draft-ietf-pim-pfm-forwarding-enhancements-02

PIM Flooding Mechanism and Source Discovery Enhancements

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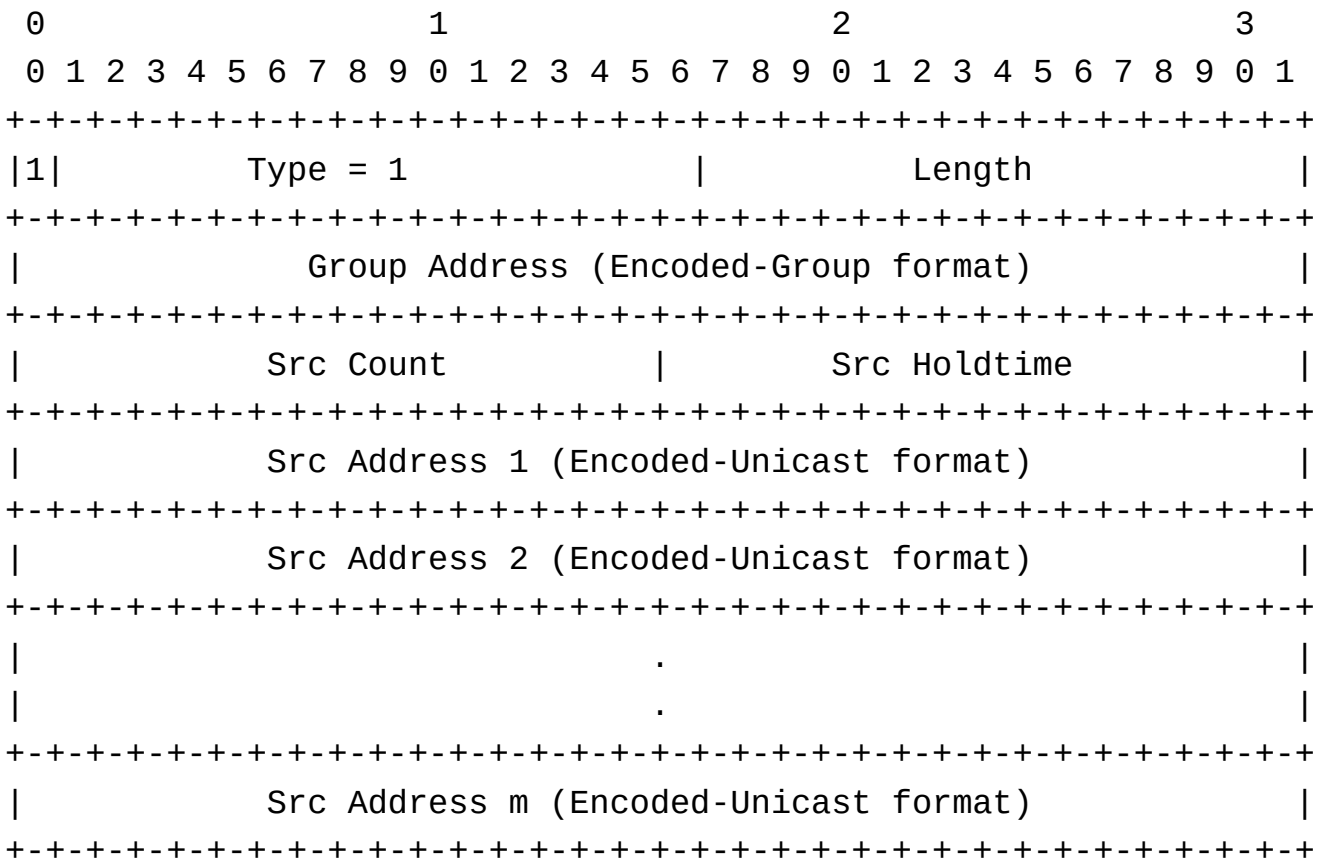
Overview

- New TLV type using Sub-TLVs to allow associating additional data in sub-TLVs for an (S,G) TLV
- Forwarding enhancements reducing amount of PFM messages sent when multiple p2p links between 2 routers.

