Dataplane Test

Thu May 12 00:26:23 PDT 2022

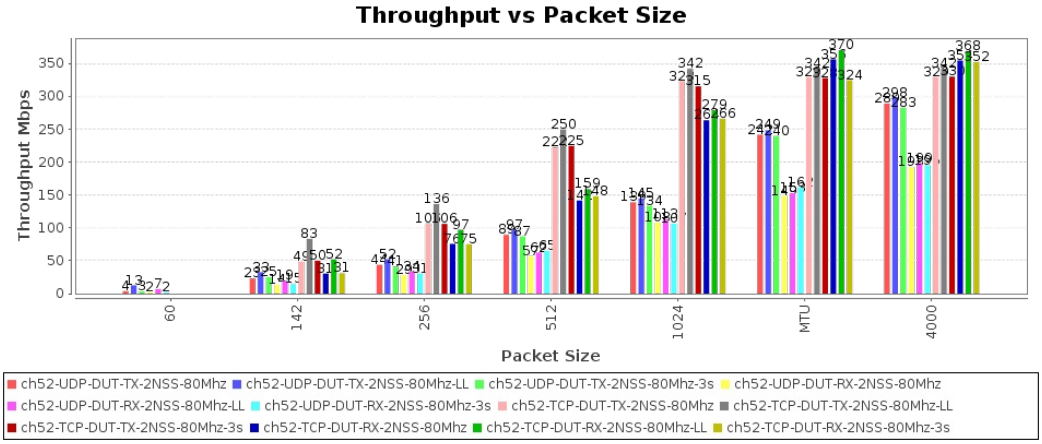
Test Setup Information				
Device Under Test	Name	webui90		
	Software Version	TIP-devel-d5d7721	Hardware Version	wifi6
	Model Number	edgecore_eap101	Serial Number	903cb36c46da
	SSIDs	open open [] ssid_wpa_5g_vlan ssid_wpa2_2g_vlan ssid_wpa2_5g_vlan		
	Passwords	[] [] [] something something something		
	BSSIDs	90:3c:b3:6c:46:dd 90:3c:b3:6c:46:de [] 92:3c:b3:6c:46:de 96:3c:b3:6c:46:dd 96:3c:b3:6c:46:de		
	Notes	[BLANK]		

Objective

The Candela WiFi data plane test is designed to conduct an automatic testing of all combinations of station types, MIMO types, Channel Bandwidths, Traffic types, Traffic direction, Frame sizes etc… It will run a quick throughput test at every combination of these test variables and plot all the results in a set of charts to compare performance. The user is allowed to define an intended load as a percentage of the max theoretical PHY rate for every test combination. The expected behavior is that for every test combination the achieved throughput should be at least 70% of the theoretical max PHY rate under ideal test conditions. This test provides a way to go through hundreds of combinations in a fully automated fashion and very easily find patterns and problem areas which can be further debugged using more specific testing.

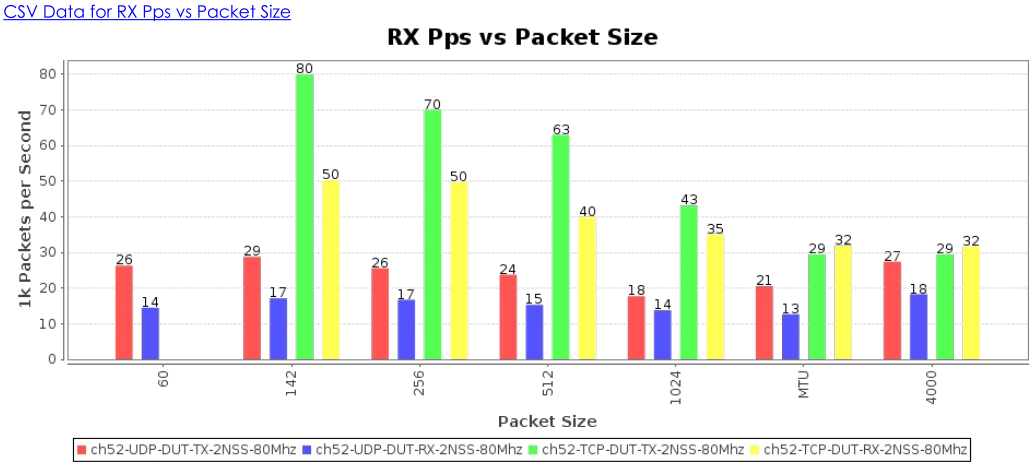
Throughput for each different traffic type. Datasets with names ending in '-LL' will include the IP, TCP, UDP and Ethernet header bytes in their calculation. For Armageddon traffic only, low-level throughput includes the Ethernet FCS and preamble. Other datasets report 'goodput' for the protocol.

