BGP Extended Community for Identifying the Target Nodes

draft-dong-idr-node-target-ext-comm-03

Jie Dong, Shunwan Zhuang @Huawei
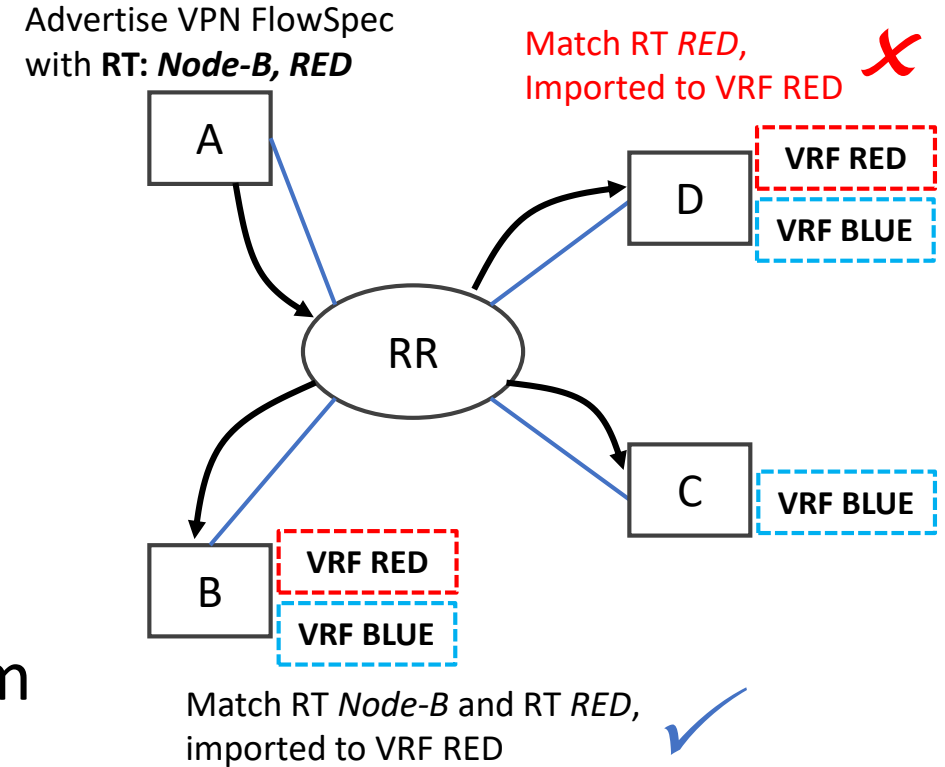
Gunter Van de Velde @ Nokia

IDR WG   IETF 109 Online Meeting   Nov. 2020

Recap of Motivation

- The target of some BGP routing or policy information may be one or a small group of BGP speakers in the network

  - BGP Flow Spec, SR policy, etc.

- For BGP SR Policy, Route Target is used to determine the target node

- For other address families, RT may still need to be used for VRF matching

  - In some cases, using RTs for both target node identification and VRF matching could be problematic
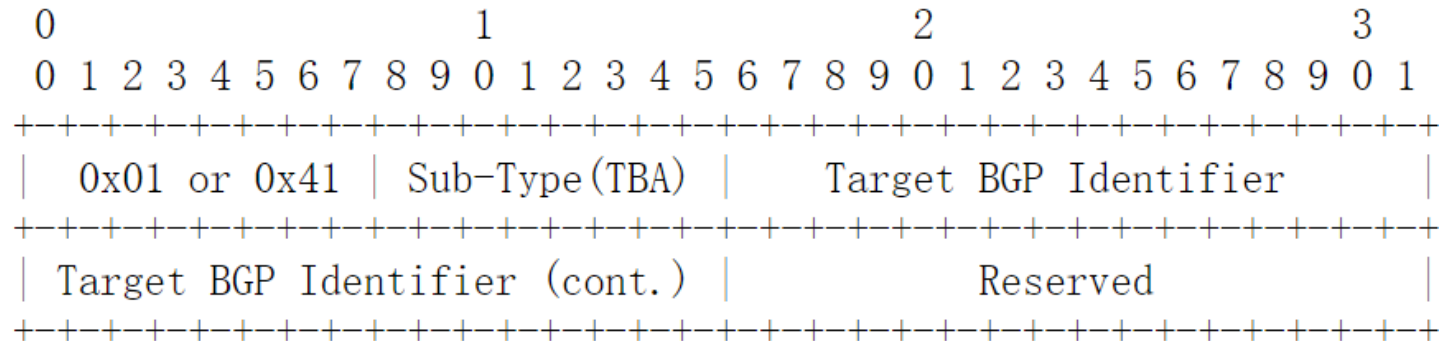
An example to show the problem

- Node A advertises a VPN FlowSpec route targeted at VRF RED on node B

- If RT is used to designate the target node B
  - Both RT *Node-B* and RT *RED* are carried in BGP Update
  - But both node B and node D would import the VPN FlowSpec route to VRF RED

- This document proposes a generic mechanism to designate the target nodes for information advertised using BGP
  - Independent from the use of RT

Advertise VPN FlowSpec
with **RT: *Node-B, RED***

Match RT *RED*,
Imported to VRF RED ✗

Match RT *Node-B* and RT *RED*,
imported to VRF RED ✓

Proposed Solution

- A new BGP extended community to carry the target node information

  - Node Target extended community (NT)

```
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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  0x01 or 0x41 | Sub-Type(TBA) |     Target BGP Identifier     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Target BGP Identifier (cont.) |           Reserved            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

  - Target BGP Identifier: 4-octet unsigned, non-zero integer to identify a BGP node

- One or more Node Target extended communities may be carried in BGP Update

Procedures

- The sending BGP speaker adds one or more NTs to BGP update
- If one of the NTs match with the local BGP ID, information in the update is eligible to be kept and installed on the receiving BGP node
    - For RR, the route is eligible to be reflected if there is other NTs in the Update
        - RR MAY reflect the route only to BGP peers whose BGP IDs match with one of the NTs
    - For ASBR, the route is eligible to be advertised to EBGP peers whose BGP IDs match with one of the NTs in the Update
- If none of the NTs match with the local BGP ID, information in the update is not eligible to be installed on the receiving BGP node
    - For RR, the route is eligible to be reflected
        - RR may reflect the route only to BGP peers whose BGP IDs match with one of the NTs

Updates in -03 version

- Describe a problem case with RT based mechanism in Introduction section

- Use BGP Identifier instead of IPv4/IPv6 addresses in the Node Target extended community

- Re-organize the procedures section, include the procedures of RR and ASBR for intra-domain scenarios

- A Compatibility Considerations section is added

Next Steps

- Comments and feedbacks are welcomed

- Revise the draft accordingly

Thank You