Generalized VPN Route Constrain

draft-dong-idr-vpn-route-constrain-00

Jie Dong, Mach Chen, Guiyan Liu, Hui Ni

IDR, Nov 2009
RT-Constrain Review

• RFC 4684 defines procedures to control VPN route distribution

• BGP speakers advertise import RTs using rt-constrain NLRI (with AFI/SAFI 1/132)
  – Origin AS (4 octets)
  – Route Target (8 octets)

• BGP speakers advertise VPN routes based on received rt-constrain information

• Benefit: VPN routes propagate only where needed, bandwidth and processing savings

• Applicable to any VPN using RT to control route distribution
Problems with RT-Constrain

- Multiple different kinds of VPNs can be deployed in the same network
  - L3 VPNv4 & VPNv6, L2VPN, Multicast VPN...
  - BGP speakers may receive unwanted VPN routes even if RT-Constrain is fully deployed

- Format of rt-constrain NLRI does not support IPv6 address specified Route Target [V6-EXT-COMM]
  - Length of the new RT is 20 octets
  - Length of the RT field is only 8 octets
Example of unwanted routes

- Similar problems exist in other scenarios
- Could be worse if more different VPNs are deployed
- Deployment of new VPNs may affect existing PEs
Root Cause

• RT-Constrain NLRI can not identify type of the requested VPN routes

• Different kinds of VPNs may use same/overlapping RT space
Proposed Solution

- A Generalized RT-Constrain solution
- New SAFI: Generalized RT membership NLRI (135)
- AFI/SAFI: 1/135, 2/135, 25/135,...
- Extended NLRI format:

<table>
<thead>
<tr>
<th>Length (1 octet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFI of VPN (1 octet)</td>
</tr>
<tr>
<td>Origin AS (4 octets)</td>
</tr>
<tr>
<td>Route Target (Variable)</td>
</tr>
</tbody>
</table>

- Benefit
  - Avoid sending & receiving of unwanted routes
  - Deployment of new VPNs will not affect existing network
Next Steps

• Comments & feedback from IDR
• Improve the draft
• WG document?