

# PCEP Extension for SR-MPLS Entropy Label Position

draft-peng-pce-entropy-label-position-06

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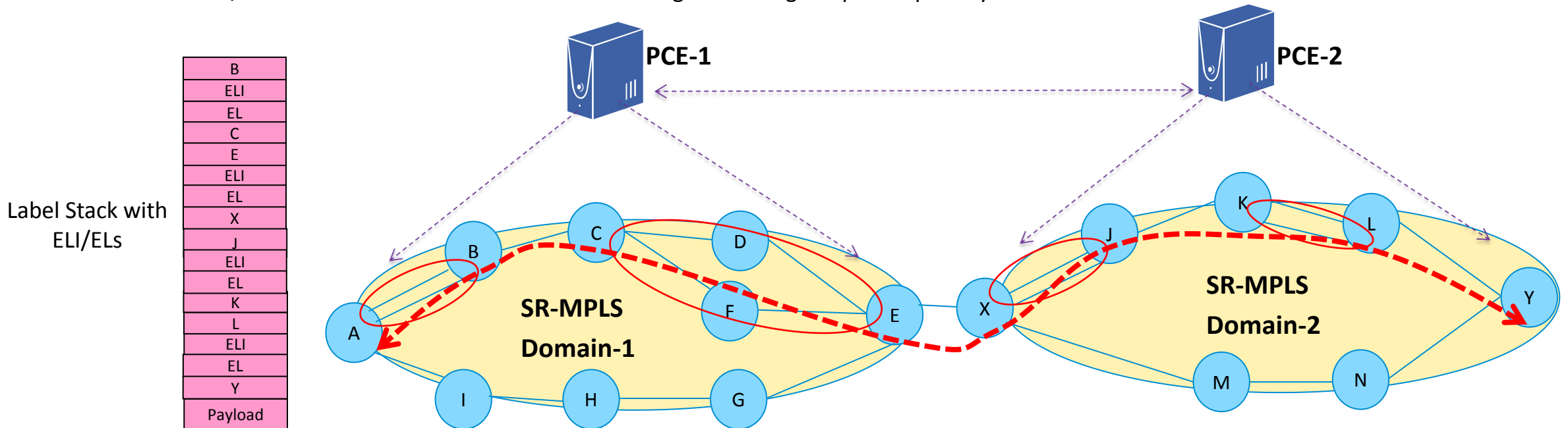
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# Update from last version

- Presented in IETF#106 and #108 and comments on the mailing list are appreciated from :
  - Stephane Litkowski / Dhruv Dhody / Tarek Saad / Zhenbin Li / Jeff Tantsura
- Change for LSP-EXTENDED-FLAG TLV
  - LSP-EXTENDED-FLAG TLV has been moved into draft-ietf-pce-lsp-extended-flags-00.
  - This document uses a flag from LSP extended flags field in LSP-EXTENDED-FLAG TLV.
- Clarification for the MSD and ERLD limitation and the requirements in PCE scenario
  - As described in RFC8662, the ingress node may not find the minimum ERLD along the path and does not support the computation of the minimum ERLD.
  - Especially in case of inter-domain scenario, PCE would be useful for computing the minimum ERLD and the position of entropy labels as well as SR paths.
- Clarification for ingress capability
  - As defined in RFC8662, multiple <ELI, EL> pairs MAY be inserted in the SR-MPLS label stack.
  - The ingress MAY be required to support the capability of inserting multiple ELI/ELs and it need to be advertised in OPEN message from PCC to PCE.
  - The E (ELP) bit is used to indicate the capability of inserting multiple ELI/EL pairs at PCC and support the SR path with ELP from PCE.
- Clarification for the ELI/ELs positions caculated for a SR-Path
  - The ELI/ELs positions is calculated at PCE for a SR-Path and the values is caculated at PCC for a specific traffic flow.

# Overview

- RFC8662 proposes to apply the entropy labels to SR-MPLS networks and provides following criteria to determine the best ELI/ELs placement:
  - a limited number of <ELI, EL> pairs SHOULD be inserted in the SR-MPLS label stack;
  - the inserted positions SHOULD be within the Entropy Readable Label Depth (ERLD) of a maximize number of transit LSRs;
  - a minimum number of <ELI, EL> pairs SHOULD be inserted while satisfying the above criteria.
- As described in RFC8662, the ingress may not find the minimum ERLD along the path and does not support the computation of the minimum ERLD.
- The controller (e.g. PCE) MAY perform the end-to-end path computation as well as Entropy Label Position (ELP) including the number and the place of the ELI/ELs based on the minimum ERLD of each segment along the path especially in inter-domain scenarios.



# PCEP Extensions

- SR-PCE-CAPABILITY sub-TLV in Open Object
  - E bit is set to 1.
  - indicates that it supports the SR path computation with ELP configuration.
  - indicates that it supports the capability of inserting multiple ELI/EL pairs at PCC .
- LSP-EXTENDED-FLAG TLV in LSP Object
  - E bit is set to 1.
  - indicates that the PCC requests PCE to compute the SR path with ELP information.

