BGP Monitoring Protocol (BMP) Enhancements for RIB View Synchronization and Monitoring Options Notification

draft-geng-grow-bmp-sync-options-and-state-02

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BMP Enhancements: RIB View Synchronization and Monitoring Options Notification

- Problem Statement
  a) First, transient faults, message loss, or session interruptions may cause inconsistencies between the RIB views of the BMP sender and collector, and the existing protocol lacks a non-disruptive mechanism to resolve such mismatches.
  b) Second, there is no standardized notification mechanism for senders to inform collectors of modified or updated monitoring reporting options, leading collectors to store stale or invalid BGP information as reporting configurations change.
- Main Idea
  - Define a new Route-Refresh message for non-disruptive RIB view synchronization between senders and collectors
  - Define a new Monitoring Options (MO) message to notify collectors of active and disabled reporting parameters. These extensions enhance the reliability and accuracy of BMP-based BGP monitoring without disrupting existing deployment workflows.

BMP Route-Refresh message

- 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:

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

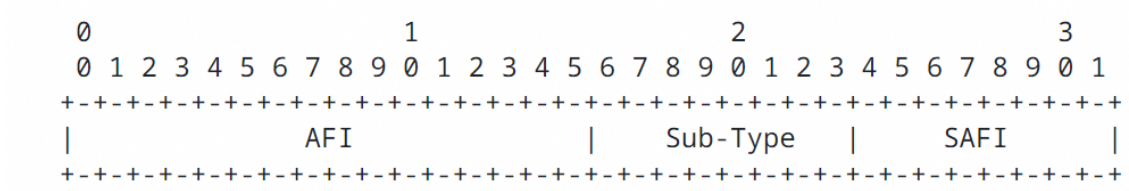

Figure 1: ROUTE-REFRESH Message

- 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).

Example of using BMP Route-Refresh messages

The sequences of BMP message transmission are shown as follows:

