Support for Path MTU (PMTU) in the Path Computation Element (PCE) communication Protocol (PCEP)

draft-li-pce-pcep-pmtu-01

Shuping Peng pengshuping@huawei.com

Shuping Peng	Huawei
Cheng Li	Huawei
Liuyan Han	China Mobile

Motivation

- In traditional MPLS, the Path MTU can be signaled via signaling protocols like RSVP-TE[3209] and LDP[RFC3988].

- However, there is no additional signaling to establish Segment Routing (SR) paths, so the SR tunnel cannot currently support the negotiation mechanism of the Path MTU.
  - SR information is reported by BGP-LS, and the PCE can calculate the SR Paths based on this info.

- When SIDs (Label or IPv6 address) are pushed in a packet, the packet will be dropped (in IPv6) or fragmented in forwarding since the packet size may exceed the Path MTU.

- From Operator:
  - When using leased line over multi-domains, MTU should be learned to avoid dropping packets.

- This draft is to specify the **extensions to PCEP** to carry **Path MTU** in PCEP messages.

METRIC Object for Path MTU

- This document defines a new type for the existing METRIC object for Path MTU.
  - T = TBD by IANA
  - B (Bound - 1 bit): Bound
  - metric-value = PMTU
- The Path MTU metric type of the METRIC object in PCEP represents the minimum of the Link MTU of all the links along the path.

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The format of the METRIC object body is as follows:

 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|               Reserved            |     Flags   |C|B|    T      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                          metric-value                         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
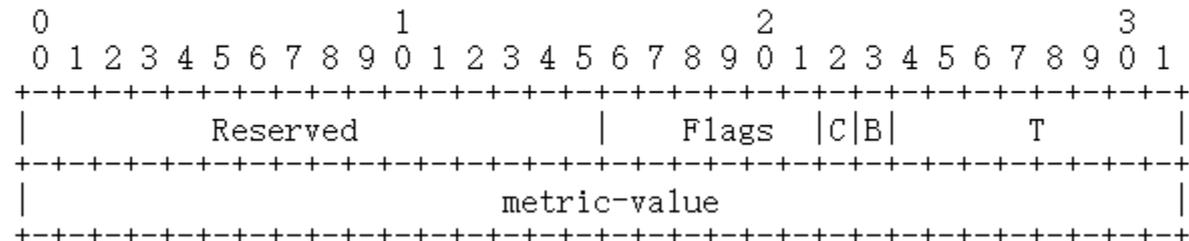
PMTU for Segment Routing

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PCC                          PCE
```

- PCE can be used for computing one or more SR-TE paths taking into account various constraints and objective functions.
    - Path MTU could be another metric for PCE to consider

PCReq message with PMTU Metric B=1, Value=1440

- Once a path is chosen, the PCE can inform an SR-TE path on a PCC using PCEP extensions specified in [RFC8664].
    - PCE could also inform the Path MTU to the PCC

PCRep message with the path

- [I-D.ietf-pce-segment-routing-ipv6] adds the support for IPv6 data plane in SR.

- **The new metric type for path MTU is applicable for the SR-TE path and does not require any additional extensions.**

PCInitiate message with PMTU Metric Value = 1500 along with the path

4
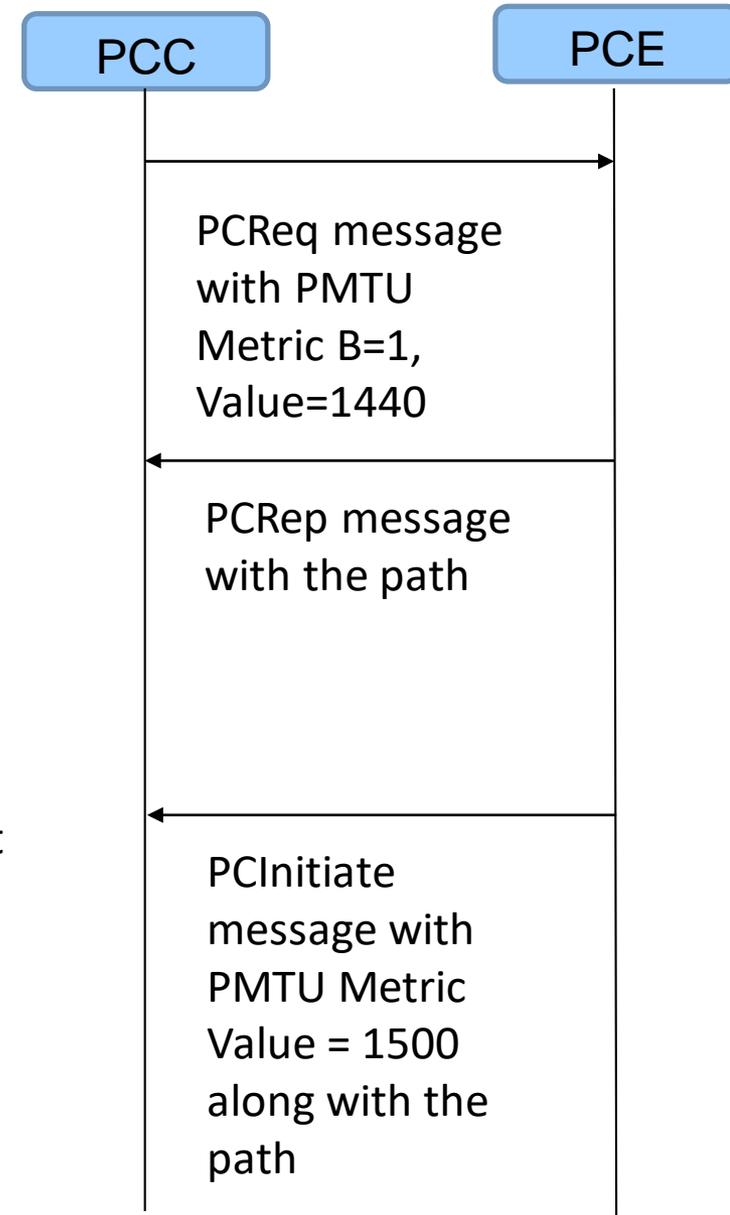
Next Step

- There is a need to convey the PMTU information over the PCEP.

- draft-ietf-idr-sr-policy-path-mtu-01 has been progressed and become a WG draft in IDR.
  - It defines extensions to BGP to distribute **path MTU** information within SR policies.

- This draft is the corresponding draft for PCEP.

- We would like to call for WG adoption for this draft.

Thank you for your attention!