BGP SR Policy Extensions to Enable IFIT

draft-ietf-idr-sr-policy-ifit-03

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Background and Motivation

- In-situ Flow Information Telemetry (**IFIT**) refers to dataplane on-path telemetry techniques, including **IOAM** (draft-ietf-ippm-ioam-data) and **Alternate Marking** (RFC8321, RFC8889)

- A headend can be informed about a candidate path for an SR Policy by using BGP (**draft-ietf-idr-segment-routing-te-policy**).

This document defines **extensions to BGP to distribute SR policies** carrying **IFIT** information.

So data plane on-path telemetry methods can be enabled automatically when the SR policy is applied

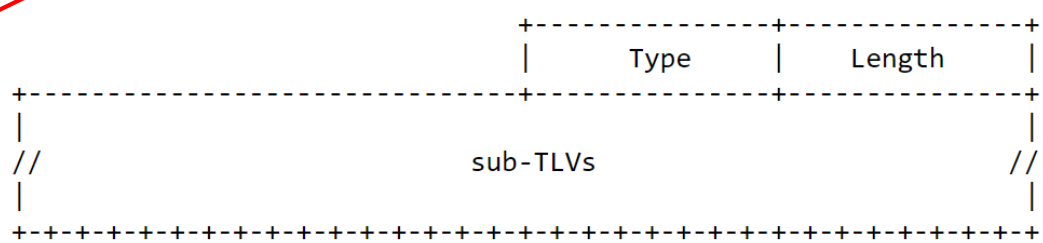
IFIT Attributes in SR Policy

The **SR Policy Candidate Path** is encoded in the Tunnel Encapsulation Attribute as defined in draft-ietf-idr-segment-routing-te-policy

- **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
          SRv6 Binding SID
          Preference
          Priority
          Policy Name
          Policy Candidate Path Name
          Explicit NULL Label Policy (ENLP)
          IFIT Attributes
          Segment List
              Weight
              Segment
              Segment
              ...
          ...
```

The format of the general IFIT Attributes Sub-TLV



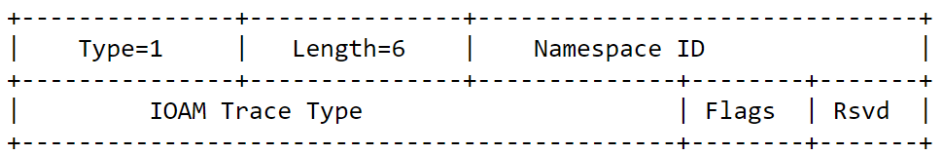
sub-TLVs currently defined:

* IOAM Pre-allocated Trace Option Sub-TLV
* IOAM Incremental Trace Option Sub-TLV
* IOAM Directly Export Option Sub-TLV
* IOAM Edge-to-Edge Option Sub-TLV
* Enhanced Alternate Marking (EAM) sub-TLV

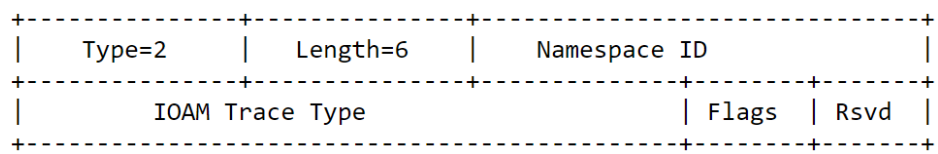
IOAM and AltMark Sub-TLVs

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

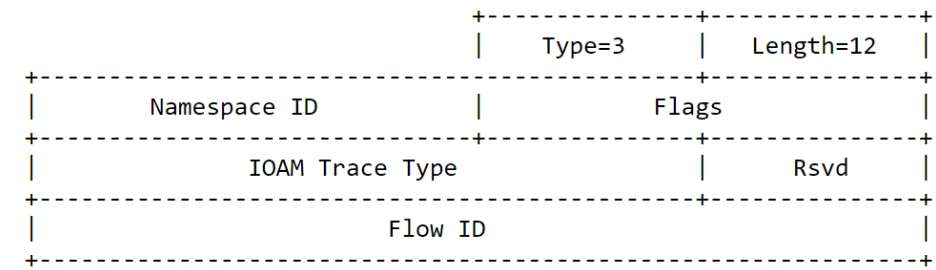
- IOAM Pre-allocated Trace Option Sub-TLV



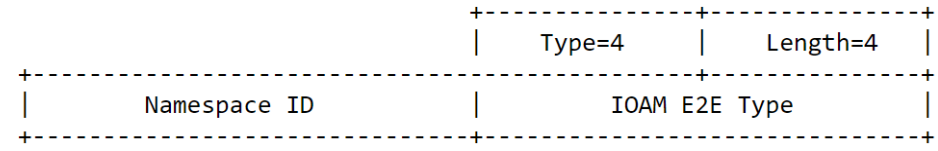
- IOAM Incremental Trace Option Sub-TLV



- IOAM Directly Export Option Sub-TLV

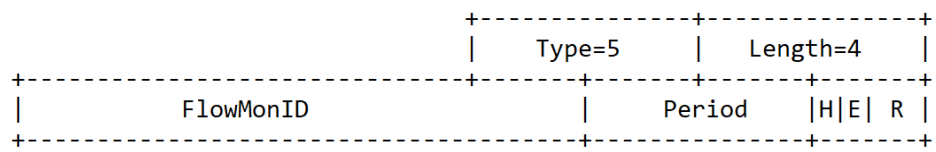


- IOAM Edge-to-Edge Option Sub-TLV



When Enhanced Alternate Marking is enabled Alt-Mark is applied to each packet of the traffic that is steered into the SR paths:

- Enhanced Alternate Marking (EAM) sub-TLV



H: A flag indicating that the measurement is Hop-By-Hop.

E: A flag indicating that the measurement is end to end.

SR Policy Architecture with IFIT

This document complements SR Policy Operations described in draft-ietf-idr-segment-routing-te-policy by adding the IFIT Attributes.

Considering the SR Policy Architecture:

- A headend can be informed about the multiple candidate paths for an SR Policy via various mechanisms (e.g. BGP or PCEP).
- Additional information (e.g. IFIT support) can be included at the candidate path level
- The selection of the best candidate path for an SR Policy can be done accordingly
- The selected candidate path and its BSID is then installed in the forwarding plane

It may be possible to choose the candidate path for the SR Policy also considering the supported IFIT Attributes.

- IFIT methods can then be enabled automatically with the SR policy

Discussion & Next Steps

- Relevant document to enable IFIT (IOAM and AltMark) control mechanisms
- IFIT Attributes added as a simple extension of **draft-ietf-idr-segment-routing-te-policy**

- Welcome questions, comments

Thank you