

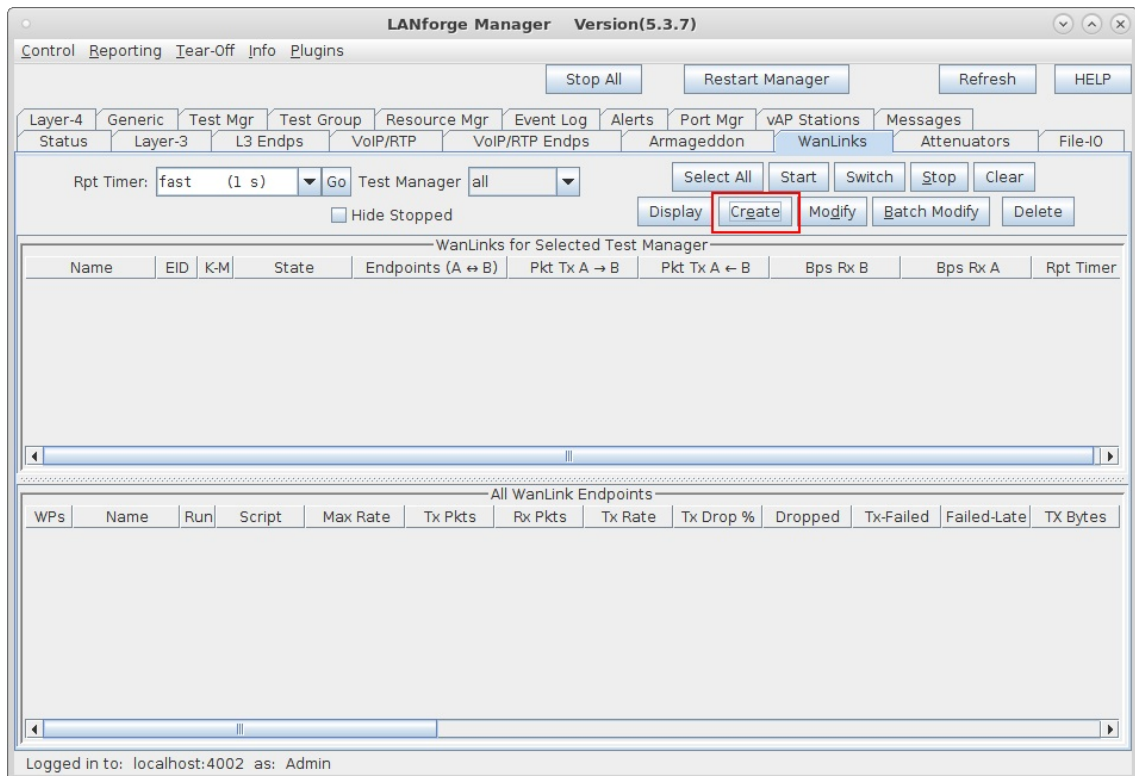
WanPath Corruptions

Goal: Setup a WanLink with WanPath Corruptions.

In this test scenario, LANforge-ICE is used to filter traffic by VLAN on a WanLink with the use of WanPaths and then use WanPath Corruptions to overwrite the DSCP field in the IP packet.

Note: VLAN filtering was recently fixed and should be used with LANforge version 5.3.7 and up.

1. Setup a WanLink connection.
 - A. Go to the **WanLinks** tab and select **Create**.



- B. Enter the WanLink name, physical ports, base transfer rate, delay, jitter etc...
These impairments will be applied to all traffic on the WanLink.

