BGP Flow Specification for SRv6

draft-li-idr-flowspec-srv6-07

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Flowspec Interim 9-27-2021
Overview

1 component type for SRv6

IPv6 Header

SRH

Contains a list <op, value >s, defining conditions on LOC, FUNC, or ARG of SID

1 component type

for SRv6

Contains a list <op, value >s, defining conditions on LOC, FUNC, or ARG of SID

operator: | e | a | field type | lt | gt | eq |

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Component Type for SRv6

Encoding: <type, LOC-Len, FUNCT-Len, ARG-Len, [op, value]>+

- type (1 octet): This indicates the new component type (TBD1, which is to be assigned by IANA).
- LOC-Len (1 octet): This indicates the length in bits of LOC in SID.
- FUNCT-Len (1 octet): This indicates the length in bits of FUNCT in SID.
- ARG-Len (1 octet): This indicates the length in bits of ARG in SID.
- [op, value]+: This contains a list of {operator, value} pairs that are used to match some parts of SID. The operator (op) byte is encoded as:

```
0 1 2 3 4 5 6 7
+-----------------------------------------------+
 0 | e | a | field type | lt | gt | eq |
+-----------------------------------------------+
```

Field type:
- 000: SID's LOC
- 001: SID's FUNCT
- 010: SID's ARG
- 011: SID's LOC:FUNCT
- 100: SID's FUNCT:ARG
- 101: SID's LOC:FUNCT:ARG

behavior of each op bit has clear symmetry with that of [RFC8955]'s Numeric Operator field

The value field depends on the field type and has the value of SID's some parts rounding up to bytes
An example of a Flow Specification NLRI encoding for: all SRv6 packets to LOC 2001:db8:3::/48 and FUNCT {range [0100, 0300]}.

Some Parts of SID

<table>
<thead>
<tr>
<th>length</th>
<th>v</th>
<th>LOC==20010db80003</th>
<th>FUN&gt;=100</th>
<th>FUN&lt;=300</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x12</td>
<td>0f</td>
<td>30 10 40</td>
<td>01</td>
<td>2001 0db8 0003</td>
</tr>
</tbody>
</table>

^   ^   ^
|   |   |

Length of LOC FUN ARG

Decoded:

- Value
  - 0x12 length 18 octets (if len<240, 1 octet)
  - TBD1(0x0f) type TBD1(0x0f) - Some Parts of SID
  - 0x30 LOC Length = 48 (bits)
  - 0x10 FUNCT Length = 16 (bits)
  - 0x40 ARG Length = 64 (bits)
  - 0x01 op LOC ==
  - 0x2001 value LOC's value = 2001:db8:3
  - 0x0db8
  - 0x0003
  - 0x4b op "AND", FUNCT >=
  - 0x0100 value FUNCT's value = 0100
  - 0xbd op end-of-list, "AND", FUNCT <=
  - 0x0300 value FUNCT's value = 0300

Component for SRv6
Component for SRv6 can be in FlowSpec V2 NLRI or changed to align to new/updated encoding of V2

Flow specification V2 with FSv2 IP Header traffic rules encoded in NLRI

component for SRv6
Thanks

Comments
Under FlowSpec V2

Component for SRv6 may be in FlowSpec V2 NLRI or changed to align to new/updated encoding of V2

Flow specification V2 with default Block traffic flow encoded in NLRI

Flow Specification V2 with Actions encoded in NLRI
Type 1 - Destination IPv6 Prefix

Encoding: <type (1 octet), length (1 octet), offset (1 octet), pattern (variable), padding (variable)

length: This indicates the N-th most significant bit in the address where bitwise pattern matching stops.

offset: This indicates the number of most significant address bits to skip before bitwise pattern matching starts.

pattern: This contains the matching pattern. The length of the pattern is defined by the number of bits needed for pattern matching (length minus offset).