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.
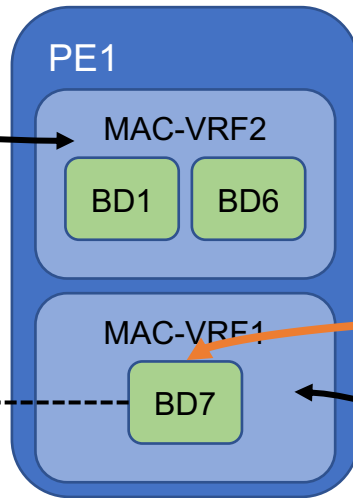
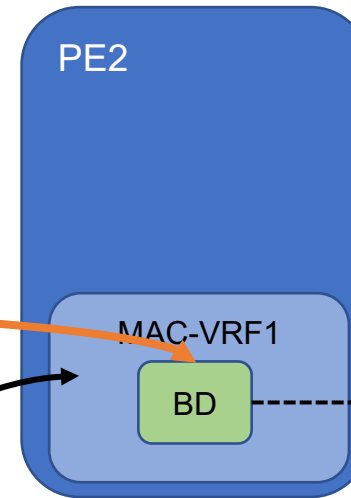# Interoperability for different Service Interface
Section 3.2

For BD/PE with <u>No</u> 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)

