PCEP Extension for
SR-MPLS Entropy Label Position

draft-peng-pce-entropy-label-position-07

Quan Xiong(ZTE)
Shaofu Peng(ZTE)
Fengwei Qin(China Mobile)

IETF 113 PCE, July 2022,
Updates from last versions

• Presented at IETF#106, #108 and #111 and comments on the mailing list are appreciated from:
  • Stephane Litkowski / Dhruv Dhody / Tarek Saad / Zhenbin Li / Jeff Tantsura/Cheng Li

• Updates before version -07
  • Move the E bit to LSP extended flags field in LSP-EXTENDED-FLAG TLV as per draft-ietf-pce-lsp-extended-flags
  • Clarification for the MSD and ERLD limitation and the requirements in PCE inter-domain scenario
  • Clarification for ingress capability and 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 calculated for a SR-Path

• Updates from version -07
  • Clarification for PCE to get MSD and ERLD capabilities and adding reference to existing underlying IGP extensions including IS-IS and OSPF
  • Clarification and remove the minimum-ERLD TLV
  • Synchronous update and consistent with the extension of BGP protocol
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.

[Diagram of SR-MPLS networks with PCE-1 and PCE-2]
PCEP Extensions

- The PCEs could get the information of all nodes such as MSD and ERLD through IGP and can compute the minimum ERLD along the end-to-end path.
  - The ERLD value can be collected via IS-IS [draft-ietf-isis-mpls-elc] and OSPF [draft-ietf-ospf-mpls-elc].
  - The MSD value can be collected via IS-IS [RFC8491] and OSPF [RFC8476].

- **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.

![Figure 2: E-flag in SR-PCE-CAPABILITY sub-TLV](image)
PCEP Extensions

- **LSP-EXTENDED-FLAG TLV in LSP Object defined in**
  
  draft-ietf-pce-lsp-extended-flags

  - E bit is set to 1.

  - indicates that the PCC requests PCE to compute the SR path with ELP information.

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

**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 and all comments have been resolved.

• Thanks for all your comments and suggestions!

• Request for adoption!
Thank you!