

A new Designated Forwarder Election for the EVPN

IETF 91

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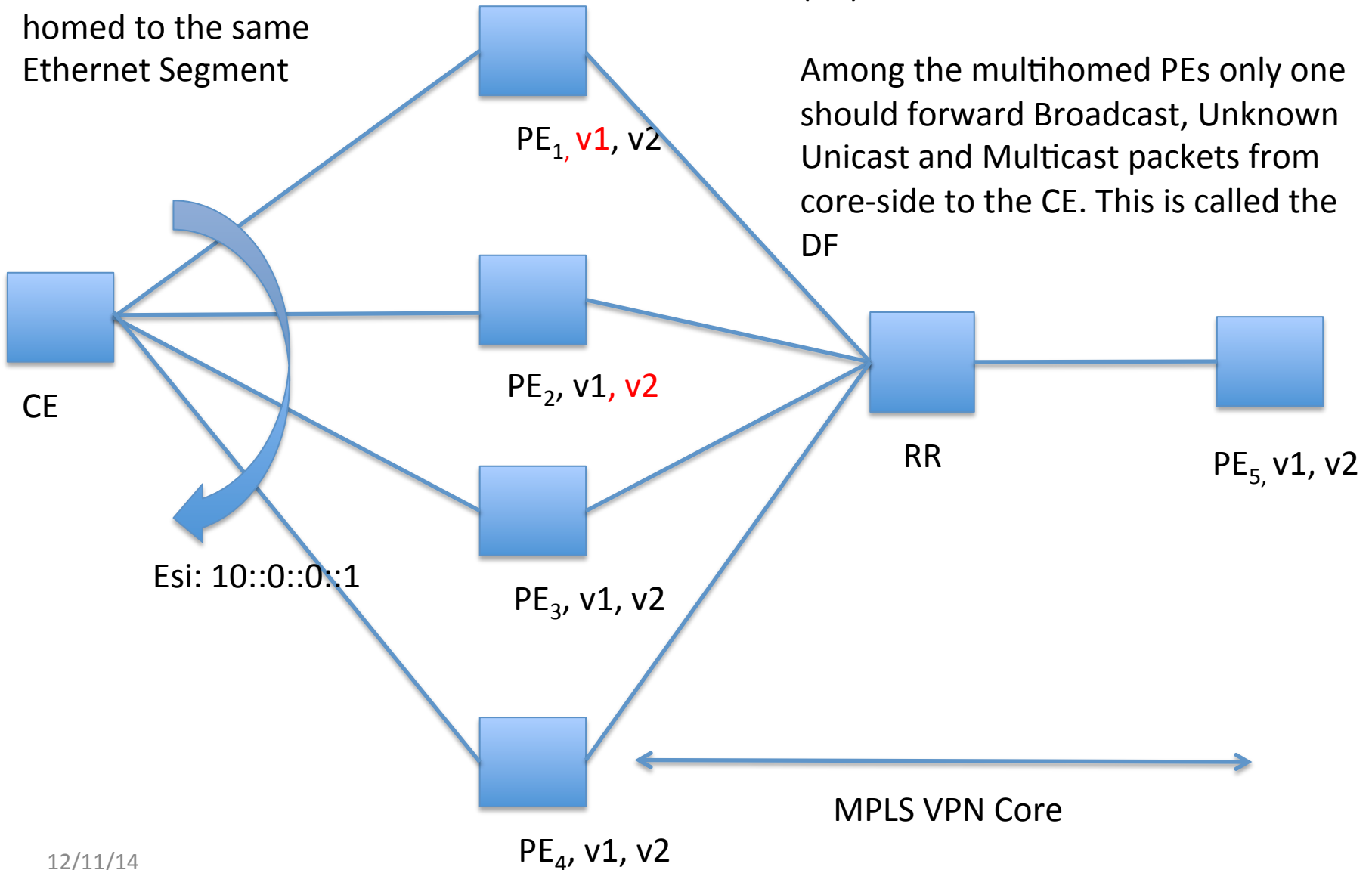
John Drake

