Extensions to BGP Signaled Pseudowires to support Flow-Aware Transport Labels

draft-keyupate-l2vpn-fat-pw-bgp-01

Bin Wen – bin_wen@cable.comcast.com

Keyur Patel – keyupate@cisco.com

Sami Boutros – sboutros@cisco.com

Jose Liste – jliste@cisco.com

Jorge Rabadan - jorge.rabadan@alcatel-lucent.com

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Problem Statement

- Ethernet services have become an important component of a SP product offering

- However, demand for high-speed Ethernet services (e.g. multi-GE or higher speeds) pose a problem for Network Operators as traffic from a given PW is not able to utilize all available paths (e.g. ECMP or LAGs) in the Core and instead it creates congestion in parts of the network

- Flow-based load-balancing in the Core becomes an important design consideration

Flow Based Multi-Pathing in the Core
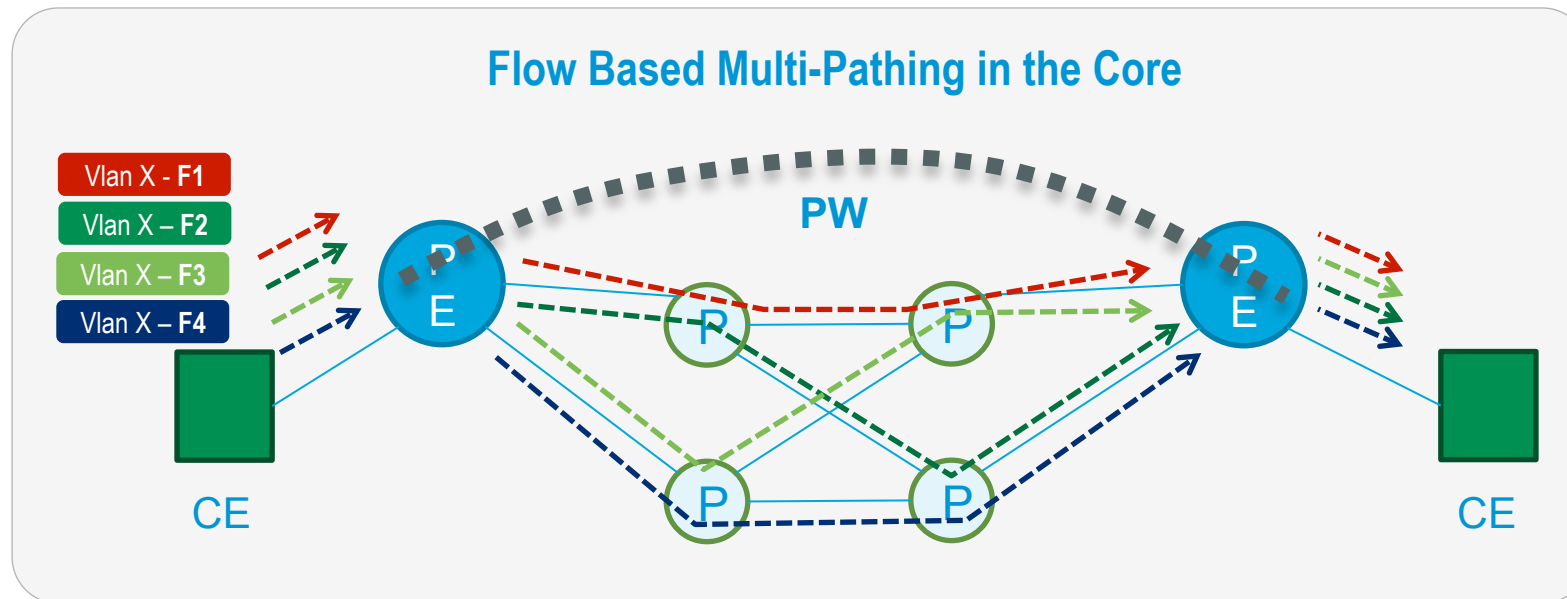
Proposal