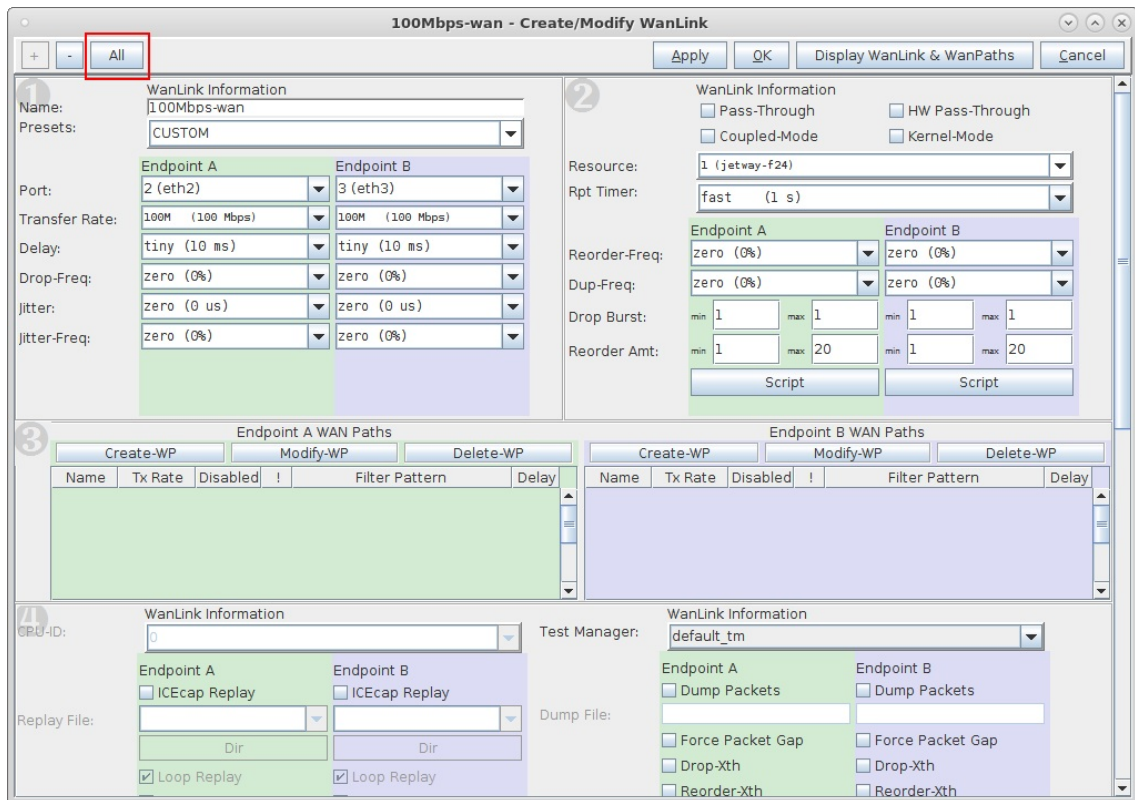
The screenshot shows a dialog box titled "100Mbps-wan - Create/Modify WanLink". At the top, there are buttons for "+", "-", "All", "Apply", "OK", "Display WanLink & WanPaths", and "Cancel". Below the buttons, the "WanLink Information" section is visible. It includes a "Name" field with the value "100Mbps-wan" and a "Presets" dropdown menu set to "CUSTOM". The configuration is split into two columns: "Endpoint A" (highlighted in green) and "Endpoint B" (highlighted in blue). The "Port" field shows "2 (eth2)" for Endpoint A and "3 (eth3)" for Endpoint B. Other fields include "Transfer Rate" (100M (100 Mbps)), "Delay" (tiny (10 ms)), "Drop-Freq" (zero (0%)), "Jitter" (zero (0 us)), and "Jitter-Freq" (zero (0%)).

- C. Select **Apply** to create the base WanLink.

