

# Assignment 2 report

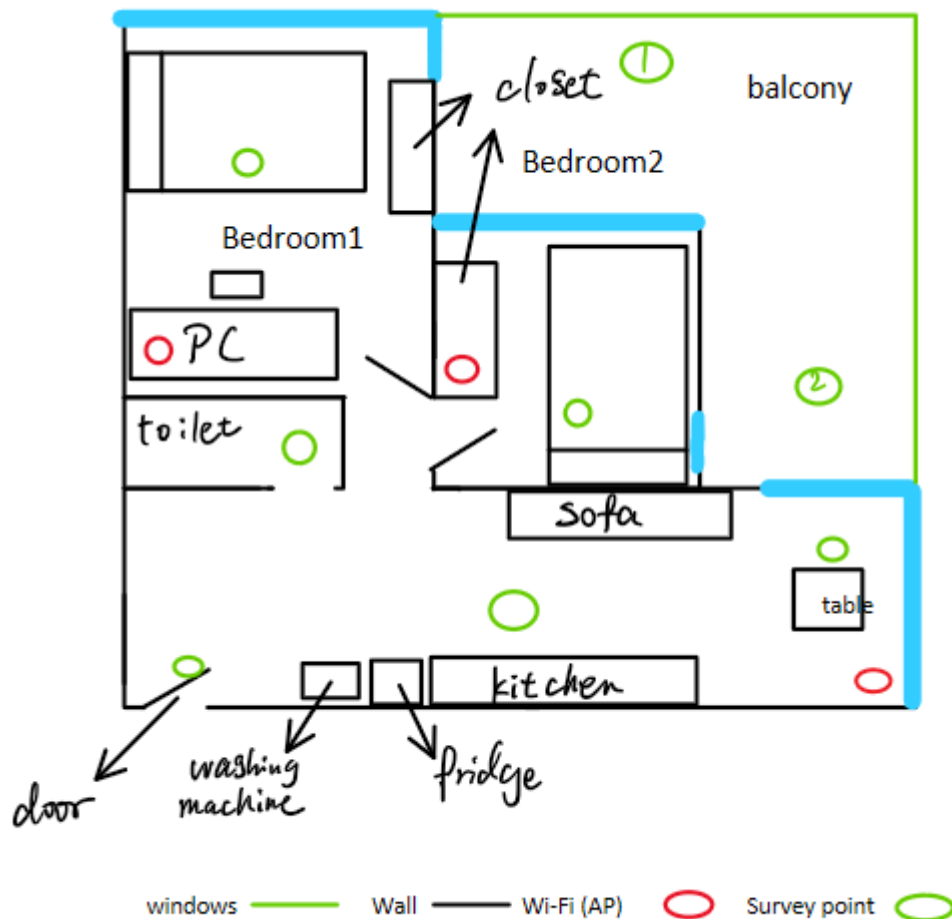
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# Task1: WLAN Network Design and Security

## 1.0 INTRODUCTION

Wi-Fi is one of the most important things in our daily life, people are surrounded by the Wi-Fi network and cannot leave it while working or studying. This report will show the survey of Wi-Fi information, and the quality of the Wi-Fi. And then there are analyzing and conclusion through my observation in part 2.

## 2.0 SURVEY





























This is how my apartment looks like. The wall is the foam-filled wall with wood, and they are not the concrete main wall in my apartment, and windows are built with Noise Control Glass. There are some electrical devices like the PC, the fridge may affect

the Wi-Fi.

(Data from Net Spot, all data measure while doors closed.

Max is the best situation, and the Optus 2.4Ghz channel is always 9, I made a mistake while doing the Excel)

### 1, Balcony 1

 duild studio	10:13:31:B2:A3:8F	11	2.4GHz	WPA2 Personal	Technicolor	b/g/n		-80	20%	-80	-80	-80	-96	4%	now
 辦公室_b	FA:8F:CA:99:5C:9A	6	2.4GHz	Open	FA:8F:CA	b/g/n		-78	22%	-77	-76	-78	-96	4%	now
 OPTUS_B5B5D0	34:6B:46:B5:B5:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n		-73	27%	-74	-73	-75	-96	4%	now
 Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Pe...	EE:08:FB	b/g/n		-76	24%	-66	-56	-77	-96	4%	now
 b16A112	80:2A:A8:6B:BF:80	58	5GHz	WPA2 Personal	Ubiquiti	a/n		-71	29%	-80	-71	-91	-96	4%	now
 Optus_B818_2109	2C:78:0E:28:21:09	5,+1	2.4GHz	WPA2 Personal	Huawei	b/g/n		-69	31%	-67	-58	-69	-96	4%	now
 Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac		-61	49%	-46	-41	-51	-87	13%	now
 Mage	34:E8:94:E9:C6:A6	11	2.4GHz	WPA2 Personal	TP-LINK	n		-66	34%	-64	-56	-66	-96	4%	now
 Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n		-52	48%	-45	-28	-82	-96	4%	now
 QIN'sPhone	76:60:CF:F8:E8:DF	9	2.4GHz	WPA2 Personal	76:60:CF	b/g/n		-52	48%	-50	-44	-52	-96	4%	now
 HP-Print-52-ENVY 4500 series	28:80:23:EF:5F:52	1	2.4GHz	WPA2 Personal	Hewlett	b/g/n		-	0%	-85	-85	-85	-	0%	13s ago
 TP-LINK_12FF	7C:8B:CA:AE:12:FE	1	2.4GHz	WPA2 Personal	TP-LINK	n		-87	13%	-87	-87	-87	-96	4%	now
 Optus_B818_2109	2C:78:0E:28:21:0E	36	5GHz	WPA2 Personal	Huawei	ac		-	0%	-90	-90	-90	-	0%	38s ago

