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N. Geng
S. Zhuang
Huawei Technologies

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Synchronizing BMP Monitoring Options and State
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Abstract

This document proposes methods to facilitate correction of BGP Routing Information Base inconsistencies in a non-disruptive manner from the BMP Sender to the BMP Collector.

Status of This Memo

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1. Introduction

The generation of BGP Adj-RIB-In, Loc-RIB and Adj-RIB-Out comes from BGP route exchange and route policy processing. BGP Monitoring Protocol (BMP) provides the monitoring of BGP Adj-RIB-In [RFC7854], BGP Loc-RIB [RFC9069] and BGP Adj-RIB-Out [RFC8671]. The RIB view inconsistency may occur between the BMP sender and BMP collector due to message loss, network flapping, instability, and faults. In this document, we define methods to facilitate correction of BGP Routing Information Base (RIB) inconsistencies in a non-disruptive manner from the BMP Sender to the BMP Collector.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "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.

2. BMP Route-Refresh message

This document defines a new BMP Route-Refresh message type (TBD1) that is used to synchronize the RIB view from the BMP sender to the BMP collector. Following the common BMP header and per-peer header is a Route-Refresh PDU. The Route-Refresh PDU is a ROUTE-REFRESH message defined in [RFC2918] and updated by [RFC7313], and its format is as follows:

Type: 5 - ROUTE-REFRESH

Message Format: One <AFI, Sub-Type, SAFI> tuple encoded as:

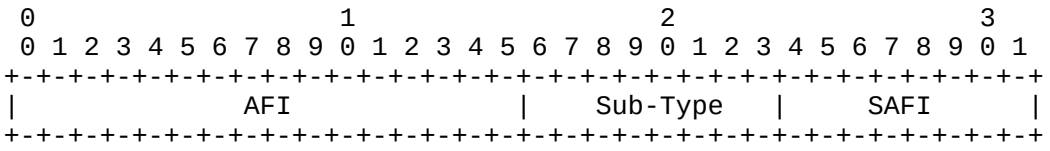

Figure 1: ROUTE-REFRESH Message

The meaning, usage, and encoding of this <AFI, Sub-Type, SAFI> tuple are defined in [RFC2918] and updated by [RFC7313] as follows:

* AFI - Address Family Identifier (2 octets)

* Sub-Type - Message Subtype (1 octet):

  - 0 - Normal route refresh request [RFC2918] with/without Outbound Route Filtering (ORF) [RFC5291]

  - 1 - Demarcation of the beginning of a route refresh (BoRR) operation

  - 2 - Demarcation of the ending of a route refresh (EoRR) operation

  - 255 - Reserved

* SAFI - Subsequent Address Family Identifier (1 octet).

2.1. Example of using BMP Route-Refresh messages

The sequences of BMP messages transmissions shown as follows:

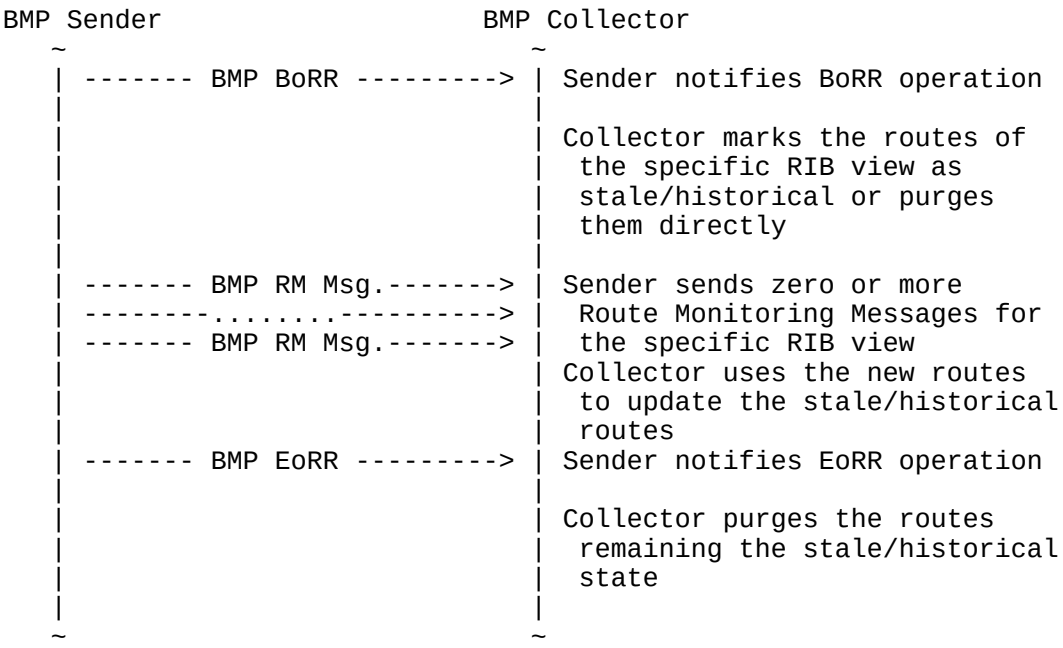

Figure 2: An example of using BMP Route-Refresh messages

3. BMP Monitoring Options message

This document defines a new Monitoring Options (MO) message type (TBD2) that is used to synchronize the monitoring options from the BMP sender to BMP collector. Following the common BMP header and per-peer header is a BMP Monitoring Options PDU. The BMP Monitoring Options PDU is defined as follows:

