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EVPN-Specific BMP RIB Statistics Extensions
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Abstract

This document defines new EVPN-specific BGP Monitoring Protocol (BMP) statistics types. These extensions include scalar counters for EVPN route types (1-8) specifically, while also keeping scope for defining counters which are EVPN route-type agnostic but related to BGP-EVPN RIB like, number of multihoming Ethernet Segments, number of multihomed EVIs, number of aliased paths, number of dynamic inter-VRF route leaking (IVRL).

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1. Introduction

[RFC7854] defines different BMP statistics message types and [I-D.ietf-grow-bmp-bgp-rib-stats] extends the BMP statistics to provide more insights into the BGP RIBs. This document extends the BMP RIB statistics by adding EVPN-specific statistics types to monitor EVPN-related events in Adj-RIB-In, Adj-RIB-Out, and Local-RIB for the EVPN address family (AFI=25, SAFI=70) as defined in [RFC7432] and extended by [RFC9135] for integrated routing and bridging, forms the basis for these statistics.

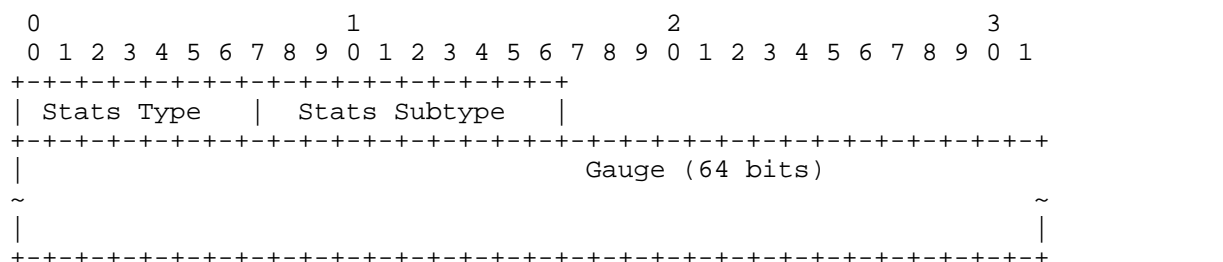
The format of the BMP statistics message remains same as defined in [RFC7854].

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. EVPN-Specific BMP Statistics Extensions

This section defines EVPN-specific statistics types for BMP, applicable to the EVPN address family (AFI=25, SAFI=70). These statistics type for all 5 RIB views: Adj-RIB-In-Pre, Adj-RIB-In-Post, Local-RIB, Adj-RIB-Out-Pre and Adj-RIB-Out-Pre. The statistics values are encoded as 1-byte Stats types, 1 bytes stats sub-type followed by 64-bit gauges. Currently there are EVPN route types numbered 1 to 8. The remaining bits provides flexibility for future extensions to EVPN . and to define more specific counters other than the route-types in future.



* Stats Type (1 bytes): EVPN stats type. Defined types are:

- Type = 0: EVNP route statistics.

* Stats subtype (1 bytes): The stats sub type. Defined subtypes are:

- Subtype = 0: EVPN route type 1 (Ethernet Auto-discovery).
- Subtype = 1: EVPN route type 2 (MAC/IP Advertisement).
- Subtype = 2: EVPN route type 3 (Inclusive Multicast Ethernet Tag Route).
- Subtype = 3: EVPN route type 4 (Ethernet Segment Route).
- Subtype = 4: EVPN route type 5 (IP Prefix Route).
- Subtype = 5: EVPN route type 6 (EVPN Inclusive Multicast Service Interface Route).
- Subtype = 6: EVPN route type 7 (EVPN Ethernet Tag Service Interface Route).
- Subtype = 7: EVPN route type 8 (EVPN IP Prefix Service Interface Route).

- Subtype = 8: EVPN route type 9 (EVPN IP Prefix Route with MAC Mobility).

3. YANG Model Alignment

The counters defined in this document align with the EVPN YANG model described in [I-D.ietf-bess-evpn-yang-07]. Route type counters map to YANG leaves for EVPN route statistics, multihoming and IVRL counters align with Ethernet Segment and VRF-related leaves, the route-map bitmap aligns with policy-related leaves, and segment failure impact aligns with failure event counters. The referenced EVPN YANG model is expired but used due to its relevance to EVPN statistics alignment. Implementations SHOULD check for newer versions. Implementations SHOULD ensure compatibility with the YANG model for integrated monitoring.

4. IANA Considerations

This document requests that IANA assign new BMP statistics types from the "BMP Statistics Type" registry for the following:

- * Type TBD_01: rib-in-pre-evpn-route-stats: Statistics for EVPN routes received before inbound policy is applied.
- * Type TBD_02: rib-in-post-evpn-route-stats: Statistics for EVPN routes after inbound policy is applied.
- * Type TBD_03: loc-rib-evpn-route-stats: Statistics for EVPN routes in the local RIB.
- * Type TBD_04: rib-out-pre-evpn-route-stats: Statistics for EVPN routes before outbound policy is applied.
- * Type TBD_05: rib-out-post-evpn-route-stats: Statistics for EVPN routes after outbound policy is applied.

The 5 types are sufficient to provide generic monitoring of EVPN route types (1-8) across Adj-RIB-In, Adj-RIB-Out, and Local-RIB.

5. Security Considerations

The security considerations of [RFC7854] apply to this document. No additional security risks are introduced by these EVPN-specific statistics, including the route-map attributes bitmap.

6. References

6.1. Normative References

- [RFC7854] Scudder, J., Fernando, R., and S. Stuart, "BGP Monitoring Protocol (BMP)", RFC 7854, DOI 10.17487/RFC7854, June 2016, <<https://www.rfc-editor.org/info/rfc7854>>.
- [RFC7432] Sajassi, A., Aggarwal, R., Bitar, N., Isaac, A., Uttaro, J., Drake, J., and W. Henderickx, "BGP MPLS-Based Ethernet VPN", RFC 7432, DOI 10.17487/RFC7432, February 2015, <<https://www.rfc-editor.org/info/rfc7432>>.
- [RFC9135] Sajassi, A., Drake, J., Boutros, S., and J. Rabadan, "Integrated Routing and Bridging in Ethernet VPN (EVPN)", RFC 9135, DOI 10.17487/RFC9135, October 2021, <<https://www.rfc-editor.org/info/rfc9135>>.
- [I-D.ietf-grow-bmp-bgp-rib-stats]
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- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

6.2. Informative References

- [I-D.ietf-bess-evpn-yang-07]
Brissette, P., Shah, H., Chen, I., and K. Patel, "Yang Data Model for EVPN", Work in Progress draft-ietf-bess-evpn-yang-07, March 2019, <<https://datatracker.ietf.org/doc/html/draft-ietf-bess-evpn-yang-07>>.

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