	BSSID	Channel	Band	Signal	Avg	Noise	Max	Min	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-51	-46	13%	-51	-87	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-52	-45	4%	-82	-96	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-76	-66	4%	-77	-96	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-52	-50	4%	-52	-98	76:60:CF

### 2, Balcony 2

 OPTUS_B5B5D0	34:6B:46:B5:B5:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n		-79	21%	-77	-65	-79	-92	8%	now
 Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Pe...	EE:08:FB	b/g/n		-78	22%	-50	-30	-78	-96	4%	now
 Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n		-64	36%	-42	-31	-64	-96	4%	now
 Optus_B818_2109	2C:78:0E:28:21:09	5	2.4GHz	WPA2 Personal	Huawei	b/g/n		-79	21%	-71	-58	-79	-96	4%	now
 Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac		-66	34%	-48	-34	-66	-87	13%	now
 Mage	34:E8:94:E9:C6:A6	11	2.4GHz	WPA2 Personal	TP-LINK	n		-64	46%	-56	-54	-59	-96	4%	now
 b16A112	80:2A:A8:6B:BF:80	56	5GHz	WPA2 Personal	Ubiquiti	a/n		-74	26%	-82	-69	-87	-96	4%	now
 Joshua	A4:2B:8C:1E:3C:0A	1	2.4GHz	WPA2 Personal	NETGEAR	b/g/n		-76	24%	-76	-76	-76	-92	8%	now
 Mage-5G	34:E8:94:E9:C6:A5	149	5GHz	WPA2 Personal	TP-LINK	ac		-	0%	-84	-84	-85	-	0%	27s ago
 HP-Print-52-ENVY 4500 series	28:80:23:EF:5F:52	1	2.4GHz	WPA2 Personal	Hewlett	b/g/n		-84	16%	-81	-73	-84	-92	8%	now
 QIN'sPhone	66:1F:43:A6:B8:73	9	2.4GHz	WPA2 Personal	66:1F:43	b/g/n		-61	39%	-54	-43	-61	-96	4%	9s ago
 [Hidden SSID]	2C:78:0E:28:21:10	36	5GHz	WPA2 Personal	Huawei	ac		-	0%	-87	-87	-87	-	0%	1min ago

	BSSID	Channel	Band	Signal	Avg	Noise	Max	Min	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-66	-48	13%	-34	-66	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-54	-42	4%	-31	-64	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-78	-50	4%	-30	-78	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-61	-54	4%	-43	-61	76:60:CF

### 3, Bedroom 2

 TP-LINK_B9FA3D9	34:E8:94:E9:3D:91	36	5GHz	WPA2 Personal	TP-LINK	ac		-60	10%	-64	-72	-67	-90	4%	now
 TP-LINK_12FF	7C:8B:CA:AE:12:FE	1	2.4GHz	WPA2 Personal	TP-LINK	n		-	0%	-81	-81	-81	-	0%	25s ago
 House of Teal	EC:BE:DD:36:15:B5	1	2.4GHz	WPA2 Personal	Sagemcom	n		-81	19%	-80	-78	-84	-92	8%	now
 TP-LINK_8073	34:E8:94:DF:80:72	1	2.4GHz	WPA2 Personal	TP-LINK	n		-71	29%	-76	-68	-87	-92	8%	now
 Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Pe...	EE:08:FB	b/g/n		-37	63%	-45	-27	-58	-96	4%	now
 Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n		-24	76%	-29	-20	-42	-96	4%	now
 QIN'sPhone	A6:6E:96:CB:8E:7C	9	2.4GHz	WPA2 Personal	A6:6E:96	b/g/n		-61	39%	-52	-30	-64	-96	4%	now
 Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac		-35	65%	-42	-29	-48	-92	8%	now
 辦公室_b	FA:8F:CA:99:5C:9A	6	2.4GHz	Open	FA:8F:CA	b/g/n		-52	48%	-65	-45	-78	-96	4%	now
 Optus_B818_2109	2C:78:0E:28:21:09	5,+1	2.4GHz	WPA2 Personal	Huawei	b/g/n		-74	26%	-69	-57	-79	-96	4%	now
 OPTUS_B5B5D0	34:6B:46:B5:B5:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n		-	0%	-70	-62	-78	-	0%	52s ago
 Joshua	A4:2B:8C:1E:3C:0A	1	2.4GHz	WPA2 Personal	NETGEAR	b/g/n		-	0%	-85	-81	-85	-	0%	1min 44s ago
 Mage	34:E8:94:E9:C6:A6	11	2.4GHz	WPA2 Personal	TP-LINK	n		-61	49%	-60	-51	-78	-96	4%	now

