

WiFi Explorer Pro 3

"The Definitive User Guide"

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Published by Bowden Networks Ltd (UK)

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Introduction

No Screenshots.

Chapter 1 - WiFi Explorer Pro 3 Product Overview

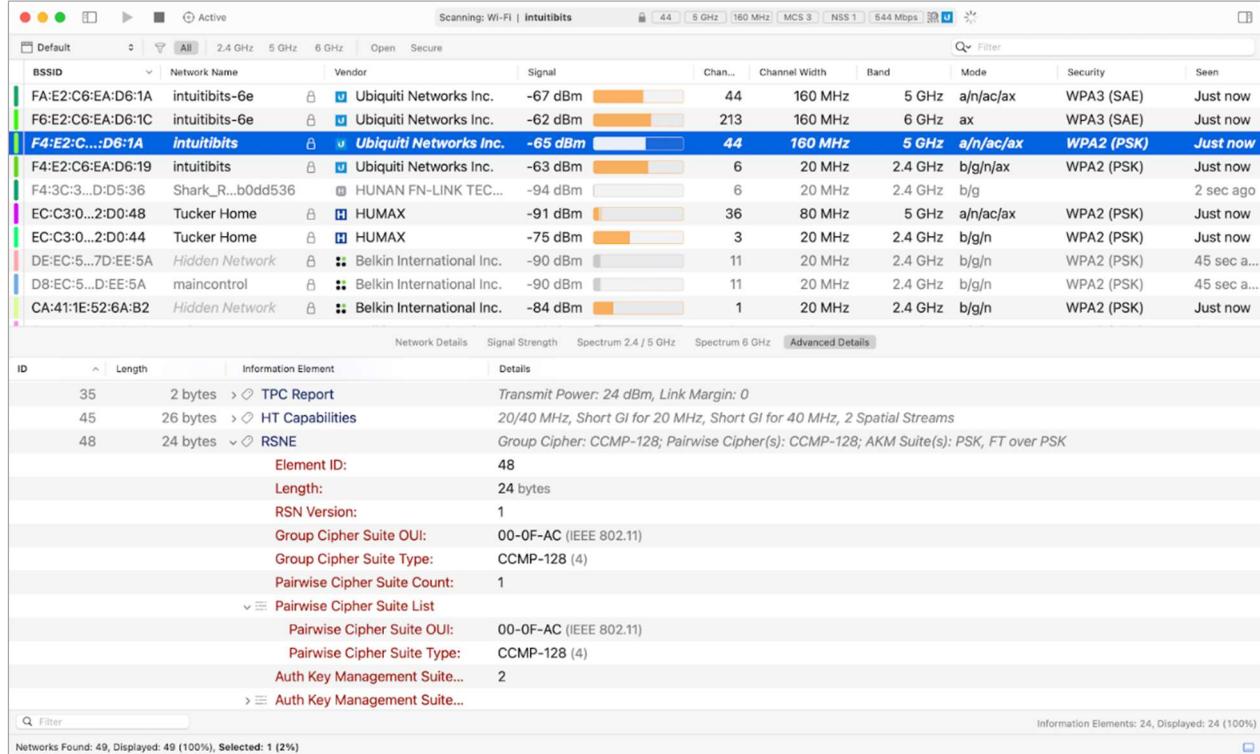


Figure 1-1 - WiFi Explorer Pro 3 User Interface

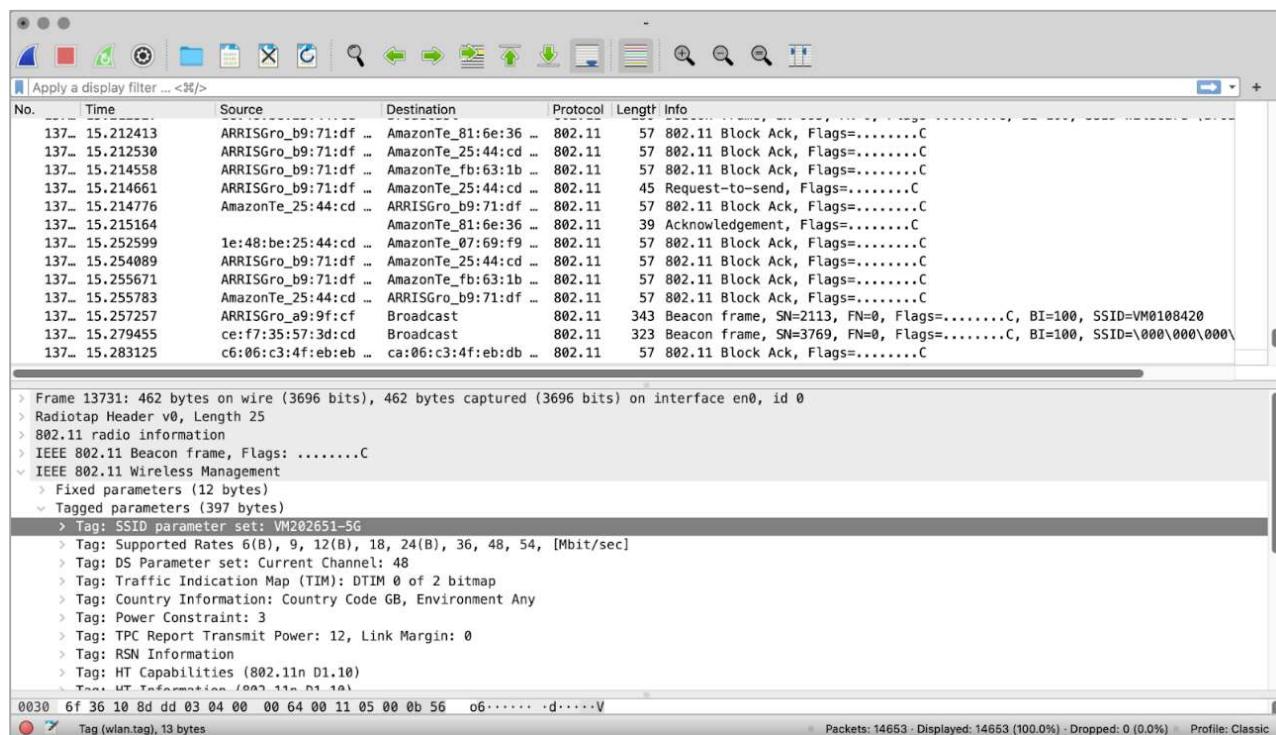


Figure 1-2 - Wireshark User Interface

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

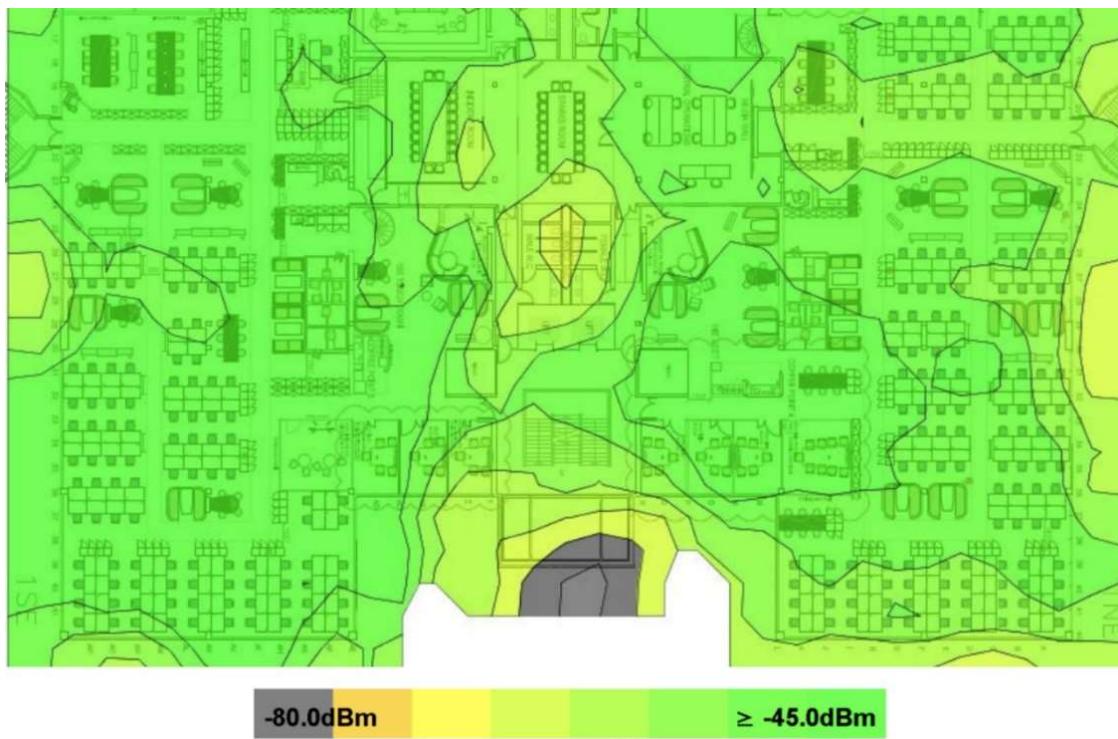


Figure 1-3 - Sample heatmap from a survey tool showing the projected signal levels of a new WLAN

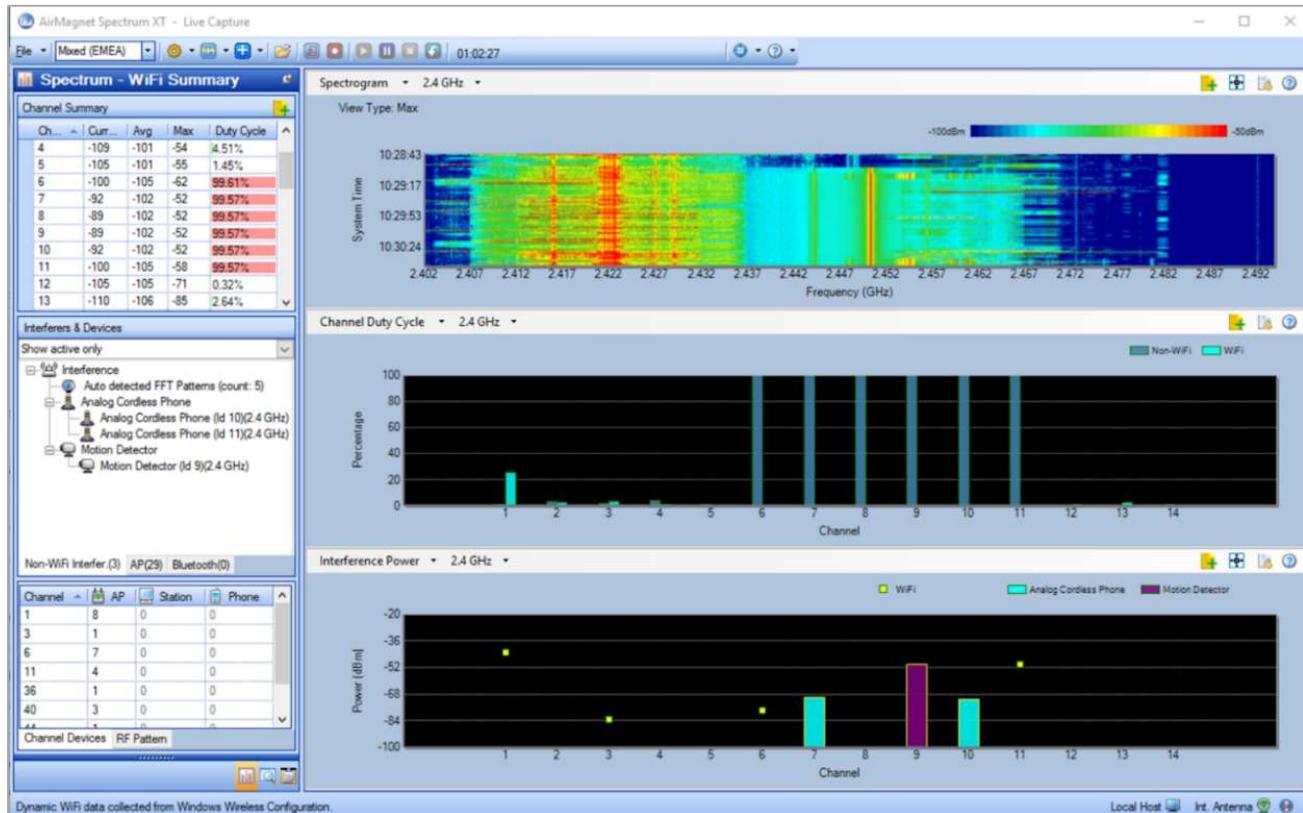


Figure 1-4 - Spectrum Analyzer screenshot

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

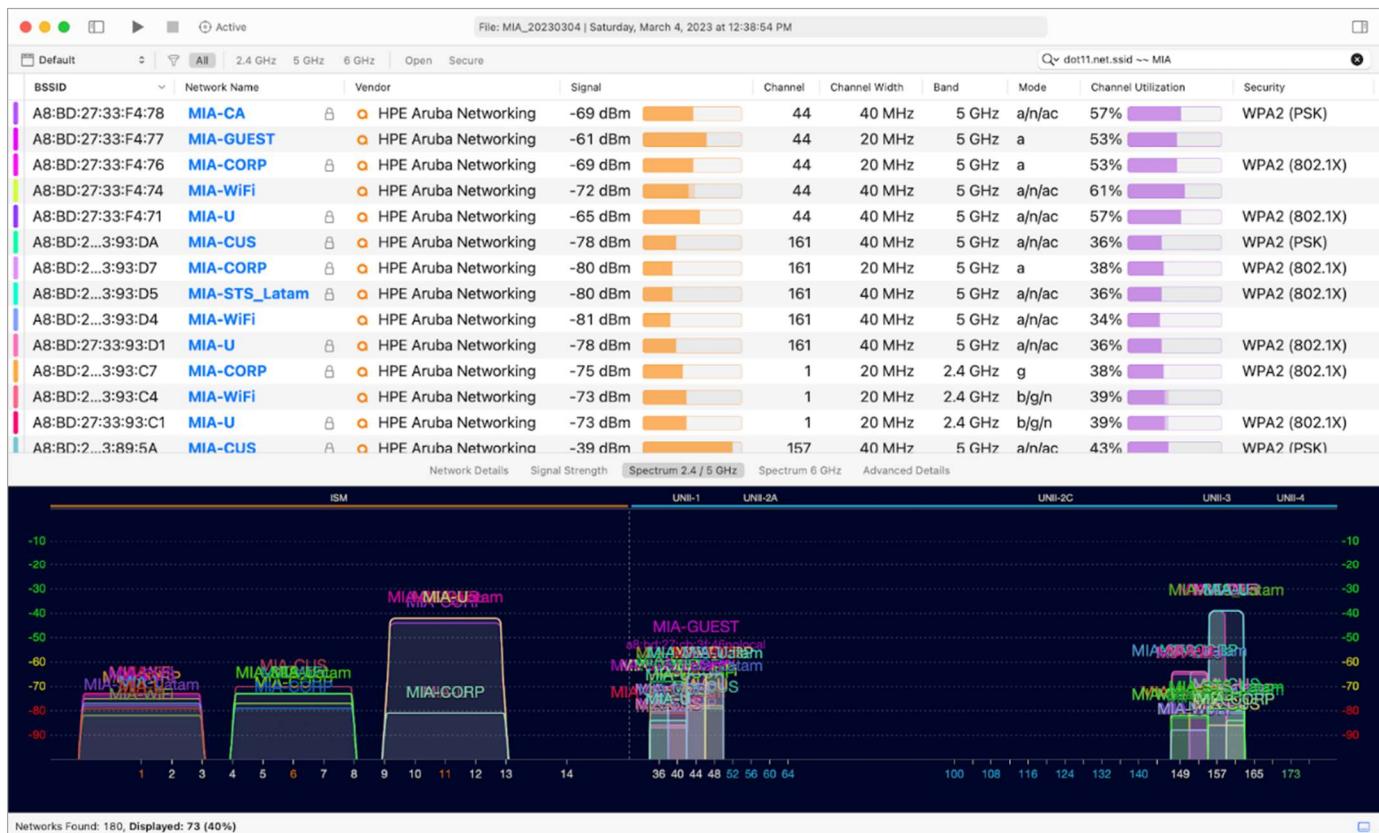


Figure 1-5 - Screenshot of WiFi Explorer Pro 3 (the premiere Wi-Fi scanner!)

Chapter 2 - WLAN Scanning Theory

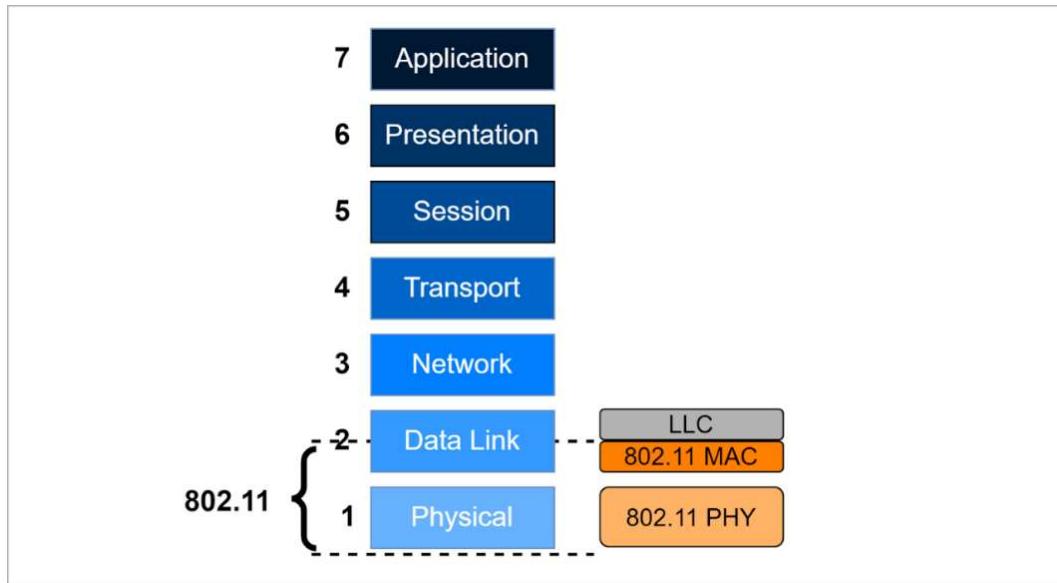


Figure 2-1 - OSI 7-layer model with 802.11 layer mapping

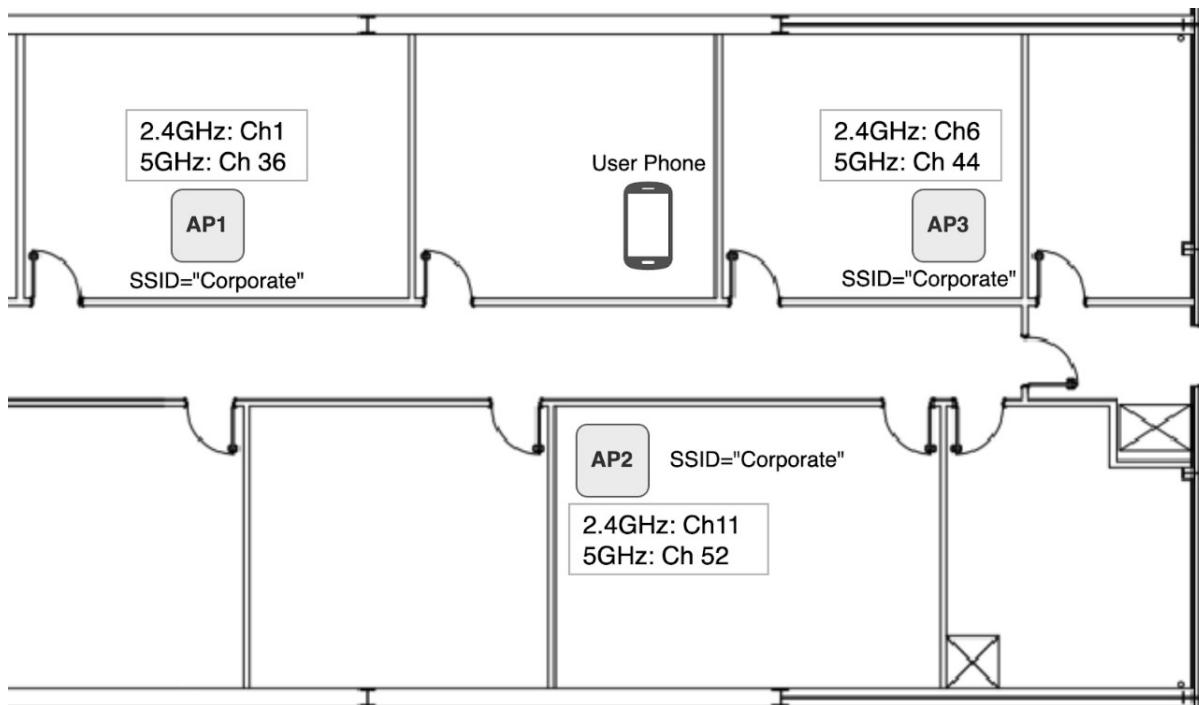


Figure 2-2 - AP channel allocations

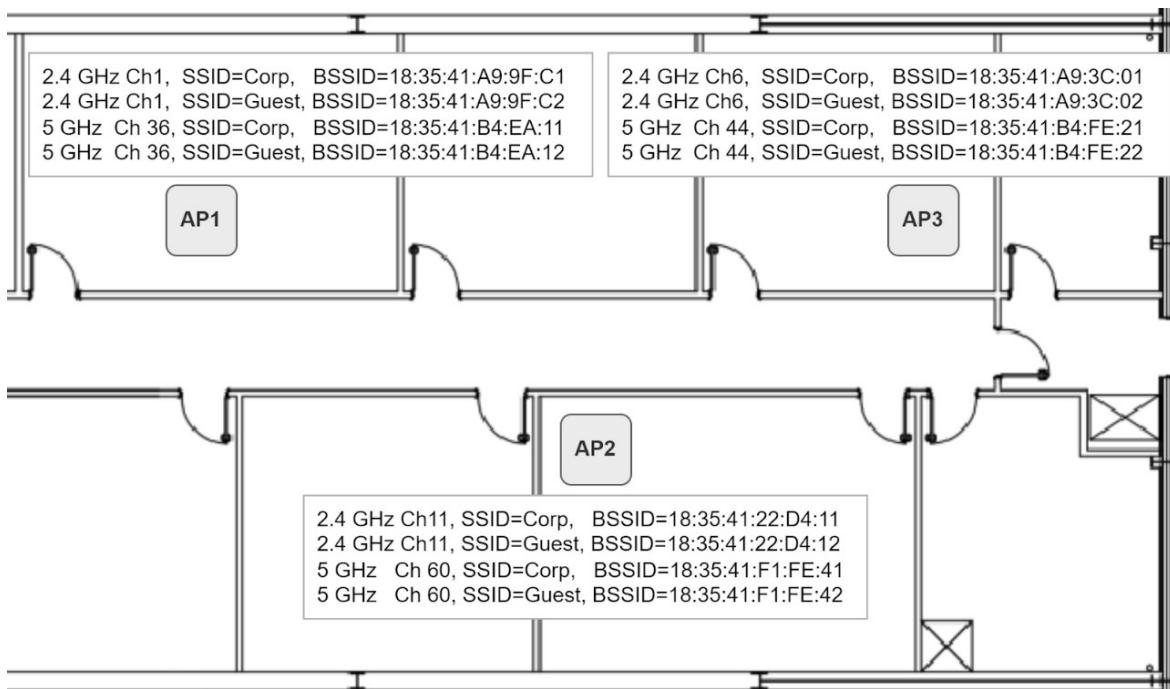


Figure 2-3 - BSSIDs for two SSIDs across the 2.4 GHz and 5 GHz radios

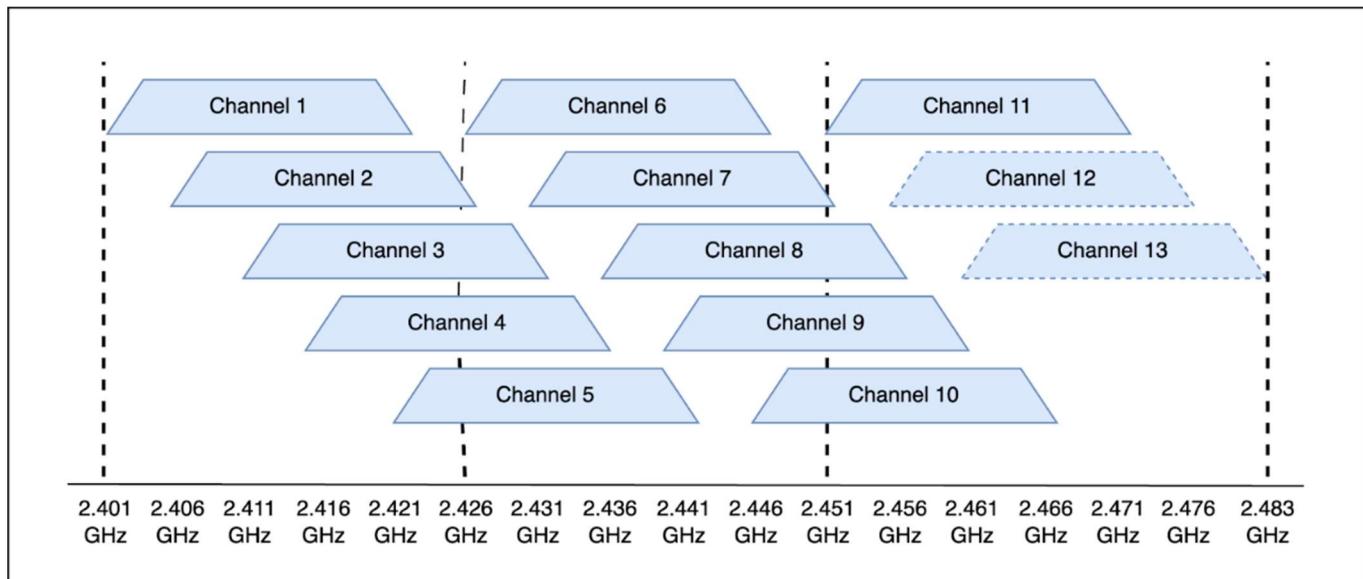


Figure 2-4 - 2.4 GHz band

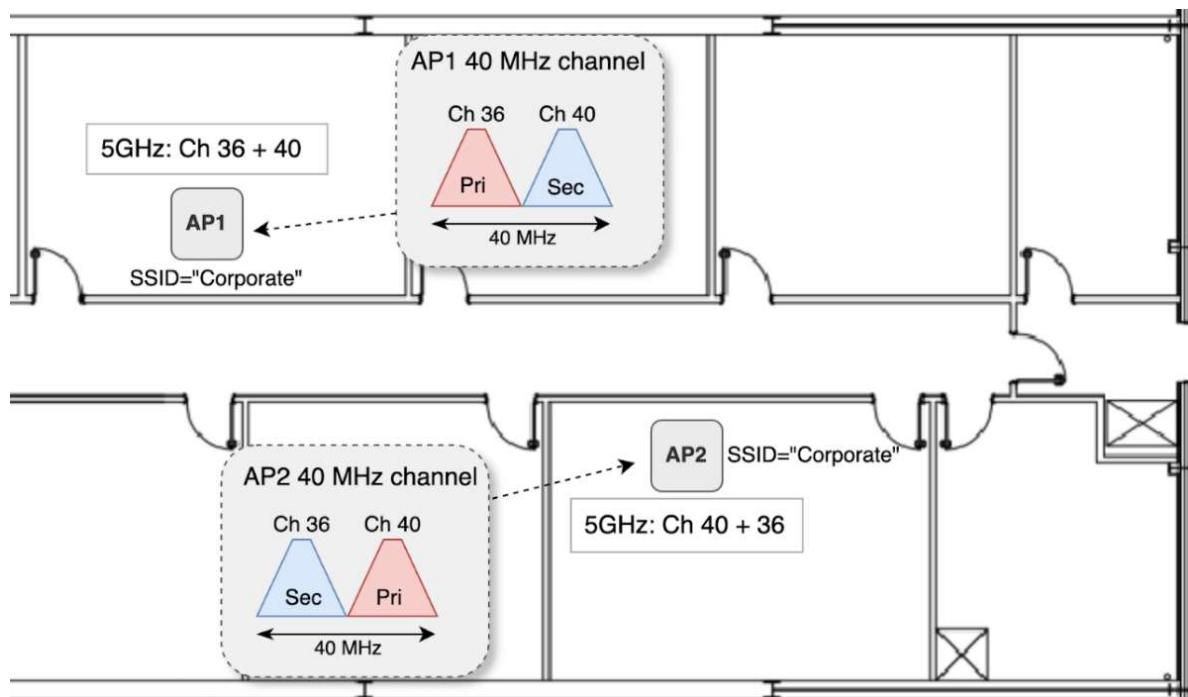


Figure 2-5 - OBSS when using bonded channels

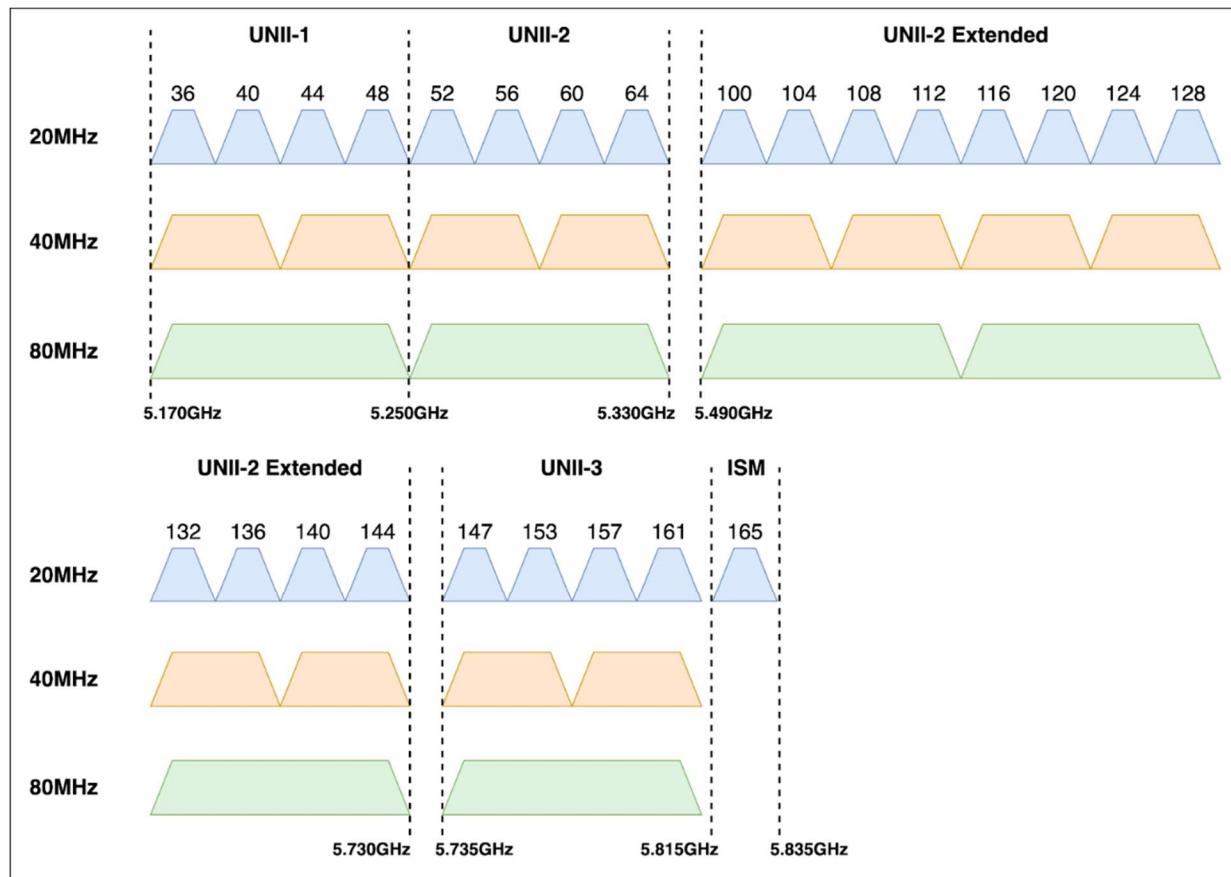


Figure 2-6 - 5 GHz Band

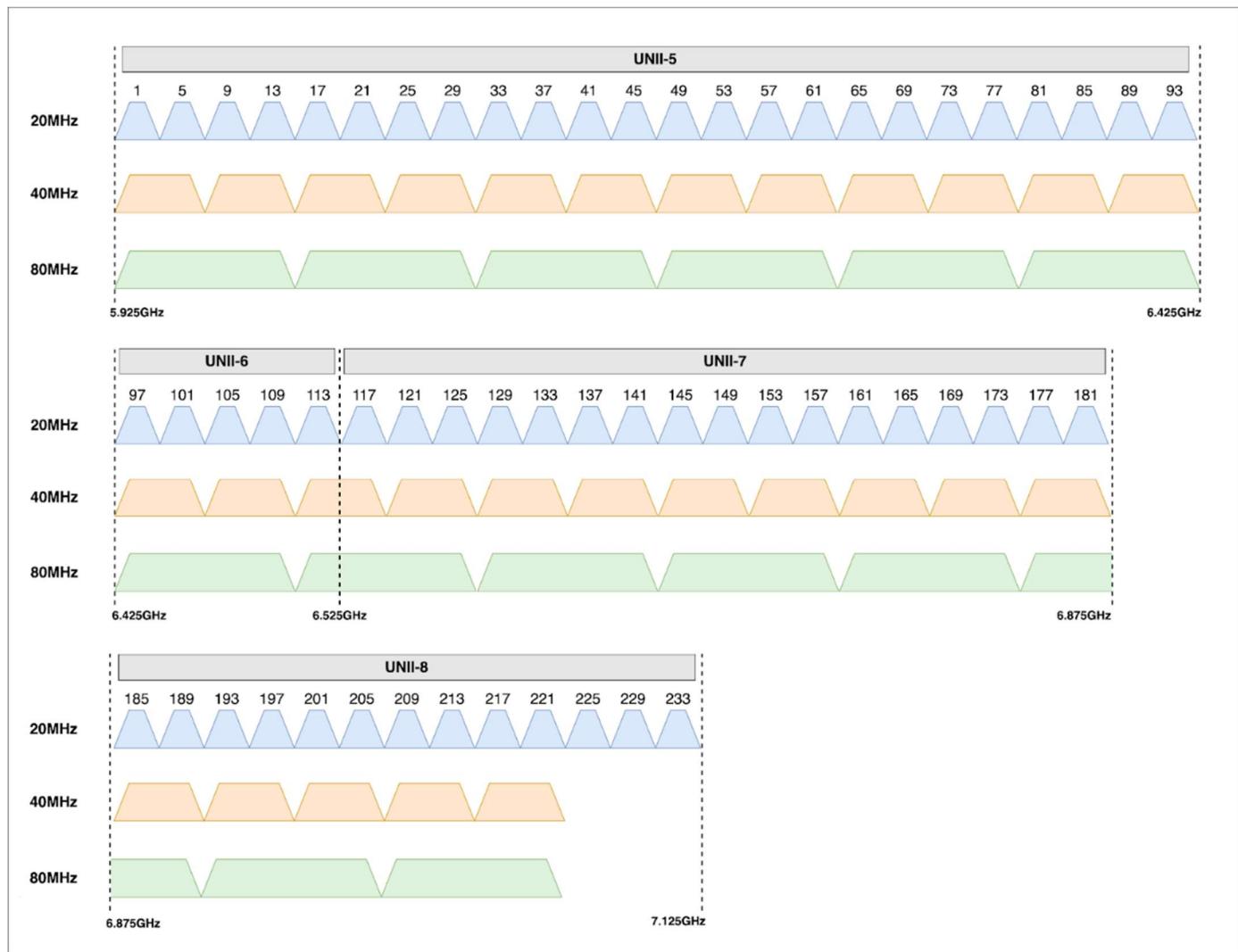


Figure 2-7 - 6 GHz band

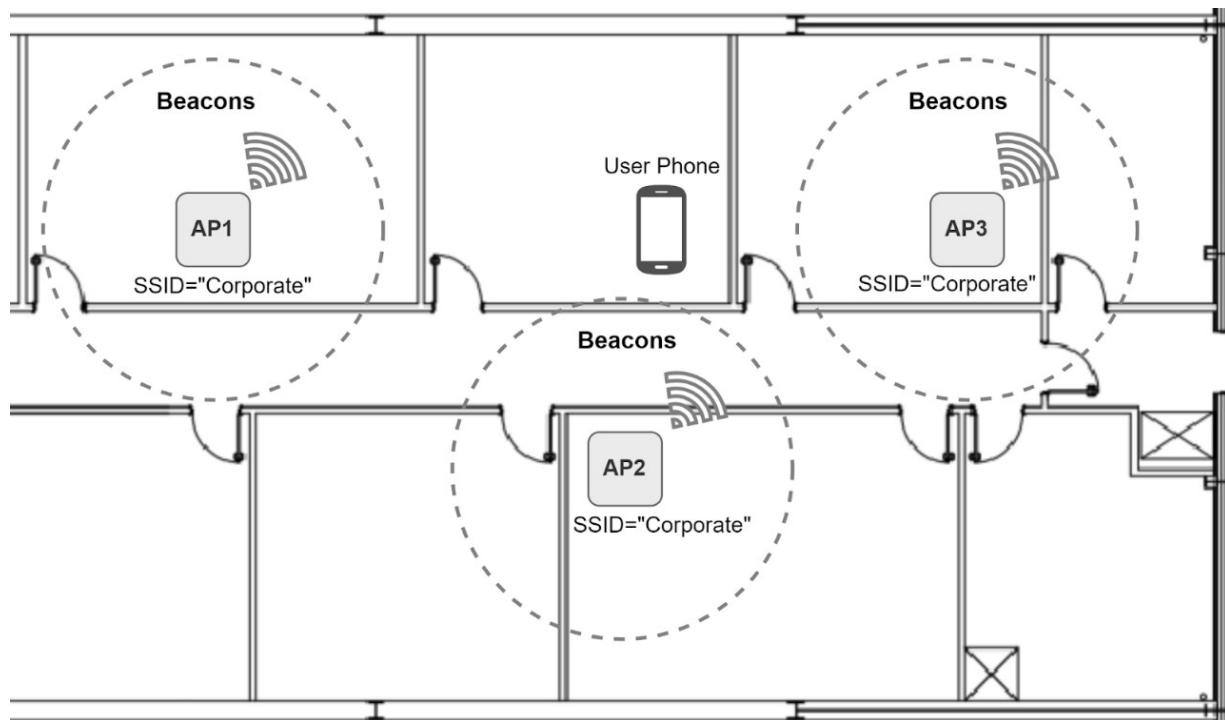


Figure 2-8 - APs broadcasting beacon frames

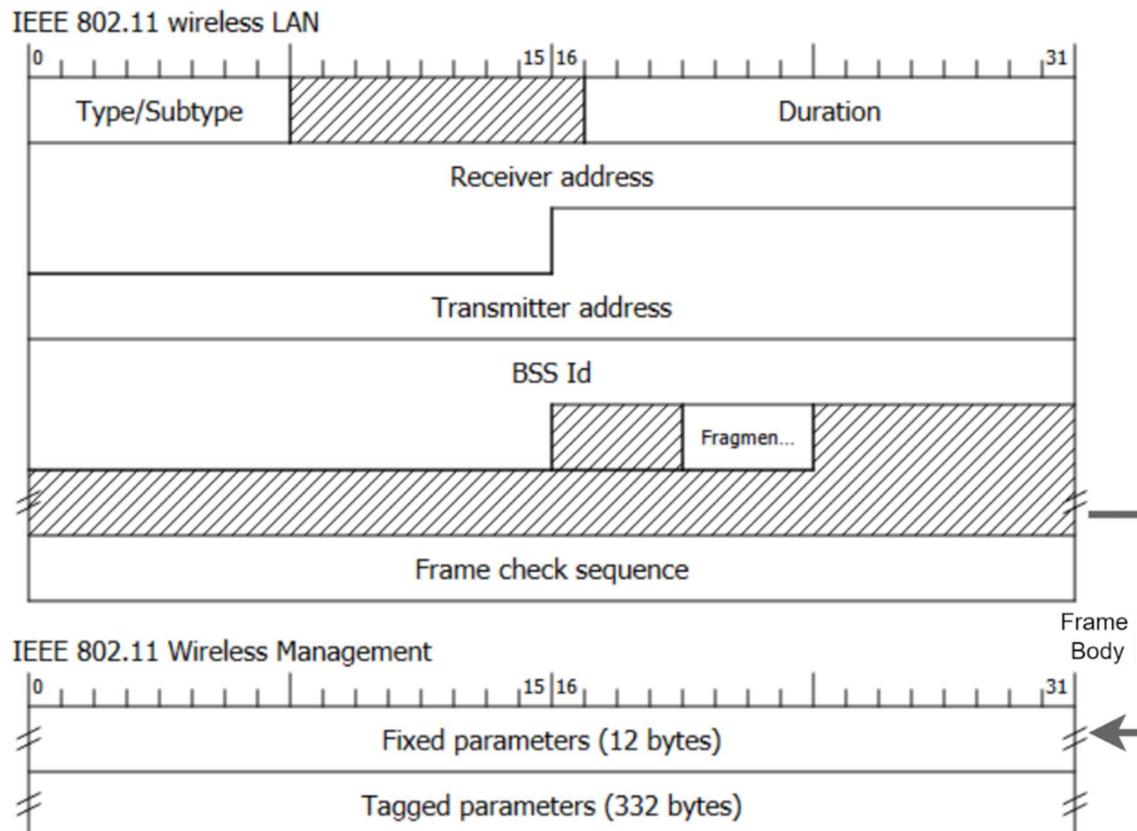


Figure 2-9 - Beacon frame format

```
> Frame 71: 369 bytes on wire (2952 bits), 369 bytes captured (2952 bits) on interface en0, id 0
> Radiotap Header v0, Length 25
> 802.11 radio information
> IEEE 802.11 Beacon frame, Flags: .......C
▼ IEEE 802.11 Wireless Management
  ▼ Fixed parameters (12 bytes)
    Timestamp: 1962171187688
    Beacon Interval: 0.102400 [Seconds]
    > Capabilities Information: 0x0111
  ▼ Tagged parameters (304 bytes)
    > Tag: SSID parameter set: "Zyxel_444D_5G"
    > Tag: Supported Rates 6(B), 9, 12(B), 18, 24(B), 36, 48, 54, [Mbit/sec]
    > Tag: Traffic Indication Map (TIM): DTIM 0 of 1 bitmap
    > Tag: Country Information: Country Code E0, Environment All
    > Tag: Power Constraint: 0
    > Tag: TPC Report Transmit Power: 19, Link Margin: 0
    > Tag: RSN Information
    > Tag: QBSS Load Element 802.11e CCA Version
    > Tag: HT Capabilities (802.11n D1.10)
    > Tag: HT Information (802.11n D1.10)
    > Tag: Extended Capabilities (8 octets)
    > Tag: VHT Capabilities
    > Tag: VHT Operation
    > Tag: Tx Power Envelope
    > Tag: Vendor Specific: Microsoft Corp.: WPS
    > Tag: Vendor Specific: Broadcom
    > Tag: Vendor Specific: Microsoft Corp.: WMM/WME: Parameter Element
```

Figure 2-10 - Beacon frame tag summary

```
▼ Tag: SSID parameter set: "Zyxel_444D_5G"
  Tag Number: SSID parameter set (0)
  Tag length: 13
  SSID: "Zyxel_444D_5G"
```

Figure 2-11 - SSID element

```
▼ Tag: QBSS Load Element 802.11e CCA Version
  Tag Number: QBSS Load Element (11)
  Tag length: 5
  QBSS Version: 2
  Station Count: 7
  Channel Utilization: 41 (16%)
  Available Admission Capacity: 0 (0 us/s)
```

Figure 2-12 - BSS load element

```

▼ Tag: RSN Information
  Tag Number: RSN Information (48)
  Tag length: 26
  RSN Version: 1
  > Group Cipher Suite: 00:0f:ac (Ieee 802.11) AES (CCM)
    Pairwise Cipher Suite Count: 1
  > Pairwise Cipher Suite List 00:0f:ac (Ieee 802.11) AES (CCM)
    Auth Key Management (AKM) Suite Count: 1
  > Auth Key Management (AKM) List 00:0f:ac (Ieee 802.11) PSK
  > RSN Capabilities: 0x008c
    PMKID Count: 0
    PMKID List

```

Figure 2-13 - RSN information

```

> Frame 1600: 147 bytes on wire (1176 bits), 147 bytes captured (1176 bits) on interface en0, id 0
> Radiotap Header v0, Length 25
> 802.11 radio information
> IEEE 802.11 Probe Request, Flags: .......C
▼ IEEE 802.11 Wireless Management
  ▼ Tagged parameters (94 bytes)
    > Tag: SSID parameter set: Wildcard SSID
    > Tag: Supported Rates 6(B), 9, 12(B), 18, 24(B), 36, 48, 54, [Mbit/sec]
    > Tag: HT Capabilities (802.11n D1.10)
    > Tag: Extended Capabilities (8 octets)
    > Tag: VHT Capabilities
    > Ext Tag: HE Capabilities

```

Figure 2-14 - Null probe request

```

> Frame 118: 204 bytes on wire (1632 bits), 204 bytes captured (1632 bits) on interface en0, id 0
> Radiotap Header v0, Length 25
> 802.11 radio information
> IEEE 802.11 Probe Request, Flags: .......C
▼ IEEE 802.11 Wireless Management
  ▼ Tagged parameters (151 bytes)
    > Tag: SSID parameter set: "Zyxel_444D_5G"
    > Tag: Supported Rates 6(B), 9, 12(B), 18, 24(B), 36, 48, 54, [Mbit/sec]
    > Tag: HT Capabilities (802.11n D1.10)
    > Tag: Extended Capabilities (11 octets)
    > Tag: VHT Capabilities
    > Ext Tag: HE Capabilities
    > Tag: Vendor Specific: Apple, Inc.
    > Tag: Vendor Specific: Epigram, Inc.
    > Tag: Vendor Specific: Microsoft Corp.: Unknown 8
    > Tag: Vendor Specific: Broadcom

```

Figure 2-15 - Directed probe request

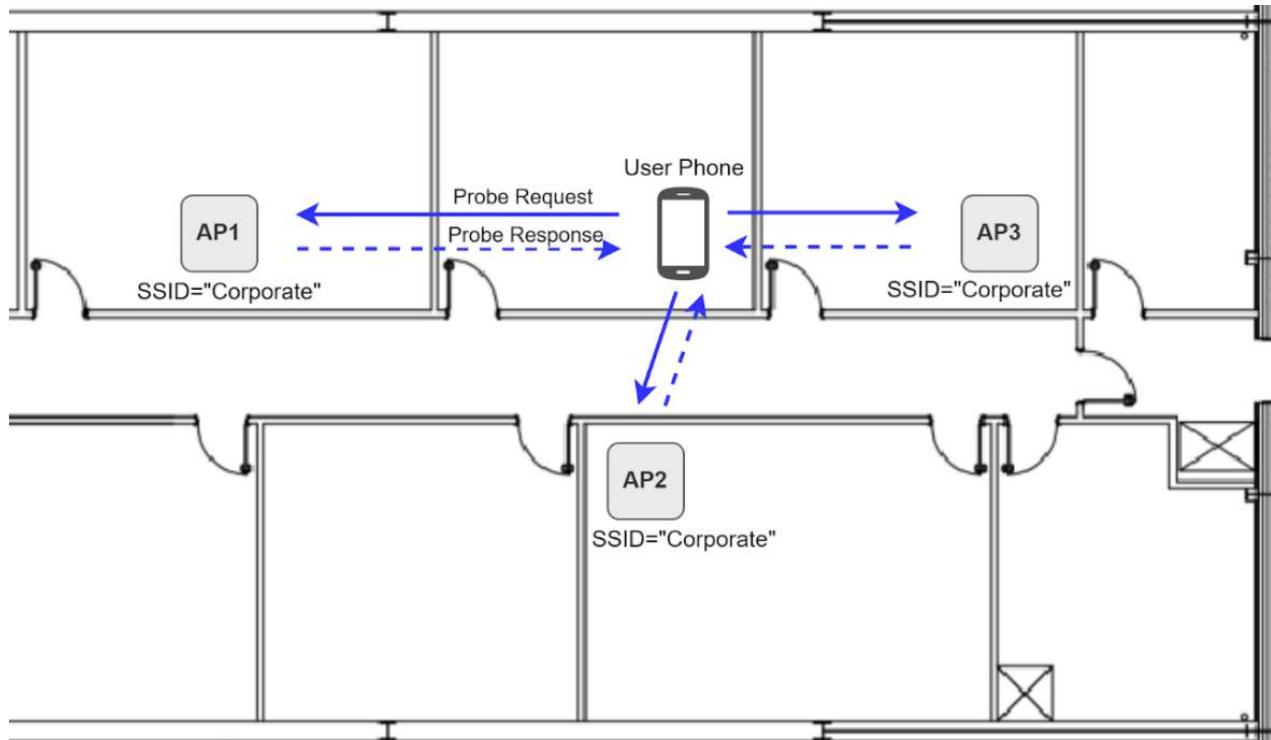


Figure 2-16 - Probe request and probe responses

```

> Frame 119: 462 bytes on wire (3696 bits), 462 bytes captured (3696 bits) on interface en0, id 0
> Radiotap Header v0, Length 25
> 802.11 radio information
> IEEE 802.11 Probe Response, Flags: .......c
└ IEEE 802.11 Wireless Management
    > Fixed parameters (12 bytes)
    < Tag: SSID parameter set: "Zyxel_444D_5G"
    < Tag: Supported Rates 6(B), 9, 12(B), 18, 24(B), 36, 48, 54, [Mbit/sec]
    < Tag: Country Information: Country Code E0, Environment All
    < Tag: Power Constraint: 0
    < Tag: TPC Report Transmit Power: 19, Link Margin: 0
    < Tag: RSN Information
    < Tag: QBSS Load Element 802.11e CCA Version
    < Tag: HT Capabilities (802.11n D1.10)
    < Tag: HT Information (802.11n D1.10)
    < Tag: Extended Capabilities (8 octets)
    < Tag: VHT Capabilities
    < Tag: VHT Operation
    < Tag: Tx Power Envelope
    < Tag: Vendor Specific: Microsoft Corp.: WPS
    < Tag: Vendor Specific: Broadcom
    < Tag: Vendor Specific: Microsoft Corp.: WMM/WME: Parameter Element

```

Figure 2-17 - Probe response

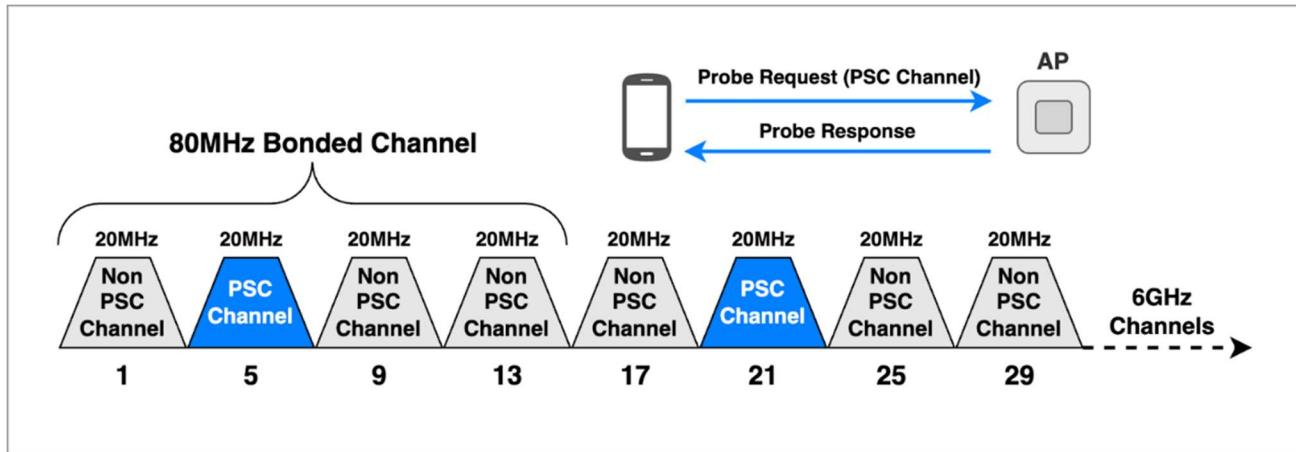


Figure 2-18 - PSC channel probes

Default		All	2.4 GHz	5 GHz	Open	Secure	>	Filter
BSSID	Network Name	Vendor	Signal	Channel	Streams	SNR		
94:18:65:B6:DC:48	BNL	Netgear Inc.	-37 dBm	48	4	59 dB		
94:18:65:B6:DC:25	VM202651-2G	Netgear Inc.	-51 dBm	1	2	32 dB		
52:0D:10:D1:A9:01	Virgin Media	ARRIS Group Inc.	-57 dBm	6	2	39 dB		
D4:20:B0:8A:31:61	VM202651-2G	Mist Systems Inc.	-62 dBm	11	4	34 dB		

Network Details		Signal Strength	Spectrum 2.4 / 5 GHz	Advanced Details
ID	Length	Information Element	Details	
192	5 bytes	> VHT Operation	Channel Width: 20 MHz or 40 MHz, Channel Center Frequ...	
195	5 bytes	> Transmit Power Envelope	Local EIRP	
201	30 bytes	> Reduced Neighbor Report	Channel: 37 (80 MHz), BSSID 0: 94:18:65:B6:DC:62, Short...	
		Element ID:	201	
		Length:	30 bytes	
		< Neighbor AP Information:	Channel 37 Operating Class 133 (80 MHz)	
		> TBTT Information Header:	0x0d10	
		Operating Class:	133 80 MHz	
		Channel Number:	37	
		< TBTT 0		
		Neighbor AP TBTT Offset:	Unknown 0xff	
		BSSID:	94:18:65:B6:DC:62 (Netgear Inc.)	
		Short SSID:	0xFA150FFC	
		> BSS Parameters:	0x4c	
		20 MHz PSD:	11.0 dBm/MHz	
		> TBTT 1		

Filter	dot11.reduced_neighbor_report	Information Elements: 22, Displayed: 22 (100%)
--------	-------------------------------	--

