

Network Working Group  
Internet-Draft  
Intended status: Standards Track  
Expires: 28 March 2020

C. Hopps  
LabN Consulting, L.L.C.  
25 September 2019

YANG Data Model for the IS-IS Reverse Metric Extension  
draft-hopps-lsr-yang-isis-reverse-metric-01

## 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

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on 28 March 2020.

## Copyright Notice

Copyright (c) 2019 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the [Trust Legal Provisions](#) and are provided without warranty as described in the Simplified BSD License.

---

Internet-Draft YANG Data Model for the IS-IS Reverse Metric September 2019

## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">2</a>
<a href="#">2.</a>	YANG Management . . . . .	<a href="#">2</a>
<a href="#">2.1.</a>	YANG Tree . . . . .	<a href="#">2</a>
<a href="#">2.2.</a>	YANG Module . . . . .	<a href="#">3</a>
<a href="#">3.</a>	IANA Considerations . . . . .	<a href="#">5</a>
<a href="#">3.1.</a>	Updates to the IETF XML Registry . . . . .	<a href="#">5</a>
<a href="#">3.2.</a>	Updates to the YANG Module Names Registry . . . . .	<a href="#">6</a>
<a href="#">4.</a>	Security Considerations . . . . .	<a href="#">6</a>
<a href="#">5.</a>	Normative References . . . . .	<a href="#">6</a>
<a href="#">6.</a>	Informative References . . . . .	<a href="#">7</a>
	Author's Address . . . . .	<a href="#">7</a>

## [1.](#) Introduction

This document defines a YANG module for managing the reverse metric extension to the intermediate system to intermediate system routing 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

```

Internet-Draft YANG Data Model for the IS-IS Reverse Metric September 2019

## [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 \[RFC8500\].

    Copyright (c) 2019 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 Simplified 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  
(<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";  
}
```

Hopps

Expires 28 March 2020

[Page 3]

---

Internet-DraftYANG Data Model for the IS-IS Reverse MetricSeptember 2019

```
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-TLV 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
-----	--

Hopps

Expires 28 March 2020

[Page 5]

Internet-Draft YANG Data Model for the IS-IS Reverse Metric September 2019

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>>.

- [RFC6241] Enns, R., Ed., Bjorklund, M., Ed., Schoenwaelder, J., Ed., and A. Bierman, Ed., "Network Configuration Protocol (NETCONF)", [RFC 6241](#), DOI 10.17487/RFC6241, June 2011, <<https://www.rfc-editor.org/info/rfc6241>>.
- [RFC6242] Wasserman, M., "Using the NETCONF Protocol over Secure Shell (SSH)", [RFC 6242](#), DOI 10.17487/RFC6242, June 2011, <<https://www.rfc-editor.org/info/rfc6242>>.
- [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>>.
- [RFC8341] Bierman, A. and M. Bjorklund, "Network Configuration Access Control Model", STD 91, [RFC 8341](#), DOI 10.17487/RFC8341, March 2018, <<https://www.rfc-editor.org/info/rfc8341>>.
- [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>>.
- [RFC8446] Rescorla, E., "The Transport Layer Security (TLS) Protocol Version 1.3", [RFC 8446](#), DOI 10.17487/RFC8446, August 2018, <<https://www.rfc-editor.org/info/rfc8446>>.
- [RFC8500] Shen, N., Amante, S., and M. Abrahamsson, "IS-IS Routing with Reverse Metric", [RFC 8500](#), DOI 10.17487/RFC8500, February 2019, <<https://www.rfc-editor.org/info/rfc8500>>.

## 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>>.

Author's Address

Hopps

Expires 28 March 2020

[Page 7]

---

Internet-Draft YANG Data Model for the IS-IS Reverse Metric September 2019

Christian Hopps



LabN Consulting, L.L.C.

Email: [chopps@chopps.org](mailto:chopps@chopps.org)