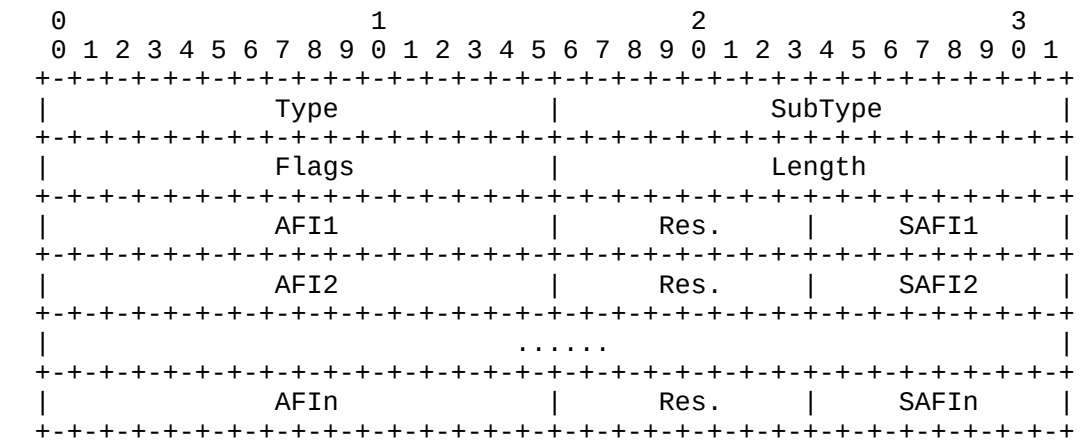

Figure 3: The BMP Monitoring Options PDU

Where:

* Type - 2 octets, It indicates as follows:
  - 1 - Adj-RIB-In
  - 2 - Adj-RIB-Out
  - 3 - Loc-RIB
* SubType - 2 octets, It indicates as follows:
  - 1 - pre-policy
  - 2 - post-policy
* Flags - 2 octets, the least significant bit of Flags Indicates whether the options are enabled or disabled, and other bits are reserved.
* Length - 2 octets
* The list of (AFI, SAFI) follows the Length field.
  - AFI - Address Family Identifier (2 octets)
  - SAFI - Subsequent Address Family Identifier (1 octet)
  - Res. - Reserved field that will be set Zero (1 octet)

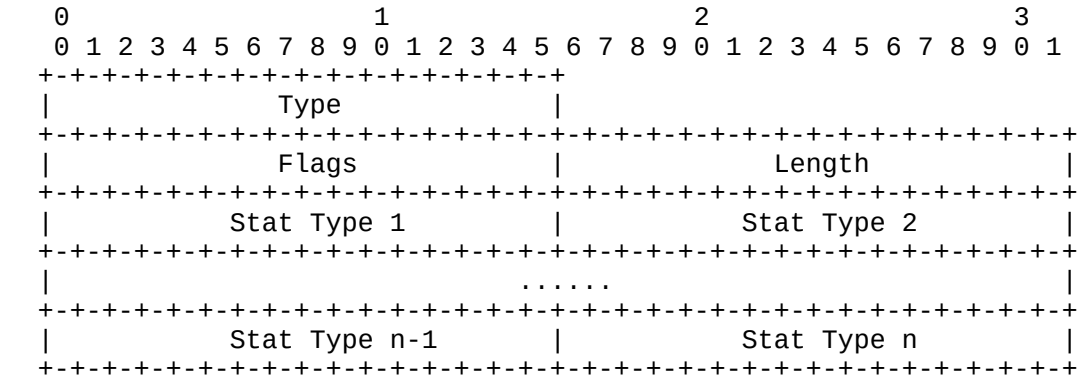

Figure 4: The BMP Monitoring Options PDU

Where:

* Type - 2 octets, It indicates as follows:

  - 4 - Stats

* Flags - 2 octets, the least significant bit of Flags Indicates whether the options are enabled or disabled, and other bits are reserved.

* Length - 2 octets

* The list of Stat Types follows the Length field.

  - Stat Type - Defines the type of the statistic [RFC7854]. (2 octets)

3.1. Example of using BMP Monitoring Options message

In the following scenario, a BGP session is established between Router1 and Router2, and IPv4 unicast, IPv4 multicast, and IPv4 labeled unicast address families are enabled on both the BGP speakers. The two BGP speakers exchange IPv4 unicast, IPv4 multicast, and IPv4 labeled unicast address family routes. Router1 as the BMP Sender sends BMP messages to the BMP Collector.