Figure 2-19 - Reduced Neighbor Report data

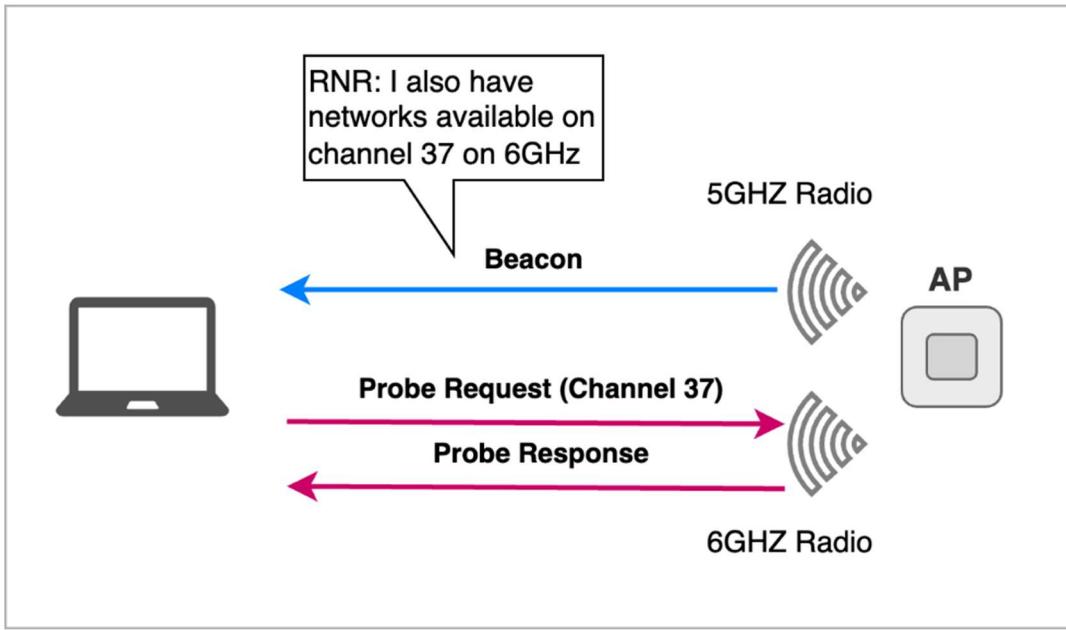


Figure 2-20 - RNR operation

Chapter 3 - Local Data Acquisition

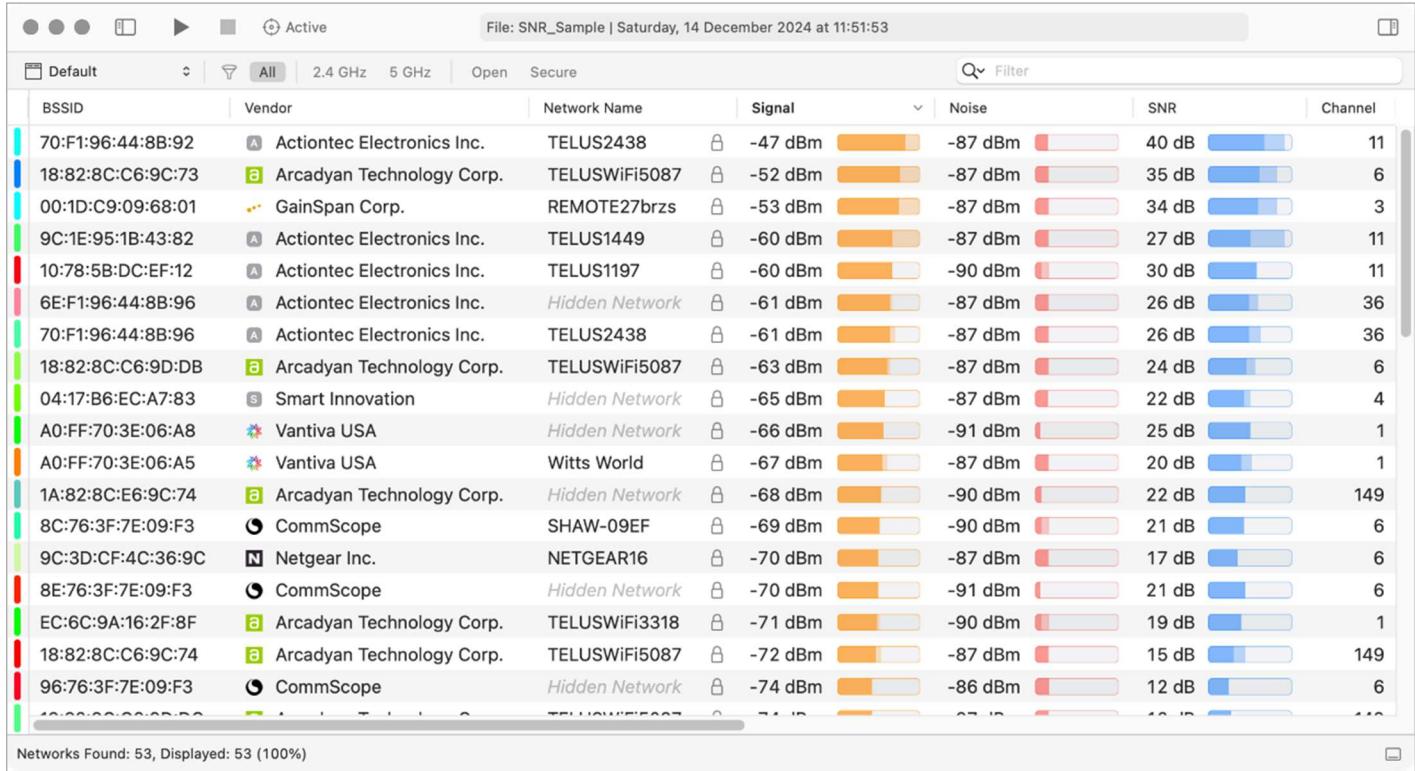


Figure 3-1 - WFE Pro 3 showing signal, noise & SNR data

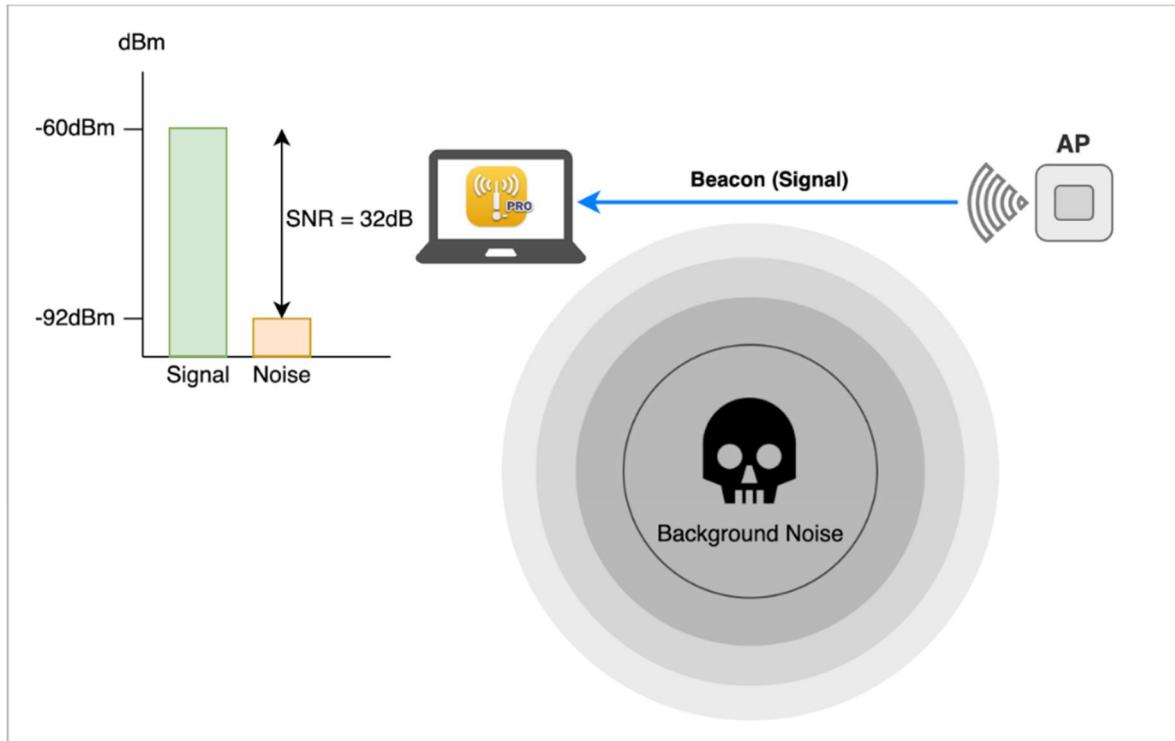


Figure 3-2 - SNR calculation

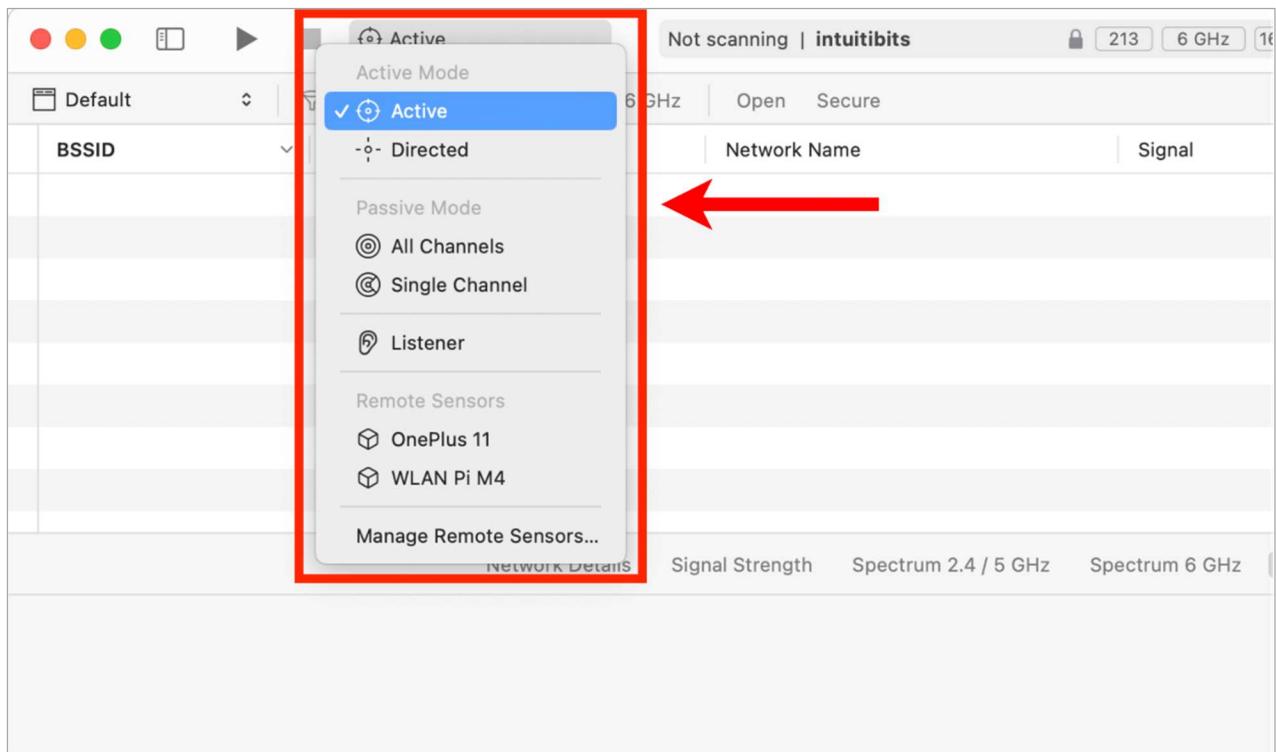


Figure 3-3 - WFE Pro 3 scanning options

Chapter 4 - Data Acquisition Using Sensors

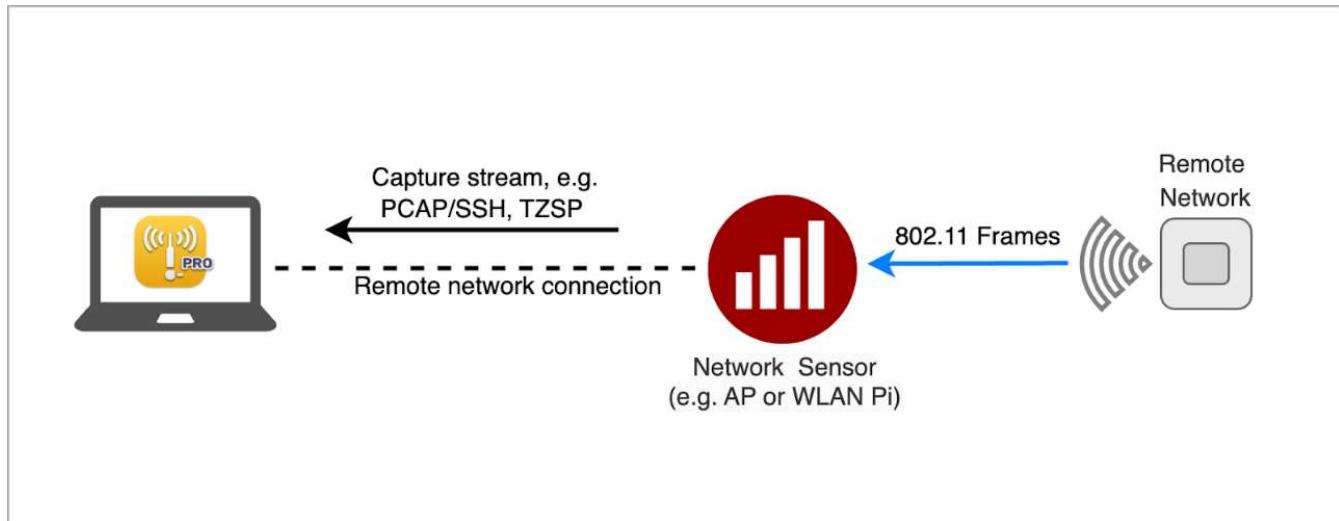


Figure 4-1 - Remote sensor operation

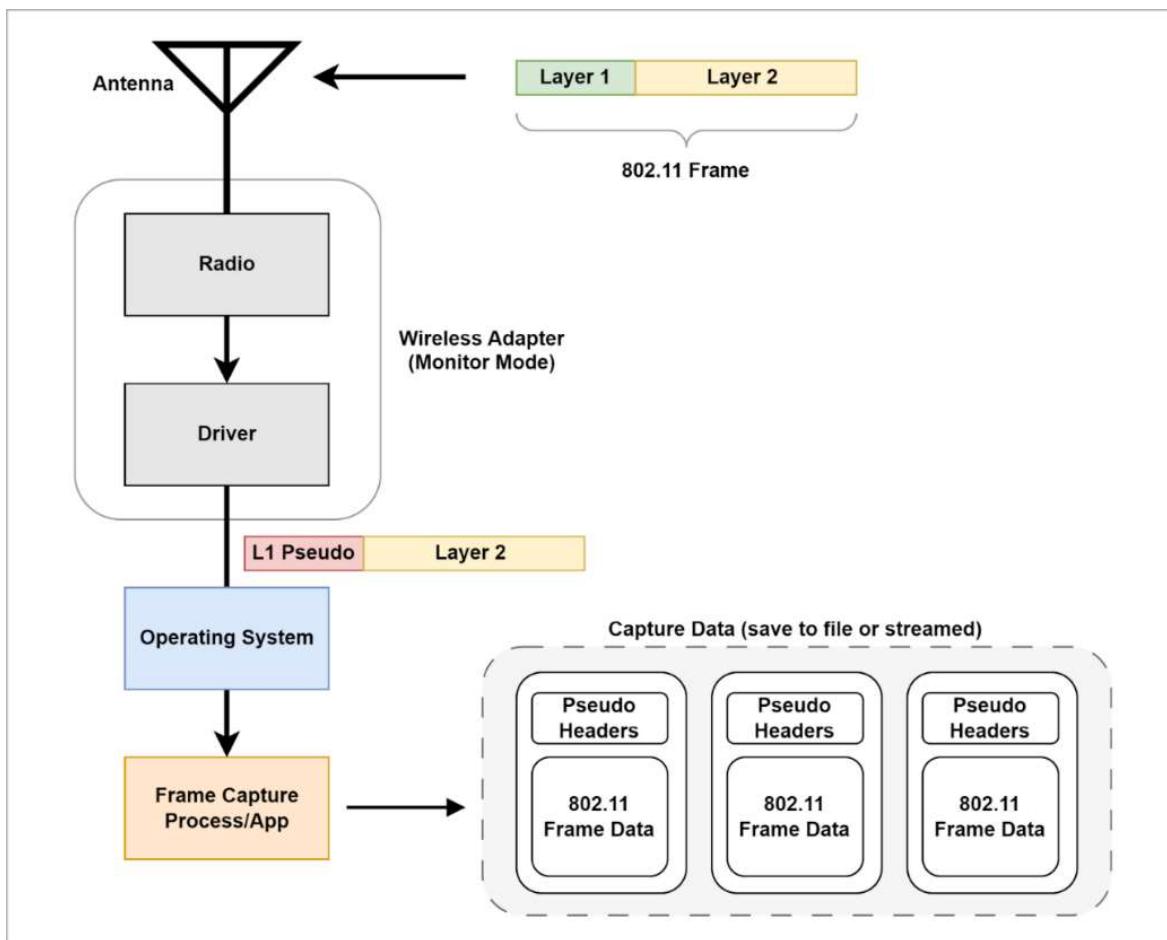


Figure 4-2 - Pseudo-header injection

```

▶ Frame 1: 277 bytes on wire (2216 bits), 277 bytes captured (2216 bits)
▼ Radiotap Header v0, Length 25
    Header revision: 0
    Header pad: 0
    Header length: 25
▶ Present flags
    MAC timestamp: 310768875
▼ Flags: 0x12
    .... ...0 = CFP: False
    .... ..1. = Preamble: Short
    .... .0... = WEP: False
    .... 0... = Fragmentation: False
    ....1 .... = FCS at end: True
    ..0. .... = Data Pad: False
    .0.. .... = Bad FCS: False
    0... .... = Short GI: False
Data Rate: 6.0 Mbps
Channel frequency: 5805 [A 161]
▼ Channel type: 802.11a (0x0140), Orthogonal Frequency-Division Multiplexing (OFDM), 5 GHz spectrum
    .... .... ...0 .... = Turbo: False
    .... .... ..0. .... = Complementary Code Keying (CCK): False
    .... .... .1... .... = Orthogonal Frequency-Division Multiplexing (OFDM): True
    .... .... 0.... .... = 2 GHz spectrum: False
    .... ....1 .... .... = 5 GHz spectrum: True
    .... ..0. .... .... = Passive: False
    .... .0... .... .... = Dynamic CCK-OFDM: False
    .... 0.... .... .... = Gaussian Frequency Shift Keying (GFSK): False
    ....0 .... .... .... = GSM (900MHz): False
    ..0. .... .... .... = Static Turbo: False
    .0... .... .... .... = Half Rate Channel (10MHz Channel Width): False
    0... .... .... .... = Quarter Rate Channel (5MHz Channel Width): False
SSI Signal: -58 dBm
SSI Noise: -92 dBm
Antenna: 1
▶ IEEE 802.11 Beacon frame, Flags: .......C
▶ IEEE 802.11 wireless LAN management frame

```

Figure 4-3 - Radiotap pseudo-header data example

```

▶ Frame 11: 209 bytes on wire (1672 bits), 209 bytes captured (1672 bits)
▼ PPI version 0, 32 bytes
    Version: 0
▼ Flags: 0x00
    .... ...0 = Alignment: Not aligned
    0000 000. = Reserved: 0x00
Header length: 32
DLT: 105
▼ 802.11-Common
    Field type: 802.11-Common (2)
    Field length: 20
    TSFT: 184674142
    Flags: 0x0001
    Rate: 866.5 Mbps
    Channel frequency: 5805 [A 161]
    ▶ Channel type: 802.11a (0x0140)
        FHSS hopset: 0x00
        FHSS pattern: 0x00
        dBm antenna signal: -50
        dBm antenna noise: -92
    ▶ IEEE 802.11 QoS Data, Flags: .....F.C

```

Figure 4-4 - PPI pseudo-header data example

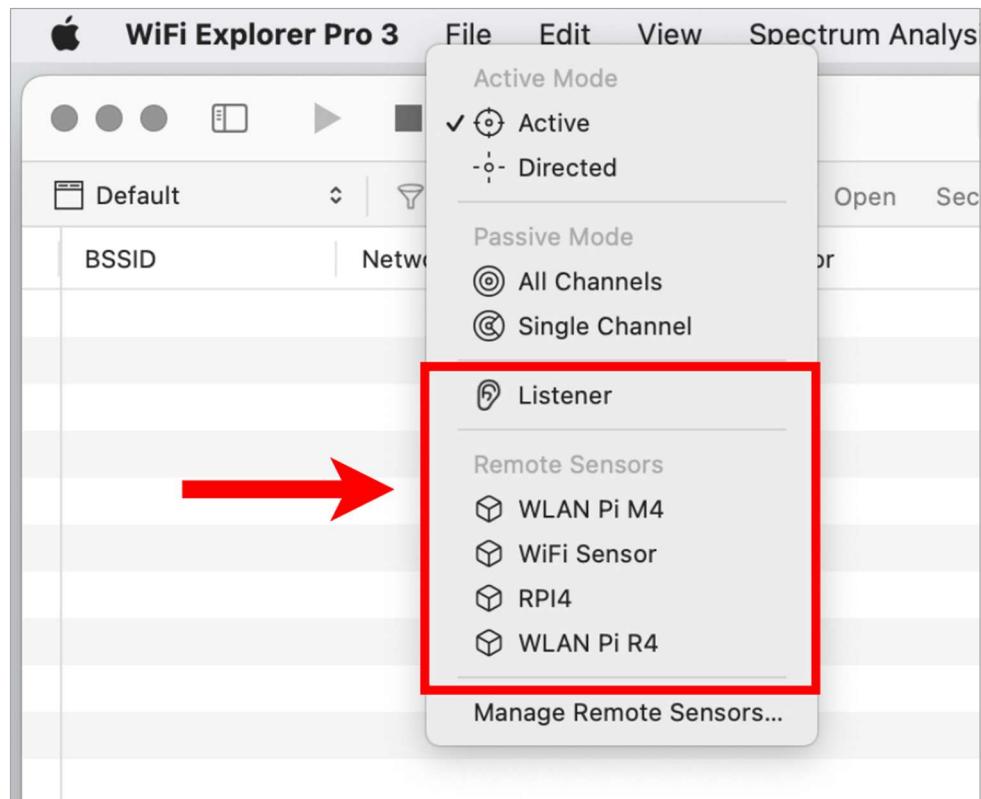


Figure 4-5 - Network sensor options

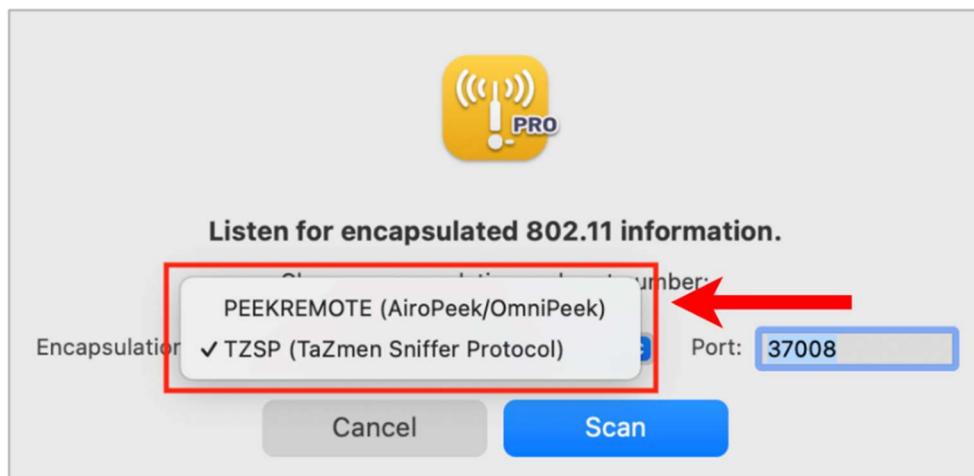


Figure 4-6 - Listener mode options available in WFE Pro 3

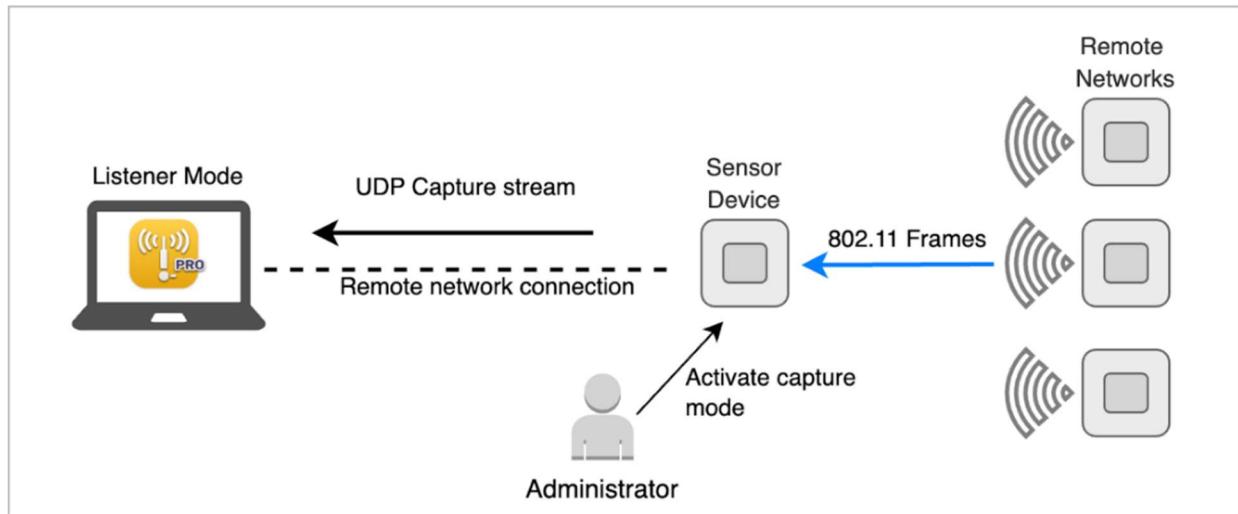


Figure 4-7 - Listener mode operation

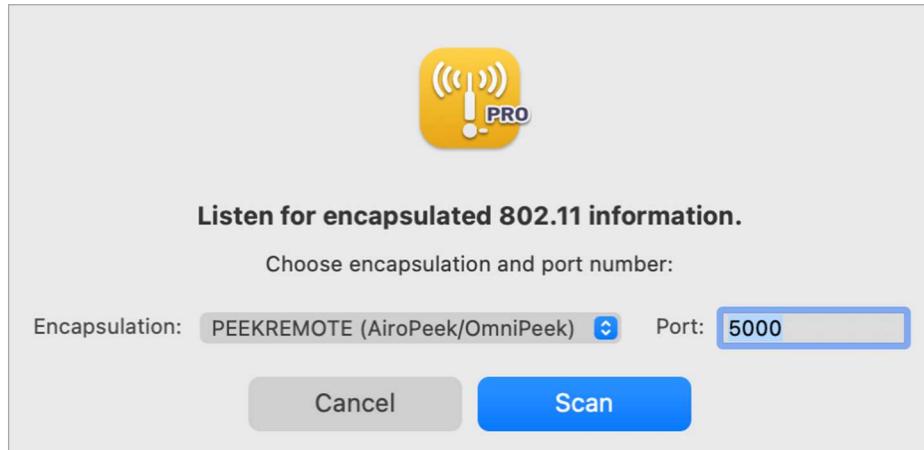


Figure 4-8 - Listener mode: PEEKREMOTE

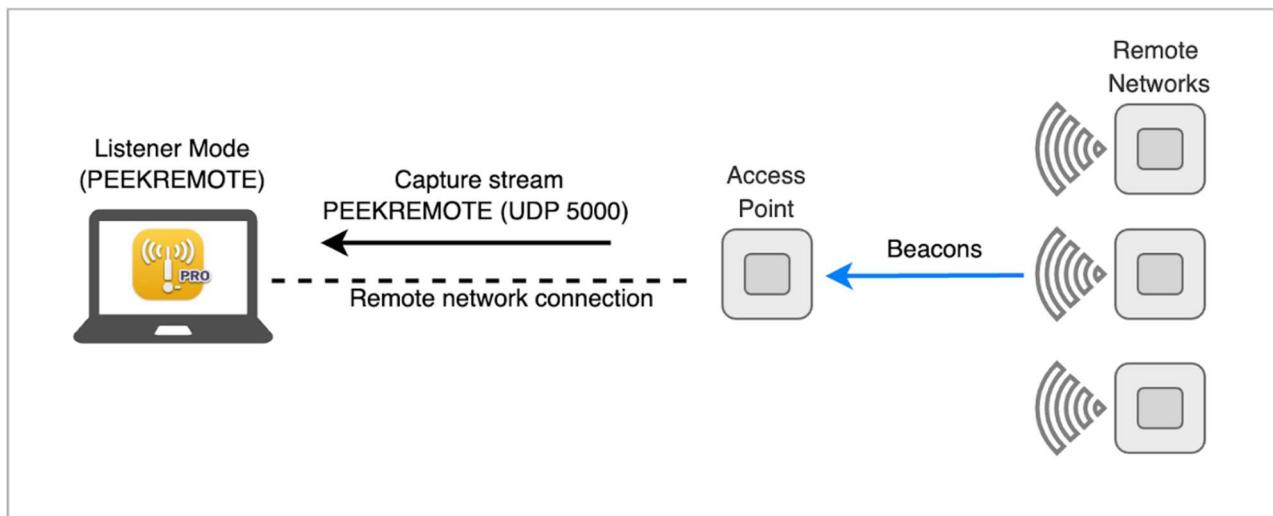


Figure 4-9 - PEEKREMOTE capture stream from an access point

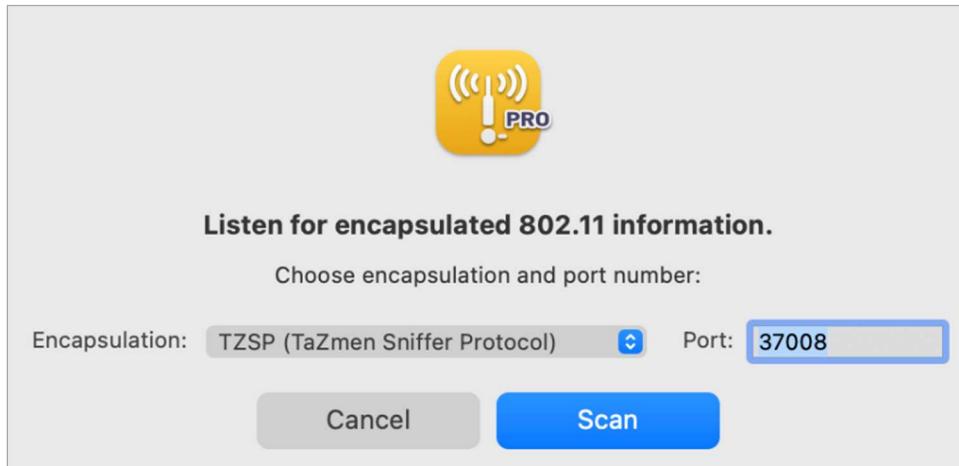


Figure 4-10 - Listener mode: TZSP

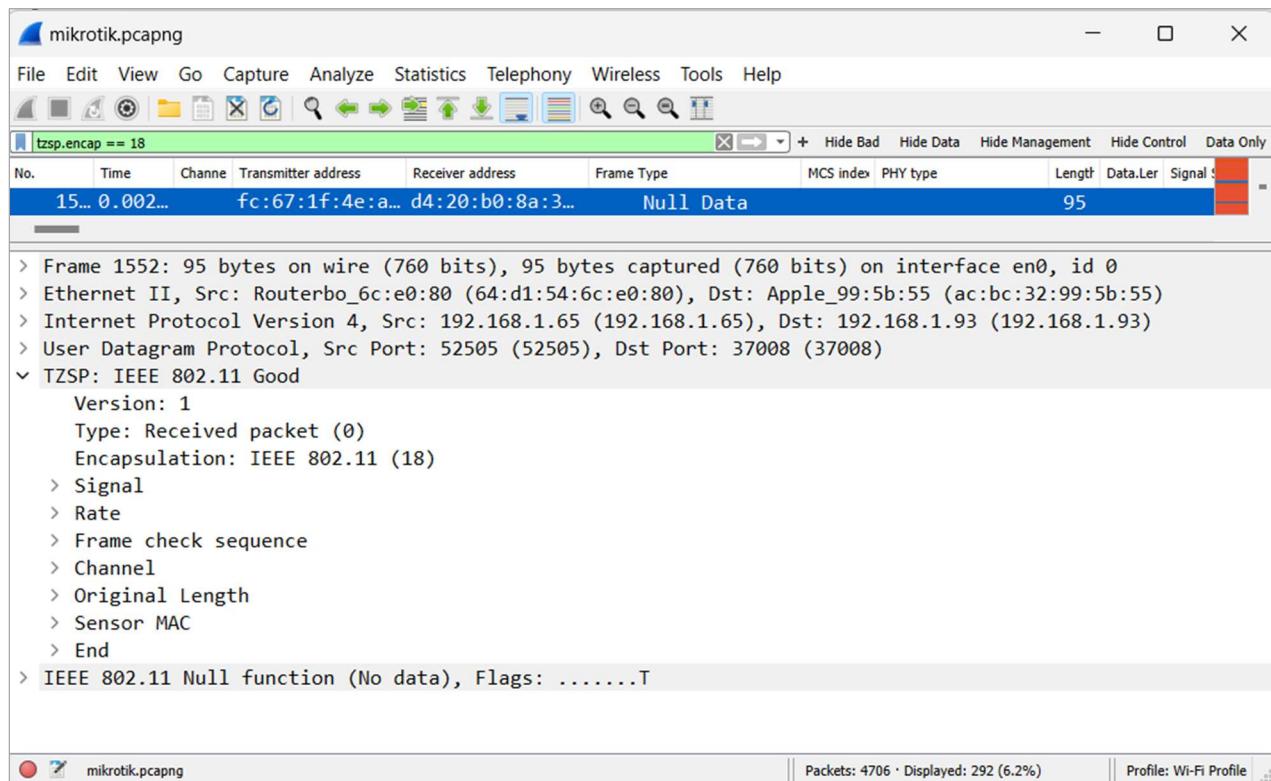


Figure 4-11 - TZSP header data example

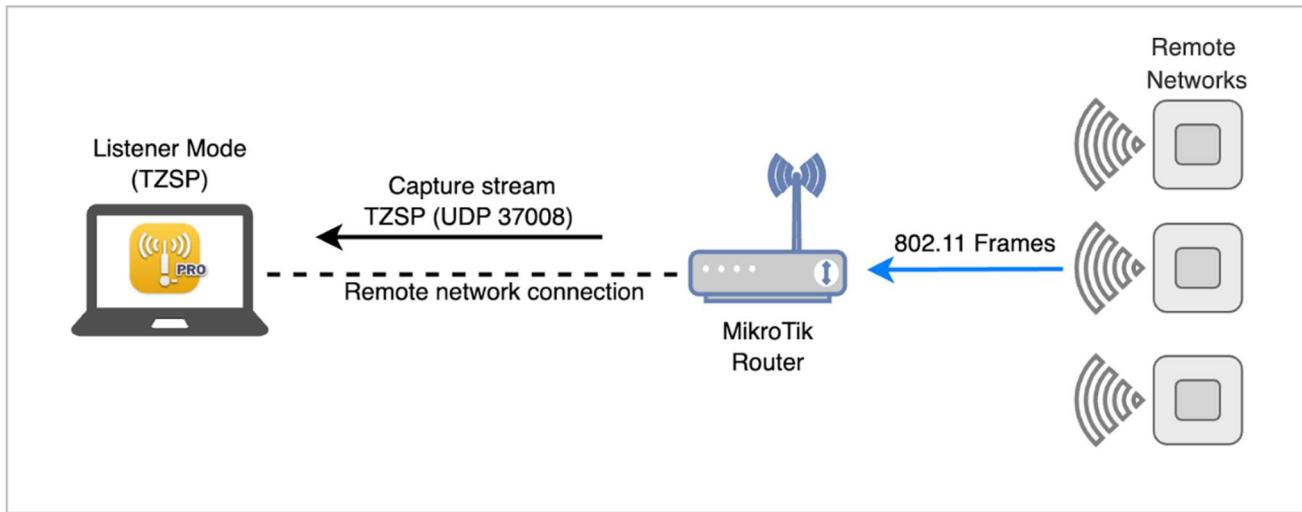


Figure 4-12 - TZSP capture stream from MikroTik device

```
Terminal <1>
[admin@hAP-ac] >
[admin@hAP-ac] > /interface wireless sniffer
[admin@hAP-ac] /interface wireless sniffer> set multiple-channels=yes only-header
s=no streaming-enabled=yes streaming-server=192.168.1.86
[admin@hAP-ac] /interface wireless sniffer> sniff wlan2
    processed-packets: 1343
        memory-size: 10229
    memory-saved-packets: 48
    memory-over-limit-packets: 1295
    stream-dropped-packets: 0
        stream-sent-packets: 1343
            real-file-limit: 10
            real-memory-limit: 10
-- [Q quit|D dump|C-z pause]
```

Figure 4-13 - MikroTik device capture

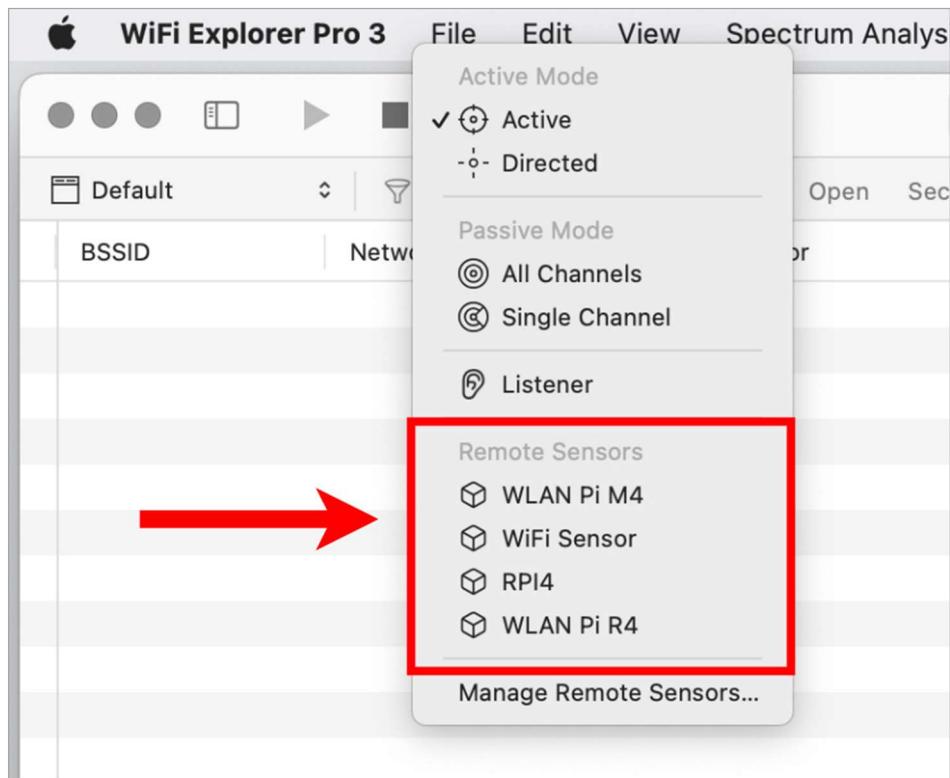


Figure 4-14 - Remote sensors selection and management options

The screenshot shows the Sensors tab of the WiFi Explorer Pro 3 application. The tab bar includes General, Profiles, Annotations, Filters, Coloring Rules, Sensors (selected), Spectrum Analysis, and Advanced.

Name	Address	Interface	Mode	Port
WLAN Pi M4	192.168.1.75	wlan0	Passive	22
WiFi Sensor	100.91.78.105	Auto	Auto	19000
RPI4	192.168.1.74	Auto	Auto	22
WLAN Pi R4	192.168.1.76	Auto	Auto	22

At the bottom left are buttons for adding (+), removing (-), and filtering (eye icon).

Figure 4-15 - Remote sensor management

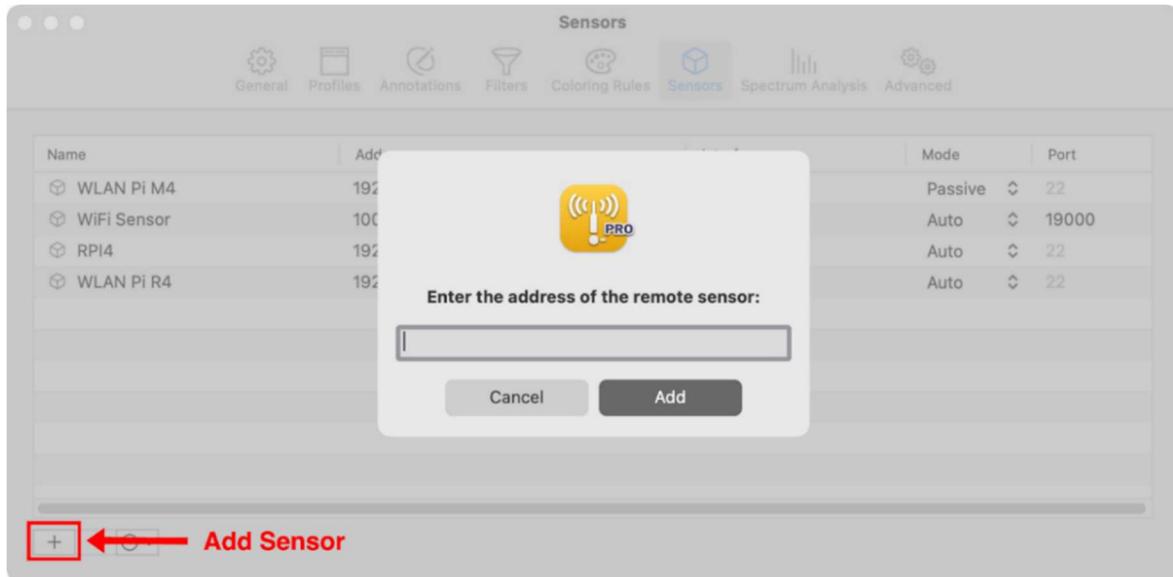


Figure 4-16 - Adding a new sensor

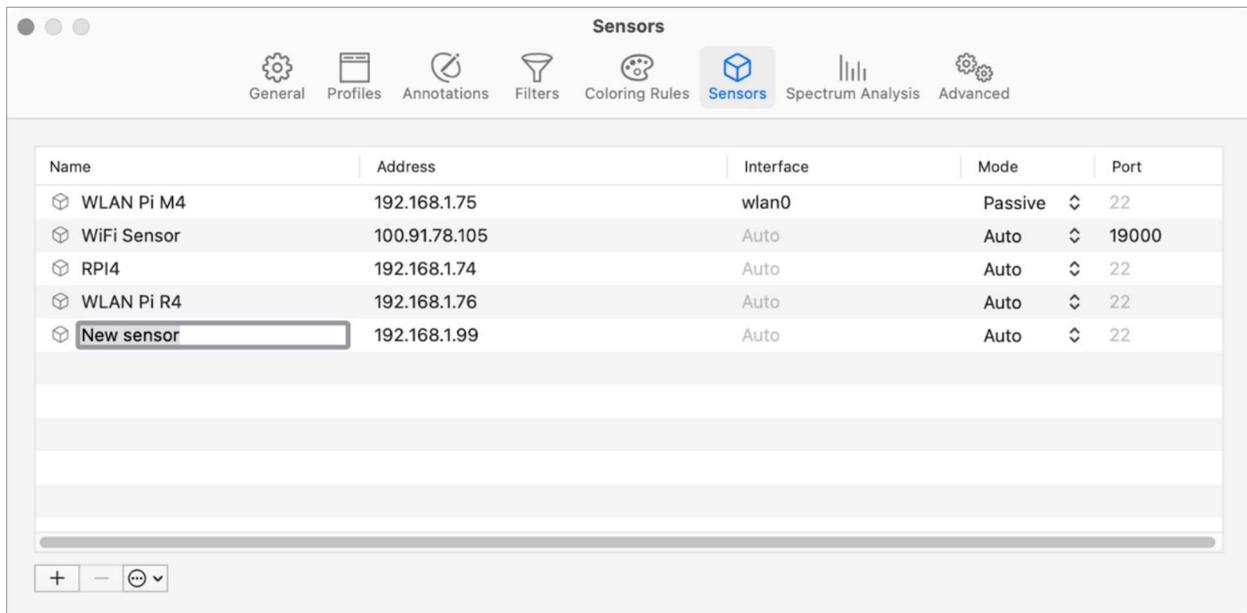


Figure 4-17 - A new sensor with initial attribute values

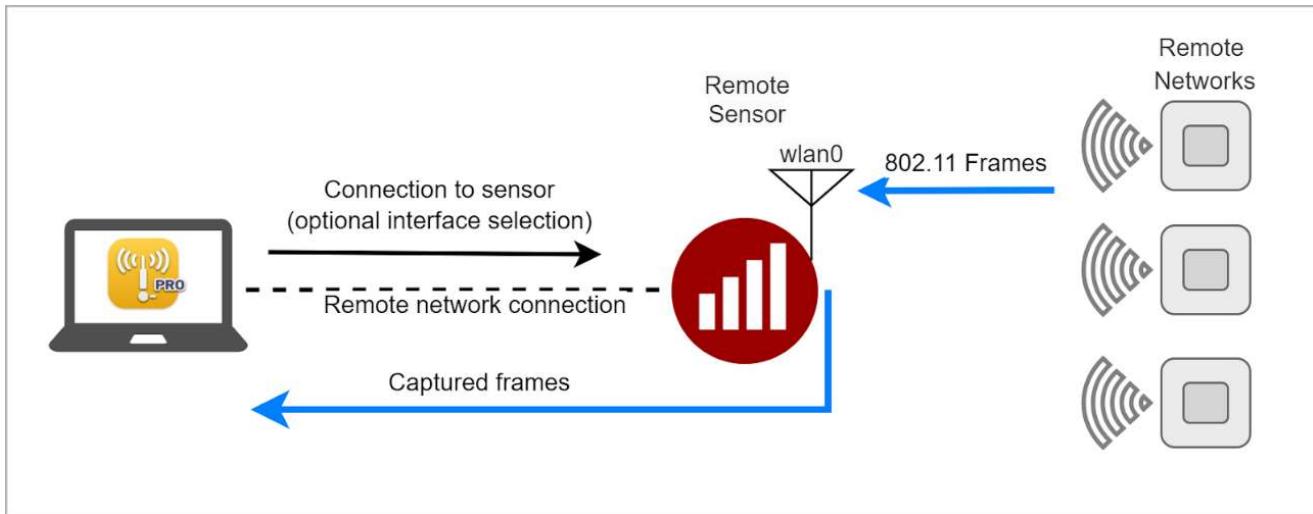


Figure 4-18 - Remote sensor operation

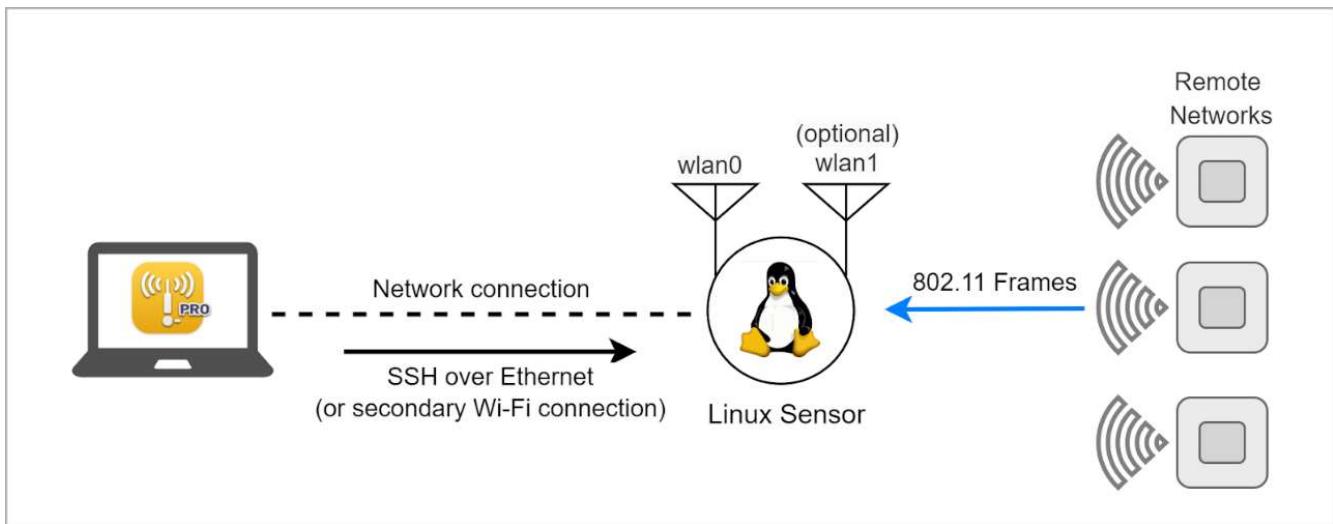


Figure 4-19 - Linux sensor overview



Figure 4-20 - WLAN Pi Pro, M4 and R4



Figure 4-21 - WLAN Pi NEO2

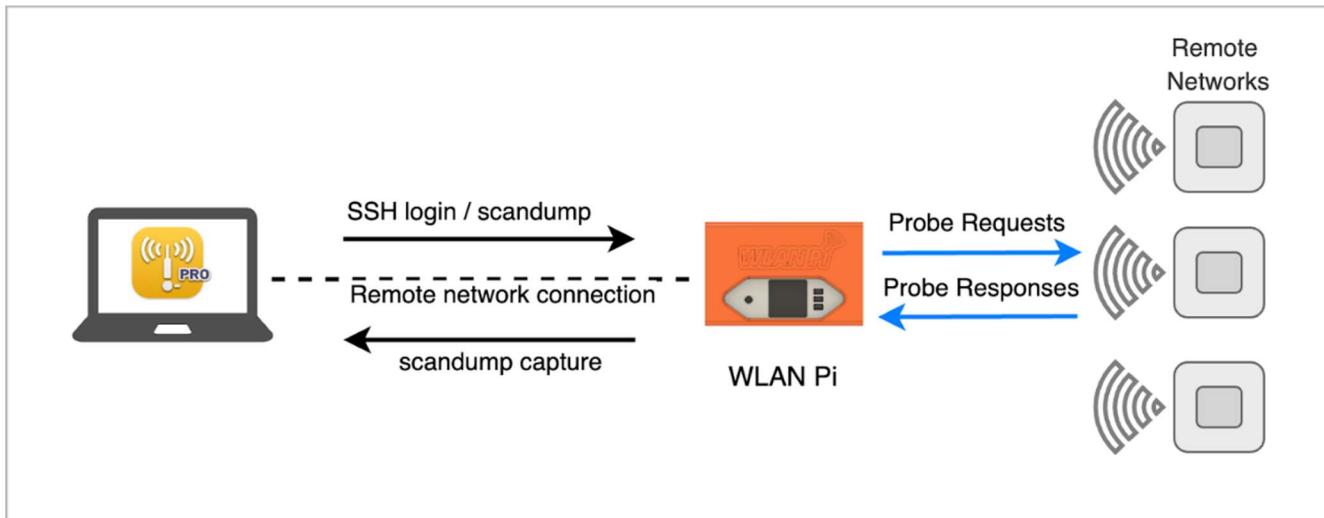


Figure 4-22 - WLAN Pi as a remote sensor using active scanning

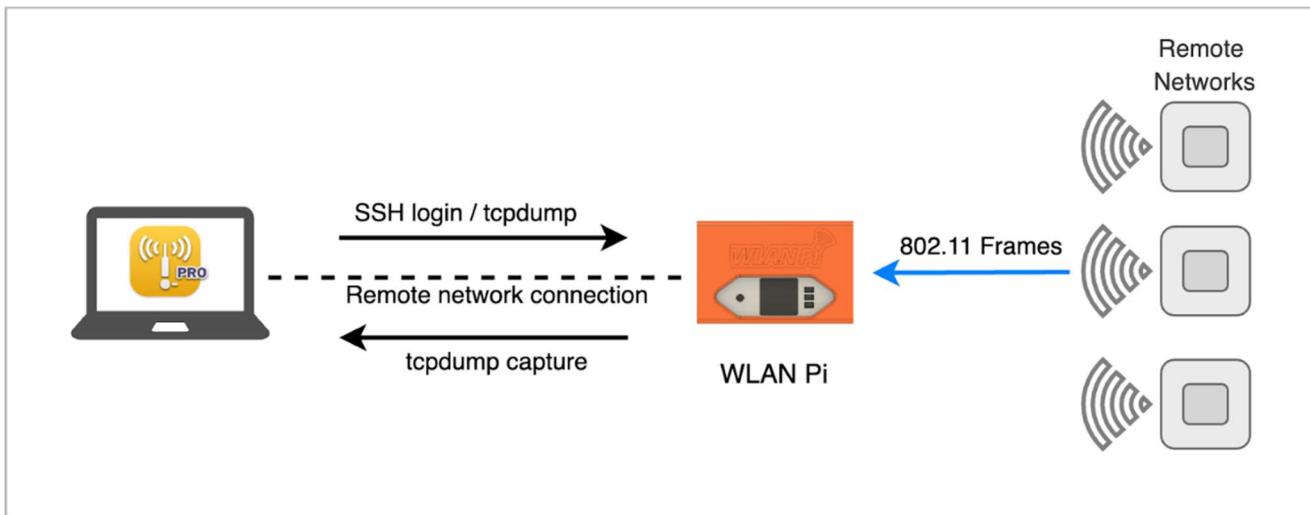


Figure 4-23 - WLAN Pi as a remote sensor using passive scanning

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

The screenshot shows the WiFi Explorer Pro 3 application interface. At the top, there is a navigation bar with tabs: General, Profiles, Annotations, Filters, Coloring Rules, Sensors (which is selected and highlighted in blue), Spectrum Analysis, and Advanced. Below the navigation bar is a table titled "Sensors" with the following data:

Name	Address	Interface	Mode	Port
WLAN Pi M4	192.168.1.75	wlan0	Passive	22
WiFi Sensor	100.91.78.105		Auto	19000
RPI4	192.168.1.74		Auto	22
WLAN Pi R4	192.168.1.76		Auto	22

At the bottom left of the main window are three buttons: a plus sign (+), a minus sign (-), and a dropdown menu icon.

Figure 4-24 - Sensor management panel showing WLAN Pi sensors

The screenshot shows the WiFi Explorer Pro 3 application interface. At the top, there is a menu bar with File, Edit, View, and Spectrum Analysis. A context menu is open over the main interface, specifically under the "Scan Mode" section. The menu items include:

- Active Mode
 - ✓ Active
 - o- Directed
- Passive Mode
 - All Channels
 - Single Channel
- Listener

A red arrow points from the left towards a red-bordered box containing the "Remote Sensors" section of the menu. This section lists the same four remote sensors as in Figure 4-24:

- WLAN Pi M4
- WiFi Sensor
- RPI4
- WLAN Pi R4

At the bottom of the red-bordered box is a "Manage Remote Sensors..." button.