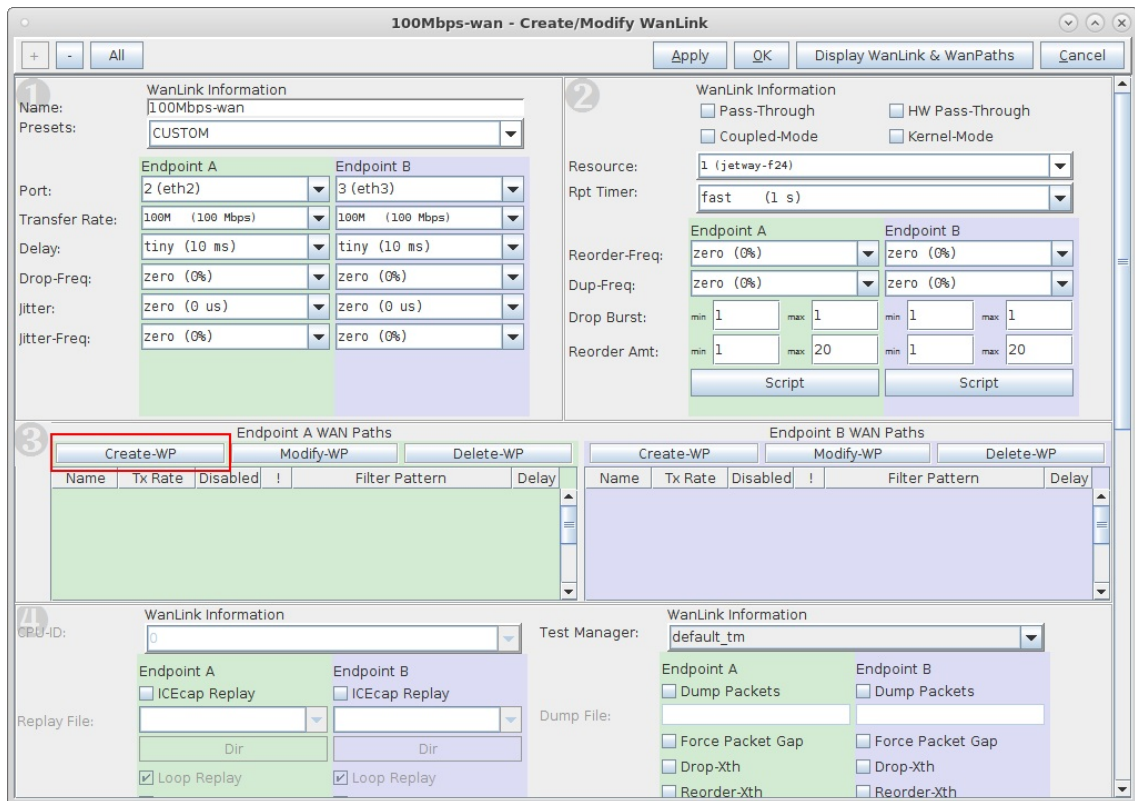
For more information see [LANforge-GUI User Guide: Creating & Modifying WanLinks](#)

2. Setup the WanPaths.

- A. Select **All** to un-hide the other WanLink config panels.



- B. In panel 3, for Endpoint-A WAN Paths, select **Create-WP**.



- C. Enter a Name and Transfer Rate for the WanPath.
Here we are matching the WanLink's transfer rate.

Create/Modify WanPath for Endpoint: 100Mbps-wan-A

Display Clear Counters Apply OK Cancel

Name: wp-a Backlog Buffer: AUTO

PCAP Filter:

Source IP/MAC: 0.0.0.0 Source Mask: 0.0.0.0

Dest IP/MAC: 0.0.0.0 Dest Mask: 0.0.0.0

Transfer Rate: 100M (100 Mbps) Delay: zero (0 us)

Jitter: zero (0 us) Drop-Freq: zero (0%)

Min Drop Burst: 1 Max Drop Burst: 1

Min Reorder Amount: 1 Max Reorder Amount: 20

Reorder-Freq: zero (0%) Dup-Freq: zero (0%)

Jitter-Freq: zero (0%) Test Manager:

ICEcap Replay Replay File: Dir

Disabled Loop Replay Replay Latency Replay Loss

Same As WanLink Replay Dup Replay Bandwidth Use Pcap Filter

Inverse Match Drop-Xth Duplicate-Xth Reorder-Xth

Corruption #0

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

Chain-to-Next Do Checksum

Corruption #1

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

Chain-to-Next Do Checksum

Corruption #2

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

Chain-to-Next Do Checksum

Corruption #3

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

Chain-to-Next Do Checksum

Corruption #4

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

Chain-to-Next Do Checksum

Corruption #5

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

Chain-to-Next Do Checksum

D. Select checkbox for **Use Pcap Filter**

The image shows a Windows-style dialog box titled "Create/Modify WanPath for Endpoint: 100Mbps-wan-A". At the top, there are buttons for "Display", "Clear Counters", "Apply", "OK", and "Cancel". The main area contains various configuration fields:

- Name: wp-a
- Backlog Buffer: AUTO
- PCAP Filter: (empty)
- Source IP/MAC: 0.0.0.0
- Source Mask: 0.0.0.0
- Dest IP/MAC: 0.0.0.0
- Dest Mask: 0.0.0.0
- Transfer Rate: 100M (100 Mbps)
- Delay: zero (0 us)
- Jitter: zero (0 us)
- Drop-Freq: zero (0%)
- Min Drop Burst: 1
- Max Drop Burst: 1
- Min Reorder Amount: 1
- Max Reorder Amount: 20
- Reorder-Freq: zero (0%)
- Dup-Freq: zero (0%)
- Jitter-Freq: zero (0%)
- Test Manager: (empty)

Below these fields is an "ICEcap Replay" section with a "Replay File:" field and a "Dir" button. There are several radio and checkbox options:

- Radio buttons: Disabled, Same As WanLink (selected)
- Checkboxes: Loop Replay, Replay Latency, Replay Loss, Replay Dup, Replay Bandwidth, Use Pcap Filter (highlighted with a red box), Inverse Match, Drop-Xth, Duplicate-Xth, Reorder-Xth

At the bottom, there are six "Corruption" sections (Corruption #0 to #5). Each section has fields for Rate (0), Corruption (Random Write), Byte-to-Write (0), Min Offset (0), and Max Offset (0). There are also checkboxes for Chain-to-Next and Do Checksum.

- E. Enter the PCAP Filter **vlan 1010** to apply any WanPath impairment or corruptions only to packets with 802.1q vlan id 1010
Expression is based on the tcpdump expression field.

Create/Modify WanPath for Endpoint: 100Mbps-wan-A

Buttons: Display, Clear Counters, Apply, OK, Cancel

Name: wp-a Backlog Buffer: AUTO

PCAP Filter: vlan 1010

Source IP/MAC: 0.0.0.0 Source Mask: 0.0.0.0

Dest IP/MAC: 0.0.0.0 Dest Mask: 0.0.0.0

Transfer Rate: 100M (100 Mbps) Delay: zero (0 us)

Jitter: zero (0 us) Drop-Freq: zero (0%)

Min Drop Burst: 1 Max Drop Burst: 1

Min Reorder Amount: 1 Max Reorder Amount: 20

Reorder-Freq: zero (0%) Dup-Freq: zero (0%)

Jitter-Freq: zero (0%) Test Manager:

ICEcap Replay Replay File: Dir

Disabled Loop Replay Replay Latency Replay Loss
 Same As WanLink Replay Dup Replay Bandwidth Use Pcap Filter
 Inverse Match Drop-Xth Duplicate-Xth Reorder-Xth

Corruption #0 Corruption #1 Corruption #2

Rate: 0 Rate: 0 Rate: 0

Corruption: Random Write Corruption: Random Write Corruption: Random Write

Byte-to-Write: 0 Byte-to-Write: 0 Byte-to-Write: 0

Min Offset: 0 Min Offset: 0 Min Offset: 0

Max Offset: 0 Max Offset: 0 Max Offset: 0

Chain-to-Next Do Checksum Chain-to-Next Do Checksum Chain-to-Next Do Checksum

Corruption #3 Corruption #4 Corruption #5

Rate: 0 Rate: 0 Rate: 0

Corruption: Random Write Corruption: Random Write Corruption: Random Write

Byte-to-Write: 0 Byte-to-Write: 0 Byte-to-Write: 0

Min Offset: 0 Min Offset: 0 Min Offset: 0

Max Offset: 0 Max Offset: 0 Max Offset: 0

Chain-to-Next Do Checksum Chain-to-Next Do Checksum Chain-to-Next Do Checksum

- F. Select **Apply** to create the WanPath.

