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Generic Subtype for BGP Four-octet AS specific extended community
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Abstract

Maintaining the current best practices with communities, ISPs and enterprises that get assigned a 4-octet AS number may want the BGP UPDATE messages they receive from their customers or peers to include a 4-octet AS specific extended community. This document defines a new sub-type within the four-octet AS specific extended community to facilitate this practice.

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1. Introduction

Maintaining the current best practices with communities, ISPs and enterprises that get assigned a 4-octet AS number may want the BGP UPDATE messages they receive from their customers or peers to include a 4-octet AS specific extended community. This document defines a new sub-type within the four-octet AS specific extended community to facilitate this practice.

As an example, [[RFC1998](#)] describes an application of BGP community attribute ([[RFC1997](#)]) to implement flexible routing policies for sites multi-homed to one or multiple providers. In a two-octet AS environment, the advertised routes are usually associated with a community attribute that encodes the provider's AS number in the first two octets of the community and a LOCAL_PREF value in the second two octets of the community. The community attribute signals the provider edge routers connected to the site to set the corresponding LOCAL_PREF on their advertisements to the IBGP mesh. In this way, customers can put into practice topologies like active-backup.

When such a provider is assigned a four-octet AS number, the existing mechanism of using communities is not sufficient since the community value can not exceed four bytes. The natural alternative is to extend the same mechanism using extended communities since it allows for encoding eight bytes of information.

[I-D.ietf-l3vpn-as4octet-ext-community] defines four-octet AS specific extended community with a designated type field. At the time of writing this document, there are two known sub-types defined: Four-octet specific Route Target extended community and Four-octet specific Route Origin extended community. This document specifies a generic sub-type for the four-octet AS specific extended community to provide benefits such as the one cited above as the Internet migrates to four-octet AS space.

1.1. 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 [RFC 2119](#) [RFC2119].

2. Generic Subtype Definition

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[illegible]

This is a transitive extended community with Type Field comprising of 2 octets and Value Field comprising of 6 octets.

The high-order octet of this extended type is set to 0x02 as defined in [\[I-D.ietf-l3vpn-as4octet-ext-community\]](#). The low-order octet or the sub-type is set to 0x04.

The Value Field consists of two sub-fields:

Global Administrator sub-field: 4 octets

This sub-field contains a four-octet Autonomous System number.

Local Administrator sub-field: 2 octets

This sub-field contains a value that can influence routing policies. It is expected that the values will be identical to the ones used in practice with standard communities and will be of significance between the local Autonomous System and its customer or peering Autonomous

Systems.

[3.](#) Deployment Considerations

A speaker with a 4-octet Autonomous System may have a customer or peer with a 2-octet Autonomous System. If such a peer supports 4-octet extended communities, then it will be able to tag its routes with the 4-octet extended community defined by the speaker. If the peer does not support 4-octet extended communities, then the speaker may need to define an appropriate standard community value for the same purpose.

Similarly, a 2-octet AS may have two valid representations as either a standard community or a 4-octet extended community with the upper two octets of the AS set to zero. Therefore, as per [\[I-D.ietf-l3vpn-as4octet-ext-community\]](#), two-octet ASes SHOULD use standard 2-octet communities rather than 4-octet AS specific extended communities in order to avoid inconsistencies.

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[4.](#) Acknowledgments

[5.](#) IANA Considerations

IANA is requested to assign sub-type 0x04 as a generic four-octet AS specific extended community.

[6.](#) Security Considerations

There are no additional security risks introduced by this design.

[7.](#) Normative References

[I-D.ietf-l3vpn-as4octet-ext-community]
Rekhter, Y., Sangli, S., and D. Tappan, "Four-octet AS Specific BGP Extended Community",
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- [RFC1997] Chandrasekeran, R., Traina, P., and T. Li, "BGP Communities Attribute", [RFC 1997](#), August 1996.
- [RFC1998] Chen, E. and T. Bates, "An Application of the BGP Community Attribute in Multi-home Routing", [RFC 1998](#), August 1996.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

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