VLAN-Aware Bundle
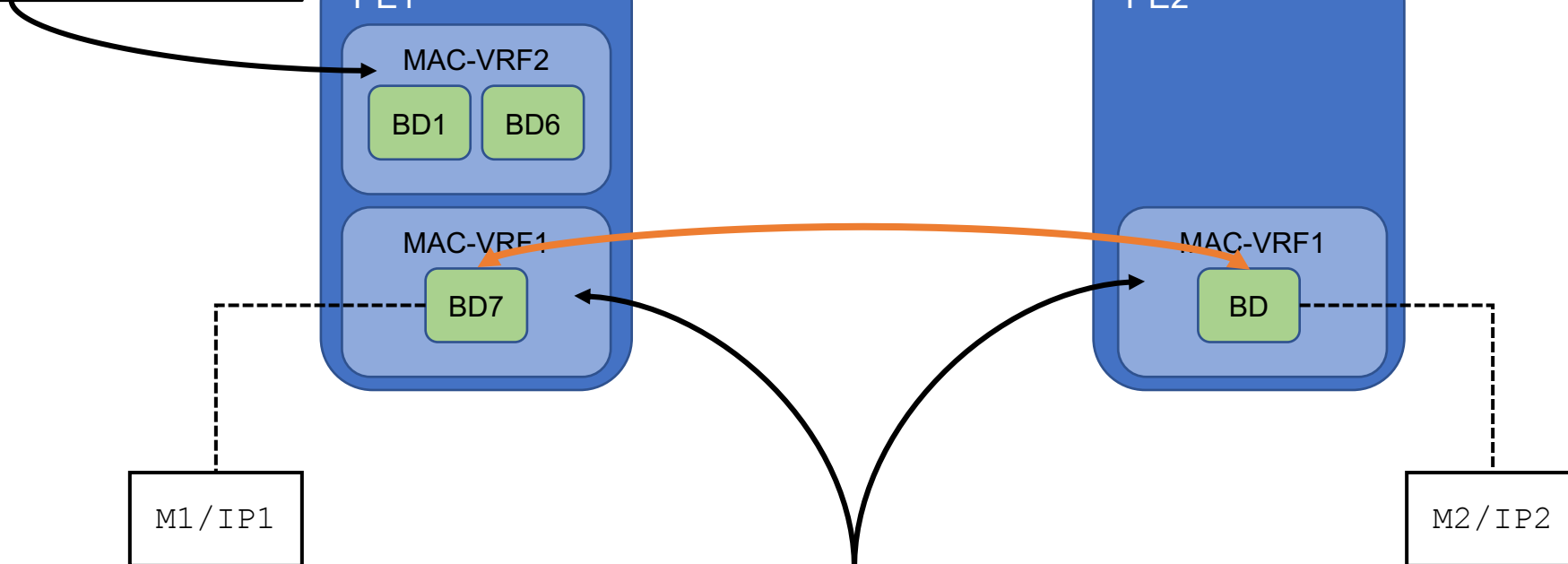Service Interface

VLAN-Based
Service Interface

PE1

MAC-VRF2

BD1   BD6

MAC-VRF1

BD7

PE2

MAC-VRF1

BD

M1/IP1

M2/IP2

Need to Interop with VLAN-Based
- Single BD per EVI
- Send EthTag0 in EVPN Type2
- Use Route-Target for MAC-VRF1 (1:1)
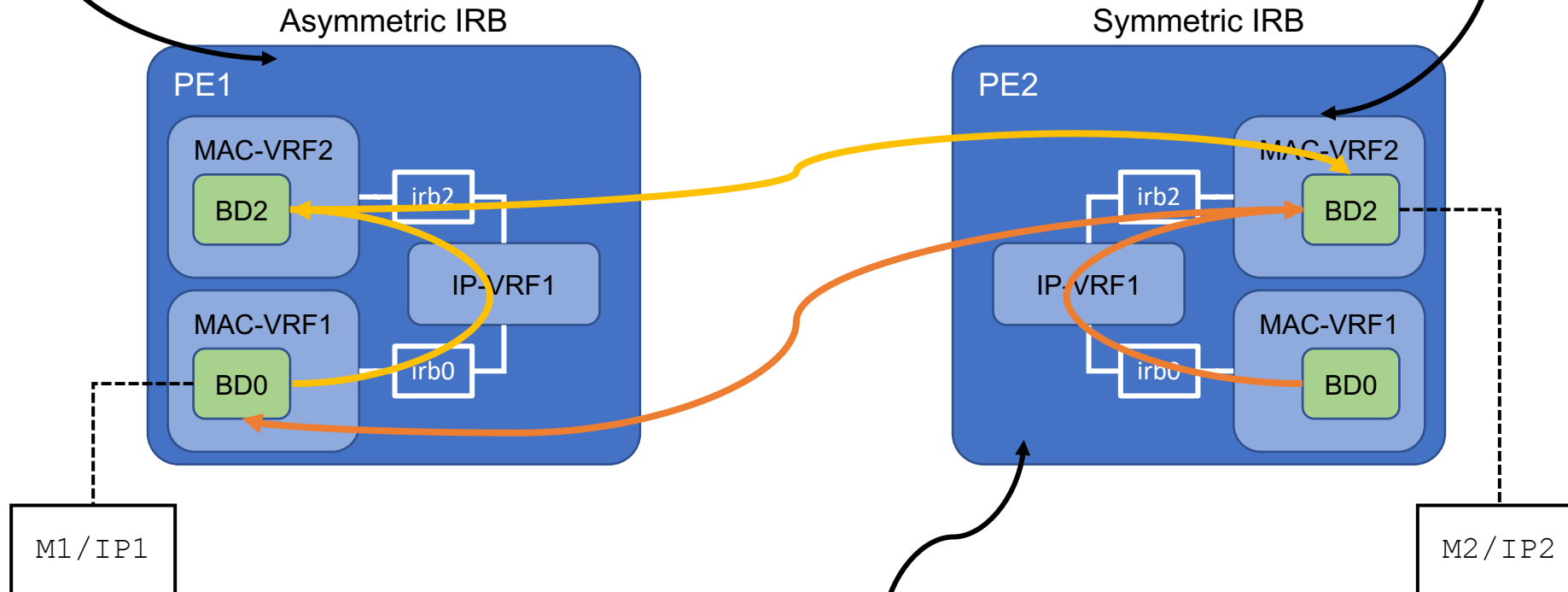
Interoperability for different IRB Types
Section 4.2

