BGP Request for Advertising Candidate Path of SR TE Policy

draft-li-idr-bgp-request-cp-sr-te-policy-00

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Motivation

• The headend of an SR Policy may be informed by various means including: Configuration, Netconf, PCEP or BGP.

PCEP: Request and Reply messages defined in [RFC5440] to match this requirement.

BGP: This document want to define.

• In some situations headend may want to pull one or a set of candidate paths from PCE/Controller rather than get all information passively.

SR Policy Headend Architecture
draft-filsfils-spring-sr-policy-considerations

Brief process with Candidate Paths request
• Step1. The headend decide to get a new candidate path from controller based on some trigger event (e.g., receive a customer route (VPN route) with special color or special BGP attribute). This trigger mechanism is **out of scope of this document**.

• Step2. The headend create a BGP UPDATE message (defined in this document) with constrains of TE, such as affinity, metric, SRLG, and so on.

• Step3. The controller will calculate one or a set of segment list based on the payload of BGP request message from headend. How to calculate the path is **out of scope of this document**.

• Step4. The controller advertise SR Policy with candidate path to headend. How to advertise the policy is **out of scope of this document** and defined in [I-D.ietf-idr-segment-routing-te-policy]
Messages and Sub-TLV

**BGP UPDATE message for CP request**

SR Policy SAFI NLRI: `<Distinguisher, Policy-Color, Endpoint>`

Attributes:

Tunnel Encaps Attribute (23)
- Tunnel Type: SR Policy
- `<Sub-TLVs>`

draft-ietf-idr-segment-routing-te-policy-07

- NLRI Length, Policy Color, Endpoint field remains unchanged
- Distinguisher field will be set to `FF:FF:FF:FF` to signal the request to controller.

**New Sub-TLV for CP constrains**

1. LSPA Sub-TLV
2. SVEC Sub-TLV
3. Metric Sub-TLV
4. Include Route Sub-TLV
5. Load-Balancing
Messages and Sub-TLV

LSPA (LSP Attributes) Sub-TLV

<table>
<thead>
<tr>
<th>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>+---------------------------------------------</td>
</tr>
<tr>
<td>Exclude-any sub-TLV</td>
</tr>
<tr>
<td>+---------------------------------------------</td>
</tr>
<tr>
<td>Include-any sub-TLV</td>
</tr>
<tr>
<td>+---------------------------------------------</td>
</tr>
<tr>
<td>Include-all sub-TLV</td>
</tr>
<tr>
<td>+---------------------------------------------</td>
</tr>
<tr>
<td>Optional sub-TLVs</td>
</tr>
</tbody>
</table>

Specifies various TE LSP attributes to be taken for path computation

* [RFC5440] and [RFC3209]

SVEC (Synchronization VECtor) Sub-TLV

<table>
<thead>
<tr>
<th>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>+---------------------------------------------</td>
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</tbody>
</table>

Allows headend to request the synchronization of a set of segment list of one CP computation requests.

- L (Link diverse)
- N (Node diverse)
- S (SRLG diverse)

* RFC5440
Messages and Sub-TLV

Metric Sub-TLV

Include Route Sub-TLV

- T=1: IGP metric
- T=2: TE metric
- T=3: Hop Counts
- T=11: Maximum SID Depth of the requested path

* RFC5440 and ietf-pce-segment-routing

Include Route Sub-TLV can be used to specify that the computed candidate path MUST traverse a set of specified network elements.

* SID and NAI are the same as SR-ERO defined in ietf-pce-segment-routing

* RFC5440, RFC3209, ietf-pce-segment-routing
Messages and Sub-TLV

The Load-Balancing Sub-TLV defined how many segment lists should be included in one candidate path.

* Option TLV: No Option TLV currently defined. If bandwidth can be reserved in SR-Policy candidate path or different load-balancing principle between segment lists for different weight here can define additional TLVs.
Next Steps

• Solicit comments
• Revise the draft accordingly
Discussion