Figure 4-25 - WFE Pro 3 scan mode selector showing WLAN Pi sensors

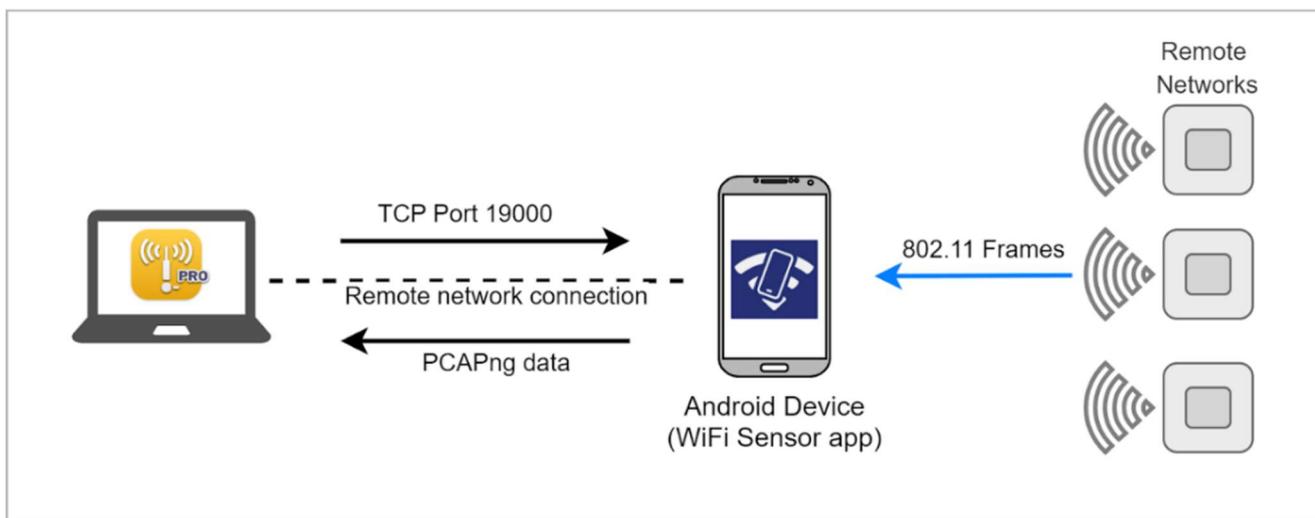


Figure 4-26 - WiFi Sensor app as a remote sensor

Sensors

Name	Address	Interface	Mode	Port
RPi3b	192.168.1.41	wlan1	Active	22
Neo3	192.168.1.65	Auto	Auto	22
WLAN Pi M4	192.168.1.32	Auto	Auto	22
WiFi Sensor	192.168.1.53	Auto	Auto	19000

+ - ⌂ ▾

Figure 4-27 - WiFi Sensor Android device added to WFE Pro 3 sensor list

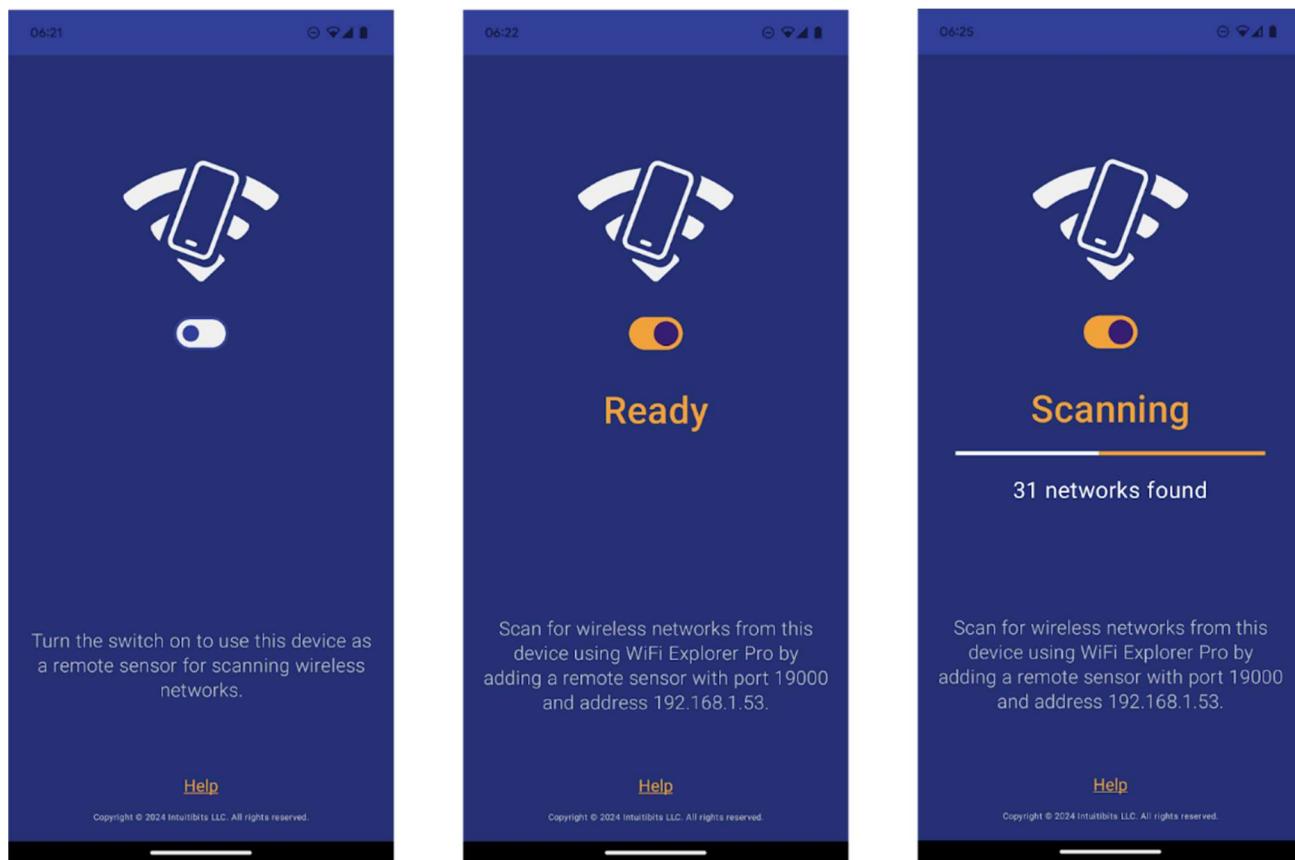


Figure 4-28 - WiFi Sensor app operation

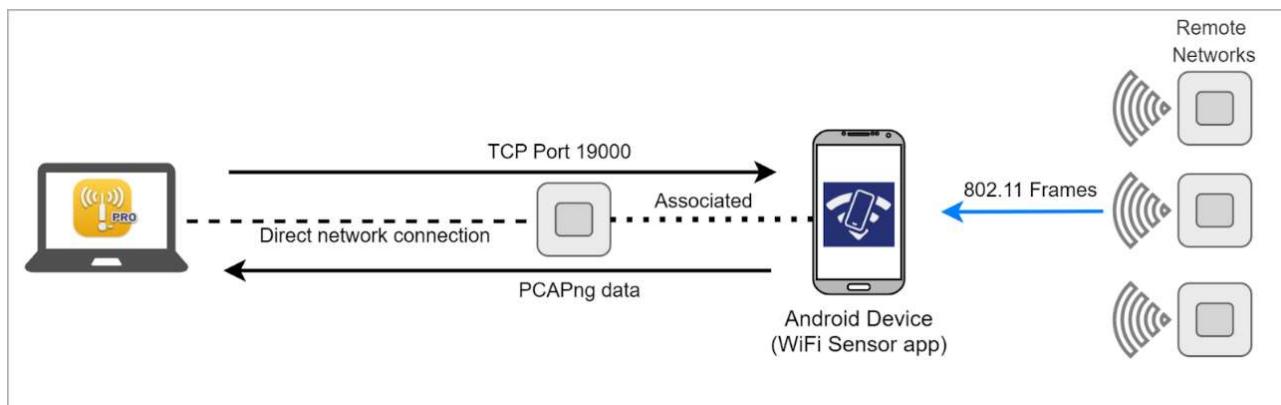


Figure 4-29 - WiFi Sensor direct connectivity

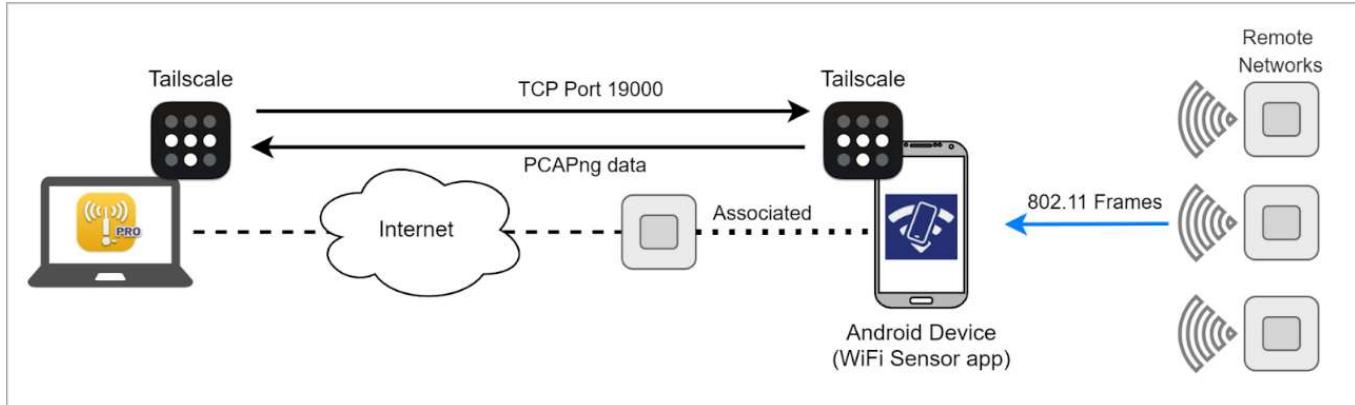


Figure 4-30 - WiFi Sensor VPN connectivity (local Wi-Fi connection)

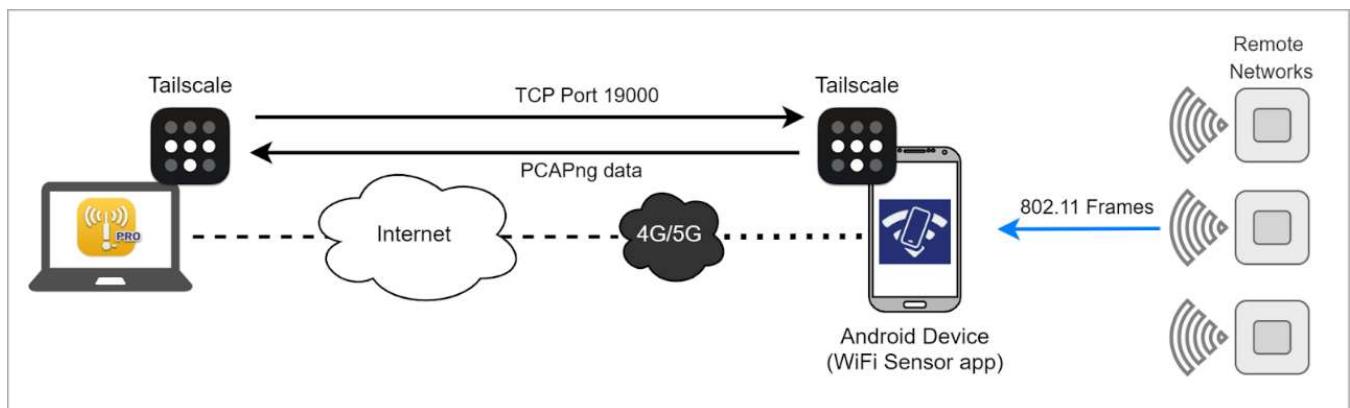


Figure 4-31 - WiFi Sensor VPN connectivity (cellular connection)

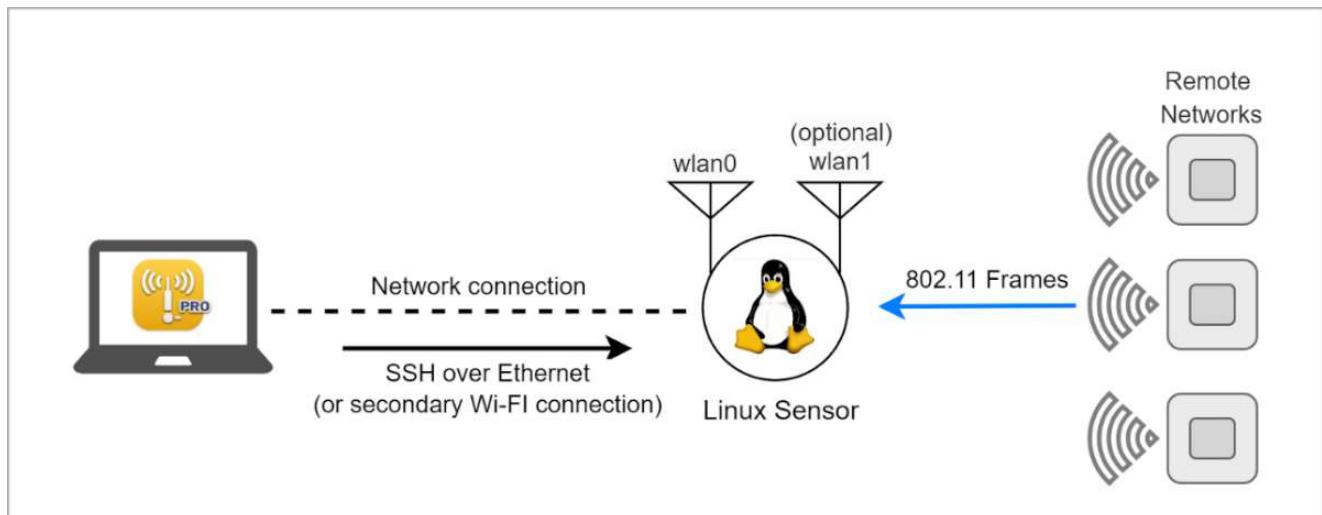


Figure 4-32 - Linux sensor overview

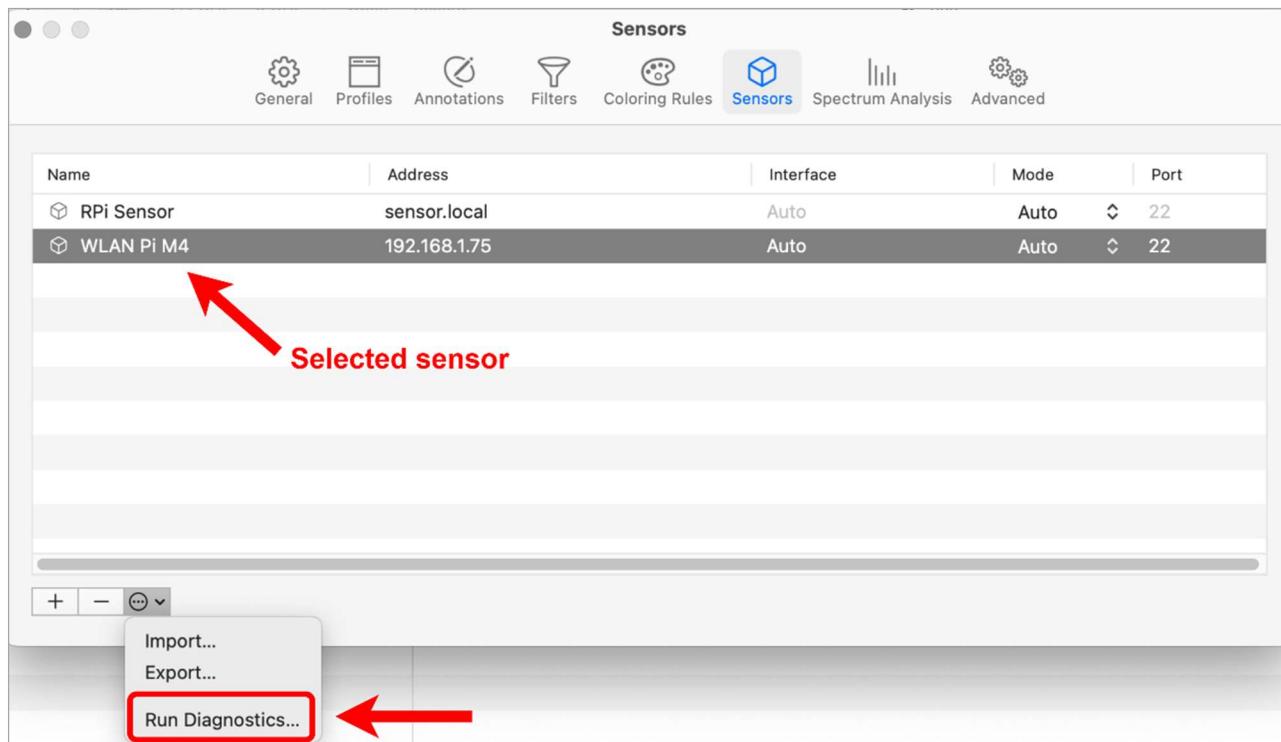


Figure 4-33 - Remote sensor diagnostics

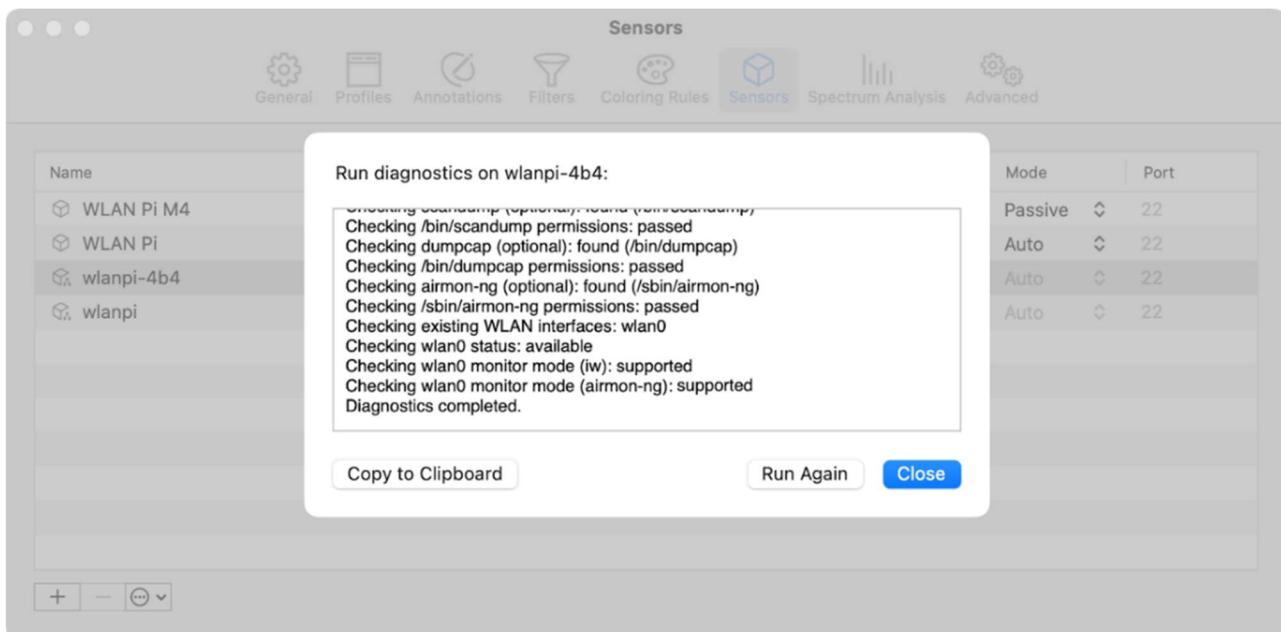


Figure 4-34 - Remote sensor diagnostics results

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

Members

Switch to new Members list

Search (Address / Name)

Display Filter

Authorized Inactive 1

Not Authorized Active 1

Bridges Hidden 0

Sort By

Address Name

Auth?	Address	Name/Description	Managed IPs	Last Seen	Version	Physical IP
<input checked="" type="checkbox"/>	372a95ed42 da:bc:d5:a7:eb:c8	Pixel6 (WiFi Sensor) (description)	fd83:048a:0632:ff8b:db99:9337:2a95:ed42 <input type="button" value="10.147.17.217"/> + 10.147.17.x	1 MINUTE	1.14.0	82.132.247.159
<input checked="" type="checkbox"/>	d3bd326b7d da:58:42:00:6d:f7	MBP(WFE Pro 3) (description)	fd83:048a:0632:ff8b:db99:93d3:bd32:6b7d <input type="button" value="10.147.17.181"/> + 10.147.17.x	37 MINUTES	1.12.2	81.98.195.90

< 1-2 / 2 >

E-Mail Join Instructions

Manually Add Member

> Members Help

Figure 4-35 - ZeroTier dashboard showing WFE Pro 3 and WiFi Sensor endpoints

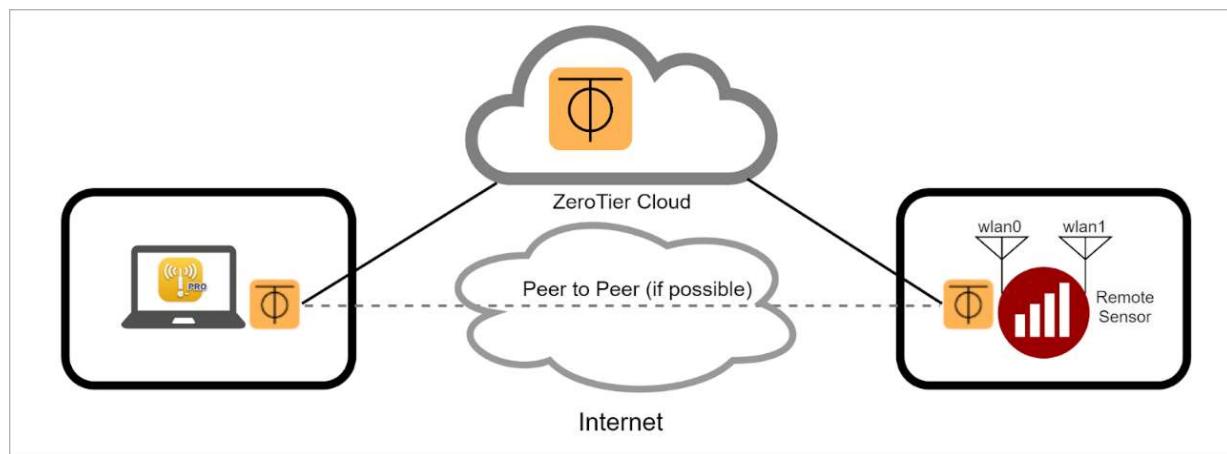


Figure 4-36 - ZeroTier Connectivity

MACHINE	ADDRESSES ⓘ	VERSION	LAST SEEN
mbp-wfe-pro-3 co.uk	100.117.201.76 ⓘ	1.70.0 macOS 12.7.5	● Connected
pixel-6-wifi-sensor co.uk	100.91.78.105 ⓘ	1.70.0 Android 14	● Connected

Figure 4-37 - Tailscale dashboard showing WFE Pro 3 and WiFi Sensor endpoints

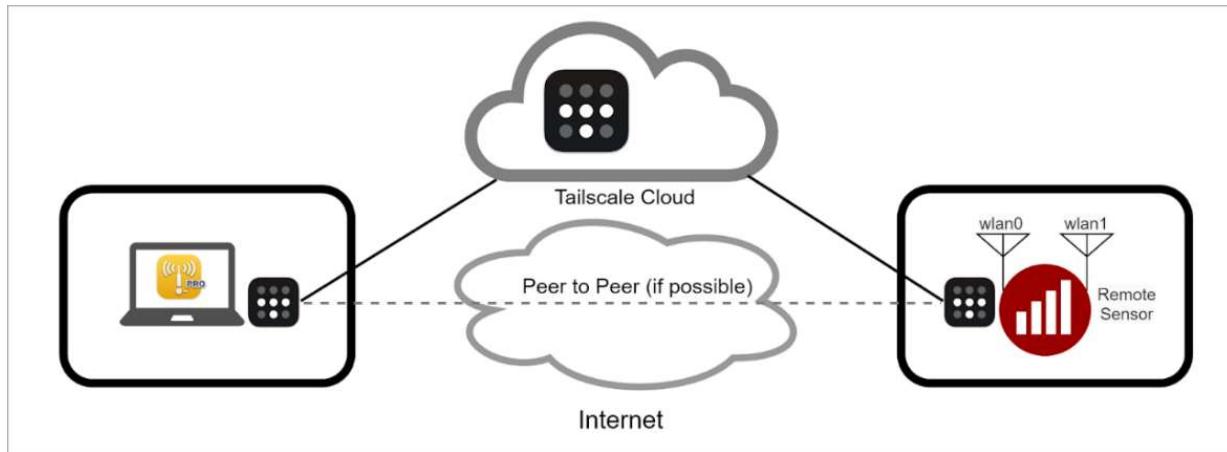


Figure 4-38 - Tailscale Connectivity

Chapter 5 - Data Import From External Systems

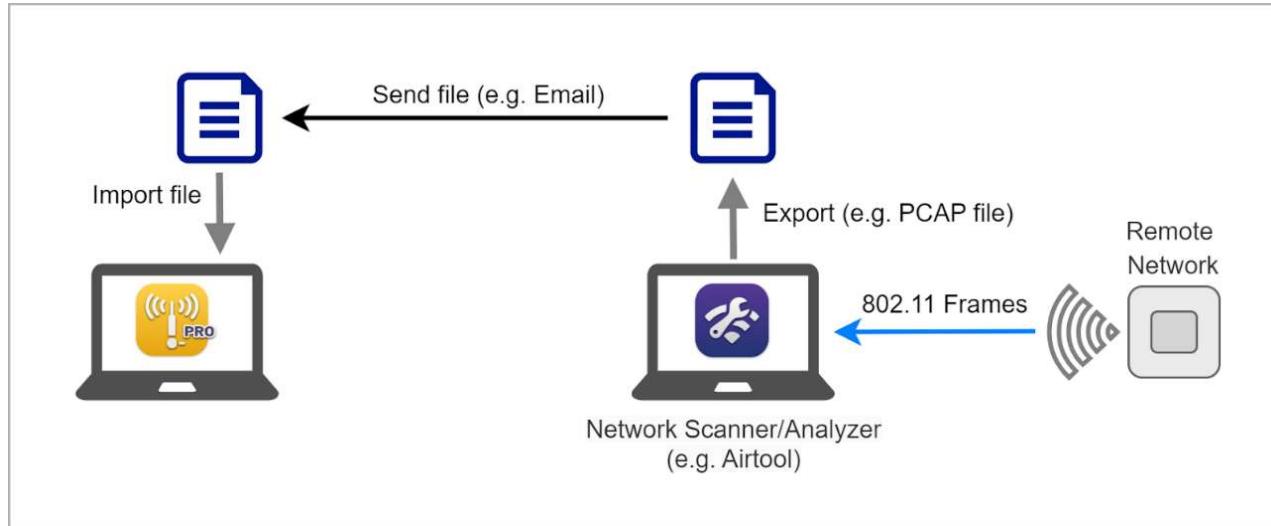


Figure 5-1 - Data import from frame capture application/utility

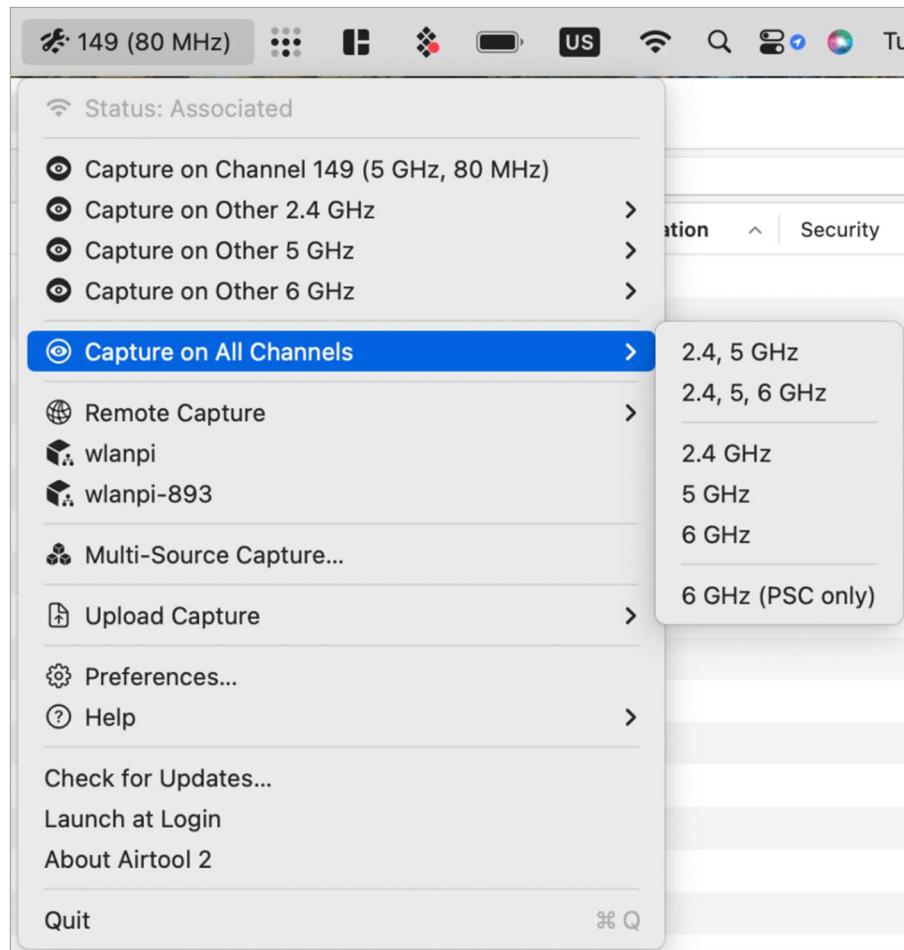


Figure 5-2 - Airtool 2 multi-channel scanning option

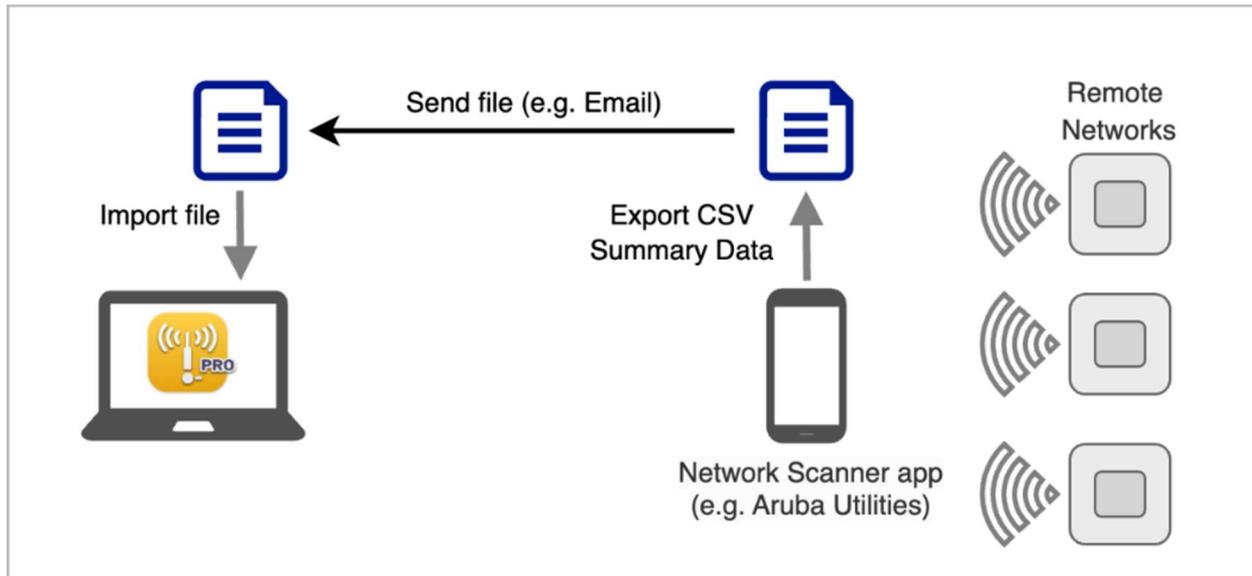


Figure 5-3 - Data import from a network scanner app

A screenshot of a Mac OS X-style text editor window titled 'text-9810CF953F47-1.txt'. The window contains the following CSV data:

```
SSID, BSS, RSSI, Channel, Time
"VM0108420", "C0:06:C3:4F:EA:C2", "-74", "12", "06:16:42"
"VM0108420", "C0:06:C3:4F:EA:C2", "-75", "12", "06:16:45"
"VM0108420", "C0:06:C3:4F:EA:C2", "-77", "12", "06:16:48"
"VM0108420", "C0:06:C3:4F:EA:C2", "-77", "12", "06:16:52"
"VM0108420", "C0:06:C3:4F:EA:C2", "-78", "12", "06:16:55"
"VM0108420", "C0:06:C3:4F:EA:C2", "-79", "12", "06:16:58"
"BT-GMA266", "78:DD:12:B5:0B:37", "-84", "1", "06:16:42"
"BT-GMA266", "78:DD:12:B5:0B:37", "-84", "1", "06:16:45"
"BT-GMA266", "78:DD:12:B5:0B:37", "-90", "1", "06:16:48"
"BT-GMA266", "78:DD:12:B5:0B:37", "-85", "1", "06:16:52"
"BT-GMA266", "78:DD:12:B5:0B:37", "-84", "1", "06:16:55"
"BT-GMA266", "78:DD:12:B5:0B:37", "-84", "1", "06:16:58"
"VM6643873", "18:35:D1:B9:71:DF", "-76", "44", "06:16:42"
"VM6643873", "18:35:D1:B9:71:DF", "-76", "44", "06:16:45"
"VM6643873", "18:35:D1:B9:71:DF", "-79", "44", "06:16:48"
```

Figure 5-4 - Exported CSV data sample

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

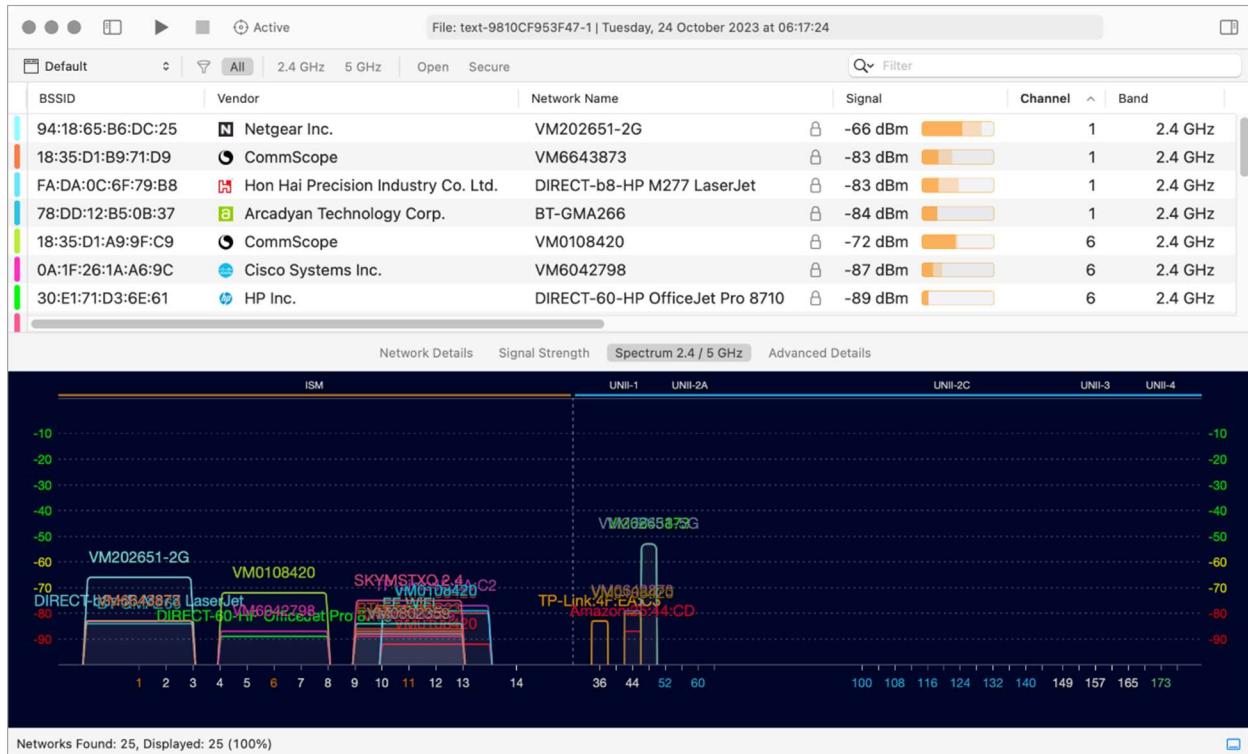


Figure 5-5 - WFE Pro 3 displaying imported CSV data (AirPort Utility)

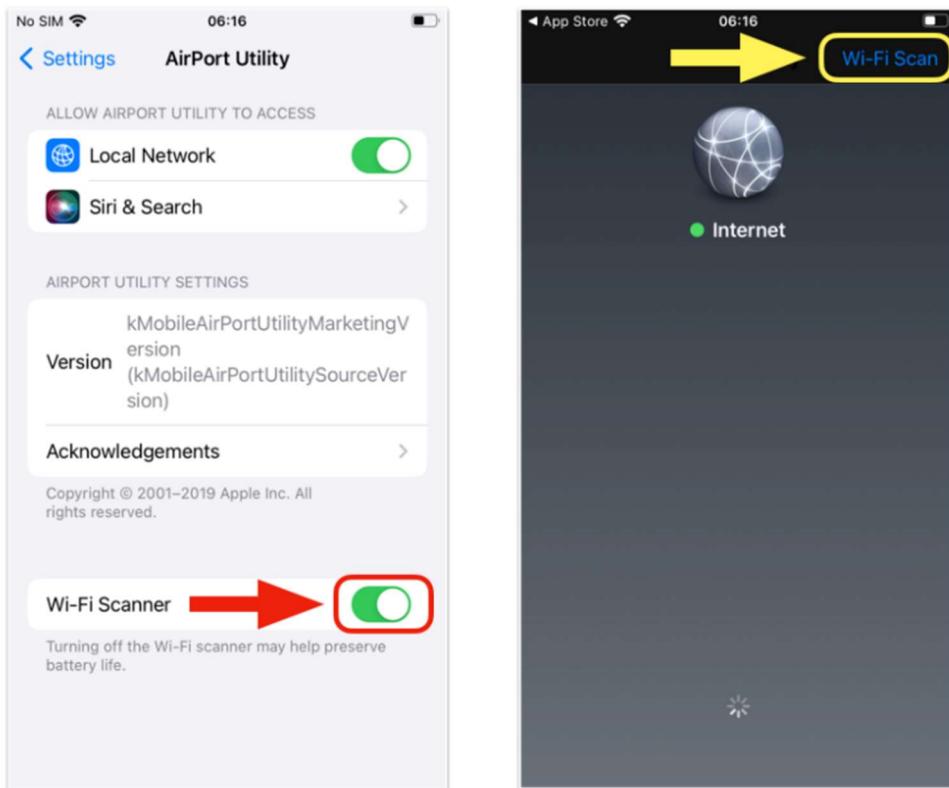


Figure 5-6 - Apple AirPort Utility setup #1

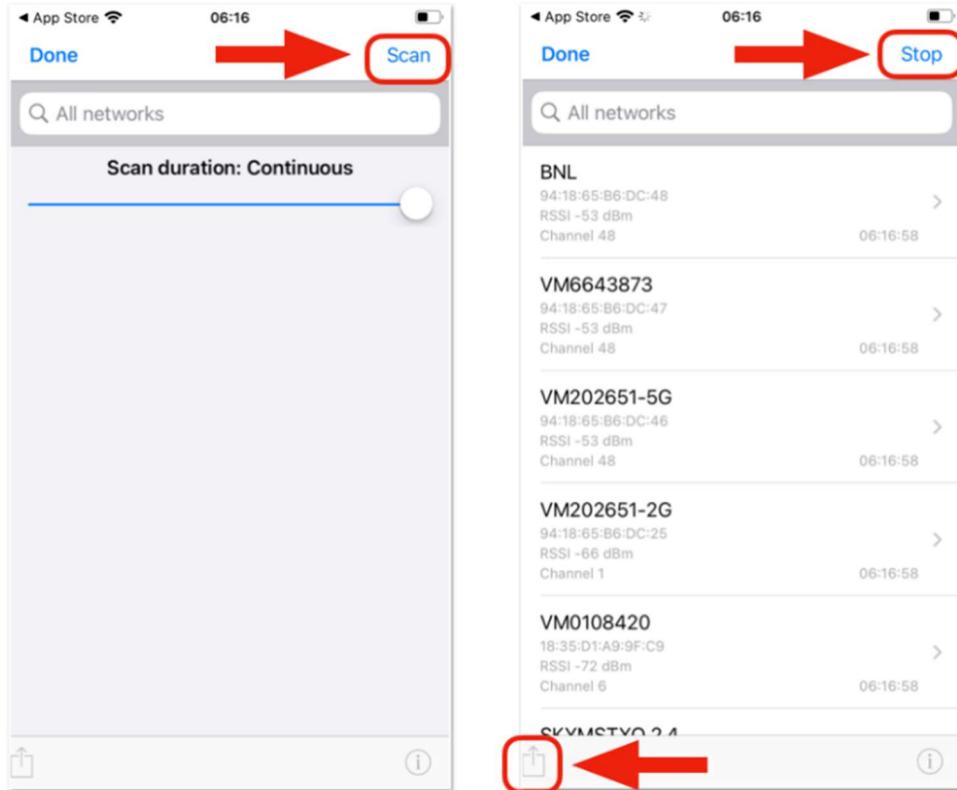


Figure 5-7 - Apple AirPort Utility setup #2

```
text-48D3-8BAE-0A-0.txt

SSID, BSS, RSSI, Channel, Time
"BNL_2G", "30:23:03:1B:42:DE", "-82", "4", "19:59:09"
"BNL_2G", "30:23:03:1B:42:DE", "-82", "4", "19:59:13"
"BNL_2G", "30:23:03:1B:42:DE", "-82", "4", "19:59:16"
"BNL_2G", "30:23:03:1B:42:DE", "-82", "4", "19:59:19"
"BNL_2G", "30:23:03:1B:42:DE", "-82", "4", "19:59:23"
"VM202651-2G", "36:23:03:1B:42:DF", "-83", "40", "19:59:09"
"VM202651-2G", "36:23:03:1B:42:DF", "-84", "40", "19:59:13"
"VM202651-2G", "36:23:03:1B:42:DF", "-87", "40", "19:59:16"
"VM202651-2G", "36:23:03:1B:42:DF", "-87", "40", "19:59:19"
"VM202651-2G", "36:23:03:1B:42:DF", "-84", "40", "19:59:23"
"VM202651-2G", "36:23:03:1B:42:DF", "-84", "40", "19:59:26"
"VM202651-2G", "36:23:03:1B:42:DF", "-84", "40", "19:59:29"
"VM202651-2G", "36:23:03:1B:42:DF", "-84", "40", "19:59:32"
"VM202651-2G", "36:23:03:1B:42:DF", "-86", "40", "19:59:36"
"VM202651-2G", "36:23:03:1B:42:DF", "-84", "40", "19:59:39"
"VM202651-2G", "36:23:03:1B:42:DF", "-84", "40", "19:59:45"
"BNL", "94:18:65:B6:DC:48", "-69", "48", "19:59:09"
"BNL", "94:18:65:B6:DC:48", "-69", "48", "19:59:13"
"BNL", "94:18:65:B6:DC:48", "-67", "48", "19:59:16"
"BNL", "94:18:65:B6:DC:48", "-65", "48", "19:59:19"
"BNL", "94:18:65:B6:DC:48", "-64", "48", "19:59:23"
"BNL", "94:18:65:B6:DC:48", "-63", "48", "19:59:26"
"BNL", "94:18:65:B6:DC:48", "-62", "48", "19:59:29"
"BNL", "94:18:65:B6:DC:48", "-63", "48", "19:59:32"
"BNL", "94:18:65:B6:DC:48", "-63", "48", "19:59:36"
```

Figure 5-8 - Raw CSV data from AirPort Utility

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

Airport Utility All 2.4 GHz 5 GHz Open Secure Filter

BSSID	Network Name	Vendor	Channel	Band	Signal	Noise (Approx)	SNR (Approx)
94:18:65:B6:DC:48	BNL	Netgear Inc.	48	5 GHz	-62 dBm	-96 dBm	34 dB
1E:48:BE:25:44:CD	Hidden Network	Amazon Technol...	44	5 GHz	-72 dBm	-96 dBm	24 dB
18:35:D1:A9:9F:C9	VM0108420	CommScope	11	2.4 GHz	-73 dBm	-96 dBm	23 dB
18:35:D1:B9:71:D9	VM6643873	CommScope	6	2.4 GHz	-75 dBm	-96 dBm	21 dB
FA:DA:0C:6F:79:B8	DIRECT...7 LaserJet	Hon Hai Precisio...	6	2.4 GHz	-78 dBm	-96 dBm	18 dB
C6:06:C3:4F:EA:C2	Hidden Network	TP-Link Technol...	9	2.4 GHz	-79 dBm	-96 dBm	17 dB
02:68:EB:44:88:B8	DIRECT...Pro 8020	HP Inc.	6	2.4 GHz	-80 dBm	-96 dBm	16 dB
C0:06:C3:4F:EA:C2	VM0108420	TP-Link Technol...	9	2.4 GHz	-80 dBm	-96 dBm	16 dB
18:35:D1:B9:71:DF	VM6643873	CommScope	44	5 GHz	-80 dBm	-96 dBm	16 dB
36:23:03:1B:42:DE	VM202651-2G	Belkin Internatio...	4	2.4 GHz	-81 dBm	-96 dBm	15 dB
3A:23:03:1B:42:DE	Hidden Network	Belkin Internatio...	4	2.4 GHz	-82 dBm	-96 dBm	14 dB
30:23:03:1B:42:DE	BNL_2G	Belkin Internatio...	4	2.4 GHz	-82 dBm	-96 dBm	14 dB
C6:06:C3:4F:EB:DA	Hidden Network	TP-Link Technol...	9	2.4 GHz	-83 dBm	-96 dBm	13 dB
C0:06:C3:4F:EB:DA	VM0108420	TP-Link Technol...	9	2.4 GHz	-83 dBm	-96 dBm	13 dB
18:83:BF:34:67:E3	BTHub5-MG23	Arcadyan Techno...	1	2.4 GHz	-84 dBm	-96 dBm	12 dB
30:23:03:1B:42:DF	VM202651-5G	Belkin Internatio...	40	5 GHz	-84 dBm	-96 dBm	12 dB
36:23:03:1B:42:DF	VM202651-2G	Belkin Internatio...	40	5 GHz	-84 dBm	-96 dBm	12 dB
5A:83:BF:34:67:E5	EE WiFi-X		1	2.4 GHz	-85 dBm	-96 dBm	11 dB
5A:83:BF:34:67:E5	EE WiFi-X		1	2.4 GHz	-85 dBm	-96 dBm	11 dB

Networks Found: 33, Displayed: 33 (100%)