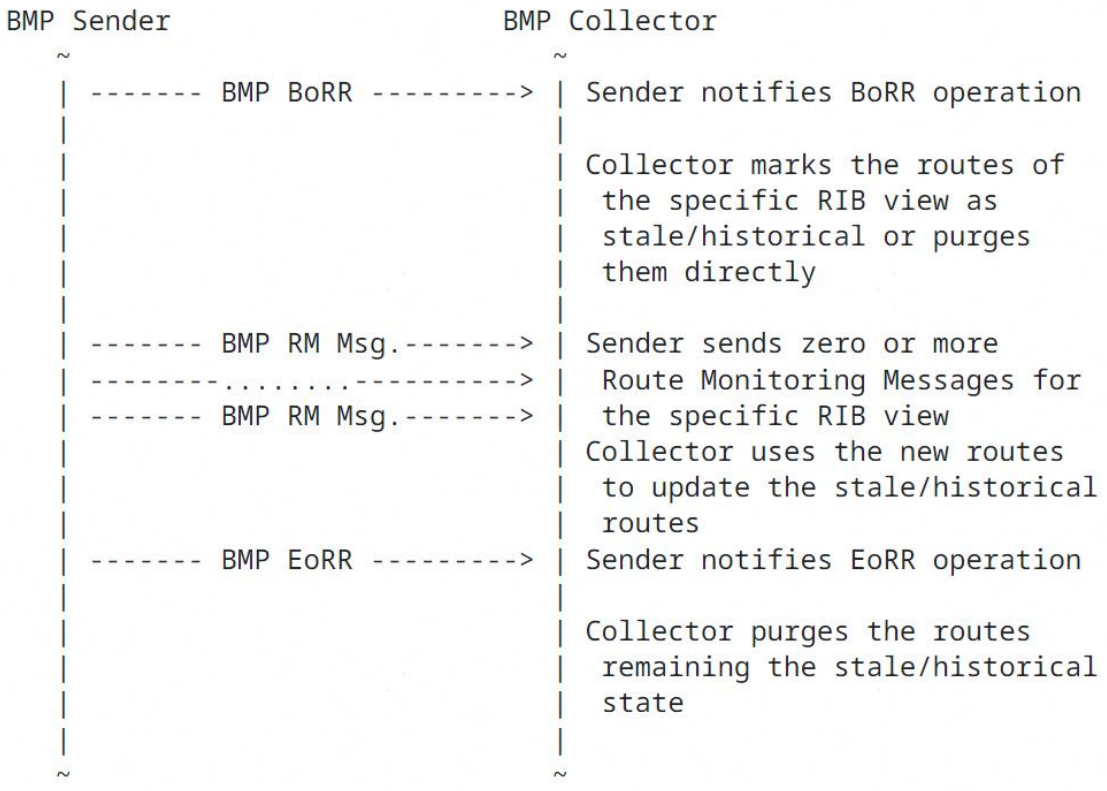

Figure 2: An example of using BMP Route-Refresh messages

BMP Monitoring Options message

- 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:

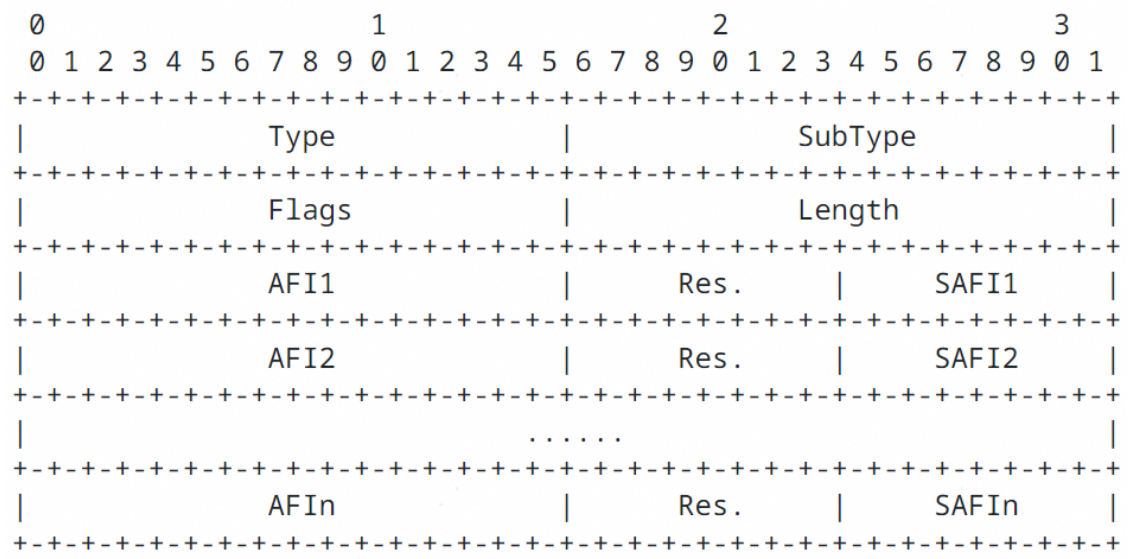

Figure 3: The BMP Monitoring Options PDU

- 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)

BMP Monitoring Options message (con't)

