

Day 45 – Configuring Random MAC or IP addressing

Testing Challenge:

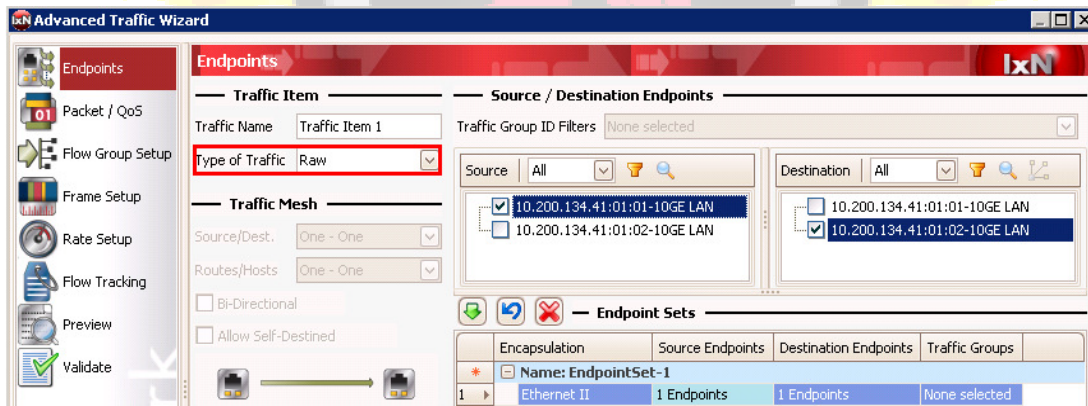
Test engineers need to measure switch/router's forwarding performance. The common test is to run Benchmark test, such as RFC2544, RFC 3918, etc. These tests should be run with various addressing patterns, such as "Increment", "Decrement", "List", "Random", etc. Random IP and/or MAC addresses is an important addressing pattern for switch/router designer. However, there is lack of support for random addressing pattern before IxNetwork 5.40.

IxNetwork 5.40 SP1 Solution:

IxNetwork 5.40 added support for random IP addressing. Now, in IxNetwork 5.40 SP1, support for random MAC addressing has been added. These together provide user great flexibility to build various address patterns.

How to do this?

1. Open Advanced Traffic wizard and select type of traffic as "Raw". Select source and destination port.



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2. Go to Packet/QoS. At right pane packet editor window, add IPv4 header and expand it.

Name	Value
Frame	length: 128
Ethernet II	
IPv4	
IP Header	
Version	4
Header Length	<AUTO> 5
IP Priority	TOS
Total Length (octets)	<AUTO> 130
Identification	0
Flags	
Fragment offset	0
TTL (Time to live)	64
Protocol	<AUTO> 61
Header checksum	<AUTO> 0x0000
Source Address	0.0.0.0
Destination Address	0.0.0.0

3. Right click at source address field and select “Random” option. This will set source address field to 32 bits bitmap.

The screenshot shows a packet editor interface. The 'Source Address' field is highlighted with a right-click context menu. The menu options are: 'Enable tracking', 'Fully Mesh This Field', 'Default Value', 'Edit', 'System Mesh', 'Auto', and 'Random'. The 'Random' option is highlighted with a red box.

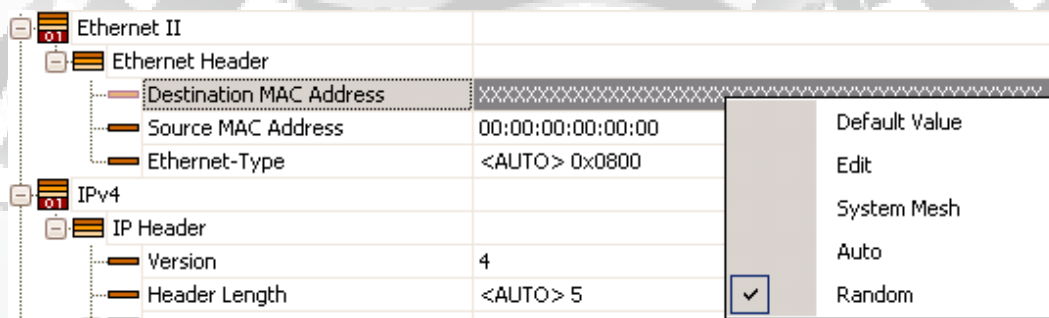
The screenshot shows the packet editor interface after the 'Random' option was selected. The 'Source Address' field now contains a 32-bit bitmap represented by 32 'x' characters: 'xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx'. The 'Destination Address' field remains '0.0.0.0'.

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4. Set the bitmap to desired IP range your want to randomize. The randomization is done in hardware. The 32 bits value is randomized and the generated value will be masked out for all bits set to 1 or 0. The algorithm is pseudo-random and will generate repeatable random sequence.

Eg. bitmap 000xxxxx.xxxxxxxxxx.xxxxxxxxxx.xxxxxxx1 will generate random IP address in range 0.0.0.1 ~ 223.255.255.255

5. IxNetwork 5.40 SP1 provides similar function to randomize MAC address. In this case, the bitmap is 48 bits.



Please note that user needs to set IP and MAC address bitmap for desired value range. By default all bits are considered in randomization algorithm. The algorithm will not make any assumption on whether the value is valid IP or MAC address.

The tracking option is not available for random field.

Conclusion:

With add on random function support, test engineer can quickly build L2/L3 traffic with random MAC and/or IP address. This can help to measure switch/router's forwarding throughput, latency, jitter parameters under such addressing pattern. Certain switch forwarding engine is design in such way which can achieve better performance random addressing pattern.