Figure 5-9 - AirPort Utility data displayed in WFE Pro 3

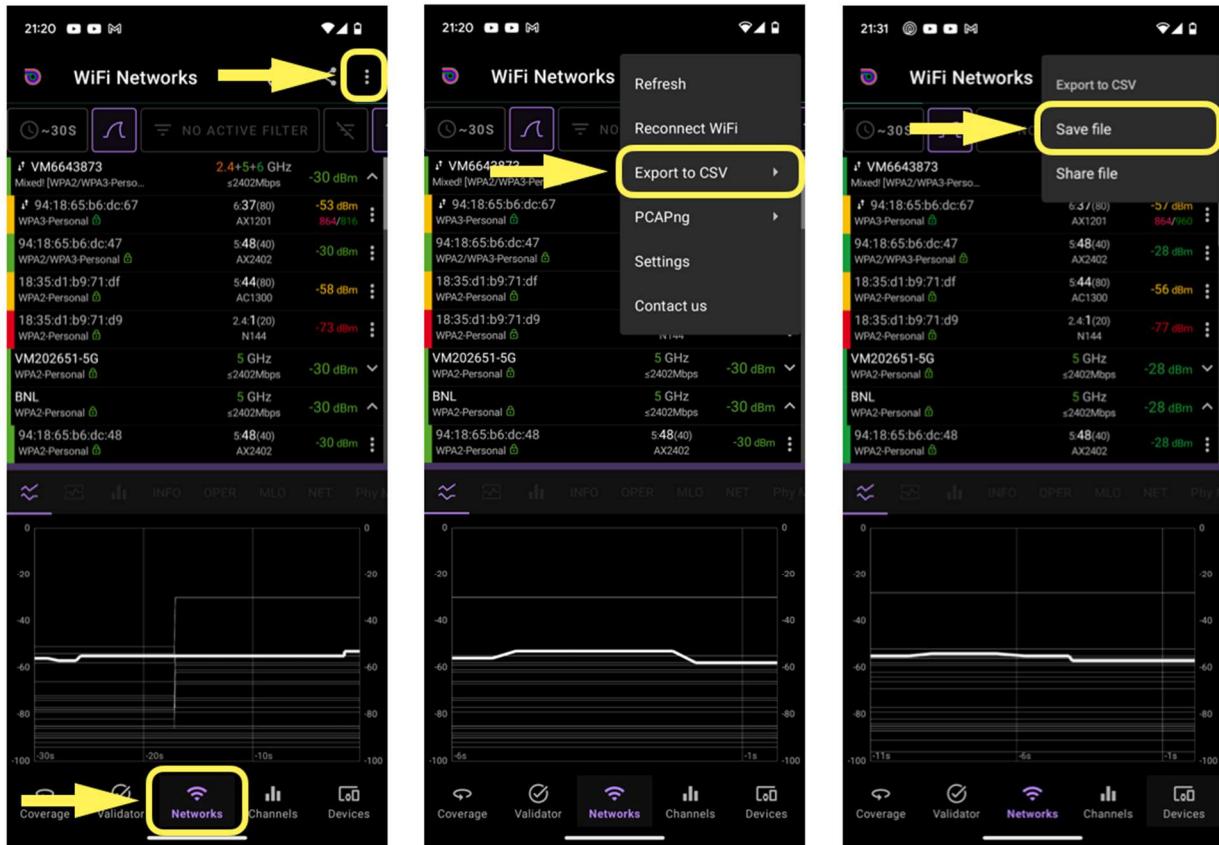


Figure 5-10 - Analiti CSV export process

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

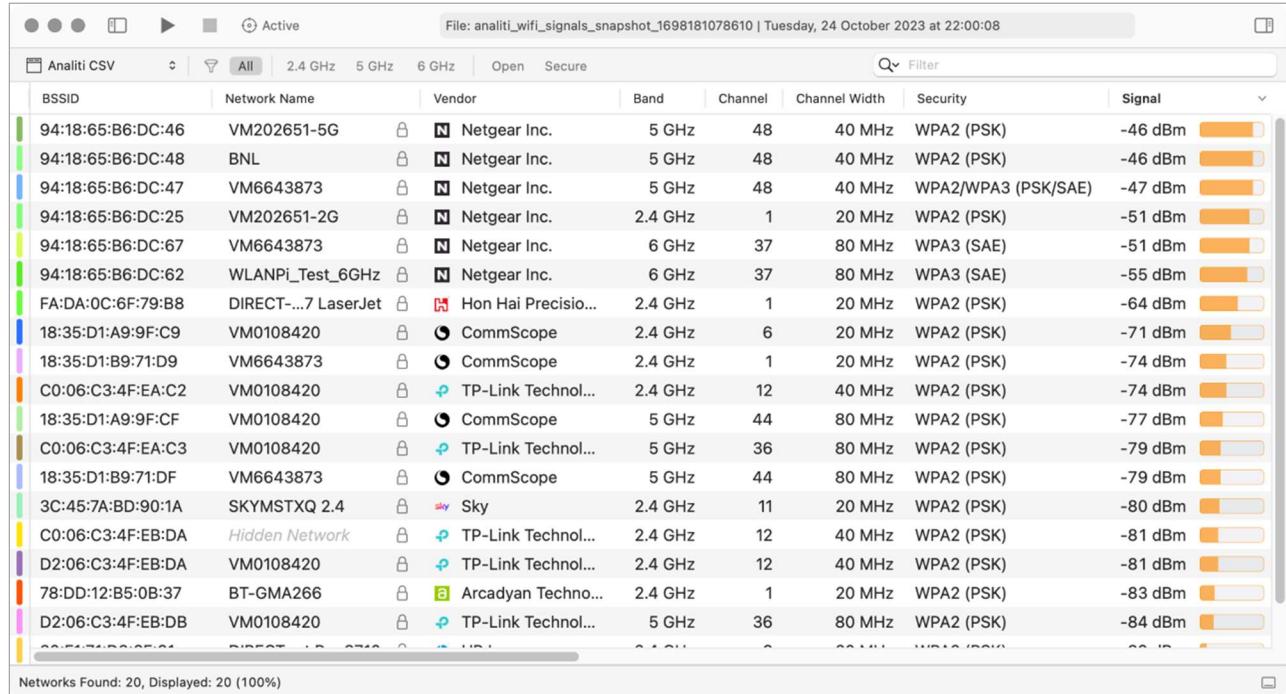


Figure 5-11 - Analiti data displayed in WFE Pro 3

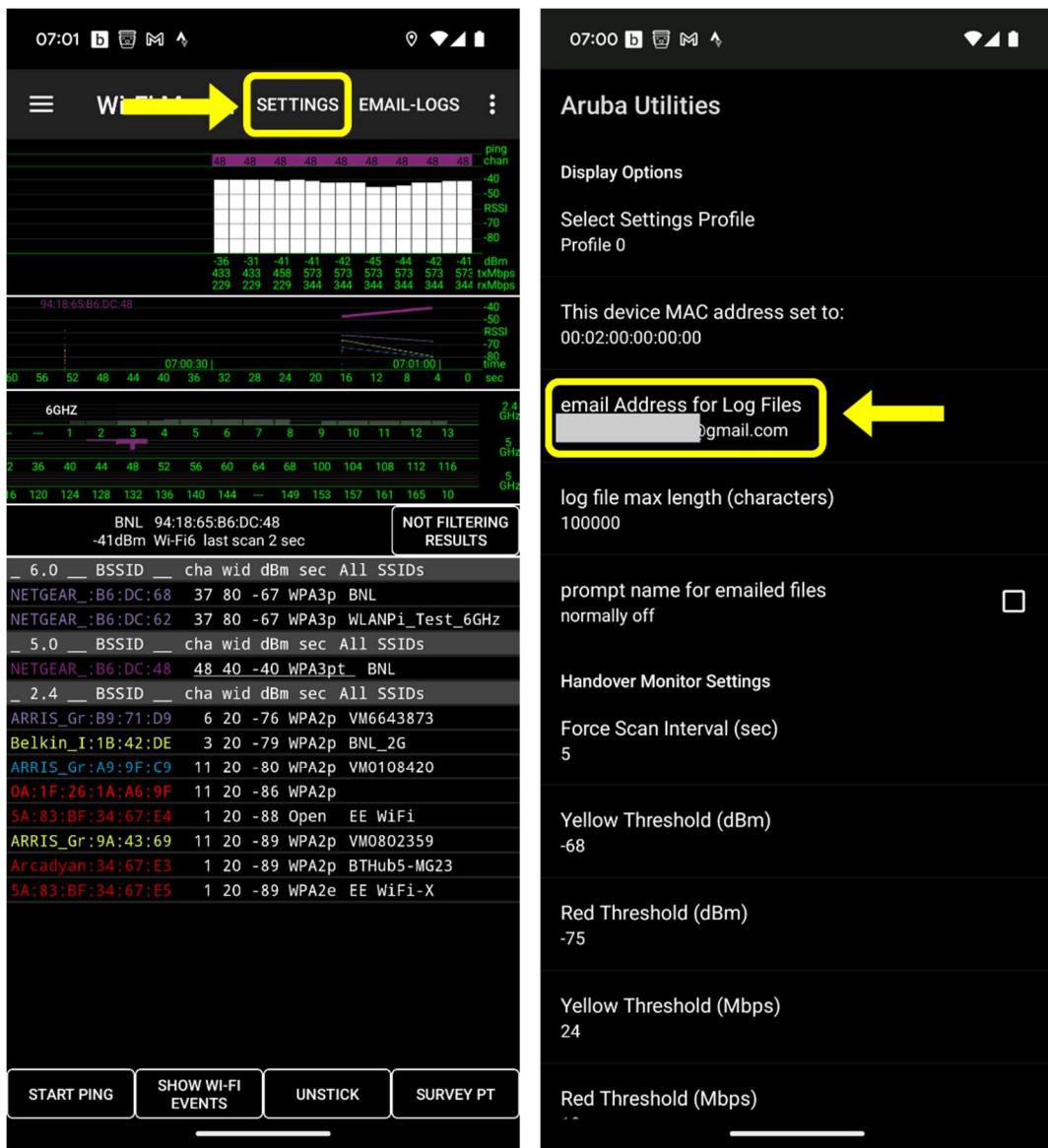


Figure 5-12 - Aruba Utilities network scan and export process #1

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

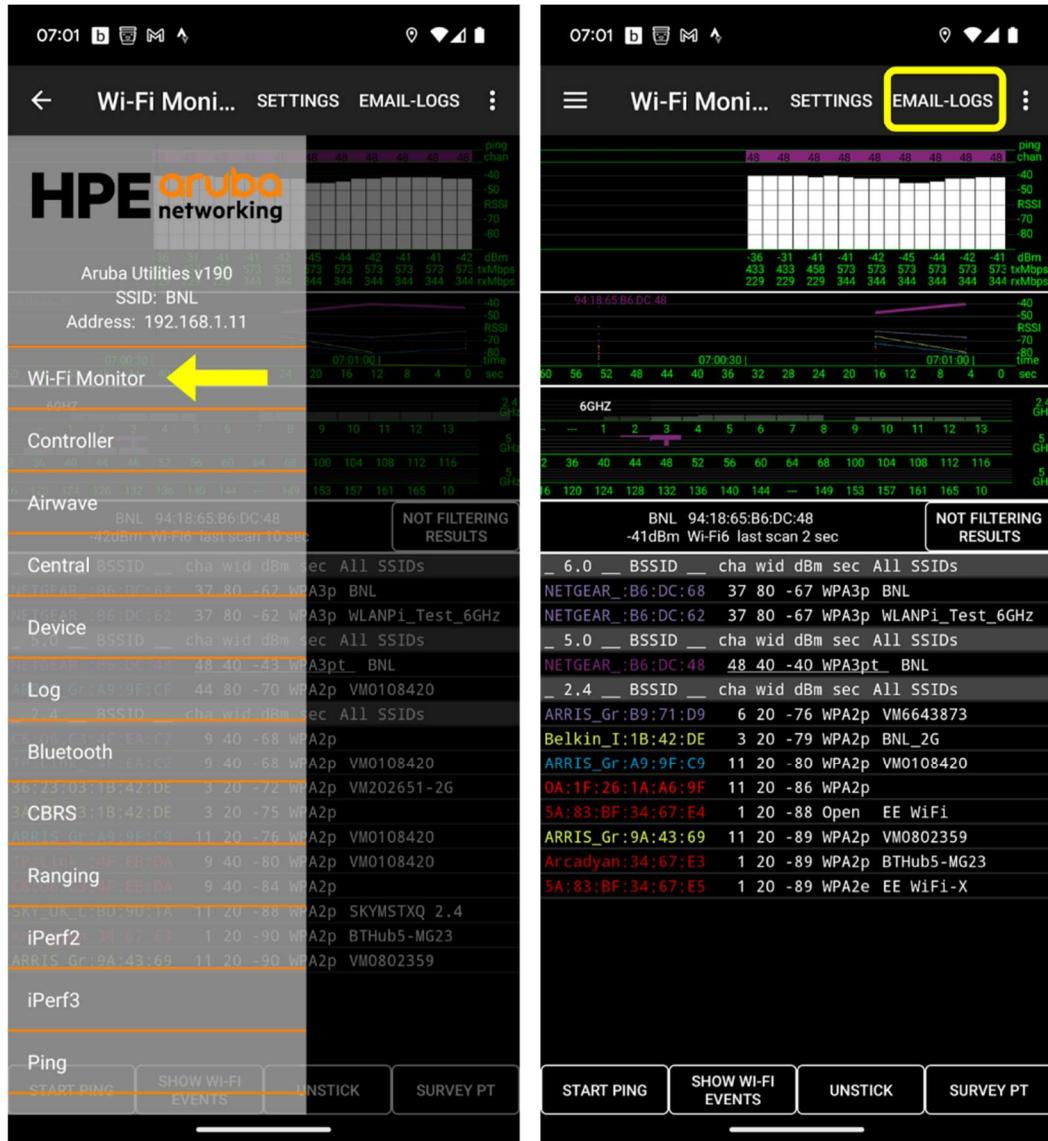


Figure 5-13 - Aruba Utilities network scan and export process #2

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

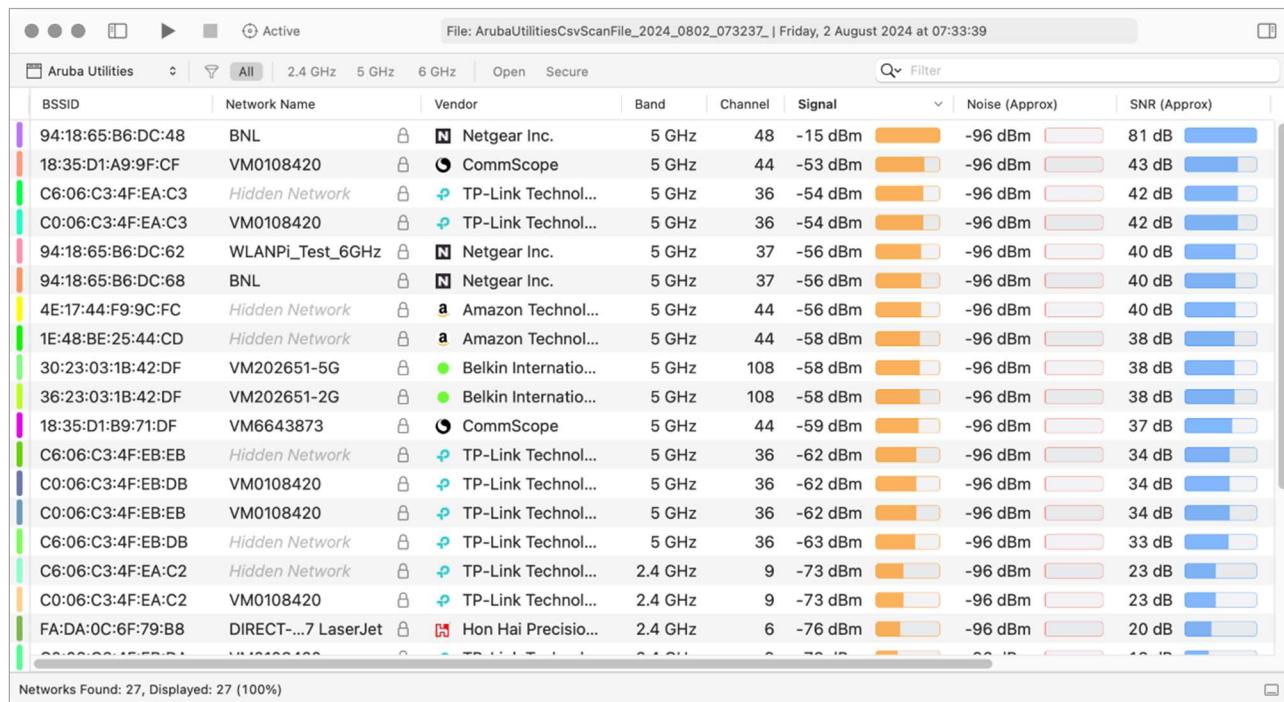


Figure 5-14 - Aruba Utilities data displayed in WFE Pro 3

Chapter 6 - Spectrum Analysis Data

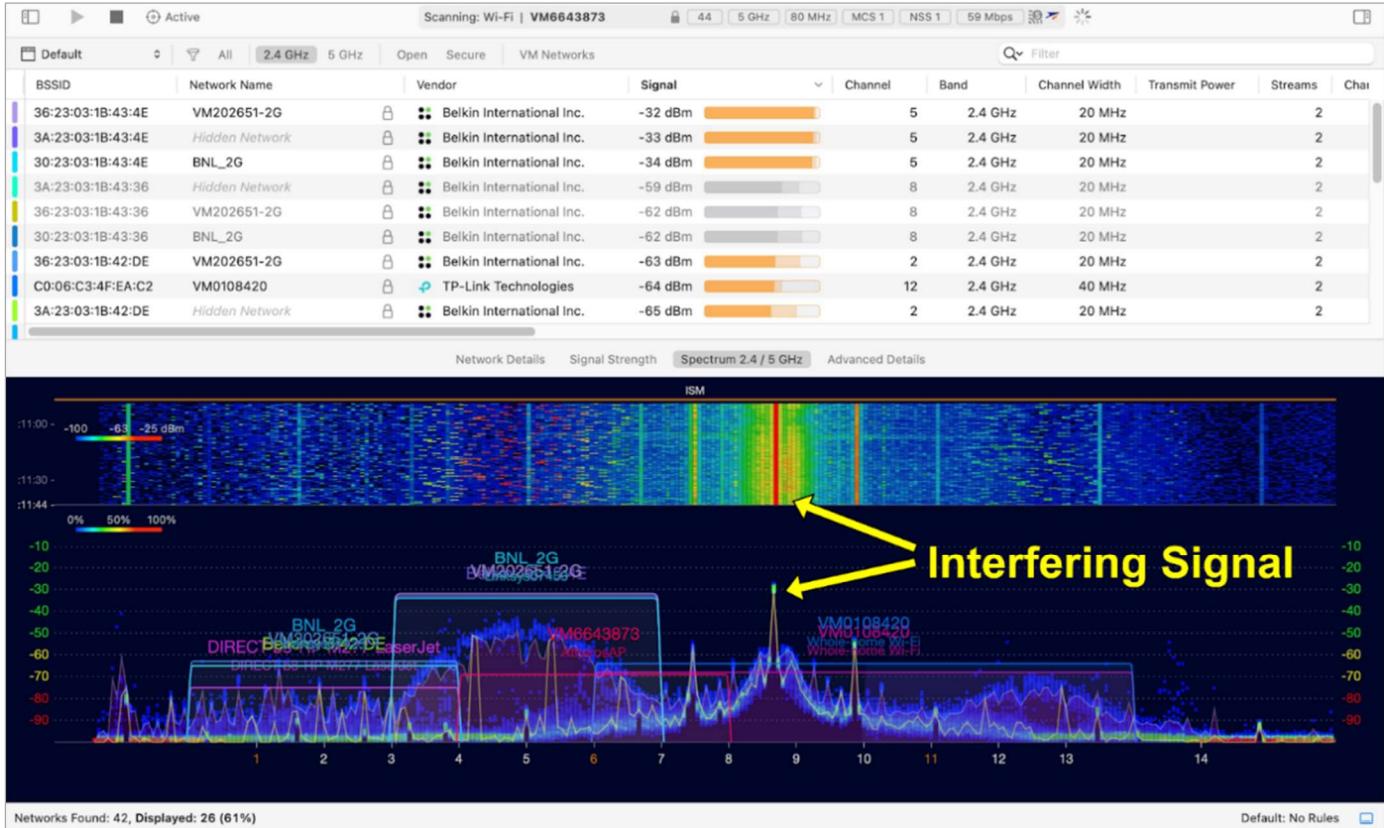


Figure 6-1 - 2.4 GHz Spectrum plot with interferer near channel 9



Figure 6-2 - MetaGeek Wi-Spy DBx & Wi-Spy 2.4x (v2) spectrum analysis dongles



Figure 6-3 - MetaGeek DBx3 spectrum analysis controls

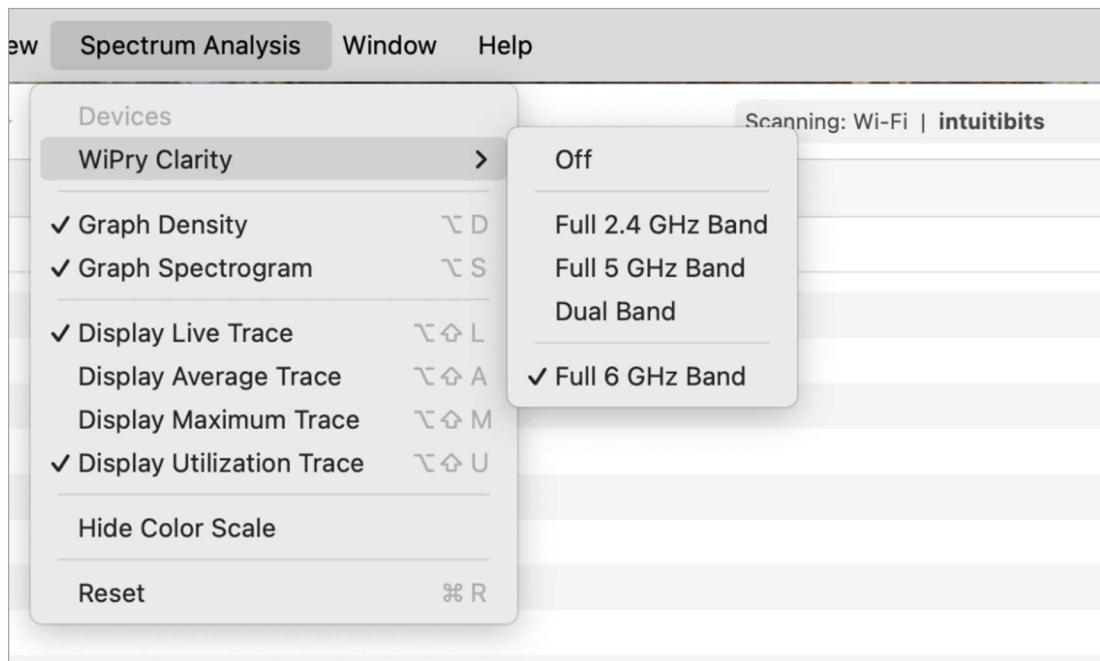


Figure 6-4 - Oscium Clarity spectrum analysis controls



Figure 6-5 - Oscium WiPry 2500x & WiPry Clarity



Figure 6-6 - RF Explorer Wi-Fi Combo



Figure 6-7 - Ubertooth One

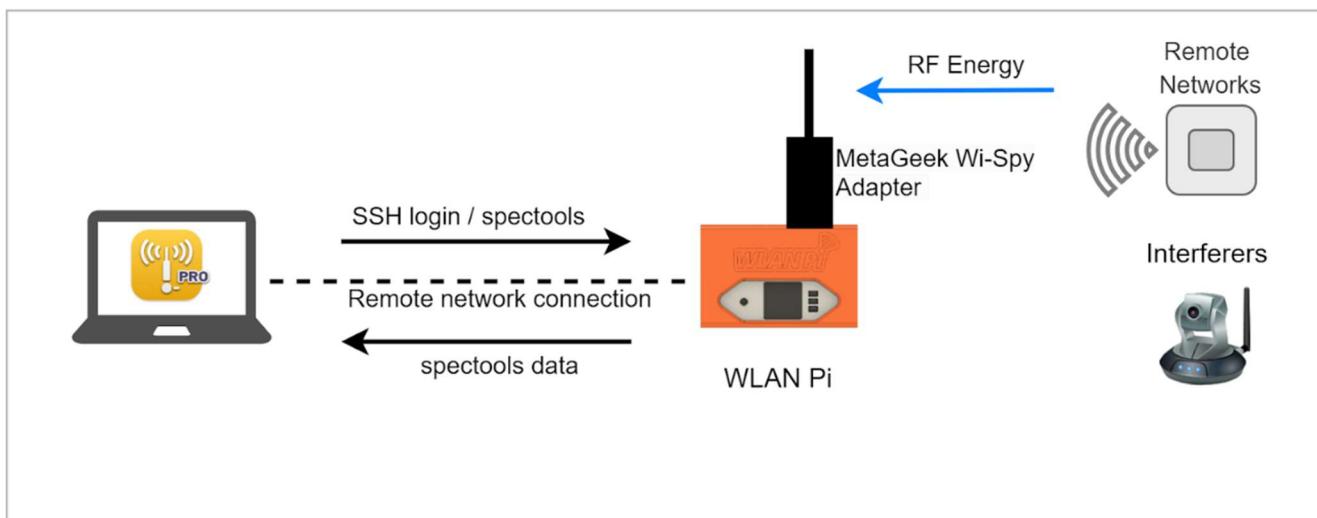


Figure 6-8 - WLAN Pi as a remote Spectrum Analysis probe



Figure 6-9 - Remote sensor Spectrum Analysis controls

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

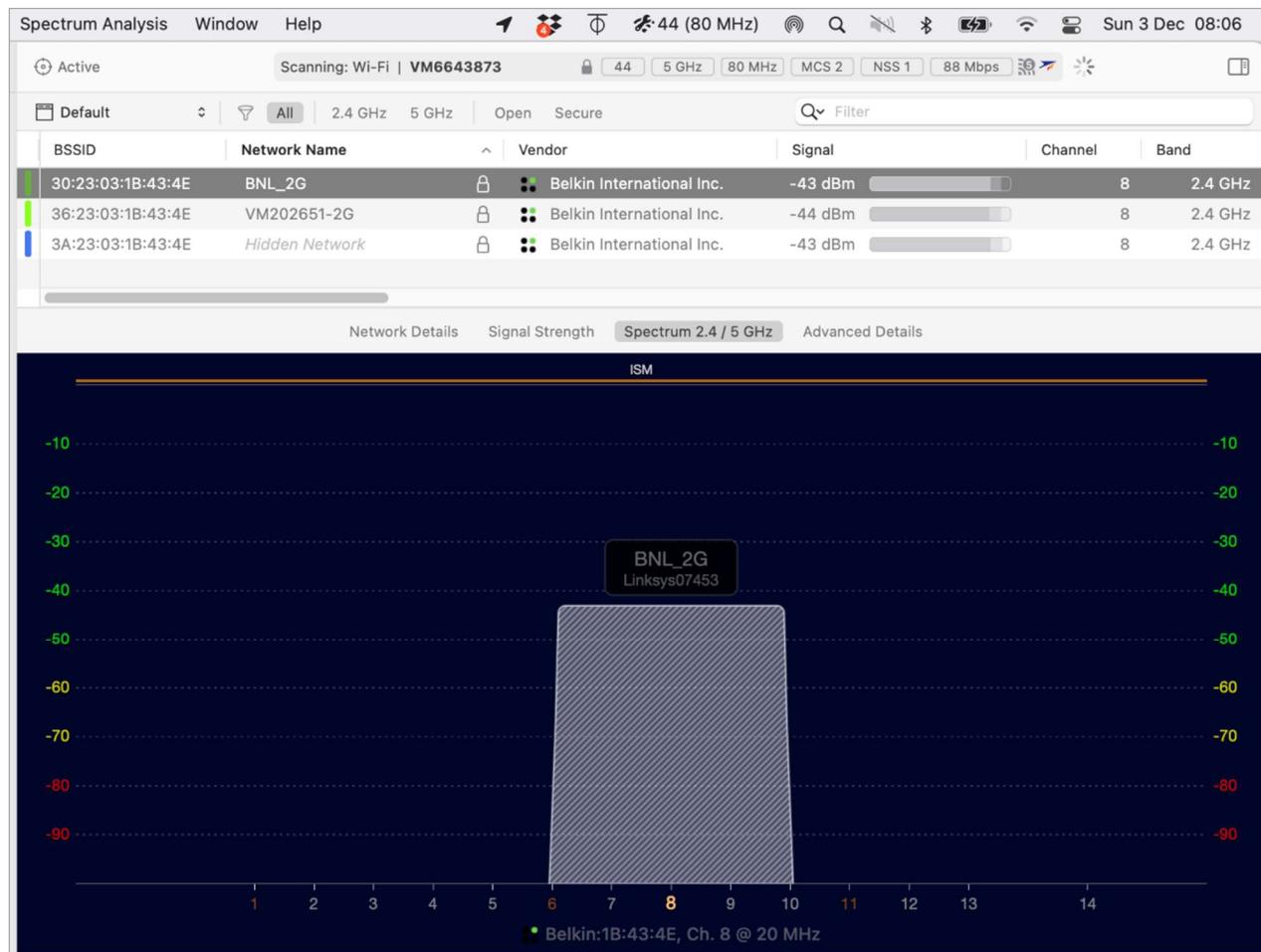


Figure 6-10 - Sample WLAN

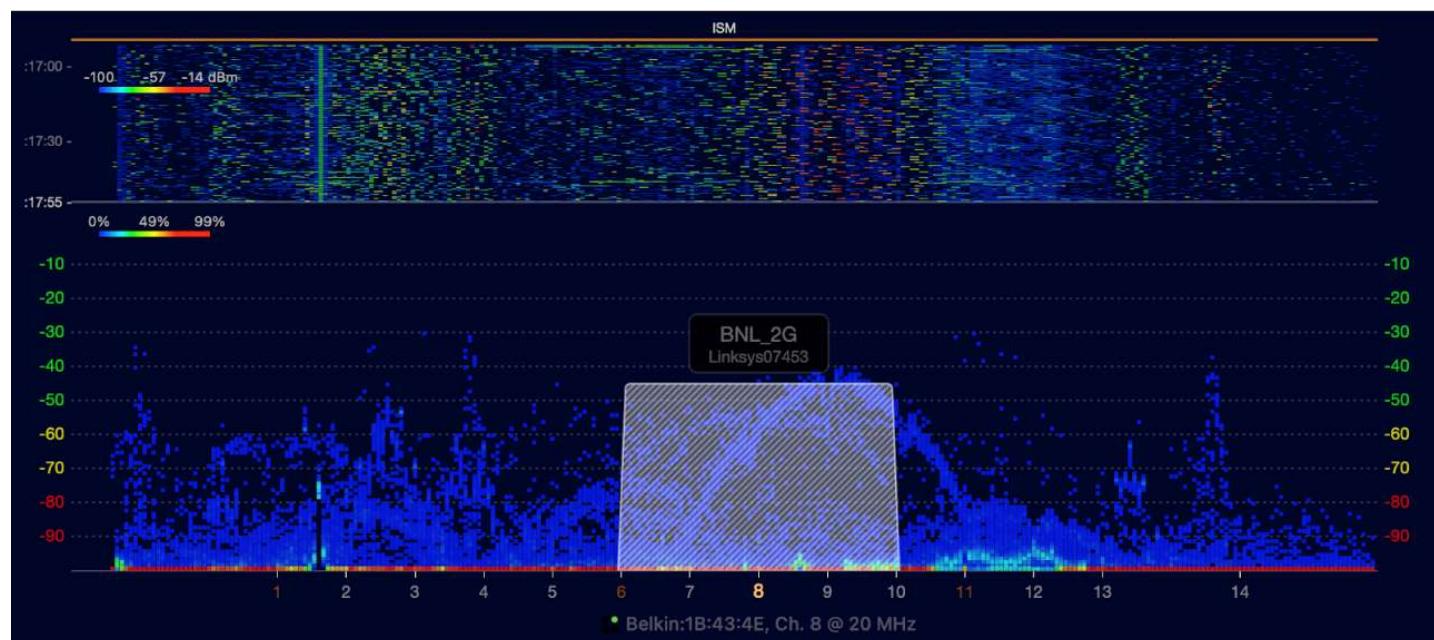


Figure 6-11 - Sample WLAN with Graph Density & Graph Spectrogram views enabled

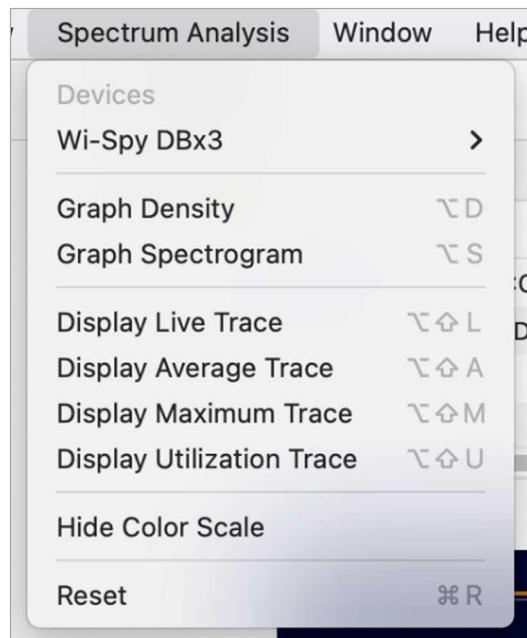


Figure 6-12 - WFE Pro 3 Spectrum Analysis options

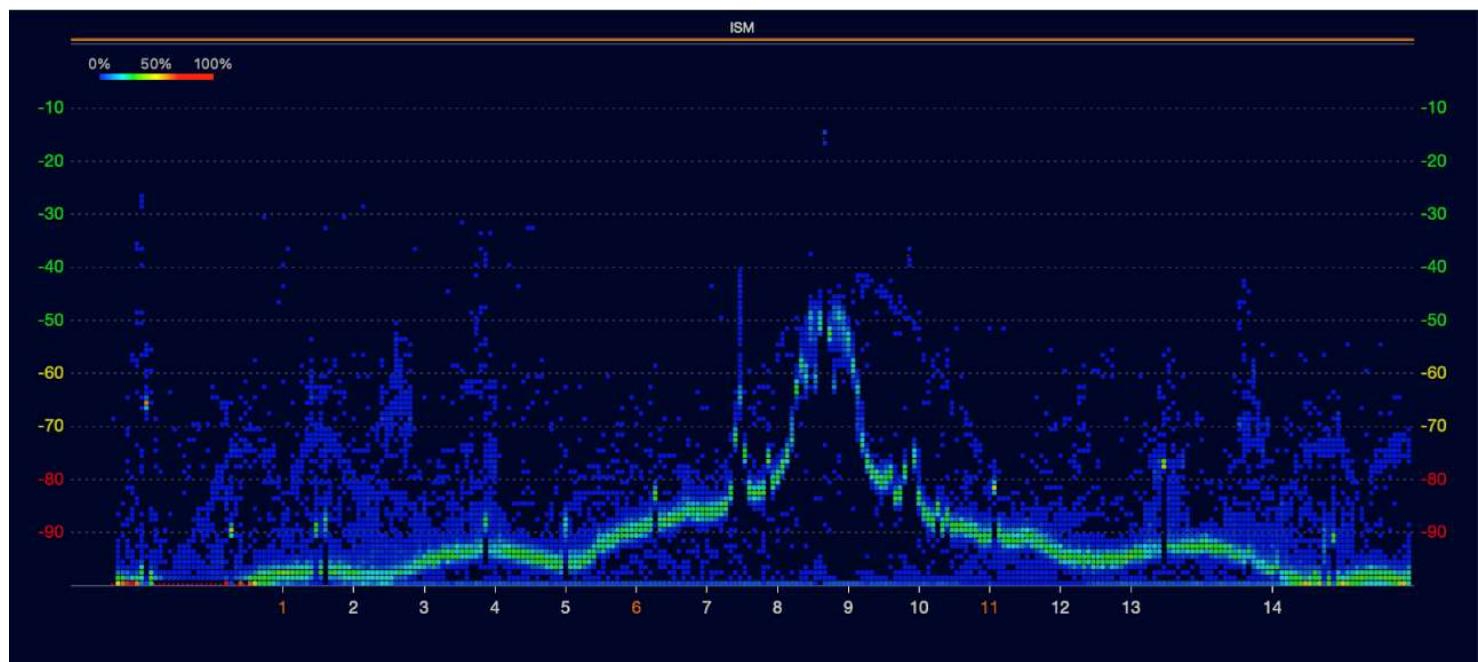


Figure 6-13 - Graph Density view detail with an interferer

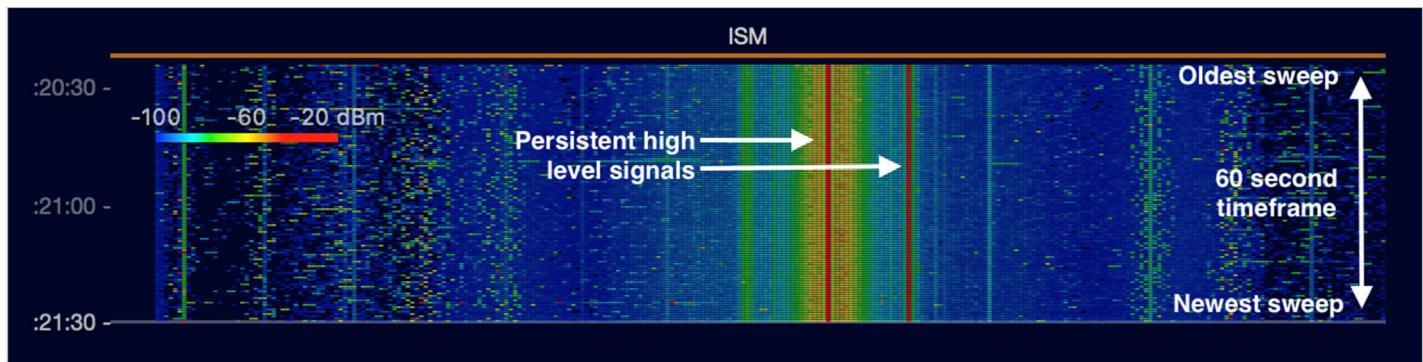


Figure 6-14 - Spectrogram view detail with an interferer

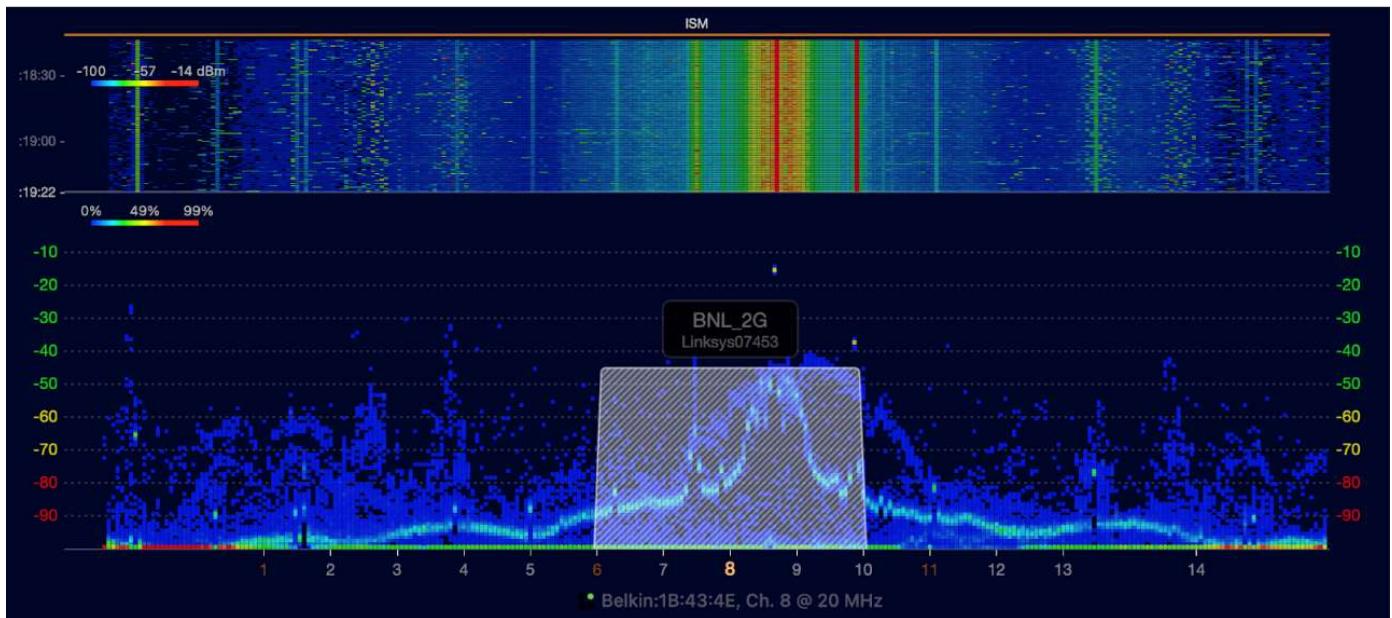


Figure 6-15 - Spectrogram (top) and density view (bottom) with an interferer

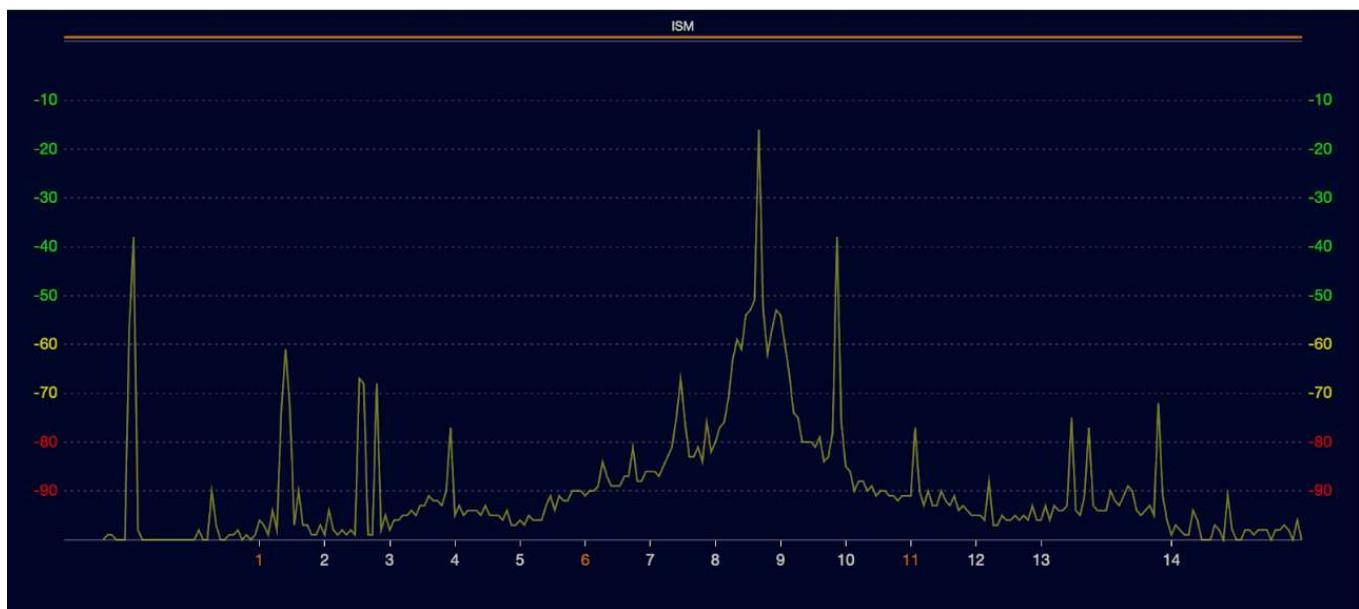


Figure 6-16 - Live trace



Figure 6-17 - Average trace

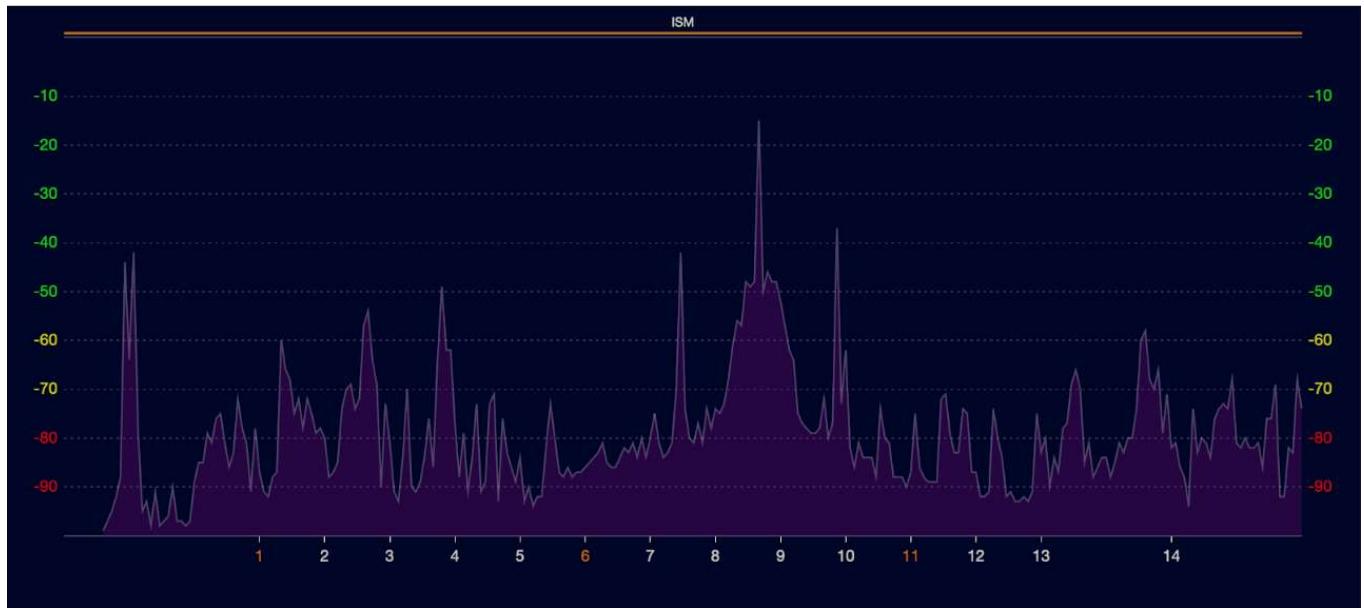


Figure 6-18 - Maximum trace

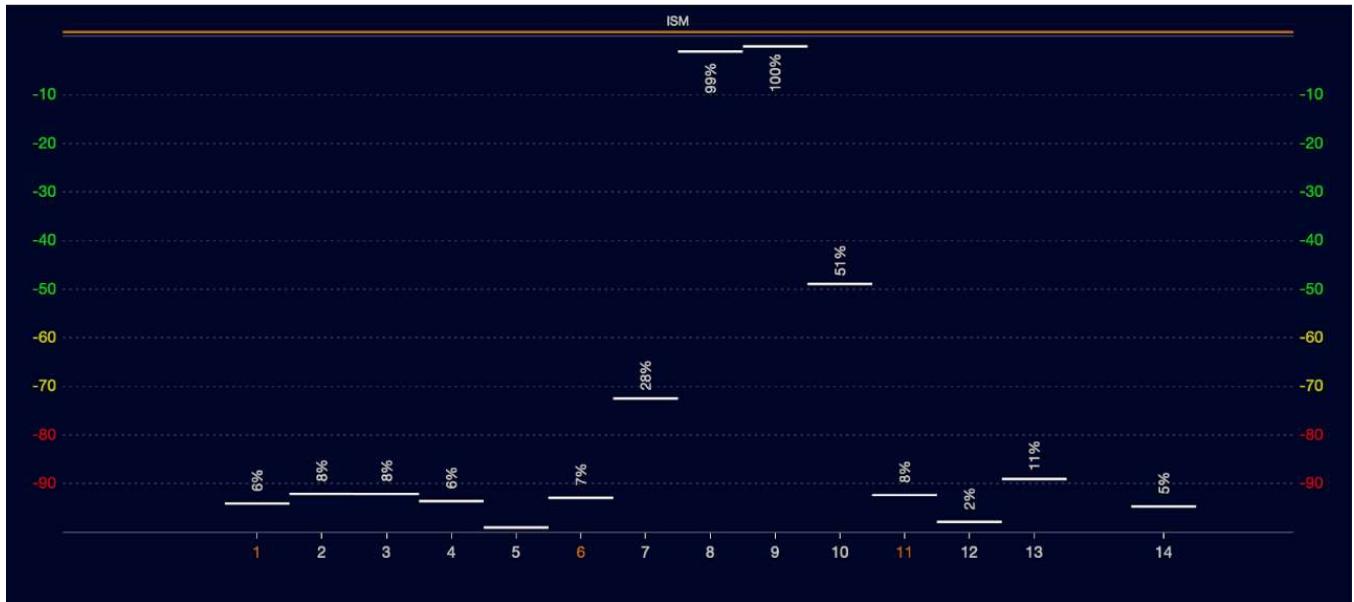


Figure 6-19 - Utilization trace

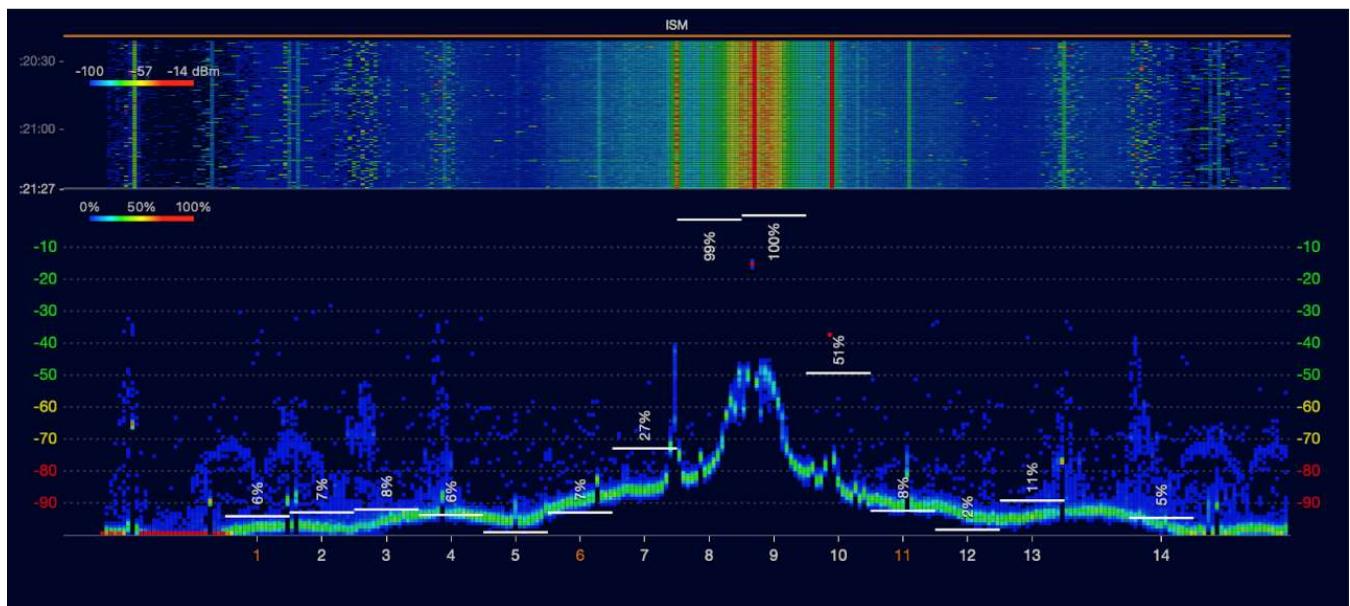


Figure 6-20 - Combined traces showing a wireless camera interferer

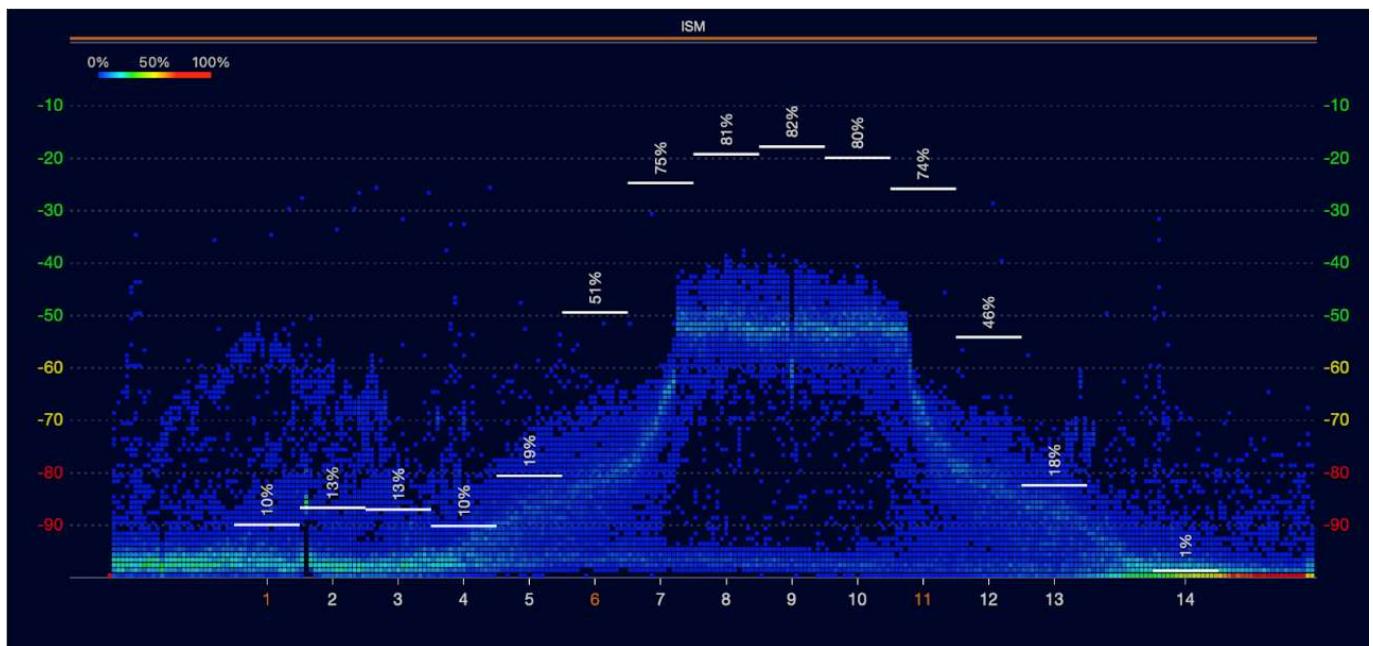


Figure 6-21 - 2.4 GHz WLAN density graph & utilization trace

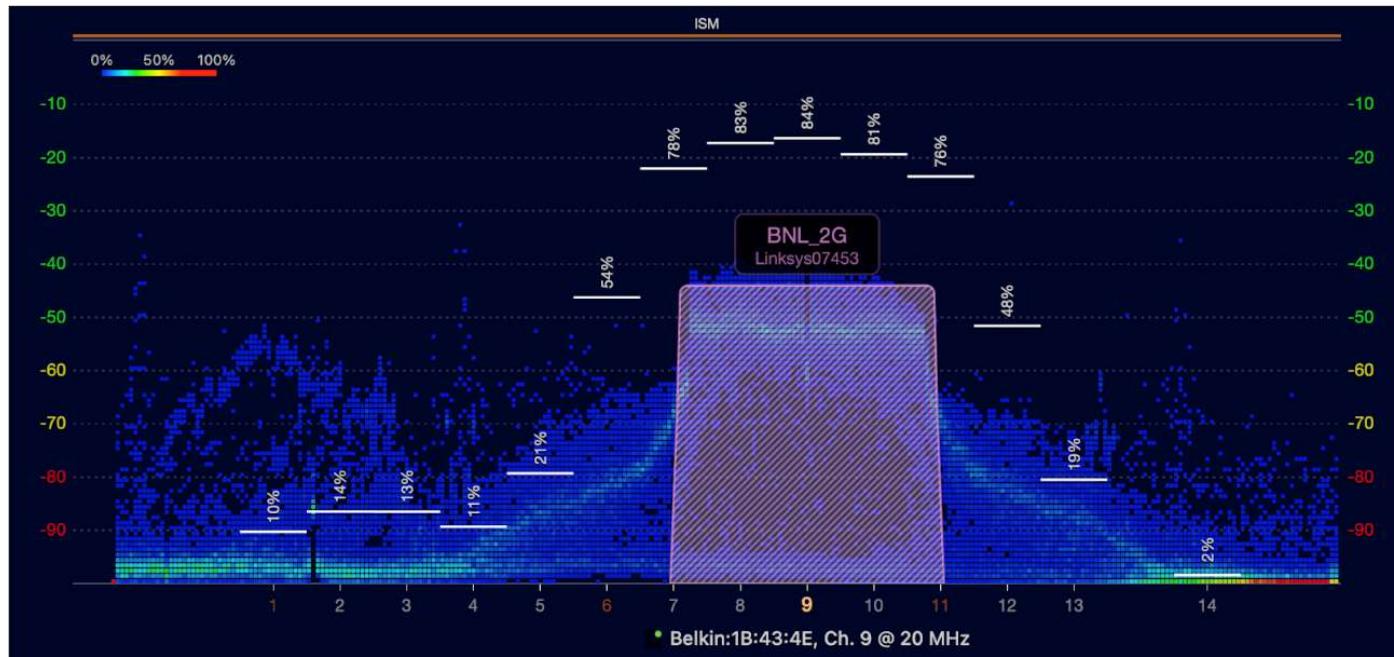
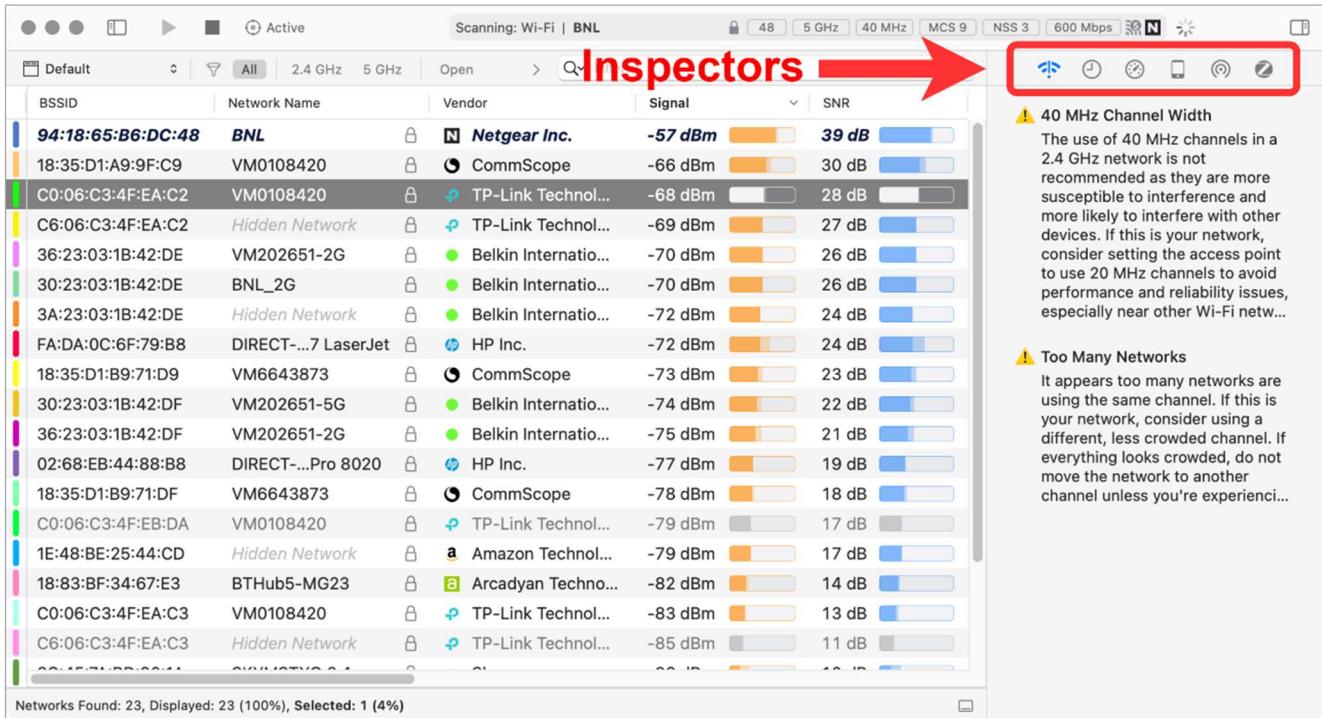


Figure 6-22 - 2.4 GHz WLAN density graph & utilization trace with network overlay

Chapter 7 - Bluetooth & Zigbee Data

Figure 7-1 - WFE Pro 3 *Inspectors* panel

Proximity UUID	Protocol	Signal	Measured Power	Major	Minor
50765...613A492	iBeacon	-68 dBm	-50 dBm	2499	61507
2F2344...9FFA6	iBeacon	-64 dBm	-66 dBm	1	1
2F2344...9FFA6	AltBeacon	-64 dBm	-66 dBm	1	1
1CA92E...A4BF6	iBeacon	-72 dBm	3 dBm	5152	0
1CA92E...A4BF6	iBeacon	-62 dBm	3 dBm	5151	0

