

ITS 423

Internet Technologies and Applications

Assignment 1

Topic

IEEE 802.11 wireless LANs of Bangkokdi Campus

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Summited to

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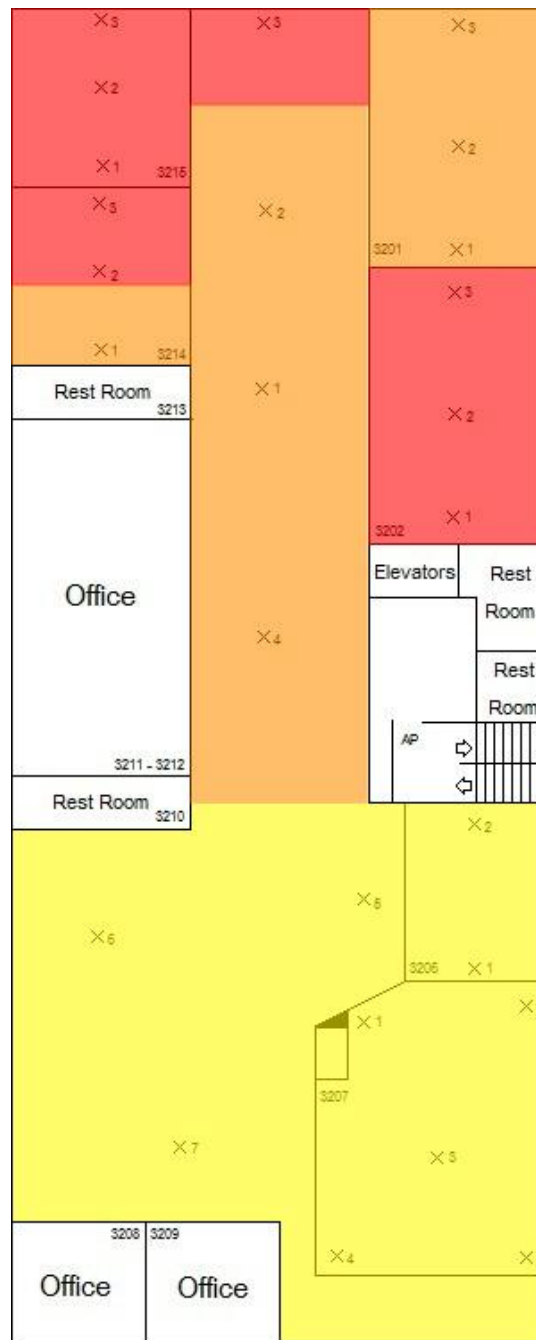
Task 1

This task is to measure the signal strength of the area provided to make a network map of SIIT Bangkadi campus. The area that we have been assigned to is the Sirindhralai Building on the 2nd floor. We gathered the information and turn the information into categories content.

