Rate vs Range

2025-03-04-09-41-22

Objective

The objective of this RVR test is to assess the performance of the Device Under Test (DUT) across varying distances by emulating real-world attenuation using programmable attenuators. This test measures throughput at each RSSI step, providing insights into signal strength, link quality, and data transmission efficiency. The results enable the analysis of upstream and downstream RSSI curves for different traffic types and station configurations using LANforge Interop.

Device Under Test	AP Model	Test-AP
	Number of Stations	Android(9), IOS(1), Windows(4), Linux(6), Mac(1)
	SSID	VINTROP_wpa2
	Password	lanforge
	Encryption	wpa2
	Traffic Direction	Bidirectional
	Traffic Pumped for each Station	10 Mbps
	Test Duration	0:09:56

Overall upload and download throughput for 21 real clients using TCP traffic.

The below graph represents overall upload and download throughput for different attenuation levels

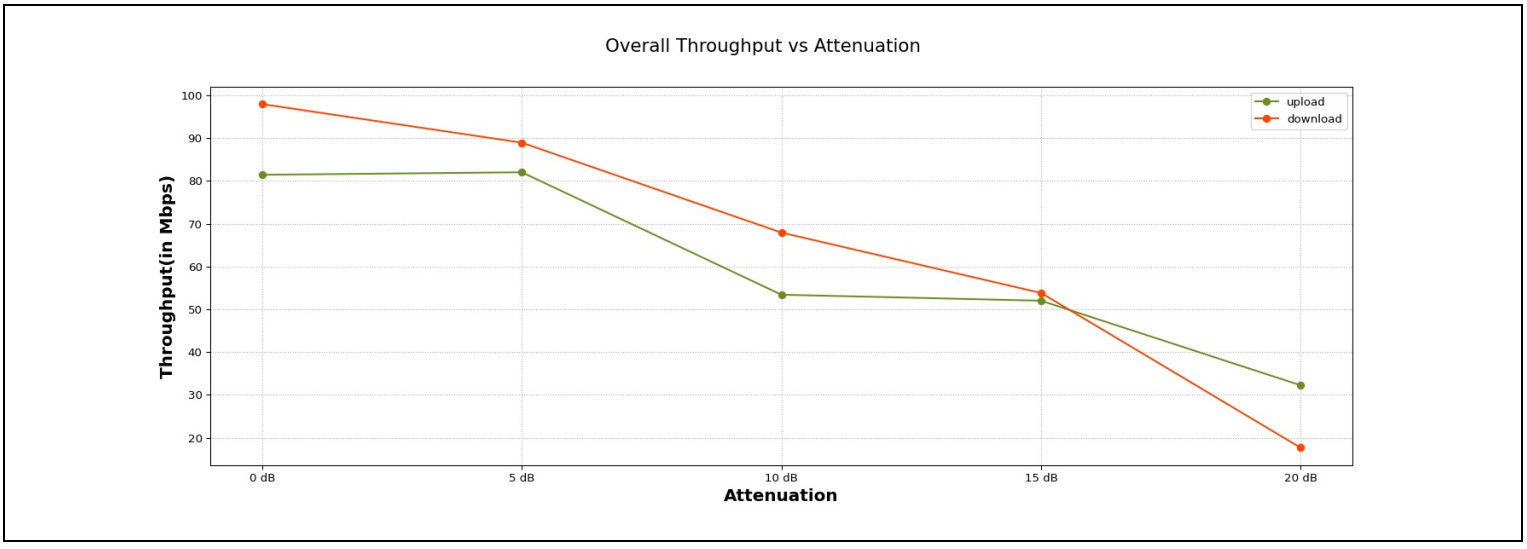
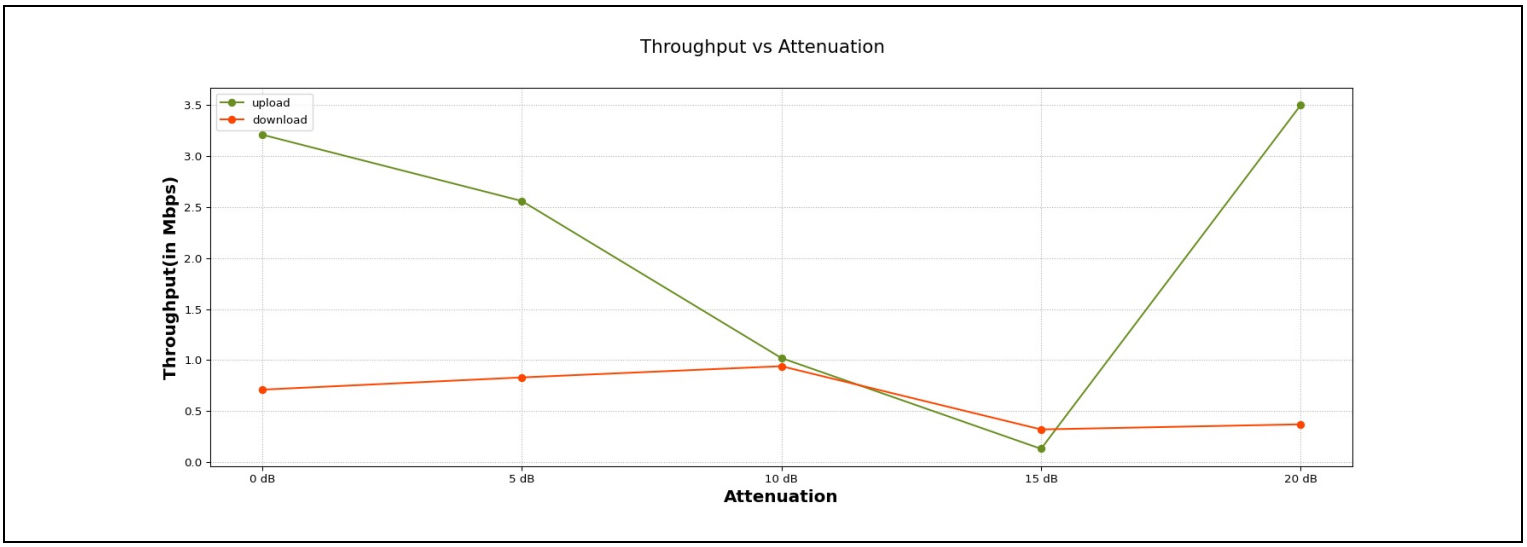


Table for Graph

Attenuation Step(dB)	Upload Throughput(Mbps)	Download Throughput(Mbps)
0 dB	81.45	97.97
5 dB	82.04	88.96
10 dB	53.42	67.94
15 dB	52.02	53.83
20 dB	32.25	17.64

Vivo1938 : TCP bidirectional



Vivo1938 : TCP RSSI Strength(in dBm)

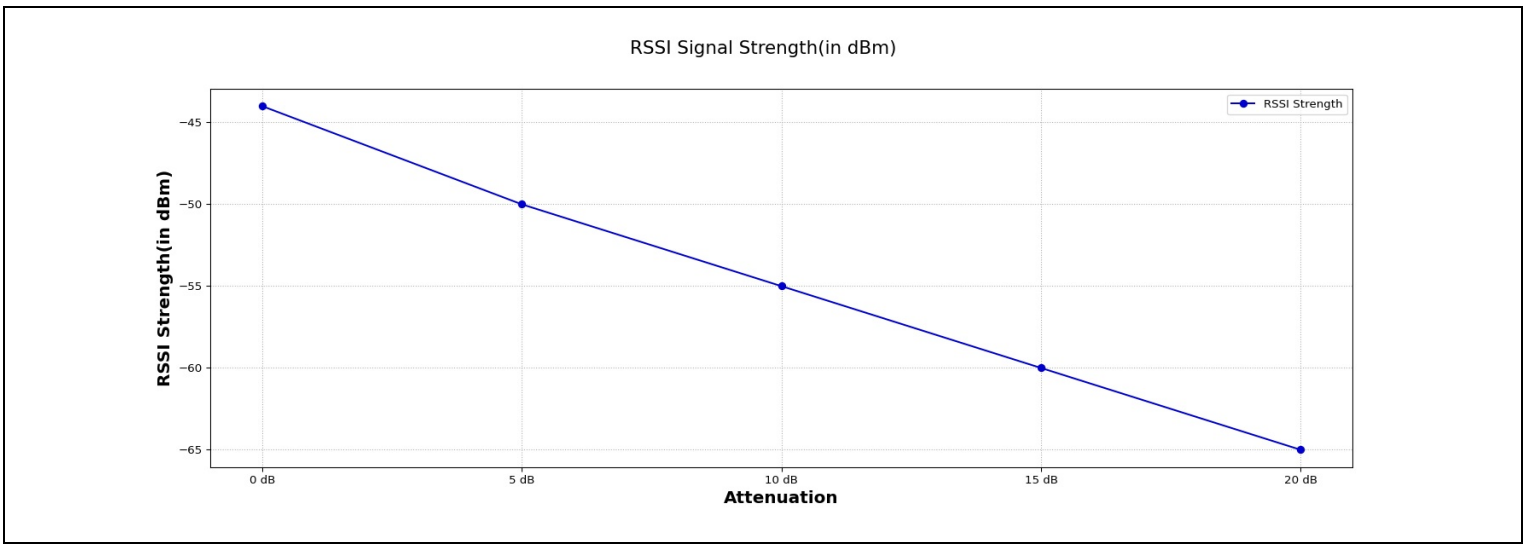
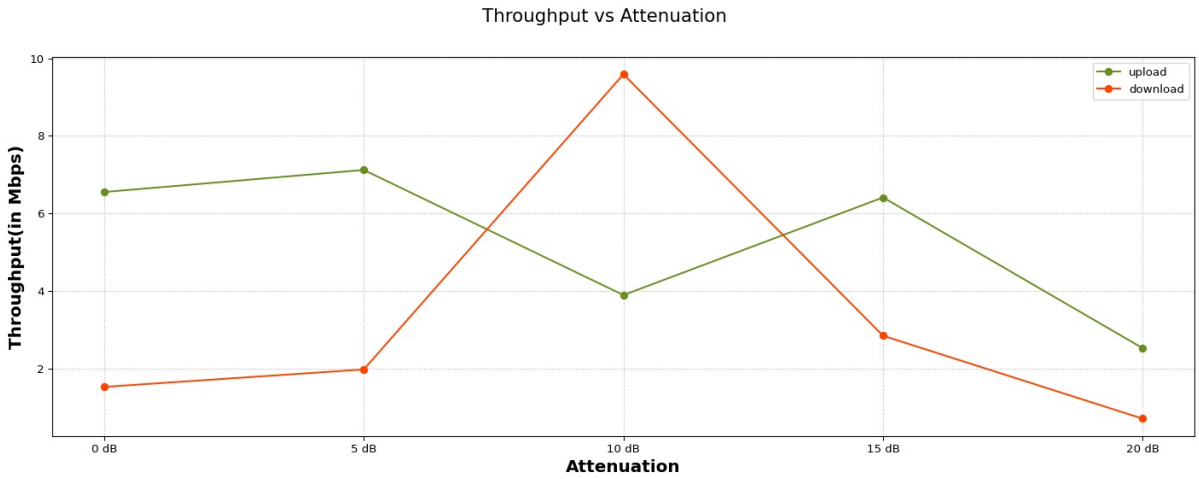


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-44	3.21	0.71
5 dB	-50	2.56	0.83
10 dB	-55	1.02	0.94
15 dB	-60	0.13	0.32
20 dB	-65	3.50	0.37

Near_Mobile_1 : TCP bidirectional



Near_Mobile_1 : TCP RSSI Strength(in dBm)

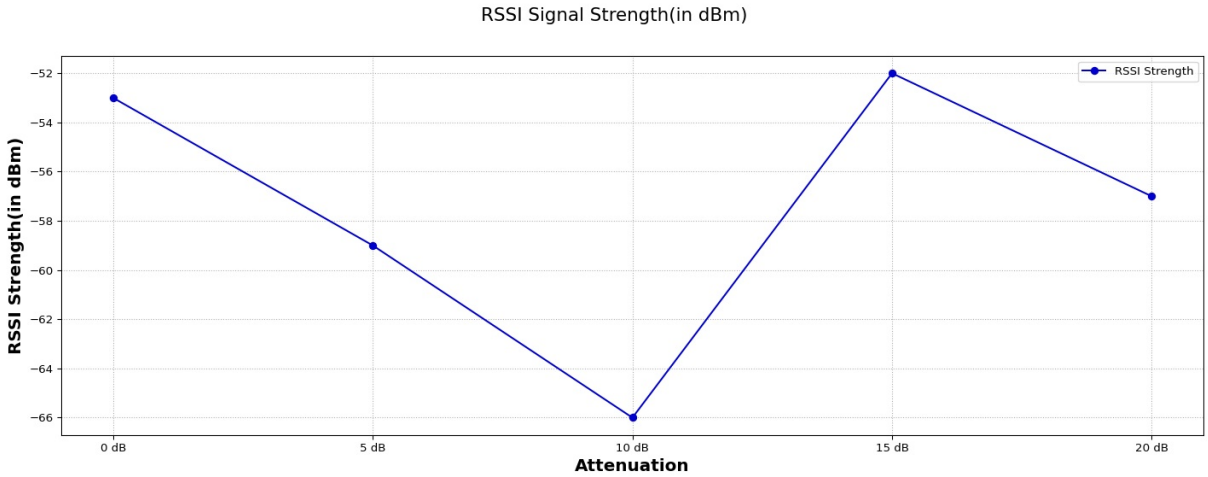
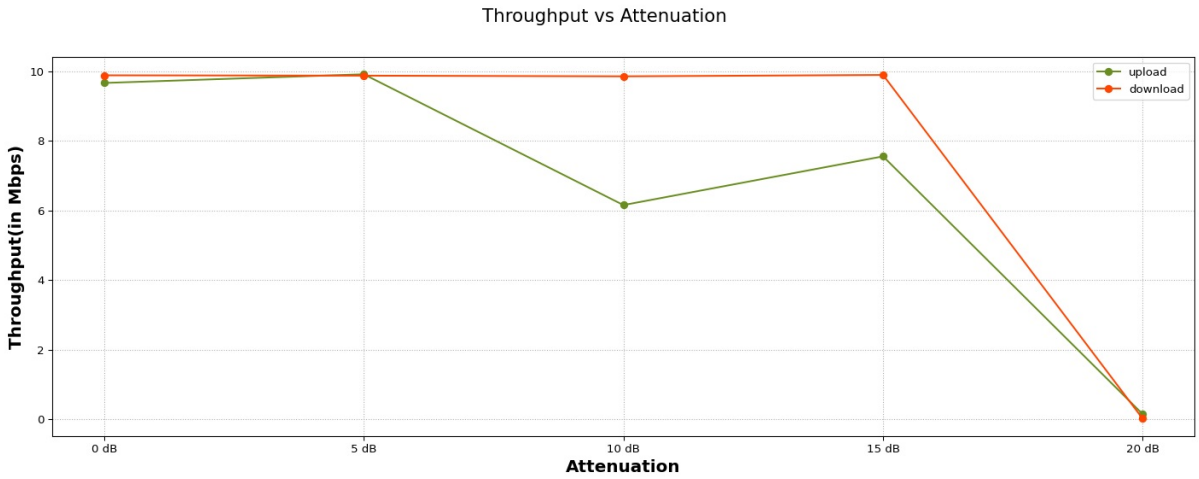


