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Clarification of the Flowspec Redirect Extended Community draft-ietf-idr-flowspec-redirect-rt-bis-05

Abstract

This document updates RFC 5575 (Dissemination of Flow Specification Rules) to clarify the formatting of the the BGP Flowspec Redirect Extended Community.

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 January 28, 2016.

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1. Introduction

Dissemination of Flow Specification Rules [RFC5575], commonly known as BGP Flowspec, provided for a BGP Extended Community [RFC4360] that served to redirect traffic to a VRF routing instance that matched the flow specification NLRI. In that RFC, the Redirect Extended Community was documented as follows:

: +--------+--------------------+--------------------------+
: | type | extended community | encoding |
: +--------+--------------------+--------------------------+
: | 0x8008 | redirect | 6-byte Route Target |
: +--------+--------------------+--------------------------+
:
: [...]
:
: Redirect: The redirect extended community allows the traffic to be
: redirected to a VRF routing instance that lists the specified
: route-target in its import policy. If several local instances
: match this criteria, the choice between them is a local matter
: (for example, the instance with the lowest Route Distinguisher
: value can be elected). This extended community uses the same
: encoding as the Route Target extended community [RFC4360].
: [...]
:
: 11. IANA Considerations
: [...]
:
: The following traffic filtering flow specification rules have been
: allocated by IANA from the "BGP Extended Communities Type -
: Experimental Use" registry as follows:
: [...]
:
: 0x8008 - Flow spec redirect

The IANA registry of BGP Extended Communities clearly identifies communities of specific formats. For example, "Two-octet AS Specific Extended Community" [RFC4360], "Four-octet AS Specific Extended Community" [RFC5668] and "IPv4 Address Specific Extended Community" [RFC4360]. Route Targets [RFC4360] identify this format in the high-order (Type) octet of the Extended Community and set the value of the low-order (Sub-Type) octet to 0x02. The Value field of the Route Target Extended Community is intended to be interpreted in the context of its format.

Since the Redirect Extended Community only registered a single code-point in the IANA BGP Extended Community registry, a common interpretation of the redirect extended community's "6-byte route target" has been to look, at a receiving router, for a route target value that matches the route target value in the received redirect extended community, and import the advertised route to the corresponding VRF instance subject to the rules defined in [RFC5575]. However, because the route target format in the redirect extended community is not clearly defined, the wrong match may occur.

This "value wildcard" matching behavior, which does not take into account the format of the route target defined for a local VRF and may result in the wrong matching decision, does not match deployed implementations of BGP Flowspec. Deployed implementations of BGP Flowspec solve this problem by defining different redirect extended communities that are specific to the format of the route target value. This document defines the following redirect extended communities:

type	extended community	encoding
0x8008	redirect AS-2byte	2-octet AS, 4-octet Value
0x8108	redirect IPv4	4-octet IPv4 Address, 2-octet Value
0x8208	redirect AS-4byte	4-octet AS, 2-octet Value

It should be noted that the low-order nibble of the Redirect's Type field corresponds to the Route Target Extended Community format field (Type). (See [RFC4360], Secs. 3.1, 3.2, and 4 plus [RFC5668], Sec. 2.) The low order octet (Sub-Type) of the Redirect Extended Community remains 0x08, contrasted to 0x02 for Route Targets.

The IANA Registries for BGP Extended Communities [RFC7153] document was written to update the previously-mentioned IANA registries to better document BGP Extended Community formats. The IANA Considerations section below further amends those registry updates in order to properly document the Flowspec redirect communities.

2. IANA Considerations

2.1. BGP Transitive Extended Community Types

IANA is requested to update the "BGP Transitive Extended Community Types" registry as follows:

0x81 - Generic Transitive Experimental Use Extended Community Part 2 (Sub-Types are defined in the "Generic Transitive Experimental Extended Community Part 2 Sub-Types" Registry)

0x82 - Generic Transitive Experimental Use Extended Community Part 3 (Sub-Types are defined in the "Generic Transitive Experimental Extended Community Part 3 Sub-Types" Registry)

2.2. Update to BGP Generic Transitive Experimental Use Extended Community Sub-Types

IANA is requested to update the "BGP Generic Transitive Experimental Use Extended Community Sub-Types" registry as follows:

0x08 - Flow spec redirect AS-2byte format. [RFC5575, RFC-to-be]

(Note to RFC Editor - replace RFC-to-be with this RFC number.)

2.3. Generic Transitive Experimental Extended Community Part 2 Sub-Types

IANA is requested to create the "Generic Transitive Experimental Use Extended Community Part 2 Sub-Types" registry. This registry should be created under the BGP Extended Communities registry. It will contain the following note:

> This registry contains values of the second octet (the "Sub-Type" field) of an extended community when the value of the first octet (the "Type" field) is 0x81.

Registry Name: Generic Transitive Experimental Use Extended Community Part 2 Sub-Types

RANGE	REGISTRATION PROCEDURE	REFERENCE
0x00-0xBF	First Come First Served	
0xC0-0xFF	IETF Review	

SUB-TYPE VALUE	NAME	
0x00-0x07	Unassigned	
0x08	Flow spec redirect IPv4 format.	[RFC-to-be]
0x09-0xff	Unassigned	

(Note to RFC Editor - replace RFC-to-be with this RFC number.)

2.4. Generic Transitive Experimental Extended Community Part 3 Sub-Types

IANA is requested to create the "Generic Transitive Experimental Use Extended Community Part 3 Sub-Types" registry. This registry should be created under the BGP Extended Communities registry. It will contain the following note:

> This registry contains values of the second octet (the "Sub-Type" field) of an extended community when the value of the first octet (the "Type" field) is 0x82.

Registry Name: Generic Transitive Experimental Use Extended Community Part 2 Sub-Types

RANGE	REGISTRATION PROCEDURE	REFERENCE
0x00-0xBF	First Come First Served	
0xC0-0xFF	IETF Review	

SUB-TYPE VALUE	NAME	
0x00-0x07	Unassigned	
0x08	Flow spec redirect AS-4byte format.	[RFC-to-be]
0x09-0xff	Unassigned	

(Note to RFC Editor - replace RFC-to-be with this RFC number.)

3. Security Considerations

This document introduces no additional security considerations than those already covered in [RFC5575]. It should be noted that if the wildcard behavior were actually implemented, this ambiguity may lead to the installation of Flowspec rules in an incorrect VRF and may lead to traffic to be incorrectly delivered.

4. Acknowledgements

The contents of this document was raised as part of implementation discussions of BGP Flowspec with the following individuals:

Andrew Karch (Cisco)

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Matthieu Texier (Arbor Networks)

Kaliraj Vairavakkalai (Juniper)

5. Normative References

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

[RFC5575] Marques, P., Sheth, N., Raszuk, R., Greene, B., Mauch, J., and D. McPherson, "Dissemination of Flow Specification Rules", RFC 5575, August 2009.

[RFC5668] Rekhter, Y., Sangli, S., and D. Tappan, "4-Octet AS Specific BGP Extended Community", RFC 5668, October 2009.

[RFC7153] Rosen, E. and Y. Rekhter, "IANA Registries for BGP Extended Communities", RFC 7153, March 2014.

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