MPLS Source Label

draft-chen-mpls-source-label-01

Mach Chen
Xiaohu Xu
Zhenbin Li
Luyuan Fang

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Problem Statement and Motivation

• No information about source encoded in MPLS label stack
  – A MPLS label identifies a FEC and assumes the destination address semantic
  – Intermediate and egress LSRs can NOT tell from which LSR a packet is sent. Especially for:
    – MP2P and MP2MP LSP (e.g., LDP based LSP, L3VPN, etc.)
    – Segment Routing based LSP (without per-flow state)

• Source identification is critical for some applications
  – Performance Measurement, Traffic Matrix Collection
  – Segment Routing - “… preserving information on the topological and service journey of a packet (e.g. the ingress to the domain for accounting/billing purpose).”
Solutions

- **MPLS Source Label (SL)**
  - Designed to identify ingress LSR of an LSP, could be:
    - Global label, or
    - Locally significant label
      - Similar to BGP VPLS Label Block (RFC 4761)

- **Source Label Indicator (SLI)**
  - A special purpose label (TBD)
  - Placed immediately before the SL
  - Indicate the next label is a SL
Use Cases (1)

- Performance Measurement (E.g., Packet Loss, throughput)
  - Source identification is the precondition of PM
  - To help the Egress or intermediate LSRs for counting

![Diagram showing LSP Label insertion at PE1 and PE2]

- PE1: Insert SL1
- PE2: Insert SL2
- LSP Labels: SLI, SL1, SL2
Use Cases (2)

- Traffic Matrix Collection and Steering
  - When Link C-D reaching its threshold
  - Collect the traffic matrix over Link C-D (at either node C or D):
    - Which flows are from node A and B? (Based on Source Label)
    - What’s the volume of each flow?
  - Then determine which flows should be moved onto other paths
Compatibility Consideration

• Egress LSR
  – Source Label Capability (SLC) negotiation: 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

• Transit LSR
  – There is no change in forwarding behavior for transit LSRs. But if a transit LSR can recognize the SLI, it may use the SL to collect traffic throughput and/or measure the performance of the LSP.

• So, there is no compatibility issue.
Next Steps

• Would like to solicit more comments and update the draft.

• WG adoption?