Summary

• Define some specificities of traffic engineering using Segment Routing

• Define the concept of an SR policy

• Define methods to steer traffic into an SR policy

• It is agnostic to the SR dataplane
Learning topology

• SR-TE architecture is multi-domain capable

• Multiple sources of topology:
  – BGP-LS, IGP, NETCONF...
The SR policy

• Identified by the tuple:
  – Head-end (where the policy will be instantiated)
  – Endpoint (what is the destination)
  – Color (that would help steering traffic)

• An SR policy may be created through multiple ways: BGP, PCEP, NETCONF, CLI...

• An SR policy may have multiple candidate paths
  – A single path is selected (preference based)
  – And installed in the FIB

• A path is associated with one or more lists of SIDs and an optional weight (UCMP)

SR policy:
<HEAD, COLOR, ENDPOINT>
   Path1 preference X:
       SID_list#1, weight W1
   Path2 preference Y:
       SID_list#2, weight W2
       SID_list#3, weight W3
Use of the binding SID

- A binding SID is associated with an SR policy path

- It provides a way to reduce the number of segments pushed by the initial source

Without binding SID, a low latency path from S to Z is: <DCI1,D,D2E,DCI3,Z>

With binding SID allocated by DCI1: <DCI1, BSID, Z> where BSID=<D,D2E,DCI3>
Traffic steering

- An SR path uses BSID corresponding to an SR policy
  
  \[
  \{A2B, B2H, H\_BSID, Z}\]

  \[
  \{H\_BSID, Z\}\]

  \[
  \{C2D, D2Z, Z\}\]

  \[
  S \rightarrow A \rightarrow B \rightarrow H \rightarrow C \rightarrow D \rightarrow Z
  \]

- Recursion on a BSID

  BGP policy:
  - match color C
  - then look for SRTE policy

  BGP route 10/8
  - NH: Z, Color: C
  - Label: L

  SR policy:
  - Head: H, Color: C, Endpoint: Z
  - BSID: B
  - SIDlist : \{S1,S2,S3\}

  FIB: (hierarchical)
  - 10/8 push L -> B -> \{S1,S2,S3\}
Traffic steering

• Class based traffic steering

SR policy:
Head: H, Color: C1, Endpoint: Z
  -> BSID: B1
  -> SIDlist: \{S1, S2, S3\}

Head: H, Color: C2, Endpoint: Z
  -> BSID: B2
  -> SIDlist: \{S4, S5, S6\}

BGP route 10/8
  NH: Z,
  Label: L

FIB: (hierarchical)
  10/8 push L
  FC0 -> IGP path
  FC1 -> B1 -> \{S1, S2, S3\}
  FC2 -> B2 -> \{S4, S5, S6\}
Next steps

• We welcome comments

• This document is a base to understand protocol extension documents