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Dissemination of Flow Specification Rules for IPv6 Implementation Report draft-vandevelde-idr-ipv6-flowspec-imp-00

Abstract

This document is an implementation report for the BGP Flow Specification Rules for IPv6 as defined in [I-D.ietf-idr-flow-spec-v6]. The respondents are experts with the implementations they reported on, and their responses are considered authoritative for the implementations for which their responses represent.

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 April 11, 2015.

Table of Contents

1. Introduction

In order to share Flow Specification Rules for IPv6 using the BGP routing protocol a new BGP Network Layer Reachability Information (NLRI) encoding format is required.

This document provides an implementation report for the BGP Dissemination of Flow Specification Rules for IPv6 NLRI Format as defined in [I-D.ietf-idr-flow-spec-v6].

The editors did not verify the accuracy of the information provided by respondents or by any alternative means. The respondents are experts with the implementations they reported on, and their responses are considered authoritative for the implementations for which their responses represent.

2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [RFC2119] only when they appear in all upper case. They may also appear in lower or mixed case as English words, without any normative meaning.

3. Implementation Forms

Contact and implementation information for person filling out this form:

Cisco
Name: Gunter Van de Velde
Email:gvandeve@cisco.com
Vendor: Cisco Systems, Inc.
Release: IOS-XR
Protocol Role: Sender, Receiver

Alcatel-Lucent
Name: Wim Henderickx
Email: wim.henderickx@alcatel-lucent.com
Vendor: Alcatel-Lucent, Inc.
Release: R12R4
Protocol Role: Sender, Receiver

4. NLRI and Extended Community subtypes

Does the implementation support the Network Layer Reachability (NLRI) subtypes as described in Section 3 and 4 of [I-D.ietf-idr-flow-spec-v6].

- N1: Type 1 - Destination IPv6 Prefix
- N2: Type 2 - Source IPv6 Prefix
- N3: Type 3 - Next Header
- N4: Type 4 - Port
- N5: Type 5 - Destination port
- N6: Type 6 - Source port
- N7: Type 7 - ICMP type
- N8: Type 8 - ICMP code
- N9: Type 9 - TCP flags
- N10: Type 10 - Packet length
- N11: Type 11 - DSCP (Diffserv Code Point)
- N12: Type 12 - Fragment

- N13: Type 13 - Flow Label
- E1: Extended Community - traffic-rate
- E2: Extended Community - traffic-action
- E3: Extended Community - redirect
- E4: Extended Community - traffic-marking

	Cisco	ALU	TBD
Rcv.N1	YES	YES	---
Snd.N1	YES	YES	---
Rcv.N2	YES	YES	---
Snd.N2	YES	YES	---
Rcv.N3	YES	YES	---
Snd.N3	YES	YES	---
Rcv.N4	YES	YES	---
Snd.N4	YES	YES	---
Rcv.N5	YES	YES	---
Snd.N5	YES	YES	---
Rcv.N6	YES	YES	---
Snd.N6	YES	YES	---
Rcv.N7	YES	YES	---
Snd.N7	YES	YES	---
Rcv.N8	YES	YES	---
Snd.N8	YES	YES	---
Rcv.N9	YES	YES	---
Snd.N9	YES	YES	---
Rcv.N10	YES	YES	---
Snd.N10	YES	YES	---
Rcv.N11	YES	YES	---
Snd.N11	YES	YES	---
Rcv.N12	YES	YES	---
Snd.N12	YES	YES	---
Rcv.N13	YES	YES	---
Snd.N13	YES	YES	---
Rcv.E1	YES	YES	---
Snd.E1	YES	YES	---
Rcv.E2	YES	YES	---
Snd.E2	YES	YES	---
Rcv.E3	YES	YES	---
Snd.E3	YES	YES	---
Rcv.E4	YES	YES	---
Snd.E4	YES	YES	---

Yes

- Rcv: BGP speaker can receive the information into the BGP process
- Snd: BGP speaker can relay the information from the BGP process

No

- o Rcv: BGP speaker can not receive the information into the BGP process
- o Snd: BGP speaker can not relay the information from the BGP process

5. Interoperable Implementations

Summary of executed Interop tests between different implementations

5.1. Alcatel-Lucent - Cisco Systems

This Interop test was between a Cisco IOS-XR router and a Alcatel-Lucent Router. Between the two BGP devices an iBGP session is established.

