BGP Extensions for Enhanced VPN A uto Discovery

draft-zhuang-bess-enhanced-vpn-auto-discovery-00

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Introduction

- As new applications develop, there proposes the requirements:
  - Auto-Discovery of L3VPN [RFC4364]
  - Enhance Auto-Discovery of VPN technologies such as MVPN, EVPN, etc.
- This document identifies the possible application s and these Auto-Discovery requirements. Then protocol extensions are defined.

Usecase 1: Centralized Traffic Optimization

- Existing Auto-Discovery mechanism of VPN technologies:
  - A-D routes are always advertised with the Export Route Target (ERT).
  - Ingress PE can use the Import Route Target (IRT) of local MVPN/EVPN instance to match the route target advertised with the NLRI to determine the relationship of these VPN instances.
  - Applications of central control is developed. For example PCE can be used to initiate setup of RSVP-TE LSP or P2MP LSP. But the controller cannot l earn between what PEs RSVP-TE LSP/P2MP LSP should be set up.
- In order to support such applications, the controller should learn the relationshi p of unicast VPN instances or multicast VPN instances distributed on different PEs.

Usecase 2: Label/Segment Allocation f or VPN Instance

- [I-D.bryant-mpls-synonymous-flow-labels] defines the concept of Syn onymous Flow Labels (SFL)
  - The SFLs are used by the egress PE to uniquely identify the source in the case of MP2P LSP to cop e with the challenge of measurement of packet loss .
  - [I-D. dong-bess-l3vpn-pm-framework]
  - [I-D. dong-bess-l3vpn-pm-framework] defines the SFL allocation methods for L3VPN LSP.
  - In order to support such applications, a PE which attaches to a pa rticular VPN needs to know all the remote VRFs on other PEs that attach to the same VPN. This is achieved via the Auto-Discovery of L3VPN mechanism.

IRT Extended Community

- This document defines a new type of the extended community , called as Import Route Target (IRT) extended community.
- The IRT Extended Community can be used for MVPN[RFC6514], L3VPN[RFC4364], EVPN[RFC7432], BGP-based VPLS [RFC4761], and BGP-AD-based VPLS[RFC6074] etc.
- According to the requirements of applications, the IRT extended community SHOULD be able to be carried with different A-D routes.

IRT Extended Communities :

Type	Sub-Type	Extended Community	Encoding
0x00	TBD	AS-2byte IRT	2-octet AS, 4-octet Value
0x01	TBD	IPv4 IRT	4-octet IPv4 Address, 2-octet Value
0x02	TBD	AS-4byte IRT	4-octet AS, 2-octet Value

BGP Extensions for L3VPN Auto-Discovery

- A new SAFI called BGP-VPN-INSTANCE SAFI is introduced.
- A new BGP NLRI called BGP-VPN-INSTANCE NLRI is introduced.
- VPN Membership A-D Route is defined.

```
+-----------------------------------------------+
| Route Type (1 octet)                          |
+-----------------------------------------------+
| Length (1 octet)                              |
+-----------------------------------------------+
| Route Type Specific (variable)                |
+-----------------------------------------------+
```

-- Type 1: VPN Membership A-D Route --

```
+-----------------------------------------------+
| Local Router's IP Address (variable)          |
+-----------------------------------------------+
| RD (8 octets)                                 |
+-----------------------------------------------+
```

Next Step

- Solicit comments and feedbacks
- Revise the draft