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-53	6.55	1.52
5 dB	-59	7.12	1.97
10 dB	-66	3.89	9.59
15 dB	-52	6.41	2.84
20 dB	-57	2.52	0.70

v2111 : TCP bidirectional



v2111 : TCP RSSI Strength(in dBm)

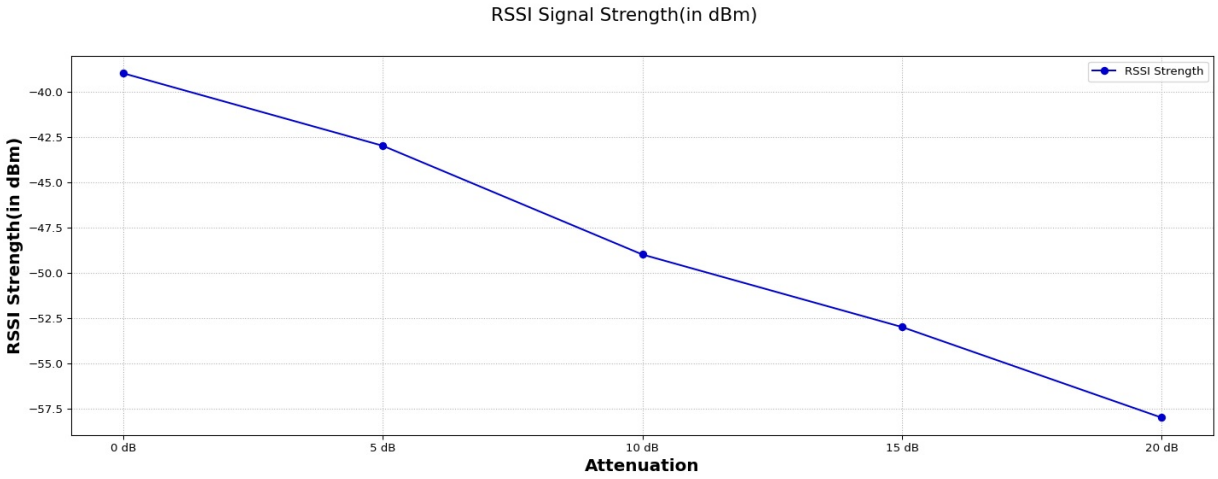
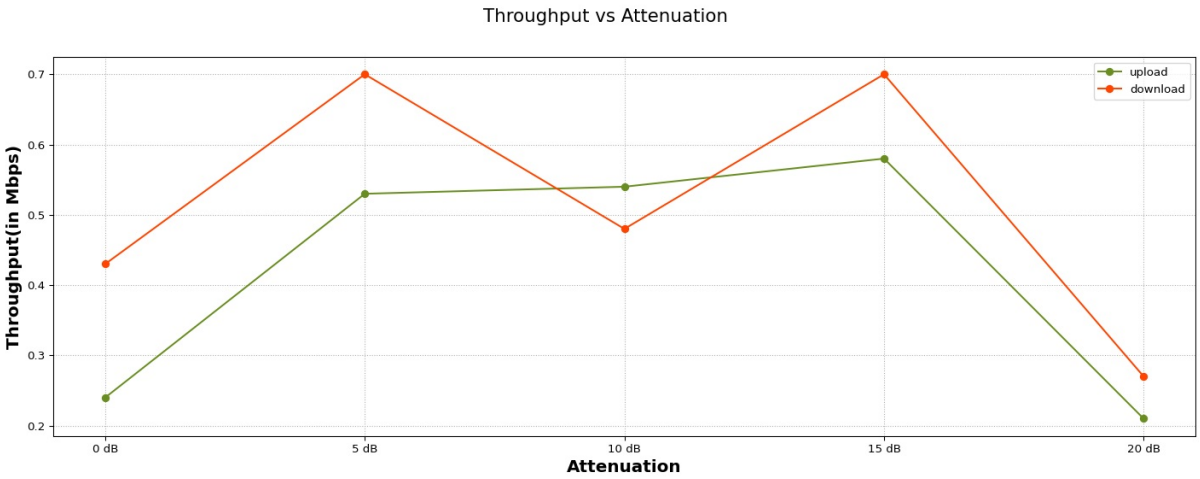


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-39	9.67	9.89
5 dB	-43	9.92	9.88
10 dB	-49	6.16	9.86
15 dB	-53	7.56	9.90
20 dB	-58	0.15	0.02

Huawei_STKL22 : TCP bidirectional



Huawei_STKL22 : TCP RSSI Strength(in dBm)

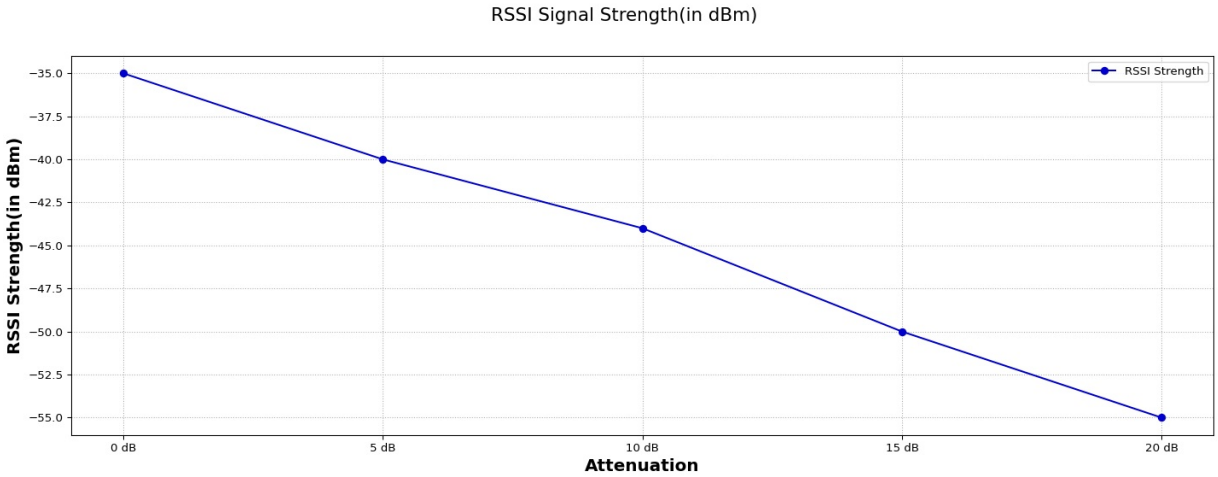
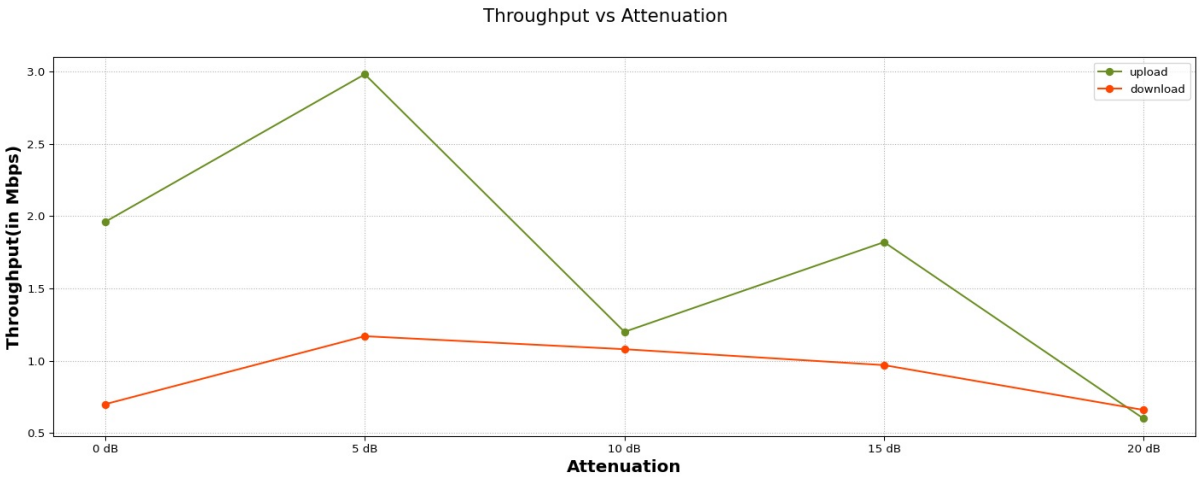


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-35	0.24	0.43
5 dB	-40	0.53	0.70
10 dB	-44	0.54	0.48
15 dB	-50	0.58	0.70
20 dB	-55	0.21	0.27

10.orG : TCP bidirectional



10.orG : TCP RSSI Strength(in dBm)

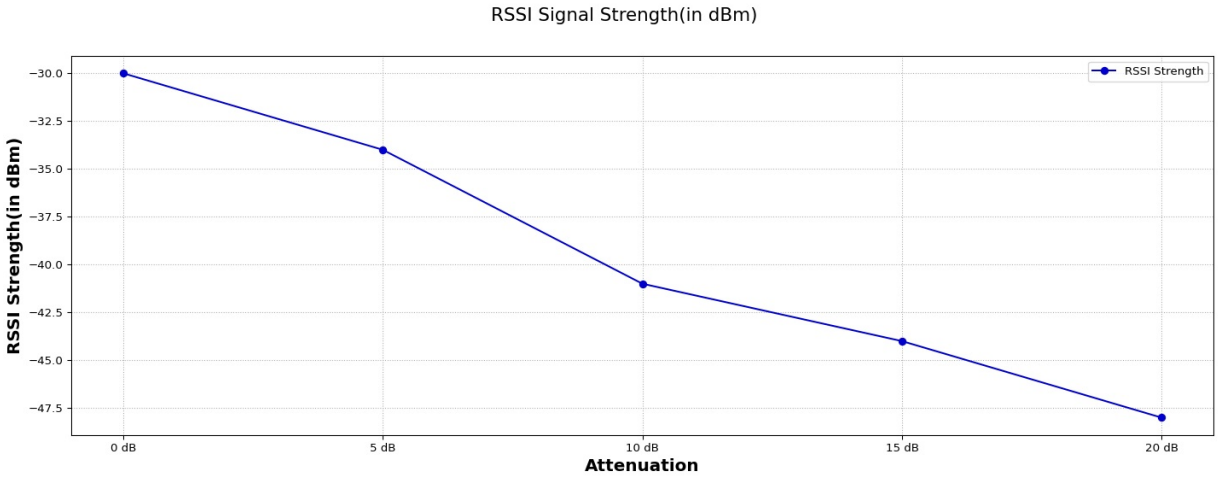
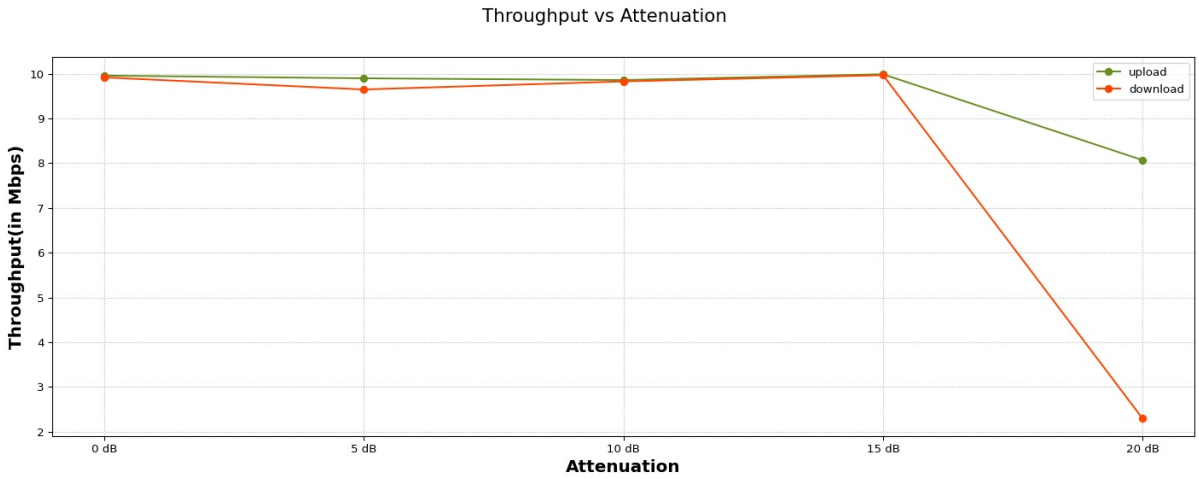


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-30	1.96	0.70
5 dB	-34	2.98	1.17
10 dB	-41	1.20	1.08
15 dB	-44	1.82	0.97
20 dB	-48	0.60	0.66

SamsungT2_tab : TCP bidirectional



SamsungT2_tab : TCP RSSI Strength(in dBm)

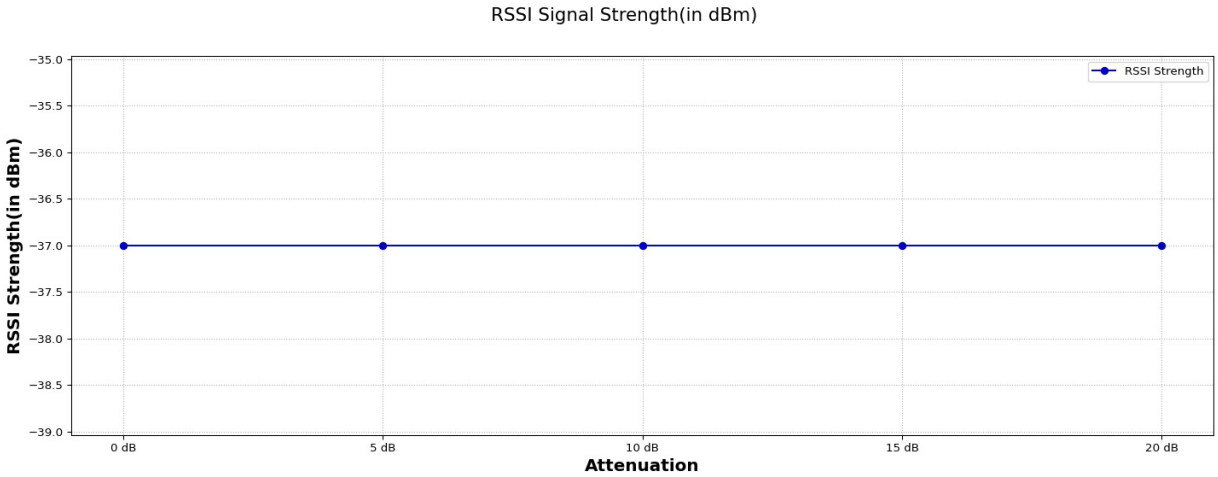
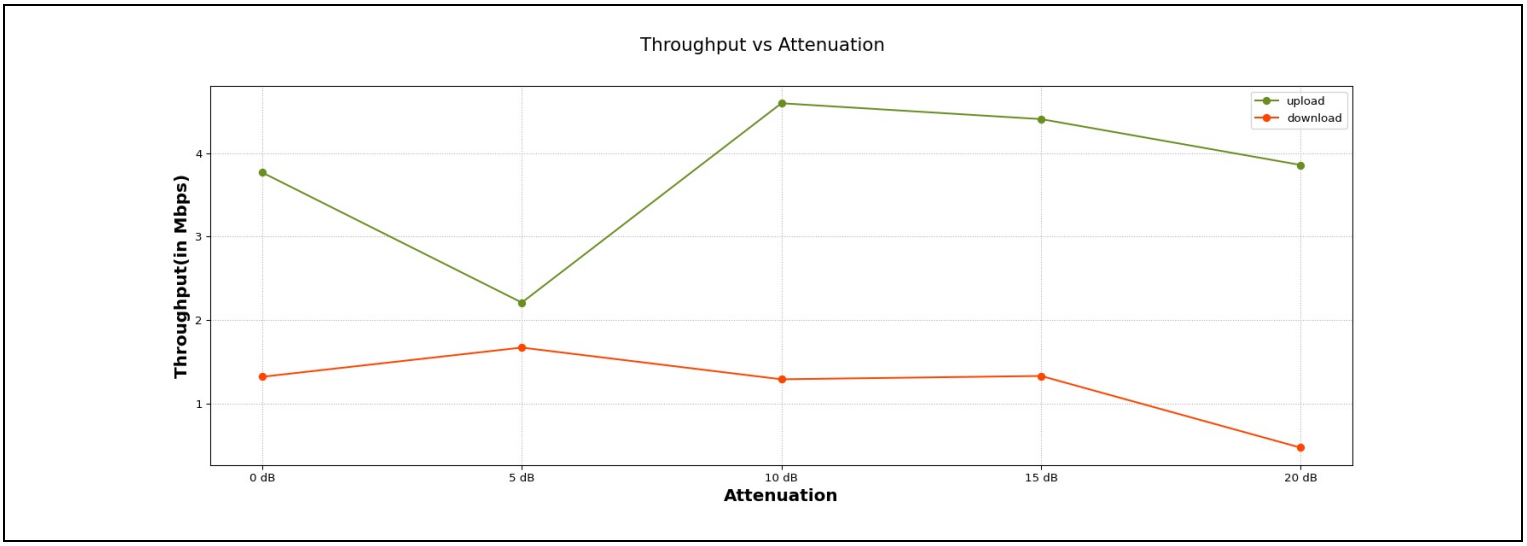


