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Large BGP Community
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Abstract

A new type of BGP community attribute that contains communities that each hold a 4-octet AS number and a 8-octet opaque field is defined.

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 [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 March 10, 2017.

Table of Contents

1. Introduction

A Large Community attribute is defined that encodes 12 bytes communities, suitable for 4-Octet Autonomous System Numbers that require 8 octets of locally significant opaque data.

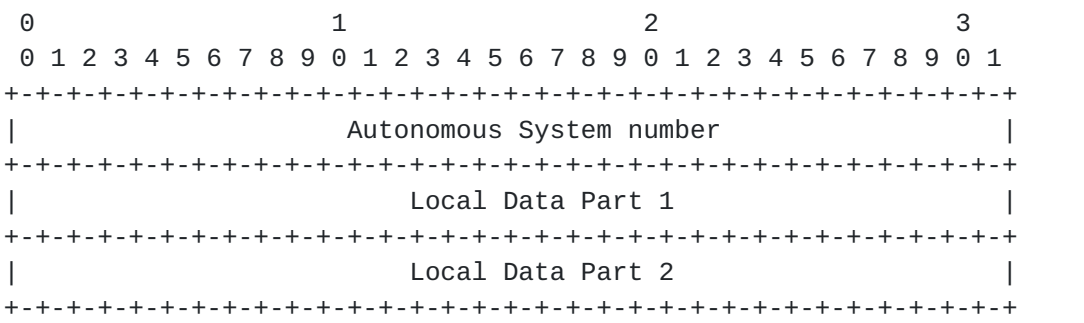
The Large Community is specifically designed to accomodate routing policy related to 4-byte ASNs, as it allows operators to specify two 4-byte ASNs and still have room for 4 bytes for an action. For example, to make a request to AS65551 to add 3 prepends when sending a route to AS65536, one might add the Large Community 65551:303:65536. AS65551 would publish a list of large communities and their associated actions. The Large Community is opaque.

To ensure rapid and smooth adoption of the new community attribute, it must be as similar to the [RFC1997] community as possible, only bigger.

2. Large BGP Community Attribute

The Large Community Attribute is a transitive optional BGP attribute, with the Type Code (suggested 41) to be assigned by IANA. The attribute consists of a set of Large Communities. All routes with the Large Community attribute belong to the communities listed in the attribute.

Each Large Community is encoded as a 12-octet quantity, as follows:



Autonomous System Number: This field indicates the Autonomous System in which the Large Community has a meaning.

Local Data part 1: data set by network operator

Local Data part 2: data set by network operator

3. Textual Representation

The textual representation of the Large Community is A:B:C, where A is the Autonomous System number, B is the Local Data part 1 and C is the Local Data part 2. A ranges from 0 to 4294967295. B ranges from 0 to 4294967295. C ranges from 0 to 4294967295. A, B and C are plain decimal non-negative integers without leading zeroes. Each number must appear, even if it is 0. For example, "0:1:2" cannot be written as ":1:2". The string is expected to match the following regular expression: ^[0-9]+:[0-9]+:[0-9]+$

4. Error Handling

The error handling of Large Community is as follows:

- The Large Community attribute SHALL be considered malformed if its length is not a non-zero multiple of 12 bytes.

- An UPDATE message with a malformed Large Community attribute SHALL be handled using the approach of "treat-as-withdraw" as described in section 2 [RFC7606].

5. Security Considerations

TBD

6. Implementation status - RFC EDITOR: REMOVE BEFORE PUBLICATION

This section records the status of known implementations of the protocol defined by this specification at the time of posting of this Internet-Draft, and is based on a proposal described in [RFC7942]. The description of implementations in this section is intended to assist the IETF in its decision processes in progressing drafts to RFCs. Please note that the listing of any individual implementation here does not imply endorsement by the IETF. Furthermore, no effort has been spent to verify the information presented here that was supplied by IETF contributors. This is not intended as, and must not be construed to be, a catalog of available implementations or their features. Readers are advised to note that other implementations may exist.

As of today these vendors have produced an implementation of Large BGP Community:

- Cisco IOS XR

- ExaBGP

The latest implementation news is tracked at http://largebgpcommunities.net/ [1].

7. IANA Considerations

IANA is requested to assign a BGP path attribute value for the Large Community attribute (suggested 41).

8. Acknowledgements

Thanks to Ruediger Volk, Russ White, Acee Lindem, Shyam Sethuram, Jared Mauch, Joel M. Halpern and Nick Hilliard for insightful review and comments.

9. References

9.1. Normative References

[RFC1997] Chandra, R., Traina, P., and T. Li, "BGP Communities Attribute", RFC 1997, DOI 10.17487/RFC1997, August 1996, <http://www.rfc-editor.org/info/rfc1997>.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <http://www.rfc-editor.org/info/rfc2119>.

[RFC7606] Chen, E., Ed., Scudder, J., Ed., Mohapatra, P., and K. Patel, "Revised Error Handling for BGP UPDATE Messages", RFC 7606, DOI 10.17487/RFC7606, August 2015, <http://www.rfc-editor.org/info/rfc7606>.

9.2. Informative References

[RFC7942] Sheffer, Y. and A. Farrel, "Improving Awareness of Running Code: The Implementation Status Section", BCP 205, RFC 7942, DOI 10.17487/RFC7942, July 2016, <http://www.rfc-editor.org/info/rfc7942>.

9.3. URIs

[1] https://largebgpcommunities.net

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