

Network Working Group  
Internet-Draft  
Intended status: Standards Track  
Expires: 27 January 2022

V. Rajaguru, Ed.  
Cisco Systems  
26 July 2021

YANG Data Model for Bidirectional Forwarding Detection (BFD) Hardware  
Offloaded Session  
draft-rvelucha-bfd-offload-yang-00

## Abstract

This document defines a extension YANG data model that can be used to manage Hardware Offloaded Bidirectional Forwarding Detection (BFD).

This document specially talks about BFD sessions that are offloaded to hardware.

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

## 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 27 January 2022.

## Copyright Notice

Copyright (c) 2021 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

Internet-Draft

BFD YANG

July 2021

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.

## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">2</a>
<a href="#">1.1.</a>	Requirements Language . . . . .	<a href="#">2</a>
<a href="#">1.2.</a>	Tree Diagrams . . . . .	<a href="#">2</a>
<a href="#">2.</a>	Design of the Data Model . . . . .	<a href="#">2</a>
<a href="#">3.</a>	BFD IP single-hop-ext hierarchy . . . . .	<a href="#">3</a>
<a href="#">4.</a>	BFD IP single-hop ext YANG Module . . . . .	<a href="#">3</a>
<a href="#">5.</a>	Security Considerations . . . . .	<a href="#">5</a>
<a href="#">6.</a>	IANA Considerations . . . . .	<a href="#">5</a>
<a href="#">7.</a>	Acknowledgements . . . . .	<a href="#">5</a>
<a href="#">8.</a>	Normative References . . . . .	<a href="#">5</a>
<a href="#">Appendix A.</a>	Change log . . . . .	<a href="#">6</a>
	Author's Address . . . . .	<a href="#">6</a>

## [1.](#) Introduction

This document defines an extension YANG data model to base model [[I-D.ietf-bfd-yang](#)] that can be used to manage BFD sessions that are offloaded to hardware. BFD is a network protocol which is used for liveness detection of arbitrary paths between systems.

### [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 [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

### [1.2.](#) Tree Diagrams

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

## [2.](#) Design of the Data Model

This yang model which is extension to base BFD yang mode been designed to manage BFD HW offloaded sessions. This new "bfd"

container is augmented by all the YANG modules for their respective specific information:

1. `ietf-bfd-ip-sh-ext.yang` augments `"/routing/control-plane-protocols/control-plane-protocol/bfd/ip-sh/sessions/session"` with the `"ip-sh-ext"` container for BFD sessions over IP single-hop extension.

### [3.](#) BFD IP single-hop-ext hierarchy

An `"ip-sh-ext"` node is added under `"bfd"` node in `control-plane-protocol`. The operational state data for each BFD IP single-hop session is under this `"ip-sh-ext"` node.

```
module: ietf-bfd-ip-sh-ext
augment /rt:routing/rt:control-plane-protocols
    /rt:control-plane-protocol/bfd:bfd/bfd-ip-sh:ip-sh
    /bfd-ip-sh:sessions/bfd-ip-sh:session:
    +--rw ip-sh-ext
        +--ro session-running-ext
            +--ro session-offloaded?    boolean
```

### [4.](#) BFD IP single-hop ext YANG Module

This YANG module imports `"ietf-bfd-ip-sh"` from RFCXXX and augments.

```
<CODE BEGINS> file "ietf-bfd-ip-sh-ext@2021-07-27.yang"
module ietf-bfd-ip-sh-ext {
```

```
    yang-version 1.1;
```

```
    namespace "urn:ietf:params:xml:ns:yang:ietf-bfd-ip-sh-ext";
```

```
    prefix "bfd-ip-sh-ext";
```

```
    // RFC Ed.: replace occurrences of XXXX with actual RFC number and
```

```
// remove this note

import ietf-bfd {
  prefix "bfd";
  reference "RFC XXXX: YANG Data Model for BFD";
}

import ietf-routing {
  prefix "rt";
  reference
    "RFC 8349: A YANG Data Model for Routing Management
    (NMDA version)";
```

```
}

import ietf-bfd-ip-sh {
  prefix "bfd-ip-sh";
  reference
    "RFC XXXX: A YANG data model for BFD IP single-hop";
}

organization "IETF BFD Working Group";
contact
  "WG Web: <http://tools.ietf.org/wg/bfd>
  WG List: <rtg-bfd@ietf.org>

  Editors: Rajaguru Veluchamy (rvelucha@cisco.com)";

description
  "This module contains the YANG definition for BFD IP single-hop
  as per RFC 5881 with some extended info.

  Copyright (c) 2018 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
  (http://trustee.ietf.org/license-info).
```

This version of this YANG module is part of RFC XXXX; see the RFC itself for full legal notices."

```
reference "RFC XXXX";
```

```
revision 2021-07-26 {  
  description "Initial revision."  
  reference "RFC XXXX: A YANG data model for BFD IP single-hop  
  extension";  
}
```

```
/*
```

```
 * Augments
```

```
*/
```

```
augment "/rt:routing/rt:control-plane-protocols/"  
  + "rt:control-plane-protocol/bfd:bfd/bfd-ip-sh:ip-sh/"  
  + "bfd-ip-sh:sessions/bfd-ip-sh:session" {  
  description "BFD augmentation for IP single-hop-ext";  
  container ip-sh-ext {
```

```
description "BFD IP single-hop top level container with  
extension";
```

```
  container session-running-ext {  
    config "false";  
    description "BFD IP single-hop extension details";  
    leaf session-offloaded {  
      type boolean;  
      description "Indicates whether BFD session is running  
      in HW.";
```

```
    }
```

```
  }
```

```
}
```

```
}
```

```
}
```

```
<CODE ENDS>
```

## [5. Security Considerations](#)

TBD.

## [6. IANA Considerations](#)

None.

## 7. Acknowledgements

I would like to thank Vengada Prasad Govindan for his support and guidance on this work.

## 8. Normative References

[I-D.ietf-bfd-yang]

Rahman, R., Zheng, L., Jethanandani, M., Pallagatti, S., and G. Mirsky, "YANG Data Model for Bidirectional Forwarding Detection (BFD)", Work in Progress, Internet-Draft, [draft-ietf-bfd-yang-17](https://www.ietf.org/archive/id/draft-ietf-bfd-yang-17), 2 August 2018, <<https://www.ietf.org/archive/id/draft-ietf-bfd-yang-17.txt>>.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.

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

- [RFC5880] Katz, D. and D. Ward, "Bidirectional Forwarding Detection (BFD)", [RFC 5880](#), DOI 10.17487/RFC5880, June 2010, <<https://www.rfc-editor.org/info/rfc5880>>.
- [RFC5881] Katz, D. and D. Ward, "Bidirectional Forwarding Detection (BFD) for IPv4 and IPv6 (Single Hop)", [RFC 5881](#), DOI 10.17487/RFC5881, June 2010, <<https://www.rfc-editor.org/info/rfc5881>>.
- [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>>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

[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>>.

#### [Appendix A](#). Change log

RFC Editor: Remove this section upon publication as an RFC.

#### Author's Address

Rajaguru Veluchamy (editor)  
Cisco Systems  
India

Email: [rvelucha@cisco.com](mailto:rvelucha@cisco.com)