KEYSIGHT TECHNOLOGIES

S1000

2026

EVPN VXLAN IP Aliasing

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Add Base Controls

1. Add 2 ports in the new configuration.
2. From New Topology add EVPN VXLAN on first port.

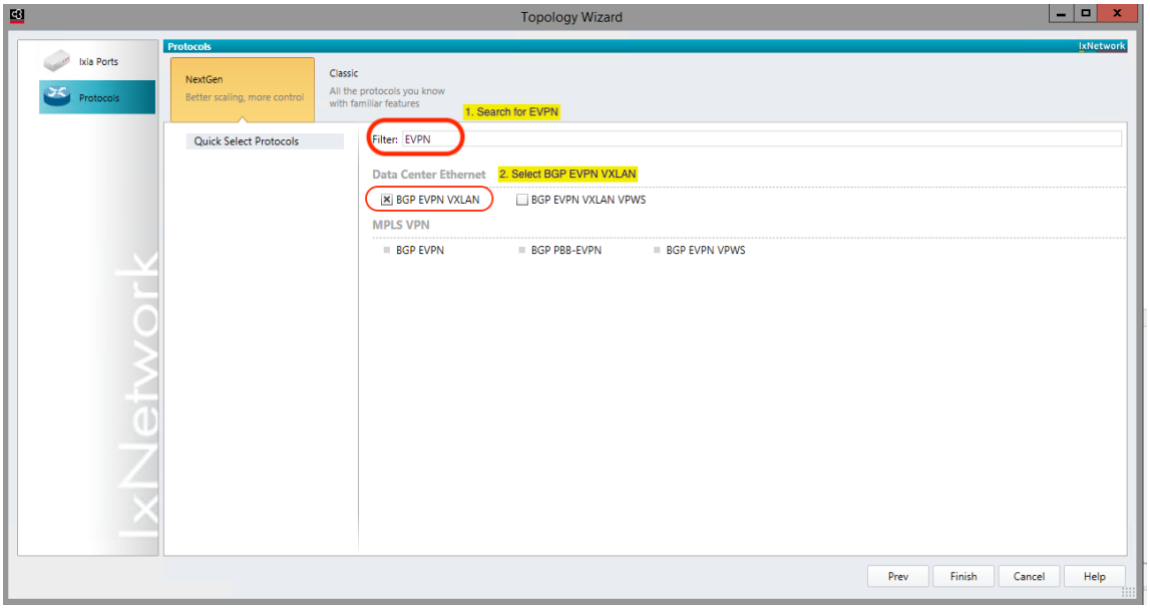

Figure 1 Add EVPN

3. Rename the topology as “Egress” and device group as “PE1-PE2”.
4. Also, set the device multiplier to 1.

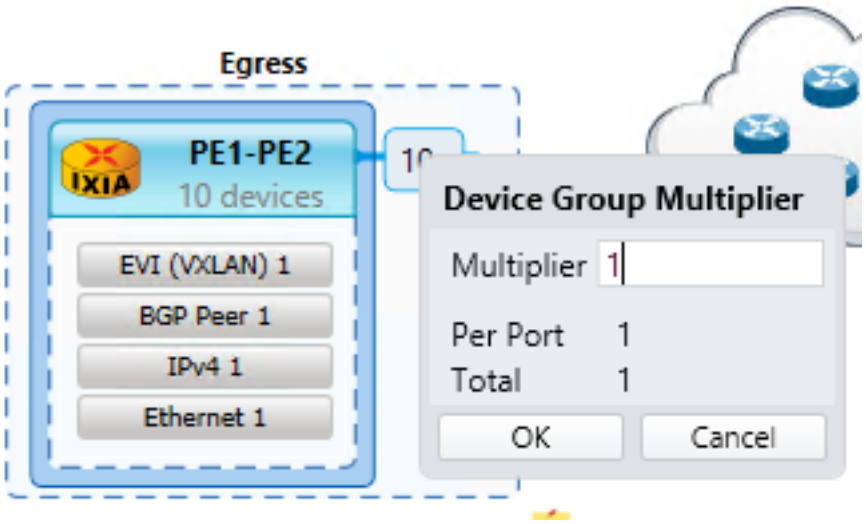

Figure 2 Adjust Device Multiplier

5. Similarly, add EVPN VXLAN device group on other port.
6. Rename the topology as “Ingress” and device group as “PE3”.

7. Also, set the device multiplier to 1.

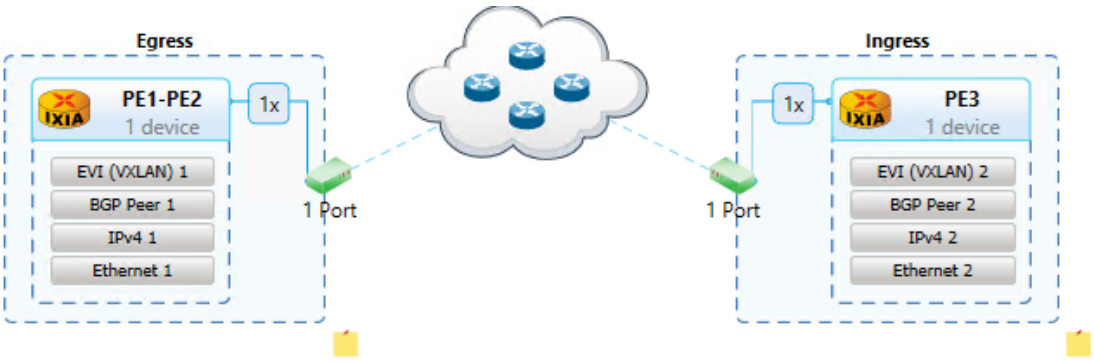

Figure 3 Base Topology

At this moment, if you are asking, where are two PEs in Egress, you are following **well**.

