BGP Extensions to Enable BGP FlowSpec Based IFIT

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Motivation , Objective and Solution

Motivation and Objective

- With the evolution of IP carried networks towards the intent-based and autonomous networks, flexible deployment of IFIT based on network dynamics and service requirements is getting a must.
- This draft defines the BGP extensions to distribute BGP FlowSpec based traffic filtering together with IFIT information. So the IFIT behavior can be applied to the specified flow automatically. In this way, IFIT is automatically enabled and running.

Solution

- Define a new BGP path attribute - IFIT attribute, which is composed of a set of TLVs.
- Define two IFIT Types: the IOAM Type and the AltMark Type.
- Define multiple IFIT Attribute Sub-TLVs:

For the IOAM Type (1) , define 4 sub-TLVs:

  * IOAM Pre-allocated Trace Option Sub-TLV, Type=1.
  * IOAM Incremental Trace Option Sub-TLV, Type=2.
  * IOAM Directly Export (DEX) Option Sub-TLV, Type=3.
  * IOAM Edge-to-Edge Option Sub-TLV, Type=4.

For the AltMark Type (2) , define 2 sub-TLVs:

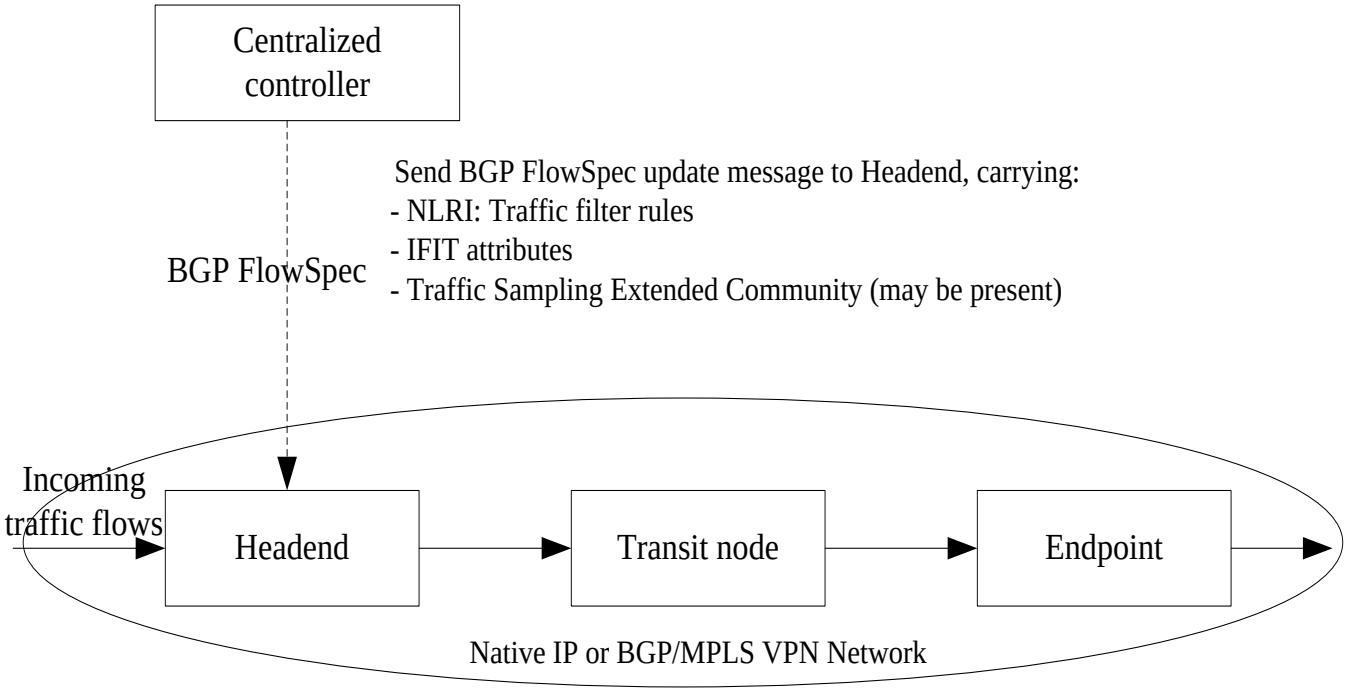
  * Alternate Marking Sub-TLV, Type=1.
  * Enhanced Alternate Marking sub-TLV, Type=2.

- Define a new Traffic Sampling Action - Traffic Sampling Extended Community, used to carry the sampling rate information for IOAM monitoring.

BGP FlowSpec Operations with IFIT Attributes

Enable IFIT:

- Generally, in operator networks, the centralized controller determines the particular user traffic to be monitored according to service requirements.
- The centralized controller also needs to determine the IFIT type applied to the specified traffic flow.
- The centralized controller sends the BGP FlowSpec update message to the headend device.
- The headend device automatically generates ACLs according to the received traffic filter rules, and encapsulates IFIT for the incoming specified traffic flow packets.



Disable IFIT:

- Once the centralized controller determines to terminate monitoring the specified traffic flow, it can withdraw the corresponding NLRI routes.
- The headend device will remove the ACLs related to the traffic filter rules and stop encapsulating IFIT for the incoming specified traffic flow packets.

IANA Considerations

IFIT Attribute Type Code

- IANA is requested to allocate the value as the type code of the attribute in the "BGP Path Attributes" registry.

Type Code	Description	Reference
TBA	IFIT Attribute	This document

Traffic Sampling Extended Community

- IANA is requested to allocate the value as the type code in the registry entitled "BGP Transitive Extended Community Types".

Type Value	Sub-Type Value	Description	Reference
TBA1	TBA2	Traffic Sampling	This document

IFIT Type

- This document requests the creation of a new registry called "IFIT Attributes TLVs"

Value	Description	Reference
1	IOAM Type	This document
2	AltMark Type	This document

IFIT Attribute Sub-TLVs

- This document requests the creation of a new registry called "IOAM Type Sub-TLVs", including 4 IOAM Options.
- This document requests creation of a new registry called "AltMark Type Sub-TLVs", including 2 AltMark Options.

Next Steps

- Any comments or any suggestions?