- Advertise MAC/IP route with MPLS Label1 only

- Ignore MPLS Label2 in received MAC/IP routes

- Install MAC/IP binding towards PE1; use MPLS Label1

- Advertise MAC/IP route with both MPLS Label

Asymmetric IRB

Symmetric IRB

PE1

MAC-VRF2

BD2

irb2

IP-VRF1

MAC-VRF1

BD0

irb0

PE2

irb2

IP-VRF1

MAC-VRF2

BD2

MAC-VRF1

BD0

irb0

M1/IP1

M2/IP2

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

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 into IP-VRF
- Validate additional MAC/IP route from PE1's Router-MAC

- Install IP prefix route (EVPN Type5)
- Ignore additional MAC/IP route with PE2'2 Router-MAC

- 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 PE2's Router MAC

Interface-Less

Interface-Ful
Unnumbered IRB

PE1

PE2

IP-VRF1

IP-VRF1

TS1/SN1

TS2/SN2
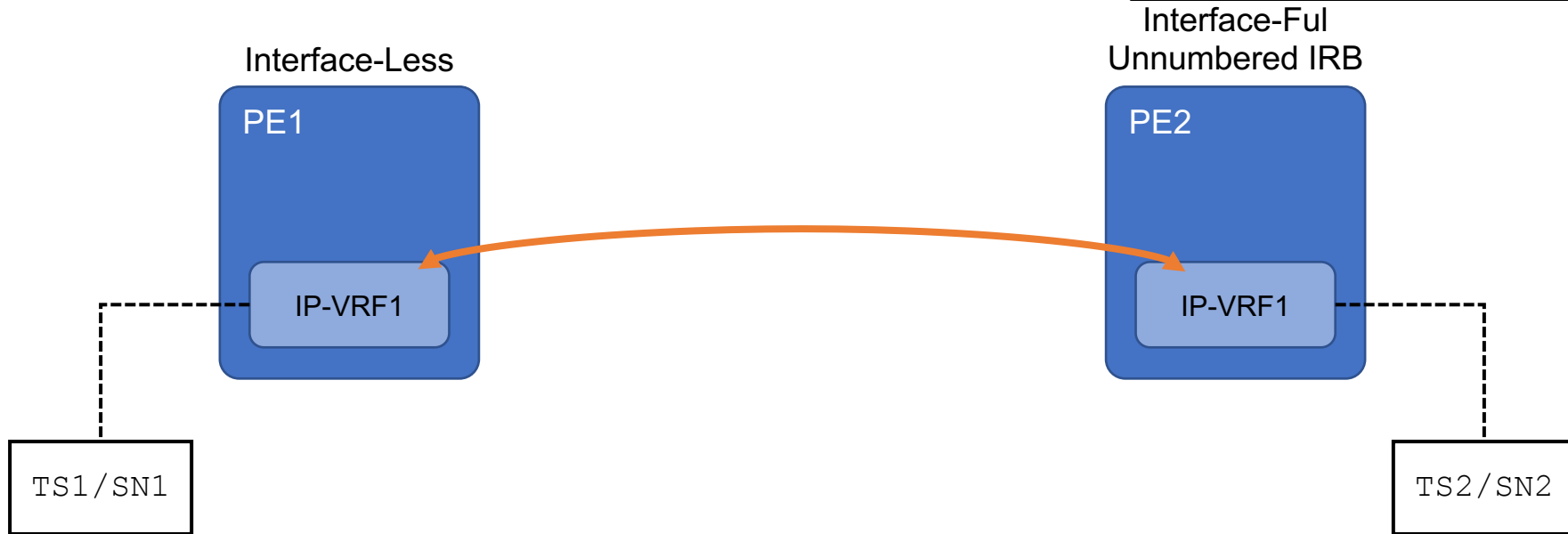
rMAC = Router MAC

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-Ful Unnumbered)

- Other vendors reached out for interest and discussion.

Conclusions and Next Steps

- The authors ask for WG adoption