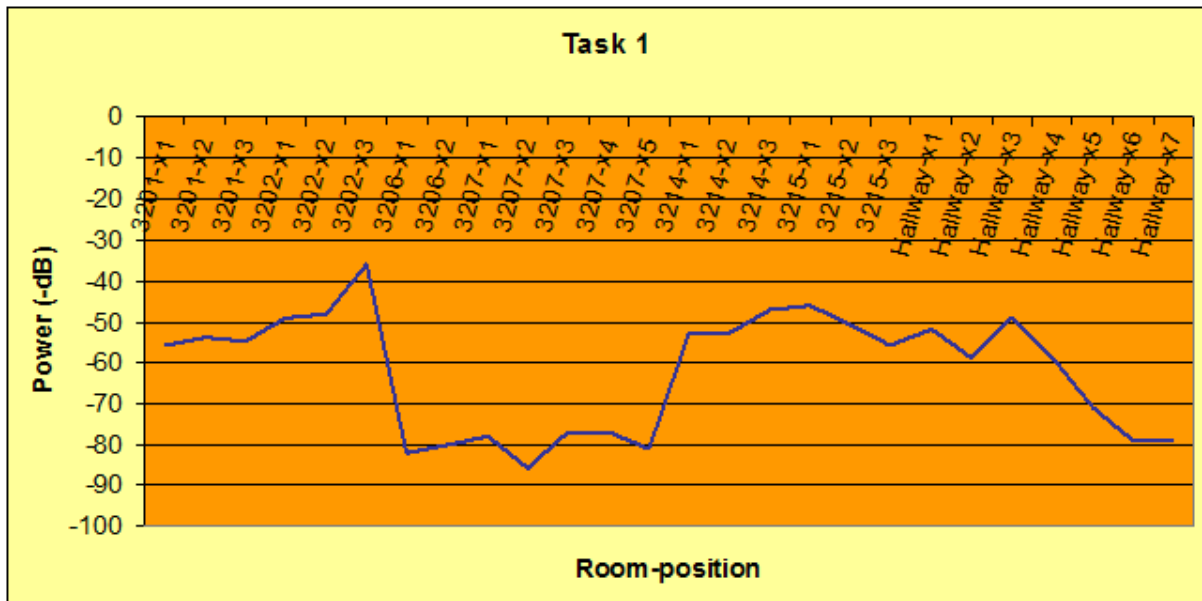
Task 1							
Room	Position	Power (dB)	Best Power (dB)	Noise (dB)	Best Noise (dB)	Max rate (dB)	Carrier
3201	X1	-56	-21	-127	-127	11	B
	X2	-54	-21	-127	-127	11	B
	X3	-55	-21	-127	-127	11	B
3202	X1	-49	-21	-127	-127	11	B
	X2	-48	-21	-127	-127	11	B
	X3	-36	-21	-127	-127	11	B
3206	X1	-82	-21	-127	-127	11	B
	X2	-80	-21	-127	-127	11	B
3207	X1	-78	-21	-127	-127	11	B
	X2	-86	-21	-127	-127	11	B
	X3	-77	-21	-127	-127	11	B
	X4	-77	-21	-127	-127	11	B
	X5	-81	-21	-127	-127	11	B
3214	X1	-53	-21	-127	-127	11	B
	X2	-53	-21	-127	-127	11	B
	X3	-47	-21	-127	-127	11	B
3215	X1	-46	-21	-127	-127	11	B
	X2	-51	-21	-127	-127	11	B
	X3	-56	-21	-127	-127	11	B
Hallway	X1	-52	-38	-127	-127	11	B
	X2	-59	-29	-127	-127	11	B
	X3	-49	-29	-127	-127	11	B
	X4	-59	-21	-127	-127	11	B
	X5	-71	-21	-127	-127	11	B
	X6	-79	-21	-127	-127	11	B
	X7	-79	-21	-127	-127	11	B

Map

We also provide the map that will show all the area that we have been measure. The color will represent the signal strength that we have. The color red will represent that the area have very strong signal. Orange will be medium range and lastly yellow for low strength of the signal.



Result of Task 1



As you can see from the graph that we provided, the signal strength went up at the room 3202 at the position of X3 which related to the result from the table and from the map that we provided. The result may not be correct, because it could be effect by the time measure, the amount of people using it, and also the weather.

Task 2

This task is to measure the throughput of the wireless link that use to send packet. We will measure the time and all of the information that we need to compare between one client and two clients. We are using one of the computers to be the server and other computers are client. We are using Linux, so we used iperf to measure the throughput. We have to connect to the router and use the server computer to set the GHz of the signal which is G, B or Mixed. For the server, we insert the command “iperf -u -s”. And for the user, we insert the command “iperf -u -c (IP of the server computer) -b (size of the packet)m”. The results are provided in the spreadsheet form and also we provided as a graph for each of the experiments.

One Client

B

Task 2				
2.44 GHz (B only)				
m	Interval (sec)	Transfer (MBytes)	Bandwidth (Mbit/sec)	Jitter (ms)
0.5	10	0.59	0.49	0.136
1	10	1.19	0.98	0.265
2	10	2.39	2	0.281
4	10	4.77	4	0.144
5	10	5.96	5	0.451
6	10	7.16	6	0.148
7	10	7.81	6.43	1.657
8	10	7.84	6.51	0.237
9	10	7.95	6.59	5.13
10	10	8.02	6.66	0.783
11	10	7.58	6.3	5.087
12	10	7.65	6.35	4.74
13	10	8.02	6.66	5.142

G

Task 2				
2.44 MHz (G only)				
m	Interval (sec)	Transfer (MBytes)	Bandwidth (Mbit/sec)	Jitter (ms)
8	10	9.49	7.95	0.132
14	10	16.7	14	142
15	10	17.1	14.3	0.136
16	10	18.8	15.7	0.062
17	10	19.8	16.6	0.129
18	10	21.5	18	0.496
25	10	29	24.6	0.034
30	10	35.6	29.9	0.032
35	10	37.1	31	0.029
36	10	39.2	32.9	0.028
37	10	39	32.6	0.962
38	10	38.7	32.4	0.192
39	10	38.4	32.2	0.16
40	10	38.6	32.2	0.328