8. Now add an IPv4 prefix to the EVPN VXLAN of Egress Topology.

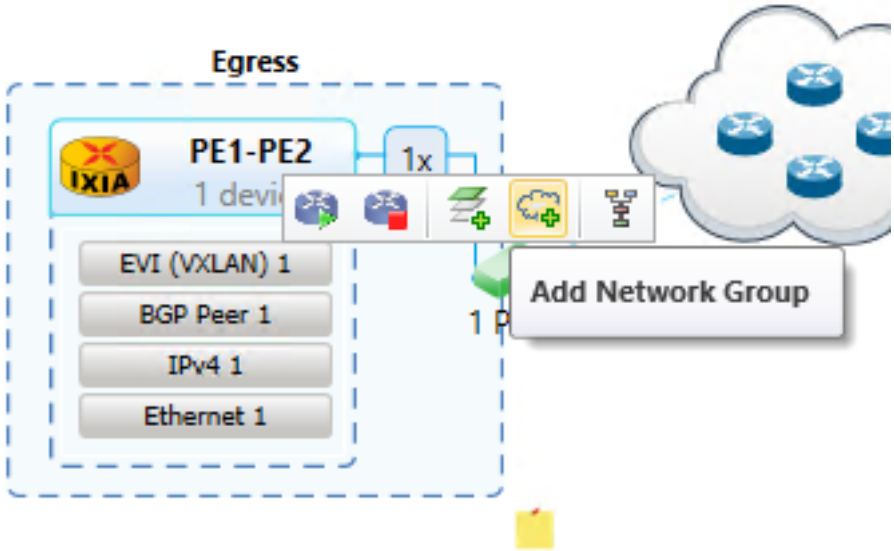

Figure 4 Choose Network Group

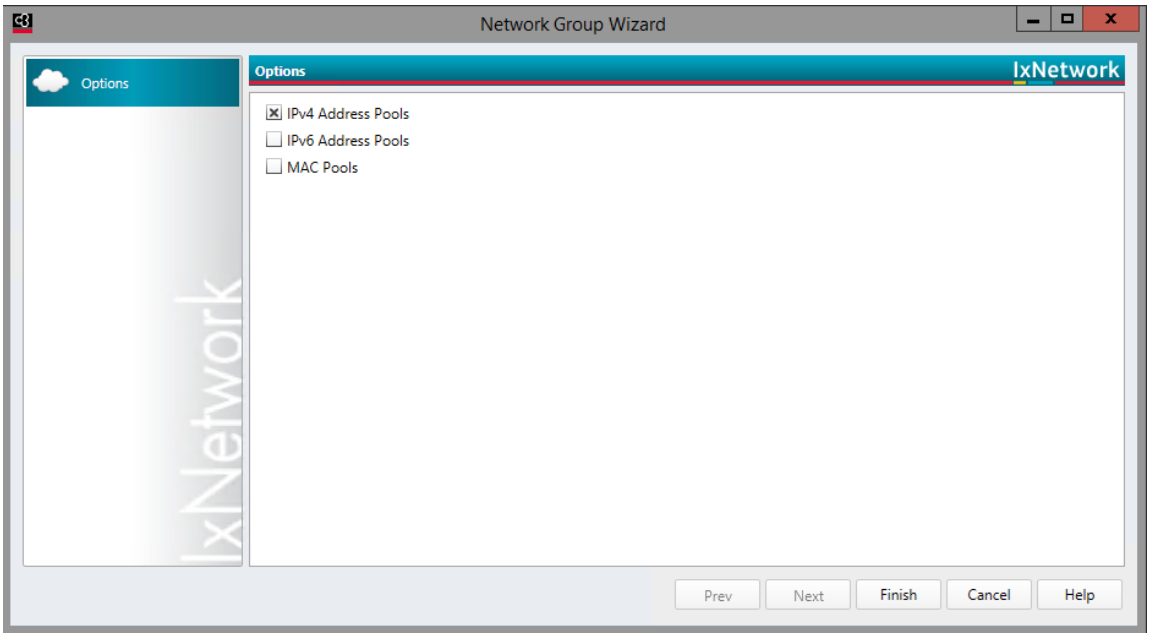

Figure 5 Select IPv4 Address Pools

9. Chose “IPv4 Address Pools” and click “Finish”.
10. Rename the network group as “MH T5” to indicate this network group will generate type 5 routes and this prefix is multi-homed (MH). Set IP address to 12.12.12.12/32

NOTE: So far, we did not trick the configuration for multi-homing.

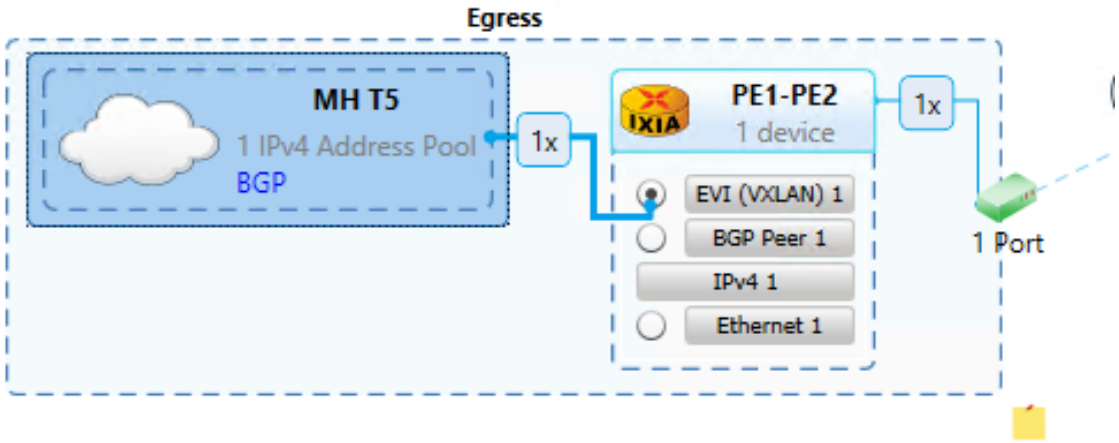

Figure 6 Type 5 attached to EVPN

11. Add a IPv4 Address pool to Ingress Topology. Set the prefix as 24.24.24.24/32. Rename the network group as “SH T5” to indicate that this prefix is associated with a single home ethernet segment. Honestly, naming this network group in such a way does not signify anything at large. Only interest of this prefix pool is that, once we create traffic, this is going to be our source.

Figure 7 Enhanced Topology with Traffic Endpoints

Configure Connectivity

12. From the left pane click on IPv4. It will open the view to configure IPv4 addresses. Set:
    a. IP Address as 10.10.10.10 and gateway as 10.10.10.20 on port1.
    b. IP Address as 10.10.10.20 and gateway as 10.10.10.10 on port2.

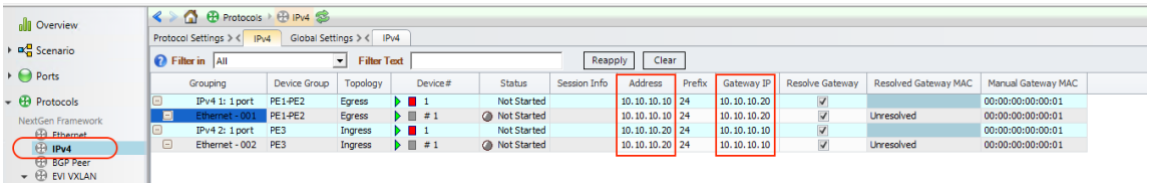

Figure 8 IP Connectivity

13. Select BGP Peer from left pan and set:
    a. DUT IP as 10.10.10.20 for first peer.
    b. DUT IP as 10.10.10.10 for second peer.

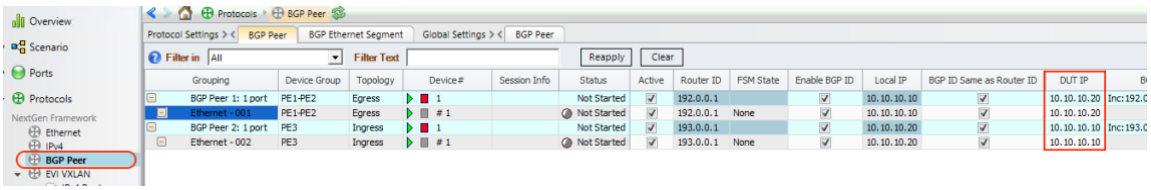

Figure 9 Configure BGP Peership

14. Also, from same BGP Peer view, chose “Learn Route Filters” tab and enable EVPN Filters.

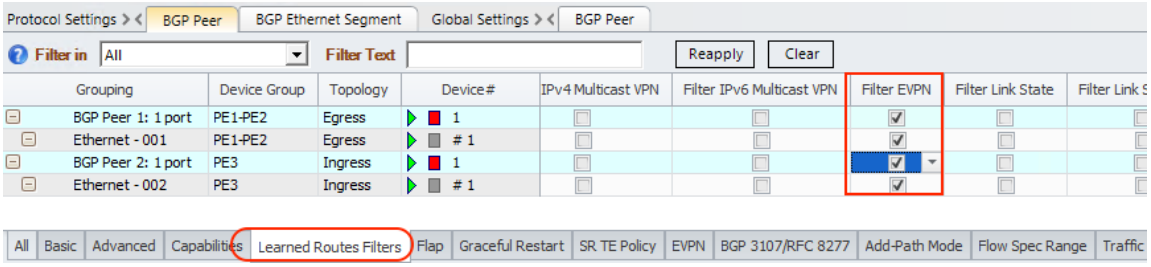

Figure 10 Set Learned Info Filter

EVPN Configuration

Before moving to configuration, let us review the topology we are trying to build here.