Figure 7-2 - Proximity beacon inspector

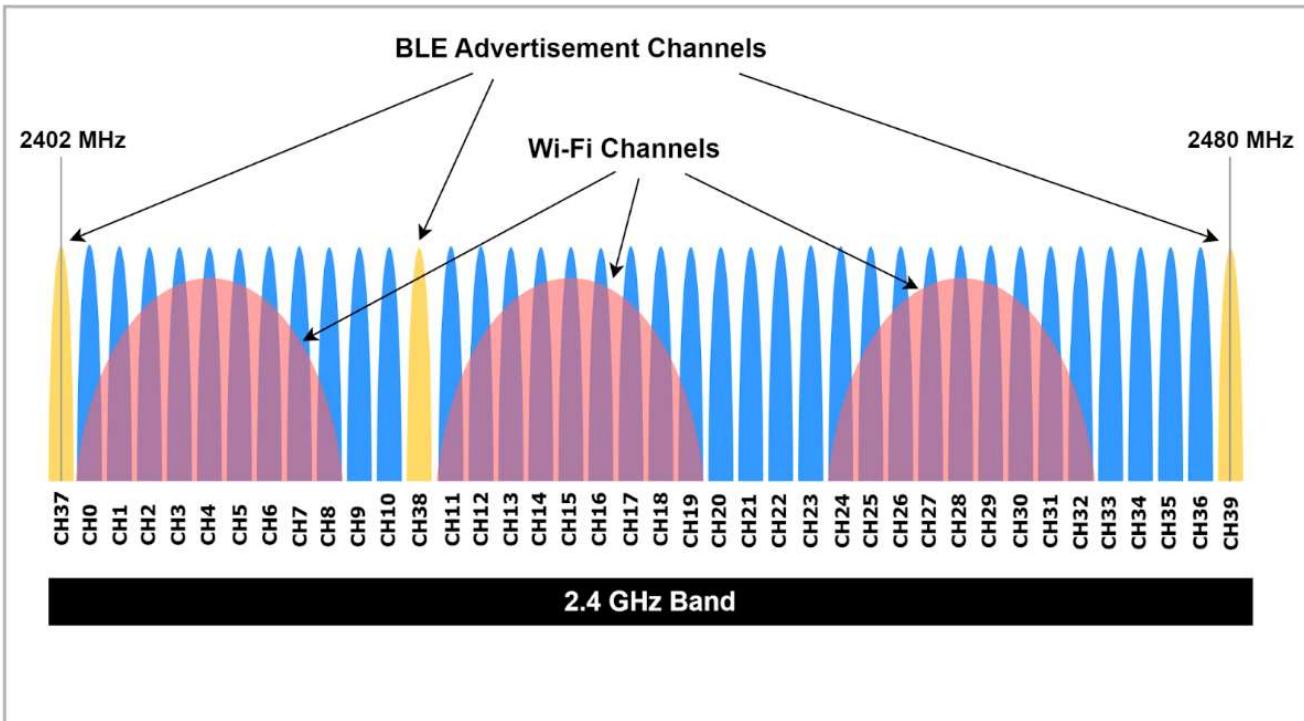


Figure 7-3 - 2.4 GHz band showing BLE channels with Wi-Fi band overlaid

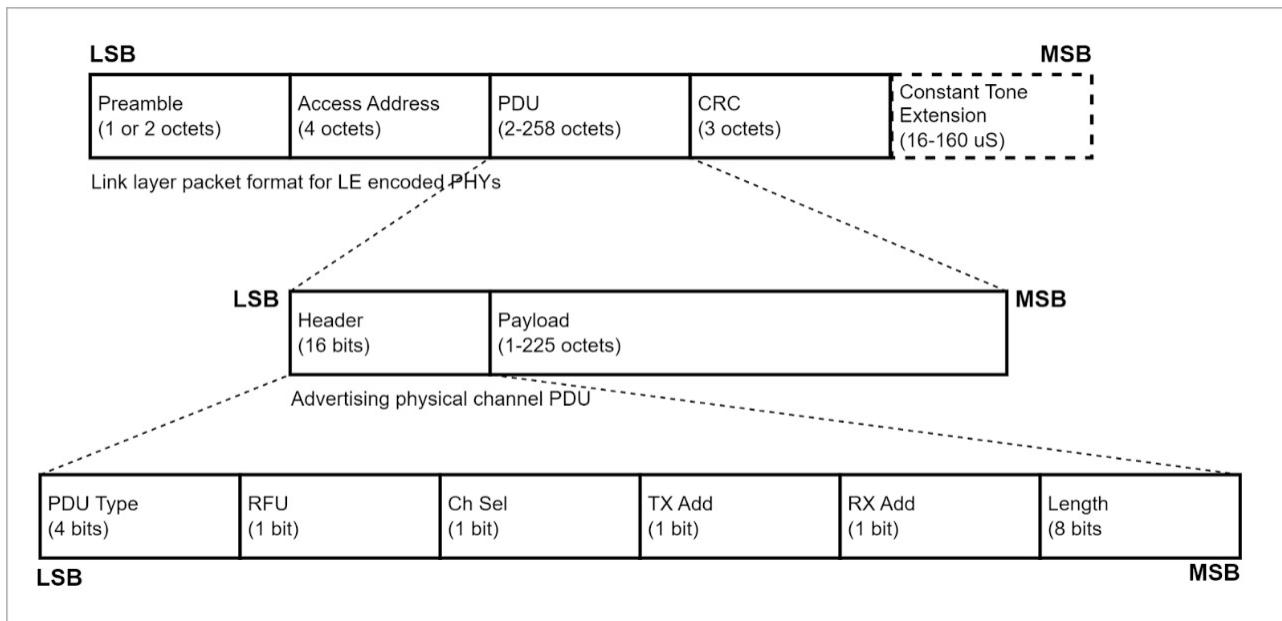


Figure 7-4 - BLE PDU details

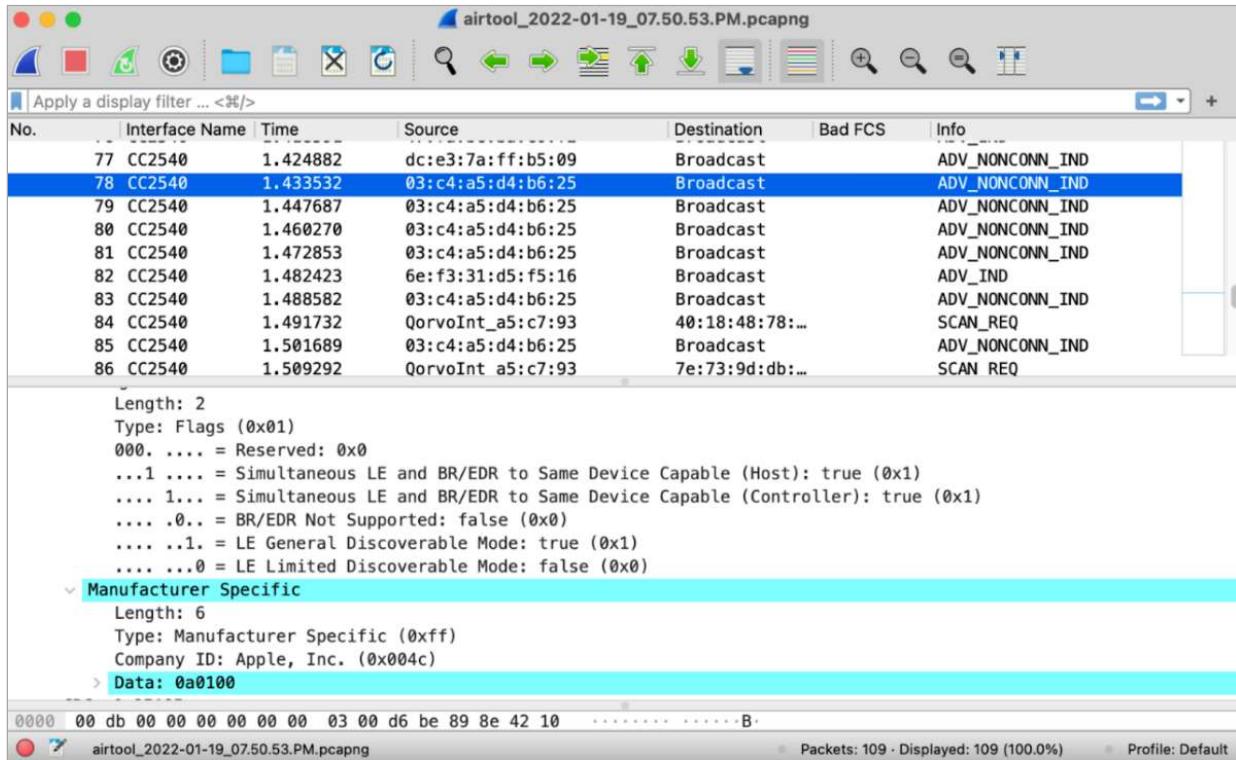


Figure 7-5 - A capture showing BLE advertisements

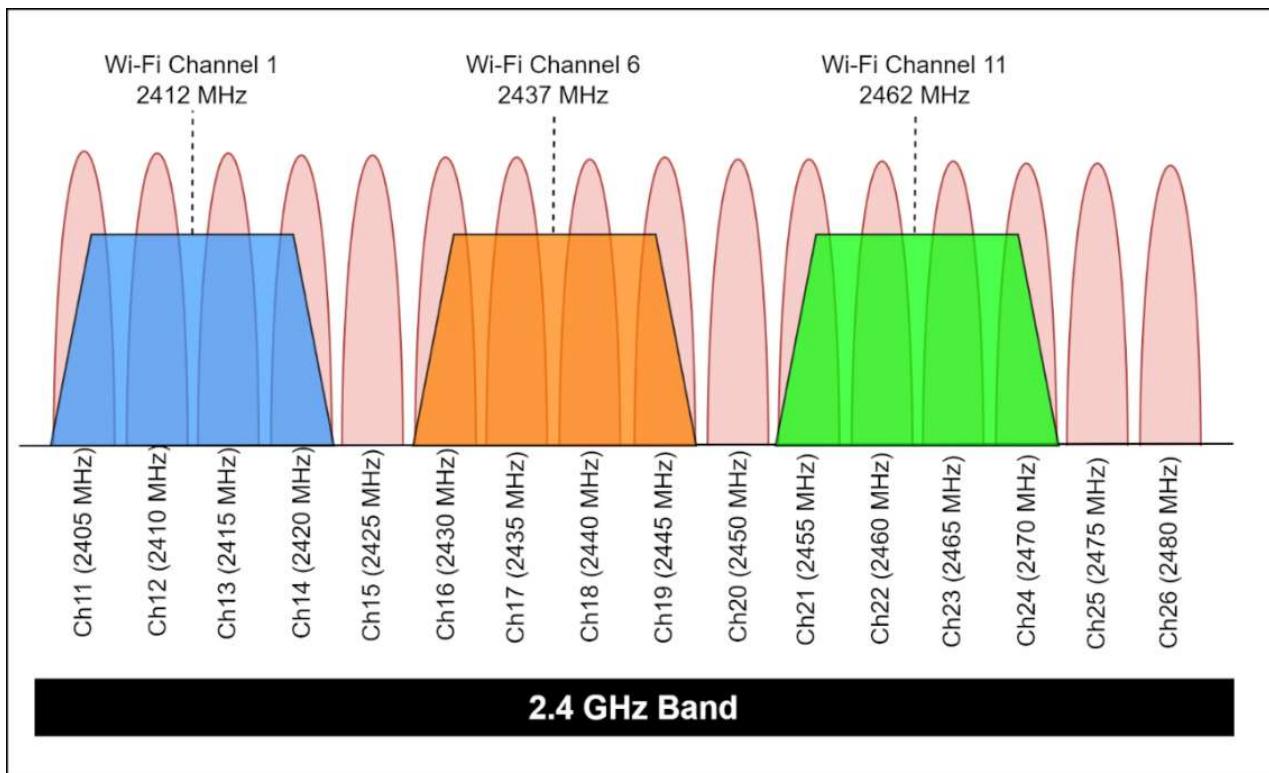


Figure 7-6 - Zigbee channel plan

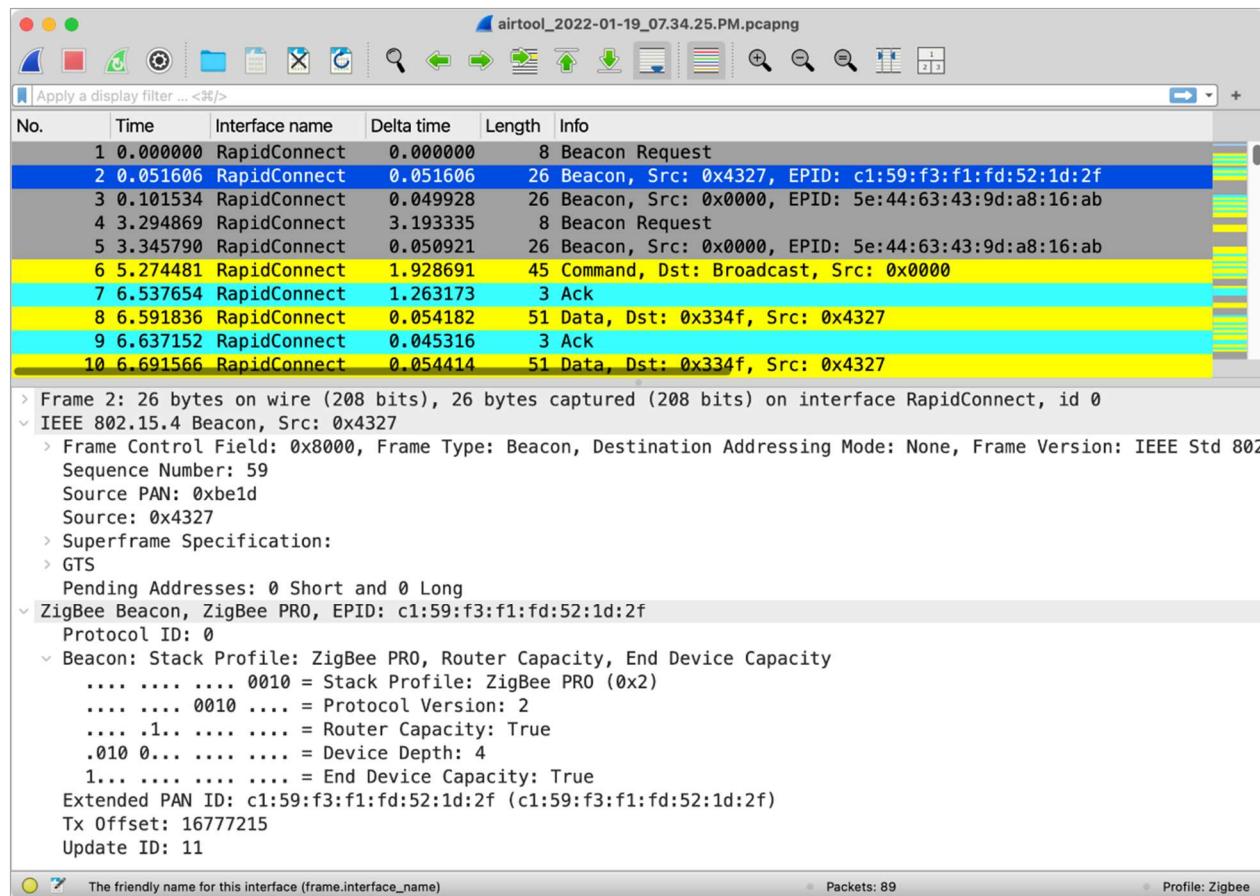


Figure 7-7 - A capture showing Zigbee beacons

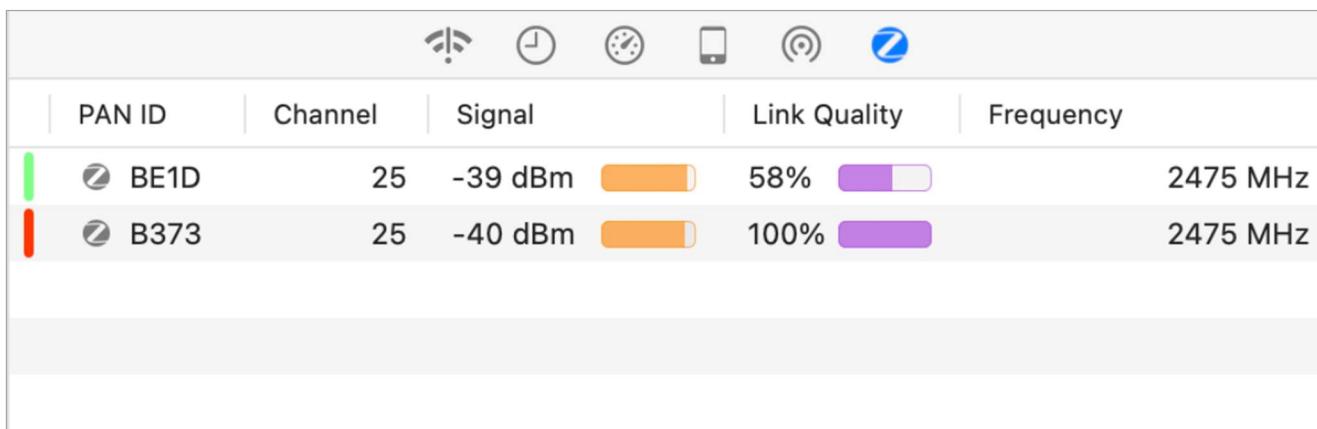


Figure 7-8 - Zigbee network discovery

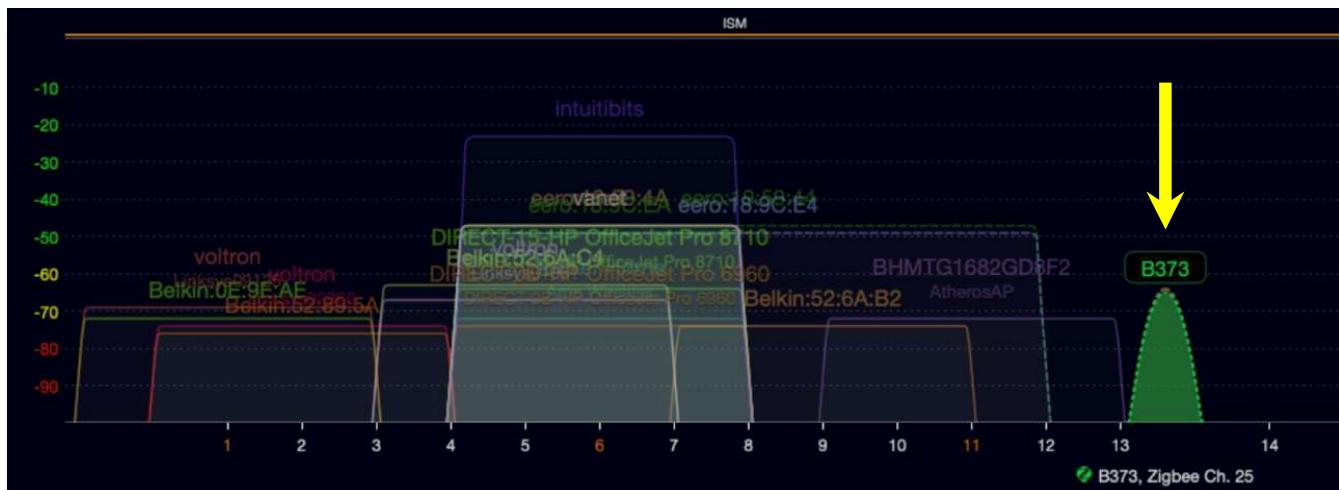


Figure 7-9 - Zigbee network overlaid on Wi-Fi networks

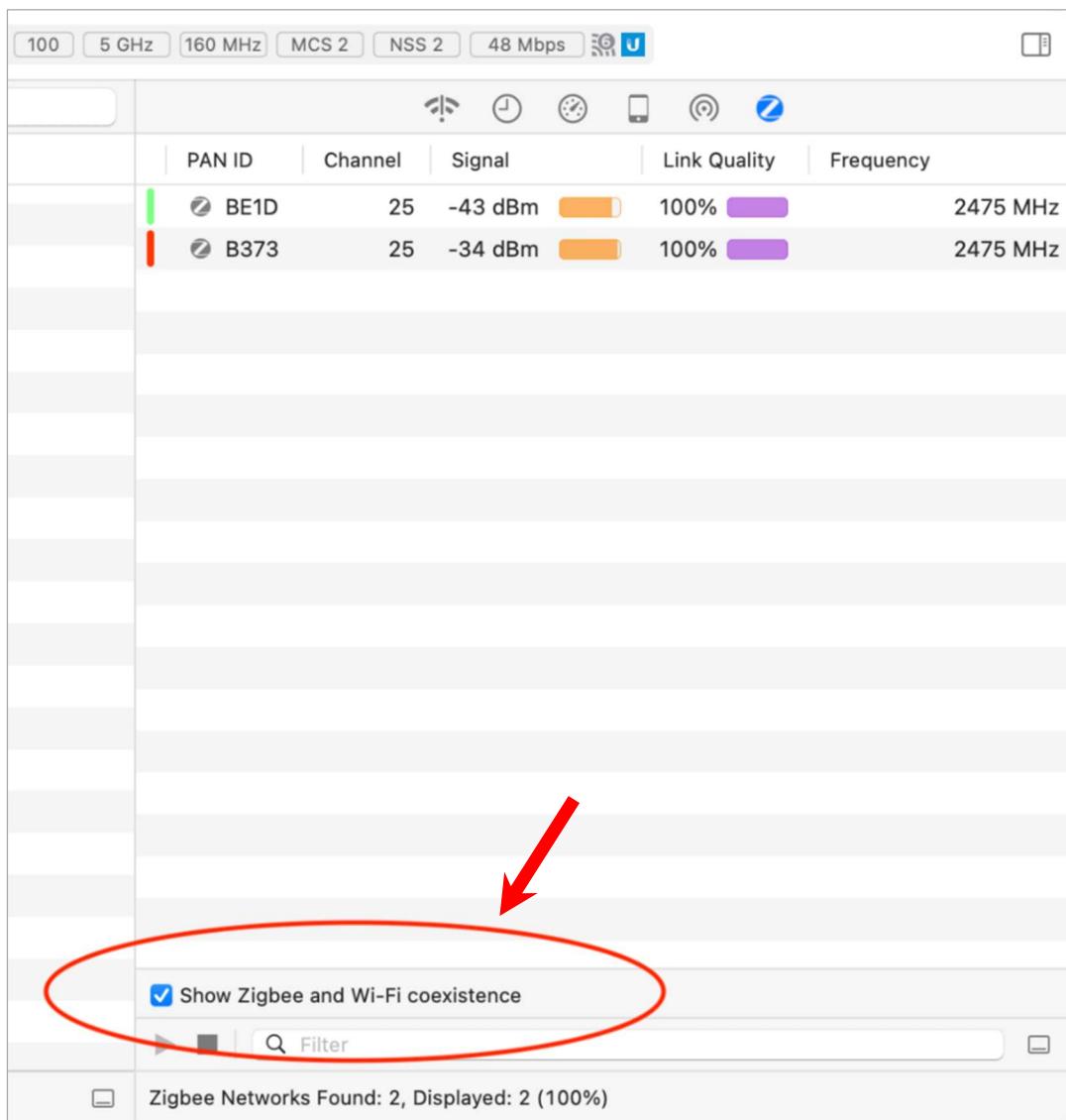


Figure 7-10 - Control to enable/disable Zigbee overlay on Wi-Fi networks



Figure 7-11 - The RapidConnect Zigbee Smart Energy USE Stick

Chapter 8 - WiFi Explorer Pro 3 UI Tour

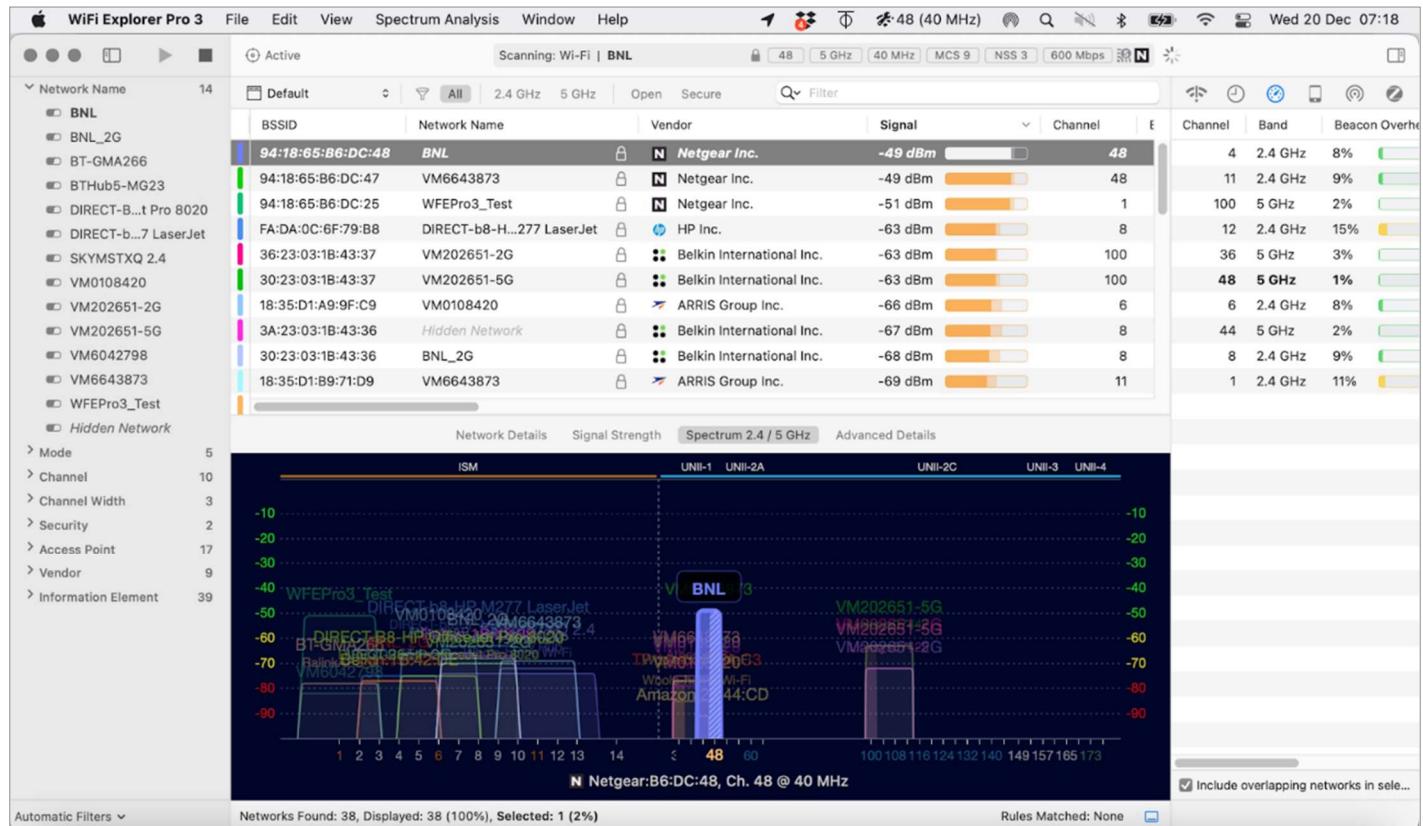


Figure 8-1 - WFE Pro 3's user interface

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)



Figure 8-2 - WFE Pro 3's user interface areas

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

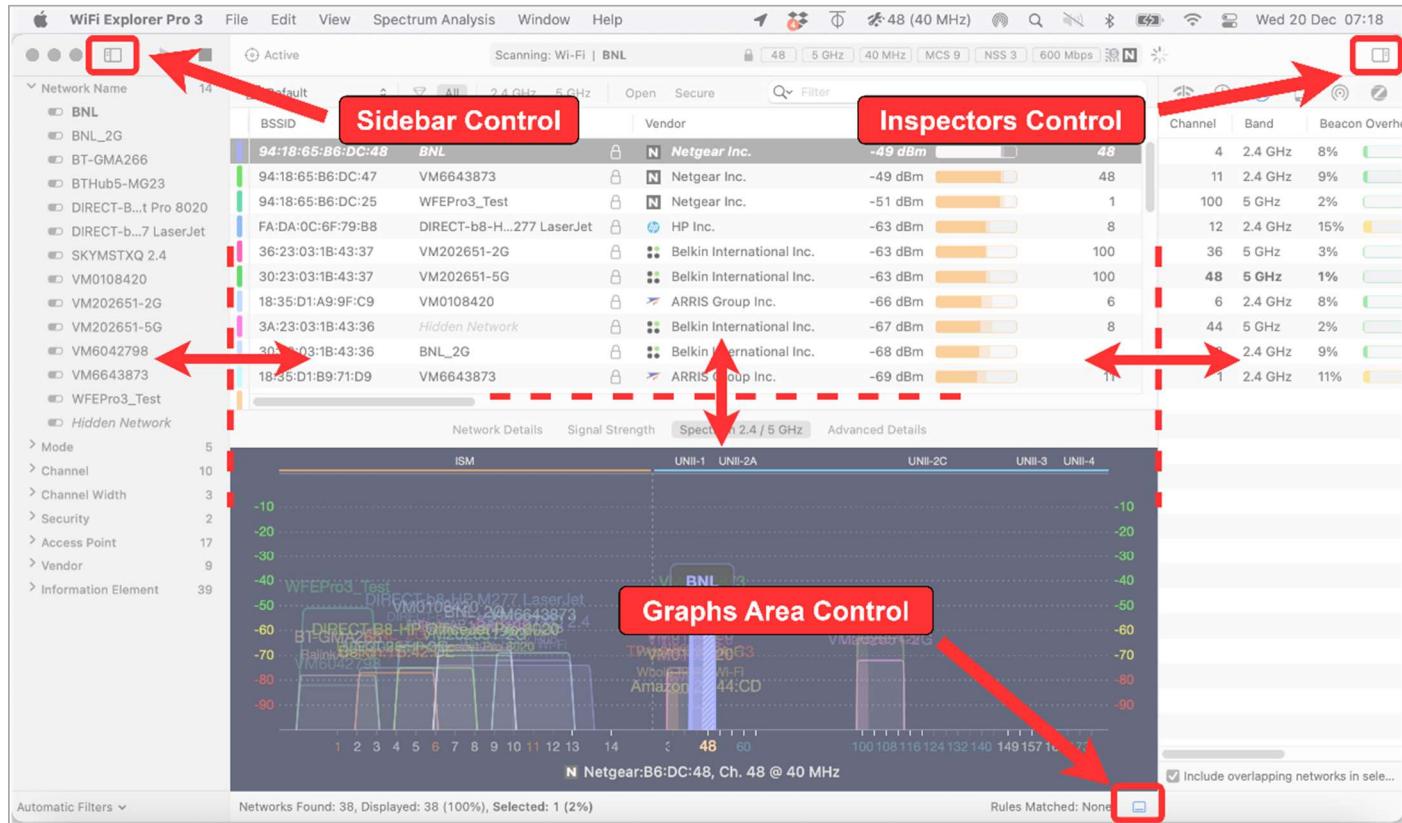


Figure 8-3 - WFE Pro 3's UI area reveal/hide controls

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

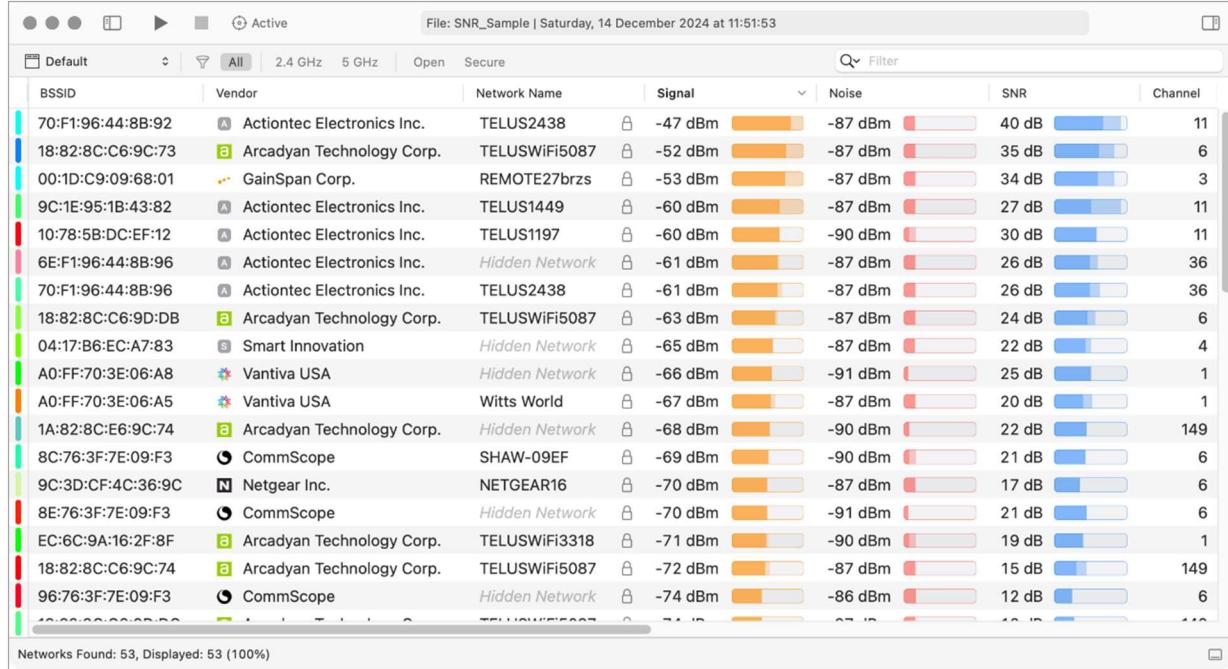


Figure 8-4 - WFE Pro 3's UI with sidebar, inspectors, and graphs areas hidden

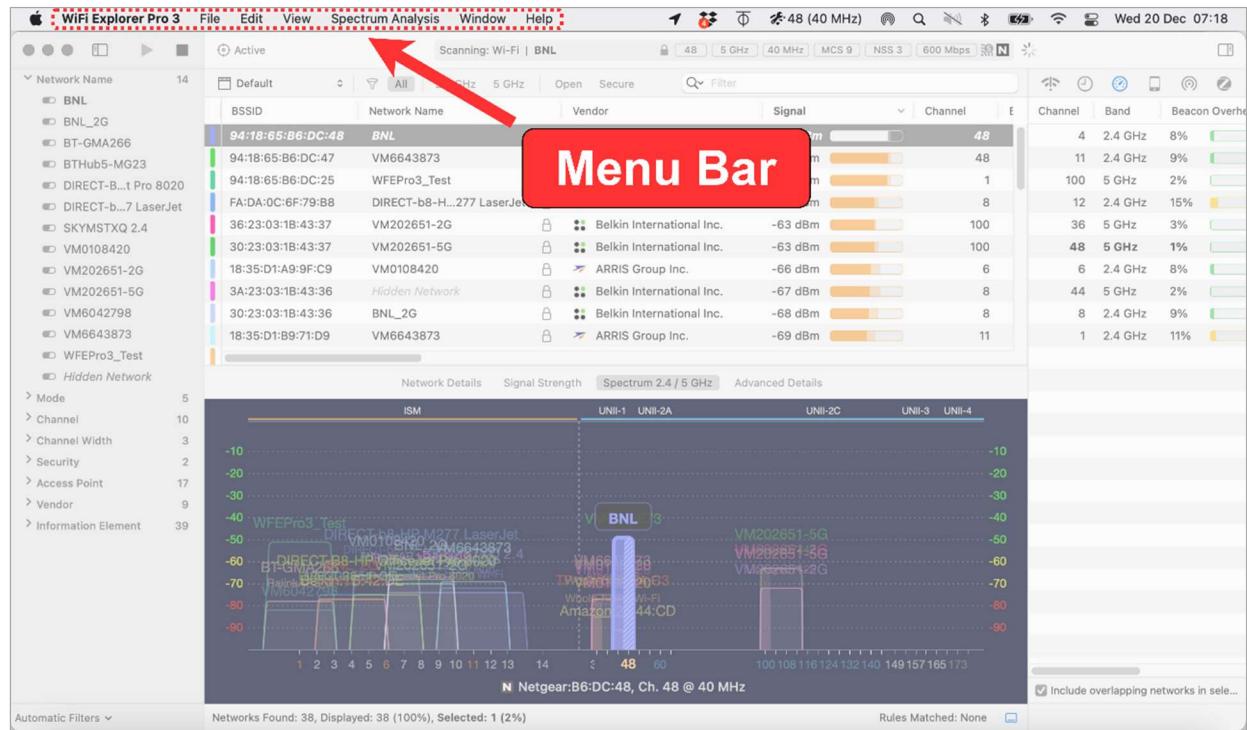


Figure 8-5 - Menu Bar UI location

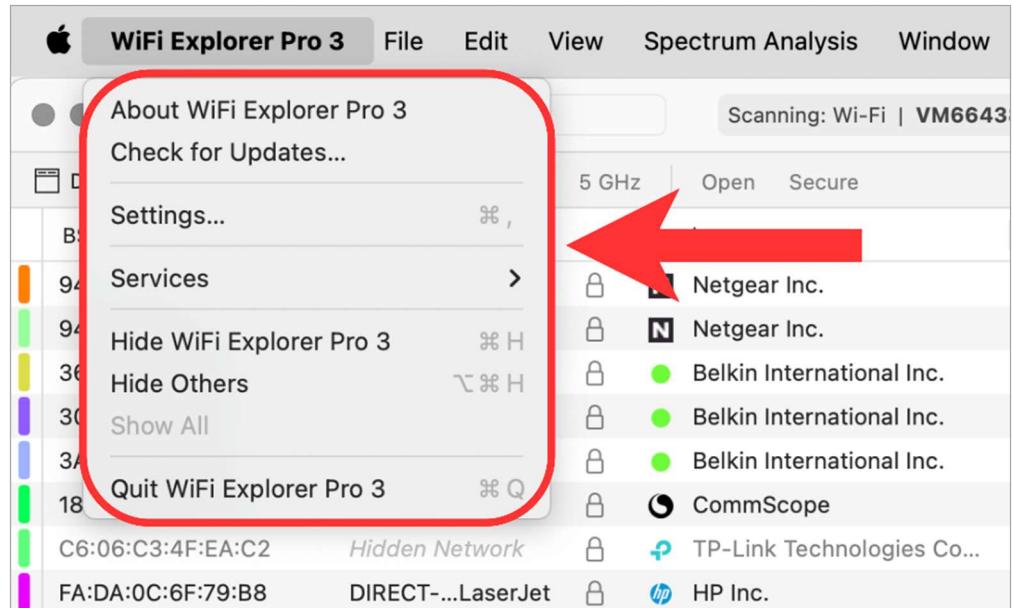


Figure 8-6 – WiFi Explorer Pro 3 menu items

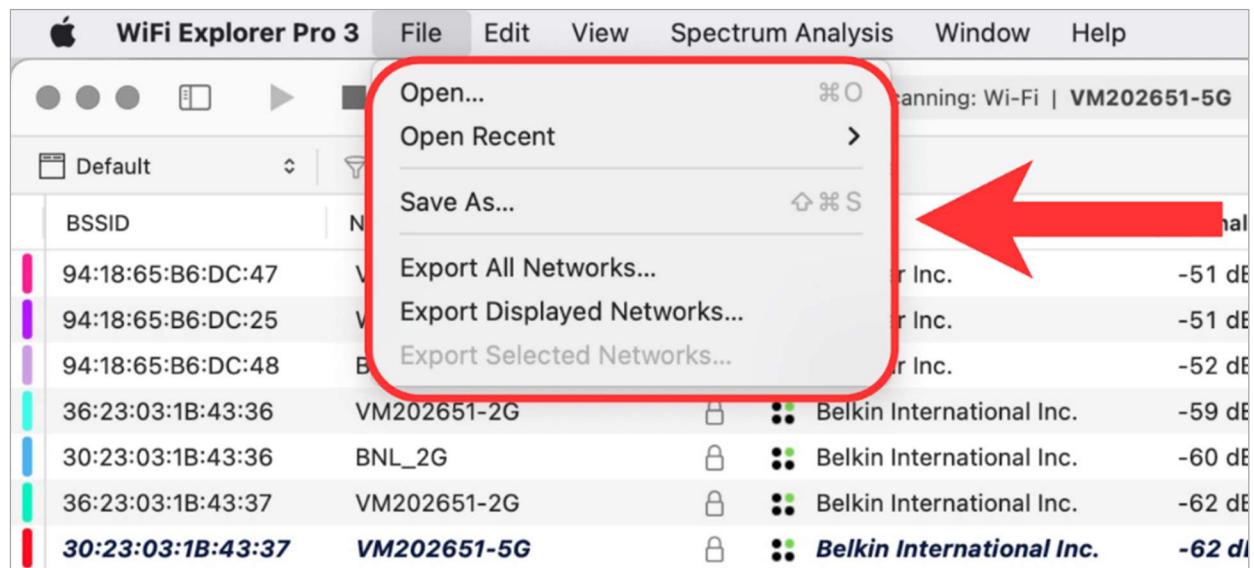


Figure 8-7 - File menu items

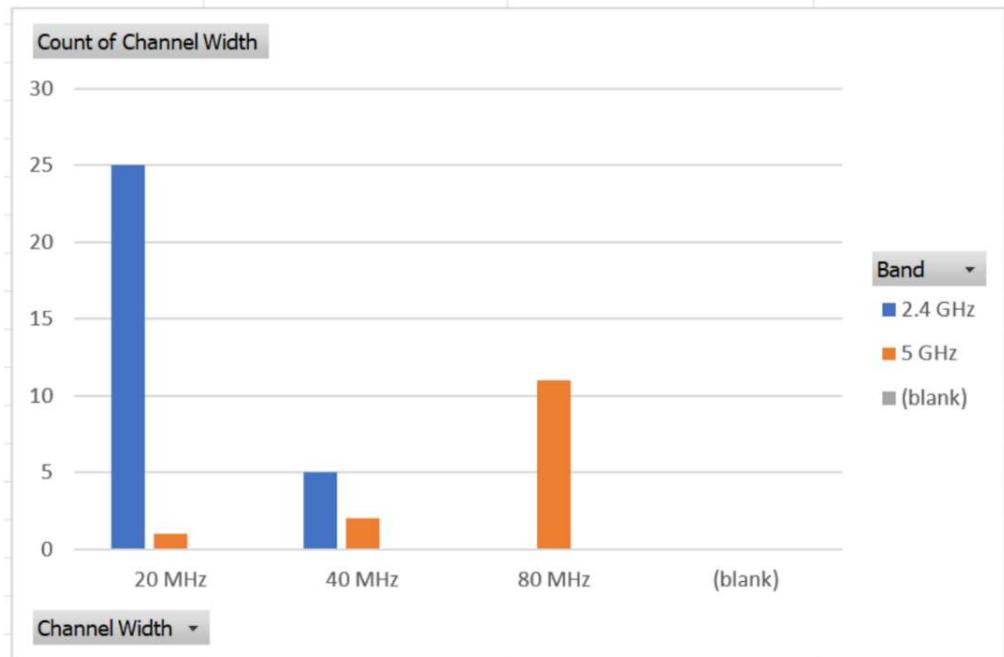


Figure 8-8 - Sample report created from exported CSV data using Excel

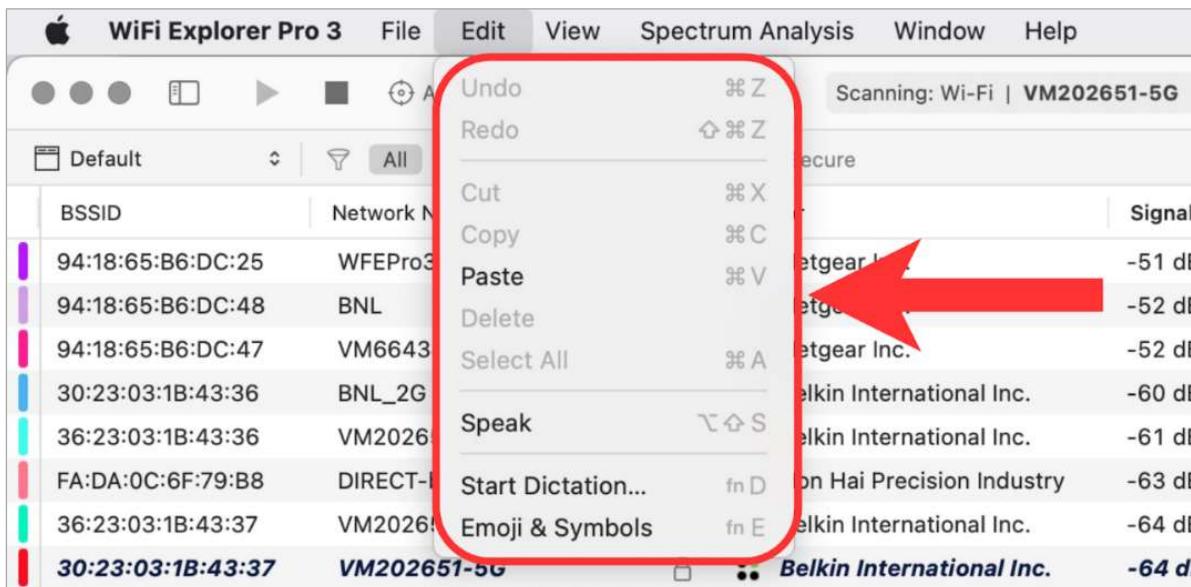


Figure 8-9 - Edit menu items

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

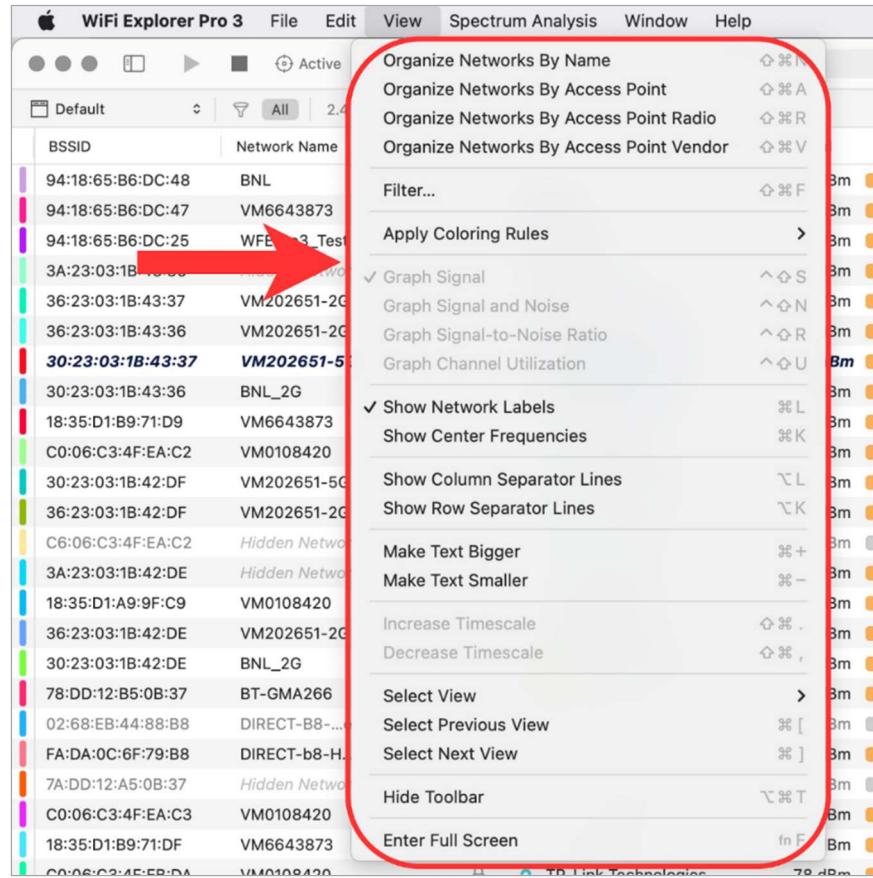


Figure 8-10 - View menu items

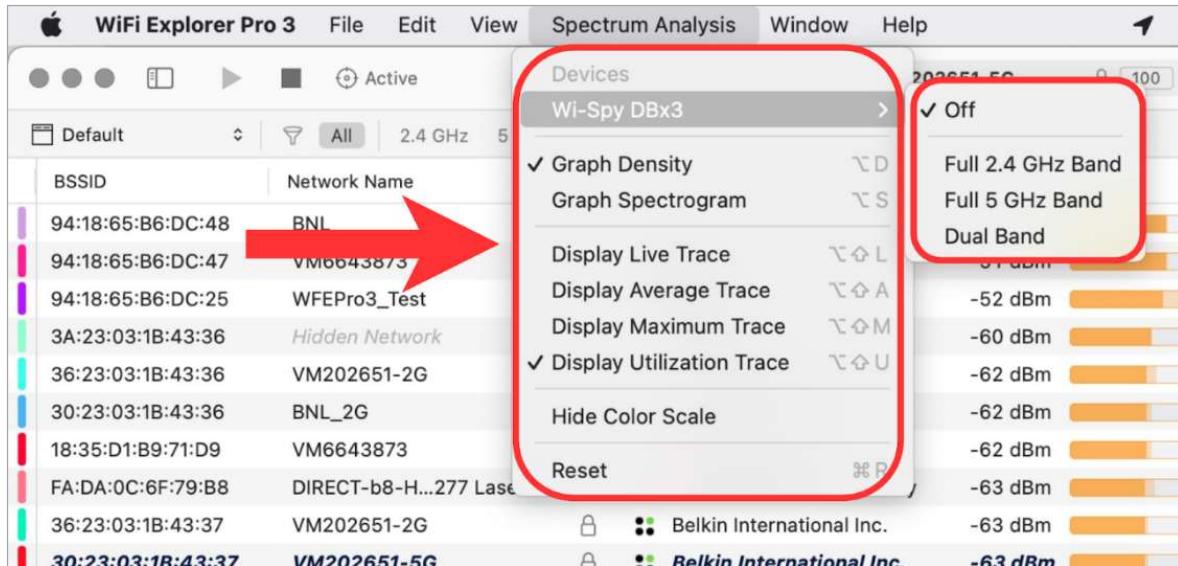


Figure 8-11 – Spectrum Analysis menu items

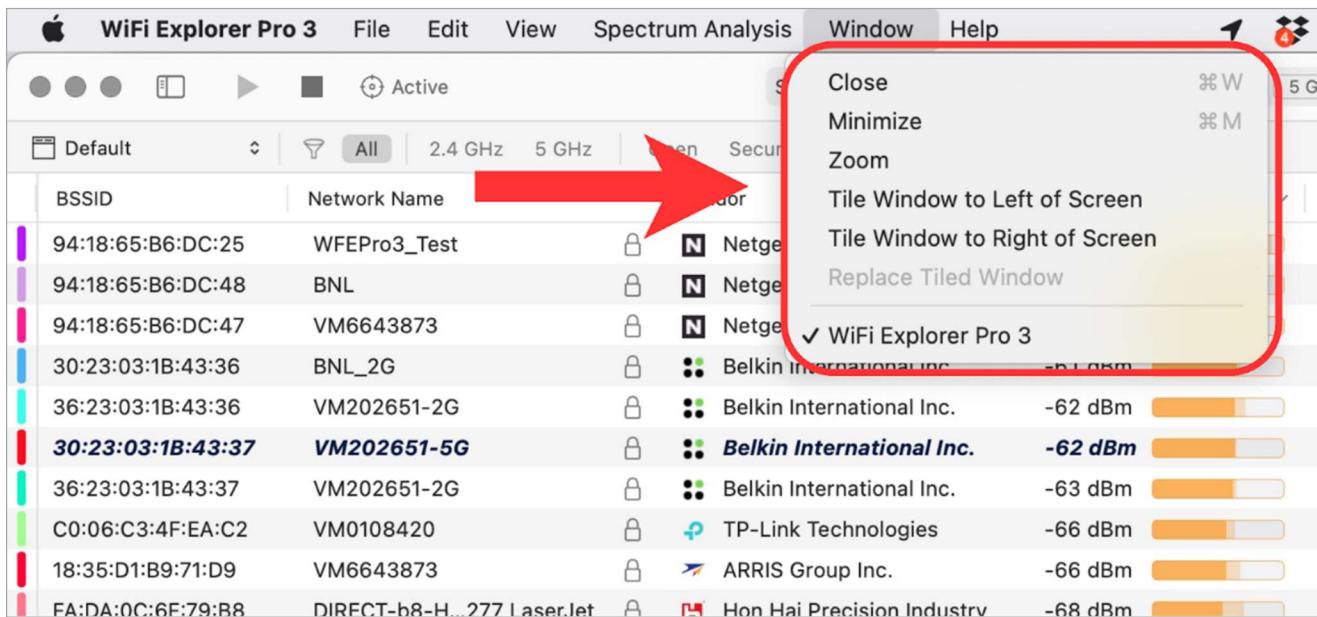


Figure 8-12 - Window menu item

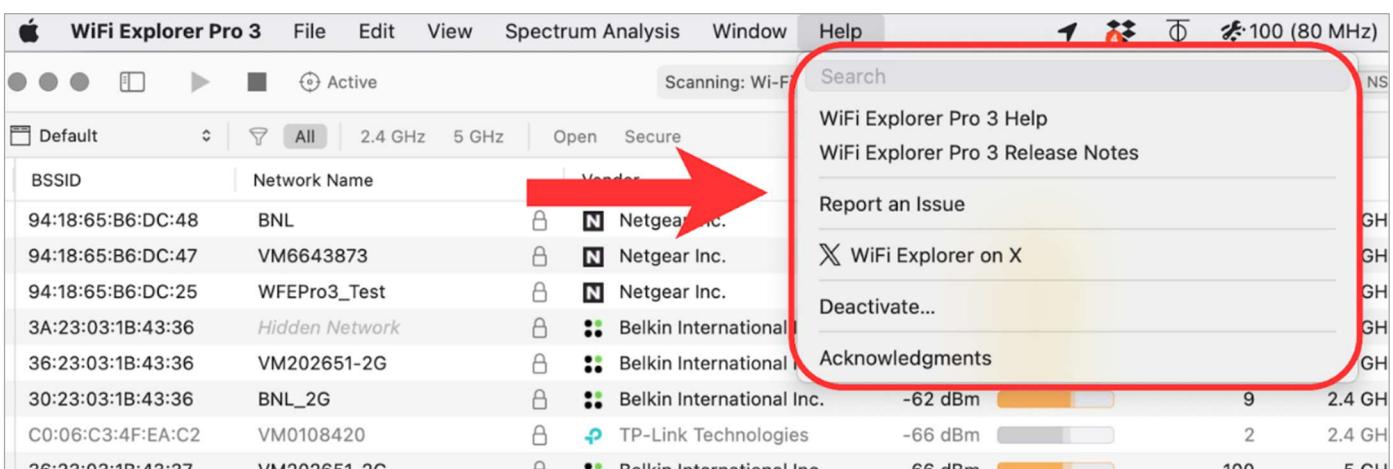


Figure 8-13 - Help menu items

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

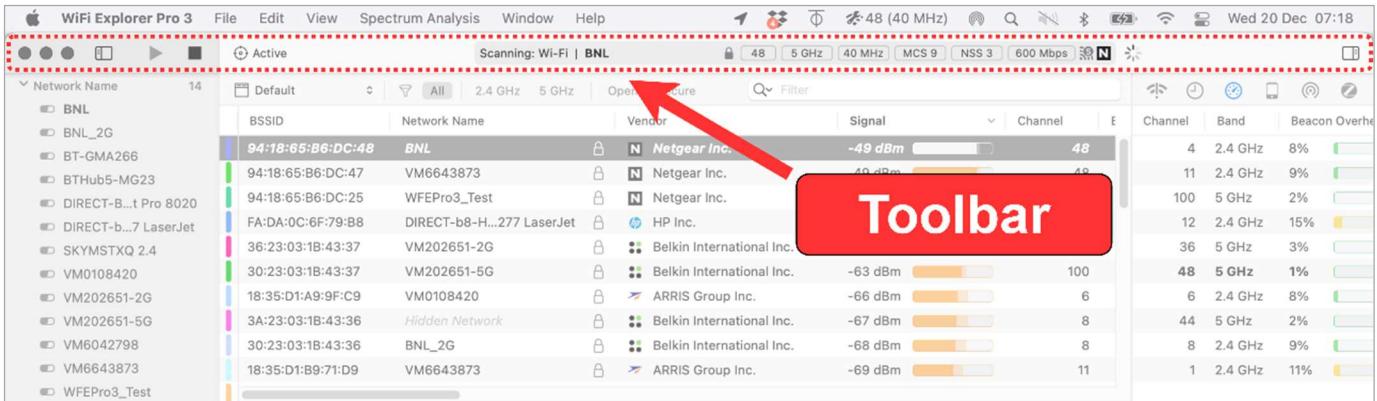


Figure 8-14 - Toolbar UI location

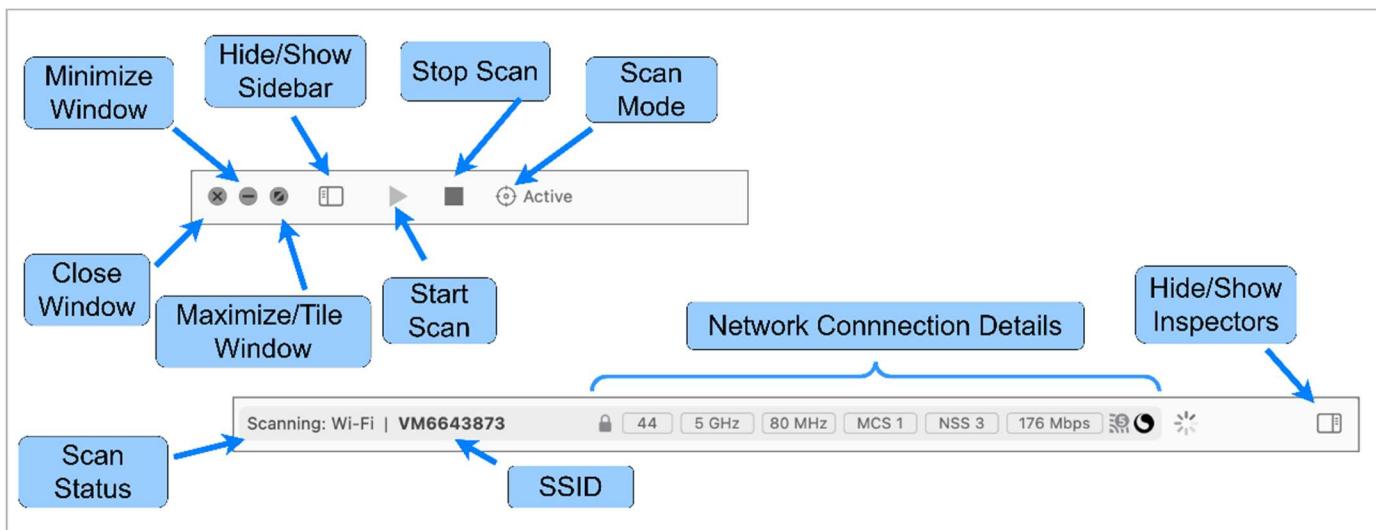


Figure 8-15 - Toolbar details (toolbar split to show details)