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-37	9.96	9.92
5 dB	-37	9.90	9.65
10 dB	-37	9.86	9.83
15 dB	-37	9.99	9.97
20 dB	-37	8.07	2.29

Vivo2030 : TCP bidirectional



Vivo2030 : TCP RSSI Strength(in dBm)

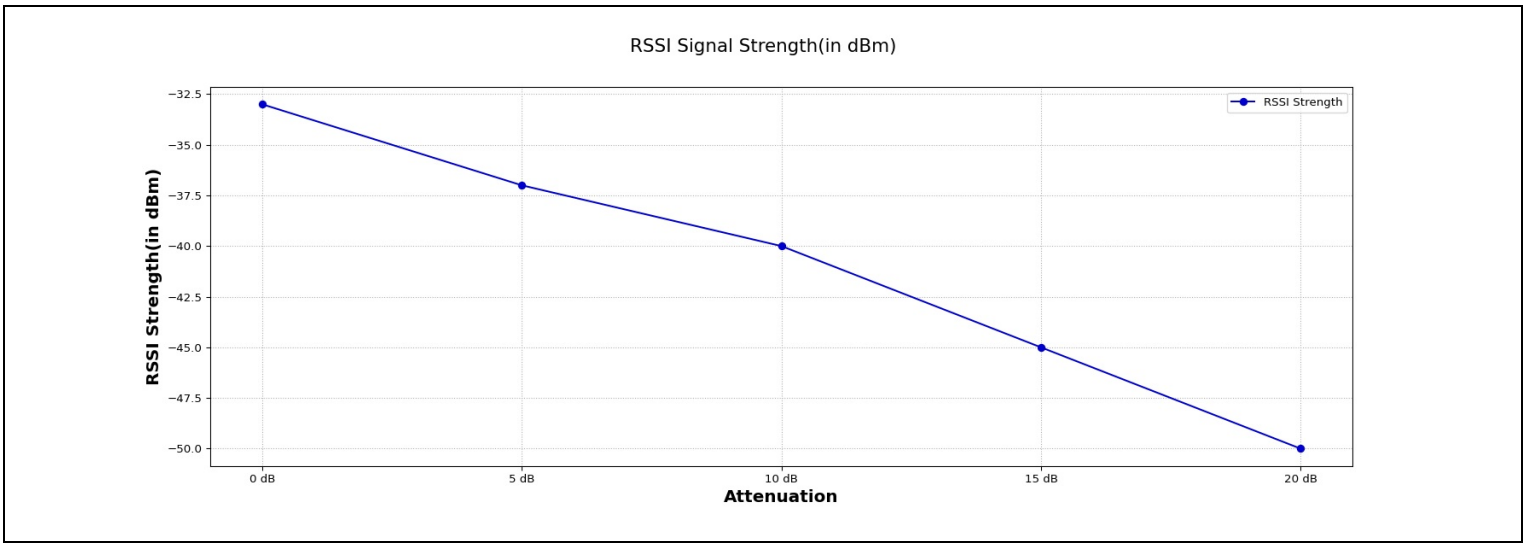
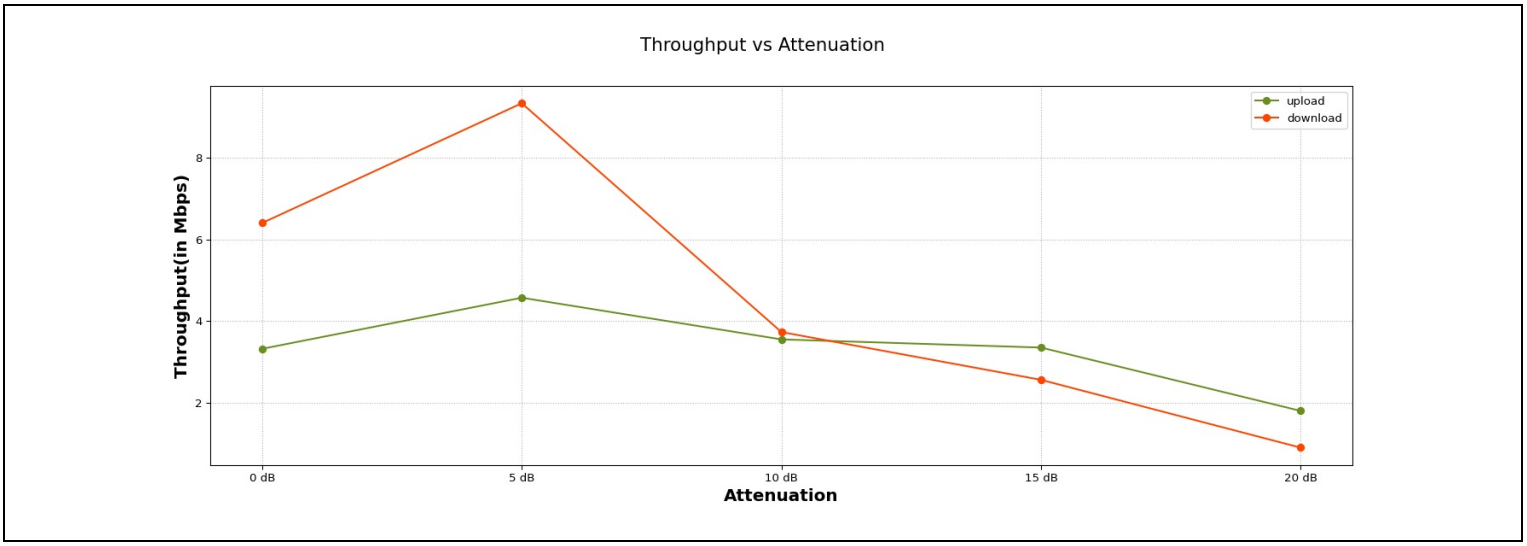


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-33	3.77	1.32
5 dB	-37	2.21	1.67
10 dB	-40	4.60	1.29
15 dB	-45	4.41	1.33
20 dB	-50	3.86	0.47

Oppo1931 : TCP bidirectional



Oppo1931 : TCP RSSI Strength(in dBm)

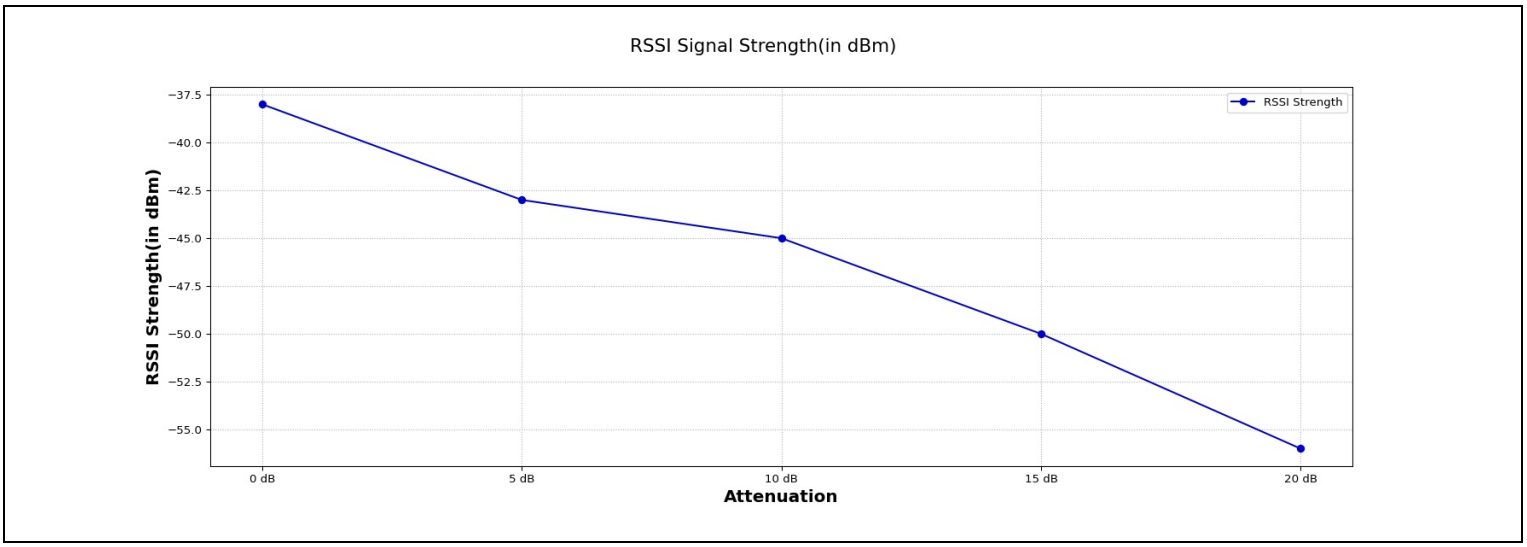
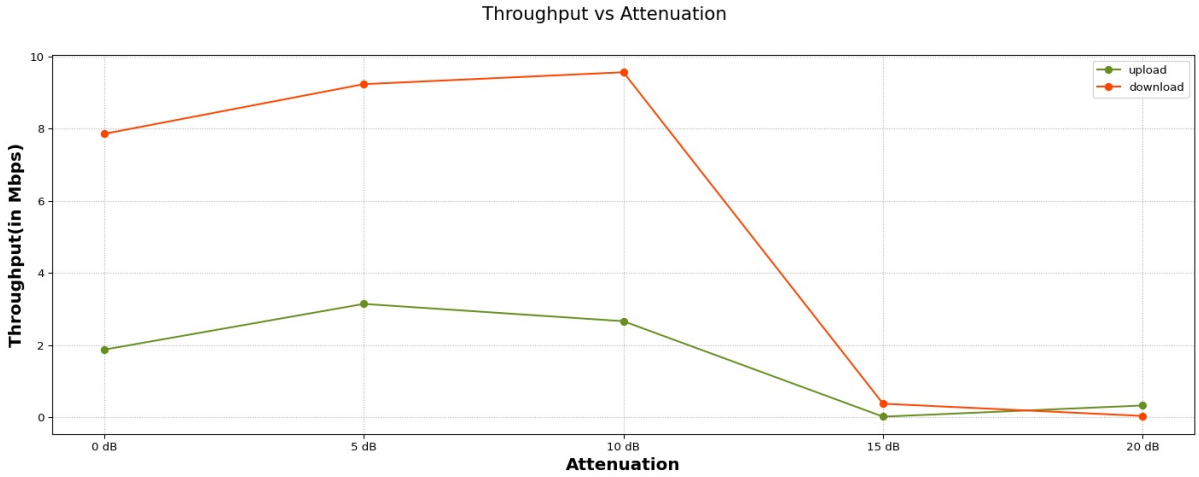


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-38	3.32	6.40
5 dB	-43	4.57	9.33
10 dB	-45	3.55	3.73
15 dB	-50	3.35	2.56
20 dB	-56	1.80	0.90

iPhone_14 : TCP bidirectional



iPhone_14 : TCP RSSI Strength(in dBm)

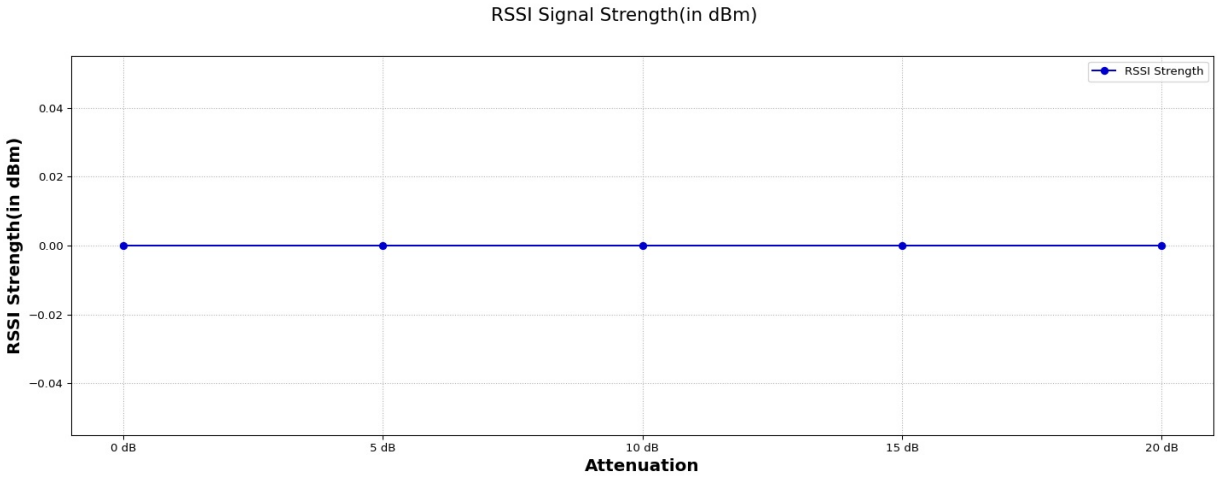
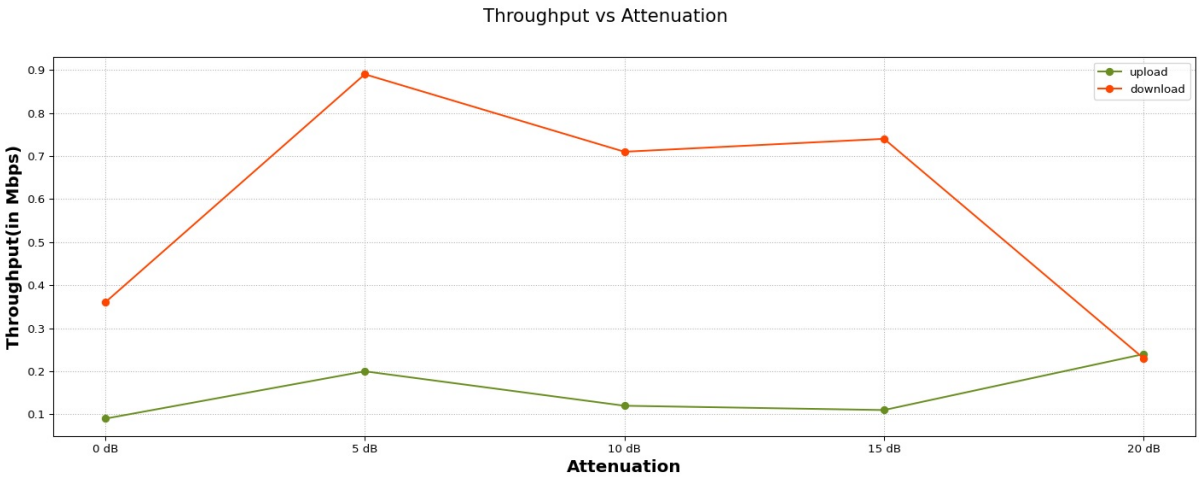


