MPLS Source Label

draft-chen-mpls-source-label-00

Mach Chen

Xiaohu Xu

Zhenbin Li

Luyuan Fang

Problem Statement

- IP forwarding based on IP header

    - IP header contains Source and Destination IP addresses

    - Intermediate and egress nodes can easily tell from where an IP packet is sent.

- MPLS forwarding based MPLS header (label and label stack)

    - MPLS label identify a FEC, a packet assigned to a FEC based on its network layer destination address

    - No source information encoded in MPLS label stack

    - Intermediate and egress LSRs can *NOT* tell from which LSR a packet is sent from the label and/or label stack.

Problem Statement (cont.)

- MPLS LSPs Categories:

  - P2P and P2MP

    - RSVP-TE LSP, PW, etc.

    - Possible to derive the source information by combination of the label and control plane information.

  - MP2P and MP2MP

    - Classic LDP based LSP, VPLS, L3VPN, etc.

    - No way to derive the source information at the receiving end

Solutions

- MPLS Source Label (SL)

  – Designed to identify ingress LSR of an LSP

  – A special purpose label: Source Label Indicator (SLI)

    – Placed immediately before the SL

    – Indicate the next label is SL

- Source Label Capability (SLC)

  – Egress signal to Ingress LSR it is able to process SL

  – Based on the SLC, ingress LSR can choose whether or not to insert SL into the stack

  – LDP, RSVP-TE, BGP extensions

MPLS label stack

| … |
| --- |
| **LSP Label** |
| **SLI** |
| **SL** |
| … |
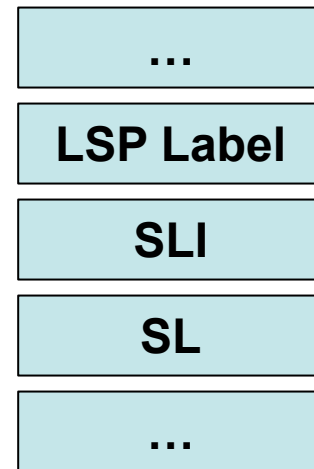
Source Label Selection

- It could be either

  - Global Label, or

  - Domain Wide Label, or

  - Local Significant Label

    - Similar to BGP VPLS Label Block (RFC 4761)

    - Each LSR allocates and distributes a block of local significant labels for Source Label usage

    - Assign each LSR a domain wide unique Identifier that is used to locate the actual label value in the block

Use Cases (1)

- Performance Measurement (E.g., Packet Loss, throughput)
  - Source identification is the precondition of PM
  - To help the egress or intermediate LSRs to count the specific flow

LSP Label
SLI
SL1

Insert SL1 PE1

PE3

LSP Label
SLI
SL2

Insert SL2 PE2
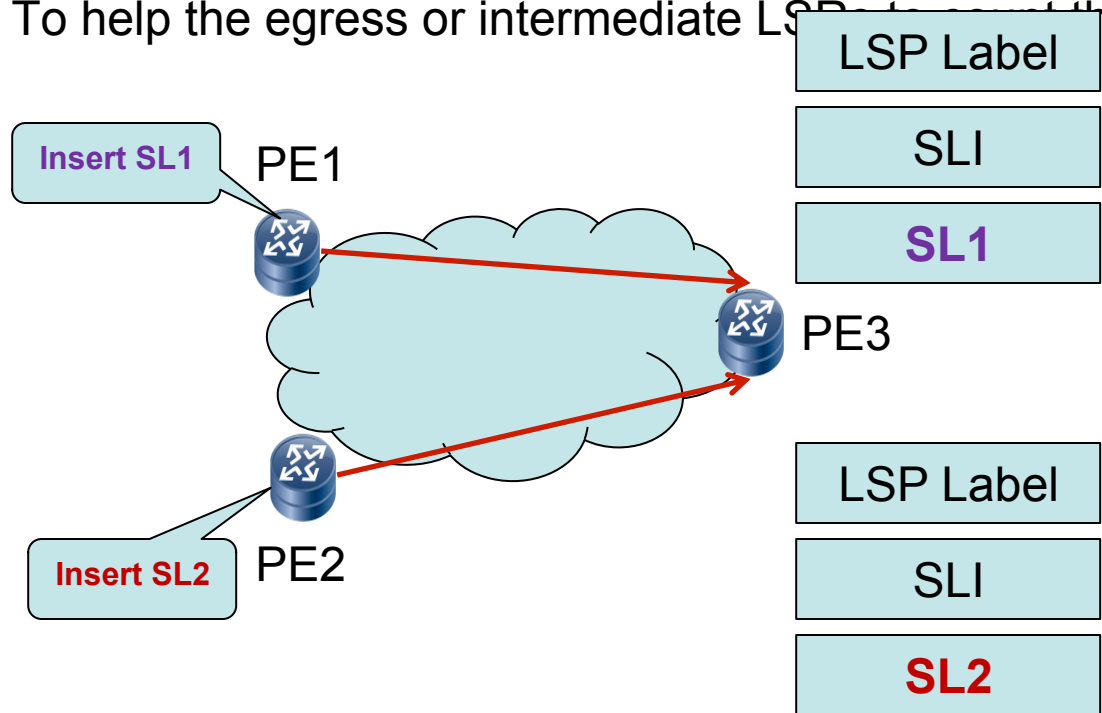
Use Cases (2)

- Traffic Matrix Measurement and Steering

  – To measure the traffic at the egress nodes. (e.g., at E1, E2, or E3)

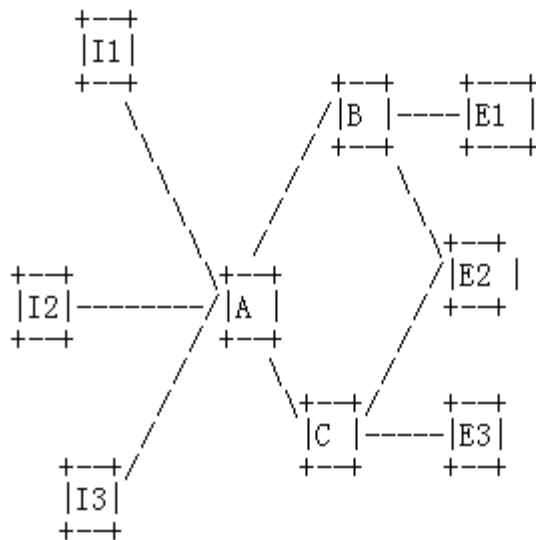 – To measure and steer traffic at A

```
    +--+
    |I1|
    +--+                    +--+    +---+
               \           /|B |----|E1 |
                \         / +--+    +---+
                 \       /
                  \     /           \+--+
    +--+     +--+  \   /            /|E2 |
    |I2|--------/|A |               /+--+
    +--+        +--+  /   \        /
                /   \         \+--+/    +--+
               /      \         |C |-----|E3|
    +--+/              +--+      +--+    +--+
    |I3|
    +--+
Figure 1: Traffic Matrix Measurement and Steering
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Next Steps

- Would like to solicit comments and feedbacks of the WG.

- Update the draft.