Network Working Group
Request for Comments: 5668
Category: Standards Track

Y. Rekhter
Juniper Networks
S. Sangli
Cisco Systems
D. Tappan
Consultant

October 2009

4-Octet AS Specific BGP Extended Community

Abstract

This document defines a new type of a BGP extended community, which carries a 4-octet Autonomous System (AS) number.

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Copyright Notice

not be created outside the IETF Standards Process, except to format it for publication as an RFC or to translate it into languages other than English.

1. Introduction

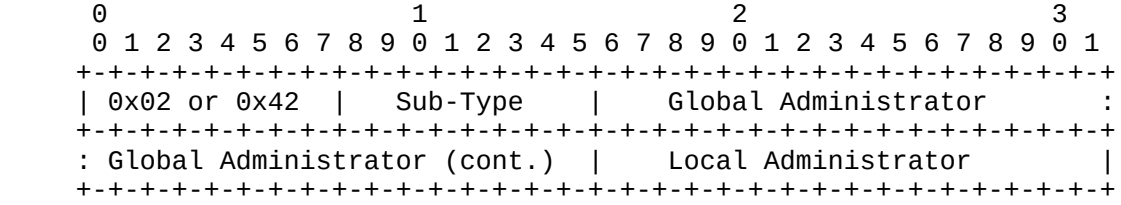
This document defines a new type of BGP extended community [RFC4360]: a 4-octet AS specific extended community. This type of extended community is similar to the 2-octet AS specific extended community, except that it can carry a 4-octet Autonomous System number.

1.1. Specification of Requirements

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 RFC 2119 [RFC2119].

2. 4-Octet AS Specific Extended Community

This is an extended type with a Type field comprising 2 octets and a Value field comprising 6 octets.



The value of the high-order octet of this extended type is either 0x02 (for transitive communities) or 0x42 (for non-transitive communities). The low-order octet of this extended type is used to indicate sub-types.

The Value field consists of 2 sub-fields:

Global Administrator sub-field: 4 octets

This sub-field contains a 4-octet Autonomous System number assigned by IANA.

Local Administrator sub-field: 2 octets

The organization identified by the Autonomous System number in the Global Administrator sub-field can encode any information in this sub-field. The format and meaning of the value encoded in this sub-field should be defined by the sub-type of the community.

3. Considerations for 2-Octet Autonomous Systems

As per [RFC4893], a 2-octet Autonomous System number can be converted into a 4-octet Autonomous System number by setting the 2 high-order octets of the 4-octet field to zero.

As a consequence, at least in principle, an Autonomous System that uses a 2-octet Autonomous System number could use either 2-octet or 4-octet AS specific extended communities. This is undesirable, as both communities would be treated as different, even if they had the same Sub-Type and Local Administrator values.

Therefore, for backward compatibility with existing deployments and to avoid inconsistencies between 2-octet and 4-octet specific extended communities, Autonomous Systems that use 2-octet Autonomous System numbers SHOULD use 2-octet AS specific extended communities rather than 4-octet AS specific extended communities.

4. IANA Considerations

This document defines a class of extended communities, called 4-octet AS specific extended communities, for which the IANA has created and will maintain a registry entitled Four-octet AS Specific Extended Community. All the communities in this class are of extended Types. Future assignments are to be made using the "First Come First Served" policy defined in [RFC5226]. The Type values for the transitive communities of the 4-octet AS specific extended community class are 0x0200-0x02ff; for the non-transitive communities of that class, they are 0x4200-0x42ff. Assignments consist of a name and the value.

This document makes the following assignments for the 4-octet AS specific extended community:

Name	Type Value
four-octet AS specific Route Target	0x0202
four-octet AS specific Route Origin	0x0203

5. Security Considerations

This document does not add new security issues. All the security considerations for BGP extended communities apply here. At the time that this document was written, there were significant efforts underway to improve the security properties of BGP. For examples of documents that have been produced up to this time of publication, see [RFC4593] and [SIDR].

There is a potential serious issue if a malformed, optional transitive attribute is received. This issue and the steps to avoid it are discussed in [OPT_TRANS].

6. Acknowledgements

Thanks to Bruno Decraene for his contributions to this document.

7. References

7.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 5226, May 2008.

[RFC4360] Sangli, S., Tappan, D., and Y. Rekhter, "BGP Extended Communities Attribute", RFC 4360, February 2006.

[RFC4893] Vohra, Q. and E. Chen, "BGP Support for Four-octet AS Number Space", RFC 4893, May 2007.

7.2. Informative References

[OPT_TRANS] Scudder, J., and E. Chen, "Error Handling for Optional Transitive BGP Attributes", Work in Progress, April 2009.

[RFC4593] Barbir, A., Murphy, S., and Y. Yang, "Generic Threats to Routing Protocols", RFC 4593, October 2006.

[SIDR] Lepinski, M. and S. Kent, "An Infrastructure to Support Secure Internet Routing", Work in Progress, July 2009.

Authors' Addresses

Yakov Rekhter
Juniper Networks, Inc.
EMail: yakov@juniper.net

Srihari R. Sangli
Cisco Systems, Inc.
EMail: rsrihari@cisco.com

Dan Tappan
Boxborough MA
EMail: Dan.Tappan@Gmail.com