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	0	1.87	7.86
5 dB	0	3.14	9.24
10 dB	0	2.66	9.57
15 dB	0	0.01	0.37
20 dB	0	0.32	0.03

SamsungM30 : TCP bidirectional



SamsungM30 : TCP RSSI Strength(in dBm)

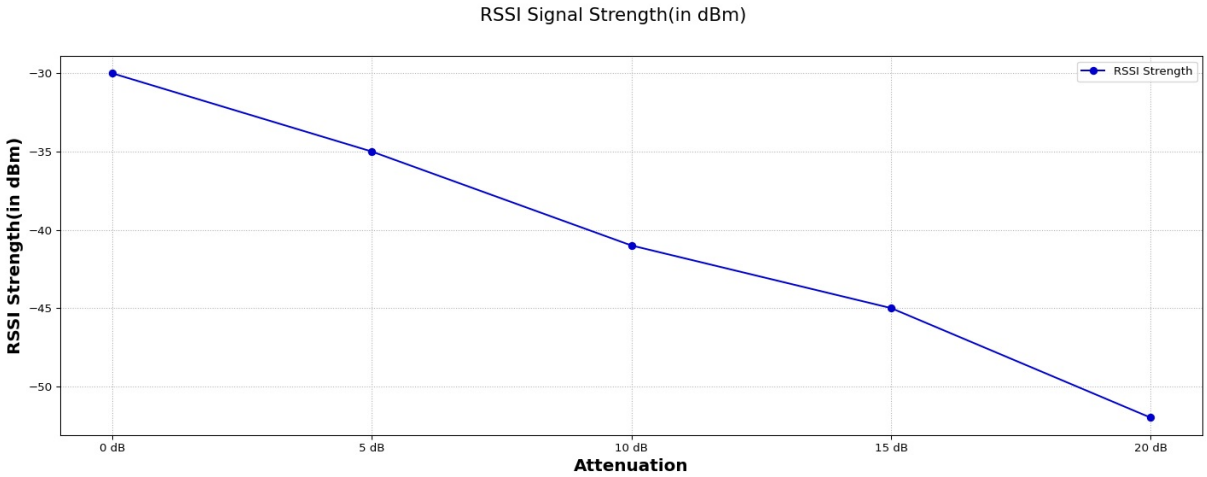
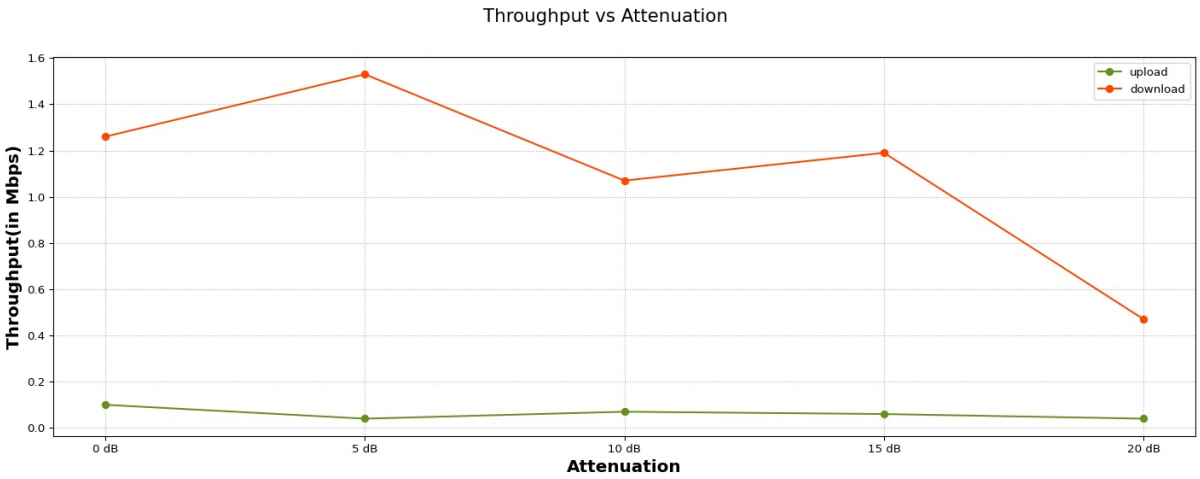


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-30	0.09	0.36
5 dB	-35	0.20	0.89
10 dB	-41	0.12	0.71
15 dB	-45	0.11	0.74
20 dB	-52	0.24	0.23

DESKTOP-3OSF0BQ : TCP bidirectional



DESKTOP-3OSF0BQ : TCP RSSI Strength(in dBm)

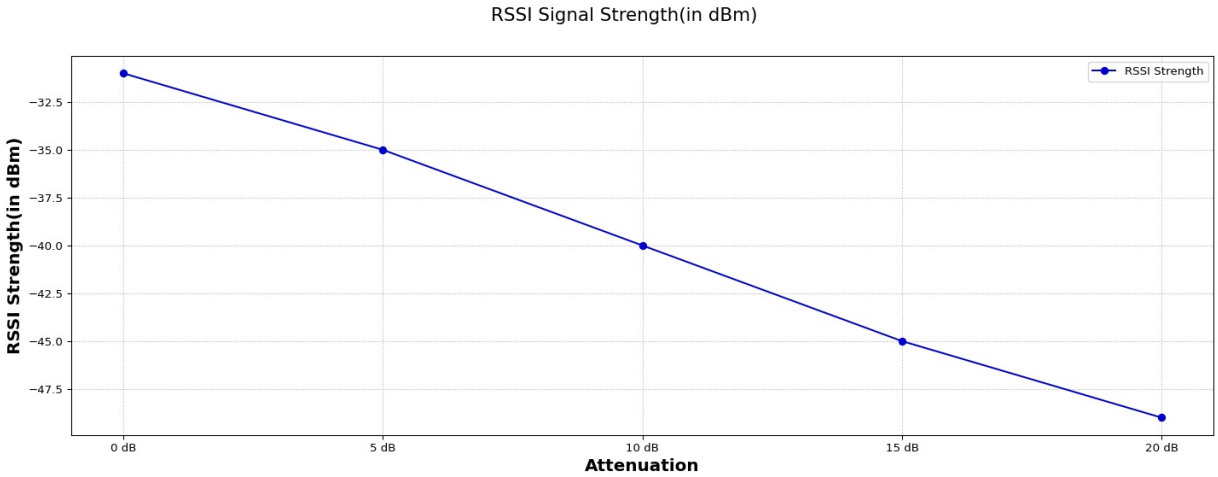
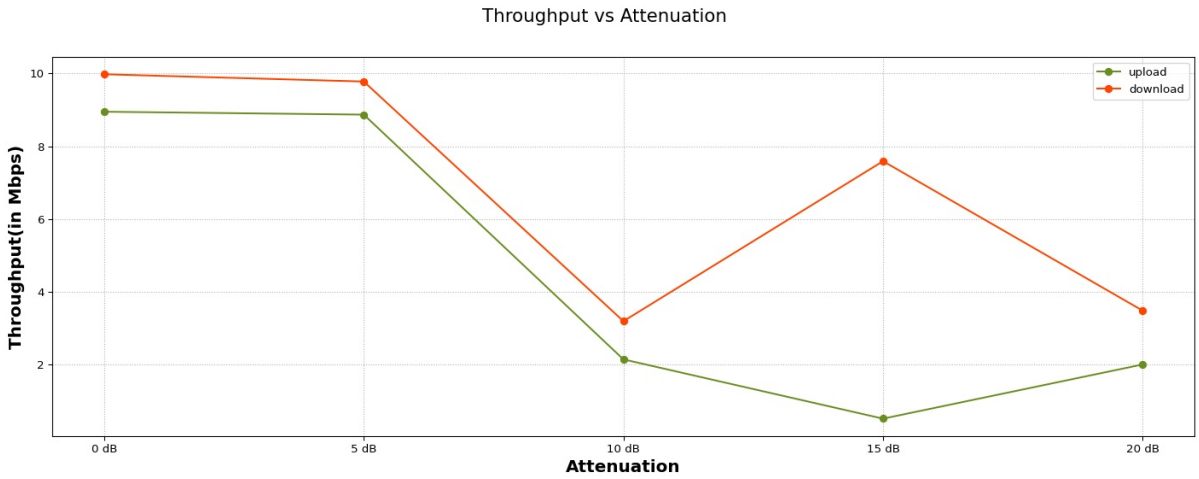


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-31	0.10	1.26
5 dB	-35	0.04	1.53
10 dB	-40	0.07	1.07
15 dB	-45	0.06	1.19
20 dB	-49	0.04	0.47

Dell : TCP bidirectional



Dell : TCP RSSI Strength(in dBm)

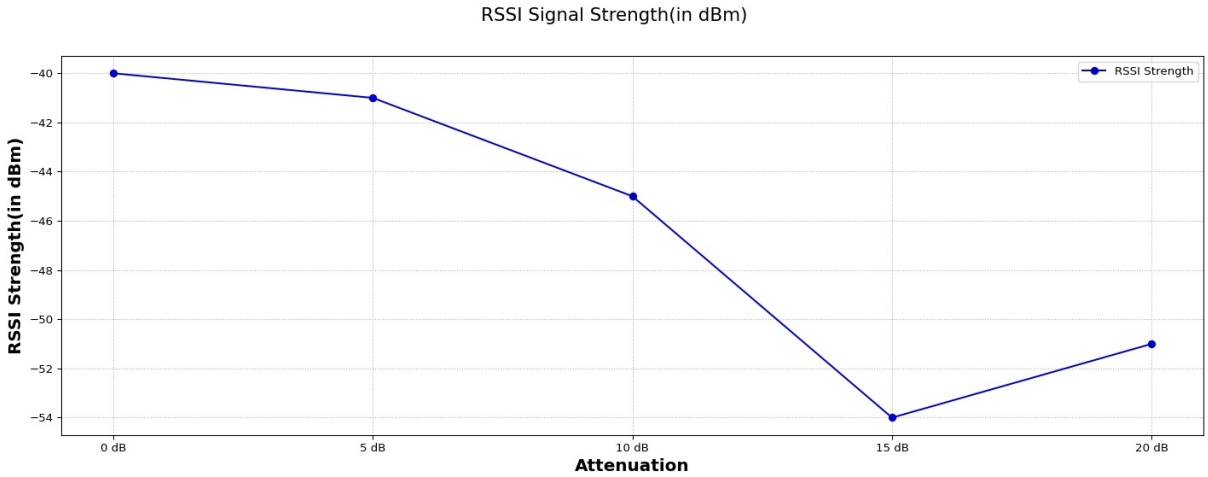
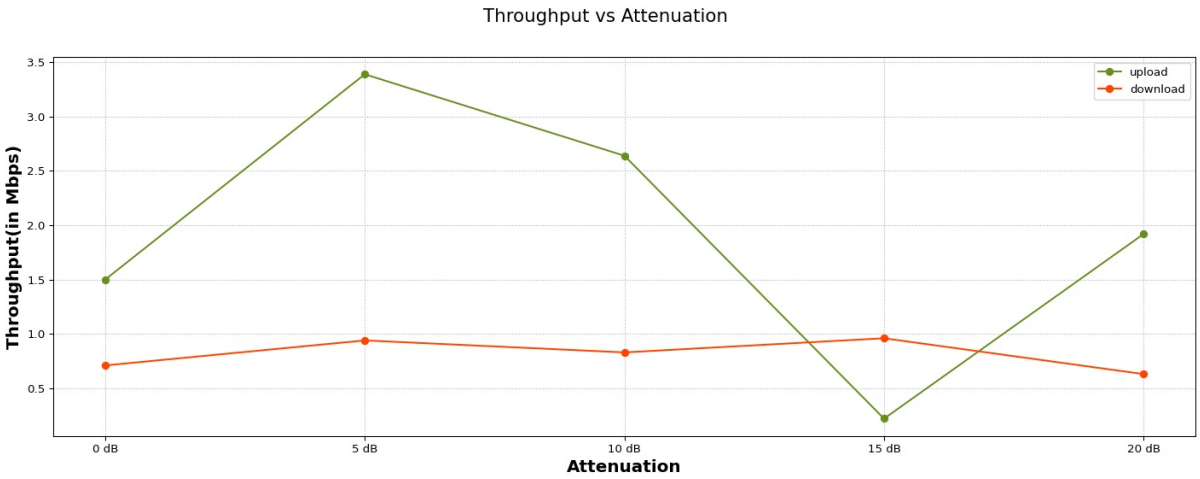


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-40	8.95	9.98
5 dB	-41	8.87	9.78
10 dB	-45	2.14	3.19
15 dB	-54	0.51	7.59
20 dB	-51	2.00	3.48

LAPTOP-G2P1JQDP : TCP bidirectional



LAPTOP-G2P1JQDP : TCP RSSI Strength(in dBm)

