Network Administration

1. 2.5GHz vs. 5GHz
    1. Why is 5GHz Wi-Fi theoretically faster than 2.4GHz Wi-Fi? (15%)
        - 因為5GHz的Wi-Fi訊號寬度比較大(頻寬比較大)，因此比較能在同樣的時間內傳輸比較多的資料。
    2. When connecting to the same AP that supports both 2.4GHz band and 5GHz band, do you always transmit your data faster using 5GHz Wi-Fi than using 2.4GHz Wi-Fi? Please write down your reasons in detail. (15%)
        - 並沒有，因為5GHz的Wi-Fi訊號比較難穿透牆壁，因此在一些情況下5GHz的訊號會比2.4GHz還要差，而這時候使用2.4GHz的Wi-Fi訊號傳輸資料會比較快速。
2. Wi-Fi encryption
    1. Find out the encryption method that CSIE wireless networks, "csie" and "csie-5G", are using, and provide the evidence. (5%)

Network Name (SSID)	Signal Str...	Signal Quality	MAC Address (BSSID)	Comment	Vendor	Achievable Rate	Max Rate	Network ...	Channel	Channel Band	Channel W...	Spatial Str...	Channel ...	Clients	Security Mode	Encryption	Auth
csie	**-43 dBm**	**86%**	**30-87-D9-71-96-4C**		**Ruckus Wireless**	**1300 Mbps**	**1300 Mbps**	**a, n, ac**	**106**	**5 GHz**	**80 MHz**	**3**			**WPA2**	**CCMP**	**WPA2-EAP**
csie	-47 dBm	88%	30-87-D9-31-96-48		Ruckus Wireless	216.7 Mbps	216.7 Mbps	b, g, n	11	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
CSIE_guest	-49 dBm	85%	30-87-D9-71-96-48		Ruckus Wireless	216.7 Mbps	216.7 Mbps	b, g, n	11	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
101_2.4G	-56 dBm	73%	30-87-D9-71-55-48		Ruckus Wireless	195 Mbps	216.7 Mbps	b, g, n	6	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-PSK
csie	-59 dBm	70%	30-87-D9-31-55-48		Ruckus Wireless	195 Mbps	216.7 Mbps	b, g, n	6	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
ntu_peap	-65 dBm	58%	00-24-6C-27-90-D1		Aruba Networks	78 Mbps	130 Mbps	b, g, n	1	2.4 GHz	20 MHz	2			WPA/WPA2	TKIP/CCMP	WPA-EAP/WPA2-EAP
NTU	-67 dBm	55%	00-24-6C-27-90-D2		Aruba Networks	52 Mbps	130 Mbps	b, g, n	1	2.4 GHz	20 MHz	2			WEP	WEP	Open
ntu_peap	-70 dBm	50%	00-24-6C-27-90-D9		Aruba Networks	60 Mbps	300 Mbps	a, n	60+64	5 GHz	40 MHz	2			WPA/WPA2	TKIP/CCMP	WPA-EAP/WPA2-EAP
ntu_peap	-71 dBm	48%	00-24-6C-27-AC-E9		Aruba Networks	60 Mbps	300 Mbps	a, n	64-60	5 GHz	40 MHz	2			WPA/WPA2	TKIP/CCMP	WPA-EAP/WPA2-EAP
NTU	-71 dBm	48%	00-24-6C-27-90-DA		Aruba Networks	60 Mbps	300 Mbps	a, n	60+64	5 GHz	40 MHz	2			WEP	WEP	Open
NTU	-71 dBm	48%	00-24-6C-27-AC-EA		Aruba Networks	60 Mbps	300 Mbps	a, n	64-60	5 GHz	40 MHz	2			WEP	WEP	Open
101_5G	-71 dBm	48%	30-87-D9-B1-55-4C		Ruckus Wireless	97.5 Mbps	1300 Mbps	a, n, ac	106	5 GHz	80 MHz	3			WPA2	CCMP	WPA2-PSK
csie	-71 dBm	48%	30-87-D9-71-55-4C		Ruckus Wireless	97.5 Mbps	1300 Mbps	a, n, ac	106	5 GHz	80 MHz	3			WPA2	CCMP	WPA2-EAP
csie-5G	-71 dBm	48%	30-87-D9-31-55-4C		Ruckus Wireless	97.5 Mbps	1300 Mbps	a, n, ac	106	5 GHz	80 MHz	3			WPA2	CCMP	WPA2-EAP
NTU	-74 dBm	43%	00-24-6C-27-AC-E2		Aruba Networks	26 Mbps	130 Mbps	b, g, n	6	2.4 GHz	20 MHz	2			WEP	WEP	Open
ntu_peap	-75 dBm	41%	00-24-6C-27-AC-E1		Aruba Networks	26 Mbps	130 Mbps	b, g, n	6	2.4 GHz	20 MHz	2			WPA/WPA2	TKIP/CCMP	WPA-EAP/WPA2-EAP
csie	-75 dBm	41%	30-87-D9-31-83-08		Ruckus Wireless	43.3 Mbps	216.7 Mbps	b, g, n	1	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
csie	-76 dBm	40%	30-87-D9-31-51-28		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	11	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
CSIE_guest	-76 dBm	40%	30-87-D9-71-51-28		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	11	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
csie	-76 dBm	40%	30-87-D9-31-5B-88		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	1	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
CSIE_guest	-76 dBm	40%	30-87-D9-71-5B-88		Ruckus Wireless		216.7 Mbps	b, g, n	1	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
CSIE_guest	-77 dBm	38%	30-87-D9-71-83-08		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	1	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
csie	-77 dBm	38%	30-87-D9-31-5A-88		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	6	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
CSIE_guest	-77 dBm	38%	30-87-D9-71-7F-C8		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	1	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
CSIE_guest	-78 dBm	36%	30-87-D9-71-5A-88		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	6	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP
csie	-78 dBm	36%	30-87-D9-31-7F-C8		Ruckus Wireless	21.7 Mbps	216.7 Mbps	b, g, n	1	2.4 GHz	20 MHz	3			WPA2	CCMP	WPA2-EAP

        - 我們可以從圖中發現csie和csie-5G都是使用WPA2-EAP
    2. Provide the main differences between this encryption method and its older version, WPA. (7%)
        - WPA是WPA2的過渡版本，而其安全性也比較差一些，在2009年就已經有日本團隊宣布可以在15分鐘內破解的WPA的加密方法。而WPA的加密方法是由WEP所改良的，但是因為原本算法的缺點，因此他依然存在著弱點。
        - 而目前WPA2的破解方式還沒有使用字典檔暴力以外的作法。
    3. Compare the current encryption method in question 2-(1) to WEP, which is the older encryption method. Please identify one advantage and one disadvantage of the current encryption method. (8%)
        - WPA2相比WEP是比較新的加密方式，而WPA2的最大優點就是他目前還沒有良好的破解方法，WPA2的缺點主要就是比較舊的機器不支援，而且加密需要花比較多一點的時間。