CSV Data for Throughput vs Packet Size



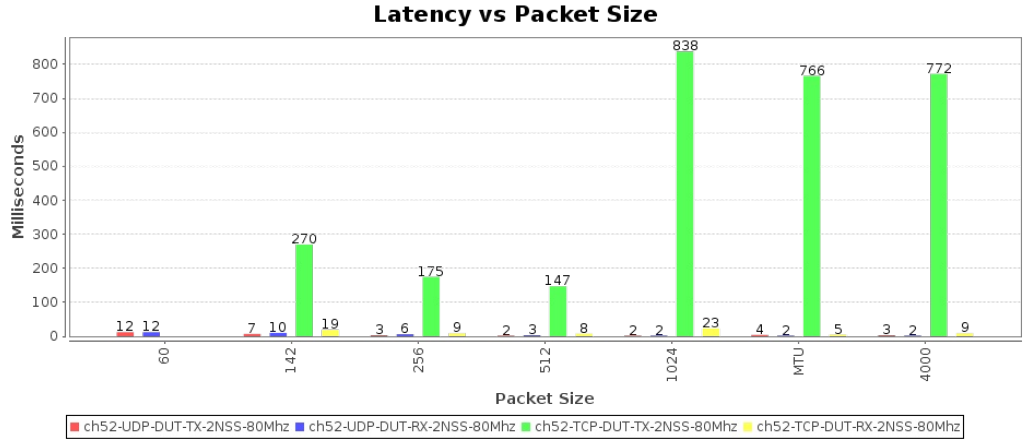
Pps throughput for each different traffic type. The values are estimated packets-per-second over the DUT, but some protocols such as TCP make this difficult to know for certain, so the value is extrapolated.

CSV Data for RX Pps vs Packet Size



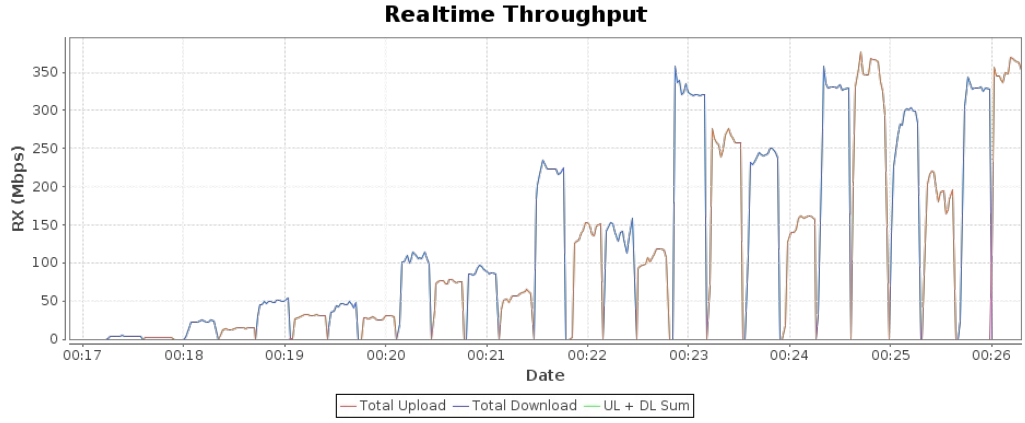
Latency for each different traffic type. If opposite-direction traffic is non-zero, then round-trip time will be reported. Otherwise, one-way latency will be reported.

