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Subcodes for BGP Finite State Machine Error

Abstract

This document defines several subcodes for the BGP Finite State Machine (FSM) Error that could provide more information to help network operators in diagnosing BGP FSM issues and correlating network events. This document updates RFC 4271.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc6608.

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Table of Contents

1. Introduction

This document defines several subcodes for the BGP [RFC4271] Finite State Machine (FSM) Error that could provide more information to help network operators in diagnosing BGP FSM issues and correlating network events. This information is also helpful to developers in lab situations. This document updates [RFC4271] by requiring that BGP implementations insert appropriate FSM Error subcodes in NOTIFICATION messages for BGP FSM errors.

2. 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 RFC 2119 [RFC2119].

3. Definition of Finite State Machine Error Subcodes

This document defines the following subcodes for the BGP Finite State Machine Error:

0 - Unspecified Error

1 - Receive Unexpected Message in OpenSent State

2 - Receive Unexpected Message in OpenConfirm State

3 - Receive Unexpected Message in Established State

4. Usage of FSM Error Subcodes

If a BGP speaker receives an unexpected message (e.g., KEEPALIVE/ UPDATE/ROUTE-REFRESH message) on a session in OpenSent state, it MUST send to the neighbor a NOTIFICATION message with the Error Code

Finite State Machine Error and the Error Subcode "Receive Unexpected Message in OpenSent State". The Data field is a 1-octet, unsigned integer that indicates the type of the unexpected message.

If a BGP speaker receives an unexpected message (e.g., OPEN/UPDATE/ROUTE-REFRESH message) on a session in OpenConfirm state, it MUST send a NOTIFICATION message with the Error Code Finite State Machine Error and the Error Subcode "Receive Unexpected Message in OpenConfirm State" to the neighbor. The Data field is a 1-octet, unsigned integer that indicates the type of the unexpected message.

If a BGP speaker receives an unexpected message (e.g., OPEN message) on a session in Established State, it MUST send to the neighbor a NOTIFICATION message with the Error Code Finite State Machine Error and the Error Subcode "Receive Unexpected Message in Established State". The Data field is a 1-octet, unsigned integer that indicates the type of the unexpected message.

5. Security Considerations

Specification, implementation, and deployment of the proposed BGP FSM Error subcodes could make BGP implementation fingerprinting easier and probably more accurate. Operators using BGP need to consider this as an operational security consideration of their BGP deployment decisions.

[BFMR2010] discusses a number of BGP security issues and potential solutions that might be relevant both to BGP implementers and BGP operators.

6. IANA Considerations

IANA has created the registry "BGP Finite State Machine Error Subcodes", within the "BGP Error Subcodes" registry, with a Registration Procedure of "Standards Action" as defined in [RFC5226] (early allocation of such subcodes is allowed, in accordance with [RFC4020]).

The registry has been populated with the following values:

Value	Name
0	Unspecified Error
1	Receive Unexpected Message in OpenSent State
2	Receive Unexpected Message in OpenConfirm State
3	Receive Unexpected Message in Established State

7. Contributors

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8. Acknowledgements

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9. References

9.1. Normative References

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9.2. Informative References

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