BGP SR Policy Extensions to Enable IFIT

draft-ietf-idr-sr-policy-ifit-02

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Fengwei Qin (China Mobile)
Hang Yuan (UnionPay)
Tianran Zhou (Huawei)
Giuseppe Fioccola (Huawei)
Yali Wang (Huawei)
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.
Changes from -01

- Specified the usage scenario of IFIT
  IFIT is a solution focusing on specific network domains according to RFC8799.
  - For a number of reasons, such as policies, options supported, style of network management and security requirements, it is suggested to limit applications including the emerging IFIT techniques to a controlled domain.

- Improved Security Considerations section
  IFIT data MUST be propagated in a limited domain to avoid malicious attacks. Solutions to ensure this requirement are respectively discussed in draft-ietf-ippm-ioam-data and draft-ietf-6man-ipv6-alt-mark.
  - A limited administrative domain provides the network administrator with the means to select, monitor and control the access to the network, making it a trusted domain also for the BGP extensions defined in this document.
IFIT Attributes in SR Policy

The SR Policy encoding structure is aligned with draft-ietf-idr-segment-routing-te-policy (in WG Last Call)

- 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 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**
  - Type=1
  - Length=6
  - Namespace ID
  - IOAM Trace Type
  - Flags
  - Rsvd

- **IOAM Incremental Trace Option Sub-TLV**
  - Type=2
  - Length=6
  - Namespace ID
  - IOAM Trace Type
  - Flags
  - Rsvd

- **IOAM Directly Export Option Sub-TLV**
  - Type=3
  - Length=12
  - Namespace ID
  - Flags
  - IOAM Trace Type
  - Rsvd
  - Flow ID

- **IOAM Edge-to-Edge Option Sub-TLV**
  - Type=4
  - Length=4
  - Namespace ID
  - IOAM E2E Type
Alternate Marking Sub-TLVs

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

```
+----------------+----------------+-------------------+
| Type=5         | Length=4        |
| FlowMonID      | Period          |
+----------------+-------------------+
| H | E | R |
```

H: A flag indicating that the measurement is Hop-By-Hop.
E: A flag indicating that the measurement is end to end.
Discussion & Next Steps

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

• Work in progress to make the draft stable

• Welcome questions, comments

Thank you