CSV Data for Latency vs Packet Size



Realtime Graph shows summary download and upload RX Goodput rate of connections created by this test. Goodput does not include Ethernet, IP, UDP/TCP header overhead.

CSV Data for Realtime Throughput



Test Information

Message
Starting dataplane test with: 28 iterations.
Skipping packet size not supported by TCP: 60

Skipping packet size not supported by TCP: 60

Constant values related to the table below.

Iteration-Duration	15s

CSV data focussed on throughput. The values reported are gathered at the end of the test iteration before traffic is stopped. The test iterations consider 'Received' traffic to be received in the dominant direction. So, if the iteration is DUT-TX, then Received traffic is traffic received on the Station from the AP. If the iteration is DUT-RX, then Received traffic is received on Ethernet port from DUT and sent by the station. Columns starting with RSSI are from the perspective of the Station, so Tx-Rate is the Station transmit Phy Rate, and Rx-Rate is the Phy Rate received by the station. Rpt-Mode is negotiated mode, not necessarily Phy Rate mode.

Channel	Frequency	Security	NSS	Cfg-Mode	Bandwidth	Pkt	Traffic-Type	Direction	Atten	Rotation	Offered-1m	Rx-Bps	Rx-Bps-1m	Rx-Bps-LL	Rx-Bps-3s	RSSI	Tx-Failed	Tx-Failed%	Tx-Rate	Rx-Rate	Rpt-Mode	Rpt-Mode-Brief
52	5260	Open	2	AUTO	80	60	UDP	DUT-TX	NA	NA	3.759 Mbps	3.754 Mbps	3.78 Mbps	12.599 Mbps	3.46 Mbps	-28	0 / 432178	0	351 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	60	UDP	DUT-RX	NA	NA	2.069 Mbps	2.072 Mbps	2.083 Mbps	6.943 Mbps	2.133 Mbps	-25	0 / 221555	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	142	UDP	DUT-TX	NA	NA	22.863 Mbps	22.782 Mbps	22.964 Mbps	32.609 Mbps	25.115 Mbps	-28	0 / 451465	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	142	UDP	DUT-RX	NA	NA	13.728 Mbps	13.664 Mbps	13.687 Mbps	19.435 Mbps	14.507 Mbps	-24	37 / 300863	0.012	866.7 Mbps	520 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	142	TCP	DUT-TX	NA	NA	49.629 Mbps	48.777 Mbps	48.799 Mbps	83.337 Mbps	50.138 Mbps	-29	0 / 1287342	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	142	TCP	DUT-RX	NA	NA	30.214 Mbps	30.436 Mbps	30.502 Mbps	52.209 Mbps	31.047 Mbps	-29	0 / 876291	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	256	UDP	DUT-TX	NA	NA	43.669 Mbps	43.383 Mbps	43.738 Mbps	52.322 Mbps	41.219 Mbps	-29	0 / 401000	0	780 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	256	UDP	DUT-RX	NA	NA	28.393 Mbps	28.553 Mbps	28.583 Mbps	34.192 Mbps	30.766 Mbps	-24	26 / 288611	0.009	780 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	256	TCP	DUT-TX	NA	NA	105.99 Mbps	105.731 Mbps	106.003 Mbps	136.248 Mbps	106.005 Mbps	-29	0 / 1140026	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	256	TCP	DUT-RX	NA	NA	75.685 Mbps	75.018 Mbps	75.616 Mbps	97.108 Mbps	75.103 Mbps	-29	0 / 798253	