	BSSID	Channel	Band	Signal	Avg	Noise	Max	Min	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-35	-42	13%	-29	-48	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-24	-29	4%	-20	-58	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-37	-46	4%	-27	-58	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-61	-52	4%	-30	-64	76:60:CF

### 4, Entrance

<input type="checkbox"/>	TP-LINK_1C9C	C0:25:E9:94:1C:9B	6	2.4GHz	WPA2 Personal	TP-LINK	n	<div><div></div></div>	-79	21%	-75	-71	-79	-96	4%	now
<input checked="" type="checkbox"/>	Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Personal	EE:08:FB	b/g/n	<div><div></div></div>	-52	48%	-50	-47	-52	-96	4%	now
<input type="checkbox"/>	Joshua	A4:2B:8C:1E:3C:0A	1	2.4GHz	WPA2 Personal	NETGEAR	b/g/n	<div><div></div></div>	-91	9%	-91	-91	-91	-92	8%	now
<input type="checkbox"/>	IPRIMUS-7523	A8:CB:3A:D9:75:2C	9	2.4GHz	WPA/WPA2 Personal	HUAWEI	b/g/n	<div><div></div></div>	-	0%	-82	-82	-82	-	0%	15s ago
<input type="checkbox"/>	duidui studio	10:13:31:B2:A3:8F	11	2.4GHz	WPA2 Personal	Technicolor	g/n	<div><div></div></div>	-87	13%	-81	-75	-87	-92	8%	now
<input checked="" type="checkbox"/>	Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n	<div><div></div></div>	-47	53%	-44	-40	-47	-96	4%	now
<input type="checkbox"/>	Telstra62D31	D4:35:1D:06:2D:31	1	2.4GHz	WPA2 Personal	Technicolor	b/g/n	<div><div></div></div>	-78	22%	-78	-77	-78	-92	8%	now
<input type="checkbox"/>	Mage	34:E8:94:E9:C6:A6	11	2.4GHz	WPA2 Personal	TP-LINK	n	<div><div></div></div>	-67	33%	-68	-67	-68	-96	4%	now
<input type="checkbox"/>	YLXX	80:37:73:A6:0C:1E	13	2.4GHz	WPA2 Personal	NETGEAR	b/g/n	<div><div></div></div>	-84	16%	-84	-84	-84	-96	4%	now
<input type="checkbox"/>	辦公室_b	FA:8F:CA:99:5C:9A	6	2.4GHz	Open	FA:8F:CA	b/g/n	<div><div></div></div>	-73	27%	-74	-73	-75	-96	4%	now
<input type="checkbox"/>	Optus_B818_2109	2C:78:0E:28:21:09	5,+1	2.4GHz	WPA2 Personal	Huawei	b/g/n	<div><div></div></div>	-75	25%	-75	-75	-75	-96	4%	now
<input type="checkbox"/>	House of Teal	EC:BE:DD:36:15:B5	1	2.4GHz	WPA2 Personal	Sagemcom	n	<div><div></div></div>	-83	17%	-83	-83	-83	-92	8%	now
<input type="checkbox"/>	Telstra Air	D6:35:1D:06:2D:33	1	2.4GHz	Open	D6:35:1D	b/g/n	<div><div></div></div>	-78	22%	-79	-78	-79	-92	8%	now
<input checked="" type="checkbox"/>	Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac	<div><div></div></div>	-55	45%	-52	-49	-55	-92	8%	now
<input type="checkbox"/>	TP-LINK_8073	34:E8:94:DF:80:72	1	2.4GHz	WPA2 Personal	TP-LINK	n	<div><div></div></div>	-59	41%	-62	-59	-65	-92	8%	now
<input type="checkbox"/>	TP-LINK_1C9C_5G	C0:25:E9:94:1C:9A	36	5GHz	WPA2 Personal	TP-LINK	ac	<div><div></div></div>	-	0%	-90	-90	-90	-	0%	15s ago
<input checked="" type="checkbox"/>	QIN'sPhone	6E:CE:EA:4D:2F:02	9	2.4GHz	WPA2 Personal	6E:CE:EA	b/g/n	<div><div></div></div>	-62	38%	-64	-62	-66	-96	4%	now
<input type="checkbox"/>	Fon WiFi	D6:35:1D:06:2D:34	1	2.4GHz	Open	D6:35:1D	b/g/n	<div><div></div></div>	-78	22%	-78	-78	-78	-92	8%	now
<input type="checkbox"/>	OPTUS_B5B5D0	34:6B:46:B5:B5:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n	<div><div></div></div>	-70	30%	-71	-70	-72	-96	4%	now

