PCEP Extensions for Tunnel Segment

draft-li-pce-tunnel-segment-01

Zhenbin Li, Huawei
Xia Chen, Huawei (Presenter)

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Requirement

- draft-sivabalan-pce-binding-label-sid-00 specifies that a binding label/SID can be associated to
  - RSVP-TE LSP
  - SR-TE path
- Such a binding label/SID can be used by an upstream node for steering traffic into the appropriate TE path to enforce TE policies.
- It proposes an approach for PCC reporting binding label/SID to PCE.
- It introduces the optional TLV called "TE-PATH-BINDING TLV" to carry binding label or SID for a TE path. This TLV is associated with the LSP object.

Requirement

- draft-li-spring-tunnel-segment-01 introduces a new type of segment, Tunnel Segment, for the segment routing.
- Tunnel segment can be used to reduce SID stack depth of SR path, span the non-SR domain or provide differentiated services.
- The tunnel segment can be
  - MPLS RSVP-TE tunnel(with primary and secondary LSP)
  - SR-TE tunnel (with primary and secondary path)
  - IP Tunnel
- PCEP should be extended to support the requirement of tunnel segment.

Introduction

- A binding label can be assigned to tunnel segment. An upstream node can use such a binding label for steering traffic into the appropriate tunnel.
- This document specifies a set of extensions to PCEP to support
  - PCC reports binding label of tunnel to PCE
  - PCE allocates label for tunnel and updates label binding of tunnel to PCC.

Problem

- Which object in PCEP can be used to carry the binding label of tunnel segment?
  - LSP object can't.
- What kind of tunnel information is carried and how to be carried?
- What's the different extension for the binding label allocated by PCC and PCE?

PCC reports binding label of tunnel to PCE

- TE object in TERpt message defined in draft-dhodylee-pce-pcep-te-data-extn-02 is selected to be extended to carry
  - TUNNEL-LABEL-BINDING TLV(defined in this document)
  - Tunnel Identifier TLV(defined in draft-chen-pce-pce-initiated-ip-tunnel-00)
  - Other tunnel related TLVs(defined in draft-chen-pce-pce-initiated-ip-tunnel-00)
    - Tunnel Name TLV
    - Tunnel Parameter TLV
    - Tunnel Attribute TLV

PCE updates label binding of tunnel to PCC

- TUNNEL object(defined in draft-chen-pce-pce-initiated-ip-tunnel-00) and Label Update Message(introduced in draft-zhao-pce-pcep-extension-for-pce-controller-01) is extended to carry
  - TUNNEL-LABEL-BINDING TLV
  - Tunnel Identifier TLV
  - Other tunnel related TLVs

```
   <pce-label-update> ::= (<pce-label-download>|<pce-label-map>
                           |<pce-label-tunnel-map>)
Where:
   <pce-label-tunnel-map> ::= <SRP>
                              <LABEL>
                              <TUNNEL>
```

Other Option

- ASSOCIATION object which define associations between LSPs may be extended to represent the RSVP-TE tunnel or SR-TE tunnel and carry the binding label of tunnel.
- But IP Tunnel can’t be represented by this object.

Next Steps

- Solicit comments about:
  - How do you consider PCEP is extended to communicate the tunnel information?
  - Which object and message is used to represent the tunnel?
  - What kind of information is carried in the tunnel related TLVs?
- solicit cooperation
- Revise the draft
  - Revise according to the latest PCEP LS draft if using which object and messages representing tunnel doesn't come to an agreement.