BGP Extensions for Service-Oriented MPLS Path Programming (MPP)
draft-li-mpls-path-programming-04.txt

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MPLS Path Programming (1)

• MPLS Path Programming (MPP)
  – draft-li-spring-mpls-path-programming
draft-li-idr-mpls-path-programming
  – Concept:
    • Flexible Label Combination
    • Flexible Mapping of Service to MPLS Tunnel
  – Why IDR:
    • Using BGP NLRIs to distribute MPLS Tunnels + Segments
    • Uses IDR drafts: RFC3170bis, draft-ietf-idr-tunnel-encaps,
draft-previdi-idr-segment-routing-te-policy
  – Desire Feedback on combination
Prototypes and Open Source of MPP

- **Prototypes:**
  - Flexibly map services to tunnels: It has been implemented.
  - Flexible label combinations: It will be delivered soon
- Delivery of protocol extensions based on ONOS will be done in the J/K version.
- Verification of the running code will be done in the DC network

![Diagram of network with BGP/PCE controller and tunnels](image)
Segment Path Programming (1)

• Segment Path Programming (SPP)
  – draft-li-spring-segment-path-programming
  – Concept:
    • Flexible Segment Combination
    • Flexible Mapping of Service to Segment Path
  – The innovation of Generalized Segment and Segment Path is introduced and protocol extension requirements are proposed.
MPLS/SR data sent from client to/from SDN controller

MPLS Mapping
- Distribute local label mapping and global mappings to central controller/client
- Carry label stack for service-oriented MPLS path.
- Carry identifier of the transport MPLS path that links service MPLS path
- Specify end-points to accept the prefix advertised by the central controller.
- Be able to set priority prefix with attributes of MPLS path programming advertised by the central controller.
- Prioritize the central controller path over client paths
- draft-li-mpls-path-programming-04.txt

• Segment Path Programming (SPP)
  - Distributes Segment Binding from Client to/from Central Controller
  - Distribute Segment (stack) for Segment Path of the service/network layer. (BGP)
  - Distribute Segment (stack) for Segment Path of the transport layer (PCE)
  - Segment stack if applied to MPLS
  [See]
draft-li-isis-spp-extensions (March 21, 2016)
draft-li-idr-flowspec-redirect-generalized-sid-00
Implementing Using IDR drafts

- **draft-ietf-mpls-rfc3107bis**
  - Expand RFC3107 to Advertise MPLS Label Stack to one address prefix;
  - Default, RFC3107 only advertise an MPLS Label to one address prefix

- **draft-ietf-idr-tunnel-encaps**
  - Using Tunnel Encapsulation Attribute to advertise MPLS Label Stack Sub-TLV & Prefix-SID List
  - The MPLS label stack sub-TLV extensions is similar as the protocol extensions defined by draft-li-idr-mpls-path-programming.

- **draft-previdi-idr-segment-routing-te-policy**
  - Reusing Tunnel Encapsulation Attribute to advertise Tunnel Identifier & Segment List
  - The Tunnel Identifier plus Segment List is similar as the "Extended Unicast Tunnel attribute" defined by draft-li-idr-mpls-path-programming.
Feedback

• Implementing all three drafts seen to hit gray areas in 3 drafts
• Drafts overlap, and we’d like to provide feedback on drafts
Next Step

• Implementation working ongoing
• Will be providing Feedback on
• Collaborative work under guidance of Routing Area ADs/SPRING WG Chairs/IDR WG Chairs.