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	512	UDP	DUT-TX	NA	NA	89.453 Mbps	88.78 Mbps	89.216 Mbps	97.188 Mbps	87.061 Mbps	-29	0 / 361440	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	512	UDP	DUT-RX	NA	NA	57.228 Mbps	57.041 Mbps	57.329 Mbps	62.453 Mbps	65.189 Mbps	-25	0 / 244788	0	780 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	512	TCP	DUT-TX	NA	NA	224.598 Mbps	220.89 Mbps	222.455 Mbps	249.65 Mbps	224.523 Mbps	-30	0 / 1016512	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	512	TCP	DUT-RX	NA	NA	141.741 Mbps	140.464 Mbps	141.585 Mbps	158.865 Mbps	148.114 Mbps	-30	0 / 618281	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	1024	UDP	DUT-TX	NA	NA	138.819 Mbps	138.139 Mbps	138.924 Mbps	144.866 Mbps	133.547 Mbps	-30	0 / 282481	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	1024	UDP	DUT-RX	NA	NA	107.755 Mbps	107.436 Mbps	108.034 Mbps	112.655 Mbps	106.585 Mbps	-25	0 / 238181	0	780 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	1024	TCP	DUT-TX	NA	NA	323.834 Mbps	321.422 Mbps	323.129 Mbps	341.77 Mbps	315.16 Mbps	-30	0 / 687969	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	1024	TCP	DUT-RX	NA	NA	263.661 Mbps	261.614 Mbps	263.569 Mbps	278.745 Mbps	266.093 Mbps	-30	181 / 638855	0.028	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	MTU	UDP	DUT-TX	NA	NA	241.679 Mbps	240.208 Mbps	241.622 Mbps	248.516 Mbps	239.842 Mbps	-29	0 / 380184	0	780 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	MTU	UDP	DUT-RX	NA	NA	148.774 Mbps	148.465 Mbps	148.78 Mbps	153.025 Mbps	161.62 Mbps	-25	0 / 197208	0	780 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	MTU	TCP	DUT-TX	NA	NA	345.204 Mbps	328.653 Mbps	329.235 Mbps	341.962 Mbps	327.764 Mbps	-30	0 / 452960	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	MTU	TCP	DUT-RX	NA	NA	355.948 Mbps	355.35 Mbps	356.223 Mbps	369.982 Mbps	324.419 Mbps	-30	0 / 549828	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	4000	UDP	DUT-TX	NA	NA	306.717 Mbps	289.015 Mbps	289.059 Mbps	298.261 Mbps	282.954 Mbps	-30	0 / 467128	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	4000	UDP	DUT-RX	NA	NA	192.779 Mbps	192.205 Mbps	192.503 Mbps	198.631 Mbps	195.302 Mbps	-25	0 / 301552	0	780 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	4000	TCP	DUT-TX	NA	NA	346.89 Mbps	327.675 Mbps	329.493 Mbps	342.232 Mbps	329.925 Mbps	-31	0 / 438677	0	866.7 Mbps	400 Mbps	802.11an-AC	802.11ac
52	5260	Open	2	AUTO	80	4000	TCP	DUT-RX	NA	NA	353.948 Mbps	352.313 Mbps	354.416 Mbps	368.1 Mbps	352.192 Mbps	-30	0 / 498409	0	780 Mbps	400 Mbps	802.11an-AC	802.11ac

CSV data focussed on TX and RX Link Rate and RSSI reports. The values reported are gathered at the end of the test iteration before traffic is stopped. The Phy Rate and RSSI are from the perspective of the Station, so Tx-MCS is MCS at which station is sending to the AP, and Rx-MCS is MCS at which the AP is sending to

the station.