The following IPv6 Flow Specification NLRI is constructed using the Cisco router as IPv6 Flow Specification controller:

```
!
class-map type traffic match-all InteropMatchList
 match destination-address ipv6 2001:2::3/128
 match source-address ipv6 2002:2::3/128
 match destination-port 1-5 7-11 13-18 20-25 27-31
 match source-port 33-37 39-43 45-50 53-58 60-65
 match ipv6 icmp-type 35
 match ipv6 icmp-code 55
 match packet length 120-130 135-140 145-160 165-200 205-225
 match dscp 1-10 11-20 22-30 32-40 52-60
 match tcp-flag 240 any
 match protocol 6-71 73-80 85-90 95-105 110-115
 end-class-map
!
policy-map type pbr InteropCiscoAlu
 class type traffic InteropMatchList
  police rate 200 bps
  !
  redirect nexthop 2001::1
  set dscp 45
 !
 class type traffic class-default
 !
 end-policy-map
```

This results with the following Flow Specification Extended communities and IPv6 Flow Specification NLRI:

```
            AFI: IPv6
             NLRI (Hex dump) :
            0x018000200100020000000000000000000000030280002002000200000000000
            000000000000303030645470349455003554 55a035f4569036ec5730503014505
            0307450b030d45120314451903 1bc51f06032145250327452b032d45320335453
            a033cc5410781230881370980f00a037845820387458c039145a003a545c803cd
            c5e10b0301450a030b45140316451e032045280334c53c
             Actions       :Traffic-rate: 200 bps DSCP: 45
               Nexthop: 2001::1  (policy.1.test1)
```

The above IPv6 Flow Specification rule is correctly received by the Alcatel-Lucent BGP speaker and is reflected as follows on the device:

```
*A:PE26>config>service>vprn>sub-if>grp-if>sap>static-host# show router 117 bgp
routes flow-ipv6
===============================================================================
 BGP Router ID:195.207.5.200    AS:65117       Local AS:65117
===============================================================================
 Legend -
 Status codes  : u - used, s - suppressed, h - history, d - decayed, * - valid
 Origin codes  : i - IGP, e - EGP, ? - incomplete, > - best, b - backup

===============================================================================
BGP FLOW IPV6 Routes
===============================================================================
Flag  Network             Nexthop                 LocalPref       MED
      As-Path
-------------------------------------------------------------------------------
u*>i  --                  2001::1                 100             None
      No As-Path

      Community Action:    ext:800:0
      Community Action:    rate-limit: 65117:110*
      Community Action:    mark-dscp: 45
      NLRI Subcomponents:
      Dest Pref : 2001:2::3/128 offset 0
      Src Pref  : 2002:2::3/128 offset 0
      Ip Proto  : [ >= 6 ] and [ <= 71 ] or [ >= 73 ] and [ <= 80 ] or [ >=
      Dest Port : [ >= 1 ] and [ <= 5 ] or [ >= 7 ] and [ <= 11 ] or [ >= 13
      Src Port  : [ >= 33 ] and [ <= 37 ] or [ >= 39 ] and [ <= 43 ] or [ >=
      ICMP Type : [ == 35 ]
      ICMP Code : [ == 55 ]
      TCP Flags : [ 240 ]
      TCP Flags : [ 240 ]
      DSCP      : [ >= 1 ] and [ <= 10 ] or [ >= 11 ] and [ <= 20 ] or [ >=
-------------------------------------------------------------------------------
Routes : 1
```

6. IANA Considerations

This document makes no request of IANA.

Note to RFC Editor: The IANA has requested that this section remain in the document upon publication as an RFC. This note to the RFC Editor, however, may be removed.

7. Security Considerations

No new security issues are introduced to the BGP defined in Dissemination of Flow Specification Rules for IPv6 [I-D.ietf-idr-flow-spec-v6].

8. Privacy Considerations

No new privacy issues are introduced to the BGP defined in Dissemination of Flow Specification Rules for IPv6 [I-D.ietf-idr-flow-spec-v6].

9. Acknowledgements

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10. Change Log

Initial Version: 8 October 2014

11. References

11.1. Normative References

[I-D.ietf-idr-flow-spec-v6] Raszuk, R., Pithawala, B., McPherson, D., and A. Andy, "Dissemination of Flow Specification Rules for IPv6", draft-ietf-idr-flow-spec-v6-05 (work in progress), March 2014.

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

11.2. Informative References

[RFC4271] Rekhter, Y., Li, T., and S. Hares, "A Border Gateway Protocol 4 (BGP-4)", RFC 4271, January 2006.

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