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YANG Data Model for the IS-IS Reverse Metric Extension

Abstract

This document defines a YANG module for managing the reverse metric extension to the the intermediate system to intermediate system routeing protocol.

Status of This Memo

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1. Introduction

This document defines a YANG module for managing the reverse metric extension to the intermediate system to intermediate system routeing protocol (IS-IS) [RFC8500], [ISO10589]. Please refer to [RFC8500] for the description and definition of the functionality managed by this module.

The YANG data model described in this document conforms to the Network Management Datastore Architecture defined in [RFC8342].

2. YANG Management

2.1. YANG Tree

The following is the YANG tree diagram ([RFC8340]) for the IS-IS reverse metric extension additions.

```
module: ietf-isis-reverse-metric
  augment /rt:routing/rt:control-plane-protocols
            /rt:control-plane-protocol/isis:isis/isis:interfaces
            /isis:interface:
    +--rw reverse-metric
       +--rw reverse-metric
       |  +--rw metric?   isis:wide-metric
       |  +--rw flags?    bits
       +--rw exclude-te-metric?   boolean
  augment /rt:routing/rt:control-plane-protocols
            /rt:control-plane-protocol/isis:isis/isis:interfaces
            /isis:interface/isis:adjacencies/isis:adjacency:
    +--ro reverse-metric
    |  +--ro metric?   isis:wide-metric
    |  +--ro flags?    bits
    +--ro te-metric?        uint32
```

2.2. YANG Module

The following is the YANG module for managing the IS-IS reverse metric functionality defined in [RFC8500].

```
<CODE BEGINS> file "ietf-isis-reverse-metric@2019-03-31.yang"
module ietf-isis-reverse-metric {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-isis-reverse-metric";
  prefix isis-rmetric;

  import ietf-isis { prefix isis; }
  import ietf-routing { prefix "rt"; }

  organization
    "IETF NETMOD Working Group (NETMOD)";
  contact
    "WG Web:  <https://tools.ietf.org/wg/netmod/>
     WG List: <mailto:netmod@ietf.org>

     Author: Christian Hopps
      <mailto:chopps@chopps.org>";

  // RFC Ed.: replace XXXX with actual RFC number and
  // remove this note.

  description
    "This module defines the configuration and operational state for
     managing the IS-IS reverse metric functionality [RFC8500].

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     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
     (https://tools.ietf.org/html/rfcXXXX); see the RFC itself for
     full legal notices.";
```

```
 revision 2019-03-31 {
   description "Initial Revision";
   reference "RFC XXXX: YANG IS-IS Reverse Metric";
 }

 grouping reverse-metric-data {
   description "IS-IS reverse metric data.";
   container reverse-metric {
     description "IS-IS reverse metric data.";
     leaf metric {
type isis:wide-metric;
description "The reverse metric value.";
     }
     leaf flags {
type bits {
  bit whole-lan {
    position 0;
    description
      "The 'whole LAN' or W-bit. If true then a DIS
       processing this reverse metric will add the metric
       value to all the nodes it advertises in the
       pseudo-node LSP for this interface. Otherwise it will
       only increment the metric for the advertising node in
       the pseudo-node LSP for this interface.";
  }
  bit allow-unreachable {
    position 1;
    description
      "The 'allow-unreachable' or U-bit. If true it allows
       the neighbor to increment the overall metric up to
       2^24-1 rather than the lesser maximum of 2^24-2, and
       if done will cause traffic to stop using rather than
       avoid using the interface.";
  }
}
description "The reverse metric flag values.";
     }
   }
```

```
 }

 grouping tlv16-reverse-metric {
   description "IS-IS reverse metric TLV data.";
   uses reverse-metric-data;
   leaf te-metric {
     type uint32;
     description "The TE metric value from the sub-TLV if present.";
   }
 }

 augment "/rt:routing/rt:control-plane-protocols/"
   +"rt:control-plane-protocol/"
   +"isis:isis/isis:interfaces/isis:interface" {
   when "rt:type = 'isis:isis'" {
     description
"This augment is only valid when routing protocol instance
 type is 'isis'.";
   }

   description
     "The reverse metric configuration for an interface.";

   container reverse-metric {
     description "Announce a reverse metric to neighbors.";
     uses reverse-metric-data;
     leaf exclude-te-metric {
type boolean;
default false;
description
  "If true and there is a TE metric defined for this
   interface then do not send the TE metric sub-tlve in the
   reverse metric TLV.";
     }
   }
 }
 augment "/rt:routing/rt:control-plane-protocols/"
   +"rt:control-plane-protocol/"
   +"isis:isis/isis:interfaces/isis:interface/"
```

```
    +"isis:adjacencies/isis:adjacency" {
    when "rt:type = 'isis:isis'" {
      description
 "This augment is only valid when routing protocol instance
  type is 'isis'";
    }

    description
      "The reverse metric state advertised by a neighbor.";
    uses tlv16-reverse-metric;
  }
}
<CODE ENDS>
```

3. IANA Considerations

3.1. Updates to the IETF XML Registry

This document registers a URI in the "IETF XML Registry" [RFC3688]. Following the format in [RFC3688], the following registration has been made:

URI urn:ietf:params:xml:ns:yang:ietf-isis-reverse-metric

Registrant Contact The IESG.

XML N/A; the requested URI is an XML namespace.

3.2. Updates to the YANG Module Names Registry

This document registers one YANG module in the "YANG Module Names" registry [RFC6020]. Following the format in [RFC6020], the following registration has been made:

name ietf-isis-reverse-metric

namespace urn:ietf:params:xml:ns:yang:ietf-isis-reverse-metric

prefix isis-rmetric

reference RFC XXXX (RFC Ed.: replace XXX with actual RFC number and remove this note.)

4. Security Considerations

The YANG module specified in this document defines 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 Network Configuration Access Control Model (NACM) [RFC8341] provides the means to restrict access for particular NETCONF or RESTCONF users to a preconfigured subset of all available NETCONF or RESTCONF protocol operations and content.

The YANG module defined in this document can enable, disable and modify the behavior of metrics used by routing. For the security implications regarding these types of changes consult the [RFC8500] which defines the functionality.

5. Normative References

[ISO10589] International Organization for Standardization, "Intermediate system to intermediate system intra-domain-routing routine information exchange protocol for use in conjunction with the protocol for providing the connectionless-mode Network Service (ISO 8473)", ISO Standard 10589, 1992.

[RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, DOI 10.17487/RFC3688, January 2004 , <https://www.rfc-editor.org/info/rfc3688>.

[RFC6020] Bjorklund, M., Ed., "YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)", RFC 6020, DOI 10.17487/RFC6020, October 2010 , <https://www.rfc-editor.org/info/rfc6020>.

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[RFC8040] Bierman, A., Bjorklund, M., and K. Watsen, "RESTCONF Protocol", RFC 8040, DOI 10.17487/RFC8040, January 2017 , <https://www.rfc-editor.org/info/rfc8040>.

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[RFC8342] Bjorklund, M., Schoenwaelder, J., Shafer, P., Watsen, K., and R. Wilton, "Network Management Datastore Architecture (NMDA)", RFC 8342, DOI 10.17487/RFC8342, March 2018 , <https://www.rfc-editor.org/info/rfc8342>.

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6. Informative References

[RFC8340] Bjorklund, M. and L. Berger, Ed., "YANG Tree Diagrams", BCP 215, RFC 8340, DOI 10.17487/RFC8340, March 2018 , <https://www.rfc-editor.org/info/rfc8340>.

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