Mixed

Task 2				
2.44 GHz (Mixed)				
m	Interval (sec)	Transfer (MBytes)	Bandwidth (Mbit/sec)	Jitter (ms)
4	10	4.77	4	0.06
10	10	11.9	10	0.057
16	10	19.1	16	0.032
22	10	26.3	22	0.076
28	10	33.4	28	0.103
34	10	40	35.5	0.03
35	10	39.7	33.3	0.3
36	10	39.1	32.8	0.045
37	10	37.1	31.1	0.724
38	10	38.2	32	0.958
39	10	39.5	33.1	0.329

Two Clients

B

Task 2				
2.44 MHz (B only)				
m	Interval (sec)	Transfer (MBytes)	Bandwidth (Mbit/sec)	Jitter (ms)
0.5	10	0.599	0.488	0.384
0.5	10	0.599	0.489	1.35
1	10	1.19	0.98	0.897
1	10	1,19	0.98	0.387
2	10	2.39	2	0.448
2	10	2.39	2	0.244
4	11.4	3.61	2.66	6.498
4	11.4	3.2	2.35	21.943
5	11.1	3.05	2.31	6.854
5	10.8	3.95	3.08	11.632
6	11.3	3.4	2.53	8.438
6	11.2	3.37	2.52	21.336
7	11.1	2.49	1.88	14.941
7	10.9	4.58	3.53	14.199
8	11.2	3.15	2.37	20.173
8	11.3	3.88	2.87	19.961
9	11.2	3.38	2.53	13.308
9	11.2	3.39	2.54	19.196
10	11.3	3.42	2.54	14.793
10	11.2	3.29	2.47	24.621
11	11.1	3.03	2.29	13.248
11	10.9	4.08	3.13	17.762
12	11.2	3.37	2.52	17.225
12	11.3	3.77	2.81	13.901
13	11.5	3.28	2.4	10.342
13	11.3	3.66	2.71	29.329

