Prior Art

- RFC 7432 EVPN All-Active Multi-Path procedures (aliasing, mass withdraw)
  - Enable overlay Equal Cost Multi-Path
  - Overlay flows load-balanced “equally” across a set of all-active multi-homing PEs
- RFC 7432 EVPN “per-service” DF election
  - Per-service DF role ”equally” distributed across a set of multi-homing PEs
Unicast ECMP

1/2 flows to ESI-1

PE1

PE2

PE-x

BGP-EVPN

100Gb

100Gb

ESI-1

Unicast flows to ESI-1

CE1

L2 stretch

CE-x

ESI-1 -> PE1

ESI-1 -> PE2

EVI-1, ESI-1

EVI-2, ESI-1

.....

EVI-x, ESI-1

ECMP
Sub-optimal Unicast ECMP – asymmetric access BW distribution

1/2 flows to ESI-1

1/2 flows to ESI-1

ECMP

EVI-1, ESI-1
EVI-2, ESI-1
......
EVI-x, ESI-1

ESI-1 -> PE1
ESI-1 -> PE2
BUM Flows – DF Service Carving

ESI-1 DF for ~1/2 EVIs

RT-4 based Service Carving

BUM Replication across all EVIs

ESI-1 DF for ~1/2 EVIs

BGP-EVPN

100Gb

100Gb

ESI-1

L2 stretch
Sub-optimal BUM Flows – DF Service Carving – asymmetric access BW

- ESI-1 DF for ~1/2 EVIs
- RT-4 based Service Carving
- ESI-1 DF for ~1/2 EVIs
- BUM Replication across all EVIs
- 200Gb
- 100Gb
- L2 stretch

PE1 — PE2 — PE-x

CE1 — CE-x
Objective

- Overlay flows load-balanced across multi-homing PEs in proportion to ESI bandwidth
- Per-service DF role (service carving) distributed across multi-homing PEs in proportion to ESI bandwidth
Objective – Unicast LB in proportion to ESI link-band-width
Objective - DF Service carving in proportion to ESI link-band-width

ESI-1 DF for 2/3rd EVIs

RT-4 based Service Carving

ESI-1 DF for 1/3rd EVIs

BUM Replication across all EVIs
Solution

**Unicast Traffic Load-Balancing**

- Local PE
  - Advertise per-ESI link-band-width attribute as part of per-ESI EAD RT-1
- Remote PE
  - ESI Path-list computed in proportion to received link-band-width attribute from each PE

**DF Service Carving**

- TBD – to be reconciled with draft-ietf-bess-evpn-pref-df-00 (Preference-based EVPN DF Election)
Next Steps

- DF election procedure to be reconciled with draft-ietf-bess-evpn-pref-df-00
- BGP Link Bandwidth Extended Community draft has expired (under discussion)
- Collaboration with additional co-authors in progress for rev-1
Weighted Multi-Path Procedures for EVPN All-Active Multi-Homing
(draft-malhotra-bess-evpn-unequal-lb-00)

Thank You

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