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YANG Model for IS-IS Segment Routing MPLS PICS

Abstract

The YANG model in this document is to query an IS-IS Protocol Implementation Conformance Statement (PICS) of Segment Routing on MPLS data plane.

Status of This Memo

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1. Overview

YANG [[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.

[\[I-D.qgp-lsr-isis-pics-yang\]](#) defines the framework to query IS-IS Protocol Implementation Conformance Statement (PICS). The module defined in this document is used to query an IS-IS PICS of Segment Routing on MPLS data plane [[RFC8667](#)].

The YANG modules in this document conform to the Network Management Datastore Architecture (NMDA) [[RFC8342](#)].

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](#)] [[RFC8174](#)].

2. Design of the Model

The YANG module is used to query an IS-IS implementation of Segment Routing on MPLS data plane [[RFC8667](#)] for the conformance of the protocol implementation.

Container "isis-pics-sr-mpls" only exists when "isis-pics-sr-mpls" is included in the list of "supported-isis-pics" in ietf-isis-pics module.

The existence of a TLV support container means the support of a TLV. The details of the flags and features are included in the container.

3. ISIS PICS for SR MPLS Tree

This document uses the graphical representation of data models defined in [[RFC8340](#)].

```
module: ietf-isis-pics-sr-mpls
  +--ro isis-pics-sr-mpls
    +--ro sr-capability-sub-tlv-support!
      | +--ro i-bit-support?   isis-pics:support
      | +--ro v-bit-support?   isis-pics:support
    +--ro prefix-sid-sub-tlv-support?      isis-pics:support
    +--ro adj-sid-sub-tlv-support?         isis-pics:support
    +--ro lan-adj-sid-sub-tlv-support?     isis-pics:support
    +--ro sid-label-tlv-support?          isis-pics:support
    +--ro sid-label-binding-tlv-support?   isis-pics:support
    +--ro mt-sid-label-binding-tlv-support? isis-pics:support
    +--ro sr-algorithm-tlv-support!
      | +--ro algo-support*   uint8
    +--ro sr-lb-tlv-support?   isis-pics:support
    +--ro srms-preference-tlv-support? isis-pics:support

augment /isis-pics:isis-pics/isis-pics:isis-pics-mptlv:
  +--ro sid-label-binding-support?      isis-pics:support
  +--ro mt-sid-label-binding-support?   isis-pics:support
```