For more information see [Tcpdump man page](#) , [Pcap Filter Syntax](#)

C. Select **OK** then create a second WanPath for this WanLink on Endpoint-B using the same values.

Create/Modify WanPath for Endpoint: 100Mbps-wan-B

Buttons: Display, Clear Counters, Apply, OK, Cancel

Name: wp-b Backlog Buffer: AUTO

PCAP Filter: vlan 1010

Source IP/MAC: 0.0.0.0 Source Mask: 0.0.0.0

Dest IP/MAC: 0.0.0.0 Dest Mask: 0.0.0.0

Transfer Rate: 100M (100 Mbps) Delay: zero (0 us)

Jitter: zero (0 us) Drop-Freq: zero (0%)

Min Drop Burst: 1 Max Drop Burst: 1

Min Reorder Amount: 1 Max Reorder Amount: 20

Reorder-Freq: zero (0%) Dup-Freq: zero (0%)

Jitter-Freq: zero (0%) Test Manager:

ICEcap Replay Replay File: Dir

Disabled Loop Replay Replay Latency Replay Loss
 Same As WanLink Replay Dup Replay Bandwidth Use Pcap Filter
 Inverse Match Drop-Xth Duplicate-Xth Reorder-Xth

Corruption #0: Rate: 100000, Corruption: Write Byte, Byte-to-Write: 40, Min Offset: 19, Max Offset: 20, Chain-to-Next, Do Checksum

Corruption #1: Rate: 0, Corruption: Random Write, Byte-to-Write: 0, Min Offset: 0, Max Offset: 0, Chain-to-Next, Do Checksum

Corruption #2: Rate: 0, Corruption: Random Write, Byte-to-Write: 0, Min Offset: 0, Max Offset: 0, Chain-to-Next, Do Checksum

Corruption #3: Rate: 0, Corruption: Random Write, Byte-to-Write: 0, Min Offset: 0, Max Offset: 0, Chain-to-Next, Do Checksum

Corruption #4: Rate: 0, Corruption: Random Write, Byte-to-Write: 0, Min Offset: 0, Max Offset: 0, Chain-to-Next, Do Checksum

Corruption #5: Rate: 0, Corruption: Random Write, Byte-to-Write: 0, Min Offset: 0, Max Offset: 0, Chain-to-Next, Do Checksum

D. Verify that the WanPaths on this WanLink are setup correctly, then select **OK** on the Create/Modify WanLink window shown here

100Mbps-wan - Create/Modify WanLink

Buttons: Apply, OK, Display WanLink & WanPaths, Cancel

1 WanLink Information: Name: 100Mbps-wan, Presets: CUSTOM

2 WanLink Information: Resource: 1 (jetway-f24), Rpt Timer: fast (1 s)

Endpoint A: Port: 2 (eth2), Transfer Rate: 100M (100 Mbps), Delay: tiny (10 ms), Drop-Freq: zero (0%), Jitter: zero (0 us), Jitter-Freq: zero (0%)

Endpoint B: Port: 3 (eth3), Transfer Rate: 100M (100 Mbps), Delay: tiny (10 ms), Drop-Freq: zero (0%), Jitter: zero (0 us), Jitter-Freq: zero (0%)

3 Endpoint A WAN Paths:

Name	Tx Rate	Disabled	!	Filter Pattern	Delay
wp-a	100 M	<input type="checkbox"/>	<input type="checkbox"/>	Pcap: vlan 1010	0