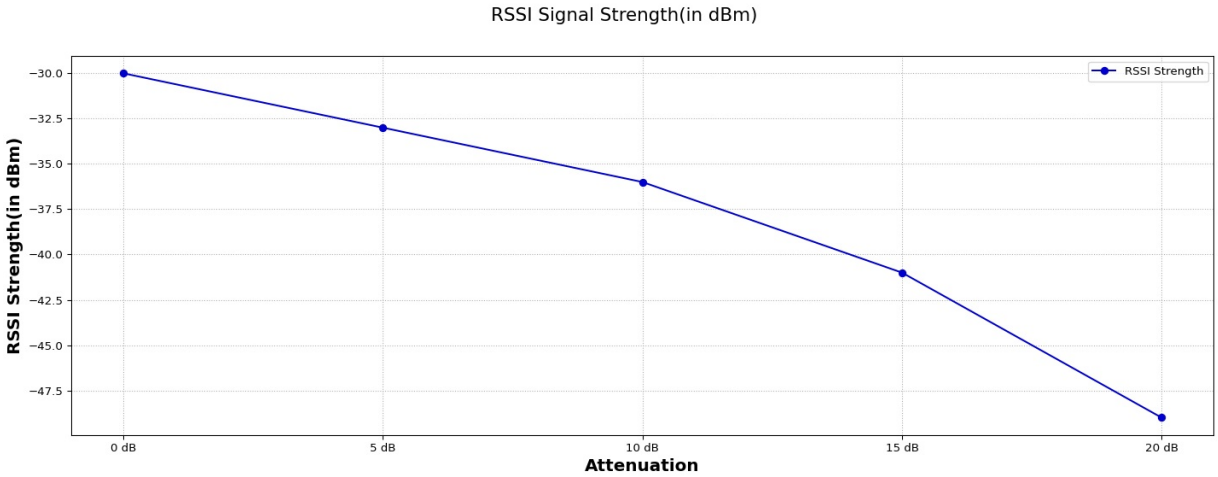
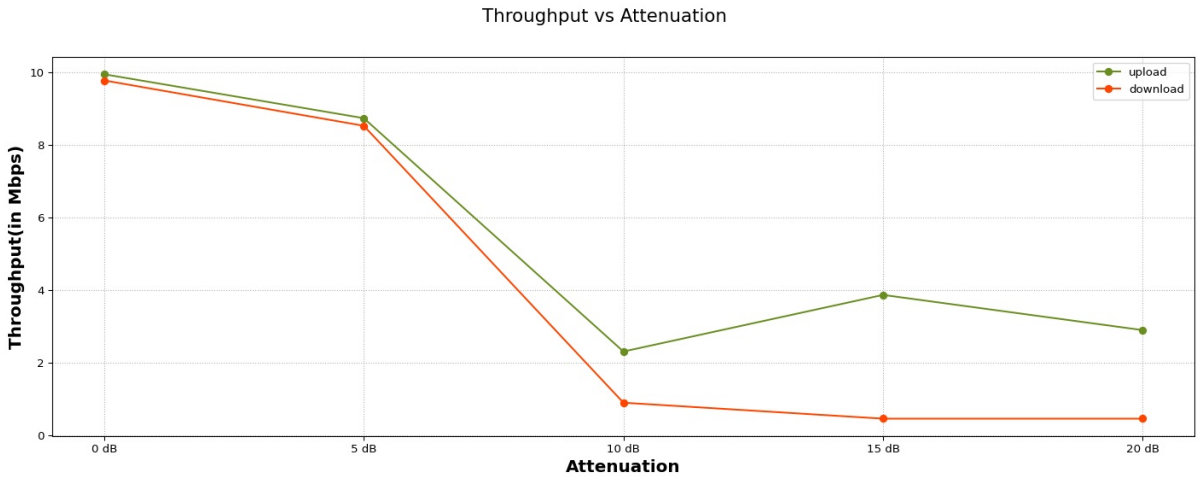


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-30	1.50	0.71
5 dB	-33	3.39	0.94
10 dB	-36	2.64	0.83
15 dB	-41	0.22	0.96
20 dB	-49	1.92	0.63

test5 : TCP bidirectional



test5 : TCP RSSI Strength(in dBm)

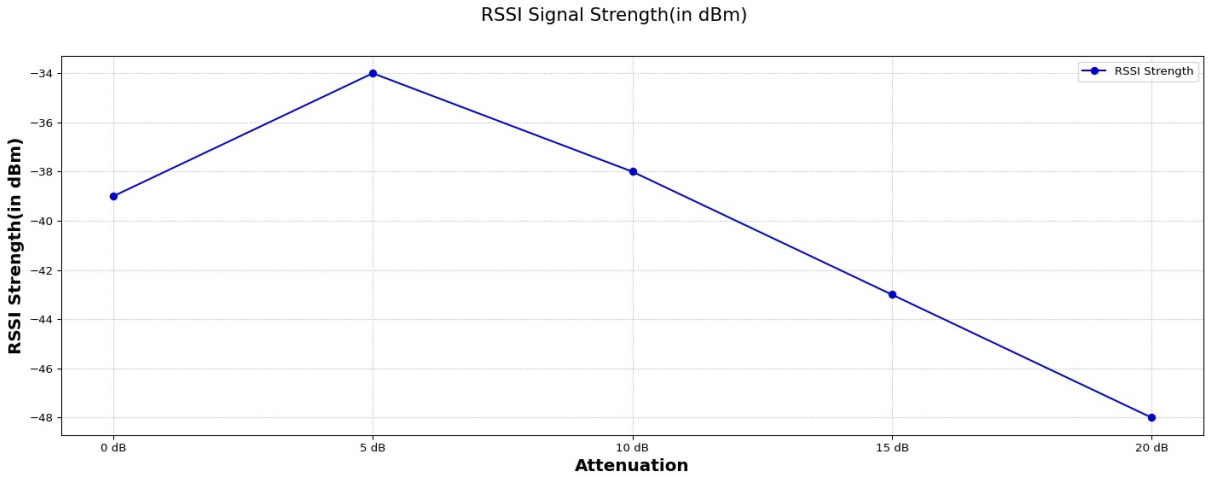
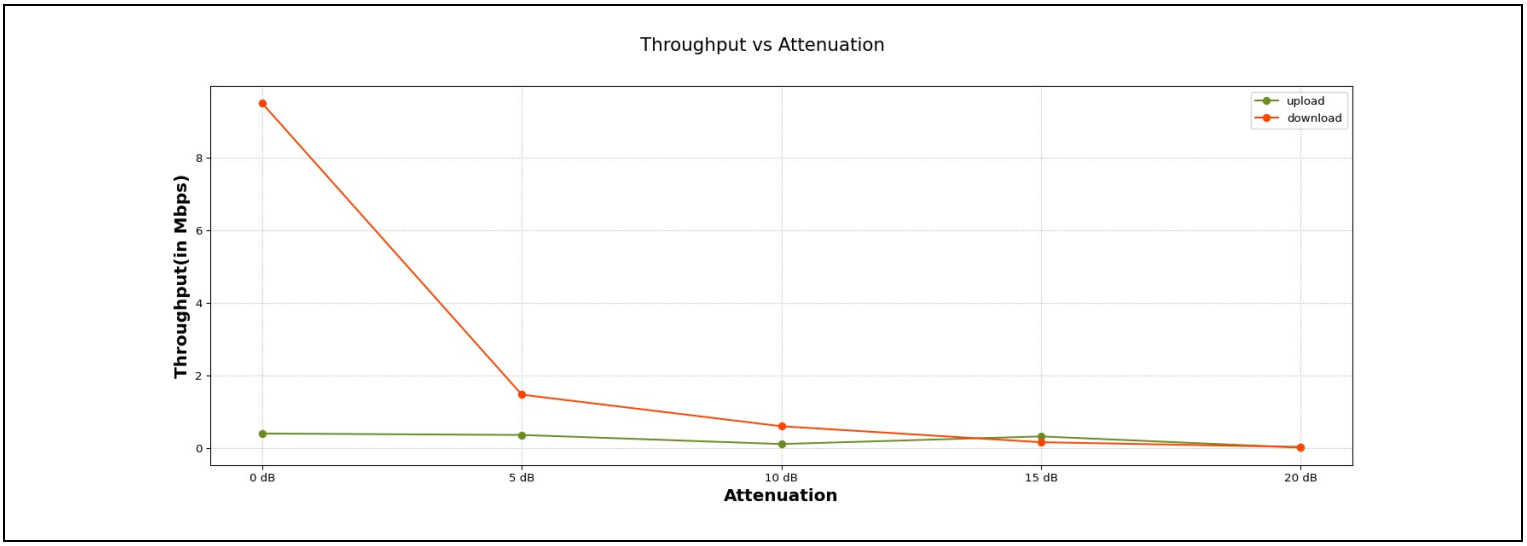


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-39	9.94	9.77
5 dB	-34	8.73	8.52
10 dB	-38	2.30	0.89
15 dB	-43	3.86	0.45
20 dB	-48	2.89	0.45

test50 : TCP bidirectional



test50 : TCP RSSI Strength(in dBm)

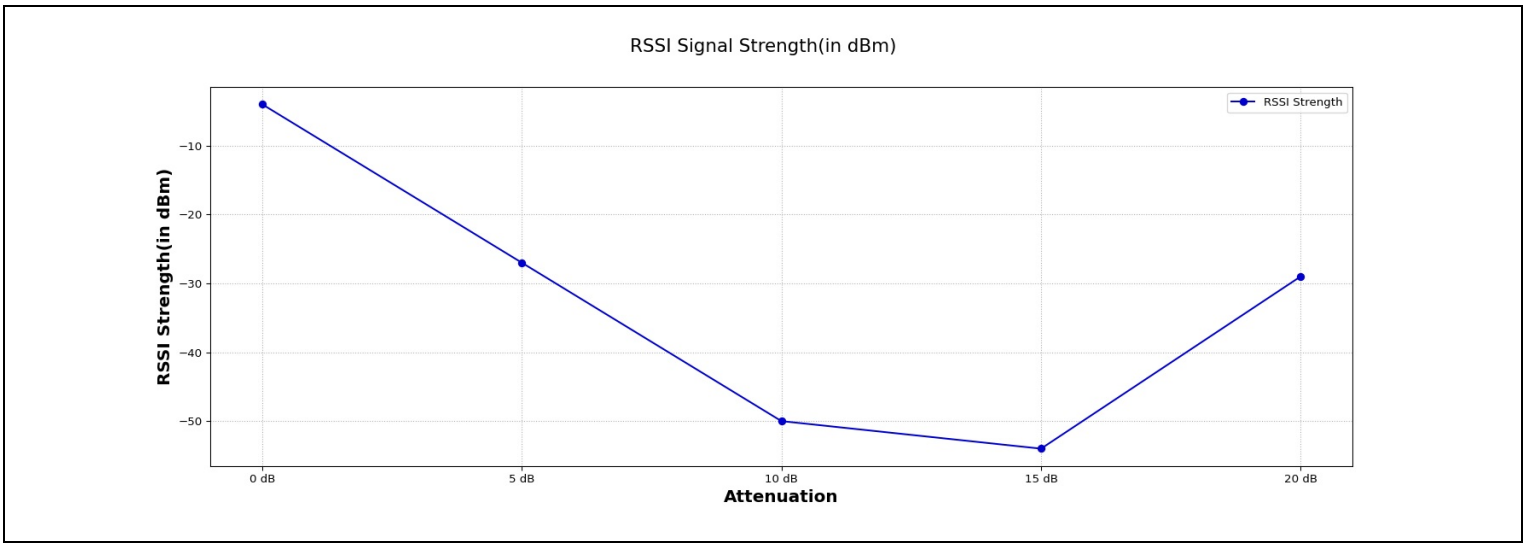
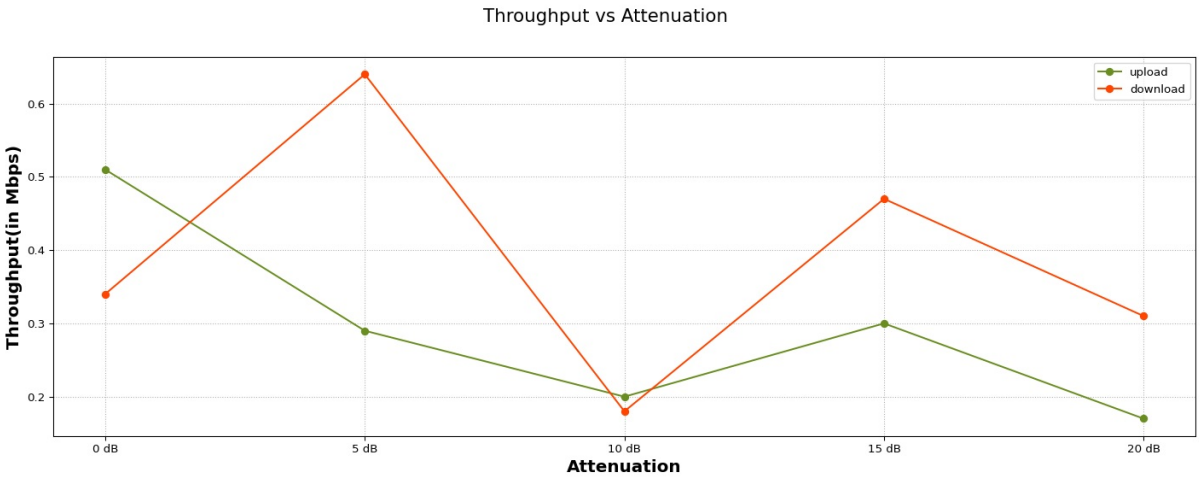


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-4	0.40	9.50
5 dB	-27	0.36	1.47
10 dB	-50	0.11	0.60
15 dB	-54	0.32	0.16
20 dB	-29	0.01	0.03

test : TCP bidirectional



test : TCP RSSI Strength(in dBm)

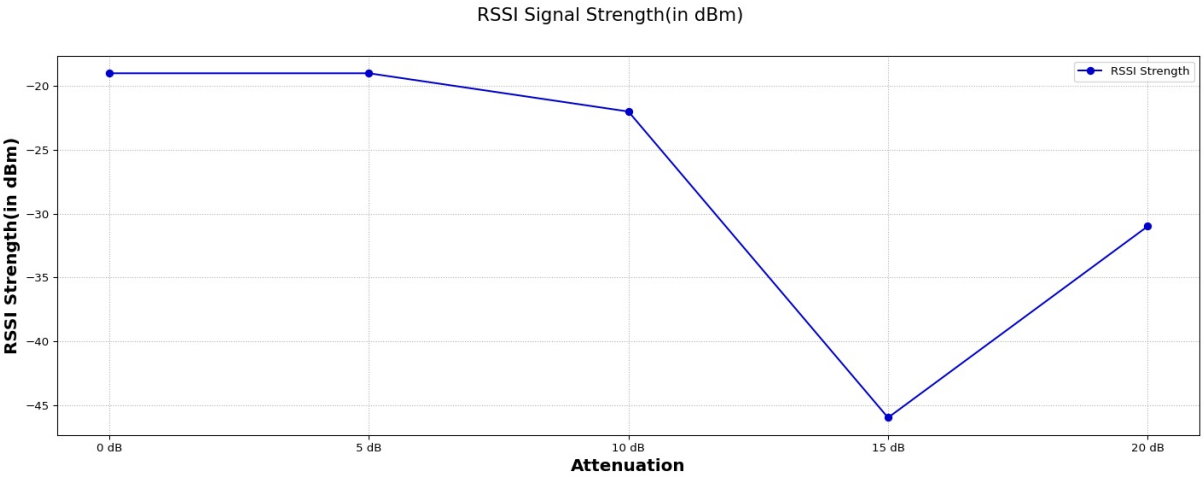
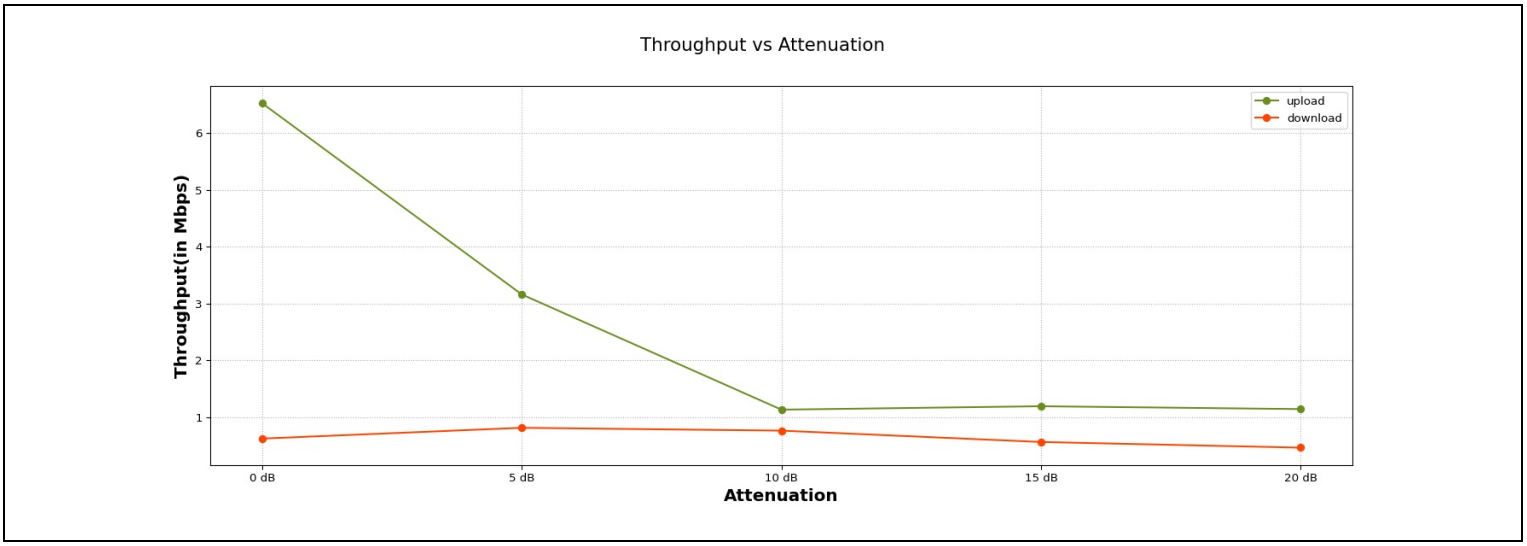