G

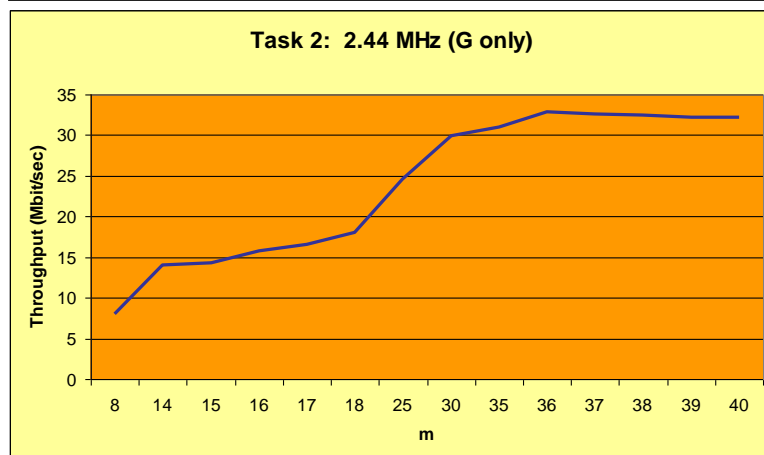
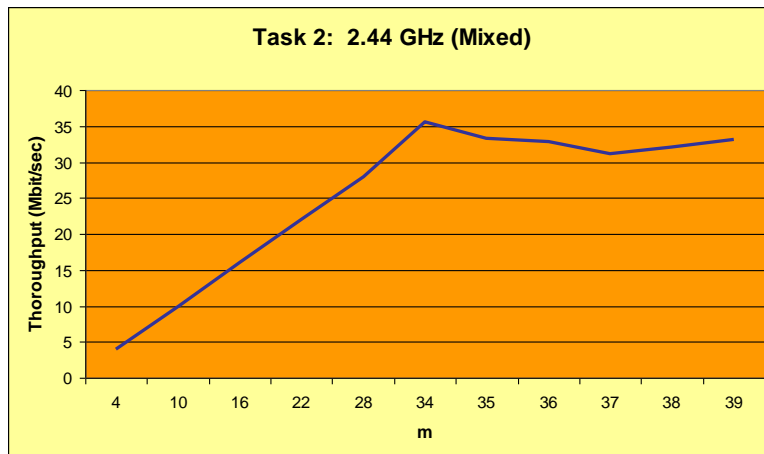
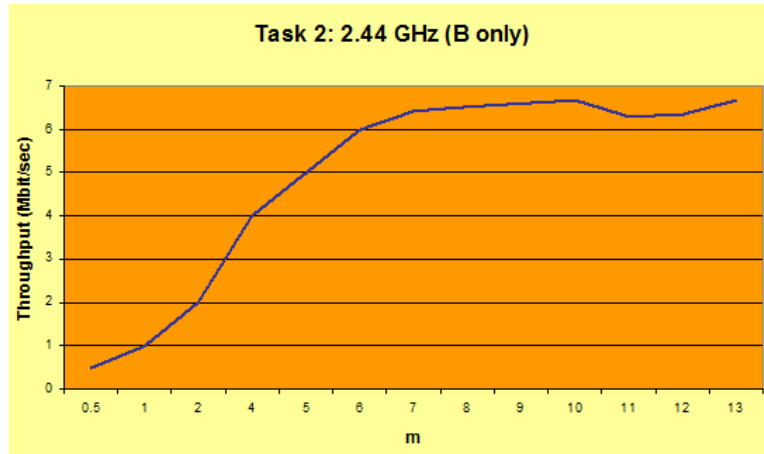
Task 2				
2.44 MHz (G only)				
m	Interval (sec)	Transfer (MBytes)	Bandwidth (Mbit/sec)	Jitter (ms)
8	10	9.54	8.02	9.54
8	10	9.54	8	9.54
14	10.2	15.6	12.9	15.6
14	10.2	15.4	12.7	15.4
15	10.2	15.7	12.9	15.7
15	10.2	15.7	13	15.7
16	10.3	15.8	12.8	15.8
16	10.3	16.6	13.5	16.6
17	10.2	15.9	13	15.9
17	10.2	16.8	13.8	16.8
18	10.2	16.5	13.6	16.5
18	10.2	16.4	13.5	16.4
25	10.2	15.9	13.1	15.9
25	10.2	16	13.1	16
30	10.3	15.7	12.8	15.7
30	10.3	17	13.9	17
35	10.2	16	13.1	16
35	10.2	16	13.2	16
36	10.2	13.6	11.2	13.6
36	10.2	17.4	14.3	17.4
37	10.2	16.6	13.7	16.6
37	10.2	16.2	13.3	16.2
38	10.2	16.5	13.6	16.5
38	10.2	16.4	13.5	16.4
39	10.2	15.9	13.1	15.9
39	10.2	16.1	13.3	16.1
40	10.3	16.2	13.2	16.2
40	10.2	16.3	13.3	16.3