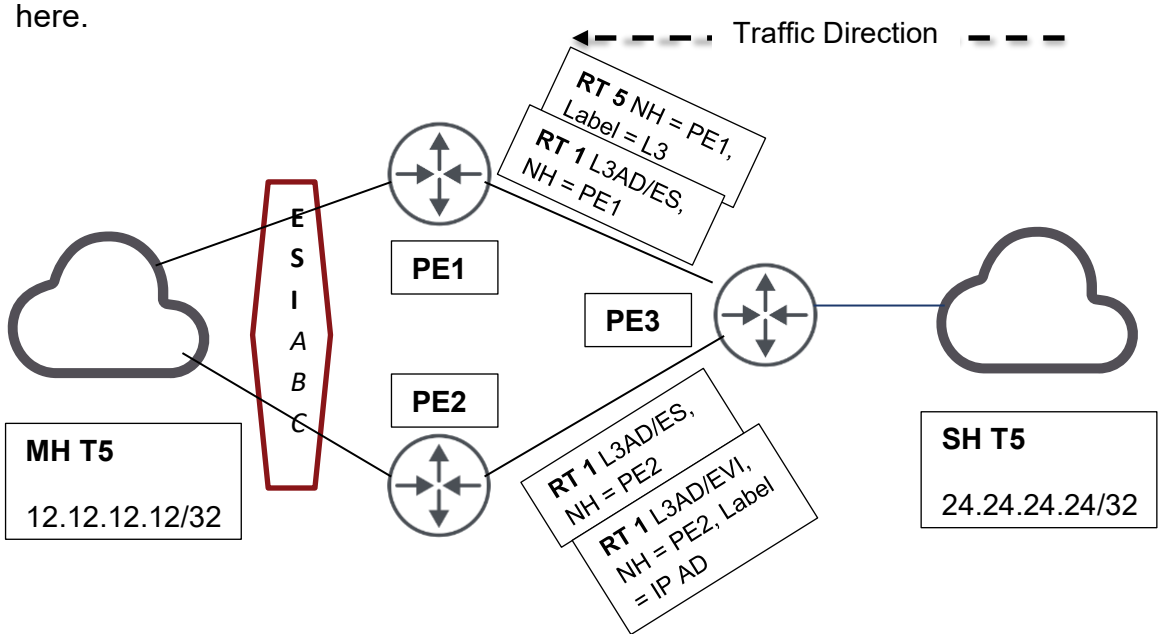

Figure 11 Interfaceless IP-VRF-To-IP-VRF Model

Here MH5 is multihomed to PE1 and PE2 with ESI value ABC. In IxNetwork we shall configure this value. Here PE1 will send RT5 for 12.12.12.12/32 prefix with next hop being set to itself. In addition to this PE1 will also send L3 Auto Discovery (AD) per Ethernet Segment (ES).

PE2 will send L3 AD per ES and L3 AD per EVI route with next hop being set to PE2. We shall simulate this in IxNetwork.

Normally traffic from 24.24.24.24/32 to 12.12.12.12/32 will follow PE1 using label L3, however for failover scenario, traffic will contain IP AD Label and sent to PE2.

With this brief description, let us continue the configuration of EVPN VXLAN.

15. Return to BGP Peer in left pane. Now chose EVPN tab. Set:
    a. Number of Ethernet Segments = 2 for port 1.
    b. Keep Number of Ethernet Segments = 1 for port 2.
    c. Change IP-VRF-To-IP-VRF to Interface-less Multihoming for both the ports.

NOTE: This is a simulation with respect to PE1 that there are two Ethernet Segments. We shall set the values same to indicate that they are part of same Ethernet Segment, therefore MH T5 is simulated as multihomed.

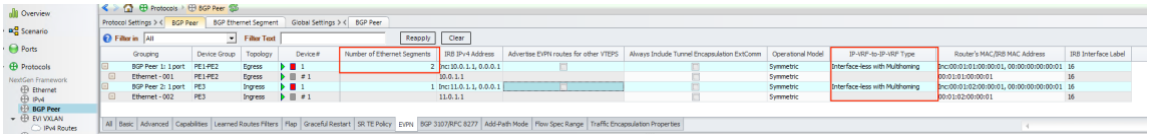

Figure 12 Creation of Ethernet Segments

16. Now, click on BGP Ethernet Segment tab. Set ESI value for Egress topology to 0x00 00 00 00 00 00 00 0A BC. Leave the values for second port.

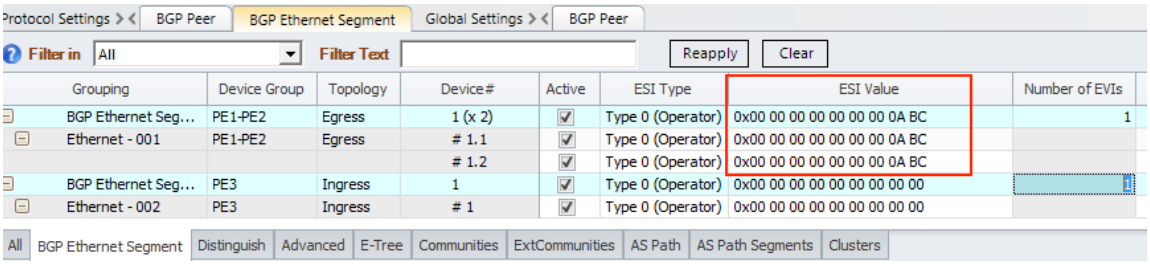

Figure 13 Set ESI Value

17. Stay in the same tab and scroll towards right. Look for Support L3 Fast Convergence field. Enable for all ports.

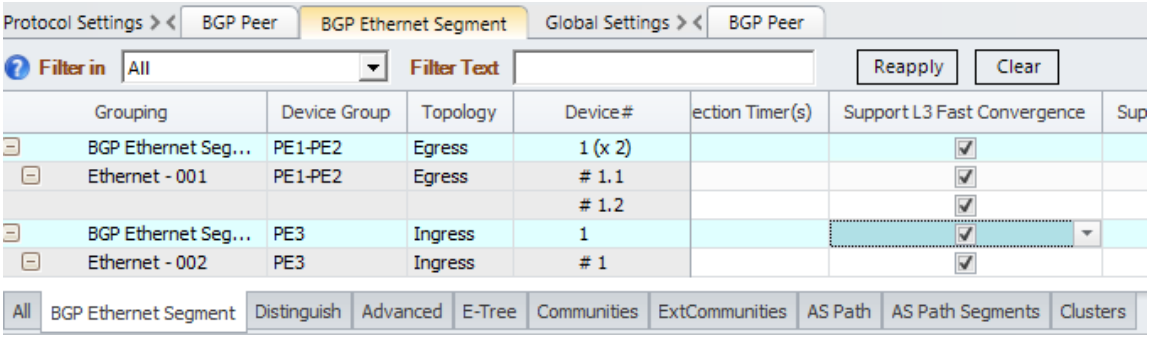

Figure 14 Enable L3 Fast Convergence

18. Enable Advertise IP Aliasing automatically only for PE2. Note in Ethernet segment 1.2, it simulates our PE2.

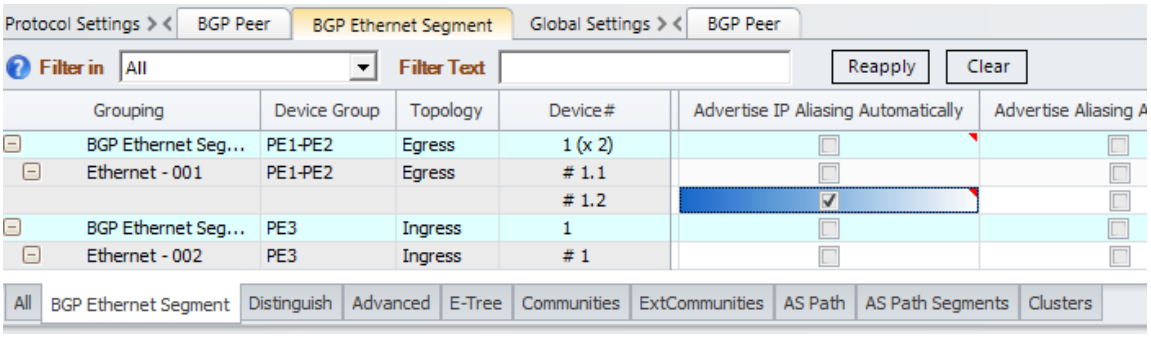

Figure 15 Advertise IP Aliasing Automatically

19. Come to Advanced Tab. Now set next hop for PE2 (1.2) manually to 30.30.30.30. Similar configuration is needed in EVI. We shall come back to this essential trick later (point 27). Note that in general these configurations are required for constructing AD per ES route.

