Network Working Group
Internet-Draft
Updates: 4271 (if approved)
Intended status: Standards Track
Expires: August 17, 2012

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February 14, 2012

Subcodes for BGP Finite State Machine Error
draft-ietf-idr-fsm-subcode-03

Abstract

This document defines several subcodes for 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.

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].

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on August 17, 2012.

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1. Introduction

This document defines several subcodes for BGP [RFC4271] Finite State Machine 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 BGP implementations to insert appropriate FSM Error subcodes in NOTIFICATION messages for BGP FSM errors.

2. Definition of Finite State Machine Error Subcodes

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

0 - Unspecific Error

1 - Receive Unexpected Message in OpenSent State

2 - Receive Unexpected Message in OpenConfirm State

3 - Receive Unexpected Message in Established State

3. 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 which indicates 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 to the neighbor a NOTIFICATION message with the Error Code Finite State Machine Error and the Error Subcode "Receive Unexpected Message in OpenConfirm State". The Data field is a 1-octet unsigned integer which indicates 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 which indicates type of the unexpected message.

4. 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.

5. IANA Considerations

IANA is requested to create 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 should be 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

6. Contributors

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7. Acknowledgements

The authors would like to thank John Scudder, Jeffrey Haas, Susan Hares, Keyur Patel, Enke Chen, Ruediger Volk and Ran Atkinson for their valuable suggestions and comments to this document.

8. References

8.1. Normative References

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[RFC4271] Rekhter, Y., Li, T., and S. Hares, "A Border Gateway Protocol 4 (BGP-4)", RFC 4271, January 2006.

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8.2. Informative References

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