	BSSID	Channel	Band	Signal	Avg	Noise	Max	Min	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-55	-52	13%	-49	-55	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-47	-44	4%	-40	-47	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-52	-50	4%	-47	-52	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-62	-64	4%	-62	-66	76:60:CF

## 5, Kitchen

<input type="checkbox"/> TP-LINK_1C9C	CO:25:E9:94:1C:9B	6	2.4GHz	WPA2 Personal	TP-LINK	n	-79	21%	-75	-71	-79	-96	4%	now
<input checked="" type="checkbox"/> Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Pe...	EE:08:FB	b/g/n	-52	48%	-50	-47	-52	-96	4%	now
<input type="checkbox"/> Joshua	A4:2B:8C:1E:3C:0A	1	2.4GHz	WPA2 Personal	NETGEAR	b/g/n	-91	9%	-91	-91	-91	-92	8%	now
<input type="checkbox"/> IPRIMUS-7623	A8:C8:3A:D9:75:2C	9	2.4GHz	WPA/WPA2 Per...	HUAWEI	b/g/n	-	0%	-82	-82	-82	-	0%	15s ago
<input type="checkbox"/> dudu studio	10:13:31:B2:A3:BF	11	2.4GHz	WPA2 Personal	Technicolor	g/n	-87	13%	-81	-75	-87	-92	8%	now
<input checked="" type="checkbox"/> Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n	-47	53%	-44	-40	-47	-96	4%	now
<input type="checkbox"/> Telstra062D31	D4:35:1D:06:2D:31	1	2.4GHz	WPA2 Personal	Technicolor	b/g/n	-78	22%	-78	-77	-78	-92	8%	now
<input type="checkbox"/> Mage	34:E8:94:E9:C6:A6	11	2.4GHz	WPA2 Personal	TP-LINK	n	-67	33%	-68	-67	-68	-96	4%	now
<input type="checkbox"/> YLXX	80:37:73:A6:0C:1E	13	2.4GHz	WPA2 Personal	NETGEAR	b/g/n	-84	16%	-84	-84	-84	-96	4%	now
<input type="checkbox"/> 群公室_b	FA:8F:CA:99:5C:9A	6	2.4GHz	Open	FA:8F:CA	b/g/n	-73	27%	-74	-73	-75	-96	4%	now
<input type="checkbox"/> Optus_BB18_2109	2C:78:0E:28:21:09	5,+1	2.4GHz	WPA2 Personal	Huawei	b/g/n	-75	25%	-75	-75	-75	-96	4%	now
<input type="checkbox"/> House of Teal	EC:BE:DD:36:15:85	1	2.4GHz	WPA2 Personal	Sagemcom	n	-83	17%	-83	-83	-83	-92	8%	now
<input type="checkbox"/> Telstra Air	D6:35:1D:06:2D:33	1	2.4GHz	Open	D6:35:1D	b/g/n	-78	22%	-78	-79	-79	-92	8%	now
<input checked="" type="checkbox"/> Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac	-55	45%	-52	-49	-55	-92	8%	now
<input type="checkbox"/> TP-LINK_8073	34:E8:94:DF:80:72	1	2.4GHz	WPA2 Personal	TP-LINK	n	-59	41%	-62	-59	-65	-92	8%	now
<input type="checkbox"/> TP-LINK_1C9C_5G	CO:25:E9:94:1C:9A	36	5GHz	WPA2 Personal	TP-LINK	ac	-	0%	-90	-90	-90	-	0%	15s ago
<input checked="" type="checkbox"/> QIN的Phone	6E:CE:EA:4D:2F:62	9	2.4GHz	WPA2 Personal	6E:CE:EA	b/g/n	-62	38%	-64	-62	-66	-96	4%	now
<input type="checkbox"/> Fon WiFi	D6:35:1D:06:2D:34	1	2.4GHz	Open	D6:35:1D	b/g/n	-78	22%	-78	-78	-78	-92	8%	now
<input type="checkbox"/> OPTUS_BB58D0	34:6B:46:B5:85:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n	-70	30%	-71	-70	-72	-96	4%	now

