Network Working Group
Internet-Draft
Intended status: Standards Track
Expires: May 23, 2013

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November 19, 2012

Assigned BGP extended communities
draft-ietf-idr-reserved-extended-communities-04

Abstract

This document defines an IANA registry in order to assign non-transitive extended communities from. These are similar to the existing well-known BGP communities defined in RFC 1997 but provide a control over inter-AS community advertisement as, per RFC RFC 4360, they are not transitive across Autonomous System boundaries.

For that purpose, this document defines the use of the reserved Autonomous System number 0.65535 in the non-transitive generic four-octet AS specific extended community type.

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].

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 May 23, 2013.

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1. Introduction

[RFC1997] defines the BGP community attribute and some BGP well-known communities whose meaning SHALL be understood by all compliant implementations. New communities can be registered in the IANA "BGP Well-known Communities" registry but it can't be assumed anymore that they will be known by all BGP implementations. Implementations or BGP policies which recognize them will behave as specified in the IANA registry. Implementations which do not recognize those new IANA assigned communities will propagate them from BGP neighbor to BGP neighbor and from AS to AS with an unlimited scope.

There is currently no agreed way to register a non-transitive well-known community.

On one hand, [RFC1997] defines BGP Well-known communities with no structure to set their transitiveness across ASes. Without structure, communities can only be filtered by explicitly enumerating all community values that will be denied or allowed to BGP speakers in neighboring ASes. This is not satisfactory as this would require upgrading all border routers to understand this community before its first usage.

On the other hand, [RFC4360] defines the BGP extended community attribute with a structure including a type and a transitive bit "T". This transitive bit, when set, allows to restrict the scope of the community within an AS. But there is no IANA registry to allocate one well-known extended community. [RFC4360] defines IANA registries to allocate BGP Extended Communities types. Each type is able to encode 2^48 or 2^56 values depending on the type being extended or regular. Therefore, one needing to reserve a single non-transitive extended community would need to reserve an extended subtype which represents 2^48 communities, while a single value is used. This would both waste the resources and disable the ability to define global policies on reserved communities, such as to accept them or to

filter them out. In addition, using a new community type typically requires a software upgrade on both the router setting the community and the router using it in a BGP policy. So this would not allow the networking community to quickly define and use a new community.

To address this limitation, this document defines an IANA registry in order to allow the registration of non-transitive extended communities. These are similar to the existing Well-known BGP communities defined in [RFC1997] but provides a control on inter-AS community advertisement. Indeed, as per [RFC4360] non-transitive communities are removed from routes propagated to another AS.

2. Assigned non-transitive extended communities

[I-D.ietf-idr-as4octet-extcomm-generic-subtype] defines a generic sub-type for the four-octet AS specific extended community. The value of the four-octets Global Administrator sub-field contains a four-octet Autonomous System number. The value of their two-octet Local Administrator sub-field has semantics defined by the Autonomous System set in the Global Administrator sub-field.

This document updates [I-D.ietf-idr-as4octet-extcomm-generic-subtype] and defines the use of the Local Administrator sub-field of the "non-transitive generic four-octet AS specific" extended community type when the AS number has the reserved value 0.65535 (0x0000FFFF).

When the AS number, encoded in the Global Administrator sub-field, has the reserved value 0.65535, the communities have global significance. The lists of those communities are maintained by the IANA in the registry "Assigned non-transitive extended communities".

Note that this use of the reserved AS number 0.65535 in the AS field of the communities is similar to the one defined by [RFC1997] for the BGP Well-Known communities. In particular, [RFC1997] also uses the reserved AS number 65535.

3. Assigned transitive extended communities

As per [RFC4893], a 2-octet Autonomous System number can be converted into a 4-octet Autonomous System number by setting the two high-order octets of the 4-octet field to zero. This applies to the reserved 2-octet Autonous System number 65535 which could use either a standard community or the 4-octet AS specific generic extended community. As noted in [I-D.ietf-idr-as4octet-extcomm-generic-subtype], this is undesirable

as they would be treated as different communities, even if they had the same values.

Therefore, this document does not define a non-transitive extended community registry and transitive communities are still to be assigned as per [RFC1997].

4. IANA Considerations

The IANA is requested to create and maintain a registry entitled "Assigned non-transitive extended communities" with the following registration procedure:

Registry Name: Assigned non-transitive extended communities with Global Significance

Range	Registration Procedures
0x0000-8000	First Come First Served
0x8001-FFFF	Standards Action/Early IANA Allocation

An application may need both a transitive and a non-transitive community and it may be beneficial to have the same value for both communities. Therefore, the IANA SHOULD try to accommodate such request to get both a non-transitive community from the above "Assigned non transitive extended communities" and a transitive community from [RFC1997] BGP Well-known Communities with the same (lower two-octets) value for both.

5. Security Considerations

This document defines IANA actions. In itself, it has no impact on the security of the BGP protocol.

It allows the allocation of non-transitive global communities which are not propagated across Autonomous System boundaries. Compared to a transitive well-known community, a non-transitive community can provide some security benefit both for the sender and the receiver of the community.

6. Acknowledgements

We would like to acknowledge John Scudder and Jeffrey Haas for their contribution to this document.

7. Normative References

[I-D.ietf-idr-as4octet-extcomm-generic-subtype]
Rao, D., Mohapatra, P., and J. Haas, "Generic Subtype for BGP Four-octet AS specific extended community", draft-ietf-idr-as4octet-extcomm-generic-subtype-06 (work in progress), October 2012.

[RFC1997] Chandrasekeran, R., Traina, P., and T. Li, "BGP Communities Attribute", RFC 1997, August 1996.

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

[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.

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

Appendix A. Appendix A. Changes / Author Notes

[RFC Editor: Please remove this section before publication]

Changes -01

- Name changed from ’Reserved BGP extended communities’ to ’Assigned BGP extended communities’
- Addition of section ’Assigned extended communities’

Changes -02: no change, refresh only.

Changes -03

- Use of AS number 0.65535 (0x0000FFFF) instead of AS 0. This is better aligned with RFC 1997 which also uses AS 65535.

- Remove the transitive flavor of assigned extended communities. RFC 1997 well-known standard communities to be used instead.

Changes -04: no change, refresh only.

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