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

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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

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7.2. Informative References

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[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>.

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