A Framework for L3VPN Performance Monitoring
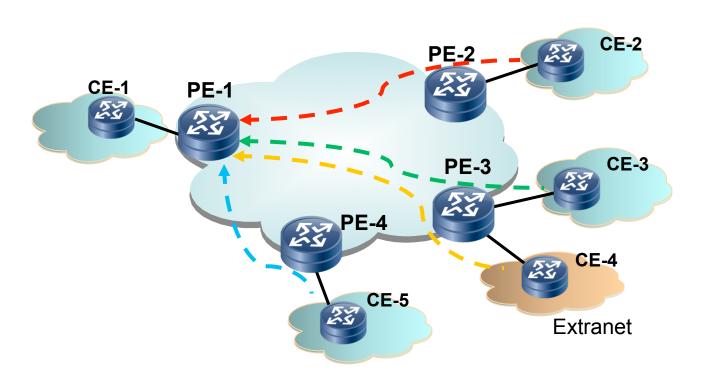
draft-dong-l3vpn-pm-framework-01

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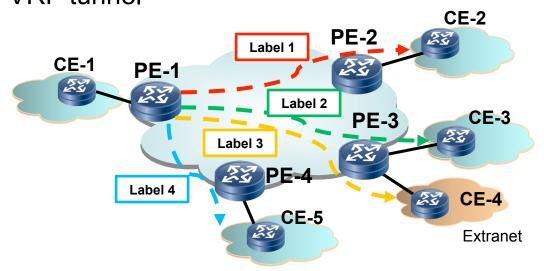
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1

L3VPN PM Framework: Point-to-Point Connection

- 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
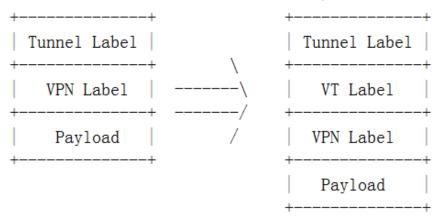

Extranet

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 different MPLS labels to remote VRFs to identify each VRF-to-VRF tunnel
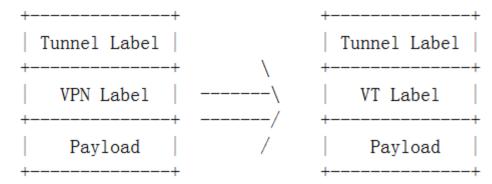

3

Data Plane Mechanisms

- Encapsulation with VT label

  – Approach1: additional VT label for Ingress VRF identification

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

  – Approach2: replace the VPN label with VT label

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

  - VPN route lookup is required in the destination VRF

Performance Monitoring in L3VPN

- PM mechanisms in RFC 6374 can be used for L3VPN

  – Measurement of Loss, delay

  – 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

Updates

- Add one co-author: Bhavani Parise

- Modify based on the careful review comments from Bhavani Parise to make explanations more precise

- TTL and COS fields process for the VT label encapsulation in the data plane are added.

Next Steps

- Solicit more comments & feedbacks

- Request to adopt as the WG draft