BGP Extension for Distributing CP Threshold Constraints of SR Policy
draft-liu-idr-bgp-sr-policy-cp-threshold

Presenter: Yisong Liu

Co-authors: Yisong Liu (China Mobile)
Changwang Lin (New H3C Technologies)
Yuanxiang Qiu (New H3C Technologies)

IETF-118
Introduction

● Background

Per [RFC9256], as long as there is a valid segment list in the active candidate path, the active candidate path is valid. But the paths of remaining segment lists may not meet the SR policy forwarding performance requirements, such as:

• Bandwidth
• Delay
• Packet loss rate

SR Policy POL1
Candidate Path CP1
  Preference 200
  Segment List 1 <SID11...SID1i>, Weight 1 1/100M
  Segment List 2 <SID21...SID2j>, Weight 1 1/100M
  Segment List 3 <SID31...SID3k>, Weight 1 1/100M

Candidate Path CP2
  Preference 100
  Segment List 4 <SID41...SID4i>, Weight 1 1/100M
  Segment List 5 <SID51...SID5j>, Weight 1 1/100M
  Segment List 6 <SID61...SID6k>, Weight 1 1/100M

- Requirement: Bandwidth >= 200M

When segment lists 1 and 2 become invalid, even if there is CP2 with lower preference that can meet the bandwidth requirement in the SR policy, the traffic will continue to be forwarded along CP1.

To address this issue, [draft-liu-spring-sr-policy-flexible-path-selection] propose a flexible SR policy candidate path selection method. It takes the forwarding quality and resource requirements of candidate paths as the selection criteria of candidate paths.

● Extension of control plane

This proposal defines extensions of BGP to distribute forwarding quality threshold and metric constraint parameters of candidate path for an SR Policy.
SR Policy encoding structure

Define two SR Policy sub-TLVs

SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>
Attributes:
  Tunnel Encaps Attribute (23)
  Tunnel Type: SR Policy (15)
  Binding SID
  SRv6 Binding SID
  Preference
  Priority
  Policy Name
  Policy Candidate Path Name
  Explicit NULL Label Policy (ENLP)

**SR Bandwidth Constraint Sub-TLV**
**SR Metric Constraint Sub-TLV**

Segment List
  Weight
  Segment
  Segment
  ...
The SR Bandwidth Constraint sub-TLV is used to carry the bandwidth threshold constraint parameter of a candidate path.

- **Type**: TBA
- **Length**: 4.
- **Flags**: None are defined at this stage.
- **Bandwidth**: 4 octets which specify the bandwidth threshold in unit of bytes per second.
SR Metric Constraint sub-TLV

The SR Metric Constraint sub-TLV is used to carry the metric constraint of a candidate path.

- **Type**: TBA
- **Length**: 4.
- **Flags**: Indicate the semantics of Metric Value.
- **Metric Type**: The type of metric.
  - 0 - IGP Metric
  - 1 - Min Unidirectional Link Delay
  - 2 - TE Metric;
  - 3 - Hop Count
  - 4 - SID List Length
- **Metric Value**: The value of metric. The metric value is specified as either an absolute value or as a percentage of the computed path metric based on the A-Flag.

<table>
<thead>
<tr>
<th>Flags</th>
<th>Metric Type</th>
<th>Metric Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **A-Flag**: 1 - Represents an absolute value.
  0 - Represents a percentage.
Next Steps

• Questions and comments
• Seeking for feedback from WG