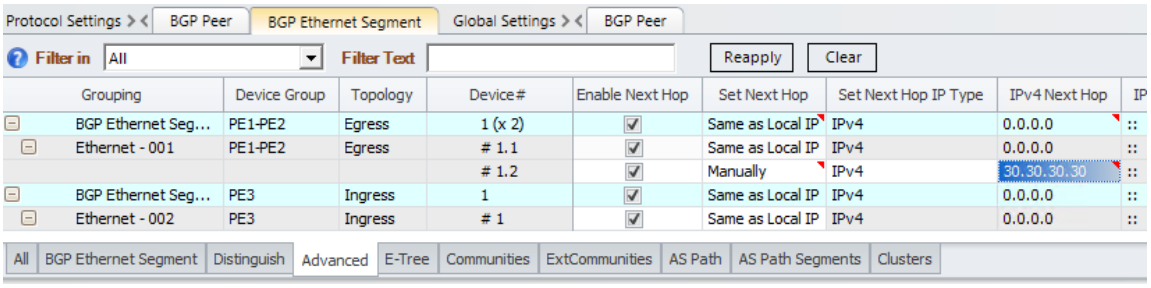

Figure 16 Nexthop in Ethernet Segment

20. From left pane select “EVI VXLAN”, reach to Advance tab and modify the nexthop in similar fashion.

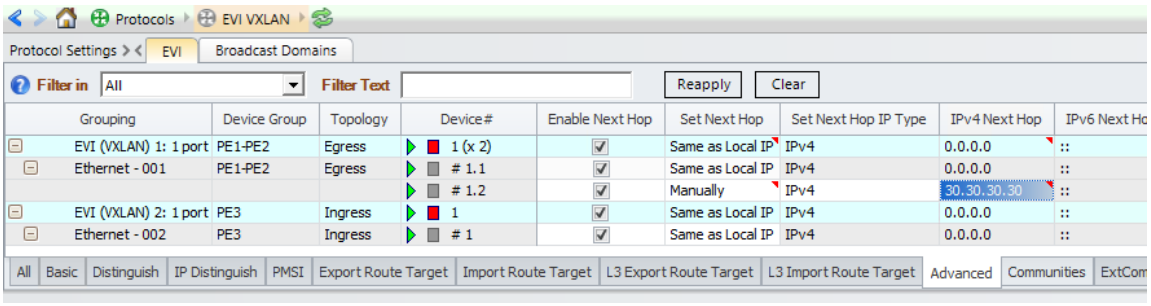

Figure 17 Nexthop in EVI

21. From left pane select “EVI VXLAN” and stay in Basic sub tab of EVI Tab. Enable “Enable L3 Target List” for both sides.
22. Scroll towards right. Set “IP AD Route Label” to 6534, 7534, and 8534 respectively for PE1, PE2, and PE3. Note important is the configuration for IP AD Route Label for Egress only. You will not find these two fields adjacent to each other, however for taking better snapshots, we have dragged IP AD Route Label field next to Enable L3 Target List.

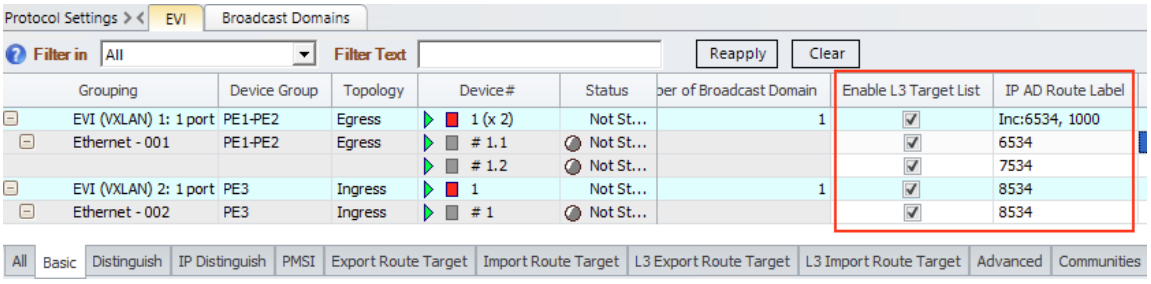

Figure 18 L3 RT and IP AD Label

23. Stay in the same Tab. Scroll to find out following fields:
    a. Include L2 Attr Ext Comm: set them for all ports
    b. Primary PE: Enable only for PE1 and PE3.
    c. Backup Flag: Enable for PE2 only.

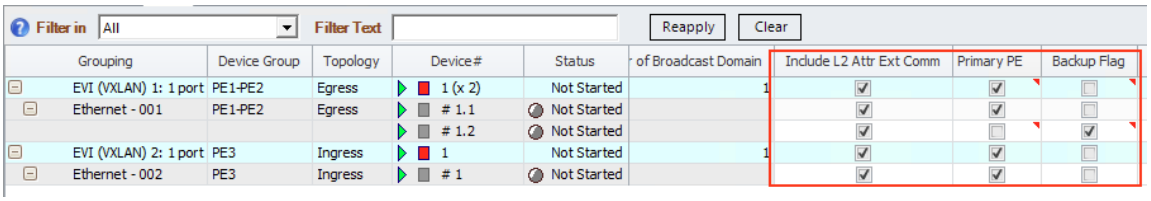

Figure 19 Enable L2 Ext Comm, Primary PE, and Backup

24. We need to set L3 Export Route Target List. Set the assigned number to 1 for PE2.

NOTE: This mismatch in Route Target will cause issues in traffic generation. In customer scenario also we have seen misconfiguration in RT values of different route types.

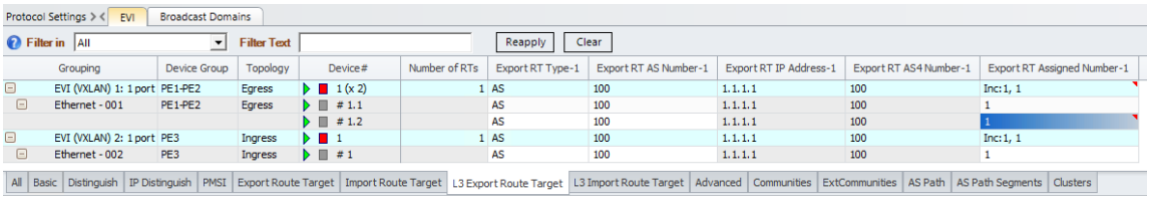

Figure 20 Set L3 RT

25. Set route label value for Egress and Ingress as 2001. Navigate from the left pane to EVI VXLAN -> IPv4 Routes. Then in the view, go to Label Space / SRv6 SID Tab.

