BGP SR Policy Extensions to Enable IFIT

draft-qin-idr-sr-policy-ifit-00

Virtual Meeting, Mar 2020, IETF 107

Fengwei Qin (China Mobile)
Hang Yuan (UnionPay)
Tianran Zhou (Huawei)
Min Liu (Huawei)
Giuseppe Fioccola (Huawei)
Background and Motivation

- An SR Policy is identified through the tuple <headend, color, endpoint>

- A headend may be informed about a candidate path for an SR Policy by various means including:
  - via configuration,
  - PCEP ([RFC8281](https://datatracker.ietf.org/doc/html/rfc8281)),

- This document defines extensions to BGP to distribute SR policies carrying In-situ Flow Information Telemetry (IFIT) information.

- So data plane on-path telemetry methods, like IOAM and Alternate Marking, can be enabled automatically when the SR policy is applied.
IFIT (draft-song-opsawg-ifit-framework) is a high level architectural framework that supports OAM applications to apply data plane on-path telemetry techniques:

- In-situ OAM (IOAM) (draft-ietf-ippm-ioam-data),
- Alternate Marking (RFC 8321 and draft-ietf-ippm-multipoint-alt-mark)
- ...

IFIT presents the potential to apply such a framework to realize reflection-loop telemetry application.
On-path Data Plane Telemetry for SR Policies

An automatic network requires SLA monitoring on the deployed service and several On-path Data Plane Telemetry methods are available.

The framework architecture allows to address the deployment challenges of these On-path Data Plane Telemetry methods.
IFIT Attributes in SR Policy

The new SR Policy encoding structure is reported below, and IFIT can be applied to the candidate path so that all the SR paths can be monitored in the same way.

- **IFIT attributes** can be attached at the candidate path level as sub-TLVs

```
SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>
Attributes:
  Tunnel Encaps Attribute (23)
    Tunnel Type: SR Policy
    Binding SID
    Preference
    Priority
    Policy Name
    Explicit NULL Label Policy (ENLP)
**IFIT Attributes**
  Segment List
    Weight
    Segment
    Segment
    ...
  ...
```
SR Policy for IOAM

When SR policy enables the IOAM, the IOAM header will be inserted into every packet of the traffic that is steered into the SR paths:

- IOAM Pre-allocated Trace Option Sub-TLV and IOAM Incremental Trace Option Sub-TLV
  
<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Namespace ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOAM Trace Type</td>
<td>Flags</td>
<td>Rsvd</td>
</tr>
</tbody>
</table>

- IOAM Directly Export Option Sub-TLV
  
<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namespace ID</td>
<td>Flags</td>
</tr>
<tr>
<td>IOAM Trace Type</td>
<td>Rsvd</td>
</tr>
<tr>
<td>Flow ID</td>
<td></td>
</tr>
</tbody>
</table>

- IOAM Edge-to-Edge Option Sub-TLV
  
<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namespace ID</td>
<td>IOAM E2E Type</td>
</tr>
</tbody>
</table>
SR Policy for Alternate Marking

SR Policy for Enhanced Alternate Marking to apply both RFC 8321 and draft-ietf-ippm-multipoint-alt-mark

- Enhanced Alternate Marking (EAM) Sub-TLV

```
+----------------+-----------------+
| Type           | Length          |
+----------------+-----------------+
| FlowMonID      | Period          |
+----------------+-----------------+
|                 | Rsvd            |
+----------------+-----------------+
```
Discussion & Next Steps

• Collect feedbacks

• Welcome questions, comments

Thank you