Endpoint B WAN Paths:

Name	Tx Rate	Disabled	!	Filter Pattern	Delay
wp-b	100 M	<input type="checkbox"/>	<input type="checkbox"/>	Pcap: vlan 1010	0

4 CPU-ID: 0 Test Manager: default_tm

WanLink Information: ICEcap Replay, Loop Replay, Dump Packets, Force Packet Gap, Drop-Xth, Reorder-Xth

For more information see [LANforge-GUI User Guide: Creating & Modifying WanPaths](#)

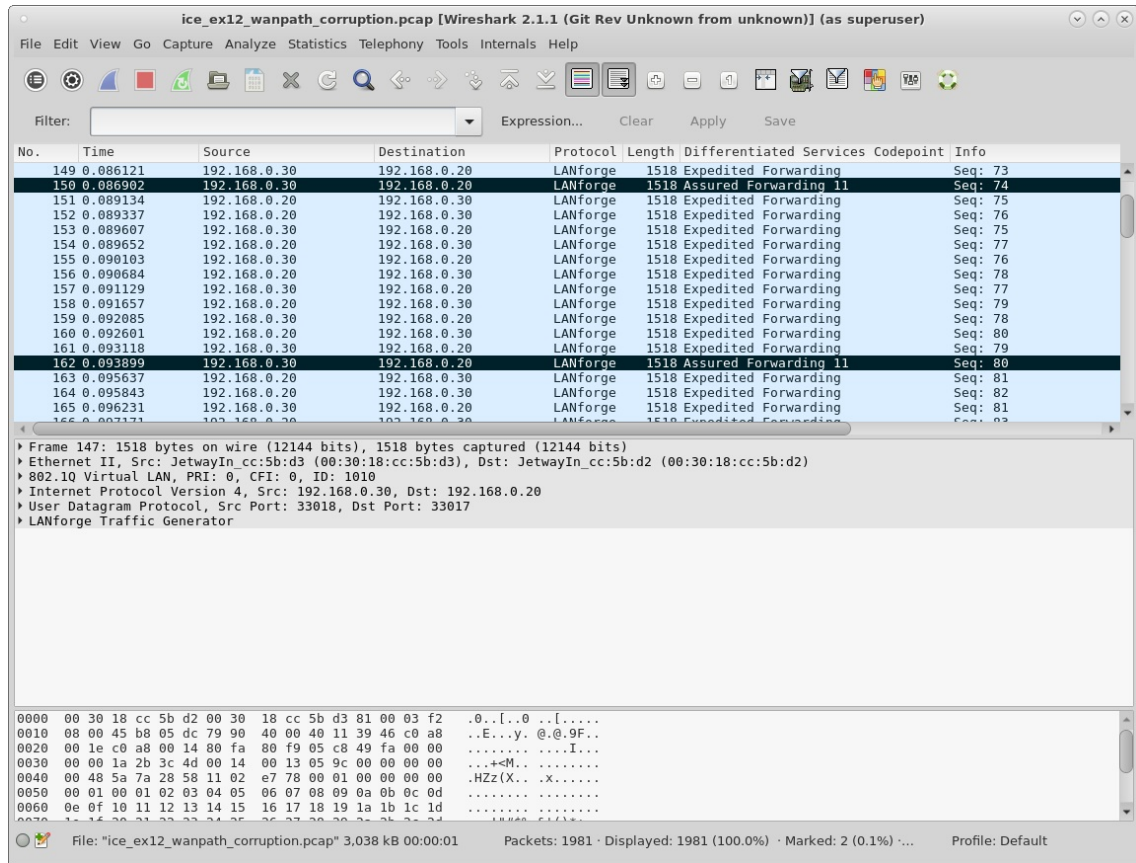
4. Run traffic through LANforge-ICE ports **eth2** and **eth3**, and capture traffic on eth2.

