Segment Encoding and Procedures for Multicast VPN Service in Native IPv6 Network

[draft-wang-spring-multicast-vpn-segment]

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- Purpose of this draft
- Proposed Solutions
- Further Action

Purpose of this draft

- Propose a segment (End.MVPN) to contain the VPN customer information, which can be used to distinguish traffic from different customers.

- Align with the unicast IP VPN address allocation.

- Implementation is similar to Rosen MVPN (will not complicate the solution).

- Advantages:

- Make the deployment and management of the multicast service more easier

- Compatible with Rosen MVPN, BIER and other technologies

Proposed Solution
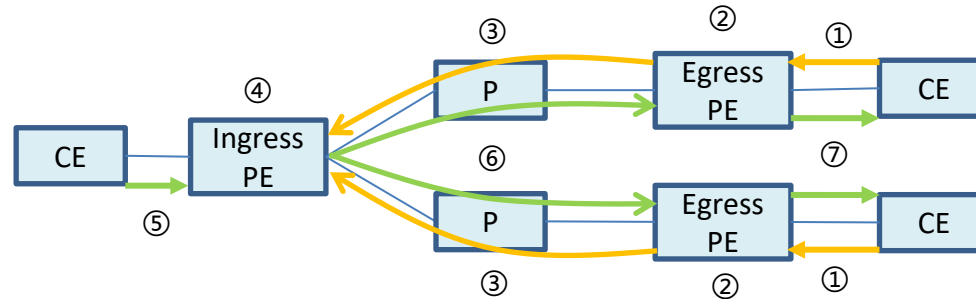
The operation process of End.MVPN

① Customer joins the multicast group.

② Egress PE generate an End.MVPN according to the VPN customer information.

③ Egress PE sends End.MVPN to ingress PE.

④ Ingress PE maintain a mapping table of End.MVPN and VPN customer information. The generated End.MVPN will be inserted into the table.

⑤ CE send a multicast packet to ingress PE.

⑥ Ingress PE encapsulates the packet with a header according to the End.MVPN mapping table. The destination address will be set to End.MVPN. Then, the packet will be sent to egress PEs. The behavior on P depends on the generation method of multicast tree.

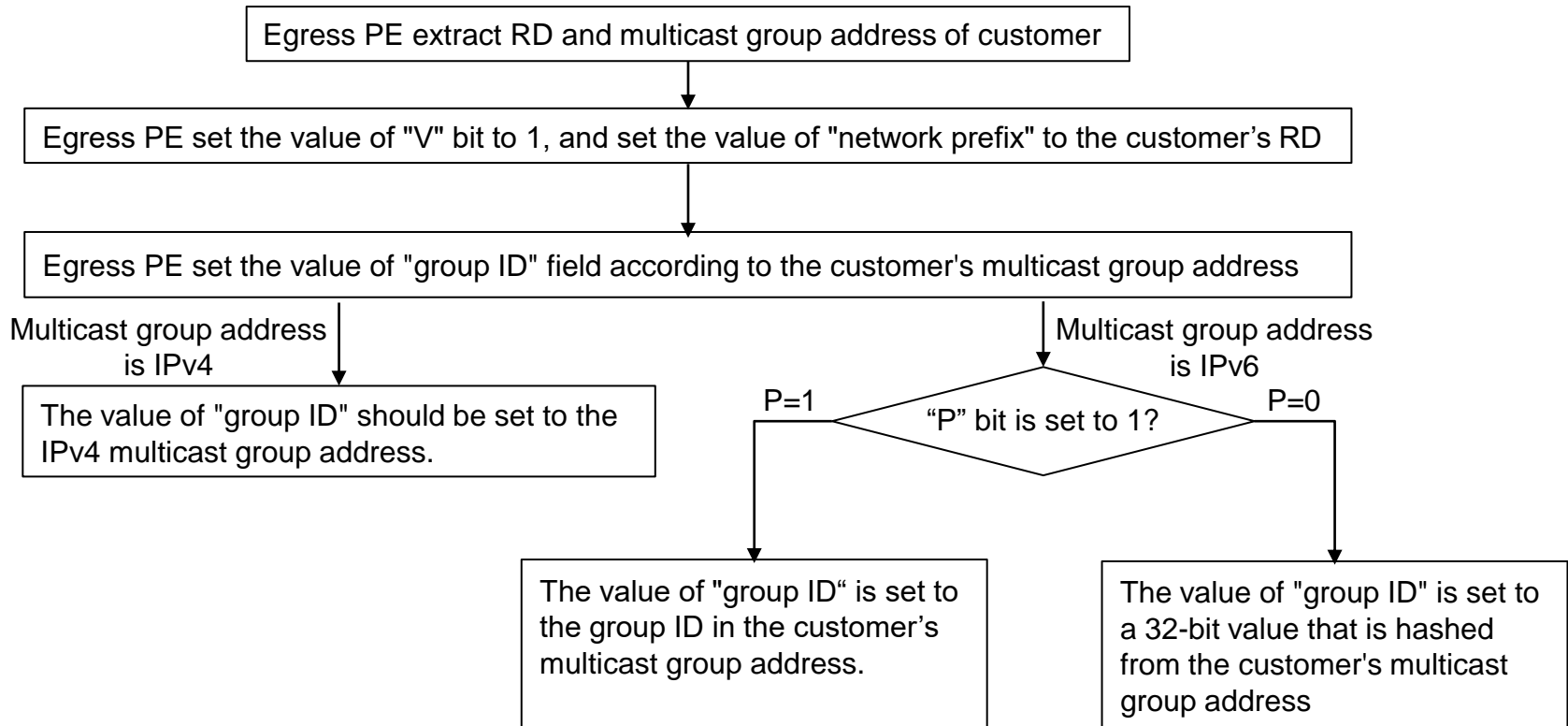⑦ Egress PEs decapsulate the packet and transmit it to the corresponding CEs.

