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# Wi-Fi Network applications for Apple Mac OS X

## By Pranay Pancholi, Loughborough University 26/3/2014

Whilst there is a large choice of Wi-Fi analytical tools available for the PC market, the choice available to MAC OS X users is somewhat limited.

This document provides an overview of 8 applications – some are free and others have a cost - that can be used to assist with Wi-Fi stumbling and surveying on Mac OS X. They can help in various ways to troubleshoot and diagnose wireless connectivity issues in the field:

- Mac OS X Wi-Fi Scanner
- iStumbler
- Chanalyzer for Mac
- NetSpot
- zPerf
- WiSpy
- WiFi Signal
- WiFi Explorer

## Mac OS X Wi-Fi Scanner

System Requirements: OS X 10.7 or later Price: Free

If you have OS X 10.7 or above there is now a useful built-in Wi-Fi scanner utility, which is used to discover nearby available wireless networks.

1. Select option button followed by pressing on *Airport* icon on the menu bar. From the drop down list select *Open Wireless Diagnostics*.



2. When prompted, enter your administrator *name* and *password*.

Wireless Diagnostics wants to make of Type your password to allow this.	changes
Name:	
Password:	
Cancel	OK

3. The Wireless Diagnostics window will appear, asking you to follow on screen instructions.



4. From the menu bar select *Window* followed by **Utilities** to open the Mac Wi-Fi Scanner application. Alternatively you can also press CMD+2 to open the application.

Window	Help				
Minimiz	Minimize				
Zoom					
Assistar	nt	<b>#1</b>			
Utilities		<b>#2</b>			
Bring A	ll to Front				
✓ Wireless	s Diagnosti	cs			

The Utilities window opens and presents you with five options:

**Info** – Displays all network information about the AP to which your device is currently associated.

Info Frame Capta	ire Logging Wi-Fi Scan Performance
Wi-Fi interface	
Interface Name	enl
MAC Address	AND REAL PROPERTY AND AND AND
Network Name	- million reasons
Active PHY Mode	802.11n
Security	WPA2 Enterprise
RSSID	data provident and data and
Country Code	GB
RSSI	-51 dBm
Noise	-86 dBm
Rate	300 Mbps
Channel	48 (5 GHz)
Channel Width	40 MHz
Bluetcoth	
Power State	Off
Paired Device Count	0
Network Configuration	
Primary IPv4 Interface	
IPv4 Address	101.011.005.000
IPv4 Router	1001.0001.0004.0
Primary IPv5 Interface	4411
IPv6 Address	part and an arrange of the
IPv6 Router	facility of the work facility of the
DNS Server	1008 1011 1 1000

Frame Capture - Allows capturing of data sent or received over the wireless network.

00	Utilities	
	0 🖸 🔯 🔹 🗸	
	Info Frame Capture Logging Wi-Fi Scan Performance	
Use you	r Mac as a dedicated sniffer to capture Wi-Fi traffic on one	of the
Use you	r Mac as a dedicated sniffer to capture Wi-Fi traffic on one channels specified below.	of the
Use your	r Mac as a dedicated sniffer to capture Wi-Fi traffic on one channels specified below.	of the

**Logging** – Allows you to capture logs for debugging events occurring on the associated wireless network.

Enable or disab	le background lo	ogging for the follo	wing system components.
Background log	ging preference may be cha	s persist across reb nged by other proc	oot, are system-wide, and cesses.
🗌 Wi-Fi		DHCP	
EAPOL		OpenDirectory	
	C	Collect Logs	

**Wi-Fi Scan** – Scans all available wireless networks within the spectrum of your area and gives recommendations for best 2.4 and 5 GHz channels available that are free to use.