4. IS-IS PICS SR-MPLS YANG Modules

```
<CODE BEGINS> file "ietf-isis-pics-sr-mpls@2024-03-03.yang"
module ietf-isis-pics-sr-mpls {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-isis-pics-sr-mpls";
  prefix isis-pics-sr-mpls;

  import iana-isis-pics {
    prefix "iana-isis-pics";
  }

  import ietf-isis-pics {
    prefix "isis-pics";
  }

  organization
    "IETF LSR - Link State Routing Working Group";
  contact
    "WG Web: <http://datatracker.ietf.org/wg/lsr>
    WG List: <mailto:lsr@ietf.org>

    Author: Yingzhen Qu
            <mailto:yingzhen.ietf@gmail.com>
    Author: Les Ginsberg
            <mailto:ginsberg@cisco.com>
    Author: Tony Przygienda
            <mailto:prz@juniper.net>";

  description
    "The YANG module is used to query an IS-IS Protocol
    Implementation Conformance Statement (PICS) of Segment
    Routing for MPLS data plane (RFC8667).

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

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    This version of this YANG module is part of RFC XXXX
    (https://www.rfc-editor.org/info/rfcXXXX); 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.";
reference
  "RFC XXXX: YANG Data Model for IS-IS Segment Routing MPLS PICS";

revision 2024-03-03 {
  description
    "Initial Version";
  reference
    "RFC XXXX: YANG Data Model for IS-IS Segment Routing MPLS PICS.";
}

container isis-pics-sr-mpls {
  when "/isis-pics:isis-pics/isis-pics:supported-isis-pics "
    + "= 'iana-isis-pics:isis-pics-sr-mpls'" {
    description
      "This container only exists when isis-pics-sr-mpls is present
      in the ietf-isis-pics module.";
  }
  config false;
  description
    "IS-IS Protocol Implementation Conformance Statement (PICS) of
    Segment Routing on MPLS data plane.";
  reference
    "RFC 8667: IS-IS Extensions for Segment Routing";

  container sr-capability-sub-tlv-support {
    presence "Support of sr-capability sub-tlv.";
    //config false;
    description
      "Support of sr-capability sub-tlv.";

    leaf i-bit-support {
      type isis-pics:support;
      description
        "support mpls-ipv4 capability.";
    }
    leaf v-bit-support {
      type isis-pics:support;
      description
        "support mpls-ipv6 capability.";
    }
  }
}

leaf prefix-sid-sub-tlv-support {
  type isis-pics:support;
```

```
    description
      "Support of prefix-sid sub-tlv.";
  }

  leaf adj-sid-sub-tlv-support {
    type isis-pics:support;
    description
      "Support of Adjacency Segment Identifier sub-tlv.";
  }

  leaf lan-adj-sid-sub-tlv-support {
    type isis-pics:support;
    description
      "Support of LAN adj-sid sub-tlv.";
  }

  leaf sid-label-tlv-support {
    type isis-pics:support;
    description
      "Support of SID/Label sub-tlv.";
  }

  leaf sid-label-binding-tlv-support {
    type isis-pics:support;
    description
      "Support of SID/Label Binding tlv.";
  }

  leaf mt-sid-label-binding-tlv-support {
    type isis-pics:support;
    description
      "Support of Multi-Topology SID/Label Binding TLV.";
  }

  container sr-algorithm-tlv-support {
    presence "Support of SR-Algorithm sub-tlv.";
    description
      "Support of SR-Algorithm sub-tlv.";

    leaf-list algo-support {
      type uint8;
      description
        "Supported algorithms.";
    }
  }

  leaf sr-lb-tlv-support {
    type isis-pics:support;
    description
      "Support of the SR Local Block sub-tlv.";
```

```

}

leaf srms-preference-tlv-support {
  type isis-pics:support;
  description
    "Support of the SRMS Preference sub-tlv.";
}
}

augment "/isis-pics:isis-pics/isis-pics:isis-pics-mptlv"
{
  description
    "Augment isis-pics-mptlv container with the TLVs defined
    in RFC 8667.";

  leaf sid-label-binding-support {
    type isis-pics:support;
    description
      "MP-TLV support of Segment Identifier/Label Binding TLV
      (type 149).";
  }

  leaf mt-sid-label-binding-support {
    type isis-pics:support;
    description
      "MP-TLV support of Multi-Topology Segment Identifier/Label
      Binding TLV(type 150).";
  }
}
}
<CODE ENDS>

```

5. Security Considerations

The YANG modules specified in this document define a schema for data that is designed to be accessed via network management protocols such as NETCONF [[RFC6241](#)] or RESTCONF [[RFC8040](#)]. The lowest NETCONF layer is the secure transport layer, and the mandatory-to-implement secure transport is Secure Shell (SSH) [[RFC6242](#)]. The lowest RESTCONF layer is HTTPS, and the mandatory-to-implement secure transport is TLS [[RFC8446](#)].

The NETCONF access control model [[RFC8341](#)] provides the means to restrict access for particular NETCONF or RESTCONF users to a pre-configured subset of all available NETCONF or RESTCONF protocol operations and content.

Some of the readable data nodes in the `ietf-isis-pics-sr-mpls.yang` module may be considered sensitive or vulnerable in some network

environments. It is thus important to control read access (e.g., via get, get-config, or notification) to these data nodes.

6. IANA Considerations

The document requests IANA to create a entry, called isis-pics-sr-mppls in the "IS-IS PICS" registry [[I-D.qgp-lsr-isis-pics-yang](#)].

This document requests IANA to add a new "identity" to the iana-isis-pics YANG module. The following statement is suggested:

```
identity isis-pics-sr-mppls {
  base "isis-pics";
  description
    "The identity for support of SR MPLS.";
  reference
    "RFC 8667: IS-IS Extensions for Segment Routing.";
}
```

This document registers a URI 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-isis-pics-sr-mppls
Registrant Contact: The IESG.
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-isis-pics-sr-mppls
namespace: urn:ietf:params:xml:ns:yang:ietf-isis-pics-sr-mppls
prefix: isis-pics-sr-mppls
reference: RFC XXXX
```

7. Acknowledgements

The YANG model was developed using the suite of YANG tools written and maintained by numerous authors.

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