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-19	0.51	0.34
5 dB	-19	0.29	0.64
10 dB	-22	0.20	0.18
15 dB	-46	0.30	0.47
20 dB	-31	0.17	0.31

test2 : TCP bidirectional



test2 : TCP RSSI Strength(in dBm)

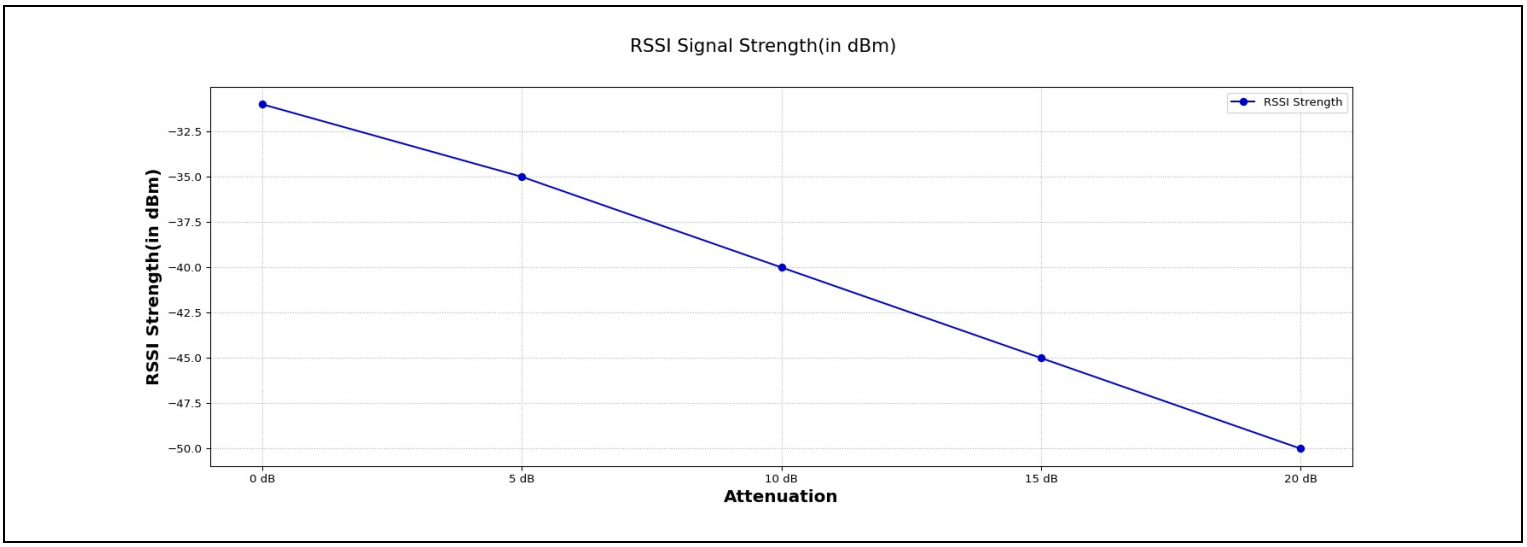
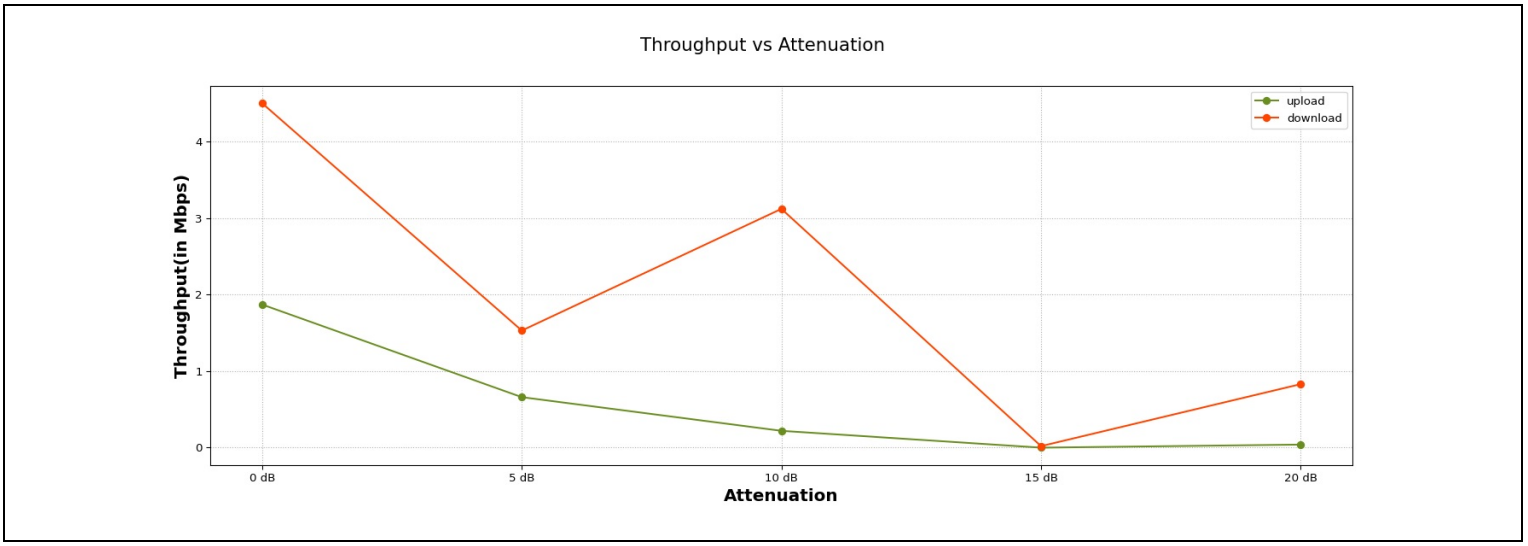


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-31	6.53	0.62
5 dB	-35	3.16	0.81
10 dB	-40	1.13	0.76
15 dB	-45	1.19	0.56
20 dB	-50	1.14	0.46

test4 : TCP bidirectional



test4 : TCP RSSI Strength(in dBm)

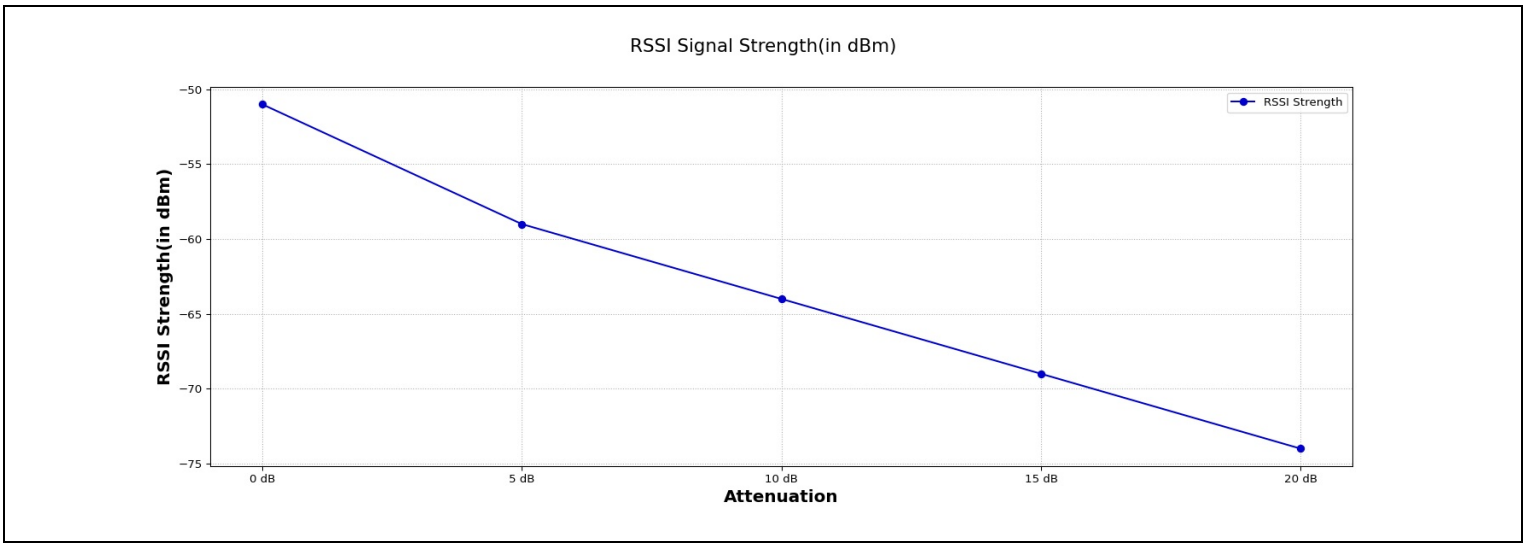


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-51	1.87	4.50
5 dB	-59	0.66	1.53
10 dB	-64	0.22	3.12
15 dB	-69	0.00	0.02
20 dB	-74	0.04	0.83

hp : TCP bidirectional

hp : TCP RSSI Strength(in dBm)

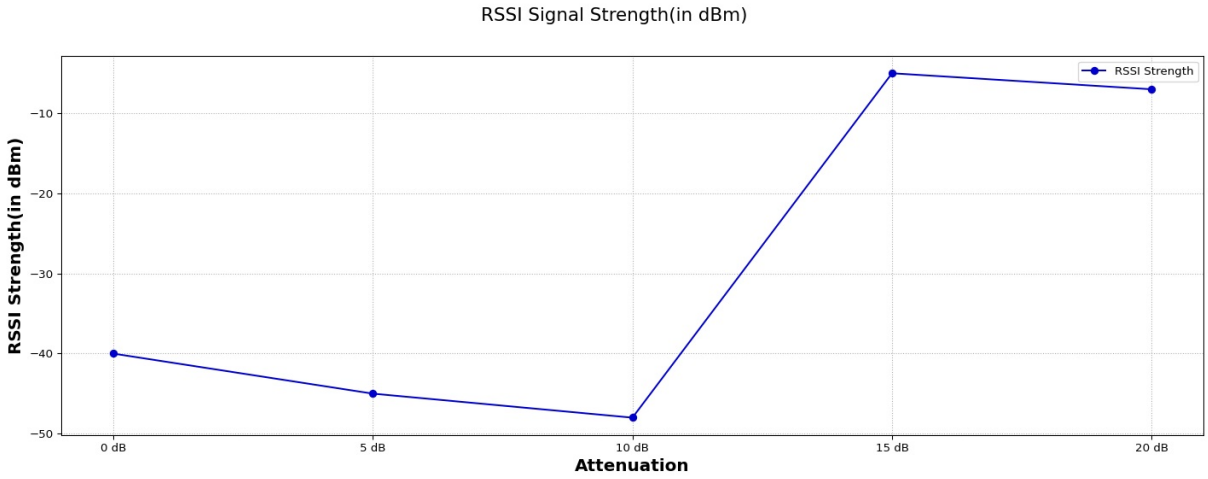
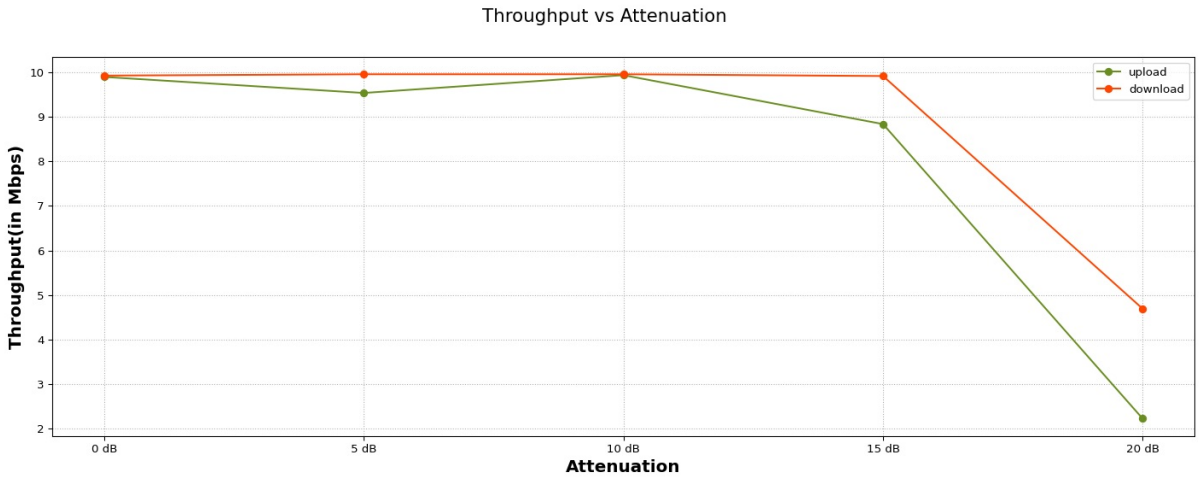


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-40	0.75	6.04
5 dB	-45	0.85	0.19
10 dB	-48	0.26	0.07
15 dB	-5	0.17	2.13
20 dB	-7	0.04	0.06

admins-MacBook-Air.local : TCP bidirectional



admins-MacBook-Air.local : TCP RSSI Strength(in dBm)

