Bitmask Route Target & Route Target Constrains Extension

draft-zzhang-idr-bitmask-route-target
draft-zzhang-idr-bgp-rt-constrains-extension

Z. Zhang, J. Haas, S. Sangli

Presented by Z. Zhang for IDR in IETF108
Bitmask RT Idea

• Two Bitmask RTs match if the result of logical AND operation of the bitmasks is not zero
  • Used to control route importation and propagation (using RTC)

• Use case: targeted distribution of Flexible Algorithm information
  • Controllers provisioned with Administrative Groups (colors) information for links and advertise BGP-LS southbound Link NLRIs, carrying a Bitmask RT
  • Bitmask encodes the link’s Administrative Groups
    • Link AGs previously encoded as a bitmask in Administrative Groups TLV in BGP-LS Attribute
  • If a router cares about a link with a particular AG, it sets the corresponding bit in locally configured Bitmask RT to pull (using RTC) and import the link NLRI
The Format

• BGP Community Container
  • New type for BitMask RT
  • GA & LA also need to match

```
| 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 |
|------------------------|------------------------|
| 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 |
| +------------------------|------------------------|
| | GA Type               | GA Length              |
| +------------------------|------------------------|
| | Global Administrator   | (variable length)      |
| +------------------------|------------------------|
| | Local Administrator    |                         |
| +------------------------|------------------------|
| | Bitmask Length         |                         |
| +------------------------|------------------------|
| ~                         | Bitmask (variable length)~
| +------------------------|------------------------|
```
Route Target Constrains Extension

• RTC originally designed for Extended Community based RTs
  • Would not work for IPv6 Address Specific RTs
• Draft-ietf-idr-bgp-ipv6-rt-constrain extends RTC to support IPv6 Address Specific RTs
  • When the prefix is not more than 12 octets, can’t tell if the RT part is a partial IPv6 Address Specific RT or a full/partial AS/IPv4 Address Specific RT
    • Could have used AFI 2 to address this problem
    • Would not work for more types of RTs, e.g. Bitmask RT

• Proposed Solution
  • Define a new SAFI for general RTC membership
"Extended Route Target constrains" SAFI NLRI

- "Path Attr Type" in NLRI identifies the type of Route Target
  - 16 (Extended Community) for EC-based RTs
  - 25 (IPv6 Address Specific Extended Community) for IPv6 Address Specific RTs
  - 34 (BGP Community Container Attribute) for any RT defined as a BGP Community Container (e.g. BitMask RT).

```
0                   1                   2                   3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----------------------+-----------------------+-----------------------+-----------------------+
| Origin AS             | Path Attr Type        | Route Target           |
+-----------------------+-----------------------+-----------------------+
| Route Target (continued, variable length )|
+-----------------------+-----------------------+-----------------------+-----------------------+-----------------------+
```
The Asks

• Seek comments

• While the new SAFI also works for IPv6 Address Specific RTC, no intention to replace draft-ietf-idr-bgp-ipv6-rt-constrain
  • Given its current status and possible implementation/deployment
  • A side question – what if draft-ietf-idr-bgp-ipv6-rt-constrain use AFI 2?