PIM MTU Hello Option for PIM Message Encapsulation

draft-lts-pim-hello-mtu

Problem Statement

- PIM message segmentation is common since the number of group states are often large
- PIM router only uses its own outbound sending link MTU to calculate message length
- If sending (e.g. downstream) MTU is smaller compared to receiving (e.g. upstream) MTU, PIM message will be discarded, resulting in unsuccessful channel setup by field report

Solution

- Enable PIM to know MTU information of its neighbor(s) by exchanging Hello messages

- Take neighbor link's MTU into account when segmenting a PIM message

- Procedures:
  - Define a new MTU option for Hello message
  - Introduce 'Sending MTU State' recording the minimum value of my outbound MTU and my neighbors' inbound MTUs on the same link
  - Refer to Sending MTU State during the encapsulation

MTU option

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|    Type = MTU Type            |          Length = 4           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                        Value = inbound MTU                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

- Carried in Hello message by MTU-capable router
- Accepted when having a valid value (e.g. not too small) and from a legal neighbor
- Ignored by MTU-incapable router

Scope

- All variants of PIM protocols, including PIM-SM,-SSM, -BIDIR, and -DM
- Applied to per-hop multicast PIM message
- Not applied to unicast Register-like messages, whose MTU issue has already been considered