Proposed Solution

8	4	4	4	4	8	64	32
11111111	ff1	scop	ff2	rsvd	plen	Network prefix	Group ID

V	R	P	T
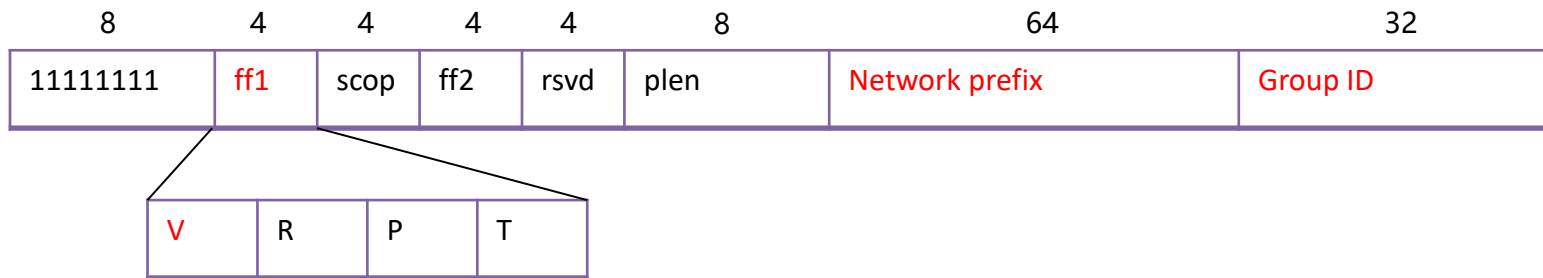
Encoding of End.MVPN

- **V** (1 bit): When it is set, it means the multicast group address is an End.MVPN SID. Otherwise, it is a common multicast address.

- **Network prefix** (64 bits): When "V" is set, this field carries the customer's RD. Otherwise, the information carried in this field should be determined by the other bits in ff1.

- **Group ID** (32 bits): This field carries the information of customer group.

Proposed Solution

Egress PE extract RD and multicast group address of customer

Egress PE set the value of "V" bit to 1, and set the value of "network prefix" to the customer's RD

Egress PE set the value of "group ID" field according to the customer's multicast group address

Multicast group address is IPv4

Multicast group address is IPv6

The value of "group ID" should be set to the IPv4 multicast group address.

P=1   "P" bit is set to 1?   P=0

The value of "group ID" is set to the group ID in the customer's multicast group address.

The value of "group ID" is set to a 32-bit value that is hashed from the customer's multicast group address

The generation of End.MVPN

Proposed Solution

When an IPv6 packet with IPv6 destination address being D is received on an egress PE, and D is associated with an End.MVPN SID on the egress PE, the egress PE does the following behavior:

S01. If (V bit in End.MVPN = 1) {

S02. Look up the End.MVPN mapping table according to End.MVPN, find out the associated RD and the related MFIB(VRF) table T.

S03. Remove the outer IPv6 header with all its extension headers.

S04. Set the packet's associated MFIB table to T.

S05. Submit the packet to the egress MFIB lookup for transmission to the new multicast downstream.

S06. } Else {

S07.Set the packet's associated MFIB table to global MFIB.

S08. Submit the packet to the egress MFIB lookup for transmission to the new multicast downstream.

S09. }

Further Action

- Comments?

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