Channel	Frequency	Security	NSS	Cfg-Mode	Bandwidth	Pkt	Traffic-Type	Direction	Tx-Mode-Rpt	Tx-NSS-Rpt	Tx-MCS	Tx-BW-Rpt	Rx-Mode-Rpt	Rx-NSS-Rpt	Rx-MCS	Rx-BW-Rpt	RSSI dBm	Tx-Phy-Rate	Rx-Phy-Rate
52	5260	Open	2	AUTO	80	60	UDP	DUT-TX	VHT	2	4	80	2	VHT	4	40	-28 [-31, -35, -32]	351.0 MBit/s VHT-MCS 4 80MHz VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	60	UDP	DUT-RX	VHT	2	8	80	2	VHT	8	40	-26 [-31, -34, -32]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	142	UDP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-29 [-31, -39, -33]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	142	UDP	DUT-RX	VHT	2	8	80	2	VHT	8	80	-25 [-32, -42, -36]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	520.0 MBit/s VHT-MCS 5 80MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	142	TCP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-29 [-30, -39, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	142	TCP	DUT-RX	VHT	2	9	80	2	VHT	9	40	-29 [-30, -40, -36]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	256	UDP	DUT-TX	VHT	2	8	80	2	VHT	8	40	-30 [-31, -38, -34]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	256	UDP	DUT-RX	VHT	2	9	80	2	VHT	9	40	-24 [-31, -38, -34]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	256	TCP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-30 [-32, -40, -34]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	256	TCP	DUT-RX	VHT	2	9	80	2	VHT	9	40	-30 [-32, -38, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	512	UDP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-30 [-31, -39, -36]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	512	UDP	DUT-RX	VHT	2	9	80	2	VHT	9	40	-24 [-31, -40, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	512	TCP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-30 [-31, -40, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	512	TCP	DUT-RX	VHT	2	9	80	2	VHT	9	40	-30 [-31, -39, -34]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	1024	UDP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-30 [-31, -39, -34]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	1024	UDP	DUT-RX	VHT	2	8	80	2	VHT	8	40	-26 [-32, -40, -35]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	1024	TCP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-31 [-32, -40, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	1024	TCP	DUT-RX	VHT	2	8	80	2	VHT	8	40	-31 [-32, -39, -35]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
																	-28	780.0 MBit/s VHT-MCS 8	400.0 MBit/s VHT-MCS 9

52	5260	Open	2	AUTO	80	MTU	UDP	DUT-TX	VHT	2	8	80	2	VHT	8	40	[-29, -40, -35]	80MHz short GI VHT-NSS 2	40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	MTU	UDP	DUT-RX	VHT	2	8	80	2	VHT	8	40	-26 [-30, -41, -36]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	MTU	TCP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-31 [-33, -39, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	MTU	TCP	DUT-RX	VHT	2	8	80	2	VHT	8	40	-31 [-32, -40, -37]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	4000	UDP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-31 [-32, -39, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	4000	UDP	DUT-RX	VHT	2	8	80	2	VHT	8	40	-25 [-32, -40, -36]	780.0 MBit/s VHT-MCS 8 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	4000	TCP	DUT-TX	VHT	2	9	80	2	VHT	9	40	-31 [-32, -39, -36]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2
52	5260	Open	2	AUTO	80	4000	TCP	DUT-RX	VHT	2	9	80	2	VHT	9	40	-30 [-31, -40, -35]	866.7 MBit/s VHT-MCS 9 80MHz short GI VHT-NSS 2	400.0 MBit/s VHT-MCS 9 40MHz short GI VHT-NSS 2

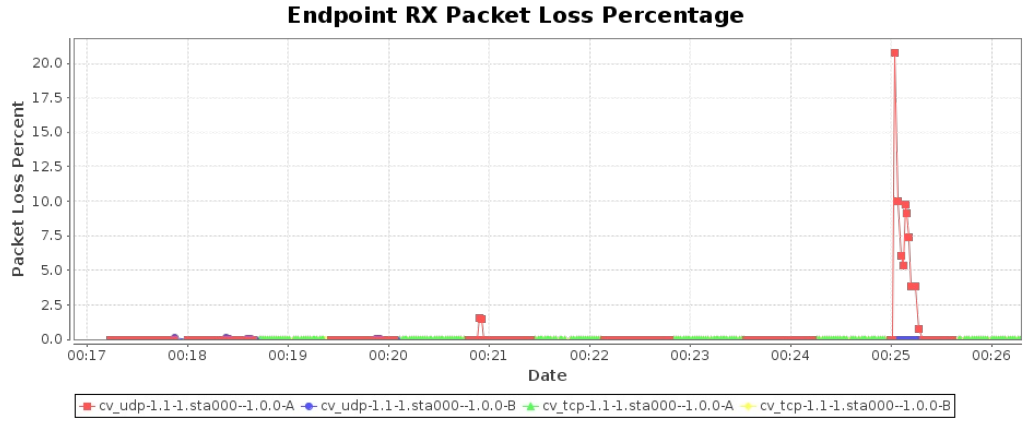
Brief csv report, may be imported into third-party tools.

