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Definition For New BGP Monitoring Protocol (BMP) Statistics Types

draft-ietf-grow-bmp-bgp-rib-stats-05

Abstract

RFC 7854 ~~defined~~ defines different BGP Monitoring Protocol (BMP) statistics message~~s~~ types to observe ~~interesting~~ events that occur on ~~the~~ a monitored router.

This document updates RFC 7854 by adding new statistics type to monitor BMP Adj-RIB-In~~rib-in~~ and Adj-RIB-Out tables~~rib-out Ribs~~.

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 23 April 2025.

Copyright Notice

Commenté [MB1]: I'm not sure about this. See below

Commenté [MB2]: Unless I'm mistaken, this one is not supported in 7854.

Commenté [MB3]: I don't see what is updated in 7854

described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Revised BSD License.

Table of Contents

1. Introduction

Section 4.8 of [RFC7854] defines a number of different BGP Monitoring Protocol (BMP) statistics types to observe ~~interesting~~ major events that occur on ~~the~~ a monitored router. Stats are either counters or gauges. ~~A 32-bit Counter is a non-negative integer that monotonically increases until it reaches a maximum value, when it wraps around and starts increasing again from 0. A 64-bit Gauge is a non-negative integer that may increase or decrease, but shall never exceed a maximum value, nor fall below a minimum one.~~

This document defines new gauges for BMP statistics message. The format of the BMP statistics message remains same as defined in [RFC7854].

xx

Commenté [MB4]: No need to repeat the def as this was already in 7854#4.8

Commenté [MB5]: Maybe introduce RFC8671 for rib-out considerations

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.

XX

Commenté [MB6]: State that the terminology is the one in 7854/8671

2. Statistics Definition

This section defines different statistics type for Adj-RIB-In and Adj-RIB-Out~~RIB-IN and RIB-OUT~~ monitoring type.

2.1. Adj-RIB-In ~~RIB-IN~~ Statistics Definition

* Type = 18: (64-bit Gauge) Current number of routes in Adj-RIBs-In-Pre-Policy. ~~The value can increase or decrease based upon ongoing~~

Commenté [MB7]: Indicate where this one is defined.

Commenté [MB8]: «Adj-RIBs-In Pre-Policy" is used in the IANA section. Please use a consistent term.

The same comment applies for other similar descriptions.

configuration change. Note that this counter gauge updates stats type 7
defined in [RFC7854] and makes it a an explicit for Adj-RIBs-In-Pre-
Policy.

* Type = 19: (64-bit Gauge) Current number of routes in per- Address Family Identifier (AFI) / Subsequent Address Family Identifier (SAFI)
Adj-RIBs-In-Pre-Policy. The value can increase or decrease based upon ongoing configuration change. Note that this counter is
similar from stats type 9 defined in [RFC7854] and makes it an
explicit for Adj-RIBs-In-Pre-Policy. The value is structured as:
2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.

* Type = 20: (64-bit Gauge) Current number of routes in Adj-RIBs-In-Post-Policy. The value can increase or decrease based upon ongoing configuration change.

* Type = 21: (64-bit Gauge) Current number of routes in per-AFI/SAFI
Adj-RIBs-In-Post-Policy. The value can increase or decrease based upon ongoing configuration change. The value is structured as:
2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.

* Type = 22: (64-bit Gauge) Current number of routes in per-AFI/SAFI
rejected by inbound policy. The value can increase or decrease based upon ongoing configuration change. Note that this counter
is different from stats type 0 defined in [RFC7854]. The stats
type 0 in [RFC7854] is the a 32 counter32-counter which is monotonically
increasing number and doesn't representsrepresent the current number of
routes rejected by an inbound policy due to ongoing configuration
changes. The value is structured as: 2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.

* Type = 23: (64-bit Gauge) Number of routes in per-AFI/SAFI
accepted by inbound policy. The value can increase or decrease based upon ongoing configuration change or network events. The
value is structured as: 2-byte Address Family Identifier (AFI),
1-byte Subsequent Address Family Identifier (SAFI), followed by a
64-bit Gauge. Some implementations, or configurations in
implementations, may discard routes that do not match policy and
thus the accepted count and the Adj-Rrib-in In counts will be identical in
such cases.