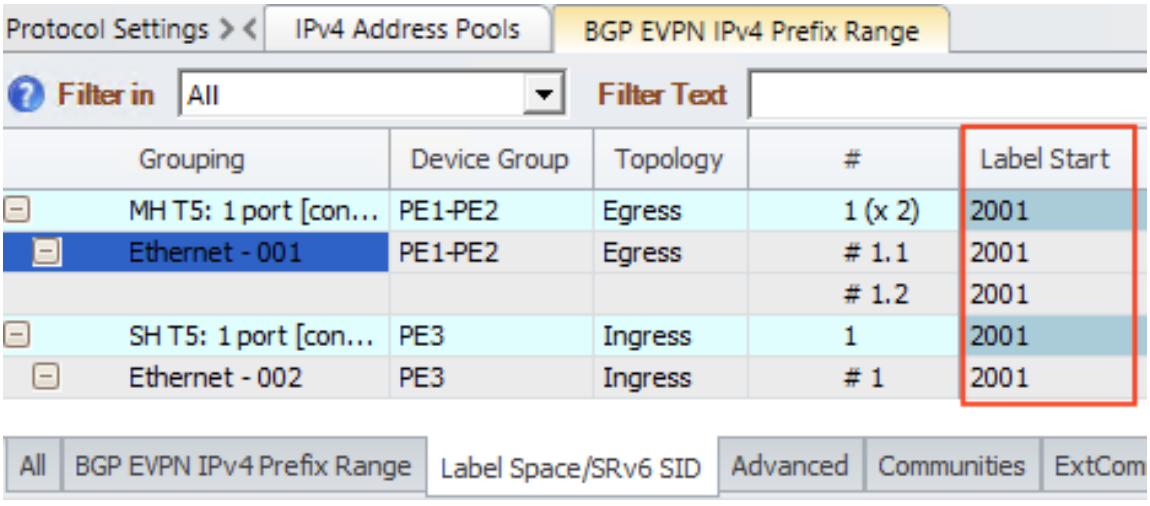

Figure 21 Set Prefix Label

26. The prefix from Egress side, should be advertised only by PE1. PE1 is our primary PE (Figure 19). This is kind of trick we have used to simulate the route advertisement is only happening by PE1 (refer Figure 11).

However, using traffic and ordinal number we shall simulate the failover situation.

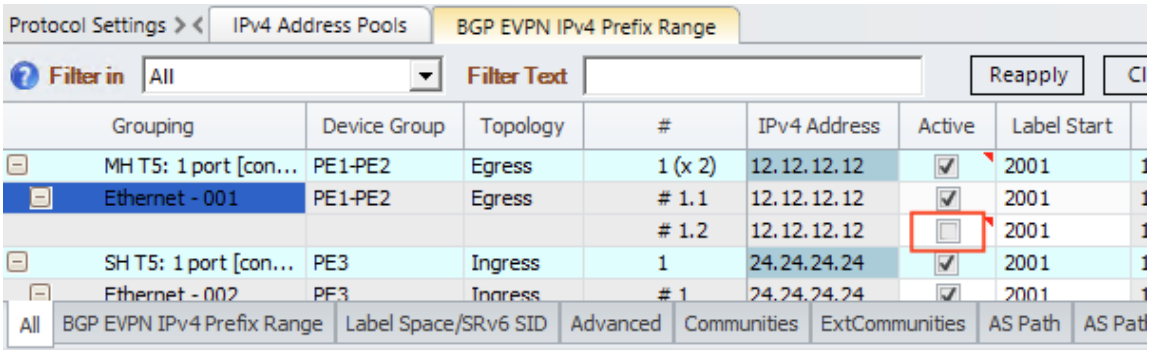

Figure 22 Advertise Prefix using PE1 only

27. At point 19, we have added a seemingly looking arbitrary next hop address 30.30.30.30 for PE2. Now, when need to inform the DUT about this address. So, advertise this IP address using BGP router of Egress Topology. Add an IPv4 Prefix Pool and set the address to 30.30.30.30/32. Rename the network group as PE2 NH.

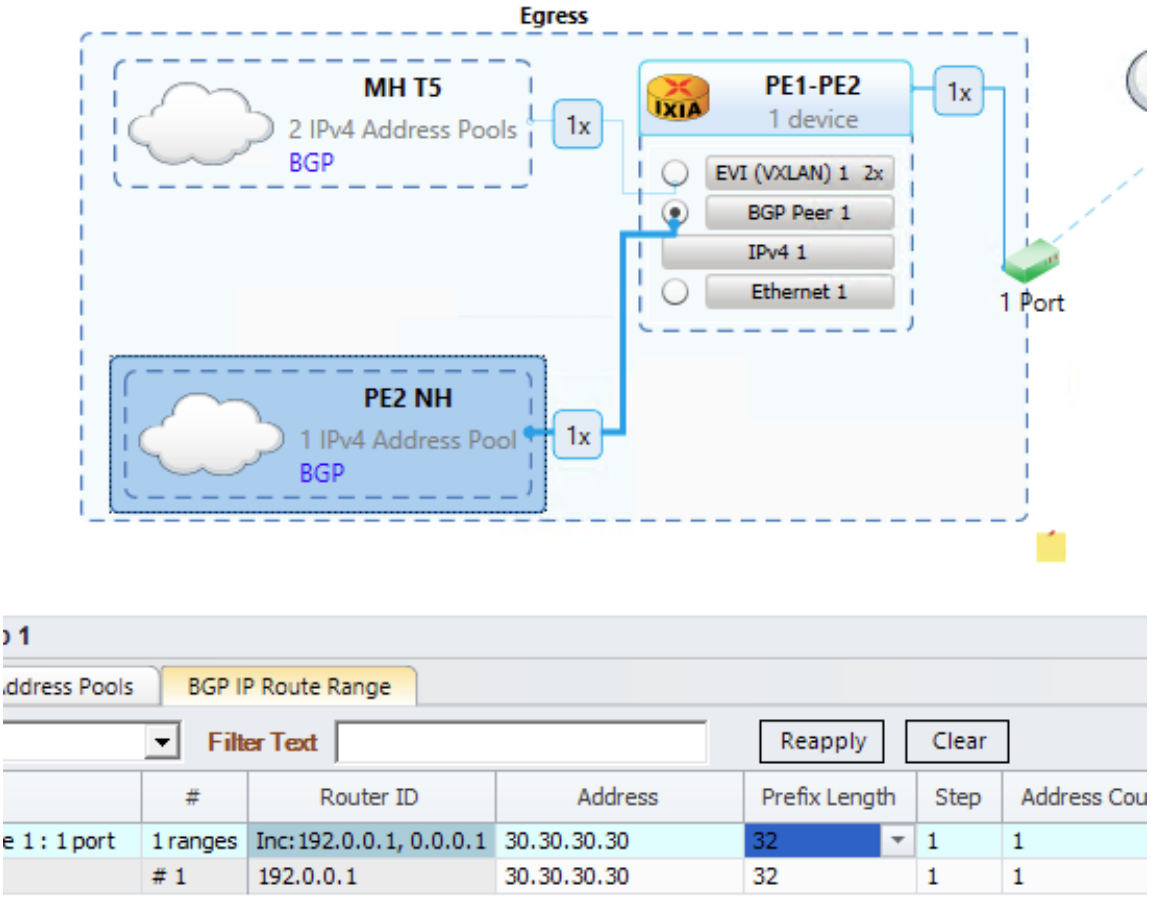

Figure 23 Advertise Nexthop PE2

Learned Information

At this stage, we are good to go to start the protocols. Once started, we shall explore the learned information. So, go ahead and start the protocols. Wait for all protocols to come up.