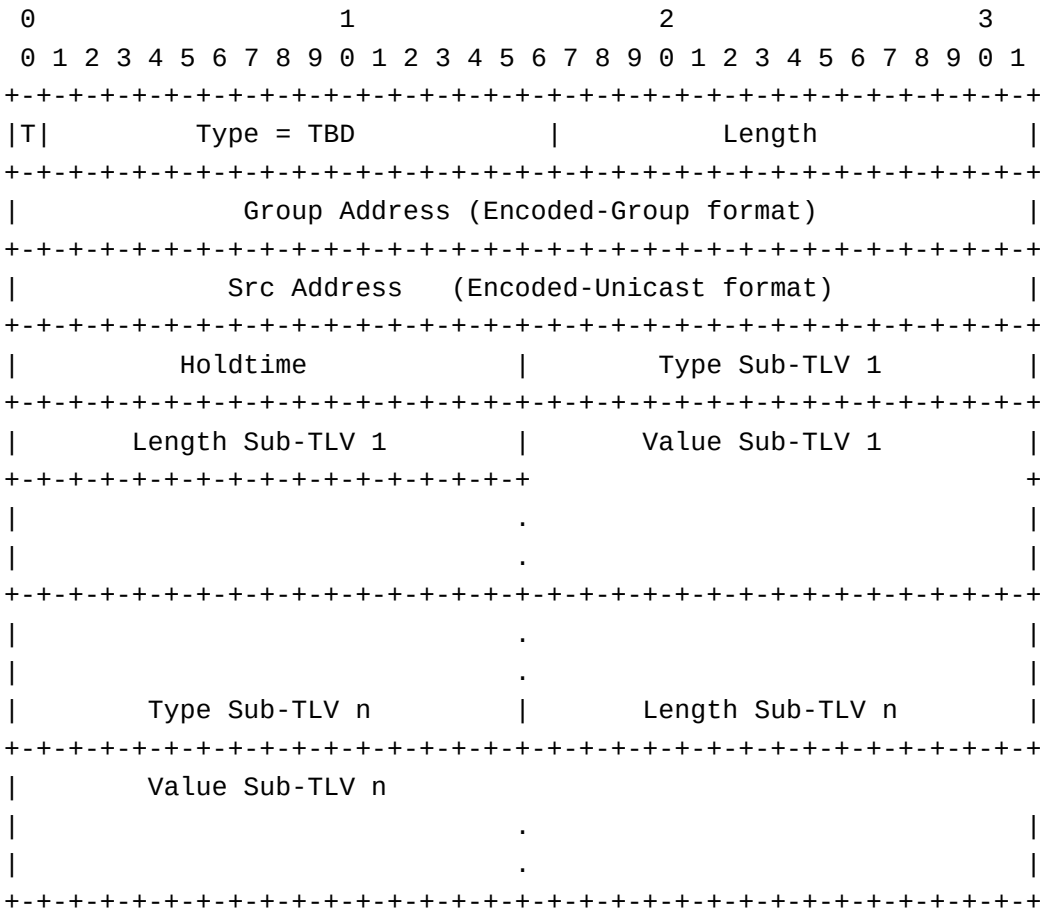
Announcing additional flow info

- PFM-SD RFC 8364 has a single TLV defined for announcing source address, group address and holdtime.
- May be useful to announce additional info about a flow.
  - Data rate may be one example
- No easy way of doing this using the existing TLV. If we add a new TLV for data rate, how do we associate the rate with the corresponding source, group, holdtime TLV?