	BSSID	Channel	Band	Signal	Avg	Max	Min	Noise	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-42	-37	-34	-42	13%	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-31	-32	-31	-32	4%	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-32	-45	-32	-52	4%	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-55	-48	-43	-96	4%	76:60:CF

## 6, PC table

<input type="checkbox"/> TP-LINK_8073_5G	34:E8:94:DF:80:71	36	5GHz	WPA2 Personal	TP-LINK	ac	-80	20%	-85	-72	-87	-96	4%	now
<input type="checkbox"/> TP-LINK_12FF	7C:8B:CA:AE:12:FE	1	2.4GHz	WPA2 Personal	TP-LINK	n	-	0%	-81	-81	-81	-	0%	3min 25s ago
<input type="checkbox"/> House of Teal	EC:BE:DD:36:15:85	1	2.4GHz	WPA2 Personal	Sagemcom	n	-78	22%	-80	-78	-84	-96	4%	now
<input type="checkbox"/> TP-LINK_8073	34:E8:94:DF:80:72	1	2.4GHz	WPA2 Personal	TP-LINK	n	-69	31%	-76	-68	-67	-92	8%	now
<input checked="" type="checkbox"/> Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Pe...	EE:08:FB	b/g/n	-52	48%	-50	-47	-52	-96	4%	now
<input checked="" type="checkbox"/> Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n	-38	62%	-29	-20	-42	-96	4%	now
<input checked="" type="checkbox"/> QIN的Phone	A6:6E:96:CB:3E:7C	9	2.4GHz	WPA2 Personal	A6:6E:96	b/g/n	-61	39%	-41	-30	-61	-96	4%	now
<input checked="" type="checkbox"/> Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac	-45	55%	-42	-29	-46	-92	8%	now
<input type="checkbox"/> 群公室_b	FA:8F:CA:99:5C:9A	6	2.4GHz	Open	FA:8F:CA	b/g/n	-71	29%	-72	-62	-78	-96	4%	now
<input type="checkbox"/> Optus_BB18_2109	2C:78:0E:28:21:09	5,+1	2.4GHz	WPA2 Personal	Huawei	b/g/n	-76	24%	-69	-57	-77	-96	4%	now
<input type="checkbox"/> OPTUS_BB58D0	34:6B:46:B5:85:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n	-72	28%	-70	-52	-77	-92	8%	now
<input type="checkbox"/> Joshua	A4:2B:8C:1E:3C:0A	1	2.4GHz	WPA2 Personal	NETGEAR	b/g/n	-81	19%	-85	-81	-85	-96	4%	now

	BSSID	Channel	Band	Signal	Avg	Max	Min	Noise	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-42	-37	-34	-42	13%	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-25	-26	-25	-28	4%	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-53	-56	-53	-58	4%	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-44	-44	-43	-45	4%	76:60:CF

## 7, Table

<input type="checkbox"/> TP-LINK_12FF	7C:8B:CA:AE:12:FE	1	2.4GHz	WPA2 Personal	TP-LINK	n	-	0%	-81	-81	-81	-	0%	4min 33s ago
<input type="checkbox"/> House of Teal	EC:BE:DD:36:15:85	1	2.4GHz	WPA2 Personal	Sagemcom	n	-81	19%	-80	-78	-84	-92	8%	now
<input type="checkbox"/> TP-LINK_8073	34:E8:94:DF:80:72	1	2.4GHz	WPA2 Personal	TP-LINK	n	-71	29%	-76	-68	-67	-92	8%	now
<input checked="" type="checkbox"/> Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Pe...	EE:08:FB	b/g/n	-27	73%	-47	-27	-68	-96	4%	now
<input checked="" type="checkbox"/> Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n	-36	64%	-29	-20	-42	-96	4%	now
<input checked="" type="checkbox"/> QIN的Phone	A6:6E:96:CB:3E:7C	9	2.4GHz	WPA2 Personal	A6:6E:96	b/g/n	-61	39%	-48	-30	-64	-96	4%	now
<input checked="" type="checkbox"/> Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac	-45	55%	-42	-29	-48	-92	8%	now
<input type="checkbox"/> 群公室_b	FA:8F:CA:99:5C:9A	6	2.4GHz	Open	FA:8F:CA	b/g/n	-53	47%	-68	-45	-78	-96	4%	now
<input type="checkbox"/> Optus_BB18_2109	2C:78:0E:28:21:09	5,+1	2.4GHz	WPA2 Personal	Huawei	b/g/n	-75	25%	-69	-57	-78	-96	4%	now
<input type="checkbox"/> OPTUS_BB58D0	34:6B:46:B5:85:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n	-78	22%	-70	-52	-78	-96	4%	now
<input type="checkbox"/> Joshua	A4:2B:8C:1E:3C:0A	1	2.4GHz	WPA2 Personal	NETGEAR	b/g/n	-	0%	-85	-81	-85	-	0%	52s ago
<input type="checkbox"/> Mage	34:E8:94:E9:C6:A6	11	2.4GHz	WPA2 Personal	TP-LINK	n	-62	38%	-60	-54	-78	-92	8%	now