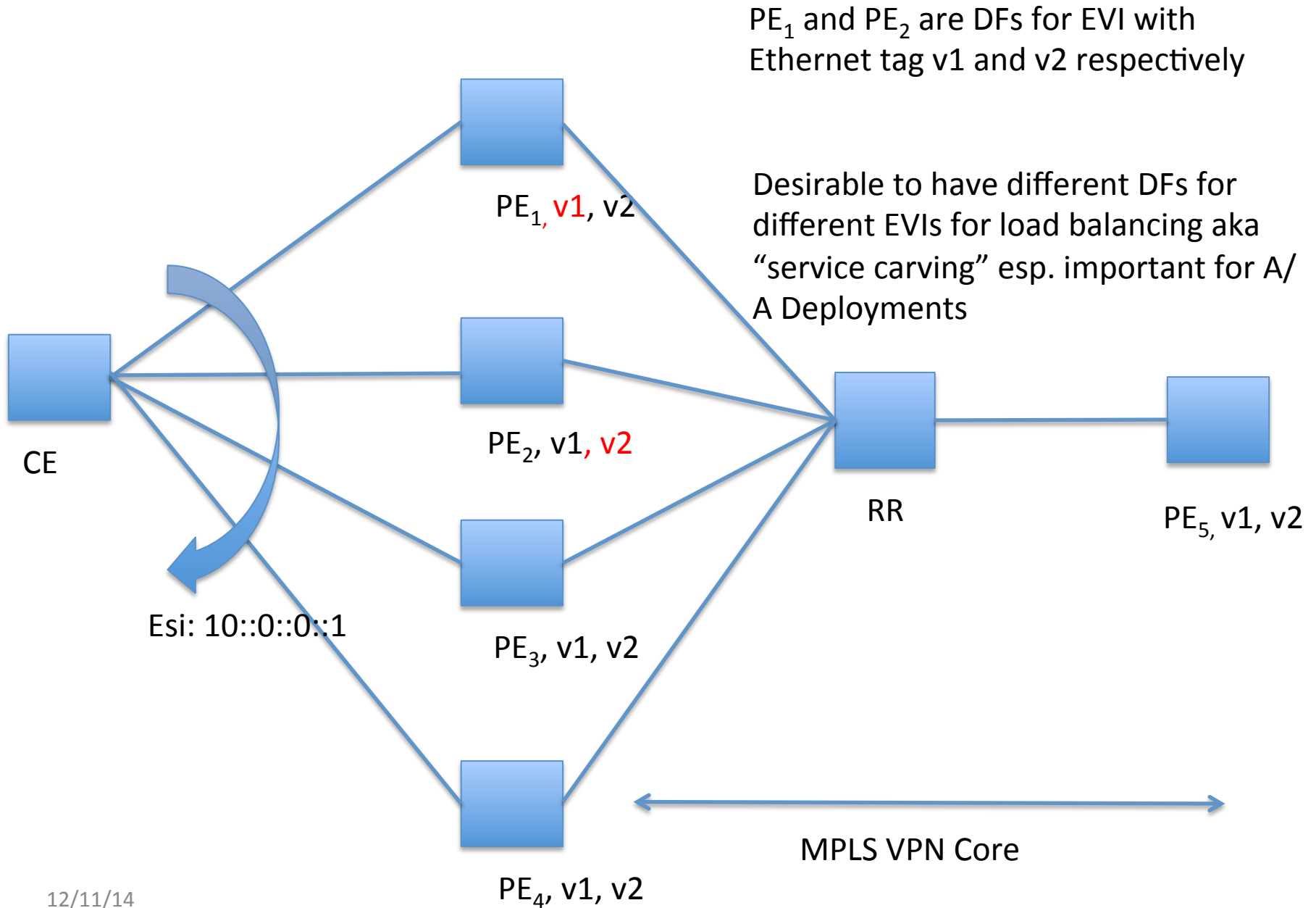
Juniper Networks

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





PEs arranged in ascending order of IP address value and given an ordinal value

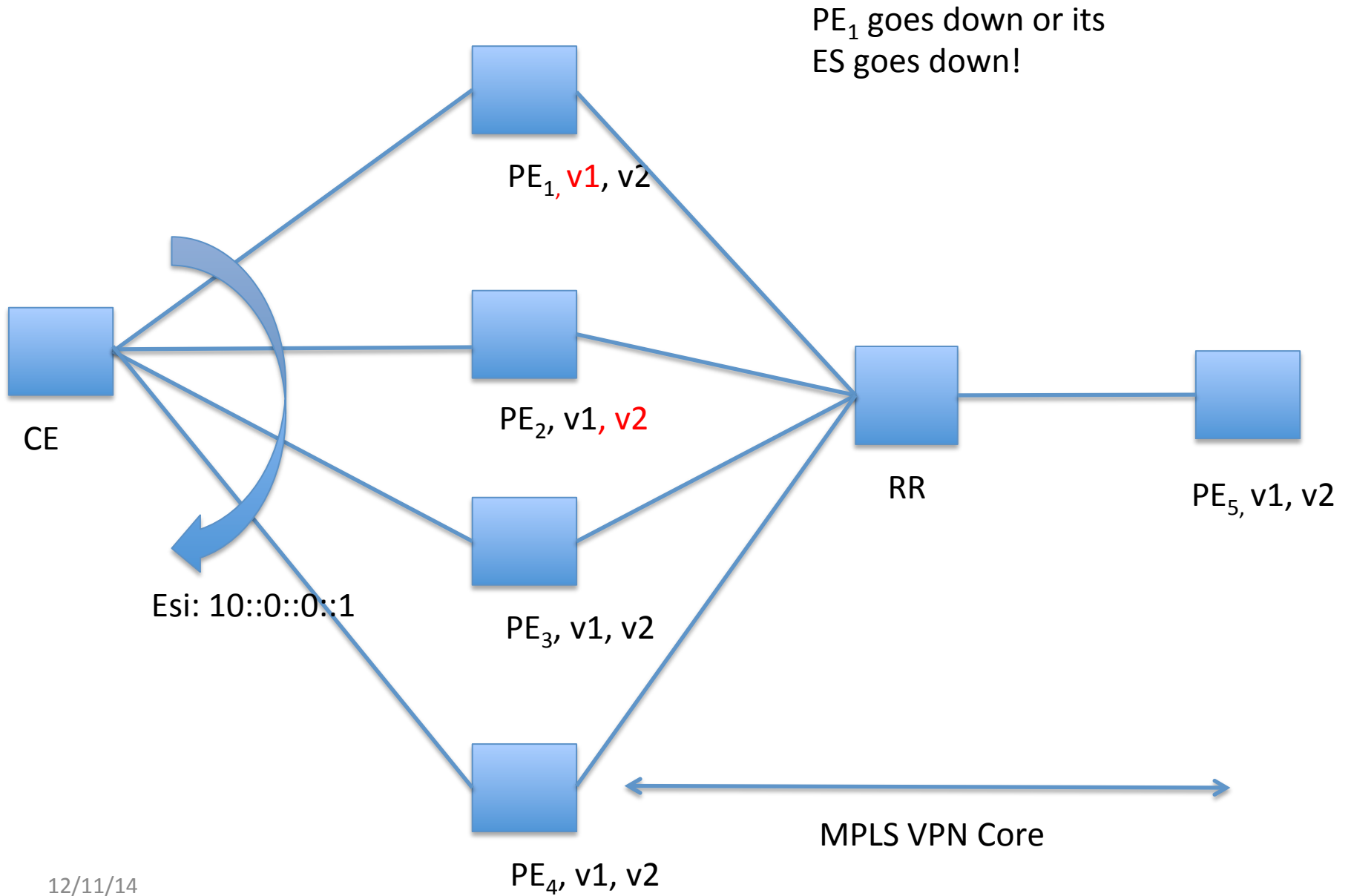
For the case when there are **N** PEs multi-homed to the **same ESI, P_{e_j}** which has **i** th ordinal ranking is the DF for EVI with tag **V**, iff **$(V \bmod N) = I$** ;

Initially

PEs (ordinal list)	Ordinal number	Ethernet tag
PE1	0	1000
PE2	1	
PE3	2	998
PE4	3	999

