

Workgroup: Inter-Domain Routing
Internet-Draft: draft-ietf-idr-bfd-subcode-00
Published: 8 February 2022
Intended Status: Standards Track
Expires: 12 August 2022
Authors: J. Haas
Juniper Networks
BGP Cease Notification Subcode For BFD

Abstract

The Bidirectional Forwarding Detection protocol (BFD) is used to detect loss of connectivity between two forwarding engines, typically with low latency. BFD is leveraged by routing protocols, including the Border Gateway Protocol (BGP), to use that detection of loss of connectivity to bring down the protocol connections faster than the native protocol timers.

This document defines a Subcode for the BGP Cease NOTIFICATION message for when a BGP connection is being closed due to a BFD session going down.

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.

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 12 August 2022.

Copyright Notice

Copyright (c) 2022 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 Revised BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Revised BSD License.

Table of Contents

- [1. Introduction](#)
- [2. BFD Cease NOTIFICATION Subcode](#)
- [3. Operational Considerations](#)
- [4. Security Considerations](#)
- [5. IANA Considerations](#)
- [6. Acknowledgments](#)
- [7. References](#)
 - [7.1. Normative References](#)
 - [7.2. Informative References](#)
- [Author's Address](#)

1. Introduction

The Bidirectional Forwarding Detection protocol (BFD) [[RFC5880](#)] is used to detect loss of connectivity between two forwarding engines, typically with low latency. BFD is utilized as a service for various clients, including routing protocols, to provide an advisory mechanism for those clients to take action when a BFD session goes down [[RFC5882](#)]. This is typically used by the clients to take faster action in terminating their connections than the native protocol timers might allow.

The Border Gateway Protocol, Version 4 (BGP) [[RFC4271](#)] terminates its sessions upon Hold Timer expiration when the speaker does not receive a BGP message within the negotiated Hold Time interval. The minimum Hold Time interval supported by the protocol is three seconds. The Hold Timer may be optionally negotiated to being disabled with a Hold Time interval of zero.

If a BGP speaker desires to have its sessions terminate faster than the supported BGP Hold Timer can accommodate upon loss of connectivity, BFD is used to supply that faster detection. When the BFD session state changes to Down, the BGP speaker terminates the

session. BGP will send a NOTIFICATION message, if possible, and then close the TCP connection for the session.

2. BFD Cease NOTIFICATION Subcode

The value (TBD) has been allocated by IANA for the "BFD Down" Cease NOTIFICATION message Subcode.

When a BGP session is terminated due to a BFD session going into the Down state, the BGP Speaker SHOULD send a NOTIFICATION message with the Error Code Cease and the Error Subcode "BFD Down".

3. Operational Considerations

A BFD session may go Down when there is only a partial loss of connectivity between two BGP Speakers. Operators using BFD for their BGP sessions make choices for what BFD timers are used based on a variety of inputs for stability vs. fast failure depending on the role BGP is playing for the deployment.

In the event of a BGP session being terminated due to a BFD Down event from partial loss of connectivity as detected by BFD, the remote BGP Speaker might be able to receive the BGP NOTIFICATION message with the BFD Down Subcode. The receiving BGP Speaker will then have an understanding that the session is being terminated because of a BFD-detected issue and not an issue with the BGP speaker.

When there is a total loss of connectivity between two BGP Speakers, it may not be possible for the NOTIFICATION message to have been sent. Even so, BGP speakers SHOULD provide this reason as part of their operational state; e.g. `bgpPeerLastError` in the BGP MIB. [[RFC4273](#)].

When the procedures in [[RFC8538](#)] for sending a NOTIFICATION message with a Cease Code and Hard Reset Subcode, and the session is being terminated because BFD has gone Down, the BFD Down Subcode SHOULD be encapsulated in the Hard Reset's data portion of the NOTIFICATION message.

4. Security Considerations

This document introduces no additional BGP security considerations.

5. IANA Considerations

IANA is requested to allocate a new value from the BGP Cease NOTIFICATION message subcodes registry with the Name "BFD Down", and a Reference of this document.

6. Acknowledgments

Thanks to Jeff Tantsura, and Dale Carder for their comments on the draft.

7. References

7.1. Normative References

- [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>>.
- [RFC4271] Rekhter, Y., Ed., Li, T., Ed., and S. Hares, Ed., "A Border Gateway Protocol 4 (BGP-4)", RFC 4271, DOI 10.17487/RFC4271, January 2006, <<https://www.rfc-editor.org/info/rfc4271>>.
- [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>>.
- [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>>.

7.2. Informative References

- [RFC4273] Haas, J., Ed. and S. Hares, Ed., "Definitions of Managed Objects for BGP-4", RFC 4273, DOI 10.17487/RFC4273, January 2006, <<https://www.rfc-editor.org/info/rfc4273>>.
- [RFC4486] Chen, E. and V. Gillet, "Subcodes for BGP Cease Notification Message", RFC 4486, DOI 10.17487/RFC4486, April 2006, <<https://www.rfc-editor.org/info/rfc4486>>.
- [RFC5882] Katz, D. and D. Ward, "Generic Application of Bidirectional Forwarding Detection (BFD)", RFC 5882, DOI 10.17487/RFC5882, June 2010, <<https://www.rfc-editor.org/info/rfc5882>>.
- [RFC8538] Patel, K., Fernando, R., Scudder, J., and J. Haas, "Notification Message Support for BGP Graceful Restart", RFC 8538, DOI 10.17487/RFC8538, March 2019, <<https://www.rfc-editor.org/info/rfc8538>>.

Author's Address

Jeffrey Haas

Juniper Networks

Email: jhaas@juniper.net