specification for the "ietf-mpls" YANG module that provides base components of the MPLS data model. It is expected that other MPLS YANG modules will augment the "ietf-mpls" base model to define data models for other MPLS technologies (e.g. MPLS LDP or MPLS RSVP-TE).

[1.1.](#) Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [BCP 14](#), [RFC 2119](#) [[RFC2119](#)].

The following terms are defined in [[RFC6020](#)]:

- o augment,
- o configuration data,
- o data model,
- o data node,
- o feature,
- o mandatory node,
- o module,
- o schema tree,
- o state data,
- o RPC operation.

[1.2.](#) MPLS Base Tree Diagram

The MPLS base tree diagram is shown in Figure 1.

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```
module: ietf-mpls
augment /rt:routing:
  +--rw mpls
    +--rw interface* [name]
      +--rw name          if:interface-ref
      +--rw config
        | +--rw enabled?   boolean
        | +--rw mtu?       uint32
      +--ro state
        +--ro enabled?    boolean
        +--ro mtu?        uint32
augment /rt:routing-state:
  +--ro mpls
```

Figure 1: MPLS Base tree diagram

[1.3.](#) MPLS Base Module

```
<CODE BEGINS>file "ietf-mpls@2016-05-11.yang"

module ietf-mpls {

  namespace "urn:ietf:params:xml:ns:yang:ietf-mpls";

  prefix "mpls";

  import ietf-routing {
```

```
    prefix "rt";
}

import ietf-interfaces {
    prefix "if";
}

organization "IETF MPLS Working Group";

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

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description

"This YANG module defines the essential components for the management of the MPLS subsystem.";

revision "2016-05-11" {

description

"Latest revision:

- Addressed MPLS-RT review comments";

reference "[RFC 3031](#): A YANG Data Model for base MPLS";

}

typedef mpls-label {

type uint32 {

range "0..1048575";

}

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description

"The MPLS label range";

}

grouping interface-mpls {

description "MPLS interface properties grouping";

leaf enabled {

type boolean;

description

"'true' if mpls encapsulation is enabled on the interface. 'false' if mpls encapsulation is not enabled on the interface.";

}

leaf mtu {

type uint32;

```

        description
            "MPLS Maximum Transmission Unit (MTU)";
    }
}

augment "/rt:routing" {
    description "MPLS augmentation.";
    container mpls {
        description
            "MPLS container, to be used as an augmentation target node
            other MPLS sub-features config, e.g. MPLS static LSP, MPLS
            LDP LSPs, and Traffic Engineering MPLS LSP Tunnels, etc.";

        list interface {
            key "name";
            description "List of MPLS interfaces";
            leaf name {
                type if:interface-ref;
                description
                    "The name of a configured MPLS interface";
            }
            container config {
                description "Holds intended configuration";
                uses interface-mpls;
            }
            container state {
                config false;
                description "Holds inuse configuration";
                uses interface-mpls;
            }
        }
    }
}

```

```

augment "/rt:routing-state" {
    description "MPLS augmentation.";
    container mpls {
        config false;
        description
            "MPLS container, to be used as an augmentation target node
            other MPLS sub-features state";
    }
}

```

```
}  
}  
  
<CODE ENDS>
```

Figure 2: MPLS base YANG module

2. IANA Considerations

This document registers the following URIs in the IETF XML registry [[RFC3688](#)]. Following the format in [[RFC3688](#)], the following registration is requested to be made.

URI: urn:ietf:params:xml:ns:yang:ietf-mpls XML: N/A, the requested URI is an XML namespace.

This document registers a YANG module in the YANG Module Names registry [[RFC6020](#)].

name: ietf-mpls namespace: urn:ietf:params:xml:ns:yang:ietf-mpls
prefix: ietf-mpls reference: [RFC3031](#)

3. Security Considerations

The YANG module defined in this document is designed to be accessed via the NETCONF protocol [[RFC6241](#)]. The lowest NETCONF layer is the secure transport layer and the mandatory-to-implement secure transport is SSH [[RFC6242](#)]. The NETCONF access control model [[RFC6536](#)] provides means to restrict access for particular NETCONF users to a pre-configured subset of all available NETCONF protocol operations and content.

There are a number of data nodes defined in the YANG module which 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.

4. References

4.1. Normative References

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4.2. Informative References

[I-D.openconfig-netmod-opstate]

Shakir, R., Shaikh, A., and M. Hines, "Consistent Modeling of Operational State Data in YANG", [draft-openconfig-netmod-opstate-01](#) (work in progress), July 2015.

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