EVPN Interoperability Modes

draft-krattiger-evpn-modes-interop-03

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Online

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Intro

- Ethernet VPN (EVPN) provides different functional modes in the area of
  - Service Interfaces
    - RFC7432 section 6
  - Integrated Route and Bridge in EVPN
    - draft-ietf-bess-evpn-inter-subnet-forwarding section 5 and 6
  - IRB Core Connectivity model
    - draft-ietf-bess-evpn-prefix-advertisement section 4.4
- The different modes are defined with different use-cases in mind and were generally mutual exclusive.
- Even with the specific use-cases and the resulting mode definition, the aim of interoperability is critical.
Focus and Key Items of this Draft

- We aim to document the different EVPN functional modes and how they can interoperate with each other.
- We don’t aim to redefine the existing functional modes.
- We consider the most pertinent interop modes as oppose to all permutations.
  - Service Interfaces
    - VLAN-Aware Bundle <> VLAN-Based
  - Integrated Route and Bridge in EVPN
    - Asymmetric IRB <> Symmetric IRB
  - IRB Core Connectivity model
    - Interface-less <> Interface-ful Unnumbered IRB
- In the future if other modes are identified, it will be addressed in future revisions.
Interoperability for different Service Interface

Section 3.2

Need to Interop with VLAN-Based
• Single BD per EVI
• Send EthTag0 in EVPN Type2
• Use Route-Target for MAC-VRF1 (1:1)

For BD/PE with No Need for Interop with VLAN-Based
• Remain in VLAN-Aware mode
• Multiple BD per EVI
• Send EthTag per BD in EVPN Type2
• Use Route-Target for MAC-VRF2 (2:2)
Interoperability for different IRB Types

Section 4.2

Asymmetric IRB

- Install MAC/IP binding towards PE1; use MPLS Label1
- Advertise MAC/IP route with both MPLS Label
- Ignore MPLS Label2 in received MAC/IP routes

Symmetric IRB

- Install MAC/IP binding towards PE1; use MPLS Label1
- Advertise MAC/IP route with both MPLS Label

For PE with No Need for Interop with Asymmetric IRB
- Install MAC/IP bindings towards PE2
- Use MPLS Label1 for MAC
- Use MPLS Label2 for IP

• Advertise MAC/IP route with MPLS Label1 only
• Ignore MPLS Label2 in received MAC/IP routes
Interoperability for different IRB Core Connectivity Modes
Section 5.1

- Advertise IP prefix route (EVPN Type5)
  - Gateway IP is 0.0.0.0
  - Use IP-VRF label and Route-Target
  - Include Router-MAC Ext. Community
- Advertise additional MAC/IP route with PE1’s Router MAC
  - Use IP-VRF Label and Route-Target
  - Include Router-MAC Ext. Community
- Install IP prefix route (EVPN Type5)
- Ignore additional MAC/IP route with PE2’s Router-MAC

PE1

IP-VRF1

TS1/SN1

rMAC = Router MAC

PE2

IP-VRF1

TS2/SN2

• Advertise IP prefix route (EVPN Type5)
  • Gateway IP is 0.0.0.0
  • Use IP-VRF label and Route-Target
  • Include Router-MAC Ext. Community
• Advertise additional MAC/IP route with PE1’s Router MAC
  • Use IP-VRF Label and Route-Target
  • Include Router-MAC Ext. Community
• Advertise additional MAC/IP route with PE2’s Router MAC

• Install IP prefix route into IP-VRF
  • Validate additional MAC/IP route from PE1’s Router-MAC
Status

• First Draft submitted July 21, 2019
  • Currently in version 03
  • Version 04 with minor updates in the works

• Implementation at various stage at various vendors
  • Cisco, Juniper, Nokia

• Interoperability testing performed during Multi-Vendor Interop Testing @ EANTC
  • EANTC - European Advanced Networking Test Center (eantc.de)
Status

• Various interoperability cases tested between the co-authoring vendors.
  • Service Interface Interoperability
    • Cisco (VLAN-Based) <> Juniper (VLAN-Aware Bundle)
  • Integrated Routed and Bridge (IRB)
    • Cisco (Symmetric IRB) <> Juniper (Asymmetric IRB)
  • IRB Core Connectivity
    • Cisco (Interface-Less) <> Nokia (Interface-Full Unnumbered)

• Other vendors reached out for interest and discussion.
Conclusions and Next Steps

• The authors ask for WG adoption