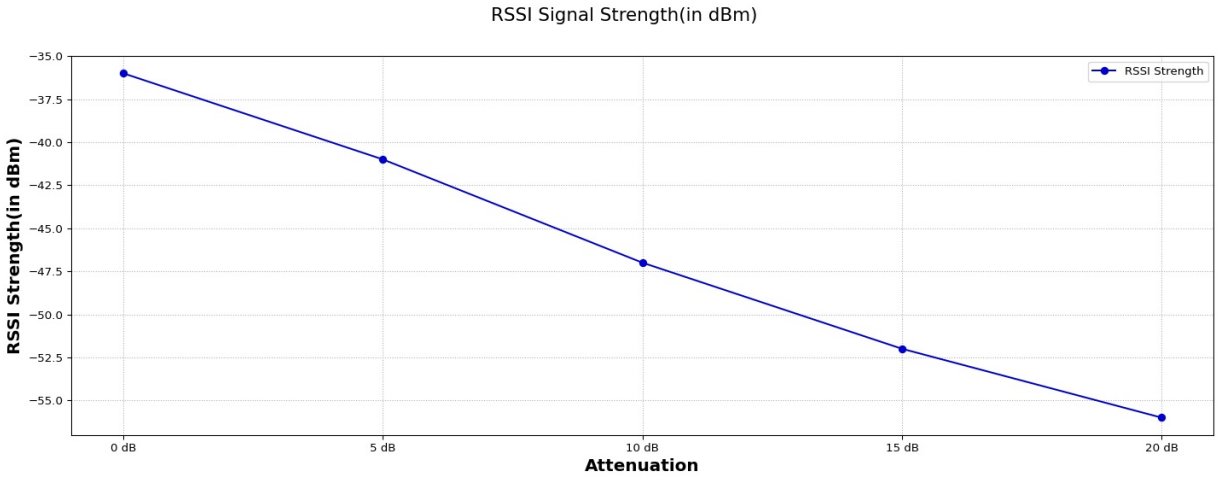
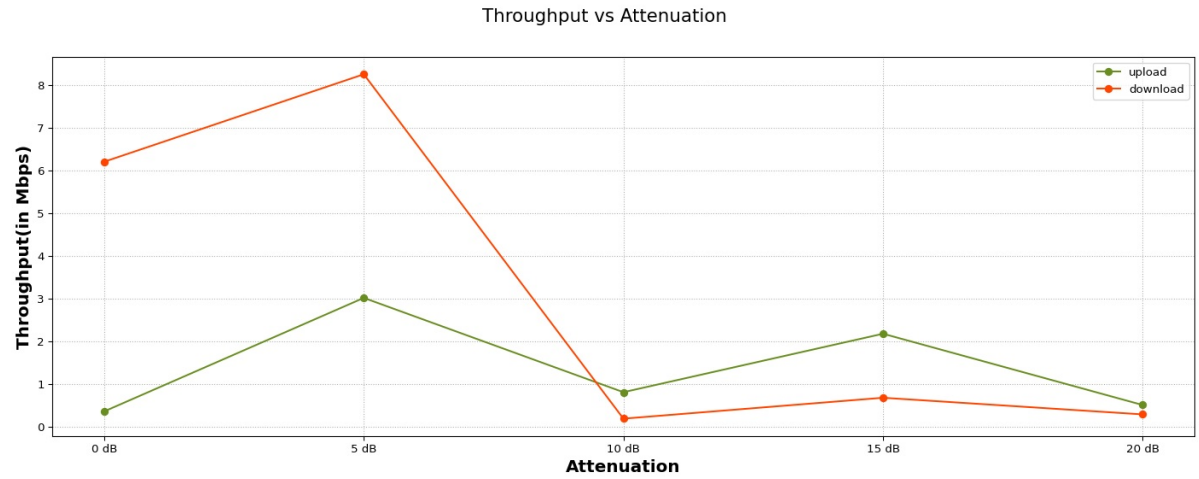


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	-36	9.90	9.93
5 dB	-41	9.54	9.96
10 dB	-47	9.94	9.96
15 dB	-52	8.84	9.92
20 dB	-56	2.22	4.69

DESKTOP-ANHCCC5 : TCP bidirectional



DESKTOP-ANHCCC5 : TCP RSSI Strength(in dBm)

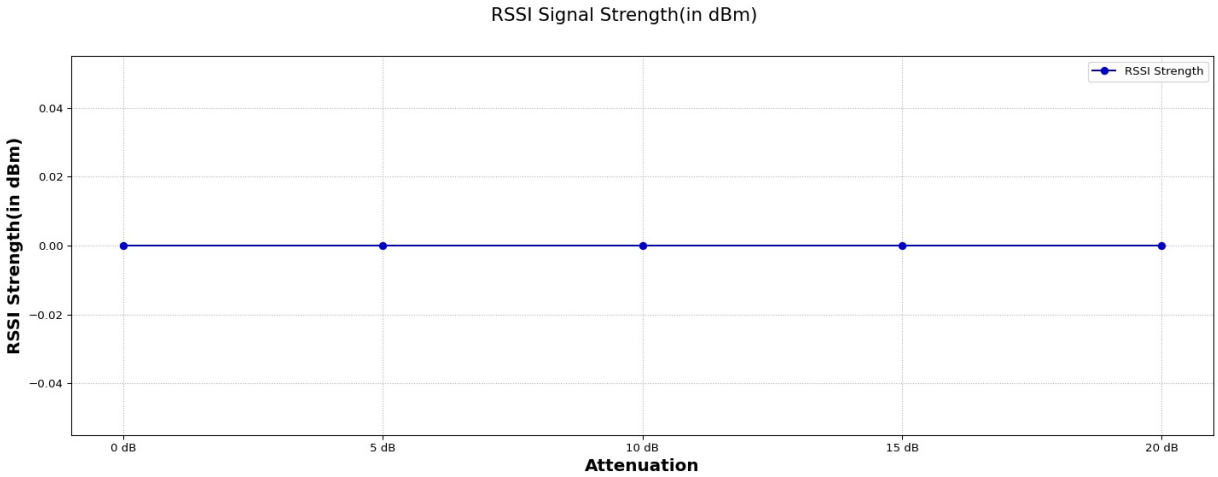


Table for Graph

Attenuation Step(dB)	RSSI Strength (in dBm)	Upload(in Mbps)	Download(in Mbps)
0 dB	0	0.36	6.21
5 dB	0	3.02	8.26
10 dB	0	0.81	0.19
15 dB	0	2.18	0.68
20 dB	0	0.51	0.29

Individual bidirectional Throughput for 21 clients using TCP traffic over 0 dB attenuation

The below graph represents Individual bidirectional throughput of all stations when attenuation set to 0 dB

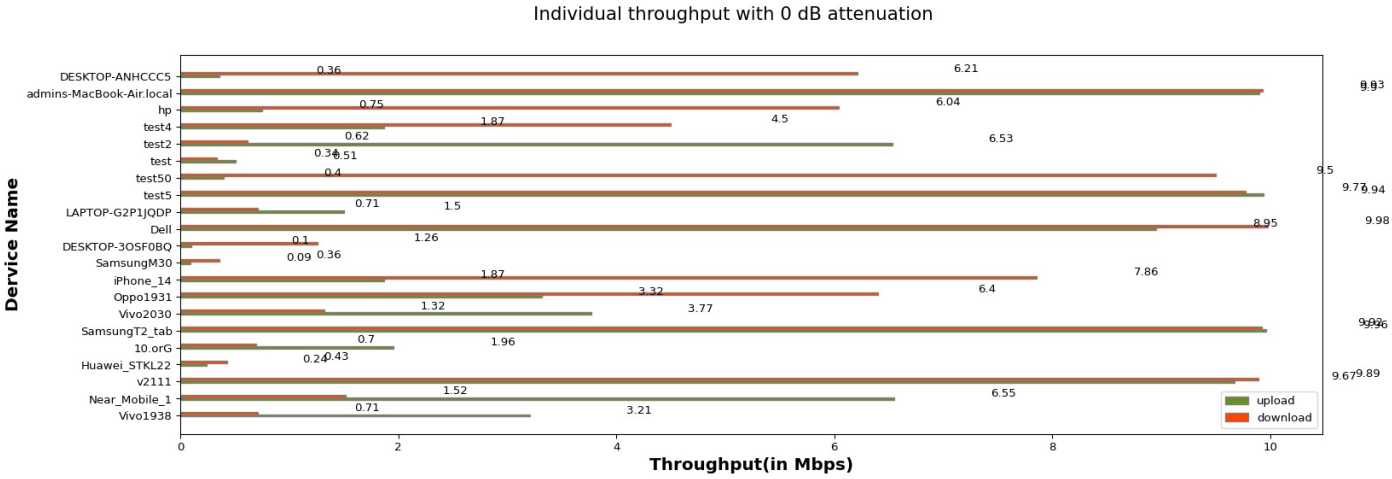


Table for Graph

Attenuation Step(dB)	Device Name	Traffic type	Upload(in Mbps)	Download(in Mbps)	Overall
0 dB	Vivo1938	TCP	3.21	0.71	3.92
0 dB	Near_Mobile_1	TCP	6.55	1.52	8.07
0 dB	v2111	TCP	9.67	9.89	19.56
0 dB	Huawei_STKL22	TCP	0.24	0.43	0.67
0 dB	10.orG	TCP	1.96	0.70	2.66
0 dB	SamsungT2_tab	TCP	9.96	9.92	19.88
0 dB	Vivo2030	TCP	3.77	1.32	5.09
0 dB	Oppo1931	TCP	3.32	6.40	9.72
0 dB	iPhone_14	TCP	1.87	7.86	9.73
0 dB	SamsungM30	TCP	0.09	0.36	0.45
0 dB	DESKTOP-3OSF0BQ	TCP	0.10	1.26	1.36
0 dB	Dell	TCP	8.95	9.98	18.93
0 dB	LAPTOP-G2P1JQDP	TCP	1.50	0.71	2.21
0 dB	test5	TCP	9.94	9.77	19.71
0 dB	test50	TCP	0.40	9.50	9.90
0 dB	test	TCP	0.51	0.34	0.85
0 dB	test2	TCP	6.53	0.62	7.15
0 dB	test4	TCP	1.87	4.50	6.37
0 dB	hp	TCP	0.75	6.04	6.79
0 dB	admins-MacBook-Air.local	TCP	9.90	9.93	19.83
0 dB	DESKTOP-ANHCCC5	TCP	0.36	6.21	6.57

Individual bidirectional Throughput for 21 clients using TCP traffic over 5 dB attenuation

The below graph represents Individual bidirectional throughput of all stations when attenuation set to 5 dB

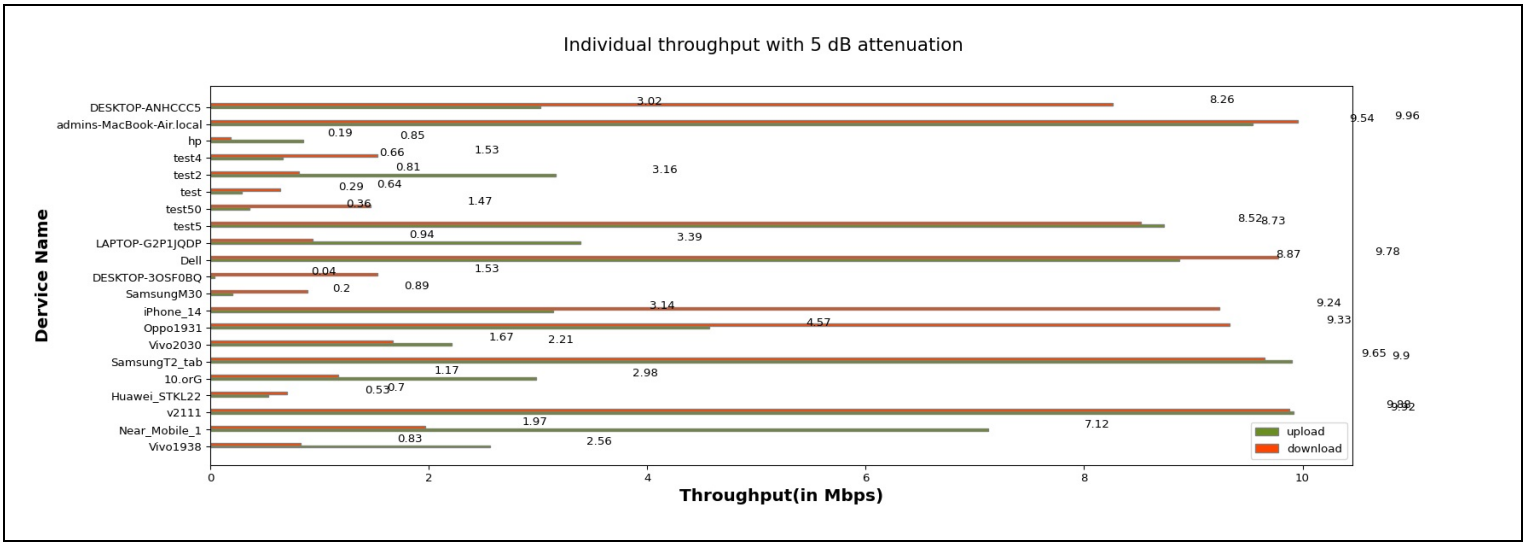


Table for Graph

Attenuation Step(dB)	Device Name	Traffic type	Upload(in Mbps)	Download(in Mbps)	Overall
5 dB	Vivo1938	TCP	2.56	0.83	3.39
5 dB	Near_Mobile_1	TCP	7.12	1.97	9.09
5 dB	v2111	TCP	9.92	9.88	19.80
5 dB	Huawei_STKL22	TCP	0.53	0.70	1.23
5 dB	10.orG	TCP	2.98	1.17	4.15
5 dB	SamsungT2_tab	TCP	9.90	9.65	19.55
5 dB	Vivo2030	TCP	2.21	1.67	3.88
5 dB	Oppo1931	TCP	4.57	9.33	13.90
5 dB	iPhone_14	TCP	3.14	9.24	12.38
5 dB	SamsungM30	TCP	0.20	0.89	1.09
5 dB	DESKTOP-3OSF0BQ	TCP	0.04	1.53	1.57
5 dB	Dell	TCP	8.87	9.78	18.65
5 dB	LAPTOP-G2P1JQDP	TCP	3.39	0.94	4.33
5 dB	test5	TCP	8.73	8.52	17.25
5 dB	test50	TCP	0.36	1.47	1.83
5 dB	test	TCP	0.29	0.64	0.93
5 dB	test2	TCP	3.16	0.81	3.97
5 dB	test4	TCP	0.66	1.53	2.19
5 dB	hp	TCP	0.85	0.19	1.04
5 dB	admins-MacBook-Air.local	TCP	9.54	9.96	19.50
5 dB	DESKTOP-ANHCCC5	TCP	3.02	8.26	11.28

Individual bidirectional Throughput for 21 clients using TCP traffic over 10 dB attenuation

The below graph represents Individual bidirectional throughput of all stations when attenuation set to 10 dB