- This memo provides a solution for load-balancing of PW traffic with the following characteristics:

    Based on Flow Aware Transport PW (IETF RFC 6391)

    Applicable to deployments with BGP-signaled VPLS (RFC4761) and BGP-signaled VPWS (RFC6624)

    Does not require any forwarding behavior changes on transit LSRs; i.e. NO changes to load-balancing hash functions on deployed P routers

- RFC4761 includes a Layer2 Info Extended Community in VPLS NLRI to convey information such as CW support, MTU, etc.

- PROPOSAL – Use two (2) unused bits in Control Flag Bit vector to encode "T" and "R" bits as defined in RFC6391

```
+-------------------------------------+
| Extended community type (2 octets)  |
+-------------------------------------+
|  Encaps Type (1 octet)              |
+-------------------------------------+
|  Control Flags (1 octet)            |
+-------------------------------------+
|  Layer-2 MTU (2 octet)              |
+-------------------------------------+
|  Reserved (2 octets)                |
+-------------------------------------+
```

```
  0 1 2 3 4 5 6 7
 +-+-+-+-+-+-+-+-+
 |Z|Z|Z|T|R|Z|C|S|        (Z = MUST Be Zero)
 +-+-+-+-+-+-+-+-+

 Control Flags Bit Vector
```

Figure 3: Layer2 Info Extended Community

FAT PW for BGP-sig VPWS / VPLS

T bit	Meaning
1	PE requesting to send PW traffic with Flow Label
0	PE will NOT send PW traffic with Flow Label

R bit	Meaning
1	PE willing to receive PW traffic with Flow Label
0	PE NOT willing to receive PW traffic with Flow Label

PE1   **PE2**

PW_{12}

PW traffic in PE1-to-PE2 direction
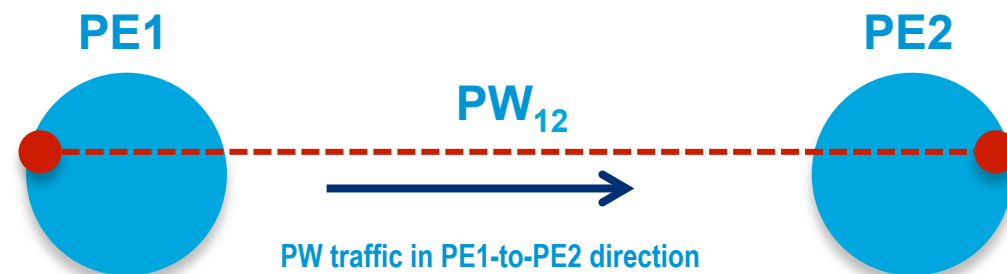
PE1 T bit	PE2 R bit	Meaning
0	0	FL NOT used for PW traffic in PE1-to-PE2 direction
0	1	FL NOT used for PW traffic in PE1-to-PE2 direction
1	0	FL NOT used for PW traffic in PE1-to-PE2 direction
1	1	FL used for PW traffic in PE1-to-PE2 direction