Mixed

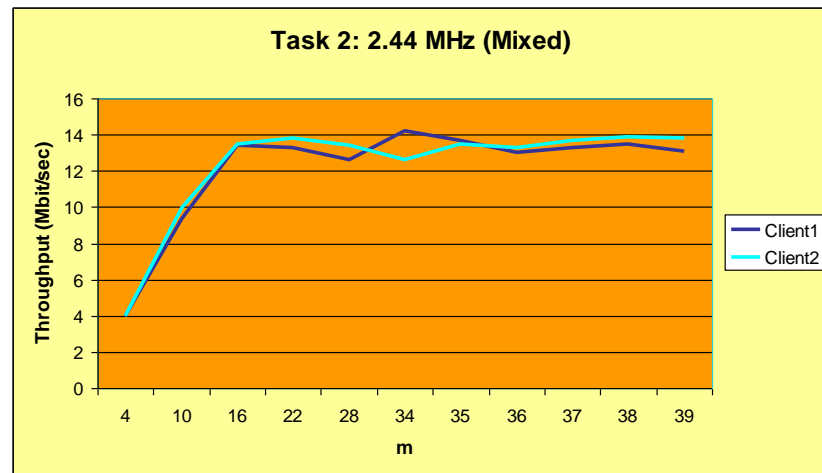
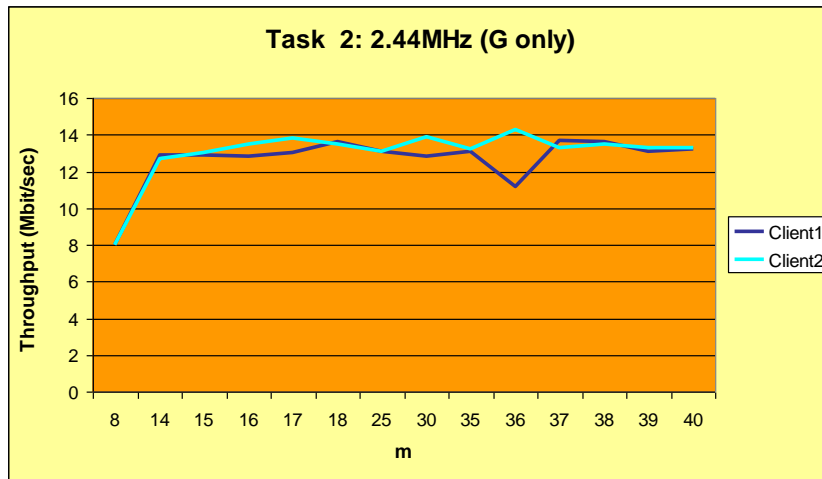
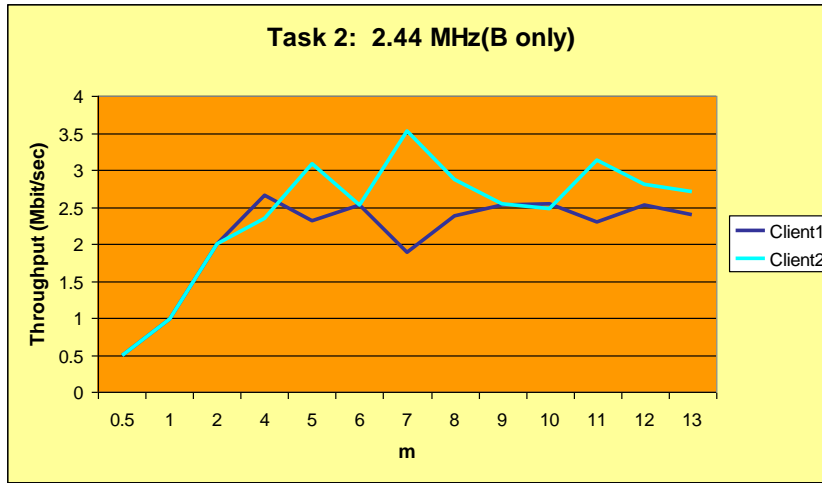
Task 2				
2.44 MHz (Mixed)				
m	Interval (sec)	Transfer (MBytes)	Bandwidth (Mbit/sec)	Jitter (ms)
4	8.4	4	4	0.117
4	9.2	4.41	4	0.295
10	10.2	11.4	9.35	0.514
10	10	11.9	9.99	0.734
16	10.2	16.3	13.4	1.942
16	10.2	16.3	13.5	3.854
22	10.2	16.2	13.3	1.024
22	10.2	16.8	13.8	1.862
28	10.3	15.5	12.6	7.781
28	10.2	16.2	13.4	0.066
34	10.2	17.4	14.2	2.082
34	10.2	15.3	12.6	3.844
35	10.2	16.7	13.7	2.473
35	10.2	16.4	13.5	4.181
36	10.2	15.9	13	2.043
36	10.2	16.3	13.3	3.339
37	10.2	16.2	13.3	2.369
37	10.2	16.7	13.7	2.977
38	10.2	16.5	13.5	2.492
38	10.2	16.9	13.9	3.746
39	10.2	16	13.1	2.243
39	10.2	16.8	13.8	4.425

Graph

One Client



Two Clients



Result of Task 2

The result is shown out to be like this, because it is related to the number of packets sent and also the size that is being sent. The class also has a limited amount that it can transfer. For example, in the one client part for the B-Class, you can see that the amount being transferred at the end becomes relatively similar to each other, this is caused due to the amount of packets it is able to send.

The amount of throughput can be calculated from the amount being transferred / time it takes to transfer. The program is also able to calculate the throughput for you as well.

For two clients, the problem happens, because two clients asking for packets at the same time cause the server to be confused and cause "receive out of order" problems, some of them also have the problem of read fail. The result in this report is not included these information, but it is stated at the spreadsheet information of the experiment.

The conclusion of this experiment is that no matter how many clients use the server at the same time, the result is still similar to a single client, but the request can cause problems and unfinished processes.

The information being sent via a wireless network can be lost or interrupted along the way.