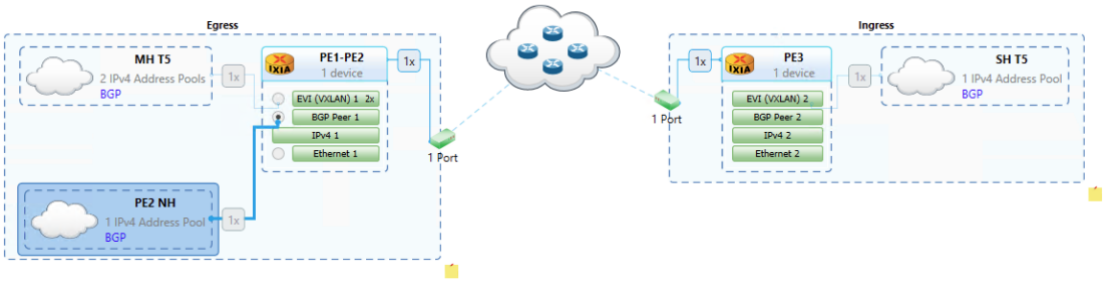

Figure 24 All are Green!

28. Now, select BGP Peer of PE3. Go to BGP Peer Grid at Basic Subtab. And right click to “Get VPN Learned Info” -> “Get EVPN Learned Info”.

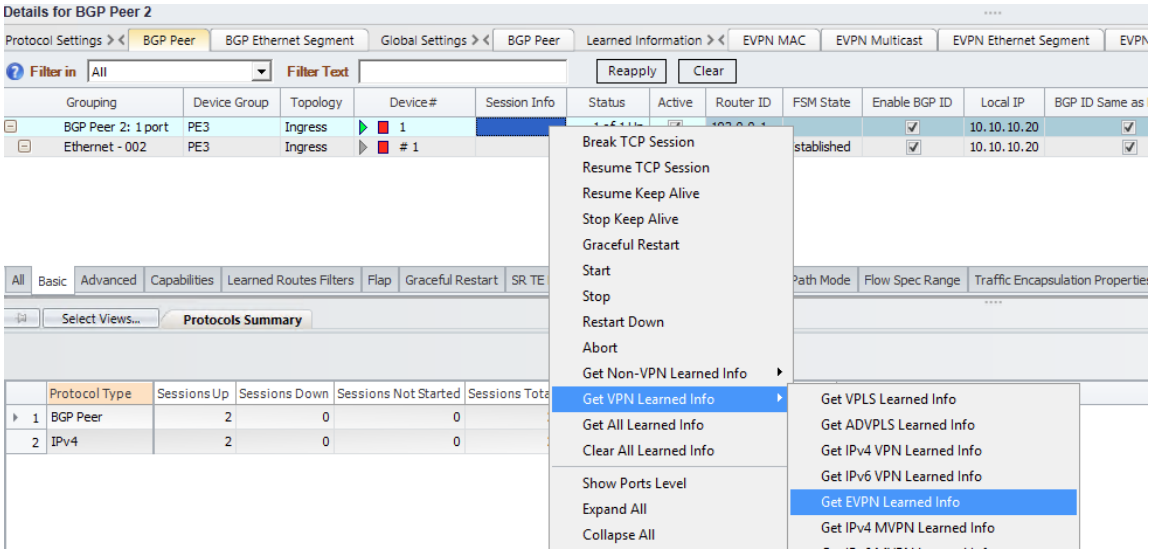

Figure 25 Fetch Learned Info

29. Now, from the learned information we shall focus on “EVPN Ethernet AD” and “EVPN IP Prefix”.

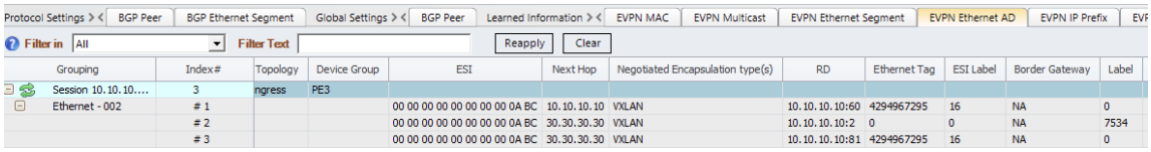

Figure 26 EVPN Ethernet AD

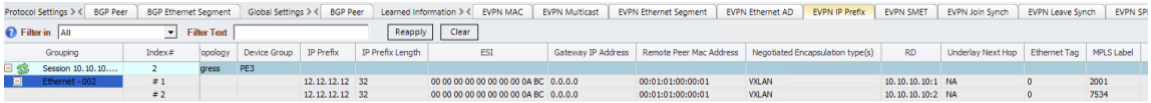

Figure 27 EVPN IP Prefix

The images are not readable quite clearly. Hence, following two tables are extracted from these images. Important fields are discussed.

EVPN Ethernet AD

	Description	ESI	Next Hop	Negotiated Encapsulation type(s)	RD	Ethernet Tag	ESI Label	Label
Entry #1	AD per ES PE1	00 00 00 00 00 00 00 00 0A BC	**10.10.10.10**	VXLAN	10.10.10.10:60	**4294967295**	16	0
Entry #2	AD per EVI by PE2	00 00 00 00 00 00 00 00 0A BC	**30.30.30.30**	VXLAN	10.10.10.10:2	0	0	**7534**
Entry #3	AD per ES by PE2	00 00 00 00 00 00 00 00 0A BC	**30.30.30.30**	VXLAN	10.10.10.10:81	**4294967295**	16	0

a. Check the next hop addresses for PE1 and PE2.
b. Check the label value for AD per EVI from PE2 as 7534. Cross check with the configuration as per Figure 18.
c. Ethernet Tag for AD per ES is set to MAX always.

EVPN IP Prefix

Field	**Entry #1**	**Entry #2**
Route Type	RT 5	RT 1: AD per EVI
IP Prefix	12.12.12.12	12.12.12.12
IP Prefix Length	32	32
ESI	00 00 00 00 00 00 00 00 0A BC	00 00 00 00 00 00 00 00 0A BC
Gateway IP Address	0.0.0.0	0.0.0.0
Remote Peer MAC Address	00:01:01:00:00:01	00:01:01:00:00:01
Negotiated Encapsulation type(s)	VXLAN	VXLAN
RD	10.10.10.10:1	10.10.10.10:2
MPLS Label	**2001**	**7534**

a. Check that RT5 is sent by PE1 (confirmed by label 2001).
b. RT1: Ad per EVI is coming from PE2 (confirmed by label 7534). Refer to Figure 15. We have enabled “Advertise IP Aliasing Automatically” for PE2 only.
c. Note entry#1 will be ordinal 0, and entry#2 will be ordinal 1. This is important to note for traffic configuration. The order is not guaranteed

when start all protocols happen. Controlled start of EVI can get a predictable outcome of ordinal numbers.

Traffic Configuration

30. Add L2-3 Traffic Items, it will open a window to select endpoints. Remember to create traffic from Ingress to Egress. We named our topologies in such a fashion that this will be self-evident. We are sending traffic from SH T5 (24.24.24.24/32) to MH T5 (12.12.12.12/32).