* Type = 24: (64-bit Gauge) Number of routes in per-AFI/SAFI
selected as primary route. The value can increase or decrease based upon ongoing configuration change or network events. The
value is structured as: 2-byte Address Family Identifier (AFI),
1-byte Subsequent Address Family Identifier (SAFI), followed by a
64-bit Gauge. A primary path route is a recursive or non-recursive path
whose nexthop next-hop resolution ends with an adjacency
draft-ietf-rtgwg-bgp-pic [I-D.ietf-rtgwg-bgp-pic]. A prefix can

Commenté [MB9]: This is redundant with the gauge type.

Commenté [MB10]: I don't understand this statement as the type is different

Commenté [MB11]: Add an authoritative reference for this one

Commenté [MB12]: Redundant with the type

Commenté [MB13]: Add an authoritative ref for this table

Commenté [MB14]: I have about the intent here. May be clearer to indicate the types code you are referring to.

have more than one primary path if multipath is configured ~~draft-lapukhov-bgp-ecmp-considerations~~ [I-D.lapukhov-bgp-ecmp-considerations]. A best~~-~~ path is also considered as a primary path.

* Type = 25: (64-bit Gauge) Number of routes in per-AFI/SAFI selected as a backup route. ~~The value can increase or decrease based upon ongoing configuration change or network events.~~ The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge. A backup path is also installed in the RIB, but it is not used until some or all primary paths become unreachable. Backup paths are used for fast convergence in the event of failures.

* Type = 26: (64-bit Gauge) Number of routes in per-AFI/SAFI suppressed by configured route damping policy. ~~The value can increase or decrease based upon configuration change or network events.~~ The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge. Suppressed refers to a path which has been declared suppressed by the BGP Route Flap Damping mechanism as described in Section 2.2 of [RFC2439].

* Type = 27: (64-bit Gauge) Number of routes in per-AFI/SAFI marked as stale by any configuration. The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge. Stale refers to a path which has been declared stale by the BGP Graceful Restart mechanism as described in Section 4.1 of [RFC4724].

* Type = 28: (64-bit Gauge) Number of routes in per-AFI/SAFI marked as stale by Long-Lived Graceful Restart (LLGR). The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge. Stale refers to a path which has been declared stale by the BGP ~~Long-Lived Graceful Restart~~ LLRG mechanism as described in Section 4.3 of [RFC9494]. ~~This is the route that are marked stale as part of LLGR process.~~

* Type = 29: (64-bit Gauge) Number of routes left until reaching the received route threshold as defined in Section 6.7 of [RFC4271]. ~~This value can increase or decrease base on ongoing configuration changes of the peer's received route threshold.~~

* Type = 30: (64-bit Gauge) Number of routes in per-AFI/SAFI left until reaching the received route threshold as defined in Section 6.7 of [RFC4271]. ~~This value can increase or decrease base on ongoing configuration changes of the peer's received route threshold.~~ The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge.

* Type = 31: (64-bit Gauge) Number of routes left until reaching ~~the~~a license-customized route threshold. This value is affected by whether a customized license exists for the relevant address family, and when the customized license is installed. This value

Commenté [MB15]: I would avoid having a normative dependency on an individual I-D.

Better to have the text should be self-contained

Commenté [MB16]: Loc-RIB?

a mis en forme : Surlignage

Commenté [MB17]: Clarify how this is tagged as «configuration»

Commenté [MB18]: Expand

can increase or decrease based on current customized information of license.

Since the license-customized route threshold is vendor specific, this type value (31) SHOULD use enterprise-specific TLV encoding as described in Section 3.3 of [I-D.ietf-grow-bmp-tlv-ebit].

For the enterprise-specific TLV of 31, E-bit ~~SHOULD~~ MUST set to 1, and 31 is 15 bits of TLV Type. As enterprise-specific Type value, 31 is determined by the Enterprise number, and does not have to be defined by INNA.

* Type = 32: (64-bit Gauge) Number of routes in per-AFI/SAFI left until reaching ~~the~~ a license-customized route threshold. This value is affected by whether a customized license exists for the relevant address family, and when the customized license is installed. ~~This value can increase or decrease based on current customized information of license.~~ The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge.

~~It's a~~Also since the license-customized route threshold is vendor specific, this type value (32) SHOULD also use enterprise-specific TLV encoding as described in Section 3.3 of [I-D.ietf-grow-bmp-tlv-ebit].

For the enterprise-specific TLV of 32, E-bit ~~SHOULD~~ MUST set to 1, and 32 is 15 bits of TLV Type. As enterprise-specific Type value, 32 is determined by the Enterprise number, and also does not have to be defined by INNA.