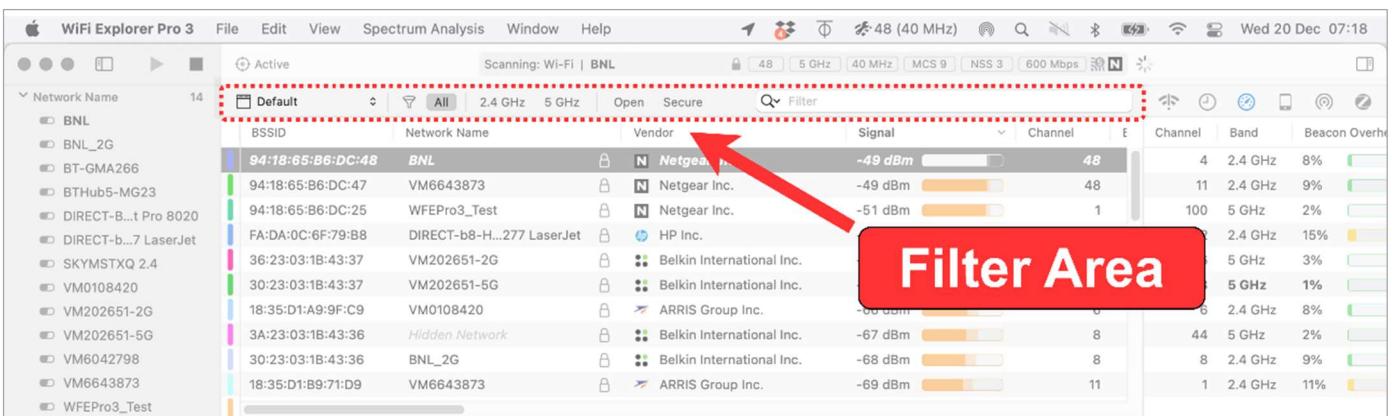


Figure 8-16 - Filter Area UI location

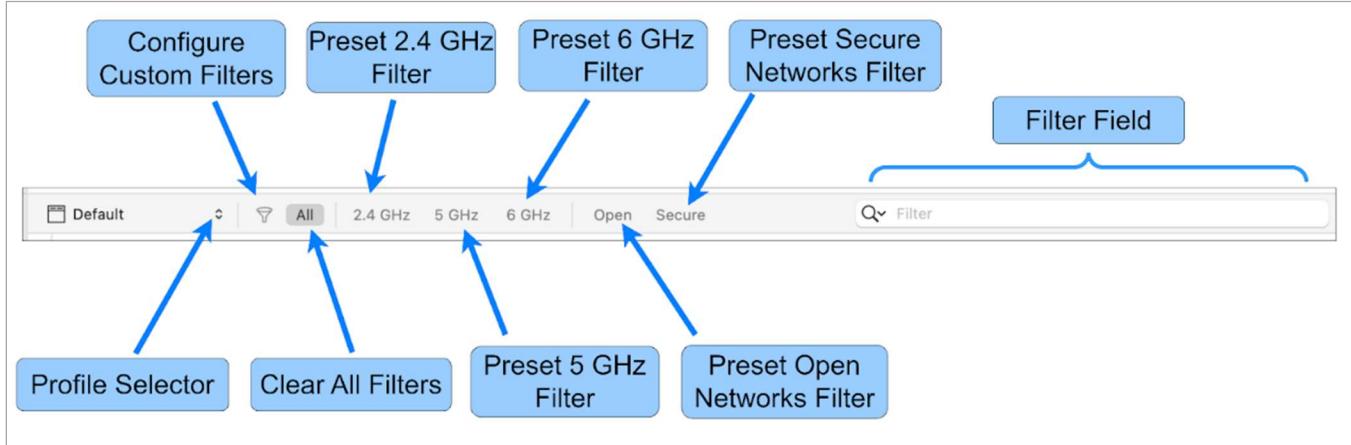


Figure 8-17 - Filter Area details

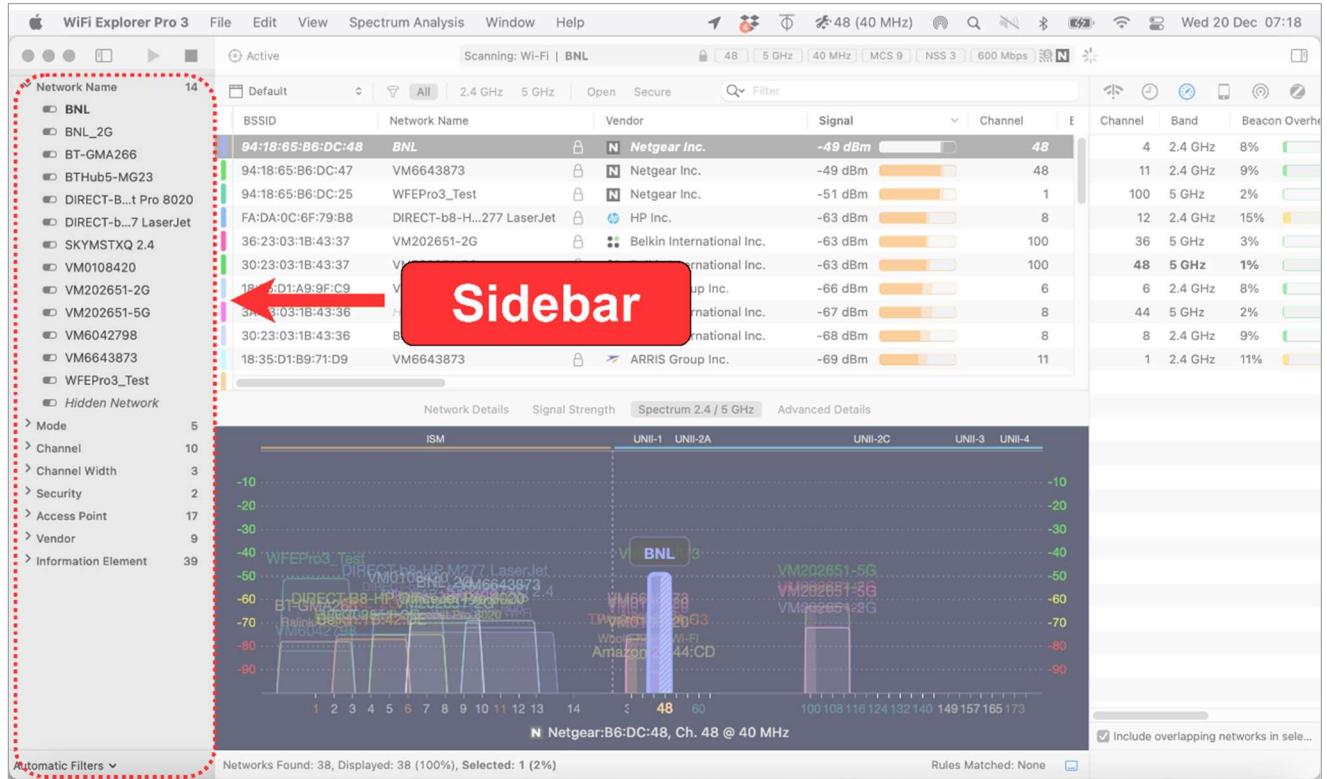


Figure 8-18 - Sidebar UI location

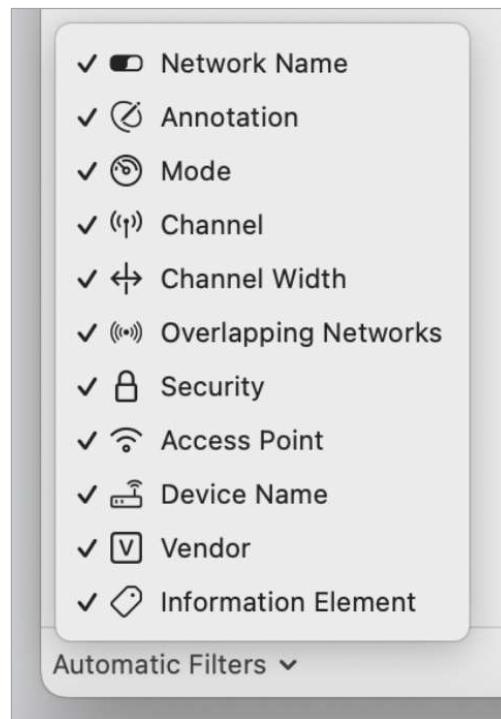


Figure 8-19 - Sidebar Automatic Filter Options

A screenshot of the WiFi Explorer Pro 3 interface showing a list of scanned networks. On the left is a sidebar with a tree view of filter categories and their counts. A red arrow points from the 'Mode' category in the sidebar to the 'Mode' column in the main table. The table has columns for Vendor, BSSID, Network Name, Signal, Channel, Band, and Mode. Two rows are visible: one for 'Netgear Inc.' with BSSID 94:18:65:B6:DC:47 and another for 'Netgear Inc.' with BSSID 94:18:65:B6:DC:48. Both rows show 'BNL' as the network name, '48' as the channel, '5 GHz' as the band, and 'a/n/ac/ax' as the mode. The mode column for the second row is highlighted with a red border.

	Vendor	BSSID	Network Name	Signal	Channel	Band	Mode
N Netgear Inc.	94:18:65:B6:DC:47	VM6643873	-55 dBm	48	5 GHz	a/n/ac/ax	
N Netgear Inc.	94:18:65:B6:DC:48	BNL	-55 dBm	48	5 GHz	a/n/ac/ax	

Figure 8-20 - Sidebar filter example using a Mode filter

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

Automatic Filters ▾ Networks Found: 35, Displayed: 33 (94%)

Figure 8-21 - Sidebar filter example using a negated Mode filter

Automatic Filters ▾ Networks Found: 38, Displayed: 38 (100%), Selected: 1 (2%) Rules Matched: None

Figure 8-22 - Networks Area UI location (also referred to as the "networks table")

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

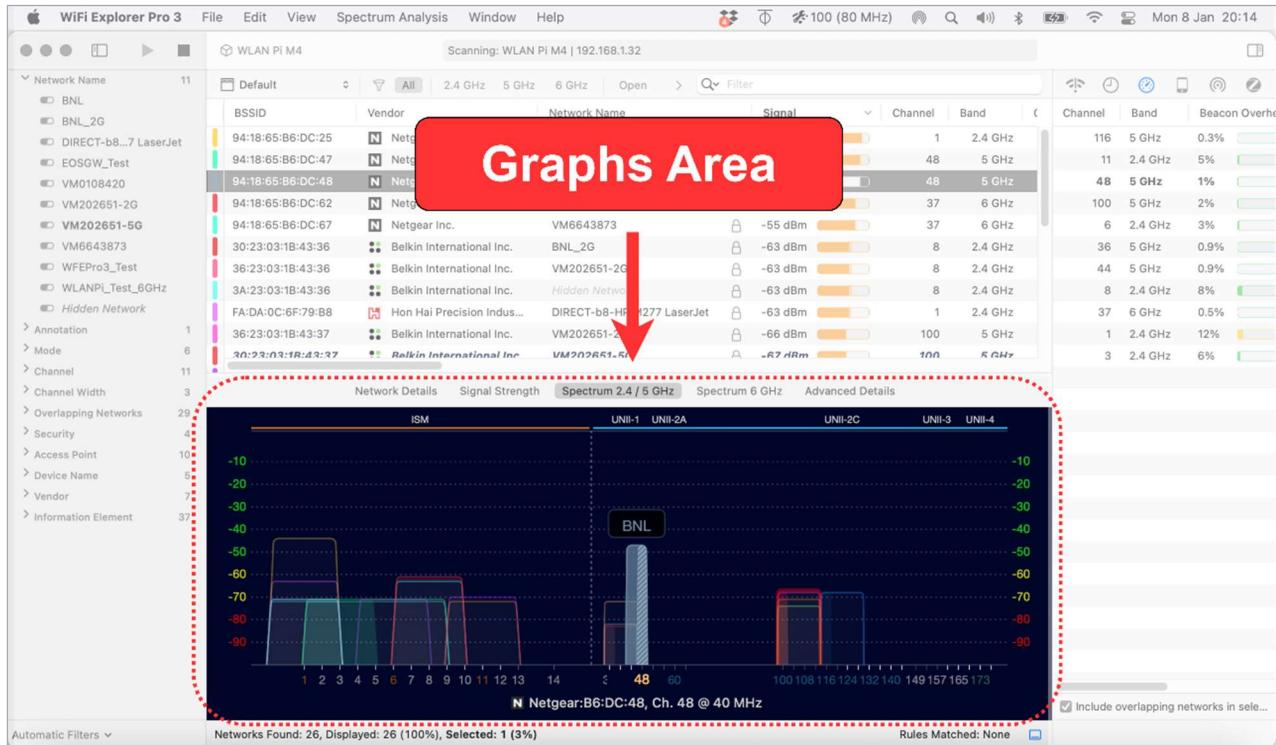


Figure 8-23 - Graphs Area UI location

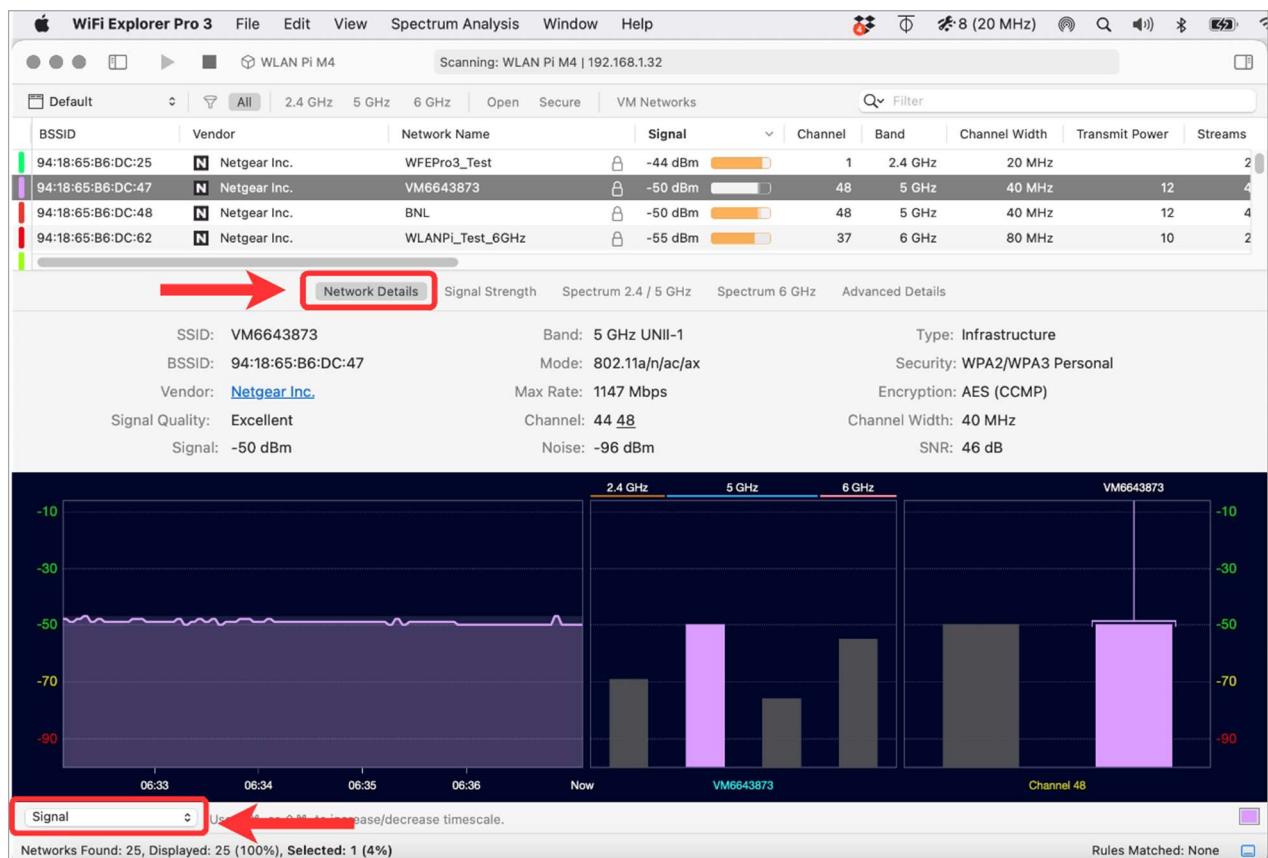


Figure 8-24- Graphs Area: Network Details panel

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

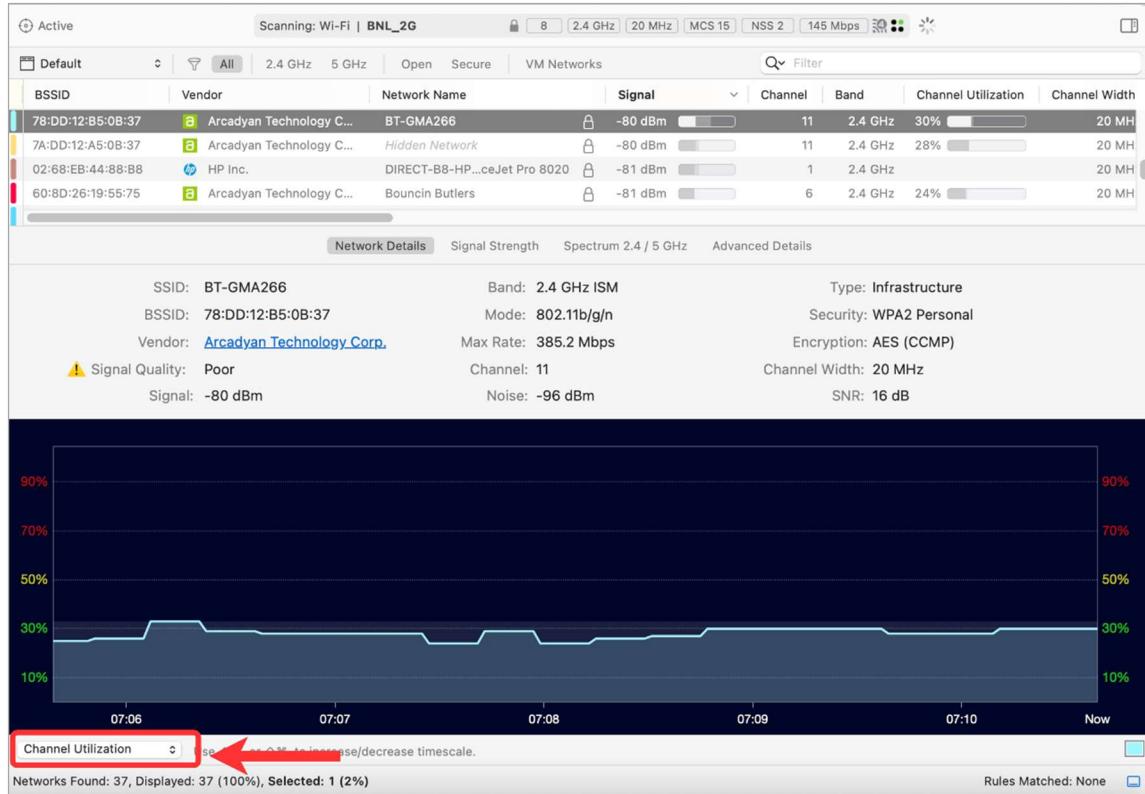


Figure 8-25 - Graphs Area: Network Details panel showing channel utilization graph

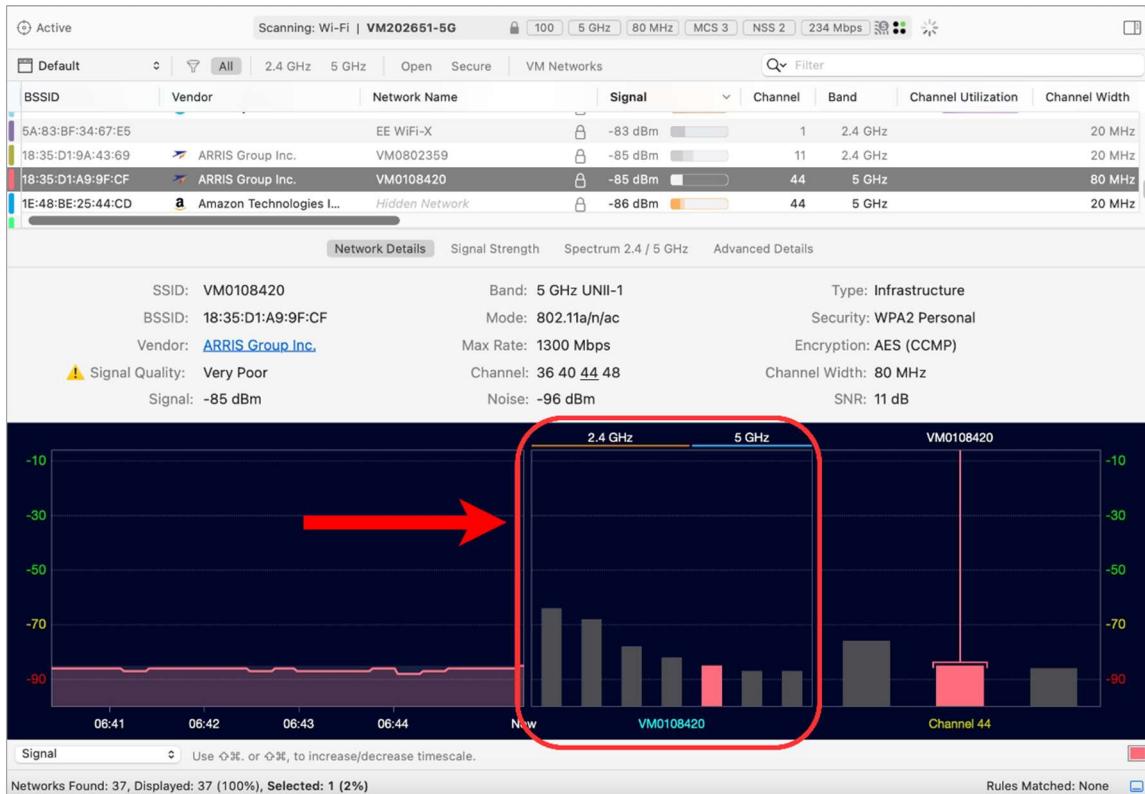


Figure 8-26 - Graphs Area: Network Details panel with SSID Band Peers Graph highlighted

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

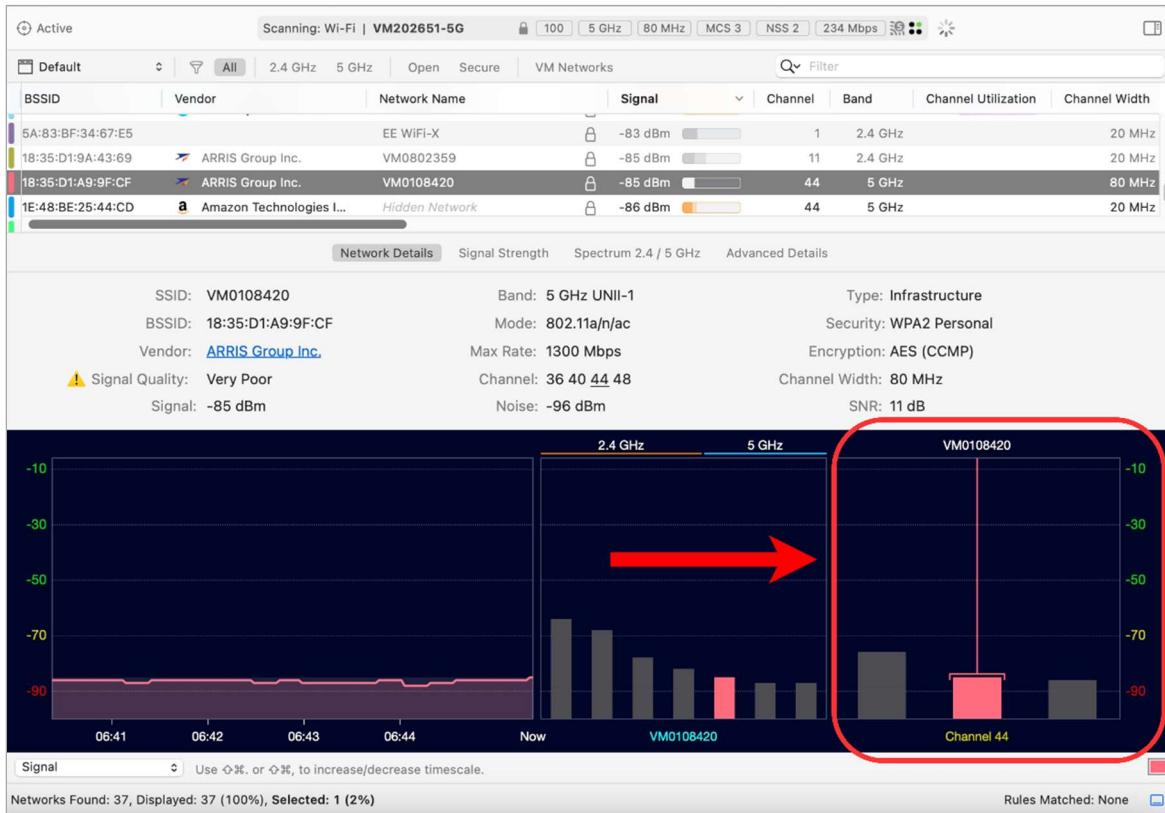


Figure 8-27 - Graphs Area: Network Details panel with the Channel Peers Graph highlighted

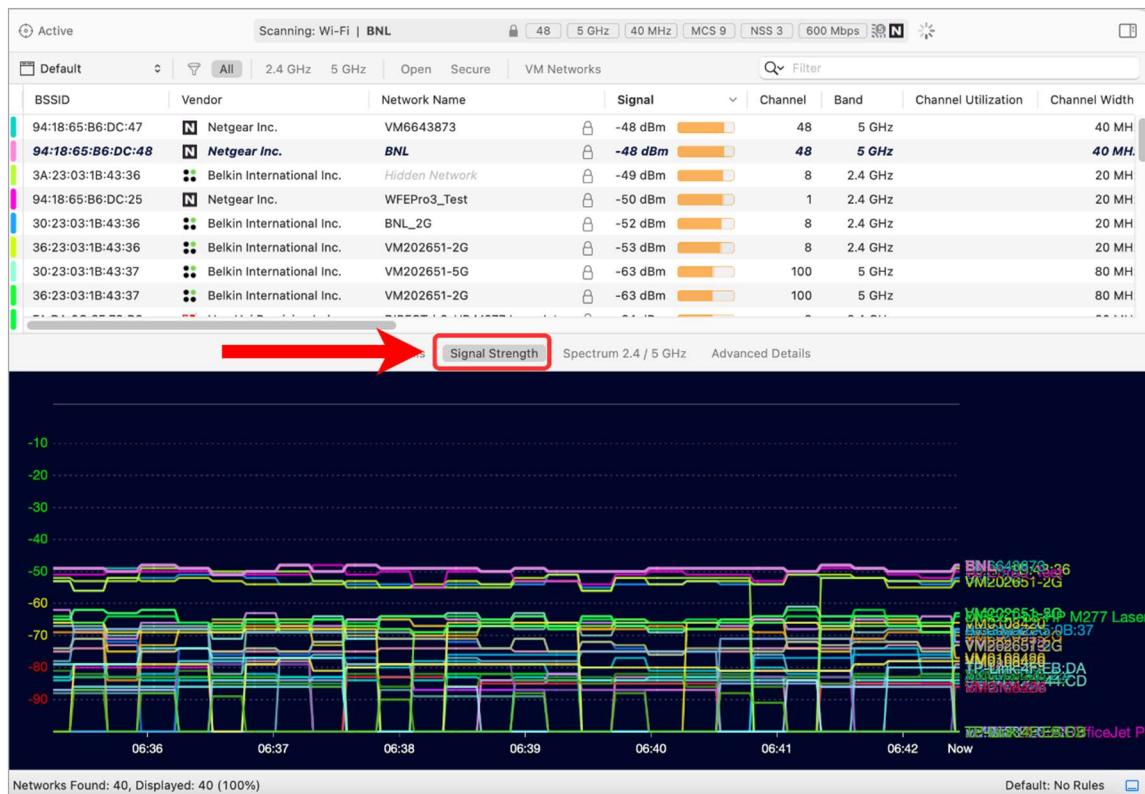


Figure 8-28 - Graphs Area: Signal Strength panel, all networks

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

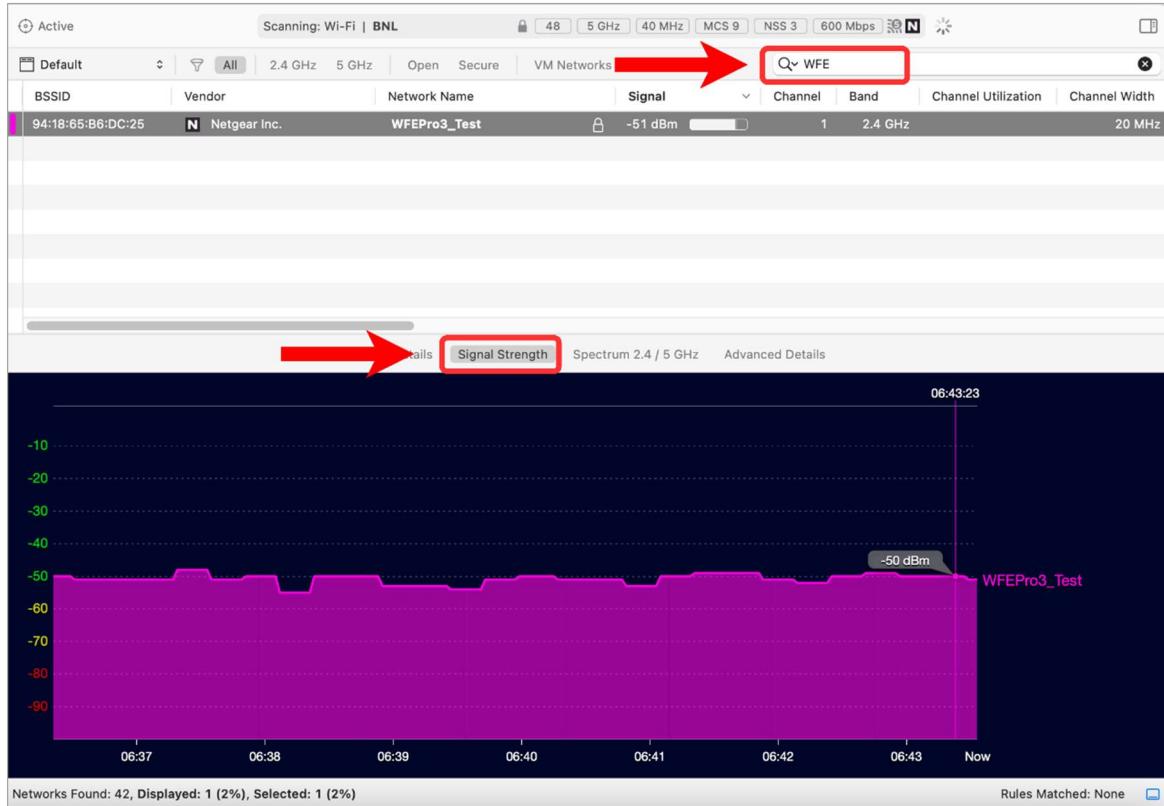


Figure 8-29 - Graphs Area: Signal Strength panel showing a single filtered BSSID

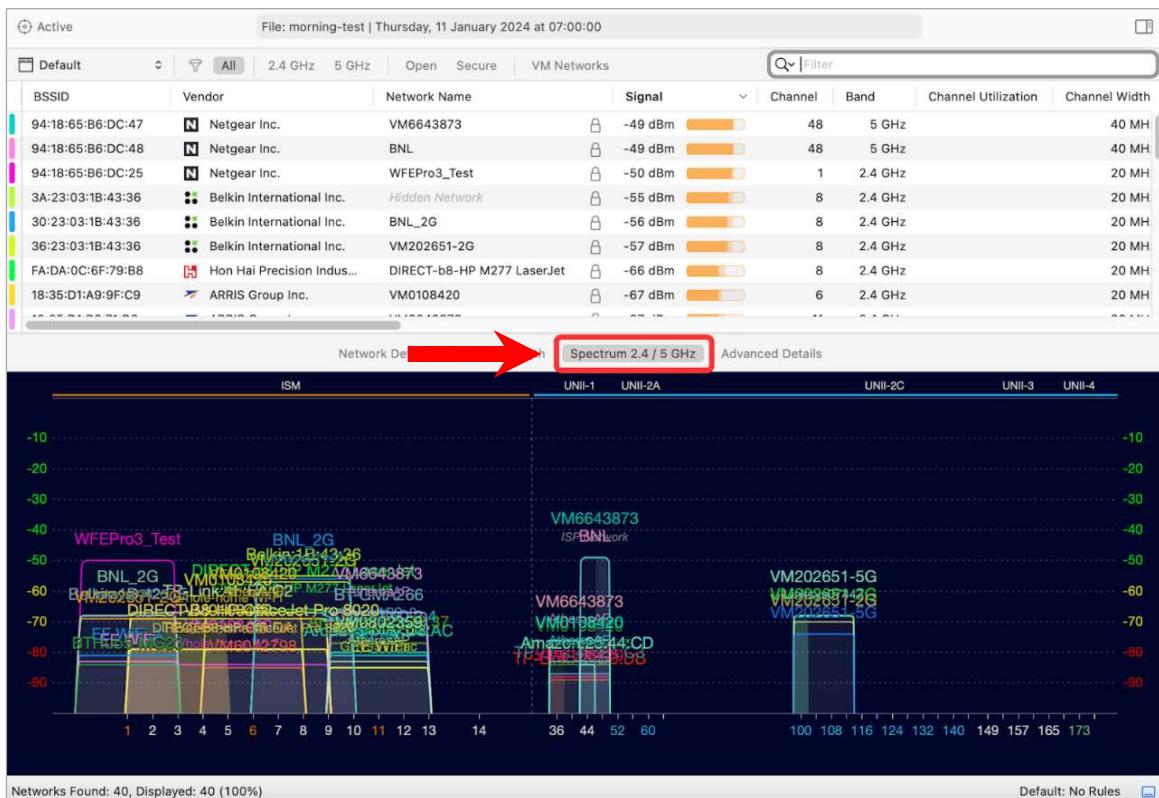


Figure 8-30 - Graphs Area: Spectrum 2.4/5 GHz panel showing all networks

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

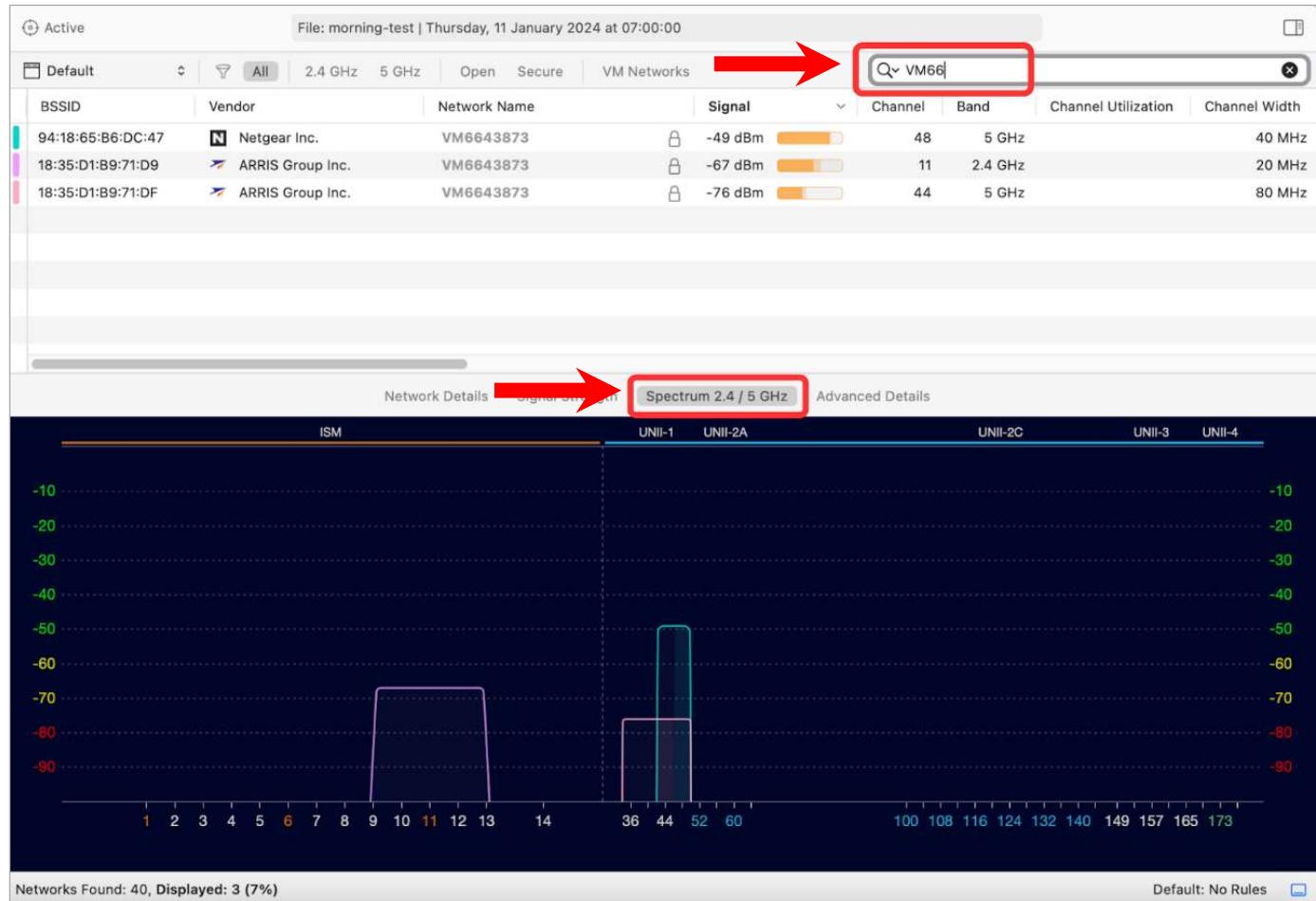


Figure 8-31 - Graphs Area: Spectrum 2.4/5 GHz panel showing a filtered network



Figure 8-32 - Graphs Area: Spectrum 2.4/5 GHz panel indicating a primary channel (ch. 100)

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

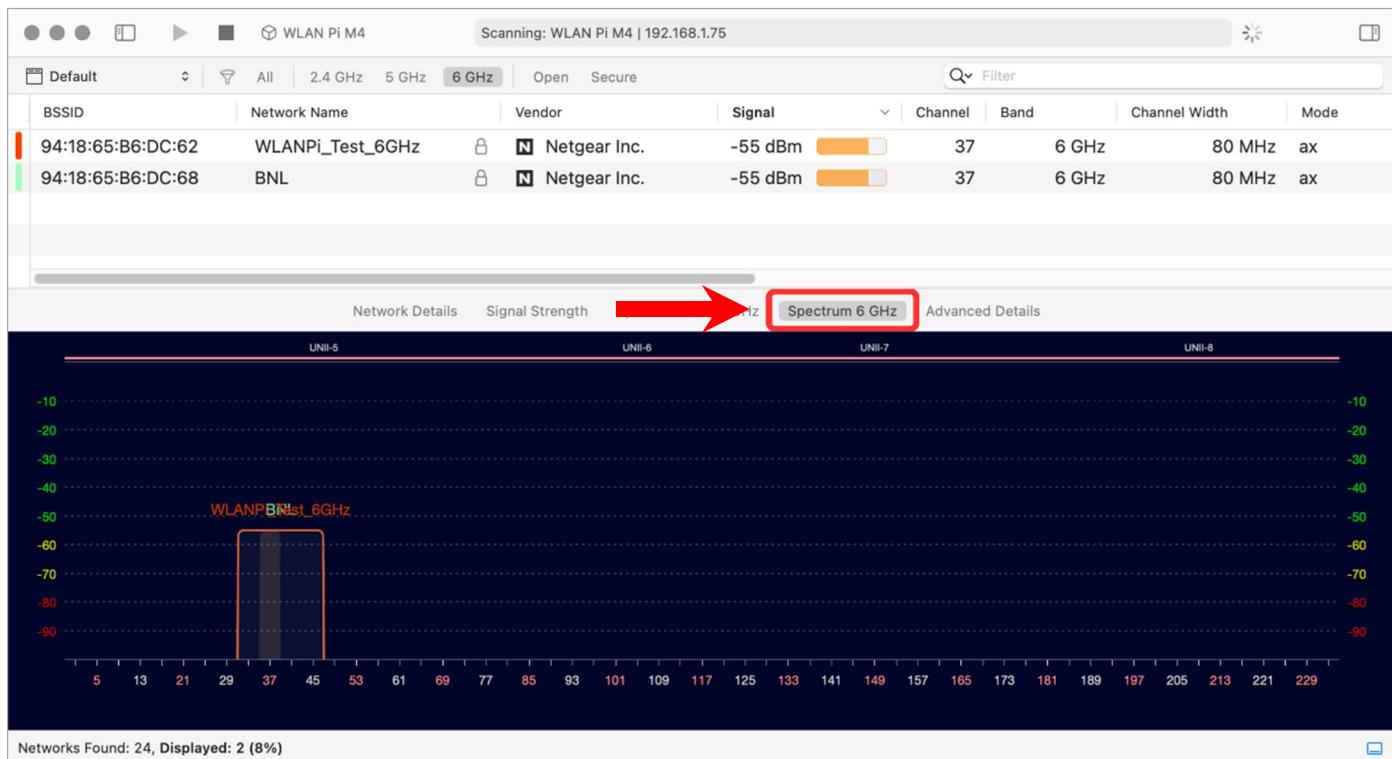


Figure 8-33 - *Graphs Area: Spectrum 6 GHz panel showing two networks*

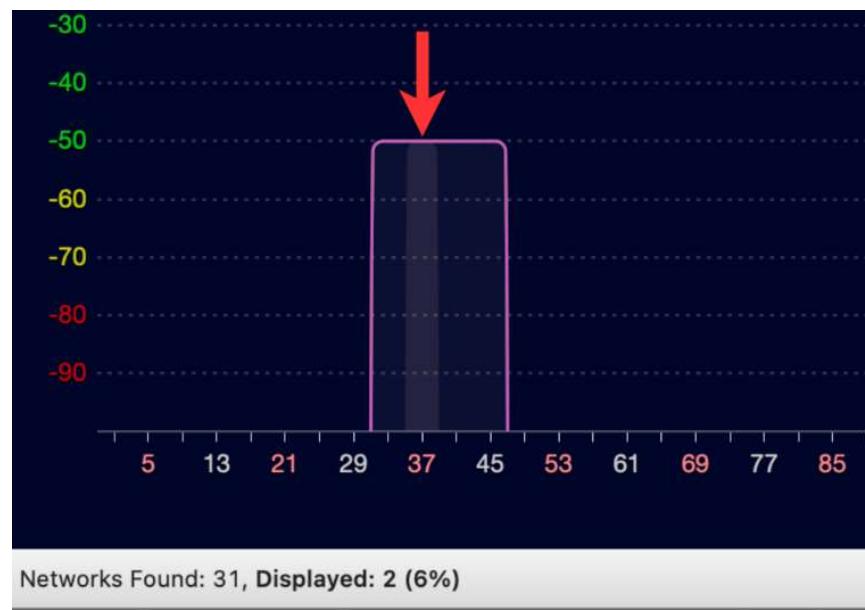


Figure 8-34 - *Graphs Area: Spectrum 6 GHz panel showing a primary channel (Ch. 37)*

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

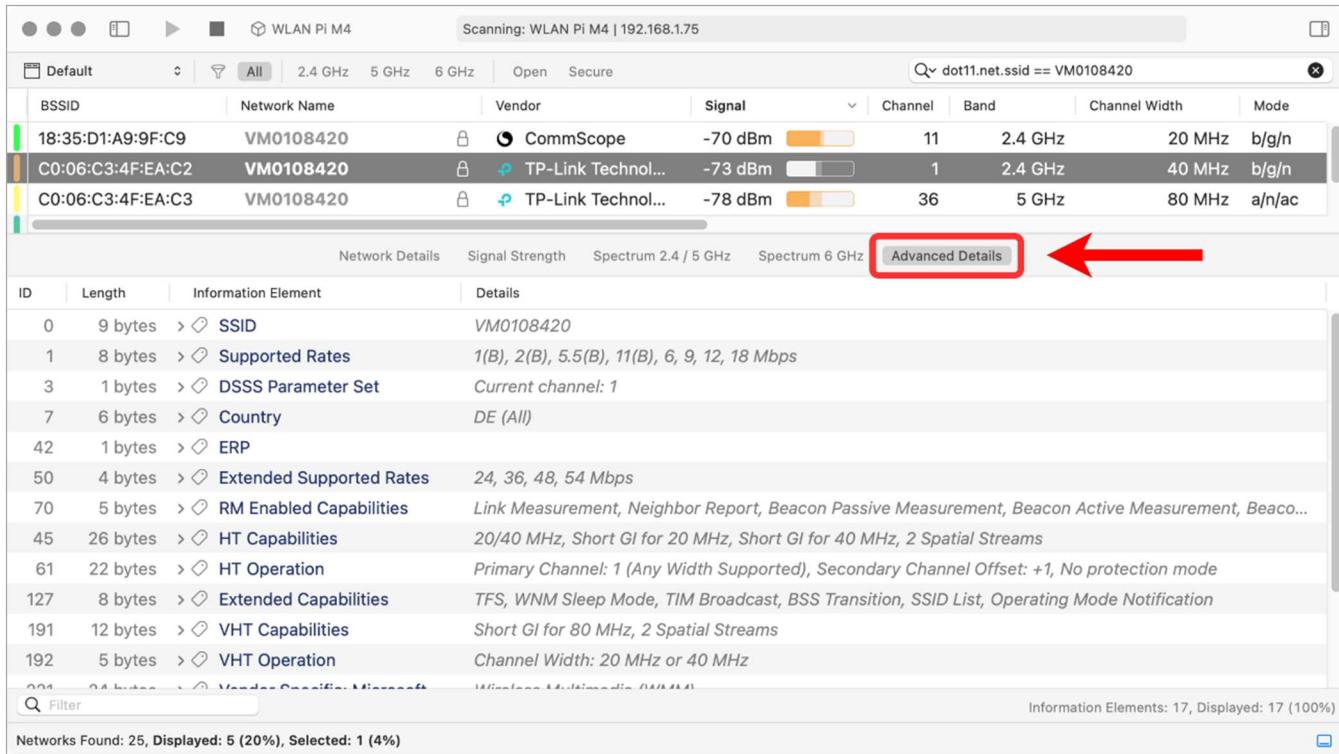


Figure 8-35 - Graphs Area: Advanced Details panel showing IEs for a selected network

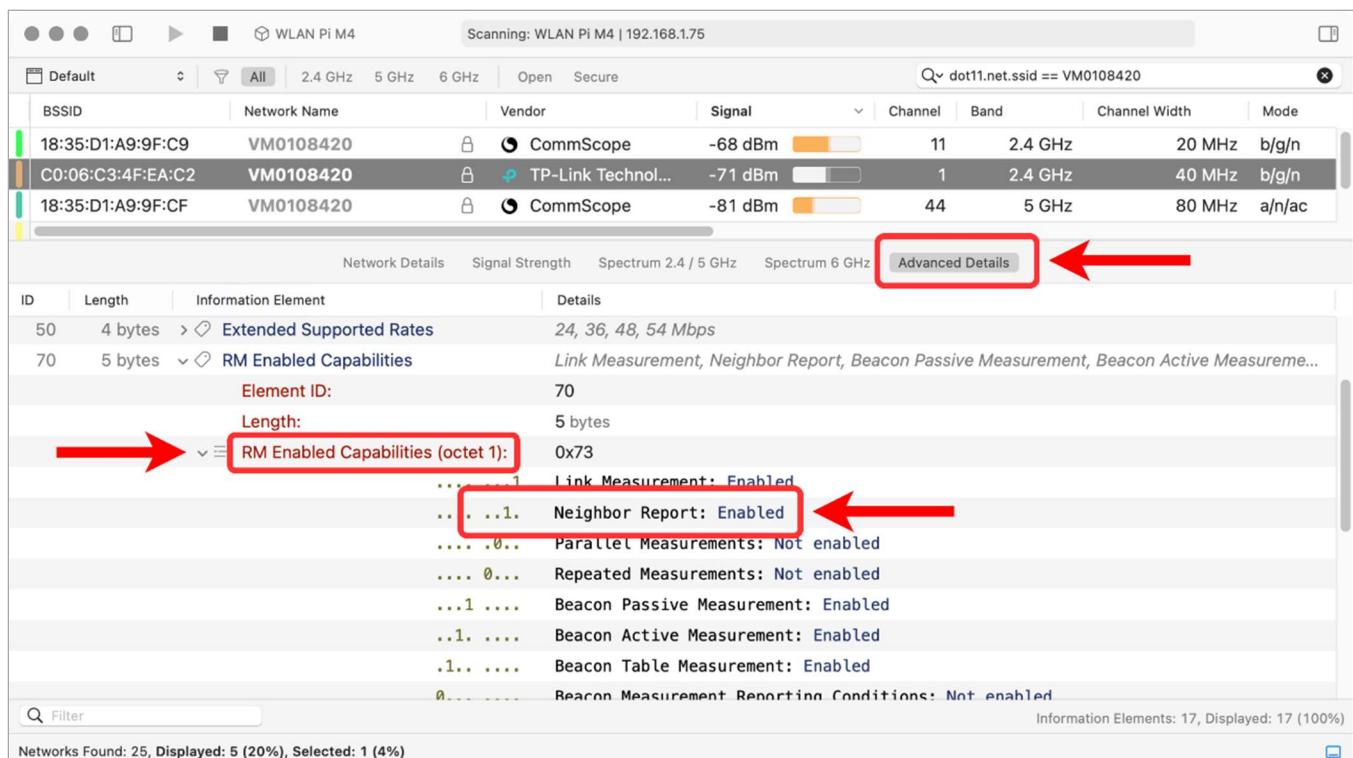


Figure 8-36 - Graphs Area: Advanced Details showing the Neighbor Report field for a selected BSSID

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

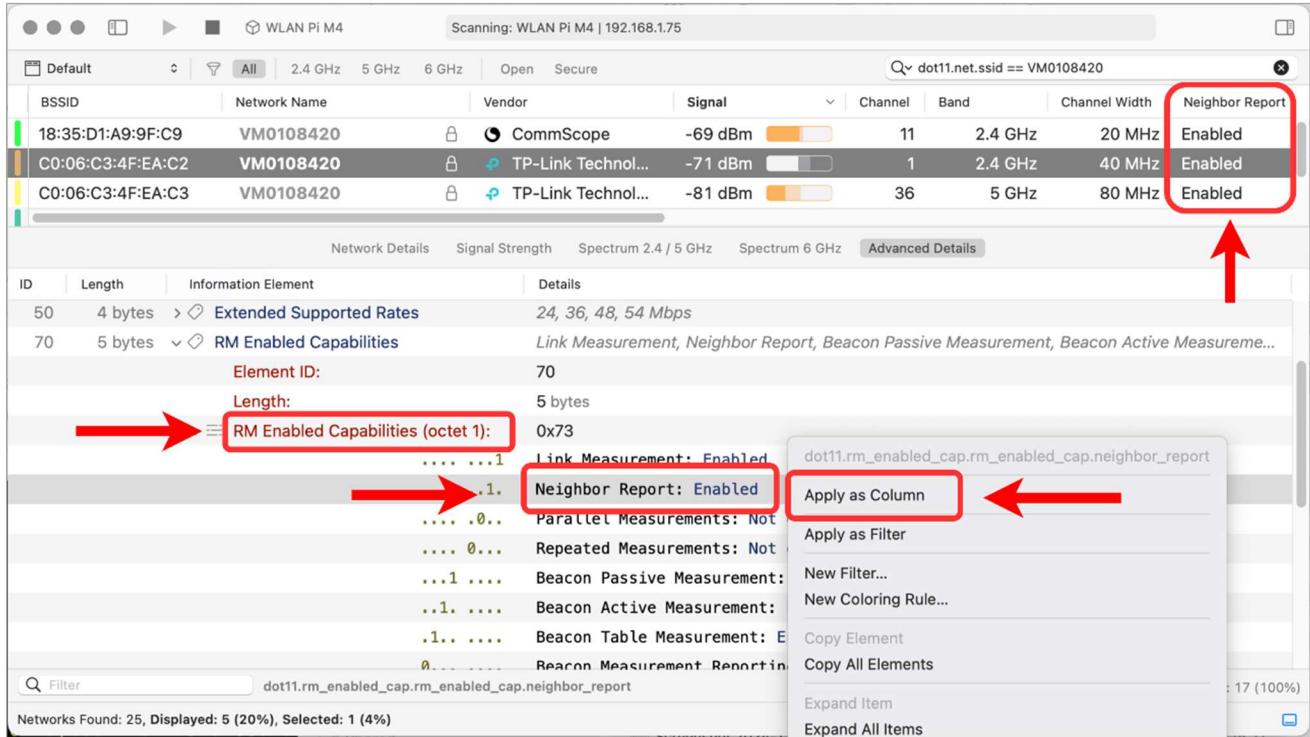


Figure 8-37 - Graphs Area: Advanced Details panel showing how to add Neighbor Report as a column