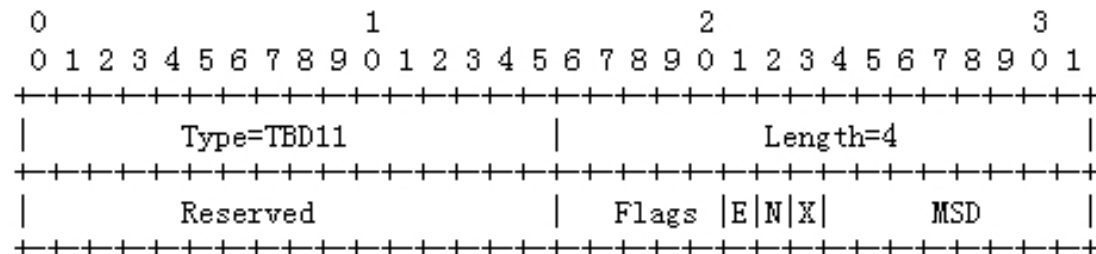


Figure 2: E-flag in SR-PCE-CAPABILITY sub-TLV

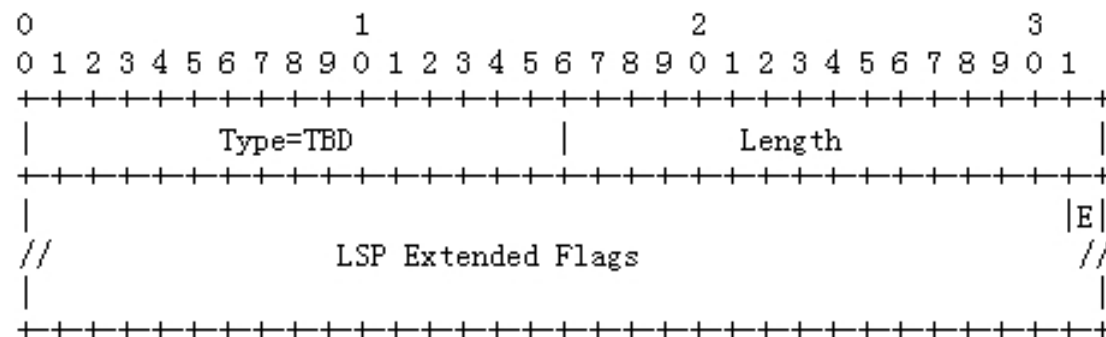


Figure 3: E-flag in LSP-EXTENDED-FLAG TLV

# PCEP Extensions

- PATH-MINIMUM-ERLD TLV in LSP Object
  - Path Minimum ERLD: indicates the minimum ERLD value of the nodes along the path.

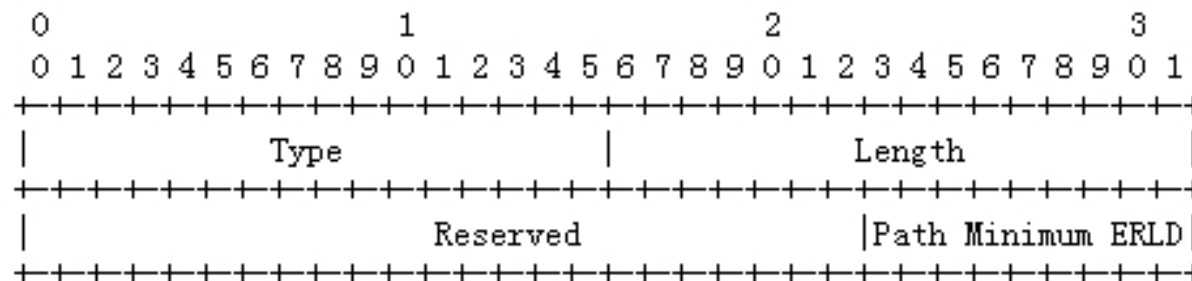


Figure 4: The PATH-MINIMUM-ERLD TLV

- SR-ERO Subobject
  - E bit is set to 1.
  - indicates that the position after this SR-ERO subobject is the position to insert <ELI, EL>, otherwise it cannot insert <ELI, EL> after this segment.

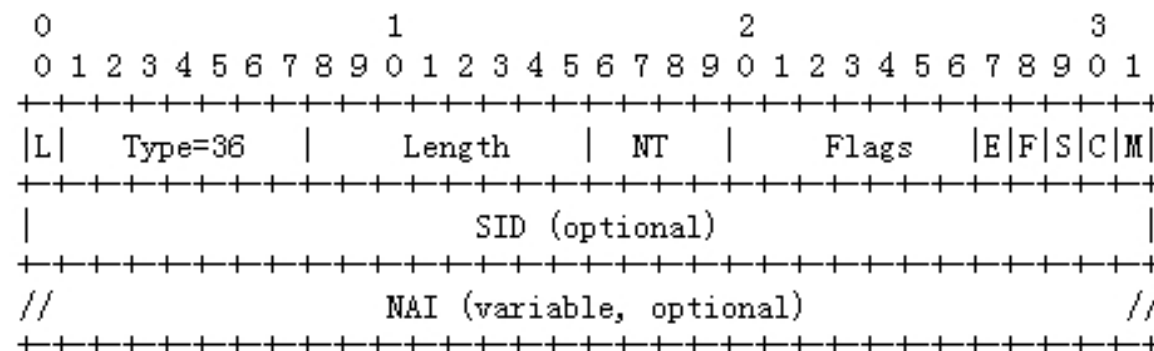


Figure 5: E-flag in SR-ERO subobject

# Next Step

- This document has been discussed many times in details at the meetings and on the mailing list.
- Thanks for all your comments and suggestions!
- Ready for adoption!

Thank you!