	BSSID	Channel	Band	Signal	Avg	Max	Min	Noise	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-45	-42	-29	-48	13%	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-36	-29	-20	-42	4%	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-27	-47	-27	-58	4%	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-51	-48	-30	-64	4%	76:60:CF

## 8, Toilet

<input type="checkbox"/> TP-LINK_8073_5G	34:E8:94:DF:80:71	36	5GHz	WPA2 Personal	TP-LINK	ac	-86	14%	-87	-85	-87	-96	4%	now
<input type="checkbox"/> TP-LINK_12FF	7C:8B:CA:AE:12:FE	1	2.4GHz	WPA2 Personal	TP-LINK	n	-	0%	-81	-81	-81	-	0%	1min 18s ago
<input type="checkbox"/> House of Teal	EC:BE:DD:36:15:85	1	2.4GHz	WPA2 Personal	Sagemcom	n	-81	19%	-80	-79	-82	-90	10%	now
<input type="checkbox"/> TP-LINK_8073	34:E8:94:DF:80:72	1	2.4GHz	WPA2 Personal	TP-LINK	n	-74	26%	-76	-73	-76	-90	10%	now
<input checked="" type="checkbox"/> Optus_4232D6 (2)	EE:08:FB:EA:0C:14	9	2.4GHz	WPA/WPA2 Pe...	EE:08:FB	b/g/n	-53	47%	-56	-53	-58	-96	4%	now
<input checked="" type="checkbox"/> Optus_4232D6	64:66:24:42:32:D8	9	2.4GHz	WPA2 Personal	Sagemcom	b/g/n	-25	75%	-26	-25	-28	-96	4%	now
<input checked="" type="checkbox"/> QIN的Phone	A6:6E:96:CB:3E:7C	9	2.4GHz	WPA2 Personal	A6:6E:96	b/g/n	-30	70%	-38	-30	-50	-96	4%	now
<input checked="" type="checkbox"/> Optus_4232D6_5GHz	64:66:24:42:32:D9	149	5GHz	WPA2 Personal	Sagemcom	ac	-44	56%	-44	-43	-45	-99	11%	now
<input type="checkbox"/> 群公室_b	FA:8F:CA:99:5C:9A	6	2.4GHz	Open	FA:8F:CA	b/g/n	-68	32%	-72	-68	-74	-96	4%	now
<input type="checkbox"/> Optus_BB18_2109	2C:78:0E:28:21:09	5	2.4GHz	WPA2 Personal	Huawei	b/g/n	-71	29%	-70	-68	-73	-96	4%	now
<input type="checkbox"/> OPTUS_BB58D0	34:6B:46:B5:85:0F	6	2.4GHz	WPA2 Personal	Sagemcom	n	-71	29%	-72	-71	-72	-96	4%	now
<input checked="" type="checkbox"/> Joshua	A4:2B:8C:1E:3C:0A	1	2.4GHz	WPA2 Personal	NETGEAR	b/g/n	-84	16%	-85	-84	-85	-90	10%	now

	BSSID	Channel	Band	Signal	Avg	Max	Min	Noise	Vender
Optus 5G	64:66:24:42:32:D9	149	5Ghz	-45	-42	-29	-46	13%	Sagemcom
Optus	64:66:24:42:32:D8	5,+1	2.4Ghz	-38	-29	-20	-42	4%	Sagemcom
WiFi extension	EE:08:FB:EA:0C:14	9	2.4Ghz	-39	-62	-39	-58	4%	EE:08:FB
Iphone hot point	76:60:CF:F8:E8:DF	9	2.4Ghz	-51	-41	-30	-61	4%	76:60:CF

## 2.1 Channel occupancy

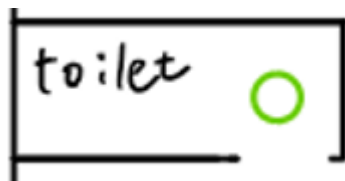
In this part, according to the survey Optus 2.4Ghz, Wi-Fi extension, and my iPhone hot point occupy the same channel 9. The Optus 5Ghz occupy channel 149. This means these APs are on the same channels.

## 2.2 Interference and Attenuation

In my room, there are not microwave or wireless headsets which affect the Wi-Fi signal, this is why my kitchen's data and living room table's data are very close.

Also, the apartment is built by a foam-filled wall, which means the foam can absorb the signal, and inside the wall, the signal cannot reflect. However, that does not mean the foam-fill wall is strong to absorb signal, this kind of wall mostly thin, and the outer layer is made by wood, which means the Wi-Fi signal can easily go through.