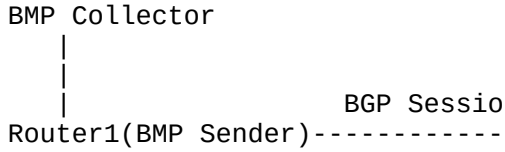

Figure 5: BGP Monitoring Example

Sender initiates the BMP protocol with the Collector:

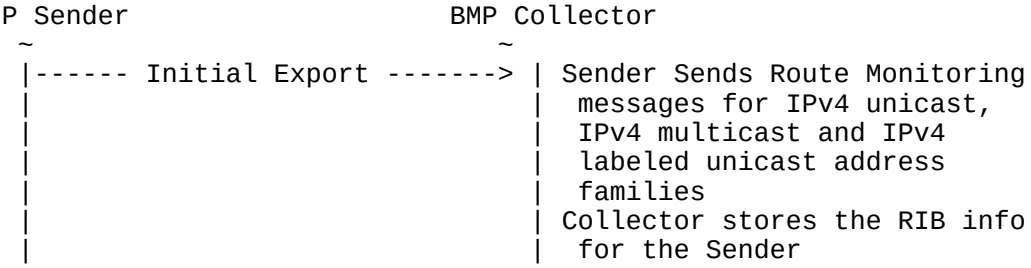

Figure 6: Sender sends Initial Export to Collector

Sender disabled the monitoring on IPv4 multicast address family:

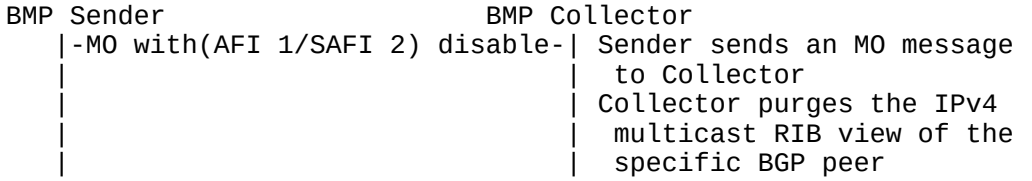

Figure 7: Sender disabled the monitoring on IPv4 multicast address family

Sender disabled the monitoring on IPv4 labeled unicast address family:

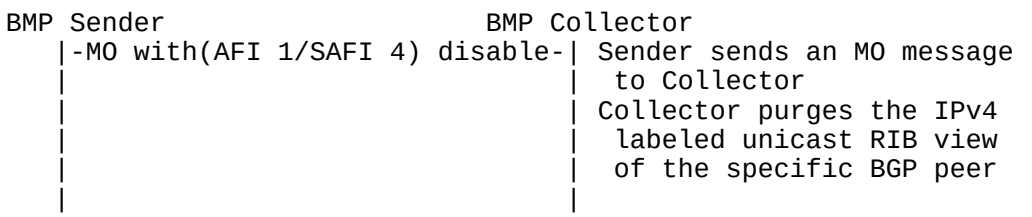

Figure 8: Sender disabled the monitoring on IPv4 labeled unicast address family

Sender enabled the monitoring on IPv4 multicast address family:

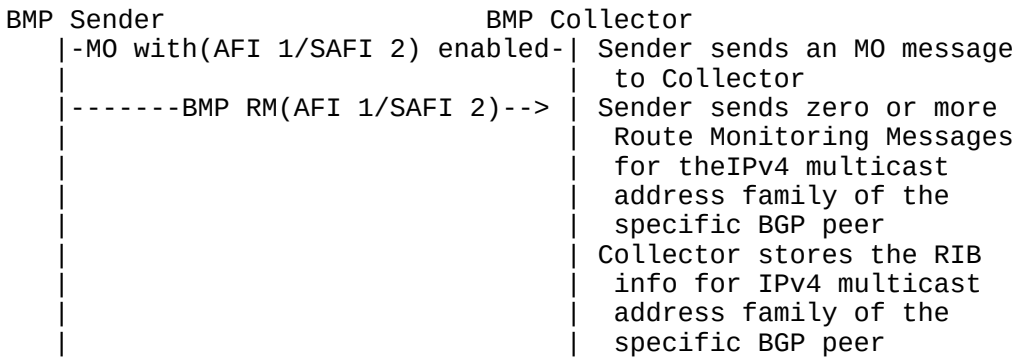

Figure 9: Sender enabled the monitoring on IPv4 multicast address family

4. IANA Considerations

TBD

5. Security Considerations of Inter-domain SPD

The same considerations as in Section 11 of [RFC7854] apply to this document. Implementations of this protocol SHOULD require that sessions only be established with authorized and trusted monitoring devices. It is also believed that this document does not introduce any additional security considerations.

6. Contributors

The following people made significant contributions to this document:

To be added.

7. Acknowledgements

The authors would like to acknowledge the review and inputs from xxx.

8. References

8.1. Normative References

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Authors' Addresses

Nan Geng
Huawei Technologies
Beijing
China
Email: gengnan@huawei.com

Shunwan Zhuang
Huawei Technologies
Beijing
China
Email: zhuangshunwan@huawei.com