BGP-LCU

draft-szarecki-idr-bgp-lcu-traffic-steering-00
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Presented by Jeffrey Haas for IETF 105
Problem Statement

Service traffic requires desired transport treatment – End to End - across Network Domains (Metros, AS Boundaries)
Foundation

• Traffic treatment encoded as 32b integer – COLOR
  • Agreed among all domains

• Intra-domain tunnels marked w/ COLOR is satisfies desired treatment
Network slicing with BGP-LCU

MP-BGP VPN
[L100 RD1, IP-x], NH=PE2, RT=1, color-ext-comm=red
[L100 RD1, IP-y], NH=PE2, RT=1, color-ext-comm=blue

BGP-LCU
[L1’ <red.PE2>], NH=ASBR2
[L2’ <blue.PE2>], NH=ASBR2

BGP-LCU
[L1” <red.PE2>], NH=ASBR1
[L2” <blue.PE2>], NH=ASBR1

BGP-LCU
[L1 <red.PE2>], NH=AR
[L2 <blue.PE2>], NH=AR

Juniper Business Use Only
<table>
<thead>
<tr>
<th>Length</th>
<th>Label</th>
<th>Rsrv</th>
<th>Prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Follows RFC8277
• Follows RFC8277
  • Prefix := <COLOR, DESTINATION>
    • COLOR := integer (32b)
    • DESTINATION := IPv4/IPv6 subnet address
  • Length 1 or 2 octets (511B)
    • COLOR, IPv6/128 DESTINATION w/ a lot of labels (160+)
BGP-LCU attributes considerations

- Remote Next-Hop
  - resolved by tunnel of matching color

- color-extended-community
  - may be useful for some deployment
  - Recommended to carry only one

- Tunnel-encapsulation
  - SHOULD NOT be carried

- Prefix SID
  - allowed
Why not tunnel encaps encoding?

• Tunnel encaps can carry endpoint, color, and a stack!
• But the NLRI key would be one instance of an end-point without allowing for path diversity for color.
• Could use add-paths to get the diversity:
  • But add-paths is per BGP neighbor and not interdomain.
BGP-LCU characteristic

• Domain independent technology;
  • Domain can use any tunnel technology.
    • E.g. SR-TE, RSVP, SR w/ IGP FlexAlgo, MRT LDP, PIGEONS, SDN/PCE/OpenFlow, ...
    • As long as tunnels meets T-intent and can carry MPLS over
• Domain Operator in full control of it’s domain.
TBD

• Non-identical and/or conflicting color codes intra- vs. inter-domain

• #COLORS x #DESTINATIONS scale
  • MPLS states on ASBRs (convergence)
  • Label space exhaustion (H/W limits)
We ask for

• Contribution