Inside the toilet, the whole room is surrounded by the wall but the signal level is



similar to the table's signal level, even the signal has to go through 1 more wall.

About the data at the balcony, the signal level reduces more than the indoor signal. This is because the noise reduction window has double glazing systems which stop the air leak. The thickness of the window is 5cm which truly reduces the level of the signal, even glass's effective rate is 2db.

The signal level of the hot point is always weak, this is because the phone is not used to emit signals.

Building Material	800 MHz Cellular Band	1900 MHz PCS B
1/2" Drywall	2.03 dB	2.43 dB
Venetian Plaster	7.91 dB	16.22 dB
6" Concrete Wall	10.11 dB	19.41 dB
Glass Window	4.35 dB	4.38 dB
1/4" Fiberglass	1.62 dB	1.90 dB
Low Emission Glass Window	33.8 dB	33.8 dB
Brick	7.57 dB	14.66 dB
Solid Wooden Door	6.11 dB	12.33 dB
Hollow Wood Door	5.39 dB	10.11 dB
1/2" OSB Plywood	3.27 dB	4.91 dB
1/2" Solid Pine	2.01 dB	5.05 dB
1/2" Solid Oak	4.68 dB	6.11 dB

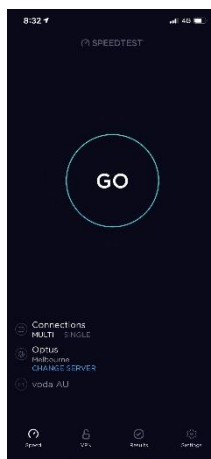
(data from Signal booster)

## 2.3 Coverage

The coverage of all signals is large, 2.4Ghz, and 5Ghz can be detected is everywhere fluently, but outside the indoor, the level of Wi-Fi not stable, and Wi-Fi extension cannot be found on balcony1, I more prefer to use the cellular data at the balcony.

## 2.4 Download and upload speeds

In this part, I use the Speed Test for testing my network.



All connection point are Optus Melbourne							
Optus 2.4Ghz	Bedroom1	balcony1	toilet	balcony2	kitchen	bedroom2	table
ms	5	6	6	6	6	5	6
Download Mbps	54.3	13.7	54.7	49.3	54.7	54.9	54.5
Upload Mbps	18.9	9.85	14.1	17.3	18.8	19.1	14.5
Wi-Fi extension	Bedroom1	balcony1	toilet	balcony2	kitchen	bedroom2	table
ms	6		6	6	7	5	6
Download Mbps	42.6		42.1	4.15	40.4	41.6	40.7
Upload Mbps	17.7		17.2	8.21	18.8	17.1	17.4
Optus 5Ghz	Bedroom1	balcony1	toilet	balcony2	kitchen	bedroom2	table
ms	5	6	5	6	5	5	6
Download Mbps	54.6	53.1	53.6	54.3	53.6	54.9	54.2
Upload Mbps	17.6	18.4	17.8	17.7	18.8	18.9	19.1
Hot point(Voda AU)	Bedroom1	balcony1	toilet	balcony2	kitchen	bedroom2	table
ms	18	24	21	20	23	24	23
Download Mbps	22.9	38.8	23.4	38.5	16.4	21.6	20.3
Upload Mbps	6.5	39.3	6.94	39.1	8.7	6.8	7.6



According to my data, 5Ghz easily penetrates the wall and it is very stable, the speed is similar to 2.4Ghz, 2.4Ghz does not have such penetrating power. However, the hot point is not stable, outdoor is faster than indoor. Wi-Fi extension cannot be detected on balcony1, it is slower than the normal Wi-Fi indoor.