RFC 8364 source, group holdtime TLV

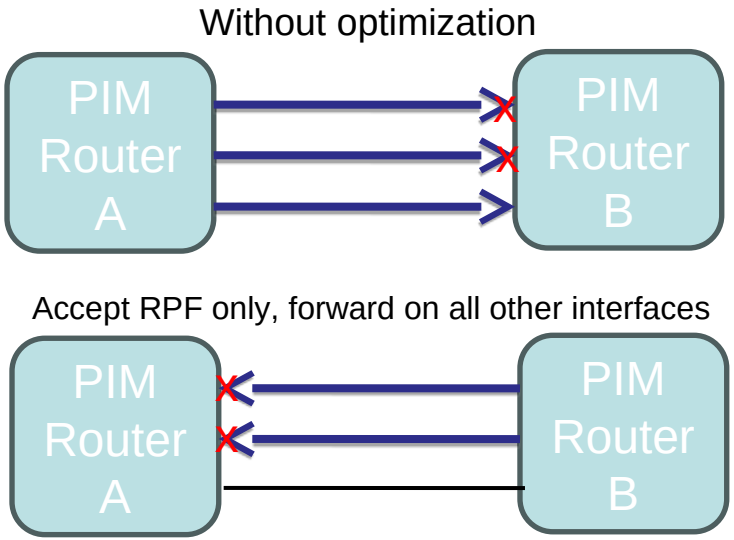


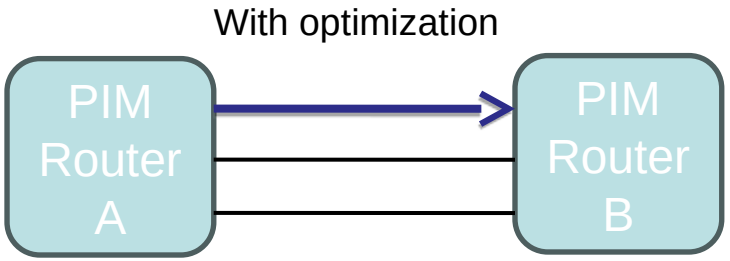
New source, group holdtime TLV with sub-TLVs



Flooding Optimization overview

- Today, PIM Flooding Mechanism (PFM) messages are flooded on all PIM interfaces and are processed via RPF checks.
- The same messages are processed on multiple links between a pair of PIM neighbors.
- This can be avoided with an optimization solution.





Proposed Solution

- With RFC 6395 compliance, routers exchange a unique Router Identifier in their PIM Hellos.
- If the router has multiple interfaces with only one neighbor per interface, the router can check if those neighbors announce an RFC 6395 Router-ID.
- If a PIM router can see the same Router-ID for multiple neighbors, PFM message exchange can be optimized by using a new PIM Hello Option.

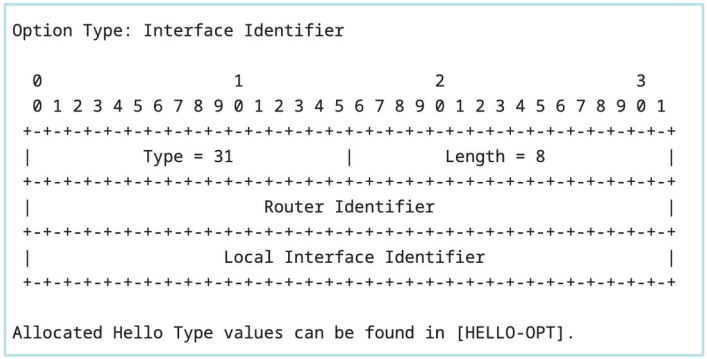


Figure: RFC6395 Hello Option

Proposed Solution

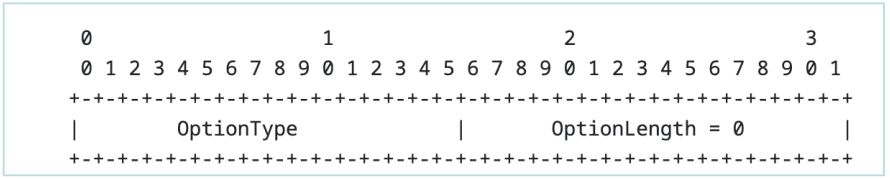


Figure: PFM optimization Hello Option

OptionType: TBD

- A new PIM Hello Option that indicates the forwarding optimization support is introduced.
- This new option, along with the unique Router-ID, can be used to choose **one link** per PIM router pair to exchange PFM messages.
- The Router-ID is used in order to relax RPF check on the chosen link as well not forwarding a message back to the router it came from on another interface.
- This would reduce the number of PFM exchanges between PIM routers, which can be useful in use-cases like PFM-SD.

Implementation details

- The forwarding optimization has been implemented
- Added details to the draft on how the optimized forwarding can be precalculated, avoiding checking neighbors and router-IDs each time a message is forwarded.