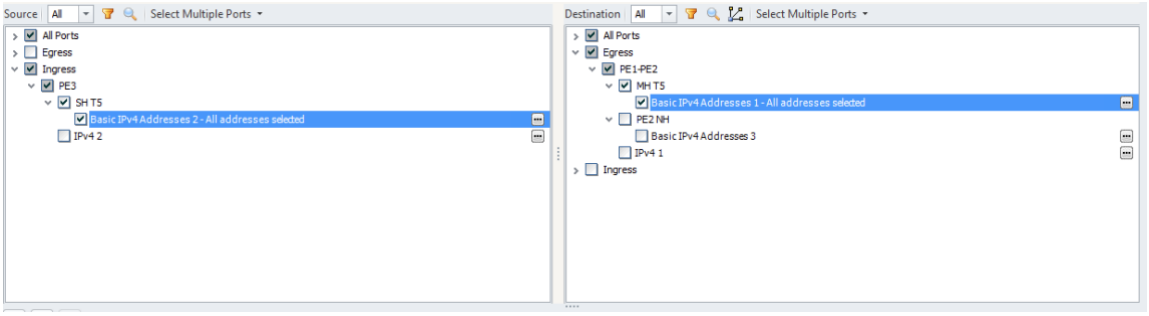

Figure 28 Endpoint Selection

31. MH T5 is multihomed to two PEs. So, there should be a single endpoint. Hence, to modify that click on the ellipses (…) associated with MH T5 prefix. It will open the traffic rectangle. Set the count of route to 1 for this given configuration. Press OK.

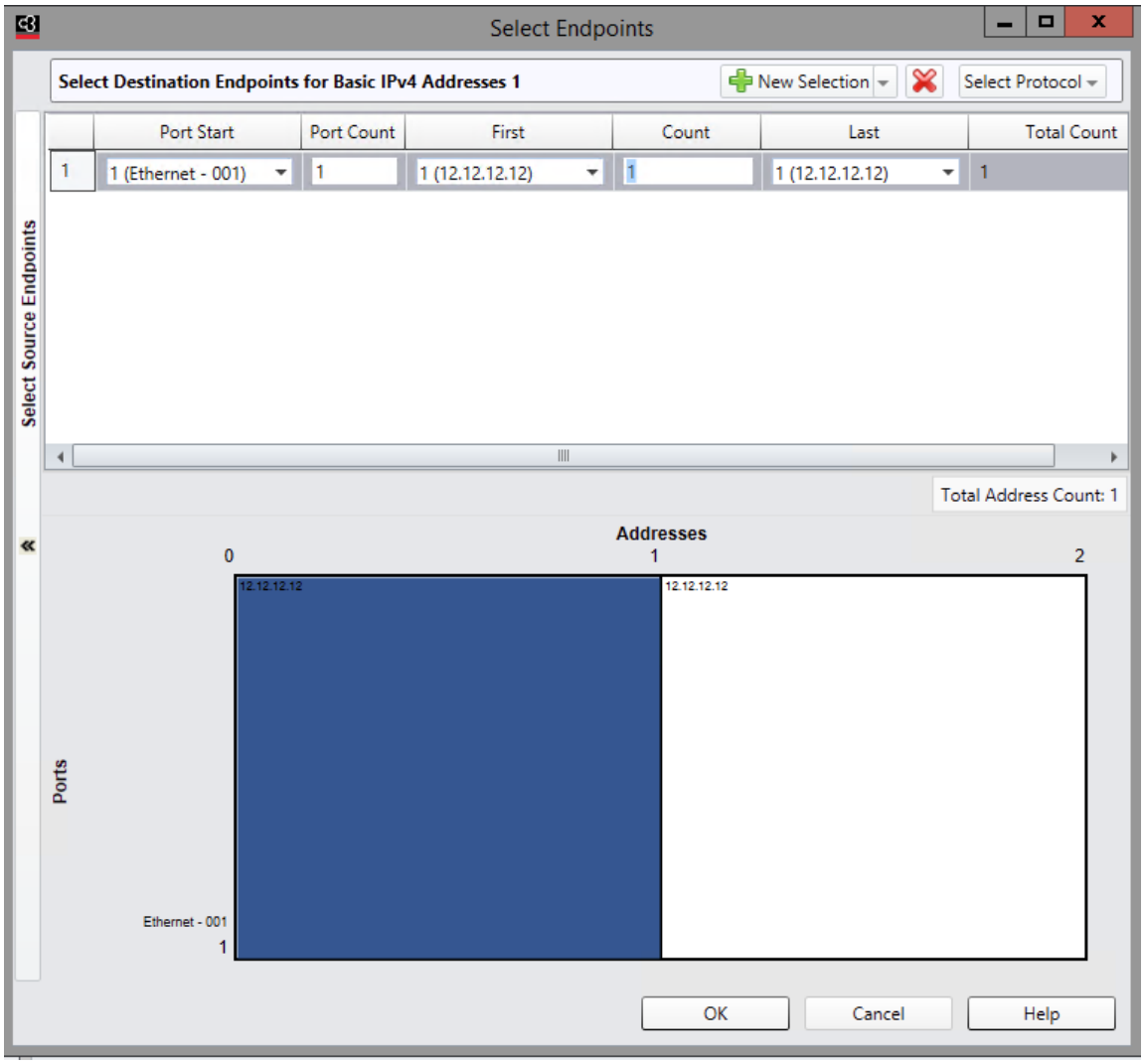

Figure 29 Traffic Rectangle

32. Now click on the arrow to update the selected endpoint set (Before click, it would be green, after it would turn gray). Check the encapsulations as follows. Click on next.

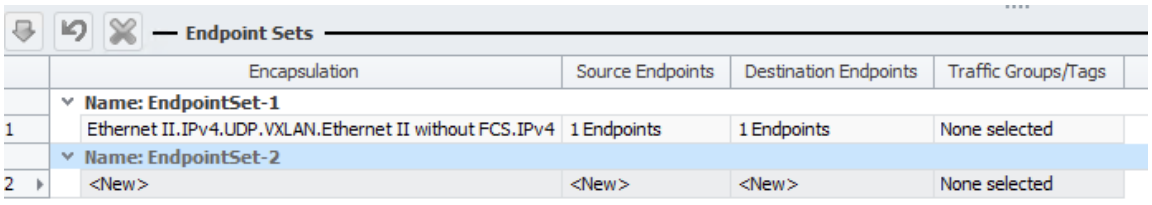

Figure 30 Final Endpoint set

33. Now, we shall see the encapsulation. Click next to Flow Group setup.
34. From flow group setup, upon clicking next we'll come to frame setup. Choose from various options to define the frame. And click Next.
35. Now, we are at Rate setup. We can choose various options to define the rate and behavior of the traffic.
36. After this page, we are at Flow tracking. Enable two options:
    a. Source/Dest Value Pair
    b. VXLAN: VNI
37. From there, we can come to Protocol Behaviors.