- A. Here we are using LANforge-FIRE on a secondary resource to send a 10Mbps bi-directional UDP flow between 802.1q VLAN endpoints eth2.1010 and eth3.1010 with an IP ToS value of decimal 184 which corresponds to DSCP value decimal 46 or Expedited Forwarding

- B. Go to the **Port Mgr** tab and highlight WanLink port eth2, then select the **Sniff Packets** button to bring up Wireshark.

Port	Pha...	Down	IP	SEC	Alias	Parent Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps
1.1.00		<input type="checkbox"/>	192.168.100.198	0	eth0		5,529,927,...	8,709,413	55	143,334	5,281,552,...	9,617,541	
1.1.01		<input checked="" type="checkbox"/>	0.0.0.0	0	eth1		0	0	0	0	0	0	0
1.1.02		<input type="checkbox"/>	0.0.0.0	0	eth2		3,482,049,...	2,399,718	0	4	7,757,660,...	4,297,3...	
1.1.03		<input type="checkbox"/>	0.0.0.0	0	eth3		3,482,026,...	2,399,705	0	0	7,757,666,...	4,297,3...	
1.1.04		<input type="checkbox"/>	0.0.0.0	0	eth4		0	0	0	0	12,506	147	
1.1.05		<input type="checkbox"/>	0.0.0.0	0	eth5		0	0	0	0	12,234	147	
1.1.06		<input type="checkbox"/>	0.0.0.0	0	wiphy0		0	0	0	0	0	0	0
1.1.07		<input type="checkbox"/>	0.0.0.0	0	wiphy1		0	0	0	0	0	0	0
1.1.08		<input checked="" type="checkbox"/>	0.0.0.0	0	wlan0	wiphy0	0	0	0	0	0	0	0
1.1.09		<input checked="" type="checkbox"/>	0.0.0.0	0	wlan1	wiphy1	0	0	0	0	0	0	0
1.2.00		<input type="checkbox"/>	192.168.100.103	0	eth0		653,572,601	5,346,946	13	15,109	5,202,101,...	4,863,373	
1.2.01		<input checked="" type="checkbox"/>	0.0.0.0	0	eth1		0	0	0	0	0	0	0
1.2.02		<input type="checkbox"/>	172.16.0.102	0	eth2		3,460,380,...	2,384,176	0	0	3,482,059,...	2,399,880	
1.2.03		<input type="checkbox"/>	172.16.0.103	0	eth3		3,460,386,...	2,384,178	0	0	3,482,036,...	2,399,868	
1.2.04		<input type="checkbox"/>	0.0.0.0	0	eth4		2,394	7	0	0	9,852	138	
1.2.05		<input type="checkbox"/>	0.0.0.0	0	eth5		2,052	6	0	0	9,852	138	
1.2.06		<input type="checkbox"/>	192.168.9.29	0	eth3.1009	eth3	0	0	0	0	9,306	131	
1.2.07		<input type="checkbox"/>	192.168.8.28	0	eth3.1008	eth3	0	0	0	0	9,306	131	
1.2.08		<input type="checkbox"/>	192.168.1.11	0	eth2.1001	eth2	84,760,294	68,374	0	0	85,730,804	68,508	
1.2.09		<input type="checkbox"/>	192.168.9.19	0	eth2.1009	eth2	0	0	0	0	9,236	130	
1.2.10		<input type="checkbox"/>	192.168.5.15	0	eth2.1005	eth2	0	0	0	0	9,236	130	
1.2.11		<input type="checkbox"/>	192.168.7.17	0	eth2.1007	eth2	0	0	0	0	9,306	131	

- C. The capture will show that periodically the DSCP field gets overwritten per the WanPath corruption logic of writing a decimal value 40 in the IP ToS field which corresponds to a DSCP value of decimal 10 or Assured Forwarding 11.



For more information see [LANforge-GUI User Guide: Layer-3 Cross-Connects](#)

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