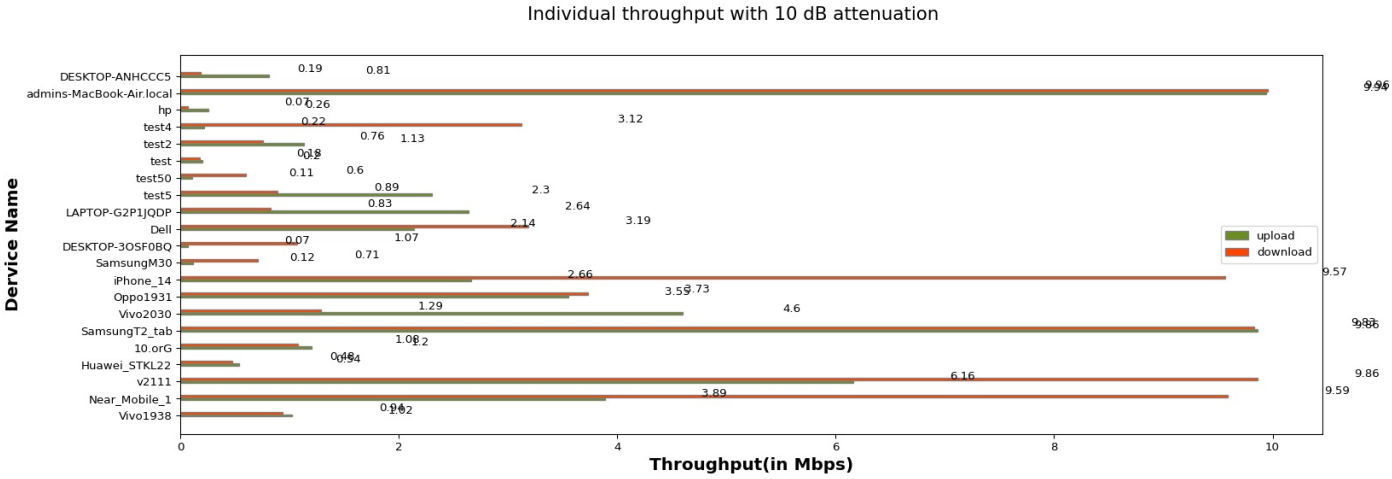


Table for Graph

Attenuation Step(dB)	Device Name	Traffic type	Upload(in Mbps)	Download(in Mbps)	Overall
10 dB	Vivo1938	TCP	1.02	0.94	1.96
10 dB	Near_Mobile_1	TCP	3.89	9.59	13.48
10 dB	v2111	TCP	6.16	9.86	16.02
10 dB	Huawei_STKL22	TCP	0.54	0.48	1.02
10 dB	10.orG	TCP	1.20	1.08	2.28
10 dB	SamsungT2_tab	TCP	9.86	9.83	19.69
10 dB	Vivo2030	TCP	4.60	1.29	5.89
10 dB	Oppo1931	TCP	3.55	3.73	7.28
10 dB	iPhone_14	TCP	2.66	9.57	12.23
10 dB	SamsungM30	TCP	0.12	0.71	0.83
10 dB	DESKTOP-3OSF0BQ	TCP	0.07	1.07	1.14
10 dB	Dell	TCP	2.14	3.19	5.33
10 dB	LAPTOP-G2P1JQDP	TCP	2.64	0.83	3.47
10 dB	test5	TCP	2.30	0.89	3.19
10 dB	test50	TCP	0.11	0.60	0.71
10 dB	test	TCP	0.20	0.18	0.38
10 dB	test2	TCP	1.13	0.76	1.89
10 dB	test4	TCP	0.22	3.12	3.34
10 dB	hp	TCP	0.26	0.07	0.33
10 dB	admins-MacBook-Air.local	TCP	9.94	9.96	19.90
10 dB	DESKTOP-ANHCCC5	TCP	0.81	0.19	1.00

Individual bidirectional Throughput for 21 clients using TCP traffic over 15 dB attenuation

The below graph represents Individual bidirectional throughput of all stations when attenuation set to 15 dB

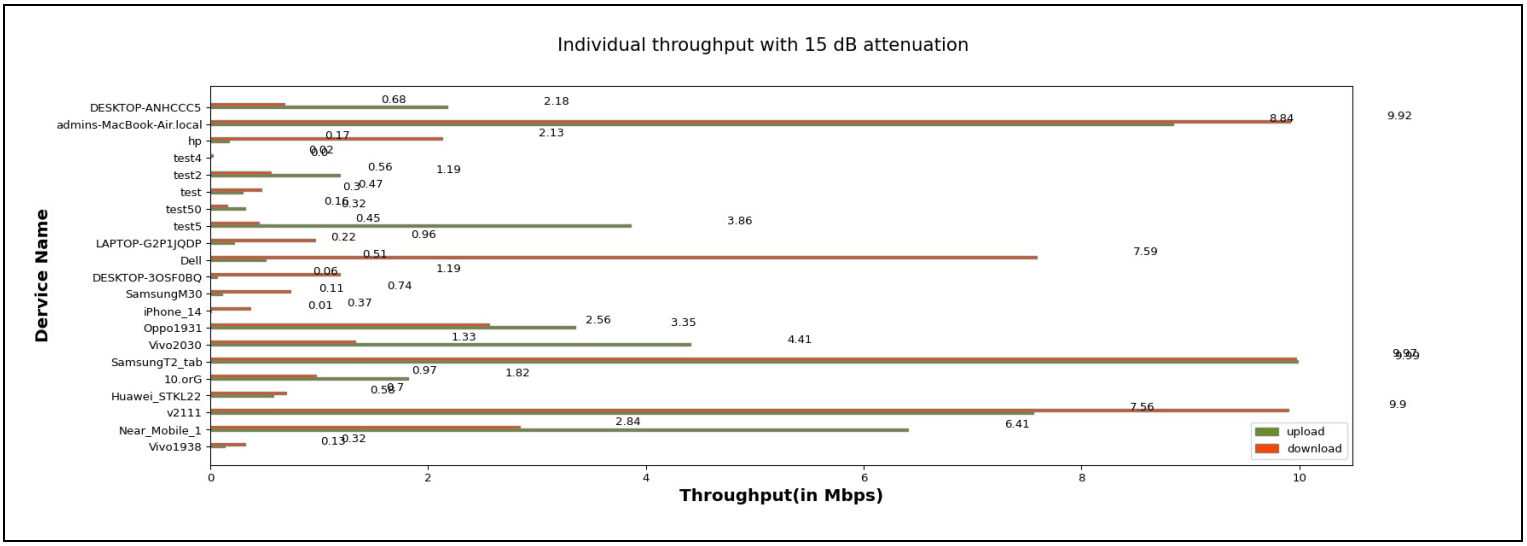


Table for Graph

Attenuation Step(dB)	Device Name	Traffic type	Upload(in Mbps)	Download(in Mbps)	Overall
15 dB	Vivo1938	TCP	0.13	0.32	0.45
15 dB	Near_Mobile_1	TCP	6.41	2.84	9.25
15 dB	v2111	TCP	7.56	9.90	17.46
15 dB	Huawei_STKL22	TCP	0.58	0.70	1.28
15 dB	10.orG	TCP	1.82	0.97	2.79
15 dB	SamsungT2_tab	TCP	9.99	9.97	19.96
15 dB	Vivo2030	TCP	4.41	1.33	5.74
15 dB	Oppo1931	TCP	3.35	2.56	5.91
15 dB	iPhone_14	TCP	0.01	0.37	0.38
15 dB	SamsungM30	TCP	0.11	0.74	0.85
15 dB	DESKTOP-3OSF0BQ	TCP	0.06	1.19	1.25
15 dB	Dell	TCP	0.51	7.59	8.10
15 dB	LAPTOP-G2P1JQDP	TCP	0.22	0.96	1.18
15 dB	test5	TCP	3.86	0.45	4.31
15 dB	test50	TCP	0.32	0.16	0.48
15 dB	test	TCP	0.30	0.47	0.77
15 dB	test2	TCP	1.19	0.56	1.75
15 dB	test4	TCP	0.00	0.02	0.02
15 dB	hp	TCP	0.17	2.13	2.30
15 dB	admins-MacBook-Air.local	TCP	8.84	9.92	18.76
15 dB	DESKTOP-ANHCCC5	TCP	2.18	0.68	2.86

Individual bidirectional Throughput for 21 clients using TCP traffic over 20 dB attenuation

The below graph represents Individual bidirectional throughput of all stations when attenuation set to 20 dB

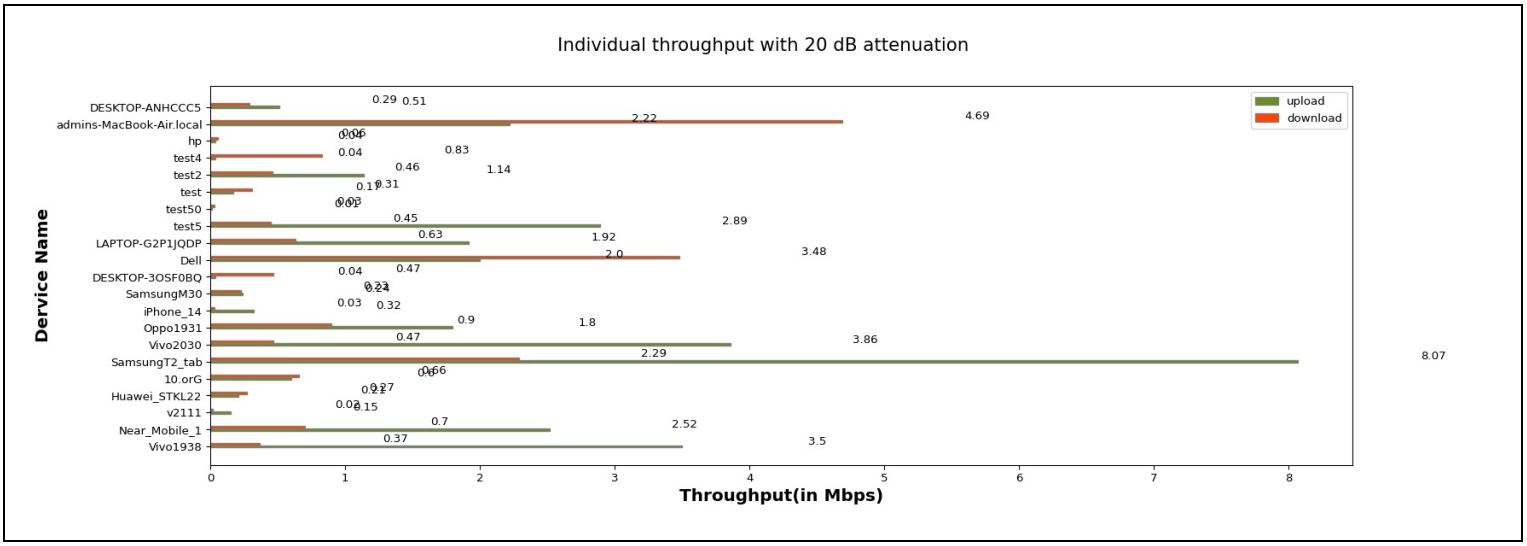


Table for Graph

Attenuation Step(dB)	Device Name	Traffic type	Upload(in Mbps)	Download(in Mbps)	Overall
20 dB	Vivo1938	TCP	3.50	0.37	3.87
20 dB	Near_Mobile_1	TCP	2.52	0.70	3.22
20 dB	v2111	TCP	0.15	0.02	0.17
20 dB	Huawei_STKL22	TCP	0.21	0.27	0.48
20 dB	10.orG	TCP	0.60	0.66	1.26
20 dB	SamsungT2_tab	TCP	8.07	2.29	10.36
20 dB	Vivo2030	TCP	3.86	0.47	4.33
20 dB	Oppo1931	TCP	1.80	0.90	2.70
20 dB	iPhone_14	TCP	0.32	0.03	0.35
20 dB	SamsungM30	TCP	0.24	0.23	0.47
20 dB	DESKTOP-3OSF0BQ	TCP	0.04	0.47	0.51
20 dB	Dell	TCP	2.00	3.48	5.48
20 dB	LAPTOP-G2P1JQDP	TCP	1.92	0.63	2.55
20 dB	test5	TCP	2.89	0.45	3.34
20 dB	test50	TCP	0.01	0.03	0.04
20 dB	test	TCP	0.17	0.31	0.48
20 dB	test2	TCP	1.14	0.46	1.60
20 dB	test4	TCP	0.04	0.83	0.87
20 dB	hp	TCP	0.04	0.06	0.10
20 dB	admins-MacBook-Air.local	TCP	2.22	4.69	6.91
20 dB	DESKTOP-ANHCCC5	TCP	0.51	0.29	0.80

Device Information:

Device Name	Device Type	MAC Address	Channel	Rx Rate (Mbps)	Tx Rate (Mbps)	SSID	Mode
Vivo1938	Android	10:bc:97:b0:7c:f3	11	72 Mbps	65 Mbps	VINTROP_wpa2	802.11abgn 20
Near_Mobile_1	Android	42:68:62:57:6f:25	11	72 Mbps	72 Mbps	VINTROP_wpa2	802.11abgn 20
v2111	Android	d4:63:de:c8:8e:2a	52	433 Mbps	390 Mbps	VINTROP_wpa2	802.11abgn-AC 80
Huawei_STKL22	Android	ac:bd:70:e2:e3:17	11	72 Mbps	72 Mbps	VINTROP_wpa2	AUTO 20

10.orG	Android	d8:6c:02:b3:fa:98	11	72 Mbps		VINTROP_wpa2	AUTO 20
SamsungT2_tab	Android	56:c0:9b:79:1d:fa	52	390 Mbps	390 Mbps	VINTROP_wpa2	802.11abgn-AC 80
Vivo2030	Android	e4:f1:d4:49:4b:e7	11	72 Mbps	72 Mbps	VINTROP_wpa2	802.11abgn 20
Oppo1931	Android	9a:8a:64:de:fb:bc	11	72 Mbps	72 Mbps	VINTROP_wpa2	AUTO 20
iPhone_14	IOS	f8:7d:76:d6:cb:cc	52	0 bps		VINTROP_wpa2	AUTO 80
SamsungM30	Android	56:c2:a7:f0:8a:f4	11	72 Mbps	72 Mbps	VINTROP_wpa2	802.11abgn 20
DESKTOP-3OSF0BQ	Windows	0c:54:15:cb:95:5d	52	65 Mbps	65 Mbps	VINTROP_wpa2	802.11abgn-AC 20 1x1
Dell	Windows	40:1c:83:3c:81:15	52	360 Mbps	1201 Mbps	VINTROP_wpa2	802.11abgn-AX 20 1x1
LAPTOP-G2P1JQDP	Windows	b4:b5:b6:b0:22:53	52	144.4 Mbps	144 Mbps	VINTROP_wpa2	802.11abgn-AC 20 1x1
test5	Linux	44:85:00:26:ba:cd	52	292.6 Mbps	866.7 Mbps	VINTROP_wpa2	802.11an-AC 80 2x2
test50	Linux	d4:1b:81:4b:3b:af	52	234 Mbps	81 Mbps	VINTROP_wpa2	802.11an-AC 80 2x2
test	Linux	8c:c8:4b:95:3e:49	11	65 Mbps	72.2 Mbps	VINTROP_wpa2	802.11bgn 20 1x1
test2	Linux	e4:b3:18:1f:ca:db	52	72.2 Mbps	144.4 Mbps	VINTROP_wpa2	802.11an 20 2x2
test4	Linux	f0:d5:bf:13:f2:a0	52	60 Mbps	866.7 Mbps	VINTROP_wpa2	802.11an-AC 80 2x2
hp	Linux	b4:b5:b6:29:bd:d9	52	52 Mbps	81 Mbps	VINTROP_wpa2	802.11an-AC 80 2x2
admins-MacBook-Air.local	Mac	ca:84:de:99:e5:58	-1	71.28 Mbps	288.0 Mbps	VINTROP_wpa2	802.11abgn-AX 20 1x1
DESKTOP-ANHCCC5	Windows	00:00:00:00:00:00	52	0	0		

Information	contact	support@candelatech.com