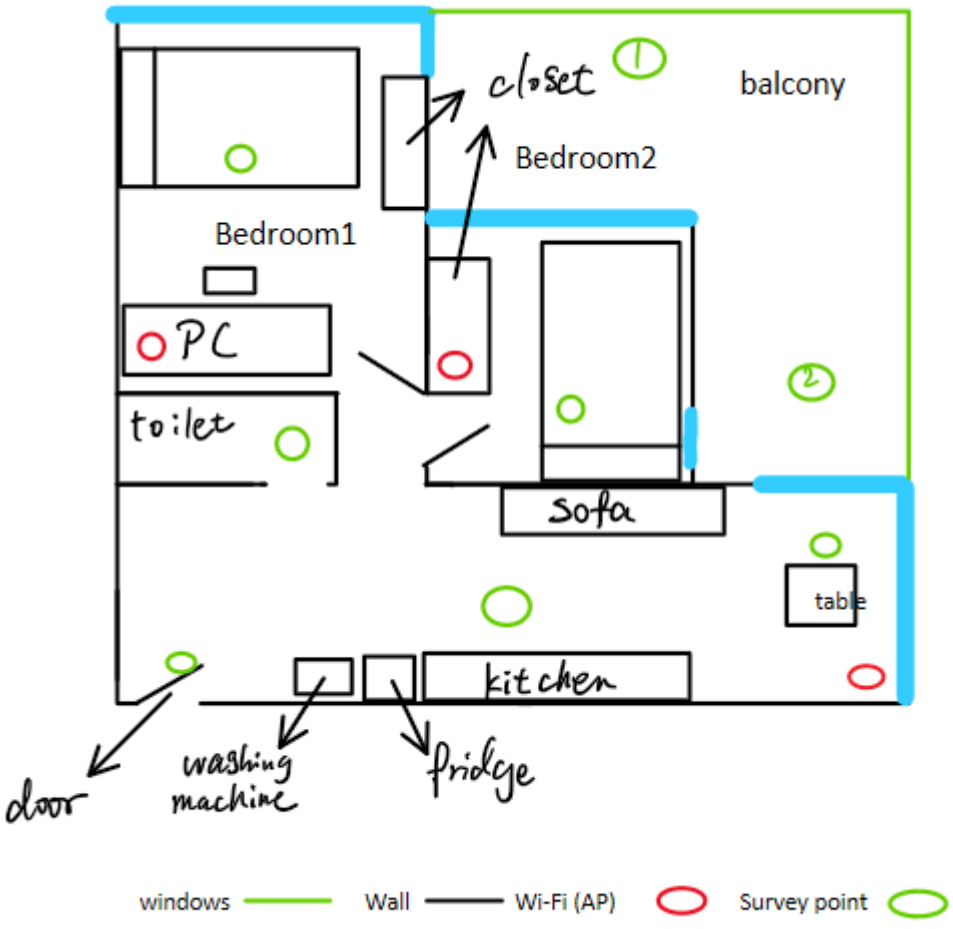
Assignment 2 report

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

	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

	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

	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

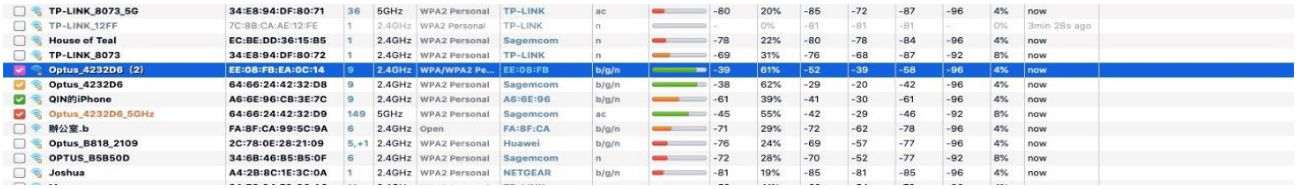
4, Entrance

	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

	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



	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

	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

	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

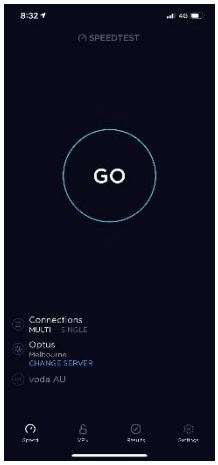
(data from Signal booster)

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"

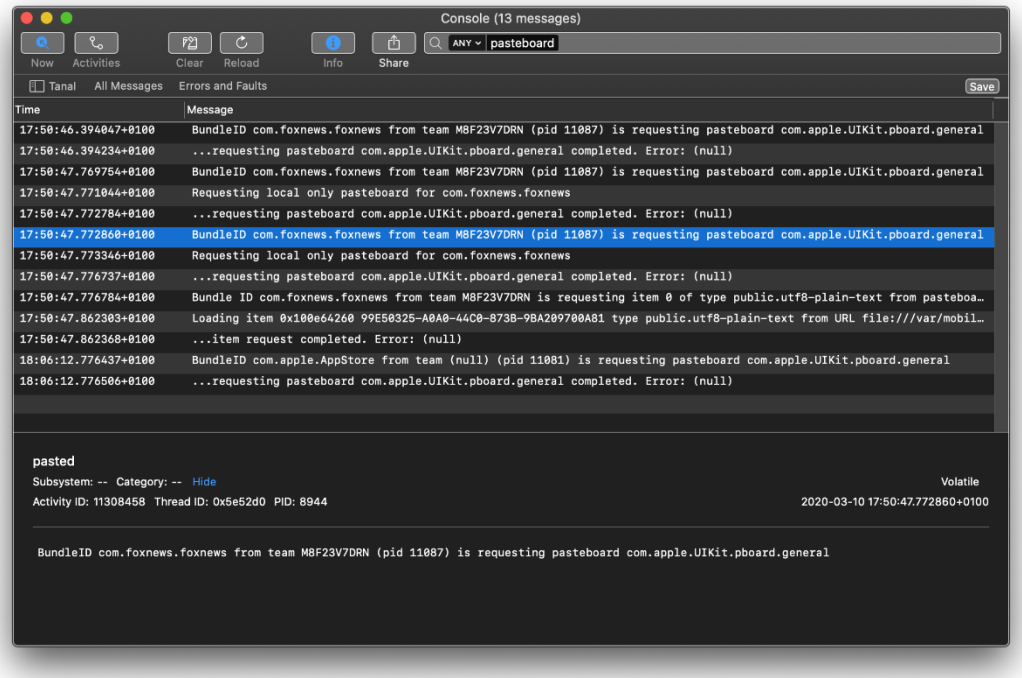
There are two researchers found a significant privacy invasion of the app "Tiktok" in March. The Tiktok app called the iOS interface and get the information from clipboards which include such as passwords, personal messages. These kinds of behavior also can easily read clipboard information on other 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"Tlt'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