BGP Extensions for Enhanced VPN Auto Discovery

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

Shunwan Zhuang, Zhenbin Li, Lucy Yong

*Huawei Technologies*

IETF 94, Yokohama, Japan
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 applications and these Auto-Discovery requirements. Then protocol extensions are defined.
Use case 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 learn between what PEs RSVP-TE LSP/P2MP LSP should be set up.
- In order to support such applications, the controller should learn the relationship of unicast VPN instances or multicast VPN instances distributed on different PEs.
Use case 2: Label/Segment Allocation for VPN Instance

- [I-D.bryant-mpls-synonymous-flow-labels] defines the concept of Synonymous Flow Labels (SFL)
  - The SFLs are used by the egress PE to uniquely identify the source in the case of MP2P LSP to cope with the challenge of measurement of packet loss.
- [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 particular 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 |

November, 2015  IETF 94 Yokohama
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.
  
  Type 1: VPN Membership A-D Route
  
  +--------------------------------------------------+
  | Local Router's IP Address (variable)              |
  +--------------------------------------------------+
  | RD (8 octets)                                    |
  +--------------------------------------------------+

- VPN Membership A-D Route is defined.
Next Step

- Solicit comments and feedbacks
- Revise the draft