BIER Interop Testing

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Participants

- FreeRtr (Csaba Mate, remote)
  - FreeRtr control plane plus software-based forwarding
- Juniper (Jeffrey Zhang)
  - Virtualized PTX platform with Express 5 ASIC (vBX)
- Nokia (Hooman Bidgoli)
  - SR-1
- Ice Wijnands
Setup #1

UBUNTU 22.04.3 Laptop

USB dongle
1G Copper
Juniper EX2300c Switch
10G Fiber
Nokia SR-1

vBX
PE1

FreeRtr
P1

vBX
PE2
P2
SR-1
Configuration

- MPLS encapsulation, BitStringLength 256, Number-of-Sets 4
- ISIS single level, subdomain 0 and 10
- MVPN overlay on PE1/PE2
  - Aggregation labels
    - all VRFs of a VPN use the same label from the default label space
      - Vs. Upstream-assigned Labels in RFC8556
      - draft-ietf-bess-mvpn-evpn-aggregation-label (RFC editor’s queue)
  - Inclusive tunnel (only one bit in the bitstring)
    - Selective tunnel tested (but not here)
  - Static BFERs added to the tunnel to allow more bits to be set
Setup #2

Linux Server @ Csaba’s Home

PIM as Flow Overlay
Testing Performed

• ISIS signaling
• MVPN & PIM as overlay signaling
• BIER forwarding
  • PE2 → FreeRtr → PE1, subdomain 10
  • PE2 → NSR-1 → PE1, subdomain 10
  • FreeRtr1 → vBX → FreeRtr2, subdomain 0
• All worked well
  • After some fixes
Challenges

• Many have noticed the stress I had ...

• Most challenges come from the virtual testing environment
  • 8 VMs running on an Ubuntu laptop
    • Very slow to bring up VMs and connections
  • I am new to virtualization and FreeRtr
    • Thanks Csaba and others for helping me out!
  • Bug fixes were quick and easy, but it took a while to get the fixes built.loaded

• Most progress was after the hackathon after we ironed out the kinks
Next Steps

• We only did some simple/informal interop testing
  • This is not intended as a testing event for robustness

• A more formal and more comprehensive interop testing is being
  considered in EANTC
  • More vendors are welcome!
  • Results would be presented in MPLS World Congress

• The industry now has BIER hardware capability across
  access/edge/aggregation/core from multiple vendors
  • Pioneering vendors and operators will break the chick-and-egg dilemma