Problem statement

- Inconsistency in BGP NH encoding brought by RFC5549 compared to RFC4364, RFC4659.

<table>
<thead>
<tr>
<th></th>
<th>RFC4364</th>
<th>RFC4659</th>
<th>RFC5549</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is defined ?</td>
<td>VPNv4 over IPv4 network</td>
<td>VPNv6 over IPv4</td>
<td>IPv6 network</td>
</tr>
<tr>
<td>IPv4 nexthop encoding format</td>
<td>VPN-IPv4</td>
<td>VPN-IPv4</td>
<td>N/A</td>
</tr>
<tr>
<td>IPv6 nexthop encoding format</td>
<td>N/A</td>
<td>VPN-IPv6</td>
<td>Regular IPv6 (no zeroes)</td>
</tr>
</tbody>
</table>

- No harm from a pure standardization perspective, BUT...
Problem statement

• Authors have looked at 9 BGP implementations (including all major vendors) regarding their support of VPNv4 over IPv6 network

• From a BGP running code perspective, we have found:
  • 7 codes following a consistent BGP NH encoding (using VPN-IPv6 address(es))
  • 2 codes not supporting the feature
  • No code compliant with RFC5549
Well we have an industry problem there...

- There is no reported (AFAWK) interoperability issue
  - The vendors should be interoperable today because they use the same encoding

- There is a standard compliancy issue
Proposed resolution

• As IETF is driven by running code, let’s the standard reflecting running codes

• RFC5549 should be respinned telling that nexthop is encoded using VPN-IPv6 address(es)

• Why ? Moving all the existing running codes to compliancy will just be risk (bugs) and pain (both for vendors and operators)
  • For a zero value !
Backward compatibility

• Of course, the proposed solution is not backward compatible.

• Do we create harm?
  • Well, today there is no deployment mixing compliant vs consistent implementations.
  • There could be a deployment purely compliant with RFC5549 (really unlikely!).
    • We don’t break anything here.
    • A knob can provide compliancy for future interop requirement with existing consistent implementations.
  • There are deployments purely using consistent implementations.
    • No change for these deployments.
In addition...

• RFC5549 does not handle the case of SAFI 129

• We would like to add some text to deal with SAFI 129 too (in the same way as SAFI 128)
Summary

• Our proposal looks reasonable:
  • Accomodating standard to running codes (that's the spirit of IETF)
  • We are happy to hear from any additional existing implementation feedback!

• We need to focus on facts, not just theory!

• We need to create as less pain/risks as we can:
  • Prefer fewer/no code changes industry wide
Process...

- RFC5549 comes from softwire (INT area)

- VPN SAFI are in BESS

- Authors would like the manage the respin in BESS

- Authors have engaged discussions with ADs. Official AD (INT, RTG) position?

- In case, we agree to continue the work, what do we do with this document?
  1. Forget it, and just respin
  2. Progress to RFC as the same time as the respin of RFC5549 for history purpose