

# **A new Designated Forwarder Election for the EVPN**

draft-mohanty-bess-evpn-df-election

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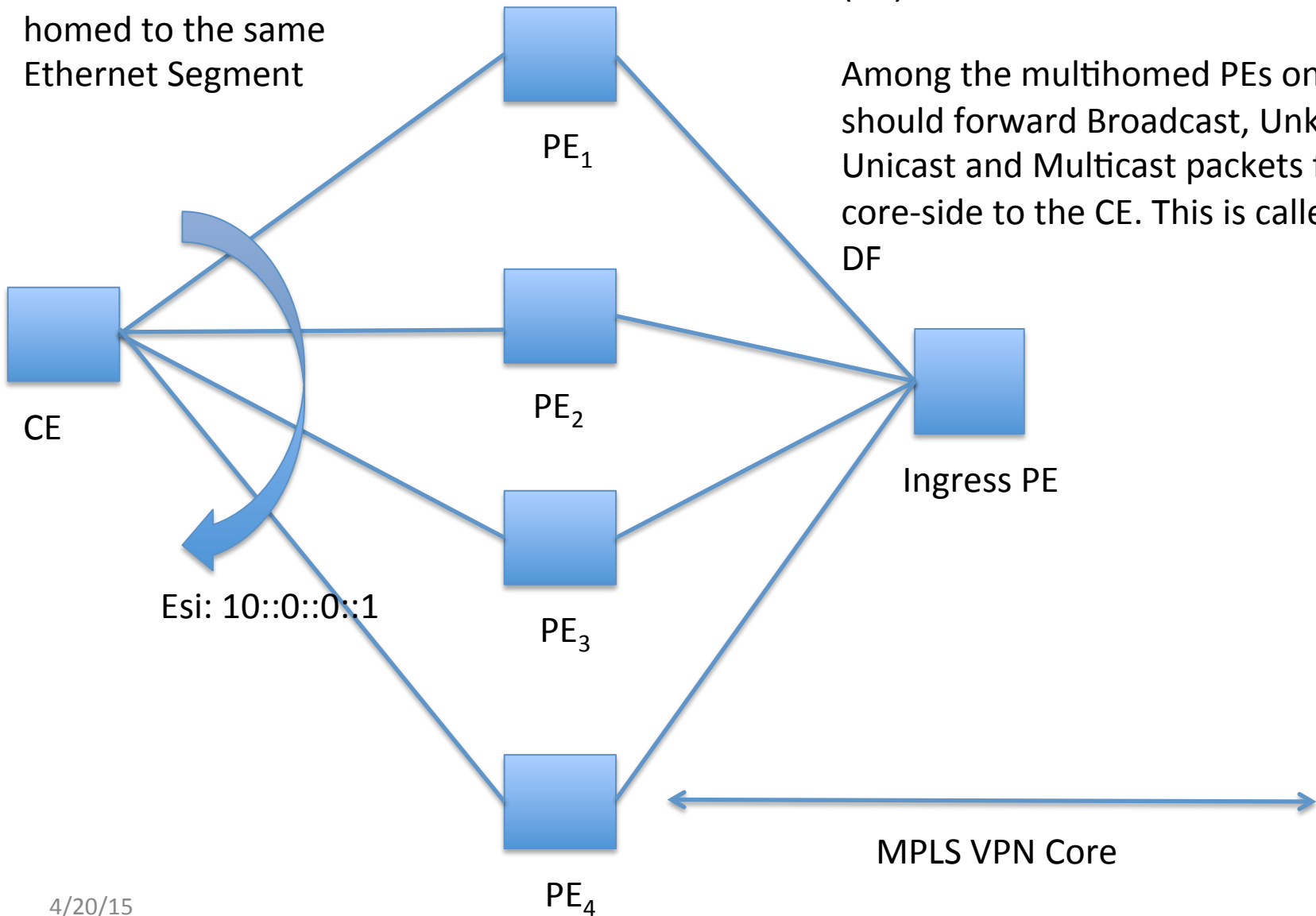
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EVPN use-case where some PEs are multi-homed to the same Ethernet Segment

What is the Designated Forwarder (DF)?

Among the multihomed PEs only one should forward Broadcast, Unknown Unicast and Multicast packets from core-side to the CE. This is called the DF



Current DF election: All E-tags change DF, even when their DF did not go down

PE	PE IP address	Ord	Ethernet tag DF	when PE1 is down	
				Ord	Ethernet tag DF
PE1	192.0.2.1	0	892,896		
PE2	192.0.2.2	1	893	0	891,894
PE3	192.0.2.3	2	894	1	892,895
PE4	192.0.2.4	3	891,895	2	893,896

Proposed DF election: E-tag whose DF did not go down does not change.

PE	PE IP address	Ethernet tag DF	Ethernet tag DF when PE1 down
PE1	192.0.2.1	894	
PE2	192.0.2.2	892,893,895	892,893,895
PE3	192.0.2.3	891	891,894
PE4	192.0.2.4	896	896

For each Tag, the PE with ordinal == (V mod N)  
becomes DF

(V mod N) for tag/IP combinations

Eth Tag		891	892	893	894	895	896
ip address	ordinal						
192.0.2.1	0	3	0	1	2	3	0
192.0.2.2	1	3	0	1	2	3	0
192.0.2.3	2	3	0	1	2	3	0
192.0.2.4	3	3	0	1	2	3	0

Eth Tag		891	892	893	894	895	896
ip address	ordinal						
<del>192.0.2.1</del>							
192.0.2.2	0	0	1	2	0	1	2
192.0.2.3	1	0	1	2	0	1	2
192.0.2.4	2	0	1	2	0	1	2

When 192.0.2.1 goes down, all Tags change DF

For each Tag, the PE with IP with the **greatest hash** becomes DF

## Hashes for tag/IP combinations

Eth Tag	891	892	893	894	895	896
ip address						
<del>192.0.2.1</del>	<del>1030724564</del>	<del>501370518</del>	<del>227039903</del>	<del>786483140</del>	<del>769731393</del>	<del>1512711410</del>
192.0.2.2	1443204555	1651686021	1683927472	166013787	2115159210	338879529
192.0.2.3	1474980878	599428380	1224551449	772514622	104185799	588040224
192.0.2.4	441543909	1306804267	1063370714	75805525	1254959328	1729765511

- When PE 192.0.2.1 goes down, hashes do not change.
- Only the Tag that used this PE for DF gets a **new greatest hash**.
- The second highest hash becomes the new highest hash, therefore it is the Backup DF.
- PE coming up is the reverse of PE going down.

# Highest Random Weight

- Every PE computes hash  $H(\text{Pe}_i, v_j)$ , for every  $\text{Pe}_i$  which is a DF participant
- $\text{Pe}_k$  corresponding to highest value of  $H$  is the DF for vlan  $v_j$

Suggested hash function

$$H = (1103515245 * ((1103515245 * S_i + 12345) \text{ XOR } \text{CRC32}(v)) + 12345)$$

Computed in modulo  $0x7FFFFFFF$  arithmetic

Where

$S_i$  = IP address of PE

$v$  = Ethernet Tag

Important property that ensures DF for a vlan does not move among unchanged PEs:

- The hash does not depend on the number of PEs

Next step:  
Request Working Group Adoption

Thanks!!!