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~~A BGP Cease Notification Subcode For-for Bidirectional~~  
~~Forwarding Detection (BFD)~~  
draft-ietf-idr-bfd-subcode-03

**Commenté [BMI1]:** I would change the title to: "A Bidirectional Forwarding Detection (BFD) Subcode for BGP Cease Notification"

## Abstract

The Bidirectional Forwarding Detection ~~protocol~~ (BFD) protocol 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 a routing~~ protocol connections faster than the native protocol timers.

This document defines a ~~Subcode-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.

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### 1. Introduction

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

The Border Gateway Protocol, Version 4 (BGP) [RFC4271] terminates its ~~sessions connections~~ upon Hold Timer expiration when the speaker does not receive a BGP message within the negotiated Hold Time interval. As per Section 4.2 of [RFC4271], the minimum Hold Time interval must be either zero or supported by the protocol ~~is at least 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 connections~~ terminate faster than the ~~supported negotiated~~ BGP Hold Timer can accommodate upon loss of connectivity with a neighbor, the BGP speakers can rely upon BFD is ~~used~~ to supply that faster detection. Concretely, when the BFD session state changes to Down, the BGP speaker terminates the ~~session connection with~~ BGP will send a NOTIFICATION message sent to the neighbor, if possible, and then, the BGP speaker closes the undelay TCP connection for the session.

### 2. BFD Cease NOTIFICATION Subcode

The value 10 has been allocated by IANA for the "BFD Down" Cease NOTIFICATION message ~~Subcode subcode~~.

**Commenté [BMI2]:** For better clarity about the meaning of "clients" in this context.

The change uses the definition provided in rfc5882.

**Commenté [BMI3]:** Many actions may be taken by a client

**Commenté [BMI4]:** This is correct, but as the previous text reasons about "connections" and that RFC4271 uses "connection" when discussing hold timer, I suggest to use a consistent terminology (connection). Thanks.

**Commenté [BMI5]:** To be consistent with RFC4486

When a BGP ~~speaker decides to session is terminated~~ a connection with a neighbor due to a BFD session going into the Down state, the BGP ~~Speaker-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~~speakers. Operators using BFD for their

BGP ~~sessions-connections~~ make choices for what BFD timers are used based upon a variety of ~~inputs-criteria, e.g., for~~ stability vs. fast failure tradeoffs. These tradeoffs depending on the role BGP is playing for the deployment. These timers can be controlled using, e.g., [I-D.ietf-idr-bgp-model].

In the event of a BGP ~~session-connection~~ being terminated due to a BFD Down

event ~~from partial loss of connectivity as detected by BFD~~, the remote BGP ~~Speaker-speaker~~ might be able to receive ~~the a~~ BGP Cease NOTIFICATION

message with a subcode of the "BFD Down-Subcode". The receiving BGP ~~Speaker-speaker~~ will

then have an understanding that the ~~session-connection~~ 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~~speakers,

it may not be possible for the Cease 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] or "last-error" in [I-D.ietf-idr-bgp-model].

When the procedures in [RFC8538] for sending a Cease NOTIFICATION message

with ~~a Cease Code and Hard Reset Subcodesubcode~~, and the ~~session-BGP connection~~ is being

terminated because BFD has gone Down, the BFD Down ~~Subcode-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 has assigned the value 10 from the BGP Cease NOTIFICATION message subcodes registry with the Name "BFD Down", and a Reference of this document.

### 6. Acknowledgments

**Commenté [BMI6]:** This should be listed as normative.

**Commenté [BMI7]:** The text should ACK at least the dependency on the BFD to take actions. Manipulating the BFD session will thus have implications on the BGP connection.

**Commenté [BMI8]:** The assignment is temporary. IANA should be requested to make that assignment permanent. I would update the text accordingly.

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

Bruno Rijsman had a substantively similar proposal to this document in 2006; draft-rijsman-bfd-down-subcode. That draft did not progress in IDR at that time. The author of this draft was unaware of Bruno's prior work when creating this proposal.

## 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>>.

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