* Type = 33: (64-bit Gauge) Current Number of routes rejected by exceeding the length threshold of ~~as~~AS-~~path~~PATH. ~~This value can increase or decrease base on ongoing configuration changes of the length threshold of as-path. For as-path attribute information, please refer to [RFC4271].~~

* Type = 34: (64-bit Gauge) Current Number of routes in per-AFI/SAFI rejected by exceeding the length threshold of ~~as-path~~AS-PATH. ~~This value can increase or decrease base on ongoing configuration changes of the length threshold of as-path.~~ The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge.

* Type = 35: (64-bit Gauge) Current Number of routes in per-AFI/SAFI Adj-RIBs-In-Post-Policy invalidated by verifying route origin Autonomous System (AS) number through the Route Origin Authorization (ROA) of Resource Public Key Infrastructure (RPKI) [RFC6811]. ~~This value can increase or decrease base on ongoing ROA changes of RPKI.~~ The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge.

* Type = 36: (64-bit Gauge) Current Number of routes in per-AFI/SAFI

Commenté [MB19]: Not sure to see th causality effect here.

Commenté [MB20]: This is redundant with the def of TLV with E-bit set. No need to repeat these details

Commenté [MB21]: Idem as above

Commenté [MB22]: I would delete as this is repeating what is in the TLV/E spec.

Adj-RIBs-In-Post-Policy validated by verifying route origin Autonomous System (AS) number through the Route Origin Authorization (ROA) of Resource Public Key Infrastructure (RPKI) [RFC6811]. This value can increase or decrease base on ongoing ROA changes of RPKI. The value is structured as: 2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.

* Type = 37: (64-bit Gauge) Current Number of routes in per-AFI/SAFI Adj-RIBs-In-Post-Policy not found by verifying route origin Autonomous System (AS) number through the Route Origin Authorization (ROA) of Resource Public Key Infrastructure (RPKI) [RFC6811]. This value can increase or decrease base on ongoing ROA changes of RPKI. The value is structured as: 2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.

Commenté [MB23]: Echo the same changes in the following section

2.2. RIB-OUTAdj-Rib-Out Statistics Definition

* Type = 38: (64-bit Gauge) Current number of routes in per-AFI/SAFI rejected by outbound policy. These routes are active routes which should otherwise would have been advertised in absenseabsence of outbound policy which rejected them. The value can increase or decrease based upon ongoing configuration change. The value is structured as: 2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge. This counter only considers routes distributed from loc-rib into the adj-ribs-out and does not include cases like BGP add-paths [RFC7911].

* Type = 39: (64-bit Gauge) Current Number of routes refused to be sent by exceeding the length threshold of as-pathAS-PATH. This value can increase or decrease base on ongoing configuration changes of the length threshold of as-path. For as-path attribute information, please refer to [RFC4271].

* Type = 40: (64-bit Gauge) Current Number of routes in per-AFI/SAFI refused to be sent by exceeding the length threshold of as-pathAS-PATH. This value can increase or decrease base based on ongoing configuration changes of the length threshold of as-path. The value is structured as: 2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.

* Type = 41: (64-bit Gauge) Current Number of routes in per-AFI/SAFI Adj-RIBs-Out-Post-Policy invalidated by verifying route origin Autonomous System (AS) number through the Route Origin Authorization (ROA) of Resource Public Key Infrastructure (RPKI) [RFC6811]. This value can increase or decrease based on ongoing ROA changes of RPKI. The value is structured as: 2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.

* Type = 42: (64-bit Gauge) Current Number of routes in per-AFI/SAFI Adj-RIBs-Out-Post-Policy validated by verifying route origin ~~Autonomous System (~~AS~~)~~ number through the ~~Route Origin Authorization (~~ROA~~)~~ of ~~Resource Public Key Infrastructure (~~RPKI~~.)~~ ~~[RFC6811]. This value can increase or decrease base on ongoing ROA changes of RPKI.~~ The value is structured as: 2-byte ~~Address Family Identifier (~~AFI~~)~~, 1-byte ~~Subsequent Address Family Identifier (~~SAFI~~)~~, followed by a 64-bit Gauge.