Networ A	BSSID	Security	Protocol	RSSI	No	Ch	Band	Width	C
address and	00.2 × 0.1 FL Md an	WPA2 Enterprise	802.11a/n	-45	-92	48	5 GHz	40 MHz	GB
aduruph.	In 17 all young Pr	WPA2 Enterprise	802.11a/n	-42	-92	40	5 GHz	40 MHz	GB
adurnam	Advantation (1) and	WPA2 Enterprise	802.11a/n	-83	-92	44	5 GHz	40 MHz	GB
adurupe	49-21039-00-0016	WPA2 Enterprise	802.11a/n	-61	-92	136	5 GHz	40 MHz	CB
aduruph.	lo 17 dihawaa 76	WPA2 Enterprise	802.11b/g/n	-41	-92	6	2.4GHz	20 MHz	GB
aduruph	An apple descind	WPA2 Enterprise	802.11b/g/n	-74	-92	6	2.4GHz	20 MHz	GB
adurupe	49-2103-00-49-11	WPA2 Enterprise	802.11b/g/n	-58	-92	11	2.4GHz	20 MHz	CB
adarrages.	60 10 17 17 64 KI	WPA2 Enterprise	802.11g	-82	-92	1	2.4GHz	20 MHz	CB
00700	to 17 all cares for	WPA2 Personal	802.11a/n	-43	-92	40	5 GHz	40 MHz	GB
E-Comb	00.0 mag 11 16.14	Open	802.11a	-76	-92	40	5 GHz	20 MHz	CB
6-Comm	00.0 mail 11.0 mail	Open	802.11b/g	-63	-92	11	2.4GHz	20 MHz	CB
a and	00.04 all 11.06 fee	WPA2 Enterprise	802.11a	-75	-92	40	5 GHz	20 MHz	GB
8-bull	00.04.48.01.04.40	WPA2 Enterprise	802.11b/g	-62	-92	11	2.4GHz	20 MHz	CB
integral (	00.2 m 87 17, 64 m	Open	802.11a/n	-45	-92	48	5 GHz	40 MHz	GB
-	too 1 Rollingson Re-	0000	002 11s/n	.43	07	40	c rus	AD MUS	00
2.4 CHz Net	tworks	1	6 Best 2.4 CH	7 Char	nels				2
			-						

**Performance** – Provides real time graph of signal strength (dBn) and signal to noise ratio (SNR).

Quality Excellent	38
RSSI	ž 36- 35-
Noise -87 dBm	34-3
Tx Rate 300 Mbps	-50
SSID	-60
BSSID	5 -75
Channel 40 (5 CHz)	-85

Note: If using OS X Lion 10.7 Wi-Fi Diagnostics can be located at /System/Library/CoreServices/

## iStumbler

System Requirements: Intel, 64-bit processor, OS X 10.8 or later, Airport Price: Free

iStumbler for OS X is a wireless network discovery tool that scans for available wireless networks, bluetooth devices and bonjour services available to your Mac.

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SUD (heterck	ecunty	Security	Protocol	C/N History	-	Level -	5/N =	Sonal -	Noise	Chappel	Innaurory	Band	Name	Into
and themese		Onen	0.0	also report		shows where the second	52.43	=40 dile	-92 /8m	6	2437 MHz	2.4 00	Arrent-made	Network .
-		PO2 1V MPA2					52.00	-40	-02 -0-	6	2437	24.04	airport-phymode	802.117
-		DOG IN MINE	9L 11	*********	_		52 00	40	-72 000	0	2437 Mills	2.4 01	location	10.00
-	80	802.1X WPA2	g, n				52 08	-40 dam	-92 dbm	0	2437 MP2	2.4 ()1	radio-lastSeen	19s ago
and the second		Open	g, n				51 d8	-41 dBm	-92 dim	6	2437 MHz	2.4 CH	radio-mail	
and a set		Open	9			Contraction of the local division of the loc	50 cit	-42 dBm	-92 dim	1	2412 MHz	2.4 CH	rapio-name	211
and an owner of	- 61	802.1X WPA2	g, n		_	single and shared at the	50 cit	-42 dbm	-92 dim	1	2412 MHz	2.4 CH	radio-secure	Enterprise WPA.2
and a reason	- 61	802.1X WPA2	a, n		-	COLUMN TWO IS NOT	49 (8	-43 dbm	-92 dam	48	5240 MHz	5 01	radio-type	W-61
and and the local division of the local divi		Onen			_	STATISTICS.	48.0	-44 days	-92 days	48	5240 MHz	5 CH	radio-vendor	1000
		Open					40.00	-44	-02 -02	40	5240	5.04	will-country-code	CB
_		Open	4, 11				43	40	- 72 0000	40	5240 Mile	5.00	with the same	201 Bytes
		Open	a, n				43 08	-49 dim	-92 dam	40	5200 MH2	2 CH	will-phymode	6.7
and the second s	- 90	802.1X WPA2	a, n			sectored to	43 dt	-49 dBm	-92 d8m	40	5200 MHz	5 CH	will-security-modes	802.1X, 802.1X W
and the second		Open	a, n			CONTRACTOR OF	42 cli	-50 dilm	-92 dim	40	5200 MHz	5 CH	will-strangest-security	802.1X WPA2
and an owner of the local division of the lo	- 61	802.1X WPA2	n		_	STREET, ST.	35 ct	-51 dim	-86 dtm	40	5200 MHz	5 CH		
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Upon starting the application the interface is very simple to follow. The information available gives details of:

- SSID Wireless network name
- Security Type of security used on available wireless network: WEP, WPA, WPA2.
- Protocol A/B/G/N/AC
- Signal to Noise History History of SNR since launch of application
- Level Signal strength displayed in bars
- Signal to Noise ratio SNR displayed in DB (Higher numbers being better)
- Signal Signal strength displayed as DBm (Lower numbers the better)
- Noise Noise level displayed as DBm
- Channel Wireless channel of AP
- Frequency Channel base frequency that AP operates in
- Band Displays whether AP is operating in 2.4GHz or 5GHz band
- Width Width AP is operating in 20MHz or 40 MHz
- Vendor Manufacturer of AP
- BSSID Mac address of the wireless access point
- Country Code Country code of AP e.g. GB, US etc
- Location Co-ordinates of AP
- Last Seen When the network was last detected since start of scanning

The new release build 100 of iStumbler now brings in an information pane on the right hand side of the application, displaying additional information about a selected SSID as well as showing previous results from the scanning timeframe slider.

		Info							Info
Name	Value	*	Level	Signal	Noise	S/N	Freq	Width Dat	e
airport-mode	Network	280		-41	-92 d8m	51 dBm	2462	N 20 MHz	just now
airport-phymode	802.112	275		-41	-92 dBm	51 dBm	2462	A 20 MHz	just now
location		2/2		-41	-92 dism	Sidem	2462	20 MHz	12s ago
radio_lastSeen	just now	277		-41	-92 dsm	51 dBm	2462	20 MHz	15s ago 29: ago
radio-mac	Juschow	275		-41	-92 dam	51 dim	2462	20 MHz	2 95 ago 30: ago
radio namo	VET	274		-41	-92 dim	51 dilm	2462	20 MHz	421 app
radio-name	151	273		-41	-92 dBm	51 dBm	2462	20 MHz	45s ago
radio-samples	512	272		-41	-92 dim	51 dilm	2462	20 MHz	1m 0s ago
radio-secure	Enterprise WPA 2	271		-41	-92 dBm	51 dBm	2462	20 MHz	1m Os ago
radio-type	Wi-Fi	270		-41	-92 dim	51 dBm	2462	20 MHz	1m 12s ago
radio-vendor	Cisco	269		-41	-92 dBm	51 dBm	2462	0 20 MHz	1m 30s ago
wifi-country-code	GB	268		-41	-92 dBm	51 dBm	2462	20 MHz	1m 30s ago
wifi-ie-size	187 Bytes	267		-41	-92 d8m	51 dBm	2462	20 MHz	1m 45s ago
wifi-mode	BSS	266		-41	-92 d8m	51 dBm	2462	20 MHz	1m 45s ago
wifi-phymode	a, n	265		-41	-92 dBm	51 dBm	2462	20 MHz	1m S7s ago
wifi-security-modes	802.1X, 802.1X WPA2	264		-41	-92 d8m	51 dBm	2462	20 MHz	2m Os ago
wifi-strongest-security	802.1X WPA2	263		-41	-92 d8m	51 dBm	2462	A 20 MHz	2m 15s ago

## iStumber for Mac can be downloaded from: http://www.istumbler.net/

## Chanalyzer for Mac

System Requirements: OS X 10.5 or later and Wi-Spy DBx Price: £350.00

Chanalyzer for Mac is a native application supported on OS X which provides colourful views of the RF spectrum to provide basic spectrum analysis functionality.

The software can be downloaded free from: <u>http://www.metageek.net/products/chanalyzer-</u><u>mac/</u> [1]

The Mac OS X version of Chanalyzer allows users to:

- View Wi-Fi network table
- Monitor and locate sources of real time interference from Wi-Fi and non Wi-Fi RF activity
- Scan 2.4GHz and 5GHz
- Waterfall view
- Real time 3D Spectrogram view of data
- Save recordings of Wi-Fi Spectrum data

To view the RF spectrum within the application the Wi-Spy DBx USB module must be purchased and inserted to your Apple Mac desktop or laptop. Without the Wi-Spy DBx USB module the Spectrum features will not operate.