FAT PW for BGP-sig VPLS
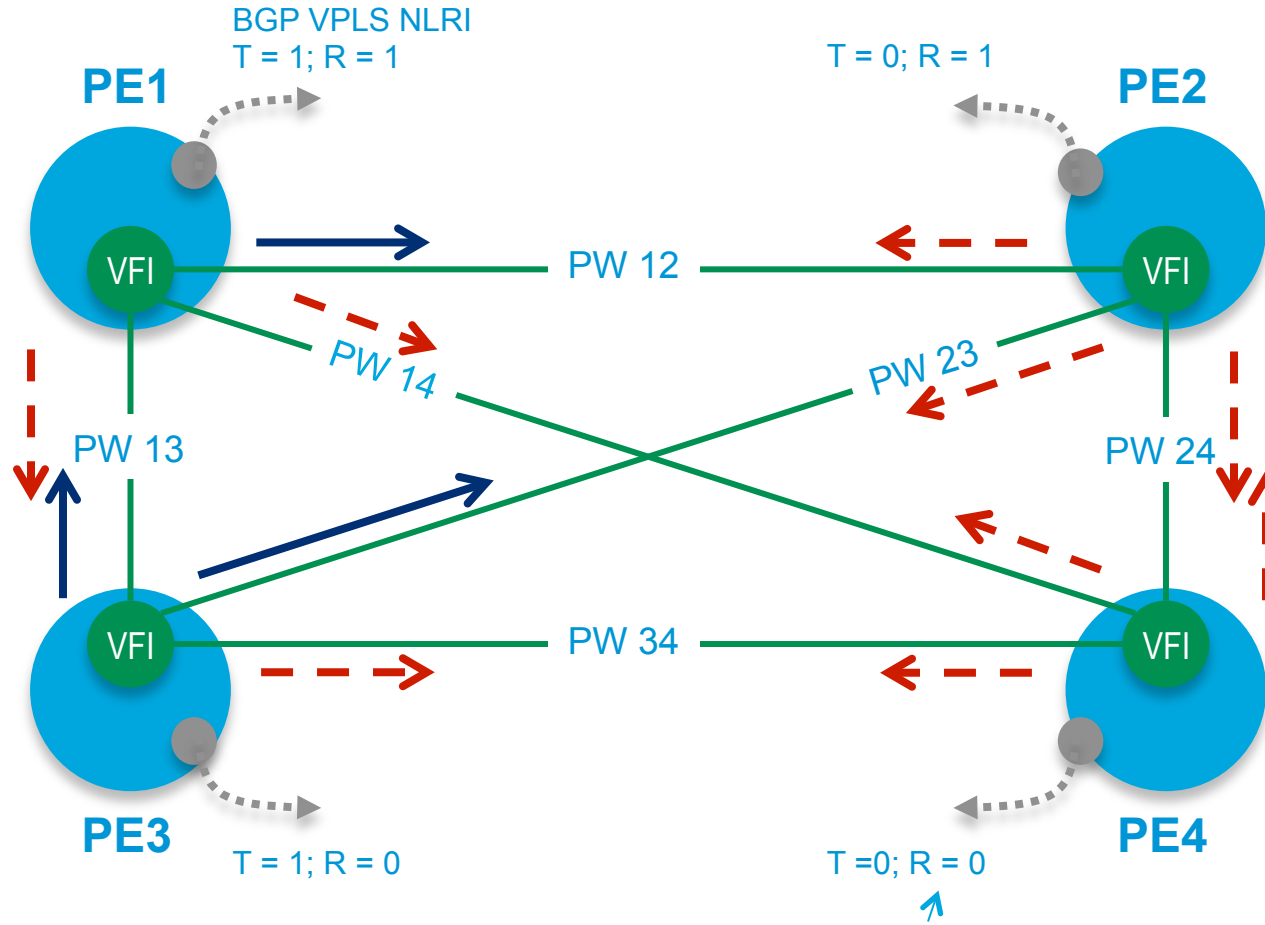
Changes from version -00 to -01

- Modified title for better readability

- Added Jorge Rabadan (Alcatel-Lucent) as a new co-author

- Modified the location of T- and R-bits in the Control-Flag field of the Layer2 Info Extended Community (in order to prevent collision with other drafts)

- Added text to clarify the behavior for VPLS scenario where PEs may not share the same flow label settings

- Clarified text describing compatibility behaviors with PEs not supporting this draft

- Acknowledged contributions from John Drake (Juniper), John Brzozowski (Comcast) and Steven Cotter (Alcatel-Lucent)

Next Steps

- Authors believe that document is ready for WG adoption

THANK YOU !