## **Task 2: Cyber Security**

### **Summary of “TikTok and 32 other iOS apps still snoop your sensitive clipboard data”**

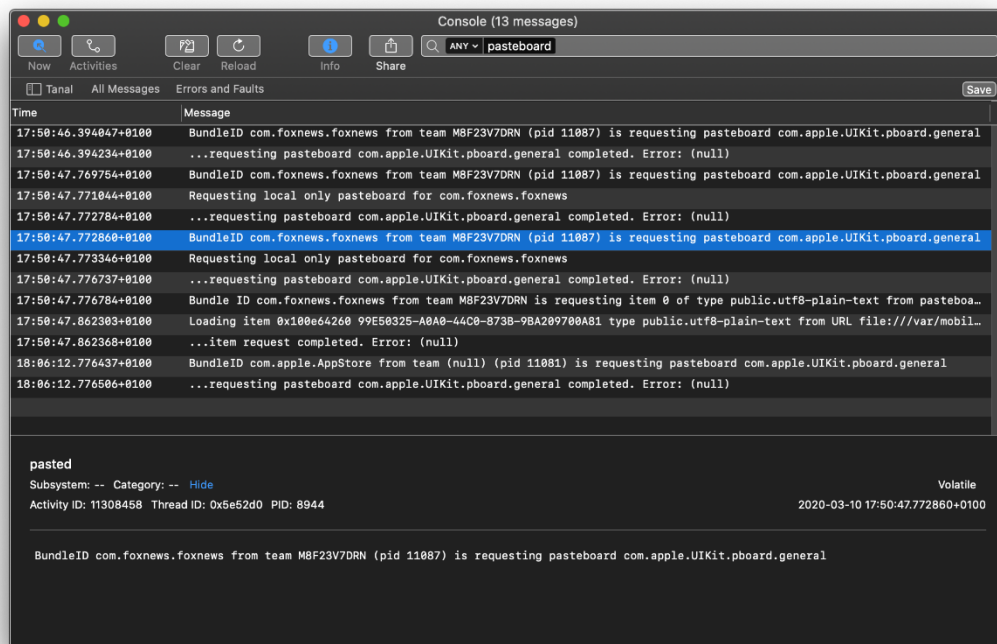
There are two researchers found a significant privacy invasion of the app “Tiktok” in March. The Tiktok app called the iOS interface and get the information from clipboards which include such as passwords, personal messages. These kinds of behavior also can easily read clipboard information on other iOS devices while these devices are connected. Even the Tiktok company decides to change the situation, Tiktok does not stop reading the clipboard. After the new iOS 14 beta can show the warning while the app checks the clipboard, the representative states this behavior just for anti-spam, the new vision of Tiktok will not have anti-spam by removing the feature on iOS, but on Android aspect, Tiktok never removes the anti-spam. Not just Tiktok fetch privacy information, some games and news apps also do the same. This kind of worry of invasion may extend to other OS users, it is a good start for apple start notice function.

### **1.0 Identify**

Tiktok is created by the Chinese firm Bytedance in 2016, today the version is 15.5.0. In 2018 the first half, these kinds of scrolling video feed got download by more than 104 million iOS users (Dan, 2020). And more than 52 apps (Joel, 2020) found to do the same thing.

## 2.0 Describe the Problem

The developer called “Mysk”, found this problem while using the XCode. The XCode is provided by the apple company for developers to build apps for iOS. The method to find it is reading the system log of the device while open the apps, all clipboard event will be logged and showed:



- 1, the app sends the requested for access with its ID
- 2, The message said loading item, means it reads the clipboard
- 3, the message shows the **public.utf8-plain-text** means what the app read is the text (Mysk, 2020)

## 3.0 Estimate the Seriousness

This behavior cause society losing the truth of internet firm, the credit is hard to build and destroy easily, and the firm should always provide service not harm for society. Meanwhile, people will be hurt if companies overlook privacy if companies use their data for selling.

In the technical aspect, the companies have to consider What level of content is read



correctly, how deep should they allow can be hard questions for every OS developer to think.

This can be a method for hackers snatching the people's behavior, people will be more anxious, and it may create a danger with these data. The scammer can use this information to make the trap looks real after knowing the name or school. Meanwhile, more bank starts create the app, that means the hacker can use the clipboard to know the passwords and the account of the bank. Online paying also become unsafe, criminal may use people PayPal or apple pay account for buying.

On the policy aspect, Donald Trump was accused of using the collection of Facebook data for attracting the target voter in the USA election, and some people worry the police may use the data to arrest people who have opinions with the government. The government should set the law for companies in collecting data to avoid these kinds of situations and surprise inspection of the company's database.

#### TASK1:

1, Signal Booster, retrieved 16 March 2020 "How Much & Which Building Materials Block Cellular & Wi-Fi Signals?" <https://www.signalbooster.com/blogs/news/how-much-which-building-materials-block-cellular-wifi-signals>

#### TASK2:

1, DAN GOODIN, retrieved 20 June 2020 "TikTok and 32 other iOS apps still snoop your sensitive clipboard data" <https://arstechnica.com/gadgets/2020/06/tiktok-and-53-other-ios-apps-still-snoop-your-sensitive-clipboard-data/>

2, Joel Khalili, retrieved 29 June 2020 "It's not just TikTok - another 53 iOS apps will snatch your clipboard data" <https://www.techradar.com/au/news/its-not-just-tiktok-another-53-ios-apps-will-snatch-your-clipboard-data>

3, Mysk, retrieved 10 March 2020 "Popular iPhone and iPad Apps Snooping on the Pasteboard" <https://www.mysk.blog/2020/03/10/popular-iphone-and-ipad-apps-snooping-on-the-pasteboard/>

4, Mysk, retrieved 11 March 2020 "Find iPhone and iPad apps that snoop on the clipboard using this trick" <https://youtu.be/cCS78ilmpuY>

