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**A YANG Data Model for MPLS Base
draft-ietf-mpls-base-yang-02**

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 [[RFC8022](#)], 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

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 [BCP 14](#), [RFC 2119](#) [RFC2119}}](#).

1.1.1. Keywords

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.


```
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@2016-07-05.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/mpls/>

    WG List:   <mailto:mpls@ietf.org>

    WG Chair:  Loa Andersson
               <mailto:loa@pi.nu>

    WG Chair:  Ross Callon
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description

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

```
revision "2016-07-05" {  
  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";  
  }  
}
```



```
    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 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

- [RFC3031] Rosen, E., Viswanathan, A., and R. Callon, "Multiprotocol Label Switching Architecture", [RFC 3031](#), DOI 10.17487/RFC3031, January 2001, <<http://www.rfc-editor.org/info/rfc3031>>.
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- [RFC8022] Lhotka, L. and A. Lindem, "A YANG Data Model for Routing Management", [RFC 8022](#), DOI 10.17487/RFC8022, November 2016, <<http://www.rfc-editor.org/info/rfc8022>>.

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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