Step Index	Position [Deg]	Attenuation [dB]	Throughput [Mbps]	Beacon RSSI [dBm]	Data RSSI [dBm]
0	NA	0	3.75	-23	-28
1	NA	0	2.07	-25	-25
2	NA	0	22.78	-23	-28
3	NA	0	13.66	-24	-24
4	NA	0	48.78	-24	-29
5	NA	0	30.44	-24	-29
6	NA	0	43.38	-24	-29
7	NA	0	28.55	-23	-24
8	NA	0	105.73	-24	-29
9	NA	0	75.02	-24	-29
10	NA	0	88.78	-24	-29
11	NA	0	57.04	-25	-25
12	NA	0	220.89	-25	-30
13	NA	0	140.46	-25	-30
14	NA	0	138.14	-25	-30
15	NA	0	107.44	-26	-25
16	NA	0	321.42	-25	-30
17	NA	0	261.61	-25	-30
18	NA	0	240.21	-24	-29
19	NA	0	148.47	-25	-25
20	NA	0	328.65	-26	-30
21	NA	0	355.35	-25	-30

22	NA	0	289.02	-25	-30
23	NA	0	192.20	-25	-25
24	NA	0	327.67	-26	-31
25	NA	0	352.31	-25	-30

Packet Loss Percentage graph shows the percentage of lost packets as detected by the receiving endpoint due to packet gaps. If there is full packet loss, then this will not report any loss since there will be no gap to detect. TCP protocol tests will never show drops since the TCP protcol will retransmit any lost frames.

CSV Data for Endpoint RX Packet Loss Percentage



Test configuration and LANforge software version	
AP Tx Power:	0
Path Loss	10
Requested Speed	85%
Requested Opposite Speed	0
Multi-Conn	1
Armageddon Multi-Pkt	1000
ToS	0
Station Bringup Wait:	30 sec (30 s)
First Byte Wait:	30 sec (30 s)
Duration:	15 sec (15 s)
Settle Time:	1 sec (1 s)
Send Buffer Size:	OS Default
Receive Buffer Size:	OS Default
RvR Helper Script:	
Channels	AUTO
Spatial Streams	AUTO
Bandwidth	No-Change
Attenuator-1	0
Attenuation-1	0..+50..950
Attenuator-2	0
Attenuation-2	0..+50..950
Turntable Chamber	0

Turntable Angles	0..+45..359
Modes	Auto
Packet Size	60, 142, 256, 512, 1024, MTU, 4000
Security	AUTO
Traffic Type	UDP, TCP
Direction	DUT Transmit, DUT Receive
Upstream Port	1.1.eth1 Firmware: 0. 6-5 Resource: lf0350-ac28
WiFi Port	1.1.sta000 Firmware: 10.1-ct-8x-__xtH-023-1d83261a Resource: lf0350-ac28
Continuous Traffic	false
Outer Loop is Attenuation	false
Show Events	true
Auto Save Report	true
Pass-Fail Tput Criteria	
Build Date	Wed 20 Apr 2022 03:39:07 PM PDT
Build Version	5.4.5
Git Version	24f9c7d438e242f3b9a22b90a55937e7af3d72f8

Key Performance Indicators CSV

META Information for Dataplane Test