A Framework for L3VPN Performance Monitoring

draft-dong-l3vpn-pm-framework-00

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Background

- Performance Monitoring (PM) in BGP MPLS L3VPN is desired

  – Meet SLA of services which are sensitive to loss, delay, jitter.

  – Provide operators with visibility to the performance of the VPN network

- Challenges for performance monitoring in existing L3VPN

  – Identifying the source VPN instance of received packets

  – Detailed analyses are provided in accompany draft:

  draft-zheng-l3vpn-pm-analysis-00

- This document describes the framework of providing PM in L3VPN

New concept for L3VPN PM

- VRF-to-VRF Tunnel (VT)
  - point-to-point connection between two VRFs in a VPN
  - VT is used by the egress PE to identify the ingress VRF
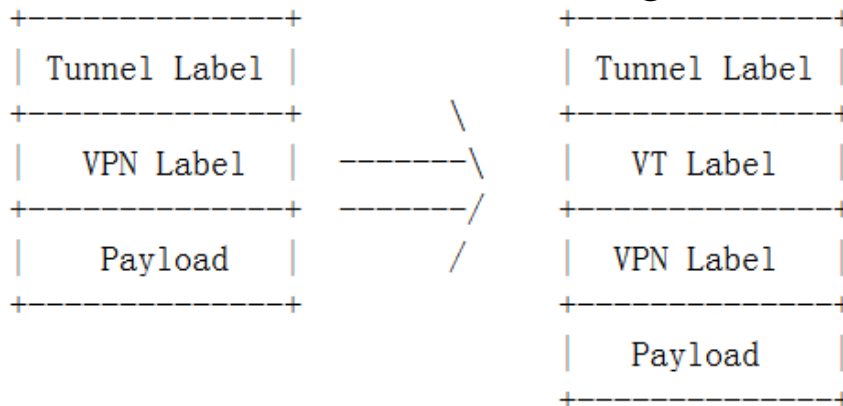 - Essential for PM in L3VPN
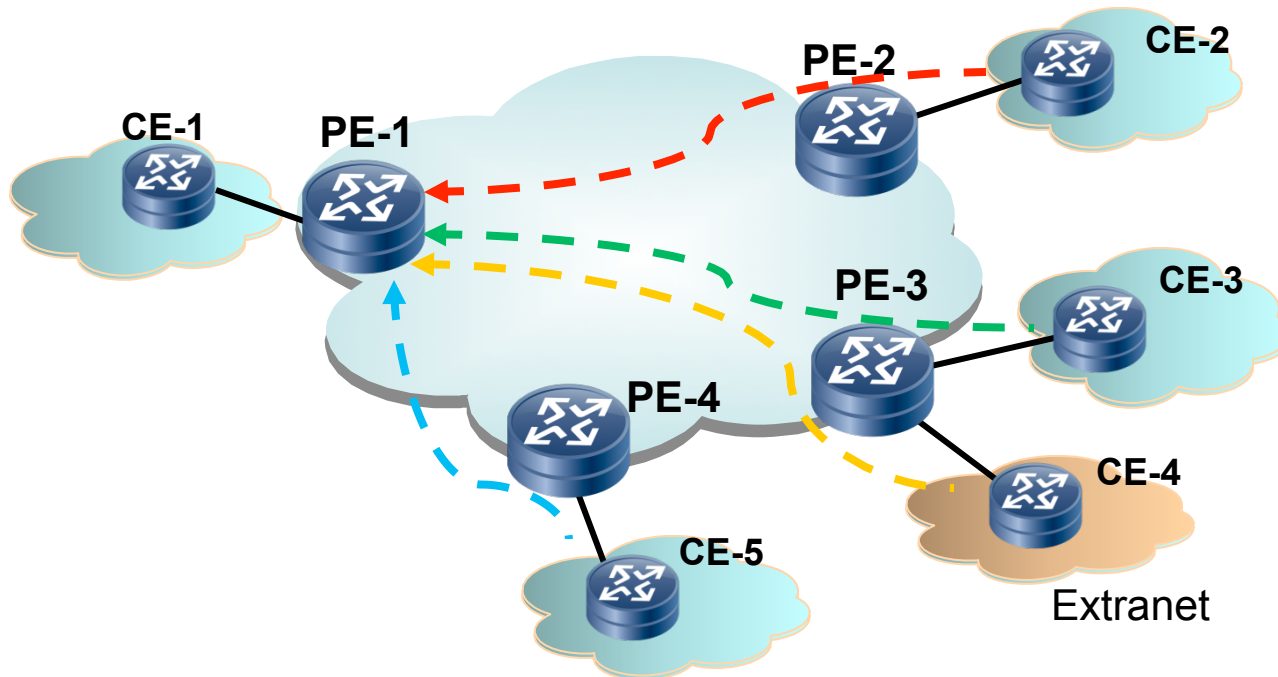
Control Plane Mechanisms