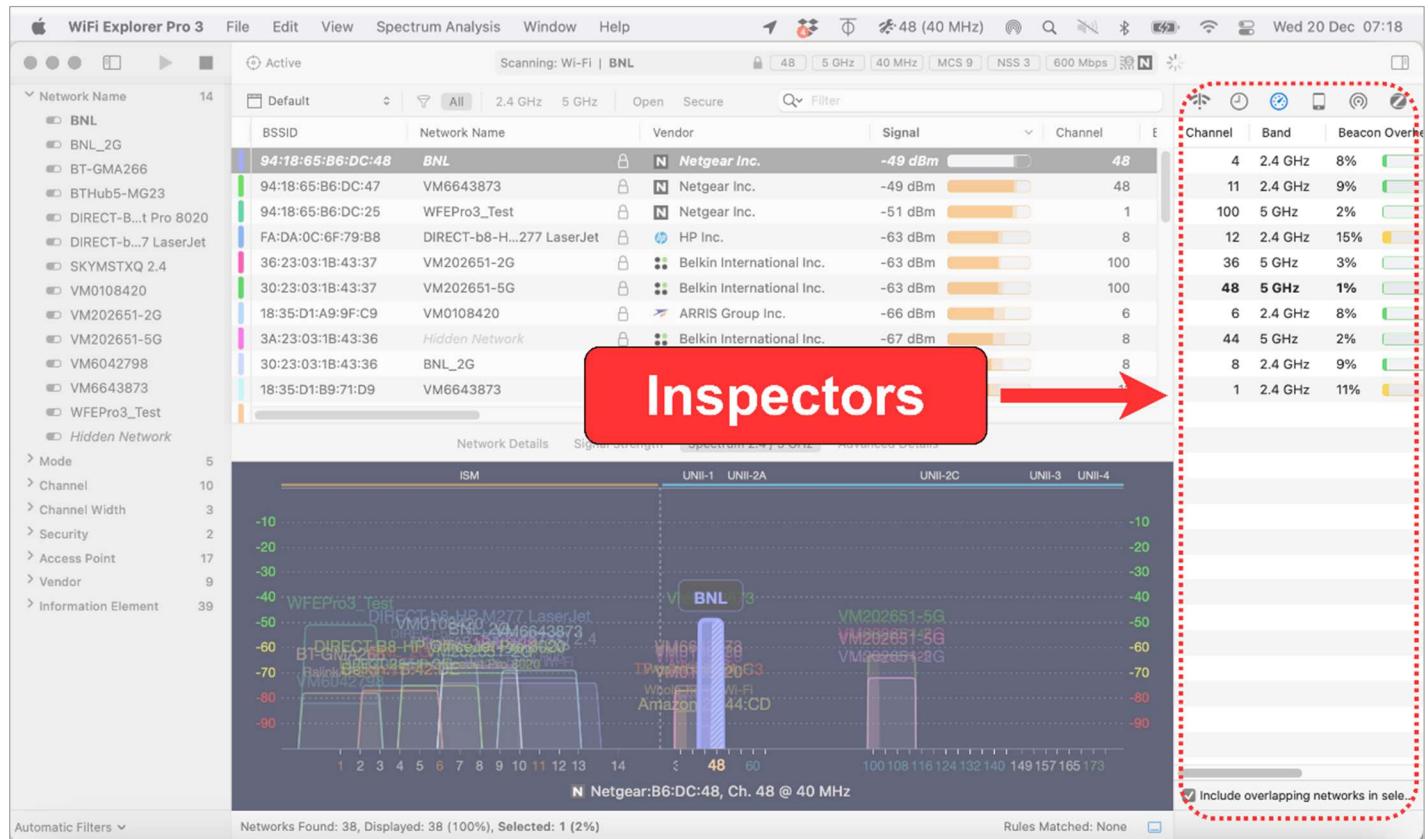


Figure 8-38 - Inspectors UI location

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

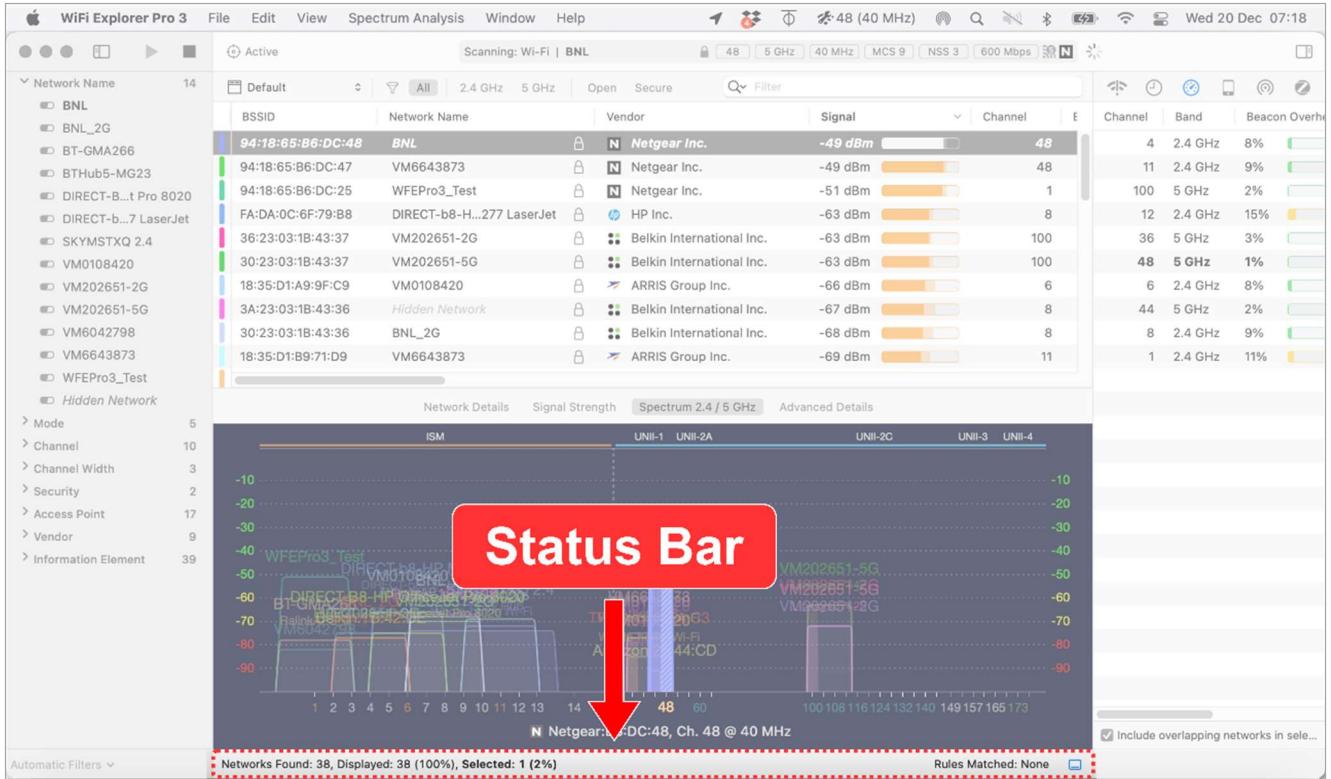


Figure 8-39 - Status Bar UI location

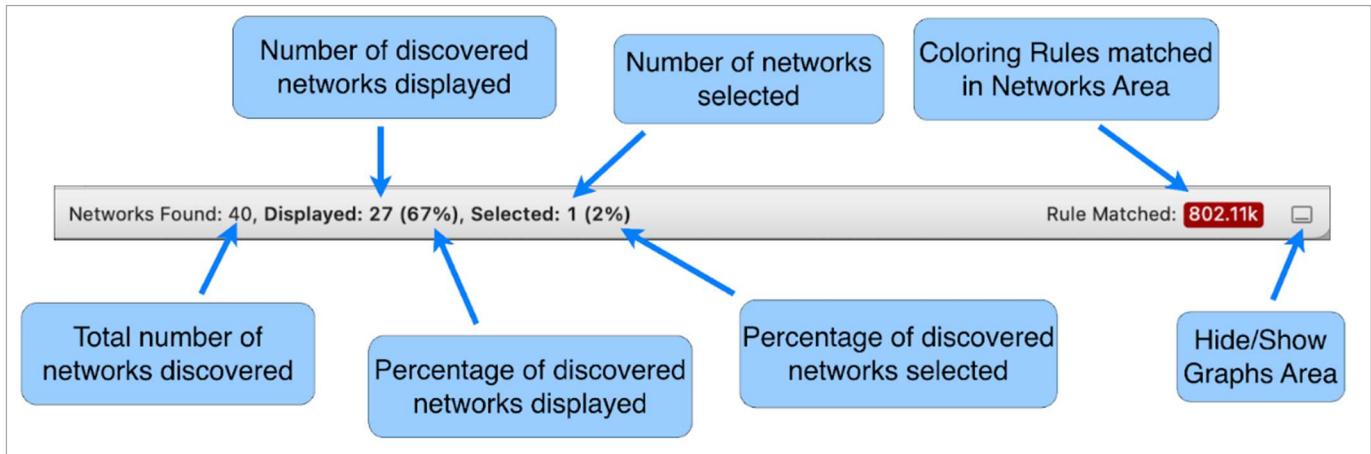
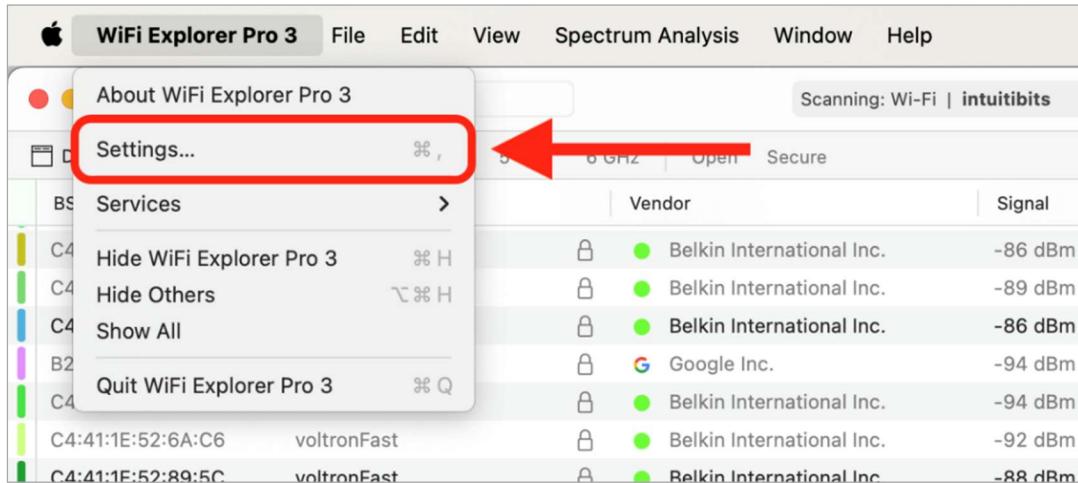
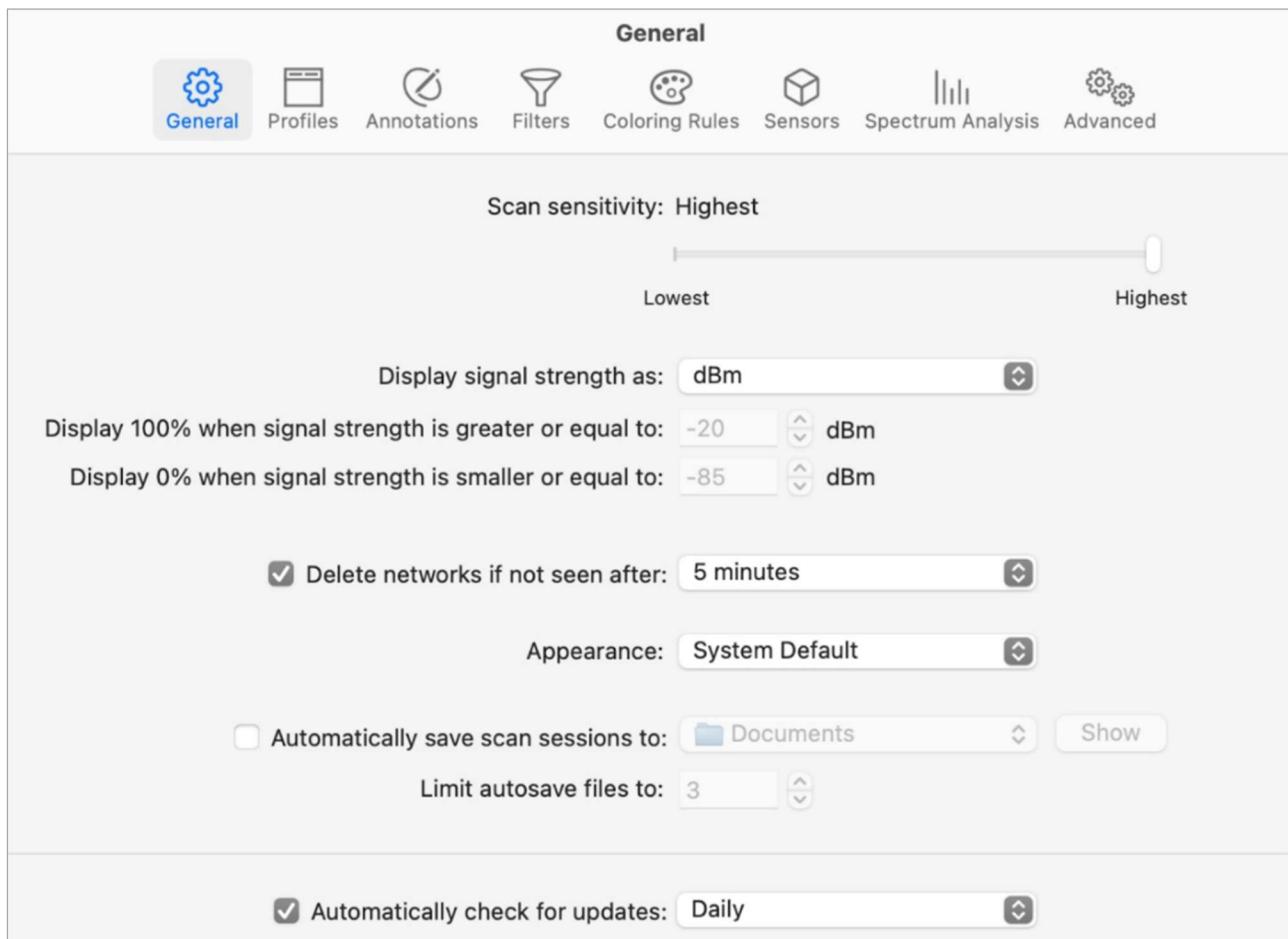


Figure 8-40 - Status Bar Details

Chapter 9 - WiFi Explorer Pro 3 Settings

Figure 9-1 - Accessing the *Settings* windowFigure 9-2 - The *General* settings tab

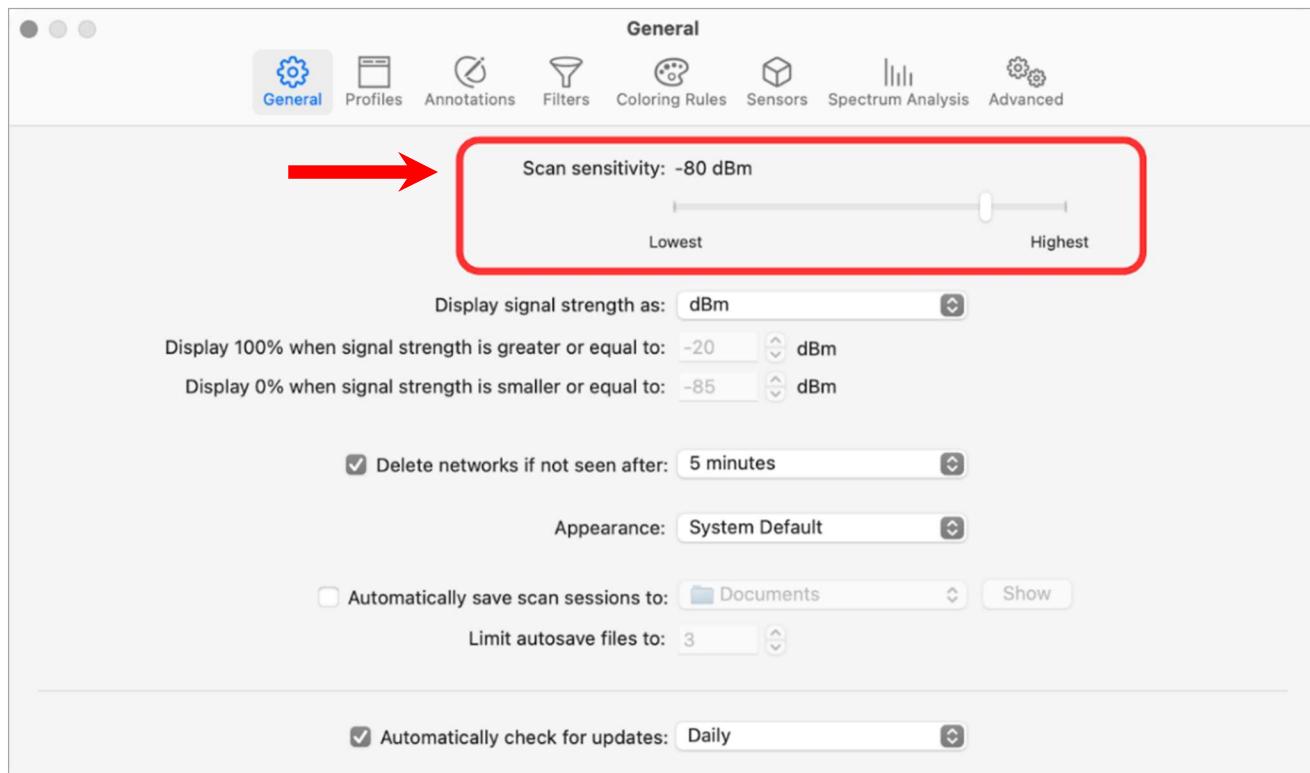


Figure 9-3 - Scan sensitivity adjustment under the *General* settings tab

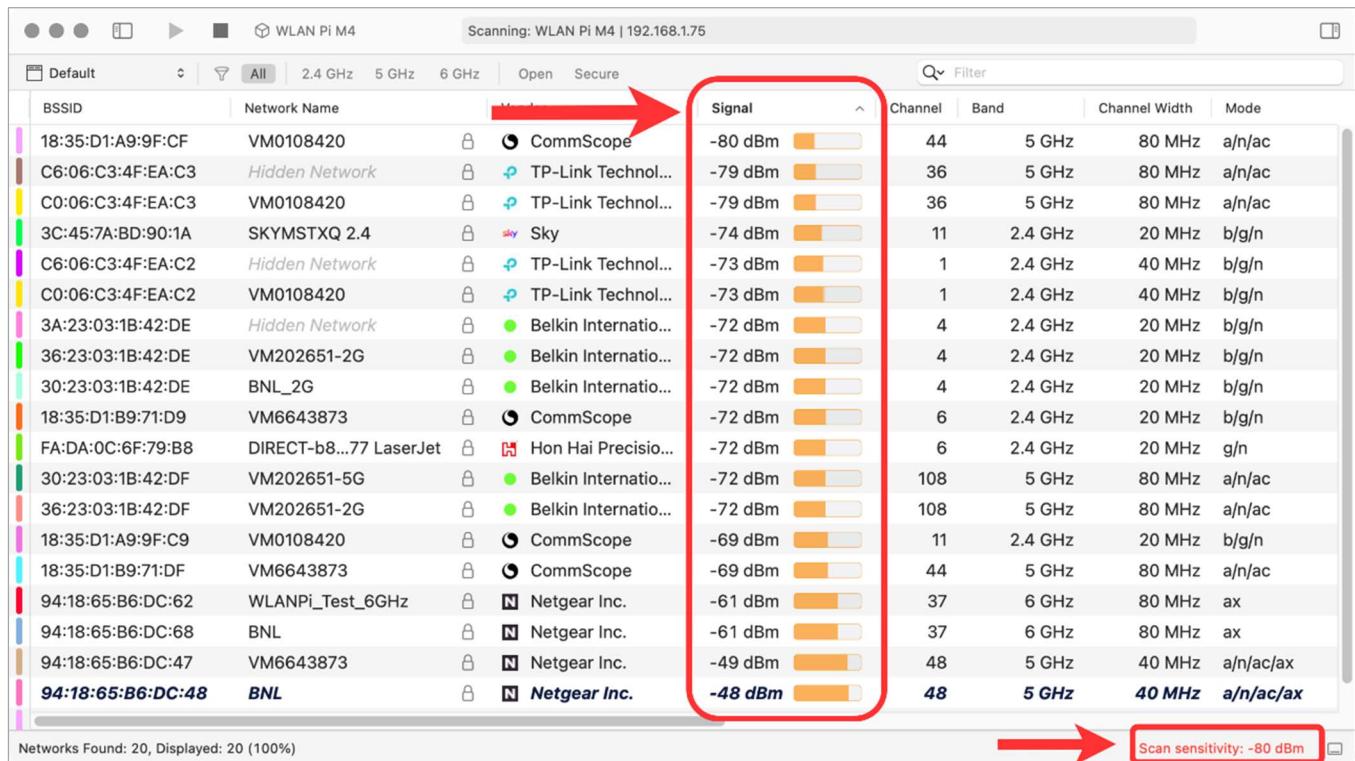


Figure 9-4 - The effect of adjusting scan sensitivity

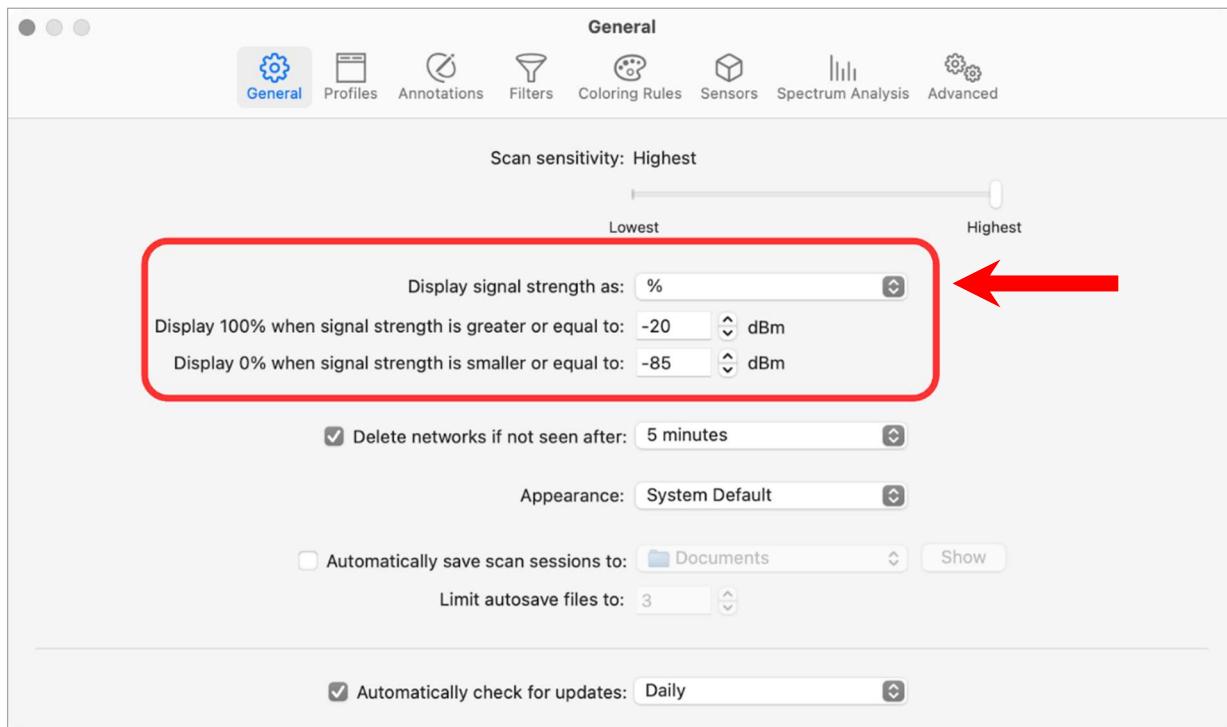


Figure 9-5 - Signal strength units under the *General* settings tab

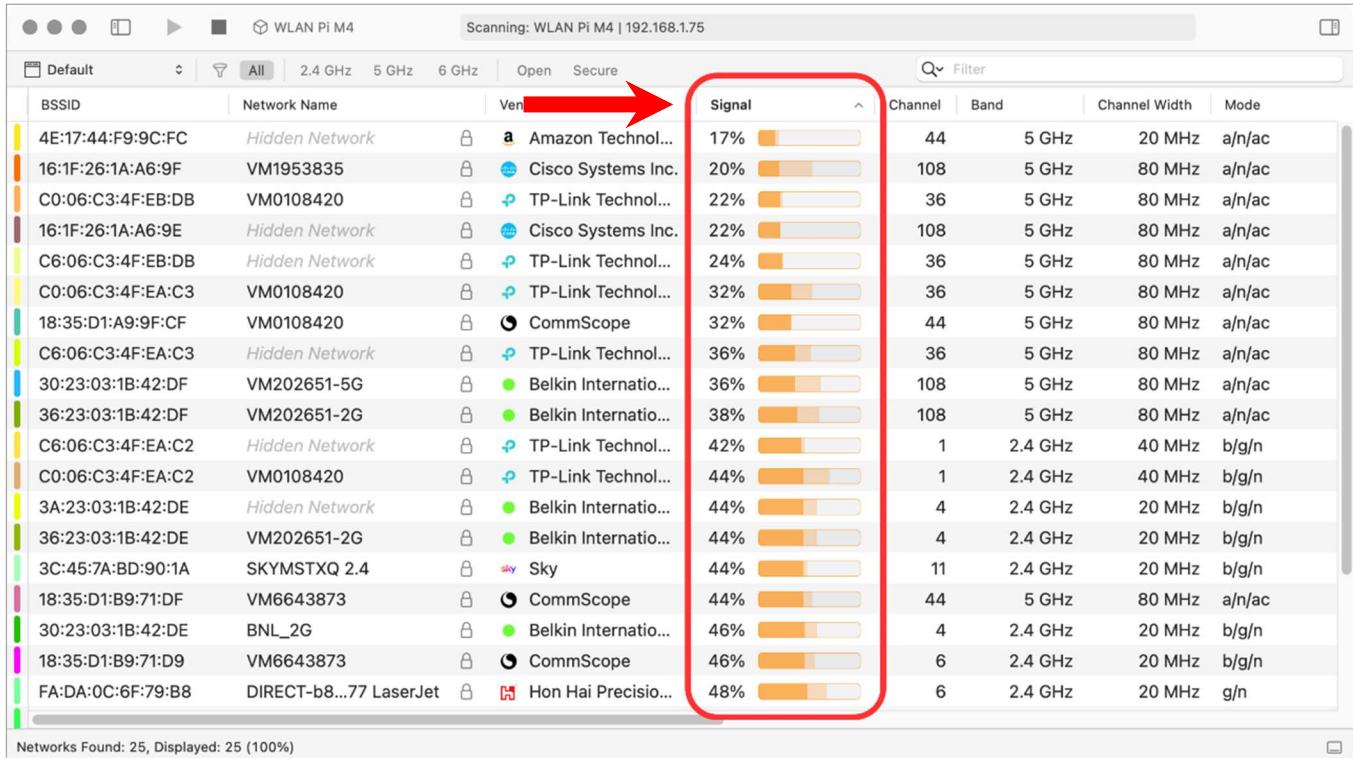


Figure 9-6 - The effect of setting signal level units to percentage values

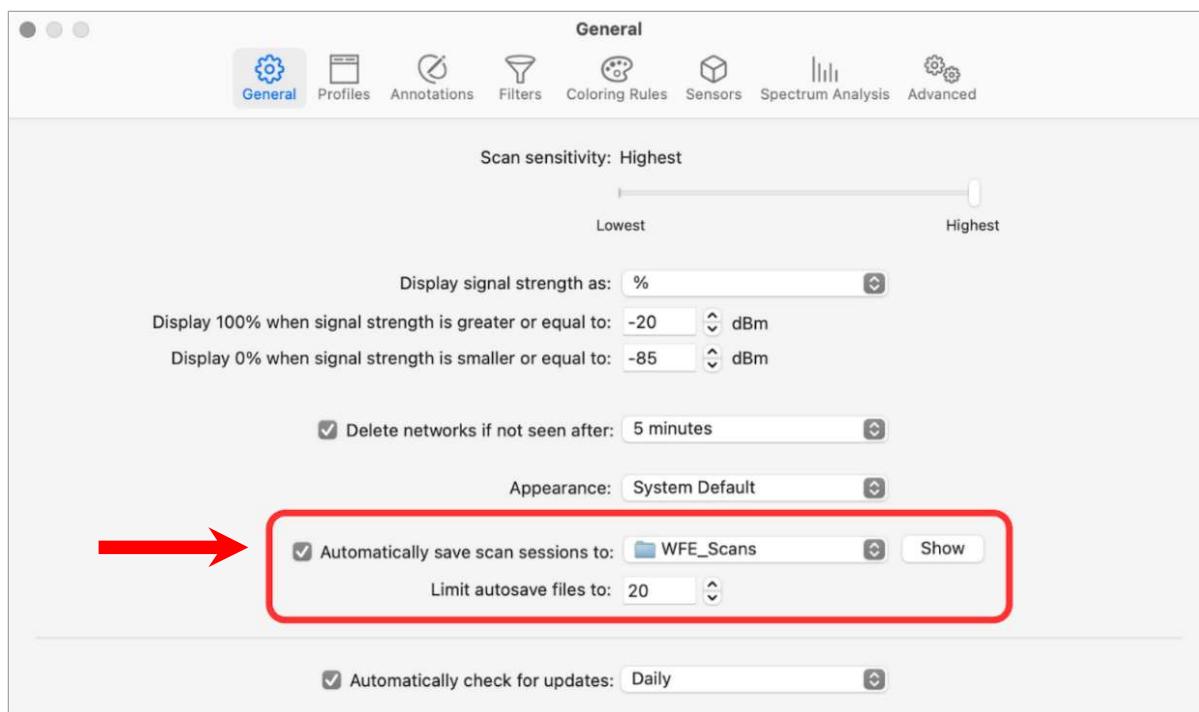


Figure 9-7 - Setting WFE Pro 3 to auto-save scan data to files

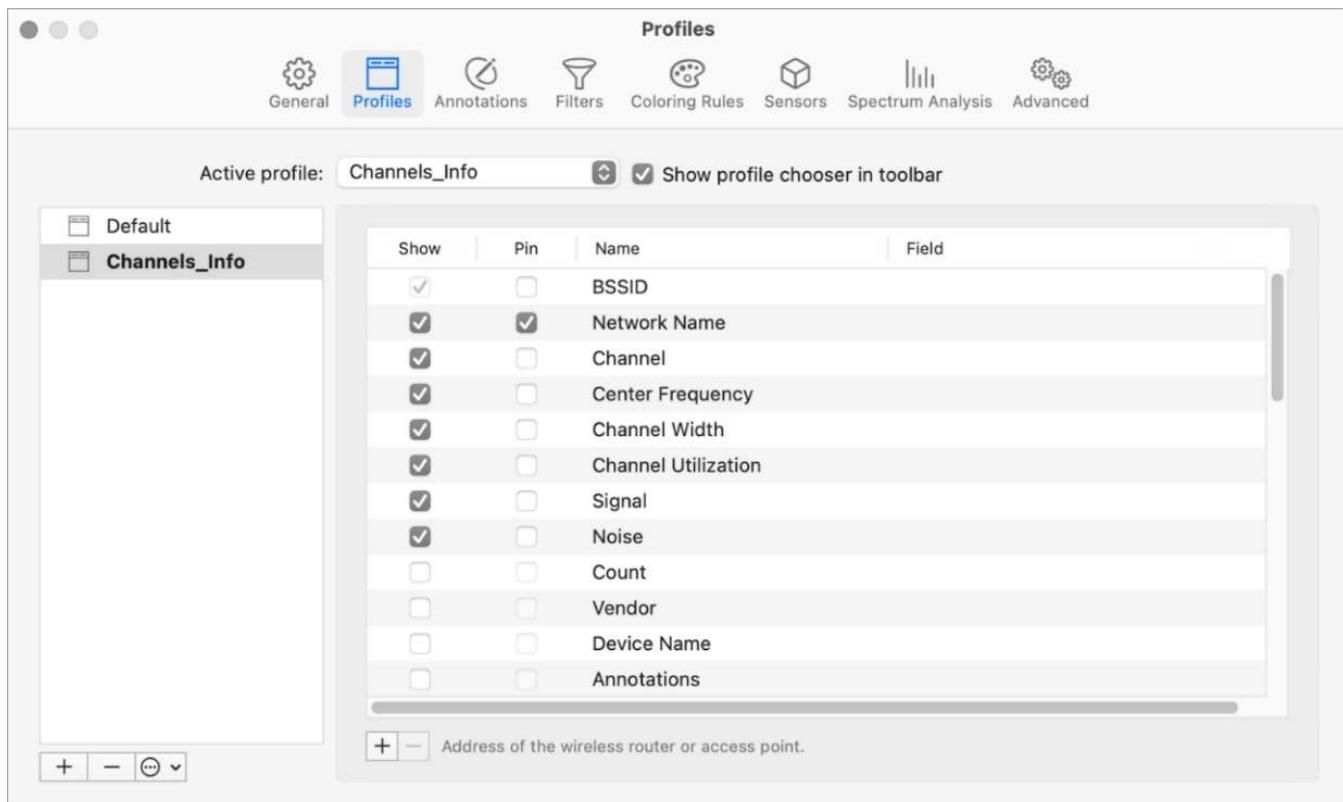


Figure 9-8 - The *Profiles* settings tab

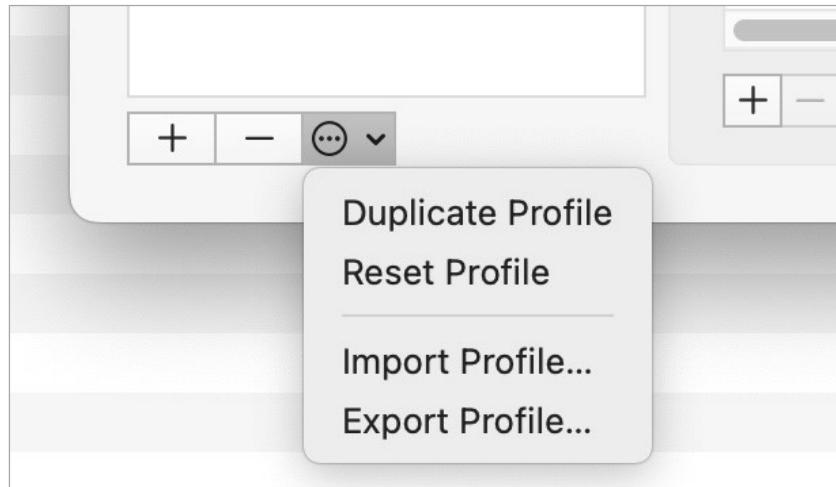


Figure 9-9 - The profiles list **More** button options

A screenshot of the 'Annotations' settings tab in WiFi Explorer Pro 3. The tab is selected and highlighted in blue. Below it are other tabs: General, Profiles, Filters, Coloring Rules, Sensors, Spectrum Analysis, and Advanced. A search bar labeled 'Search' is at the top. A table lists BSSIDs and their annotations:

BSSID	Annotation
30:23:03:1B:43:3?	Office AP
94:18:65:B6:DC:25	Test AP
94:18:65:B6:DC:47	ISP Network

At the bottom left are '+', '−', and '(?)' buttons. A note below them states: 'BSSID may include * or ?, for example: 88:1F:A1:31:* or 88:1F:A1:31:E6:?E.'

Figure 9-10 - The **Annotations** settings tab

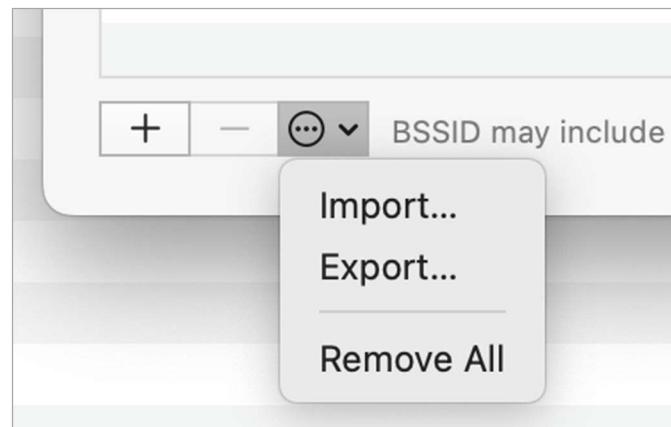


Figure 9-11 - The annotations list *More* button options

The screenshot shows the 'Filters' tab selected in the top navigation bar. Below it is a table listing filters:

Show	Label	Filter
<input checked="" type="checkbox"/>	Netgear Networks	dot11.net.vendor == "Netgear Inc."
<input checked="" type="checkbox"/>	Ch 48	48
<input checked="" type="checkbox"/>	Gt than -60	dot11.net.signal > -60

At the bottom left are buttons for adding (+), removing (-), and changing order (a circular arrow). A note says 'Drag filters to change their presentation order.'

Figure 9-12 – The *Filters* settings tab

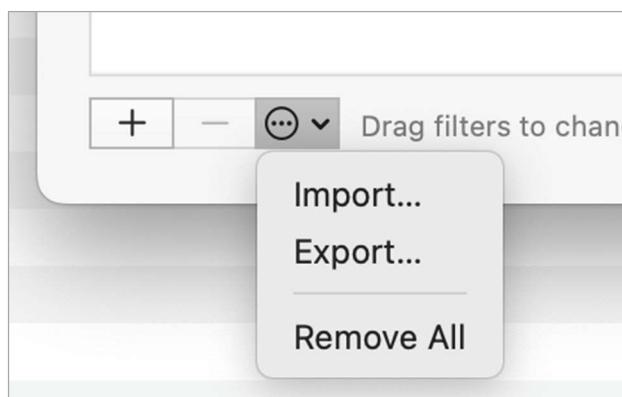


Figure 9-13 - The filters list *More* button options

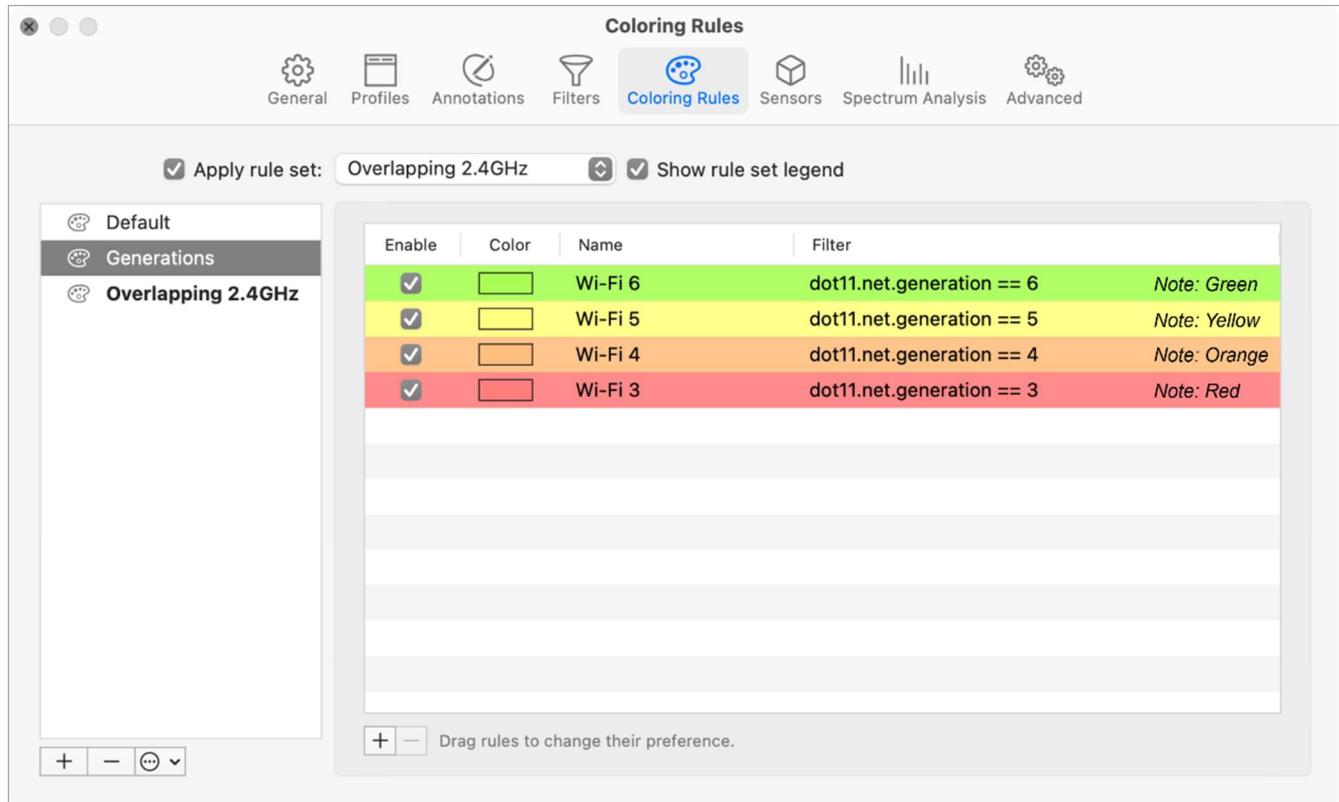


Figure 9-14 - The *Coloring Rules* settings tab

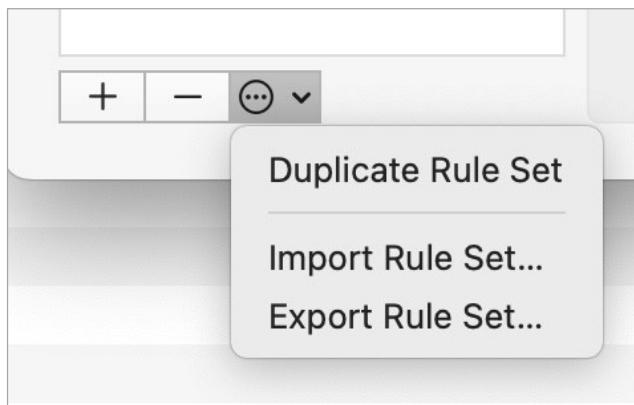


Figure 9-15 - The coloring rule sets list *More* button options

The screenshot shows the 'Sensors' settings tab in WiFi Explorer Pro 3. At the top, there are tabs for General, Profiles, Annotations, Filters, Coloring Rules, Sensors (which is selected and highlighted in blue), Spectrum Analysis, and Advanced. Below the tabs is a table with the following columns: Name, Address, Interface, Mode, and Port. The table contains four rows of data:

Name	Address	Interface	Mode	Port
WLAN Pi M4	192.168.1.75	wlan0	Passive	22
WiFi Sensor	100.91.78.105	Auto	Auto	19000
RPI4	192.168.1.74	Auto	Auto	22
WLAN Pi R4	192.168.1.76	Auto	Auto	22

At the bottom left of the table area are three small buttons: a plus sign (+), a minus sign (-), and a circular arrow with a downward arrow (refresh).

Figure 9-16 - The *Sensors* settings tab

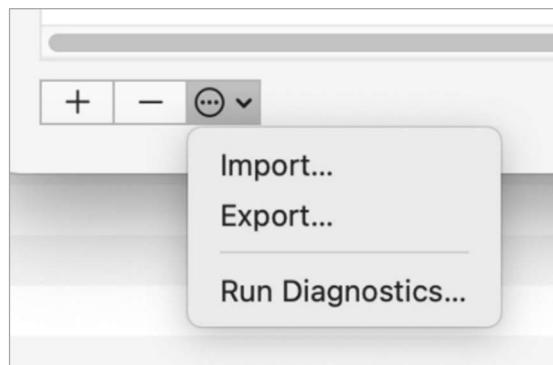


Figure 9-17 - The sensors list *More* button options

The screenshot shows the 'Spectrum Analysis' settings tab in WiFi Explorer Pro 3. At the top, there are tabs for General, Profiles, Annotations, Filters, Coloring Rules, Sensors, Spectrum Analysis (which is selected and highlighted in blue), and Advanced. Below the tabs are several configuration options:

- A checkbox labeled "When a spectrum analyzer is connected:" followed by two checked checkboxes: "Start spectrum analysis automatically" and "Display highlighted networks only".
- A checkbox labeled "Decay (seconds):" with a value of 30 and up/down arrows to adjust it.
- A checkbox labeled "Averaging window size (seconds):" with a value of 30 and up/down arrows to adjust it.
- A checkbox labeled "Utilization threshold (dBm):" with a value of -85 and up/down arrows to adjust it.
- A checkbox labeled "Color scale:" followed by another checked checkbox labeled "Autoscale".

Figure 9-18 – The *Spectrum Analysis* settings tab



Figure 9-19 – Spectrum analysis Average Trace

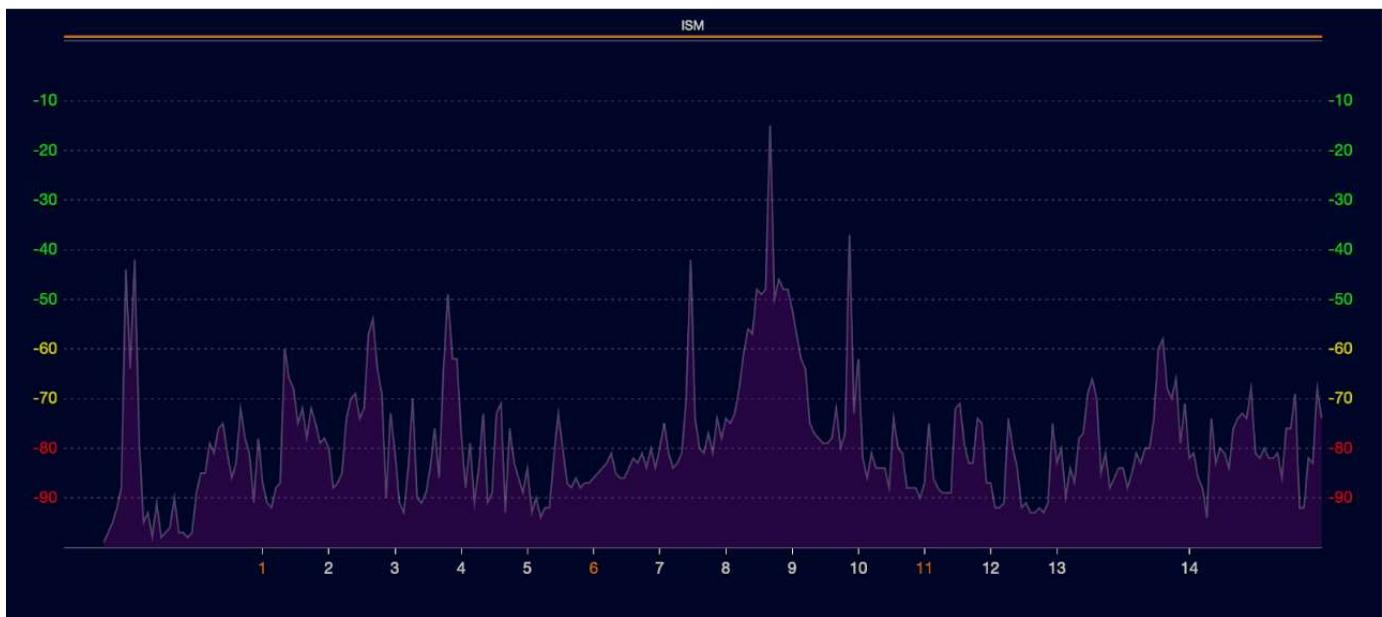


Figure 9-20 – Spectrum analysis Maximum Trace

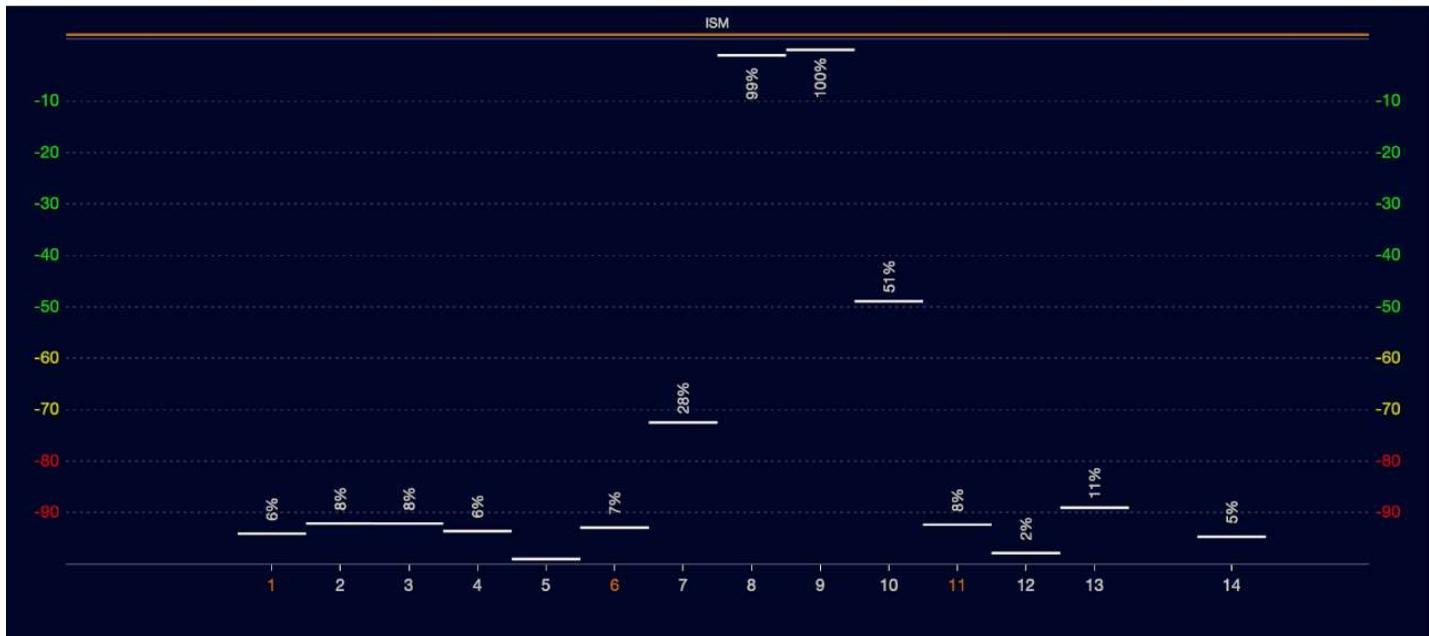


Figure 9-21 – Spectrum analysis Utilization Trace

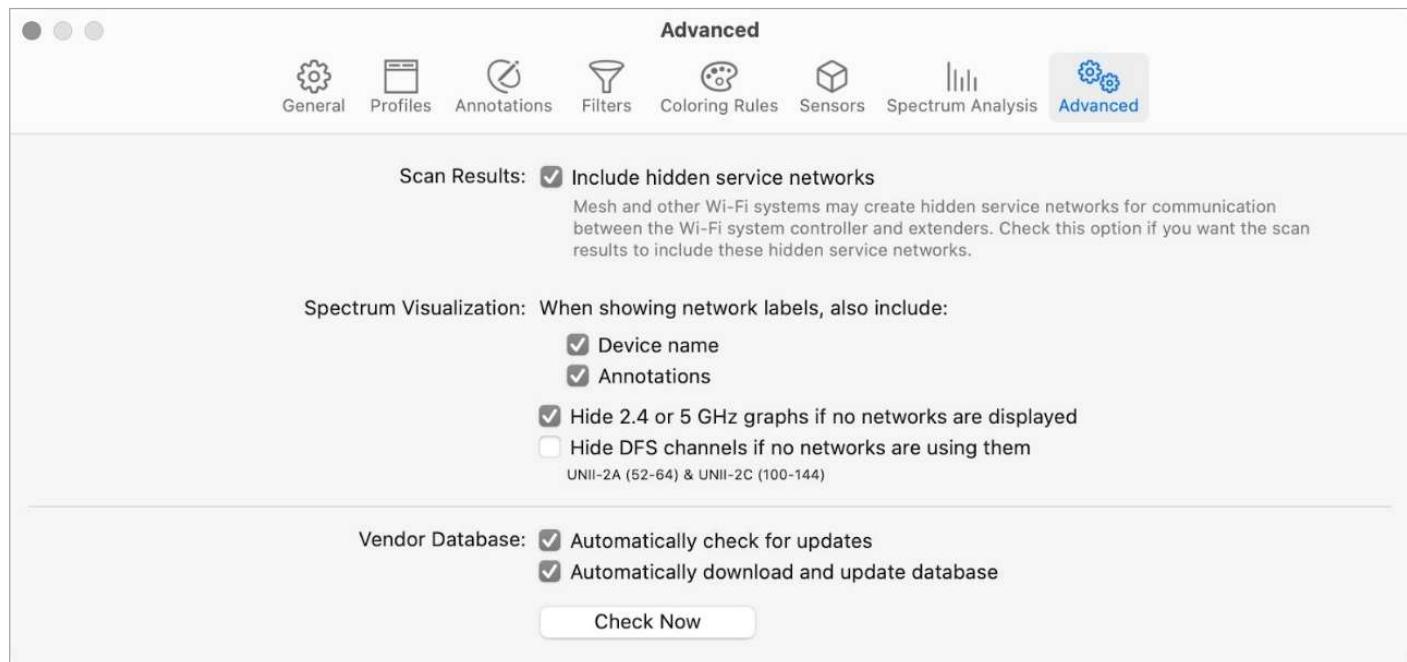


Figure 9-22 – The *Advanced* settings tab

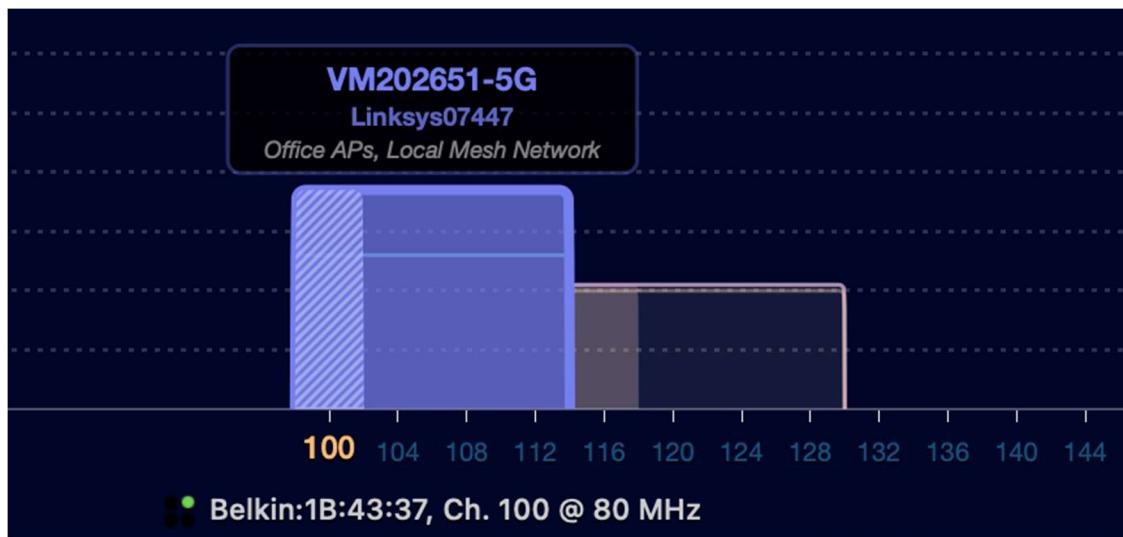


Figure 9-23 – Spectrum Visualization with device names & annotations enabled

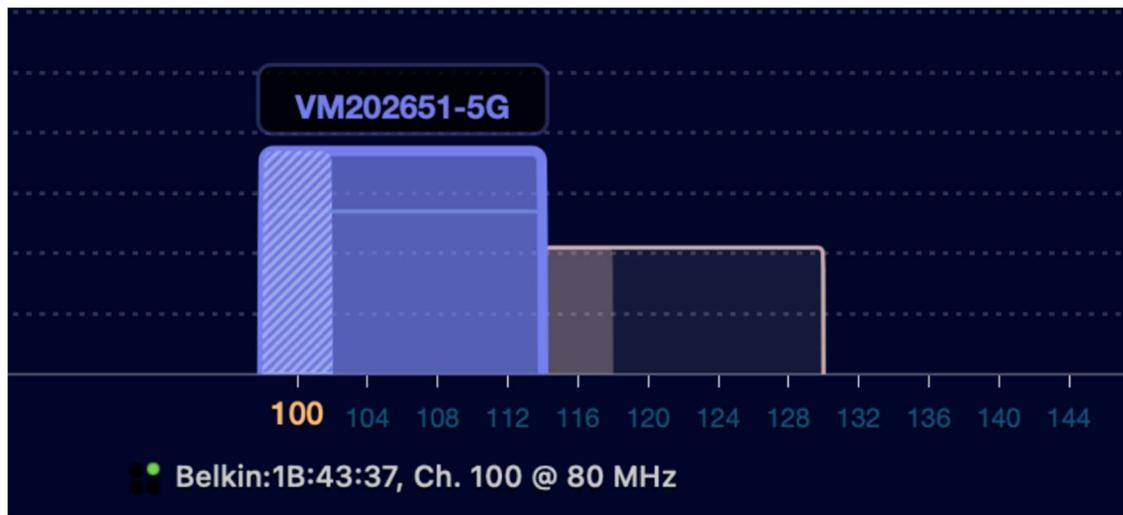


Figure 9-24 – Spectrum Visualization with device names & annotations disabled

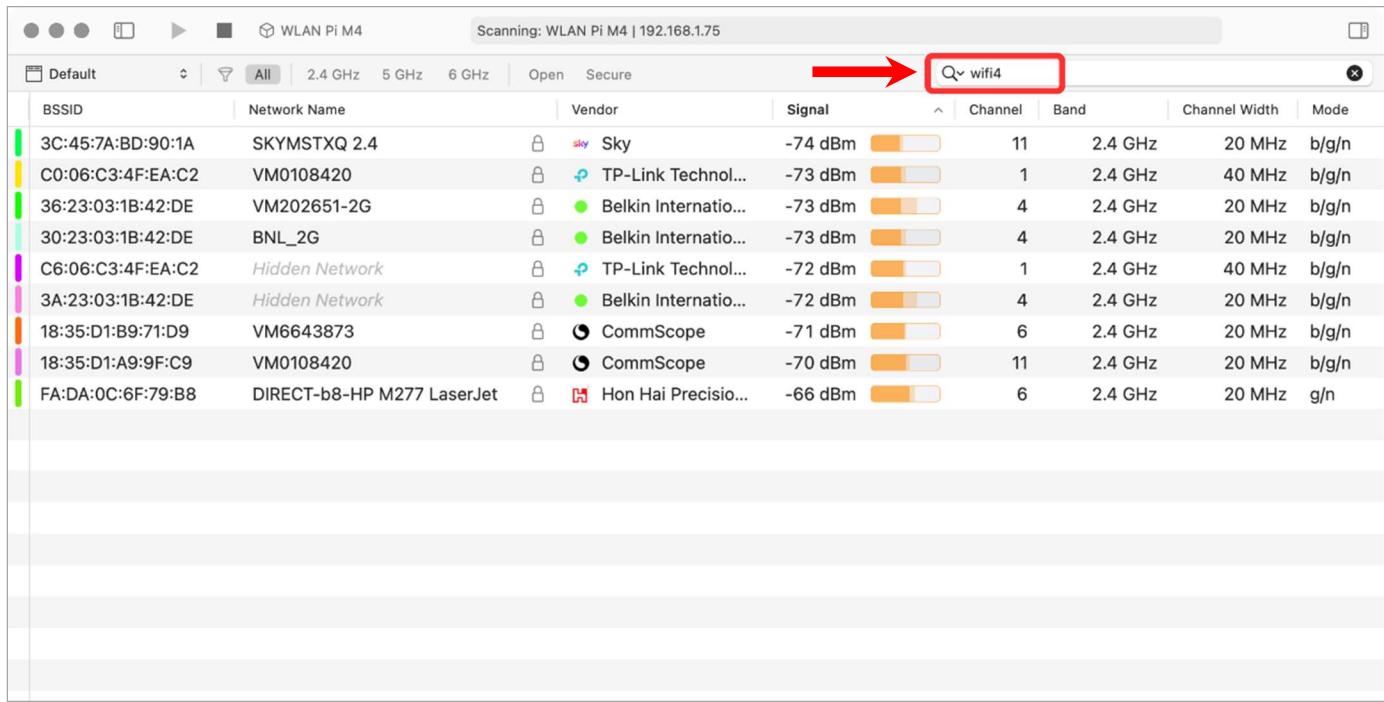
BSSID	Vendor	Network Name
18:35:D1:B9:71:DF	ARRIS Group Inc.	VM6643873
18:35:D1:A9:9F:CF	ARRIS Group Inc.	VM0108420