* Type = 43: (64-bit Gauge) Current Number of routes in per-AFI/SAFI Adj-RIBs-Out-Post-Policy not found by verifying route origin AS number through the ROA of RPKI.
The value is structured as: 2-byte AFI, 1-byte SAFI, followed by a 64-bit Gauge.
~~Autonomous System (AS) number through the Route Origin Authorization (ROA) of Resource Public Key Infrastructure (RPKI) [RFC6811]. This value can increase or decrease base on ongoing ROA changes of RPKI. The value is structured as: 2-byte Address Family Identifier (AFI), 1-byte Subsequent Address Family Identifier (SAFI), followed by a 64-bit Gauge.~~

3. IANA Considerations

IANA has assigned the following new parameters in the BMP Statistics Types registry, part of the BMP parameters registry group (https://www.iana.org/assignments/bmp-parameters/bmp-parameters.xhtml).

This document requests IANA to update the reference cited for the entries with the RFC number to be assigned to this document.

~~3.1. BMP RIB-IN Statistics Types~~

Commenté [MB24]: As there is no hierarchy in the registry

~~This document defines new BMP RIB-IN statistic types for statistics reporting (Section 2.1):~~

* Type = 18: (64-bit Gauge) Number of routes currently in Adj-RIBs-In Pre-Policy.

* Type = 19: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-In Pre-Policy.

* Type = 20: (64-bit Gauge) Number of routes currently in Adj-RIBs-In Post-Policy.

* Type = 21: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-In Post-Policy.

* Type = 22: (64-bit Gauge) Number of routes currently in per-AFI/SAFI rejected by inbound policy.

* Type = 23: (64-bit Gauge) Number of routes currently in per-AFI/SAFI accepted by inbound policy.

* Type = 24: (64-bit Gauge) Number of routes currently in per-AFI/

SAFI selected as primary route.

* Type = 25: (64-bit Gauge) Number of routes currently in per-AFI/SAFI selected as backup route.

* Type = 26: (64-bit Gauge) Number of routes in per-AFI/SAFI suppressed by configured route damping policy.

* Type = 27: (64-bit Gauge) Number of routes in per-AFI/SAFI marked as stale by any configuration.

* Type = 28: (64-bit Gauge) Number of routes in per-AFI/SAFI marked as stale by LLGR.

* Type = 29: (64-bit Gauge) Number of routes left until reaching the received route threshold.

* Type = 30: (64-bit Gauge) Number of routes in per-AFI/SAFI left until reaching the received route threshold.

* Type = 31: (64-bit Gauge) Number of routes left until reaching the license-customized route threshold.

* Type = 32: (64-bit Gauge) Number of routes in per-AFI/SAFI left until reaching the license-customized route threshold.

* Type = 33: (64-bit Gauge) Number of routes currently rejected due to exceeding the length threshold of as-path.

* Type = 34: (64-bit Gauge) Number of routes currently in per-AFI/SAFI rejected due to exceeding the length threshold of as-path.

* Type = 35: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-In Post-Policy invalidated after verifying route origin AS number through the ROA of RPKI.

* Type = 36: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-In Post-Policy validated after verifying route origin AS number through the ROA of RPKI.

* Type = 37: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-In Post-Policy not found after verifying route origin AS number through the ROA of RPKI.

~~3.2. BMP RIB-OUT Statistics Types~~

~~This document defines new BMP RIB-OUT statistic types for statistics reporting (Section 2.2):~~

* Type = 38: (64-bit Gauge) Number of routes currently in per-AFI/SAFI rejected by outbound policy.

* Type = 39: (64-bit Gauge) Number of routes currently refused by exceeding the length threshold of ~~as-path~~AS-PATH.

* Type = 40: (64-bit Gauge) Number of routes currently in per-AFI/SAFI refused by exceeding the length threshold of ~~as-path~~AS-PATH.

* Type = 41: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-Out Post-Policy invalidated after verifying route origin AS number through the ROA of RPKI.

* Type = 42: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-Out Post-Policy validated after verifying route origin AS number through the ROA of RPKI.

* Type = 43: (64-bit Gauge) Number of routes currently in per-AFI/SAFI Adj-RIBs-Out Post-Policy not found after verifying route origin AS number through the ROA of RPKI.

4. Security Considerations

The considerations in Section 11 of [RFC7854] apply to this document. It is also believed that this document does not add any additional security considerations.

5. Acknowledgements

The author would like to thank Jeff Haas for his valuable input.

6. Normative References

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a mis en forme : Surlignage

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