IPv6 Minimum Path MTU Hop-by-Hop Option

<draft-ietf-6man-mtu-option>

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Background

- Current RFC8201 PMTUD isn't working well.

- This hop-by-hop option came from the idea that it will be more reliable for the Destination to send Path MTU feedback to the Source.

  - Better trust relationship than RFC8201 PMTUD.

- Intended to compliment (D)PLPMTUD, to indicate a large PMTU instead of black-holing larger packets when PTB message are not returned.

- It may not work in all places [RF7872] etc., but we suggest it can help some places.

Path MTU HBH Option

```
 Option      Option      Option
  Type      Data Len     Data
+--------+--------+--------+--------+-------+--------+-+
|BBCTTTTT|00000100|    Min-PMTU     |    Rtn-PMTU    |R|
+--------+--------+--------+--------+-------+--------+-+
```

Option Type:

BB   00   Skip over this option and continue processing.
C   1   Option data can change en-route to destination.

TTTTT 10000 Option Type assigned from IANA [IANA-HBH].

Length: 4 Size of the value field in Option Data field.

Min-PMTU: n 16-bits. The minimum PMTU, reflecting smallest
            link MTU across the path.

Rtn-PMTU: n 15-bits. The returned minimum PMTU, carrying the 15
            most significant bits of the latest received Min-PMTU
            field. Zero if no Reported MTU is being returned.

R   n 1-bit. R-Flag. Set by the source to signal a destination
            should include received Reported PMTU in Rtn-PMTU field.

Basic Operation

- **Routers**
  - If configured MTU is less than Min-PMTU of the outgoing link, router rewrites the Min-PMTU with the smaller value.
- **Hosts (sending)**
  - Fill in Min-PMTU field with MTU of the outgoing link
  - Set Rtn-PMTU field to cached reported Min-PMTU of the flow.
  - R-Flag requests destination host to return Min-PMTU value
- **Hosts (receiving)**
  - Save reported Min-PMTU for the flow
  - If the R-Flag is set, include a Minimum Path MTU option in the next outgoing packet for the flow.

Status

- \<draft-ietf-6man-mtu-option-11\>
  - Advanced by 6MAN to IESG as Experimental on 2021-09-30