- Step1: VPN membership auto-discovery

  – Mechanism similar to BGP AD in RFC 6074

  – PEs obtain VPN membership information of the remote PEs/VRFs

- Step2: VRF-to-VRF Label Allocation

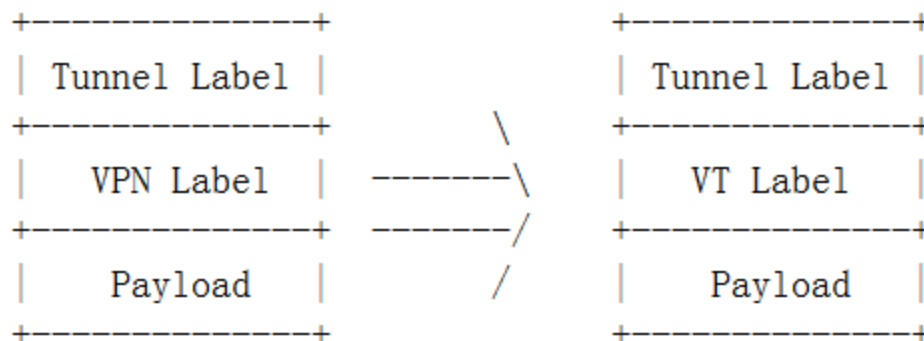 – PE-1 allocates unique MPLS label for each remote VRF to identify the VRF-to-VRF tunnel

Extranet
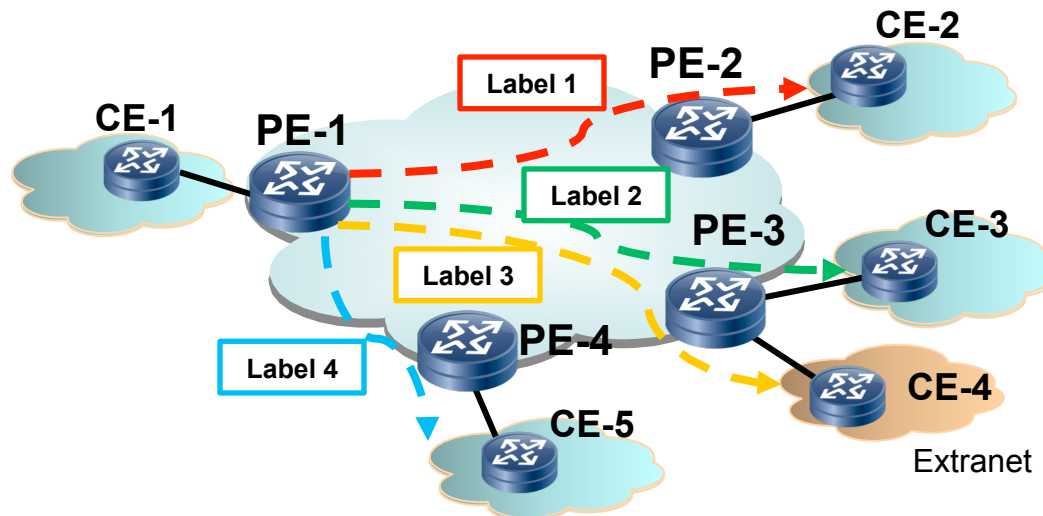
Data Plane Mechanisms

- ## Packet Encapsulation with VT label

  - ### Approach 1: additional VT label for Ingress VRF identification

```
+-------------+                      +-------------+
| Tunnel Label |                     | Tunnel Label |
+-------------+          \           +-------------+
|  VPN Label  |   -------\          |   VT Label  |
+-------------+   ------/           +-------------+
|   Payload   |        /            |  VPN Label  |
+-------------+                     +-------------+
                                    |   Payload   |
                                    +-------------+
```

  - ### Approach 2: replace VPN label with VT label

```
+-------------+                      +-------------+
| Tunnel Label |                     | Tunnel Label |
+-------------+          \           +-------------+
|  VPN Label  |   -------\          |   VT Label  |
+-------------+   ------/           +-------------+
|   Payload   |        /            |   Payload   |
+-------------+                     +-------------+
```

- VT label identifies the connection between source VRF and destination VRF

- VPN route lookup in the destination VRF is required

Performance Monitoring in L3VPN

- PM mechanisms in RFC 6374 can be used for L3VPN

  - Loss & Delay measurement

  - Format of source and destination addresses in the Addressing Object are defined for L3VPN

    - source address: (RD + PE address) of source VRF

    - destination address: (RD + PE address) of destination VRF

Next Steps

- Solicit comments & feedbacks

- Revise the draft