#### NetSpot

System Requirements: OS X 10.6 or later Price: Free for home users, \$149 for Pro, \$500 for Enterprise.

NetSpot is an application for Mac OS X that is used for wireless analysis, troubleshooting and wireless site survey. NetSpot comes in three versions: free, pro and enterprise. NetSpot is predominantly another wireless discovery scanner like iStumbler. However NetSpot also brings capability of doing wireless site surveys natively on Mac OS X. Although not as advanced and more established such as AirMagnet Survey Pro and Ekahau Site survey applications, which are Windows, only based applications. NetSpot does however produce simple passive and active wireless surveys with ease for OS X users.

• To use NetSpot as a wireless discovery tool to obtain a scan for nearby networks, first launch **NetSpot** and click on **Discover** on the top left of the window.

		0	O DISC	OVER	100	ALCO DE LA CALCOLINA DE LA CALC	E EXPORT	Ou	SER GUIDE	THE ASI	A QUEST	TION	* UP	RADE TO	O PRO			
540	_	8550		Ch	Band	Security	Vendor	Mode	Level (SNR)	Signal	Signal N	Avg	Max	Min	Noise	Not	Last seen	
	10.00	-	-	11	2.4CHz	WPA2 Enterprise	ProCurve	b/g	_	-61	39%	-60	-57	-62	-92	8%	now	
0.+	di termini	-	-	40	5GHz	Open	ProCurve		-	-73	27%	-74	-73	-75	-92	8%	now	
	-		-	4	SCH2	Open	CISCO	a/n	_	-45	55%	-45	-45	-45	-92	85	now	
•	-	-	-	1	2.4GHz	Open	CISCO			-81	19%	-82	-81	-82	-92	8%	now	
2 🔹	-	-	-	4	SCHI	WPA2 Enterprise	cisco	a/n	_	-47	53N	-48	-47	-48	-85	15%	now	
•	-	-	-	48	SCHz	Open	CISCO		_	-45	54%	-47	-45	-48	-92	85	now	
	and the	-	-	4	SCH2	Open	cisco	a/n	_	-45	55N	-45	-45	-45	-92	8%	now	
•	6 (Lane)	-	-	11	2.4GHz	Open	ProCurve	b/g	_	-61	39%	-62	-61	-64	-92	85	now	
	-	-	-	4	SCHE	WPA2 Enterprise	CISCO	a/n	_	-45	55%	-46	-45	-46	-92	8%	now	
•	-	-	-	44	SCH2	Open	CISCO			-83	17%	-84	-83	-85	-92	8%	now	
2 🔍	-		-	4	SCH2	WPA2 Enterprise	CISCO	a/n	_	-45	55%	-46	-45	-46	-92	85	now	
2 3	-	-	-	6	2.4GHz	WPA2 Enterprise	CISCO	g/a	-	-70	30%	-71	-70	-71	-92	8%	now	
•	-	-	-	1	2.4GHz	Open	cisco			-81	19%	-81	-79	-82	-92	85	now	
2 🔍	-	-	-	1	2.4GHz	WPA2 Enterprise	CISCO			-81	19%	-82	-81	-82	-92	85	now	
•	-	-	-	3	2.4GHz	Open	cisco	g/n		-82	18N	-82	-82	-82	-92	8%	now	
	-	-	-	1	2.4GHz	WPA2 Enterprise	CISCO	g/n		-86	14%	-85	-85	-85	-92	85	now	
	1.04	-		40	SCHE	WPA2 Enterprise	ProCurve		-	-74	26%	-75	-74	-75	-92	8%	now	
	-	-	-	6	2.4GHz	WPA2 Enterprise	CISCO	g/n	_	-43	57%	-43	-43	-43	-92	8%	now	
•	-	-	-	4	SCH2	Open	CISCO	a/n	_	-45	54%	-47	-46	-48	-92	8%	now	
23	-	-	-	1	SCH2	WPA2 Enterprise	CISCO	a/n	_	-61	39%	-62	-61	-63	-92	8%	now	
•	-	-	-	1	SCH2	Open	cisco	8/0	_	-61	39%	-62	-61	-63	-92	8%	now	
	may set	-	-	136	SCHz	Open	CISCO		_	-62	385	-62	-61	-63	-92	85	now	
	-	-	-	6	2.4GHz	Open	cisco	g/n	-	-71	29%	-71	-71	-71	-92	8%	now	
2 4	-	10000	-	6	2.4GHz	WPA2 Enterprise	CISCO	g/#		-86	14%	-87	-86	-87	-92	85	now	
	PAUSE	P DETAIL	LS	50	an interv	al: Ssec :				Filter	networks	Q				25	of 29 shown	

- Shortly after you will see all wireless SSIDs available.
- By default the application is set to scan for every 5 seconds. You can change the scan interval from 5 seconds, 10 seconds, 30 seconds to 1 minute from the *scan interval drop down list.*
- There is a *filter networks* option available on bottom right of the application.

