Update on
draft-ietf-bess-mvpn-expl-track

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Two Major Topics

- First topic
  - Use of *PMSI Tunnel Attribute (PTA)* as follows:
    - Tunnel type of *no tunnel information*,
    - *Leaf Info Required (LIR)* flag set
  - This provide mechanism for ingress node to learn:
    - which egress nodes are interested in receiving which multicast flows from the ingress node
    - without impacting the binding of flows to tunnels
  - Useful information for monitoring
- Second topic
  - New *PTA* flag: *Leaf Info Required per Flow (LIR-pF)*

Leaf Info Required per Flow (LIR-pF)

- Ingress-PE can send *wildcard S-PMSI* route with *LIR-pF* set

- Egress-PEs respond with a *Leaf* route for each flow

  - *route key* field identifies individual flow

- Without *LIR-pF*, egress-PE responds with only one *Leaf* route

  - *route key* field contains the wildcard (the *S-PMSI's NLRI)*

  - cannot identify individual flows

- Useful with BIER or Ingress Replication, since ingress-PE:

  - benefits from per-flow response,

  - can save the overhead of sending per-flow *S-PMSI* route.

- **N.B.:** this changes the ingress PE processing of received *Leaf* routes, because now a valid *Leaf* route may have a *route key* that is not identical to an *S-PMSI* route's *NLRI*

Recent Changes

- Many clarifications and textual improvements

  - Thanks to Stephane Litkowski for thorough shepherd's review

- Changes in the way *Leaf* routes are constructed when sent in response to *LIR-pF*

  - New and improved way of identifying that a *Leaf* route is a response to *LIR-pF*

  - Much more detailed spec of how the *PTA* of such a *Leaf* route is constructed

    - depending upon the *PTA* of the *S-PMSI* route to which it is a reply

- New section detailing how an ingress node processes a received Leaf route whose route key is not identical to the NLRI of a sent x-PMSI route

Marking a *Leaf* Route to Indicate that it is a Response to *LIR-pF*

- New technique:
  - If and only if *Leaf* route is response to *LIR-pF*, it carries a *PTA* with *LIR-pF* set
    - (so *PTA* is now mandatory in such *Leaf* routes)
- Previous drafts instead required modification of the *RD* in the *route key* field:
  - that was a more complex solution with more unintended side-effects

More Detail about Constructing *PTA of Leaf* Route in Response to *LIR-pF*

- New details about how to set *Tunnel type* field:

  - when *Leaf's PTA* can have same *tunnel type* field as corresponding S-PMSI route

  - vs. when it can specify *no tunnel type*

- New details about how to set *MPLS Label* field:

  - For *Ingress Replication*, specifies procedure that allows:

    - Ingress to send one wildcard *S-PMSI* route

    - Egress to not only reply with one *Leaf* route per flow, but also to **optionally** specify an MPLS label for each flow

- Informational reference added to bier-mvpn document, which covers these details for the case where the ingress specifies a tunnel type of BIER

New Section On Ingress Node Processing of Received *Leaf* Routes

- If *Leaf* route *PTA* has *LIR-pF* set, route key field doesn't have to match *NLRI* of any *S-PMSI* route originated by the ingress

  - but the *Leaf* route does have to be a valid response to some *S-PMSI* route, or it won't impact the multicast processing on the ingress node

  - ingress node has to match the Leaf route to the right *S-PMSI* route (or at least keep an eye on the *Leaf* route until there is a right *S-PMSI* route)

- Details provided for handling received *Leaf* routes, with *LIR-pF* set, that specify *IR* tunnels and per-flow MPLS labels

What Documents Does this Update?

- Updates RFC 6625 *(MVPN Wild Cards),*
  - RFC 6625 neglects to handle combination of wild cards with *PTA* that specifies *no tunnel type*

- Modifies ingress node processing of received *Leaf* routes, therefore updates:
  - RFC 6514 *(Base spec for BGP-MVPN)*, which says that *Leaf* route *root key* must be identical to *NLRI* of corresponding *S-PMSI* route
  - RFC 7524 (*Inter-Area Segmentation)* which also has *Leaf* routes whose *route keys* don't correspond exactly to the *NLRI* of an *S-PMSI* route.

Next Steps

- Document is ready for WG LC

- It has been claimed that this document is a normative reference of the BIER-MVPN spec, which is ready to go to the RFC Editor

  - We hope we can move this document along quickly, so as not to block the BIER documents.