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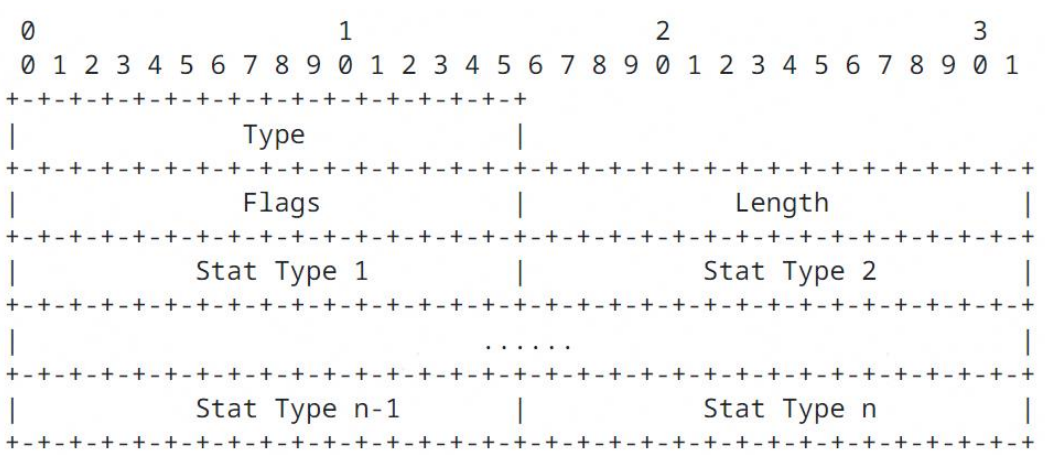

Figure 4: The BMP Monitoring Options PDU

- 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)

Example of using BMP Monitoring Options message

- Disable the monitoring on a specific address family

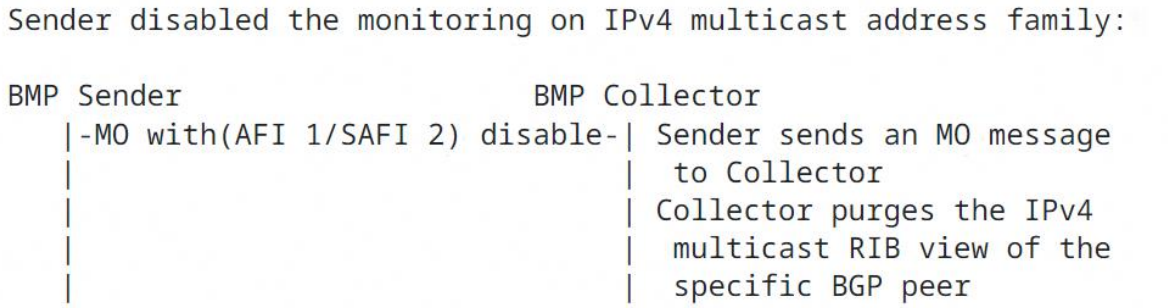

Figure 7: Sender disabled the monitoring on IPv4 multicast address family

- Enable the monitoring on a specific address family

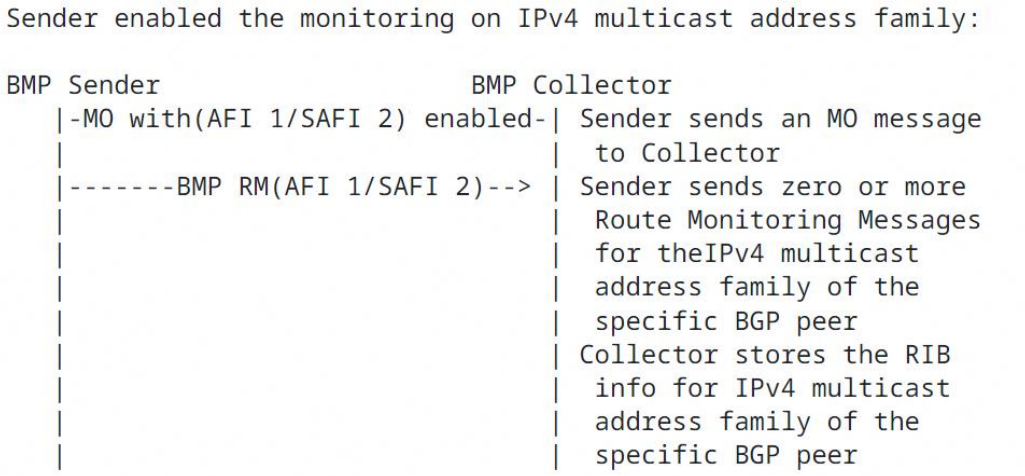

Figure 9: Sender enabled the monitoring on IPv4 multicast address family

Thanks!