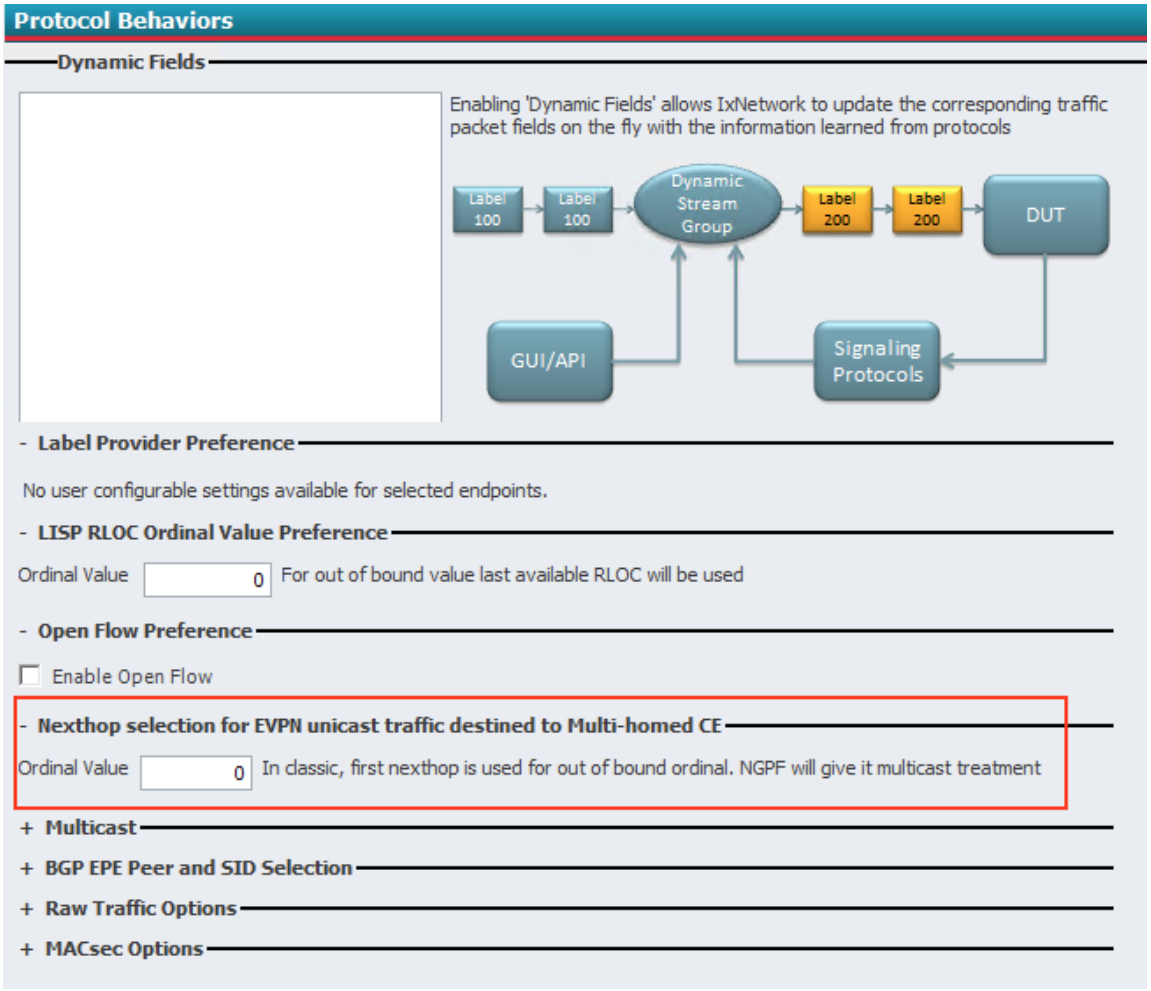

Figure 31 Protocol Behaviors

38. With respect to the given configuration, the ordinal value for next hop selection is important. When we give value 0, here, we can see that VNI is coming as 2001, whereas when ordinal value is 1, VNI is coming as 7534. Refer to learned information section.

39. Next page would be Preview. Once the following window comes, click on “View Flow Groups/Packet”. Then select the flow group. And then check the packets to see that VNI is 2001.

Ordinal Value = 0

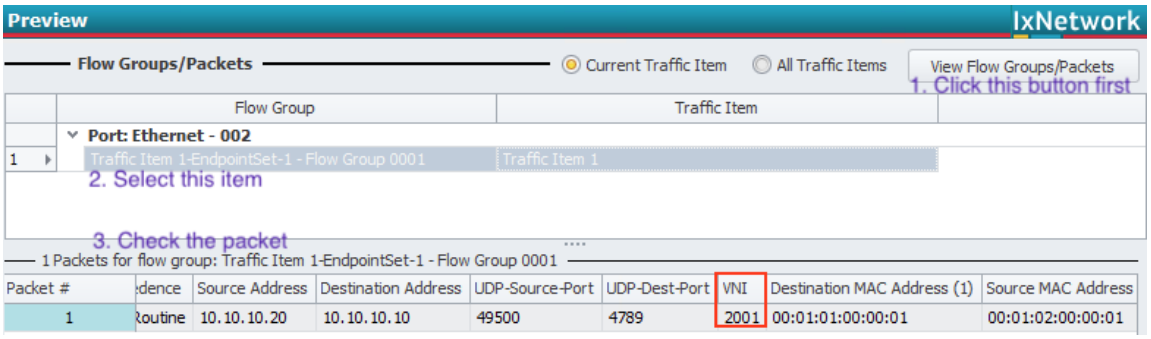

Figure 32 Traffic Preview for Ordinal = 0

Ordinal Value = 1

In figure 30, had we chosen Ordinal value as 1, we would get VNI = 7534, instead of 2001.

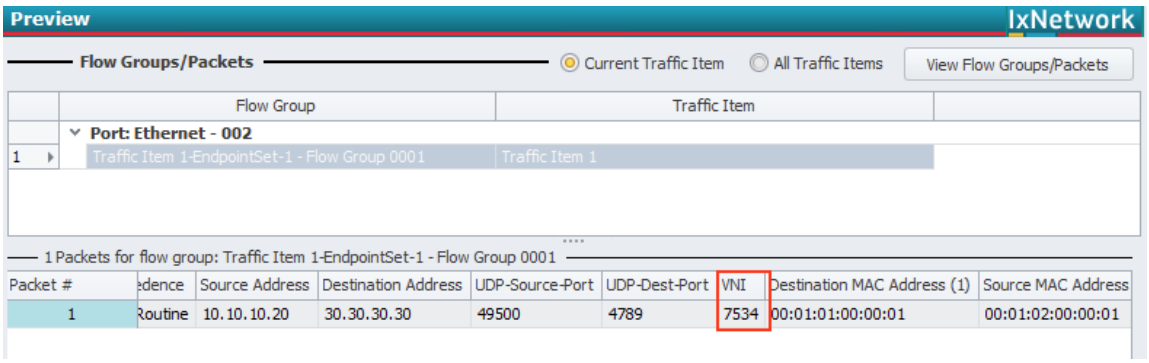

Figure 33 Traffic Preview for Ordinal = 1

40. Now, proceed to the next. This is to validate the traffic. Finish to create the traffic item.
41. Traffic item will look like as follows.

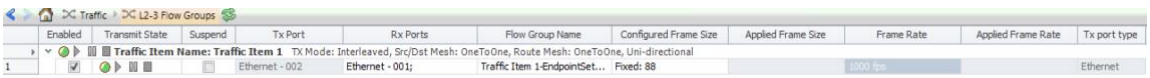

Figure 34 Traffic Item

42. Apply traffic.

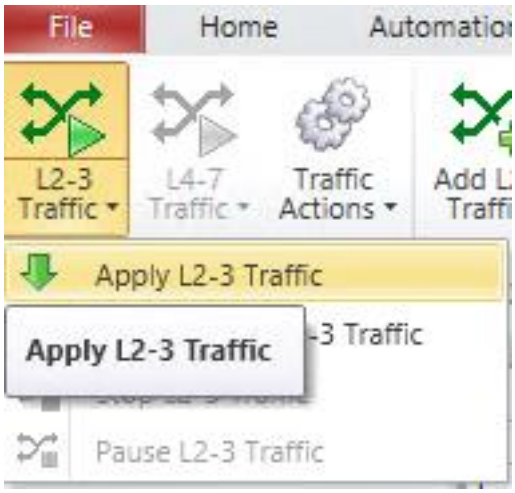

Figure 35 Apply Traffic

43. Start traffic. Find the option from same location for Apply Traffic.
44. In the statistics, you would find the trackers in yellow, as defined in point 36.

	Tx Port	Rx Port	Traffic Item	VXLAN:VNI	Source/Dest Value Pair	Tx Frames	Rx Frames	Frames Delta	Loss %	Tx Frame Rate	Rx Frame Rate	Tx L1 Rate (bps)
1	Ethernet - 002	Ethernet - 001	Traffic Item 1	7,534	24.24.24.24-12.12.12.12	81,984	81,984	0	0.000	1,000.000	1,000.000	1,088,000.000

Figure 36 Traffic Stats