When PE1 is down

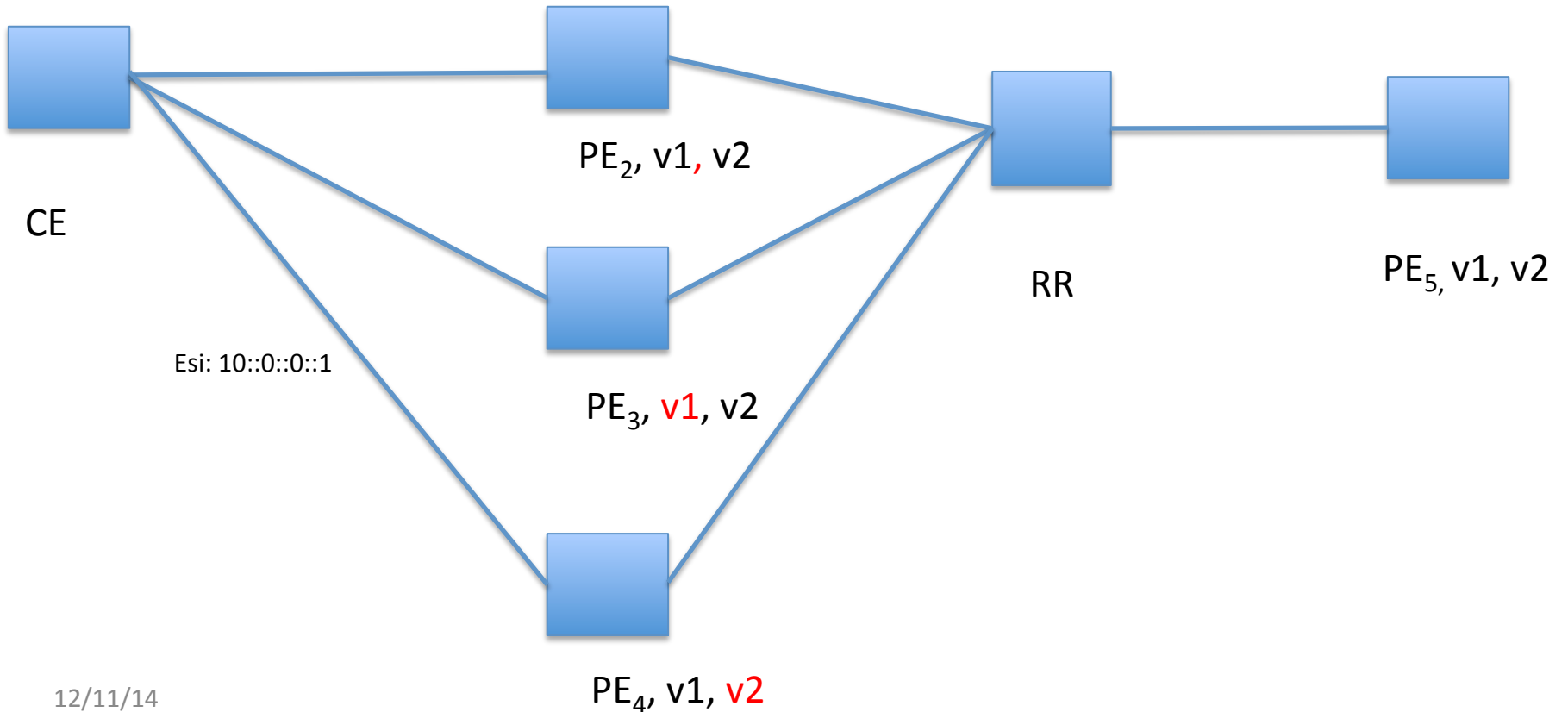
PE2	0	999
PE3	1	1000
PE4	2	998



When PE₁ goes down:

PE₃ becomes the new DF for v1

PE₄ becomes the new DF for v2

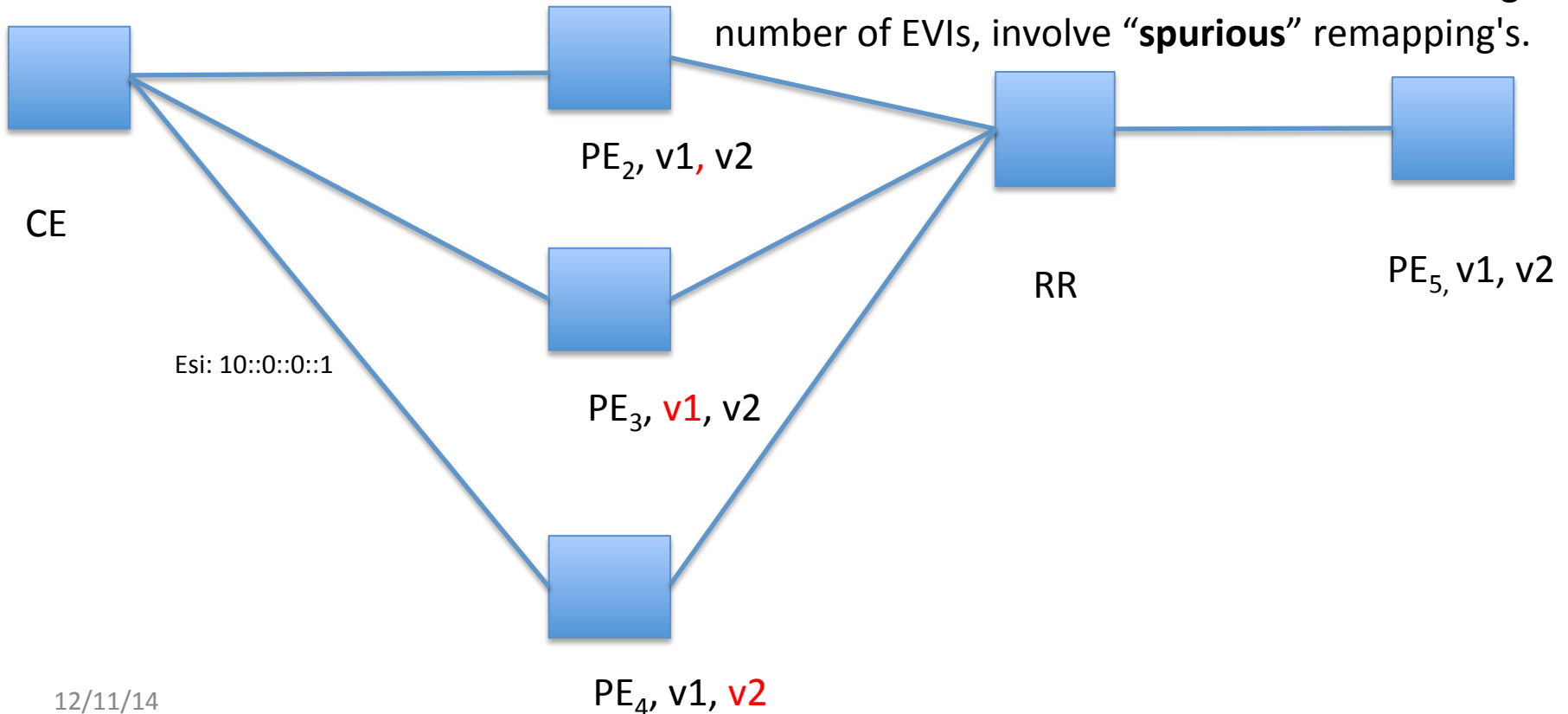


Notice however why the DF for v2 needed to change?

PE₁ was not its DF, PE₂ was, and it did not go down.

The **remapping of the DF for v2**, was it **really required** at all? Answer is **NO**.

Problem becomes more acute if there are a large number of EVIs, involve “**spurious**” remapping's.



Conclusion: Not really robust

- An Addition, Deletion or a simple flap of the ES Segment on one PE may cause DFs to change for all tags
- Problem is the modulo-N hash operation, the **dependency on 'N'** is the culprit; causes system-wide disruption
- Need to find a solution which is **independent of 'N'** and **irrespective of PEs going up or down**. This is key idea

Highest Random Weight

- Every PE computes hash $H(\text{Pe}_i, v_j)$, for every Pe_i which is a DF participant
- Forms an ordinal list of H values in descending order
- Pe_k corresponding to highest value is the DF for van v_j

PE	Ordinal list	Ethernet Tag	maxH(PE, v)
PE1	0	1000	✓
PE2	1	998	✓
PE3	2		
PE4	3	9999	✓

PE	Ordinal list	Ethernet Tag	maxH(PE, v)
PE2	1	998	✓
PE3	2		
PE4	3	9999, 1000	✓

Thanks!!!