Other additional options are available by pressing *Discover* from the menu bar.

Discover	Survey	Edit	Window	Help
Pause re	al-time w	vireless	s scanning	
Show de	tails of th	ne sele	cted netwo	ork
Scan int	erval			•
Reset wi	reless dis	covery		0**
Clear in	active net	works		☆第1
Export				

NetSpot can also be used for carrying out wireless site surveys.

To undertake a wireless site survey, first start NetSpot and click on the **Survey** button on the top left of the application. Click on **Start a new survey** to create a new survey or **Open a saved project** to continue to work on a previous survey. In this example **Start a new survey** is selected.



Next you have options to give your project a name, zone name and zone area type. Select option to load your map from file and press *continue*. If you do not have a floor plan available you also have the option to draw a sketch by selecting *Draw it*.

00	NetSpot - New sur	vey			
Carbonovice Q sue	VITY) LE DOORT QUSER CU	IDE 1ª ASI	K A QUESTION #	UPCRADE TO PRO	
Details of the new project					
Area map calibration	New project name:	Building A			
Network selection		e.g. Our cozy	office		
Active scanning configuration Ready to on	East and a series	Council File			
	First zone name.	Ground Fio	or nor		
		top around in			
	Zone's area type:	Closed offic	ce space or apartment	t 0	
		Helps configu	re default sampling set	tings he project	
	How would you like	to create a	map for this zone?		
	dt - 5	<b>T 1</b>	Contraction of the local division of the loc	12.10	
		1	0	1978	
	1000 B	tere de	mr. 8	Line of	
	Load from file	Draw it	Sample map	Blank map	
	۲	0	0	0	
	Converting of the second se				
	Choose hie	or drag-n-	drop it here (/Users/i	rranay/D	
					Continue -t
ncel					Contracte

The floor plan is now loaded onto the screen you require to scale the floor plan. Click on two points on the map and enter the actual distance in a choice of meters or feet. Actual distance can be measured by using a laser pointed measuring tool.

Discove	NetSpot - Building A	
Details of the new project     Area map calibration     Network selection     Arter serverine configuration		
<ul> <li>Access scenning comparation</li> <li>Ready to go</li> </ul>	Hand Hand Hand Hand Hand Hand Hand Hand	
	7.00 1.00 1.00 1.00	
	Now, please, specify 2 points on the map and input actual distance between them	
Cancel	+ Back 2 of 2 required points specified Actual distance: 8 meters \$	Continue -+

The next screen allows you to select non-broadcasting networks into the scan.

B O O	NetSpot - Building A generation to pro
Details of the new project     Area map calibration     Network selection     Active scanning configuration     Ready to go	NetSpot surveys automatically include all open Wi-FI networks. At this step, you can add non-broadcasting networks to the list of those included in the survey. Each addition will increase scanning time.
	add another network manually  Keep in mind that every network you add now to scanning will increase the time required for every sample to be taken by at least 10  Keep in mind that every network you add now to scanning will increase the time required for every sample to be taken by at least 10
Cancel	+ Back Continue -

Next screen allows you to choose scanning options if you wish to perform an active or passive scan.

00	NetSpot – Building A	
O DISCOVER	SURVEY CORPORT OUSER CUDE TASK A QUESTION & UPCRADE TO PRO	
<ul> <li>Details of the new project</li> <li>Area map calibration</li> <li>Aretwork selection</li> <li>Active scanning configuration</li> <li>Ready to go</li> </ul>	By default, NetSpot will perform a passive wireless survey. An active scan can be enabled at this step that measures upload and download speeds.         Chire Scanning diabled         Diable Active Scanning of the selected network(s)	
	only be performed on networks that your MacBook can connect to.	

Now you are ready to perform your walkthrough. Walk to starting point of where you want to start survey and point on the map to your corresponding standing spot. NetSpot will take measurements, which takes approximately 5 seconds. Ensure you do not move from the spot whilst the measurement is taking place. Once the first measurement is taken, continue to take measurements on the whole area you wish to survey.



• Once complete you can press *stop scan* on the bottom left of the window which then you can then visualize from the produced heat map. From the drop down list on bottom middle of the screen you can change the heat map view to show: signal to noise ratio, signal level, noise level, quantity of APs, signal to interference ratio, frequency band coverage, etc.

#### **zPerf** System Requirements: OS X 10.6 or later Price: Free

zPerf is a bandwidth measuring performance application for Mac OS X. The application can act as a client or as a server. zPerf allows for OS X to OS X throughput testing through wired and wireless connections.

To start throughput using zPerf, start the application on the machine that will act as the server, followed by clicking on the **Server** button. Keep note of Server IP Address as this will be used to connect to and from the Client machine. Press **Run Server** to start the zPerf server.

Server IP Address:	Server Port:	5201	Run Server	Clear Logs
Server Logs:				

On the client machine start zPerf and click on *Client*. Enter the *Server Address* and *Server Port* that has been set in screenshot above. Set your *Test Duration* and *Transfer Direction* as *Client To Server*. Click on *Run Client* to start the test.

Server Address:	10.0.1.10	Run Client	Clear	Test Results
Server Port:	5201	Test Results:		
Test Duration:	30	Interval	Transfer	S/R Bandwidth
Stats Interval:	10			

• Depending on the duration of your test, results will start to appear on both the client and server.

## Client:

Server Address:	100.00.000	Run Client	Clear	Fest Results
Server Port:	5201	Test Results:		
		Interval	Transfer	S/R Bandwidth
Test Duration:	30	0.00-30.01 sec	399.12 MB	111.58 Mbps
Stats Interval:	10	20.00-30.01	131.12 MB	109.95 Mbps
		10.00-20.00	133.25 MB	111.77 Mbps
Transfer Direction:	Server To Client	0.00-10.00 sec	134.75 MB	113.01 Mbps
_	_			

## Server:

erver Logs:		Server Port. 520		Kunning	Clear Logs
131.231.109.19 Send Receive	00:30 00:30	299.12 MB 299.12 MB	Feb 21, 2014 1 83.59 Mbps/sec 83.59 Mbps/sec	4:40:00	

## WiSpy

System Requirements: OS X 10.6 or later Price: Free

Available from: http://www.mkdsoftware.com/software/ [2]

WiSpy is a tiny application that sits on your menu bar that simply displays what SSID you are connected to and your current transmit rate. This is useful to determine what link speed connection you are achieving from where you are located.

300		_
Connected to 300 Mbps	at	
About WiSpy		
Quit WiSpy		

\_\_\_\_\_

## WiFi Signal System Requirements: OS X 10.7 or later Price: £0.69 Available from the Apple App Store: <u>https://itunes.apple.com/gb/app/wifi-</u> signal/id525912054?mt=12 [3]

WiFi Signal is another tiny application that again sits on your menu bar similar to WiSpy, which displays your transmit rate, along with more additional information of channel, signal, noise, SNR and a real time live signal strength/noise level graph. The application can also recommend alternative channels for your network to avoid signal overlap and channel conflicts.



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## WiFi Explorer

System Requirements: OS X 10.6 or later Price: £1.99

Available from the Apple App Store: <u>https://itunes.apple.com/gb/app/wifi-</u> explorer/id494803304?mt=12 [4]

WiFi Explorer for Mac OS X is another wireless network scanner tool that lets you quickly identify available wireless networks, signal overlapping and conflict of channels on 2.4 GHz and 5 GHz frequency bands. Features include detecting channel, band type, maximum data rate, type of security and device manufacturer that are presented within a clear easy to use user interface.

WiFi Explorer also shows additional network details, such as visualisations of signal strength and WiFi environment of the 2.4 GHz and 5 GHz frequency bands.

The network details tab provides information from a selected network from the networks list table, providing details of the connected AP as shown in screenshot below.



The signal strength tab displays a visualisation of all available networks' signal strengths.



## 2.4 GHz:



# 5 GHz:



**Source URL:** https://community.jisc.ac.uk/library/advisory-services/wi-fi-network-applications-apple-mac-os-x

#### Links

- [1] http://www.metageek.net/products/chanalyzer-mac/
- [2] http://www.mkdsoftware.com/software/
- [3] https://itunes.apple.com/gb/app/wifi-signal/id525912054?mt=12
- [4] https://itunes.apple.com/gb/app/wifi-explorer/id494803304?mt=12