Figure 9-25 – Networks table showing Arris Group Inc. devices



Figure 9-26 – Online lookup of the 18:35:D1 OUI details

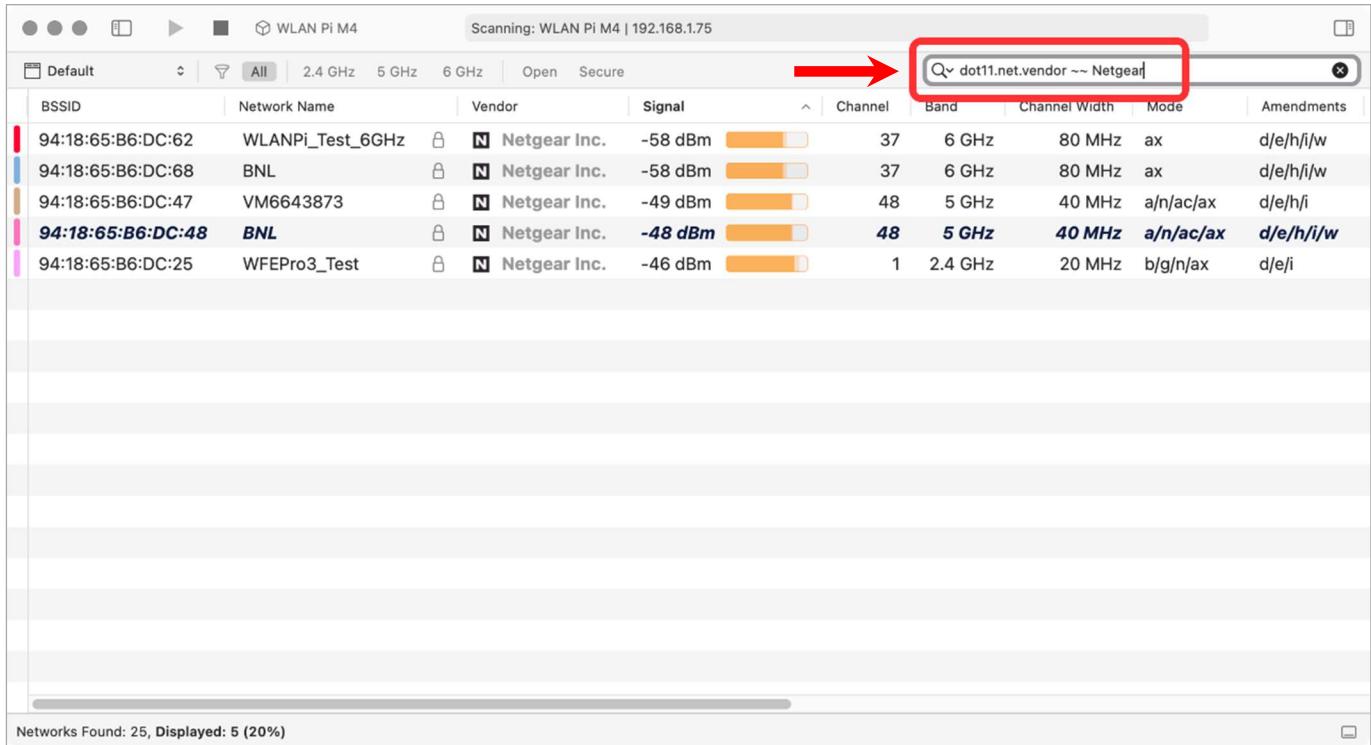
Chapter 10 – Data Visualization: Filter Expressions & Display Filters



Scanning: WLAN Pi M4 | 192.168.1.75

Default		Network Name	Vendor	Signal	Channel	Band	Channel Width	Mode
3C:45:7A:BD:90:1A	SKYMSTXQ 2.4	Sky	-74 dBm	11	2.4 GHz	20 MHz	b/g/n	
C0:06:C3:4F:EA:C2	VM0108420	TP-Link Technol...	-73 dBm	1	2.4 GHz	40 MHz	b/g/n	
36:23:03:1B:42:DE	VM202651-2G	Belkin Internatio...	-73 dBm	4	2.4 GHz	20 MHz	b/g/n	
30:23:03:1B:42:DE	BNL_2G	Belkin Internatio...	-73 dBm	4	2.4 GHz	20 MHz	b/g/n	
C6:06:C3:4F:EA:C2	Hidden Network	TP-Link Technol...	-72 dBm	1	2.4 GHz	40 MHz	b/g/n	
3A:23:03:1B:42:DE	Hidden Network	Belkin Internatio...	-72 dBm	4	2.4 GHz	20 MHz	b/g/n	
18:35:D1:B9:71:D9	VM6643873	CommScope	-71 dBm	6	2.4 GHz	20 MHz	b/g/n	
18:35:D1:A9:9F:C9	VM0108420	CommScope	-70 dBm	11	2.4 GHz	20 MHz	b/g/n	
FA:DA:0C:6F:79:B8	DIRECT-b8-HP M277 LaserJet	Hon Hai Precisio...	-66 dBm	6	2.4 GHz	20 MHz	g/n	

Figure 10-1 – Filtering with keywords



Scanning: WLAN Pi M4 | 192.168.1.75

Default		Network Name	Vendor	Signal	Channel	Band	Channel Width	Mode	Amendments
94:18:65:B6:DC:62	WLANPi_Test_6GHz	Netgear Inc.	-58 dBm	37	6 GHz	80 MHz	ax	d/e/h/i/w	
94:18:65:B6:DC:68	BNL	Netgear Inc.	-58 dBm	37	6 GHz	80 MHz	ax	d/e/h/i/w	
94:18:65:B6:DC:47	VM6643873	Netgear Inc.	-49 dBm	48	5 GHz	40 MHz	a/n/ac/ax	d/e/h/i	
94:18:65:B6:DC:48	BNL	Netgear Inc.	-48 dBm	48	5 GHz	40 MHz	a/n/ac/ax	d/e/h/i/w	
94:18:65:B6:DC:25	WFEPro3_Test	Netgear Inc.	-46 dBm	1	2.4 GHz	20 MHz	b/g/n/ax	d/e/i	

Networks Found: 25, Displayed: 5 (20%)

Figure 10-2 – Network attribute filter applied to the networks table

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

The screenshot shows the WiFi Explorer Pro 3 interface with a search bar at the top containing the query `Q~ dot11.rm_enabled_cap.rm_enabled_cap.neighbor_report`. A red arrow points from the search bar to a context menu that has appeared over an information element field in the details pane. The context menu includes options like "Apply as Column", "Apply as Filter" (which is highlighted with a red box), "New Filter...", "New Coloring Rule...", "Copy Element", "Copy All Elements", and "Expand Item".

BSSID	Network Name	Vendor	Signal	Channel	Band	Channel Width	Mode	Amendments
C0:06:C3:4F:EB:DB	VM0108420	TP-Link Tec...	-83 dBm	36	5 GHz	80 MHz	a/n/ac	d/e/i/k/v
C6:06:C3:4F:EA:C3	Hidden Network	TP-Link Tec...	-80 dBm	36	5 GHz	80 MHz	a/n/ac	d/e/i/k/v
18:35:D1:A9:9F:CF	VM0108420	CommScope	-80 dBm	44	5 GHz	80 MHz	a/n/ac	d/e/i/k/v
C0:06:C3:4F:EA:C3	VM0108420	TP-Link Tec...	-78 dBm	36	5 GHz	80 MHz	a/n/ac	d/e/i/k/v

Figure 10-3 – Information element field filter applied to the networks table

The screenshot shows the WiFi Explorer Pro 3 interface with a search bar at the top containing the query `Q~ dot11.net.ssid == VM0108420`. A red arrow points from the search bar to the results table below. The table lists several wireless networks, with the first five matching the specified SSID. The results pane at the bottom shows "Networks Found: 25, Displayed: 5 (20%)".

BSSID	Network Name	Vendor	Signal	Channel	Band	Channel Width	Mode	Amendments
C0:06:C3:4F:EB:DB	VM0108420	TP-Link Tec...	-82 dBm	36	5 GHz	80 MHz	a/n/ac	d/e/i/k/v
18:35:D1:A9:9F:CF	VM0108420	CommScope	-80 dBm	44	5 GHz	80 MHz	a/n/ac	d/e/i/k/v
C0:06:C3:4F:EA:C3	VM0108420	TP-Link Tec...	-79 dBm	36	5 GHz	80 MHz	a/n/ac	d/e/i/k/v
C0:06:C3:4F:EA:C2	VM0108420	TP-Link Tec...	-72 dBm	1	2.4 GHz	40 MHz	b/g/n	d/e/i/k/v
18:35:D1:A9:9F:C9	VM0108420	CommScope	-72 dBm	11	2.4 GHz	20 MHz	b/g/n	d/e/i/k/v

Figure 10-4 – Filtering using a comparison operator

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

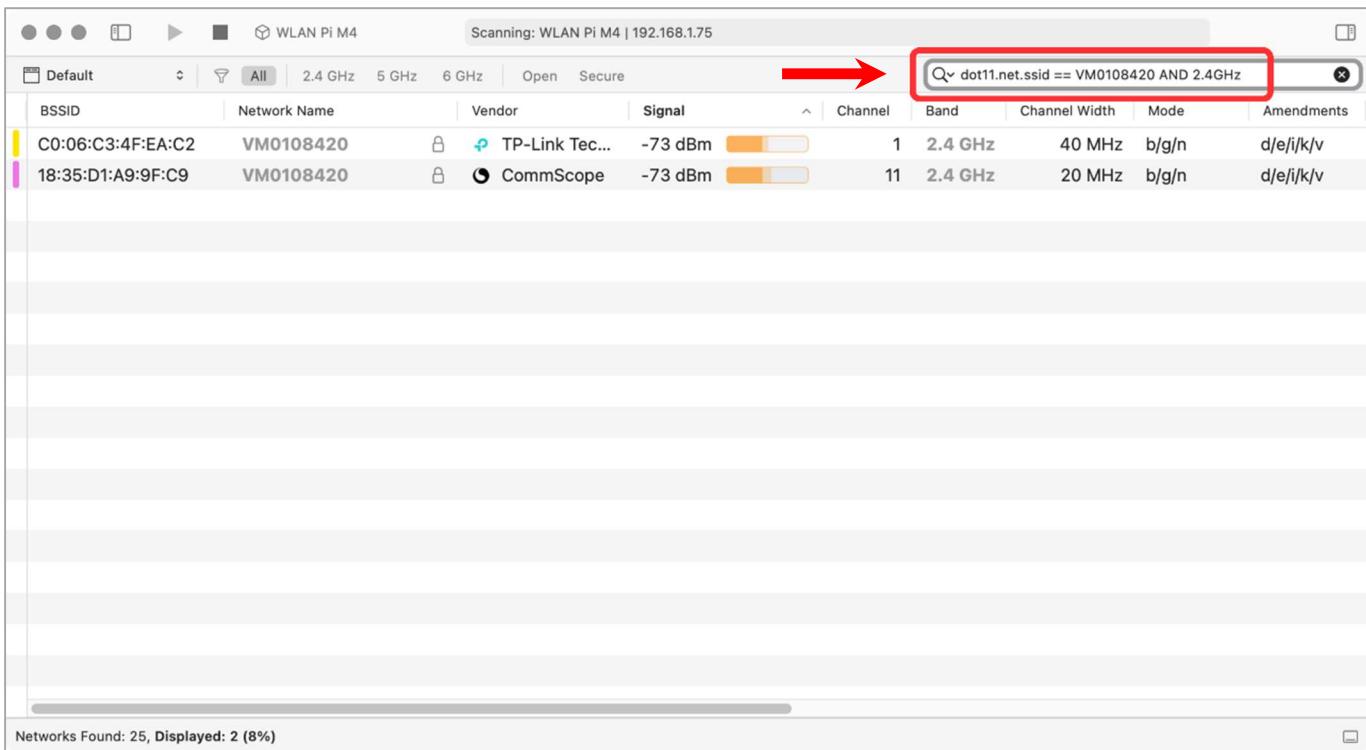


Figure 10-5 – Filtering example using multiple expressions

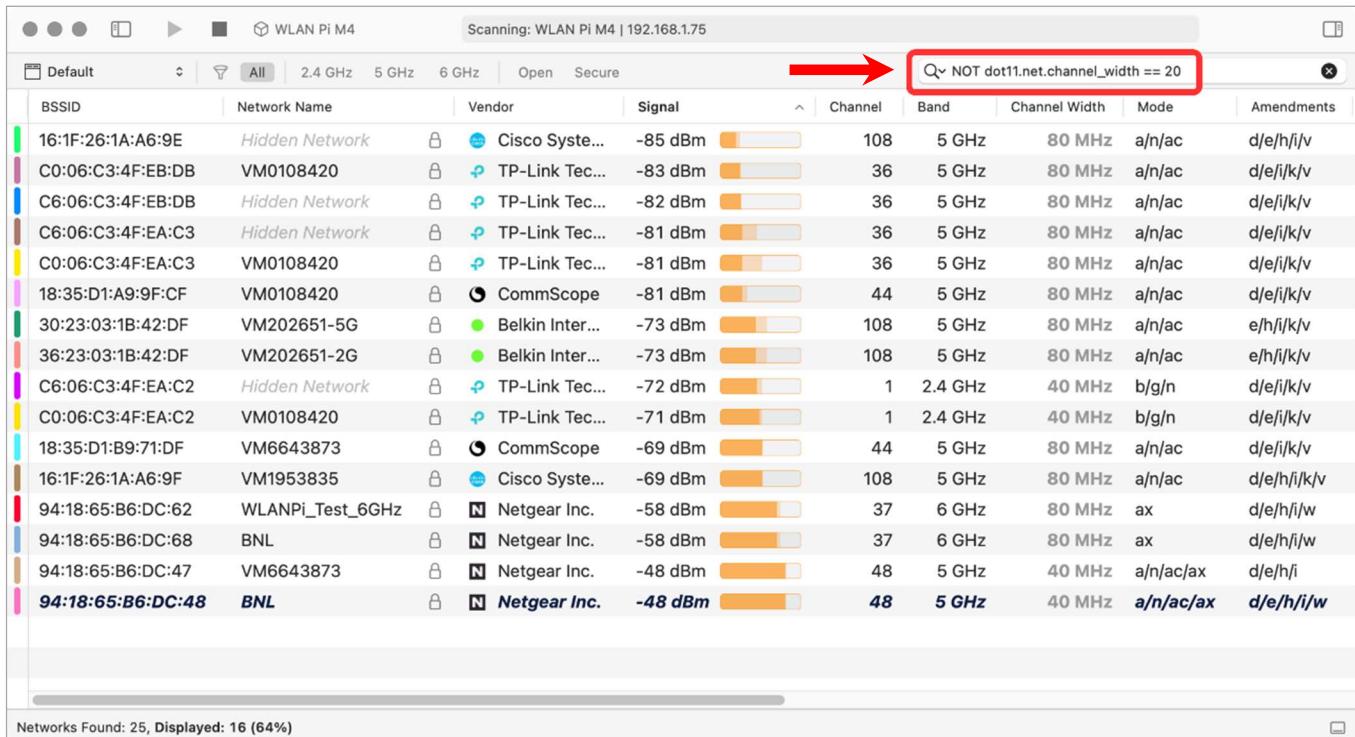


Figure 10-6 – Filtering using the negation operator

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

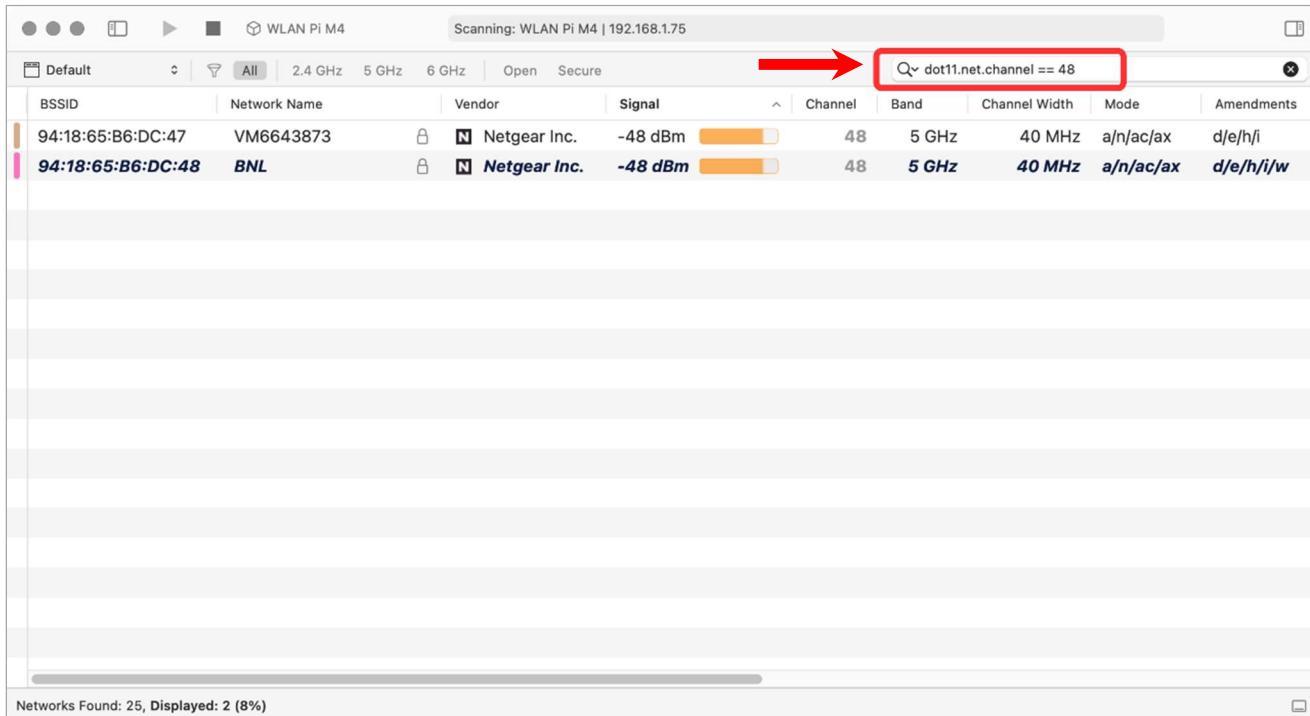


Figure 10-7 – Filter field location

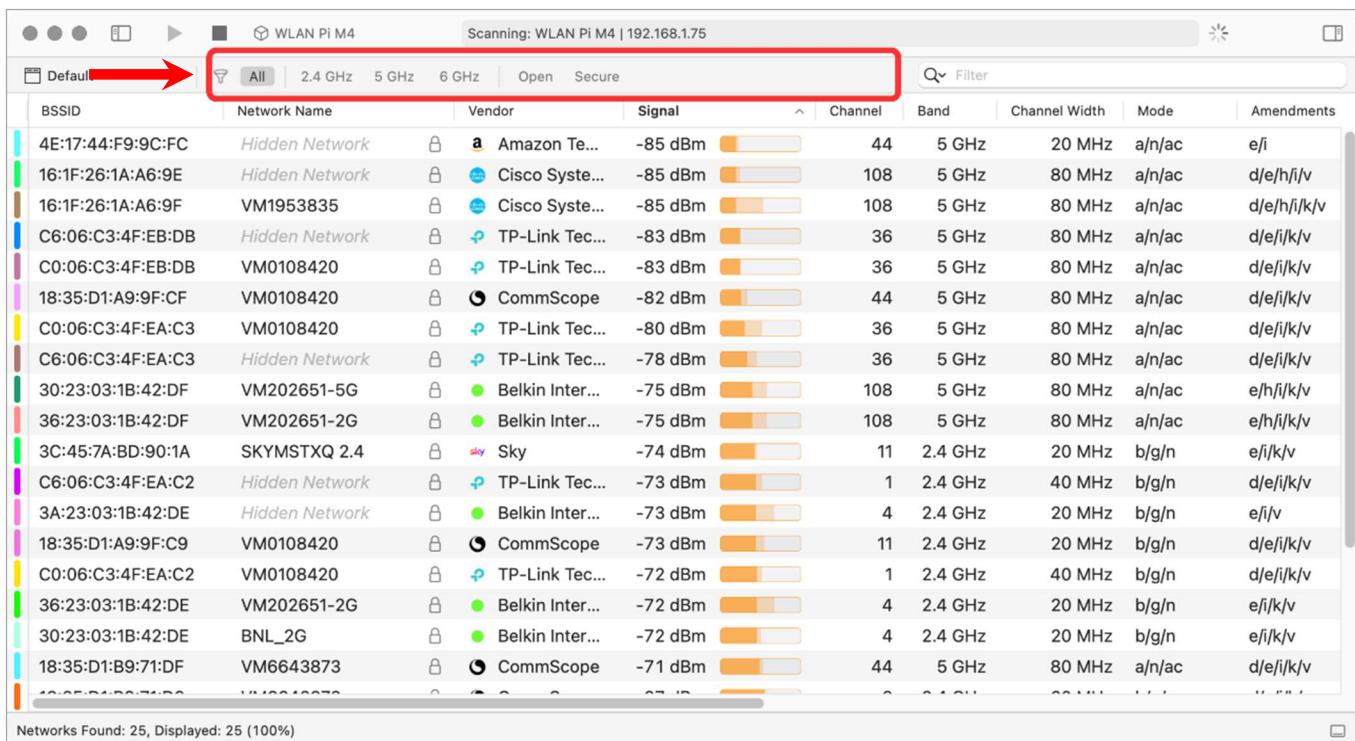


Figure 10-8 – Quick filter bar location

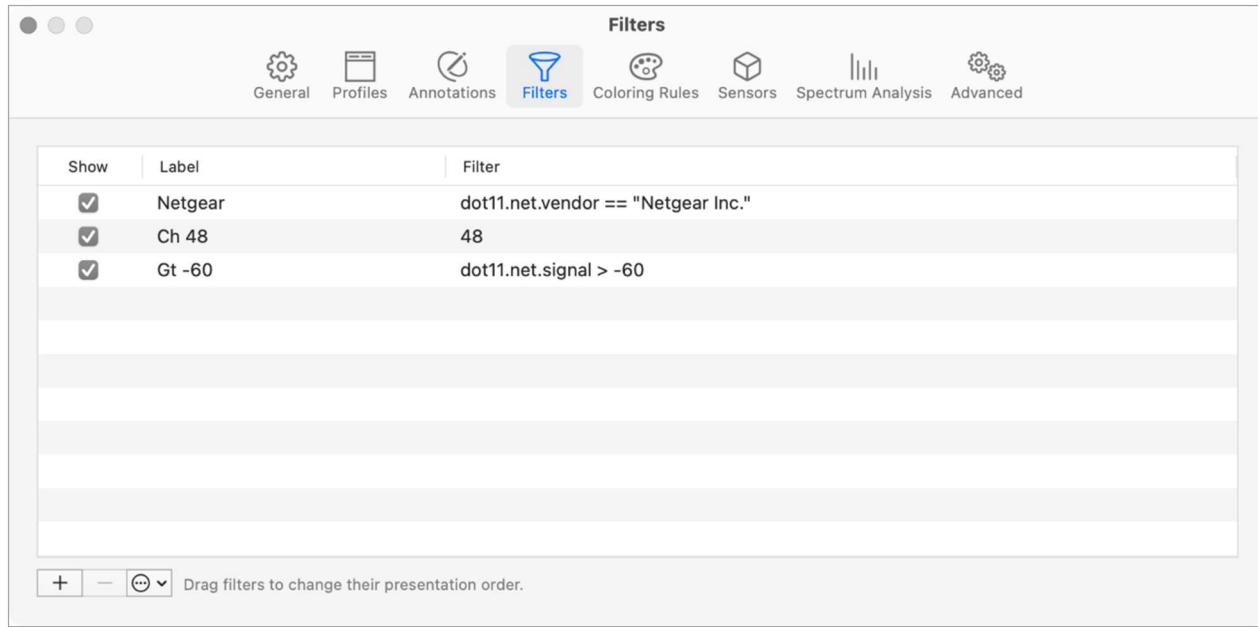


Figure 10-9 – The *Filters* settings tab

The screenshot shows the main interface of WiFi Explorer Pro 3, displaying a list of scanned wireless networks. The header includes buttons for Default, All, 2.4 GHz, 5 GHz, 6 GHz, Open, Secure, Netgear, Ch 48, and Gt -60. A red box highlights the 'Gt -60' filter in the quick filter bar. A red arrow points from this filter down to the list of networks, specifically highlighting the 'Signal' column.

BSSID	Network Name	Vendor	Signal	Channel	Band	Channel Width	Mode	Amendments
94:18:65:B6:DC:62	WLANPi_Test_6GHz	Netgear Inc.	-58 dBm	37	6 GHz	80 MHz	ax	d/e/h/i/w
94:18:65:B6:DC:68	BNL	Netgear Inc.	-58 dBm	37	6 GHz	80 MHz	ax	d/e/h/i/w
94:18:65:B6:DC:47	VM6643873	Netgear Inc.	-48 dBm	48	5 GHz	40 MHz	a/n/ac/ax	d/e/h/i
94:18:65:B6:DC:48	BNL	Netgear Inc.	-48 dBm	48	5 GHz	40 MHz	a/n/ac/ax	d/e/h/i/w
94:18:65:B6:DC:25	WFEPro3_Test	Netgear Inc.	-46 dBm	1	2.4 GHz	20 MHz	b/g/n/ax	d/e/i

Figure 10-10 – Custom filters on the quick filter bar

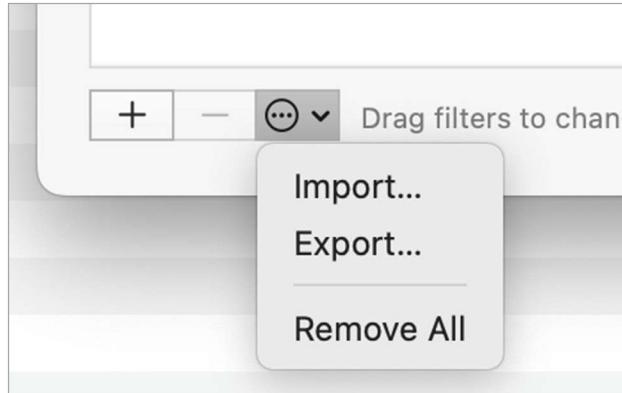


Figure 10-11 - The filters list **More** button options

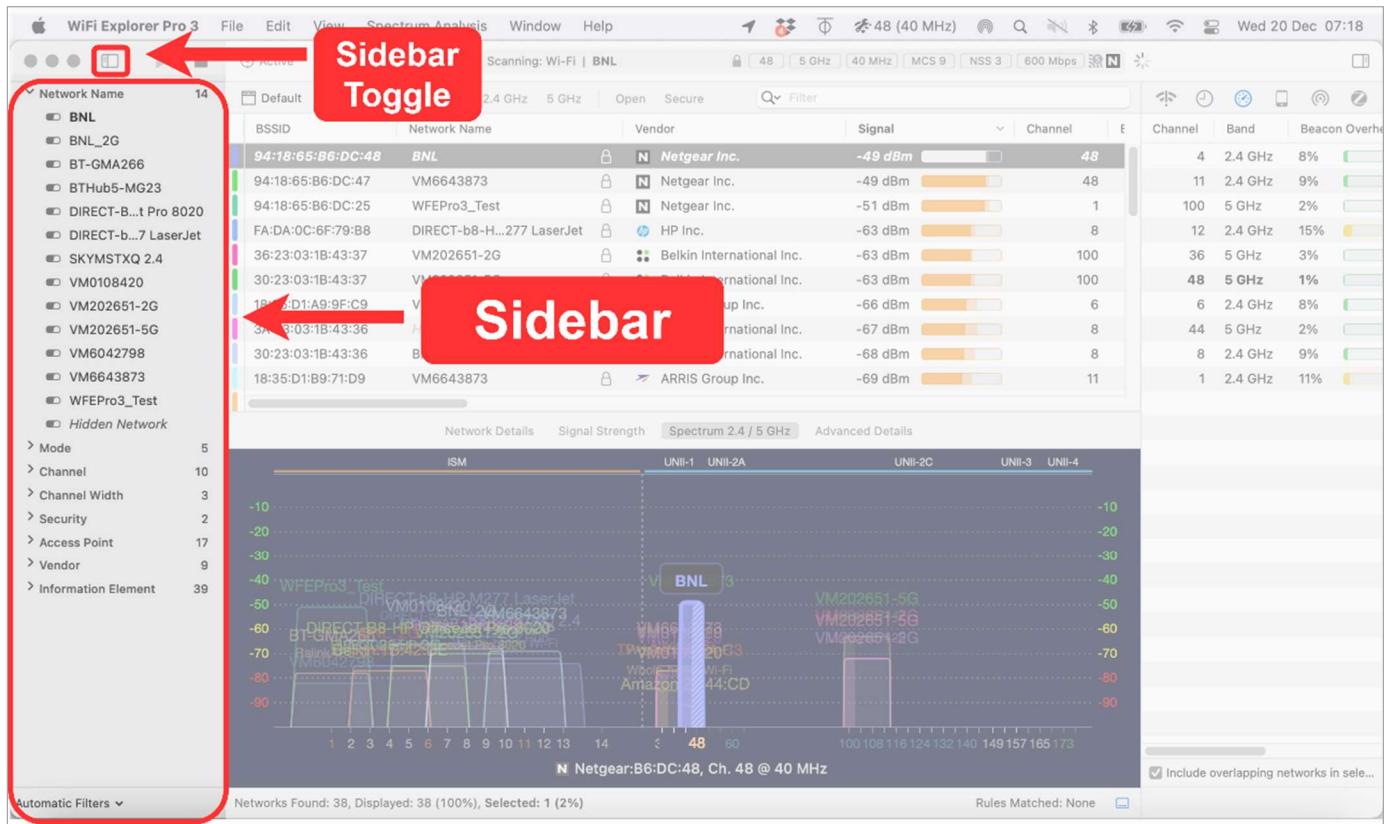


Figure 10-12 - **Sidebar** UI location

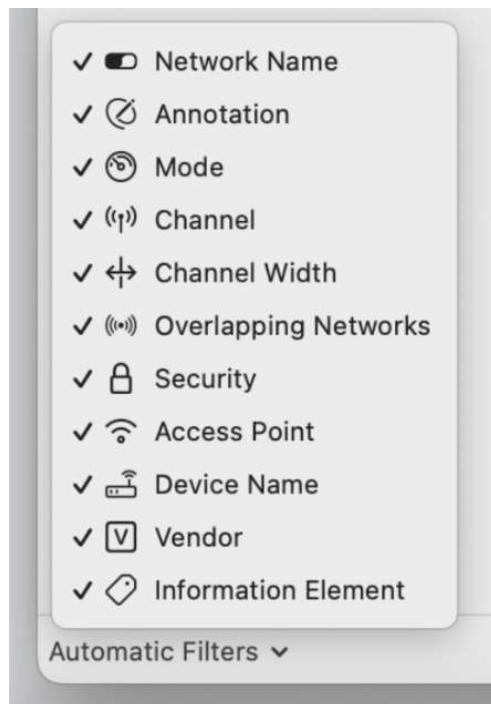


Figure 10-13 - Sidebar *Automatic Filter* options

The screenshot shows the main interface of WiFi Explorer Pro 3 after applying the 'Mode' filter. The left sidebar shows a tree view of filter categories, with 'Mode' expanded and '802.11a/n/ac/ax' selected, highlighted with a red border. The main pane displays a table of scanned networks, with the 'Mode' column filtered to show only rows where the mode is 'a/n/ac/ax'. The table includes columns for Vendor, BSSID, Network Name, Signal, Channel, Band, and Mode. Two rows are visible, both belonging to Netgear Inc. with BSSID 94:18:65:B6:DC:47 and Network Name BNL, and both listed as '802.11a/n/ac/ax' in the Mode column. A red arrow points from the '802.11a/n/ac/ax' entry in the sidebar to the corresponding row in the table.

Scanning: Wi-Fi BNL		48	5 GHz	40 MHz	MCS 9	NSS 3	600 Mbps	WPA2	N	...
<input checked="" type="checkbox"/> Default	<input checked="" type="checkbox"/> All	2.4 GHz	5 GHz	Open	Secure					
Vendor	BSSID	Network Name	Signal	Channel	Band	Mode				
Netgear Inc.	94:18:65:B6:DC:47	VM6643873	-55 dBm	48	5 GHz	a/n/ac/ax				
Netgear Inc.	94:18:65:B6:DC:48	BNL	-55 dBm	48	5 GHz	a/n/ac/ax				

Figure 10-14 - Sidebar filter example using a *Mode* filter

Vendor	BSSID	Network Name	Signal	Channel	Band	Mode
Netgear Inc.	94:18:65:B6:DC:25	WFEPro3_Test	-50 dBm	1	2.4 GHz	b/g/n/ac
HP Inc.	FA:DA:0C:6F:79:B8	DIRECT...aserJet	-67 dBm	11	2.4 GHz	g/n
Belkin Internatio...	3A:23:03:1B:42:DE	Hidden Network	-69 dBm	4	2.4 GHz	b/g/n
CommScope	18:35:D1:B9:71:D9	VM6643873	-71 dBm	11	2.4 GHz	b/g/n
CommScope	18:35:D1:A9:9F:C9	VM0108420	-71 dBm	11	2.4 GHz	b/g/n
TP-Link Technol...	C6:06:C3:4F:EA:C2	Hidden Network	-72 dBm	1	2.4 GHz	b/g/n
TP-Link Technol...	C0:06:C3:4F:EA:C2	VM0108420	-72 dBm	1	2.4 GHz	b/g/n
Belkin Internatio...	36:23:03:1B:42:DE	VM202651-2G	-72 dBm	4	2.4 GHz	b/g/n
Belkin Internatio...	30:23:03:1B:42:DE	BNL_2G	-72 dBm	4	2.4 GHz	b/g/n
CommScope	18:35:D1:B9:71:DF	VM6643873	-73 dBm	44	5 GHz	a/n/ac
Belkin Internatio...	30:23:03:1B:42:DF	VM202651-5G	-75 dBm	108	5 GHz	a/n/ac
Belkin Internatio...	36:23:03:1B:42:DF	VM202651-2G	-75 dBm	108	5 GHz	a/n/ac
HP Inc.	02:68:EB:44:88:B8	DIRECT...o 8020	-78 dBm	1	2.4 GHz	g/n
Amazon Technol...	1E:48:BE:25:44:CD	Hidden Network	-79 dBm	44	5 GHz	a/n/ac
TP-Link Technol...	C6:06:C3:4F:EB:DA	Hidden Network	-80 dBm	1	2.4 GHz	b/g/n
	5A:83:BF:34:67:E4	EE WiFi	-80 dBm	1	2.4 GHz	b/g/n
TP-Link Technol...	C0:06:C3:4F:EB:DA	VM0108420	-81 dBm	1	2.4 GHz	b/g/n
Arcadyan Techno...	18:83:BF:34:67:E3	BTHub5-MG23	-82 dBm	1	2.4 GHz	b/g/n
	CC:15:74:BD:00:11	SKYNETV2.0.1	-82 dBm	11	2.4 GHz	b/g/n

Figure 10-15 - Sidebar filter example using a negated Mode filter

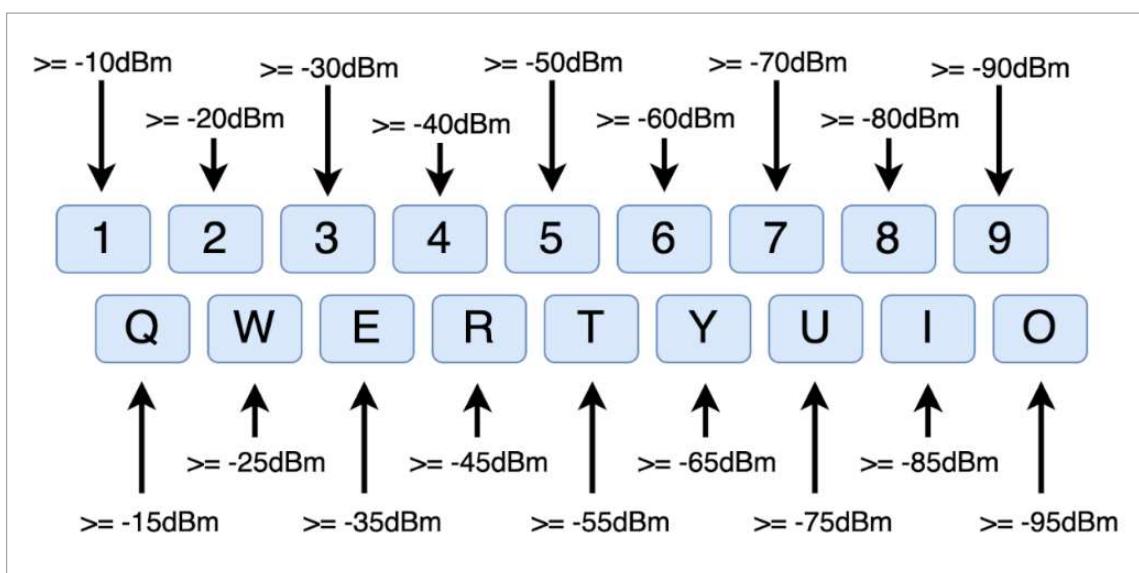


Figure 10-16 - Keyboard shortcut filters

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

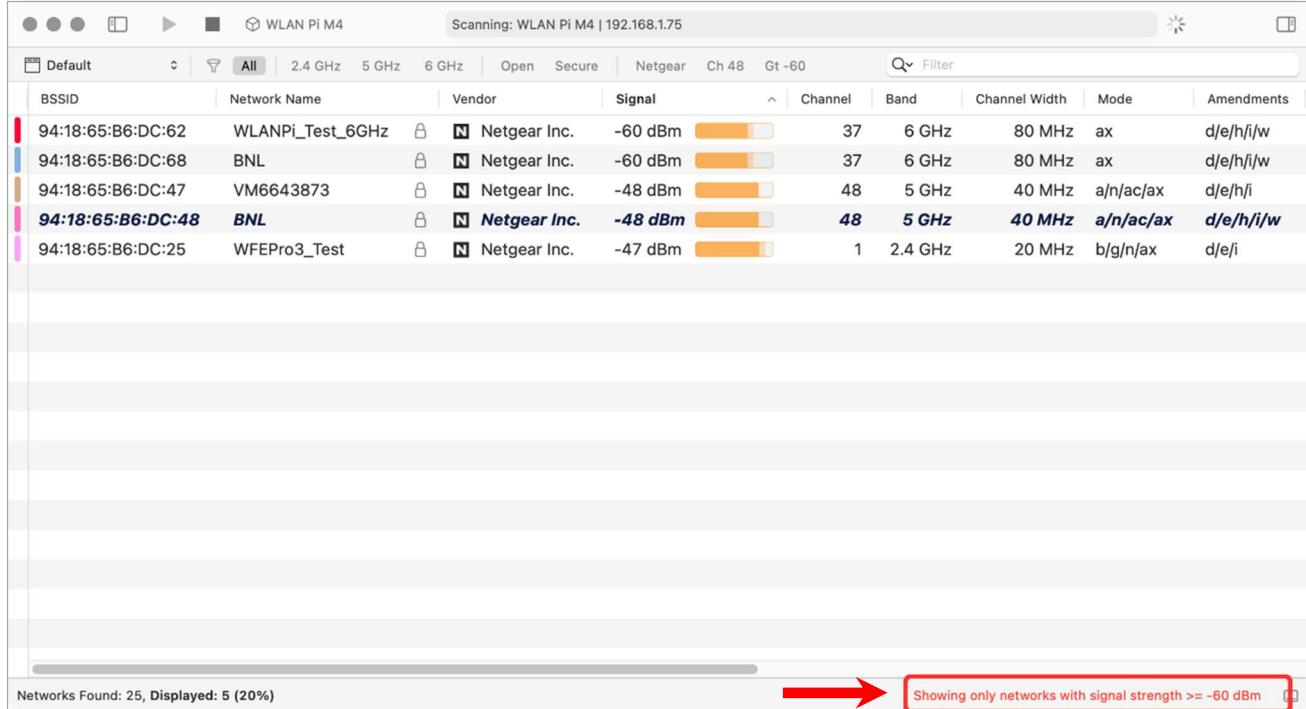


Figure 10-17 - Keyboard shortcut filter applied for -60 dBm (Ctrl-6)

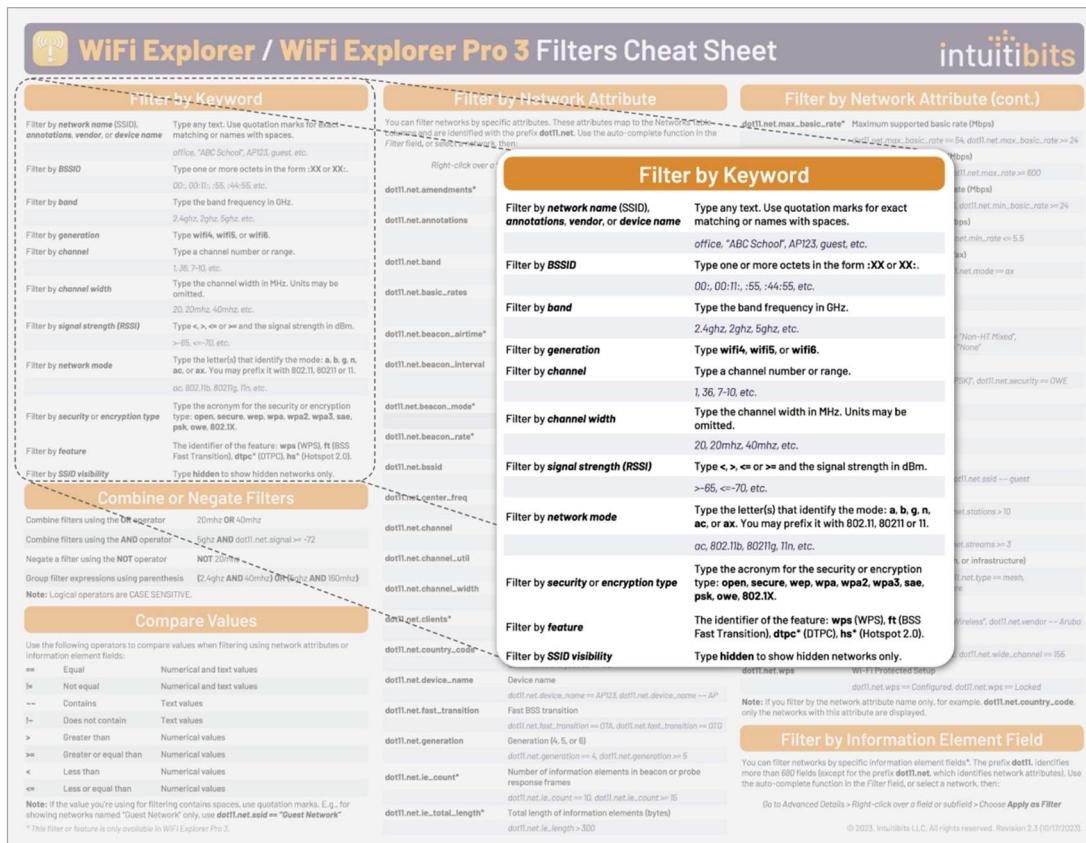


Figure 10-18 – Filters cheat sheet available from www.intuitibits.com

Chapter 11 - Data Visualization: Columns & Profiles

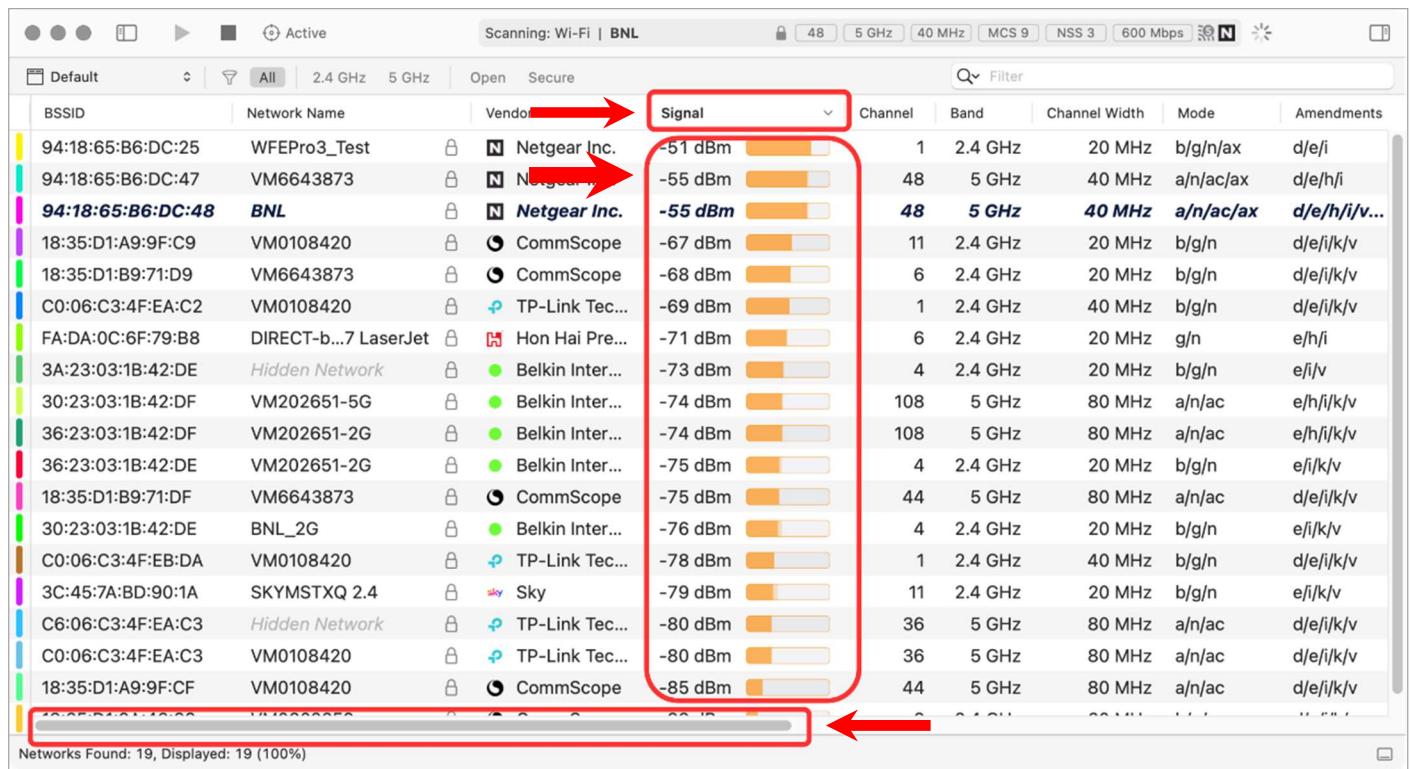


Figure 11-1 - Typical WLAN scan data listing

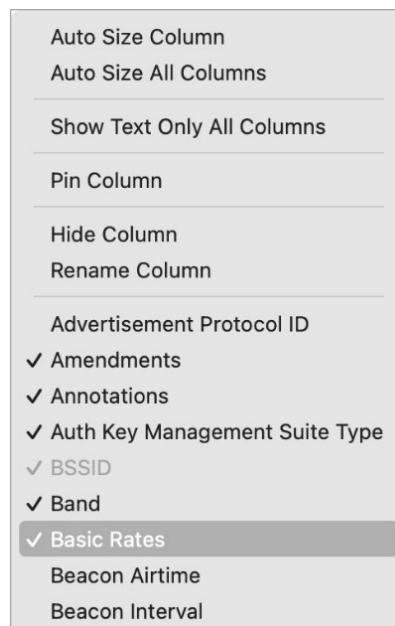


Figure 11-2 - Columns menu (accessed by Control-clicking any column header)

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

The screenshot shows the WiFi Explorer Pro 3 interface during a scan for 'BNL'. A context menu is open over the 'Group Cipher Suite Type' column for the entry 'CCMP-128'. The menu items include 'Apply as Column' (highlighted with a red box), 'Apply as Filter', 'New Filter...', 'New Coloring Rule...', 'Copy Element', 'Copy All Elements', and 'Expand Item'. A red arrow points from the 'RSN Version' row to the 'dot11.rsn.group_cipher_suite_type' entry in the bottom left of the interface.

BSSID	Network Name	Vendor	Signal	Channel	Band	Channel Width	Group Cipher Suite Type	Mode
94:18:65:B6:DC:25	WFEPro3_Test	Netgear Inc.	-54 dBm	1	2.4 GHz	20 MHz	CCMP-128	b/g/n/a
94:18:65:B6:DC:47	VM6643873	Netgear Inc.	-55 dBm	48	5 GHz	40 MHz	CCMP-128	a/n/ac/
94:18:65:B6:DC:48	BNL	Netgear Inc.	-56 dBm	48	5 GHz	40 MHz	CCMP-128	a/n/ac,
C6:06:C3:4F:EA:C2	Hidden Network	TP-Link Tec...	-65 dBm	1	2.4 GHz	40 MHz	CCMP-128	b/g/n
C0:06:C3:4F:EA:C2	VM0108420	TP-Link Tec...	-67 dBm	1	2.4 GHz	40 MHz	CCMP-128	b/g/n

Figure 11-3 - Custom column addition

The screenshot shows the 'Profiles' settings tab. The 'Profiles' tab is selected in the top navigation bar. A custom profile named 'Channels_Info' is selected in the profile list on the left. The main area displays a list of fields with checkboxes for 'Show' and 'Pin' columns. Fields listed include BSSID, Network Name, Channel, Center Frequency, Channel Width, Channel Utilization, Signal, Noise, Count, Vendor, Device Name, and Annotations. Below the list is a text input field for the address of the wireless router or access point, with '+' and '-' buttons for clearing it.

Show	Pin	Name	Field
<input checked="" type="checkbox"/>	<input type="checkbox"/>	BSSID	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Network Name	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Channel	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Center Frequency	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Channel Width	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Channel Utilization	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Signal	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Noise	
<input type="checkbox"/>	<input type="checkbox"/>	Count	
<input type="checkbox"/>	<input type="checkbox"/>	Vendor	
<input type="checkbox"/>	<input type="checkbox"/>	Device Name	
<input type="checkbox"/>	<input type="checkbox"/>	Annotations	

Figure 11-4 – The *Profiles* settings tab showing a custom profile

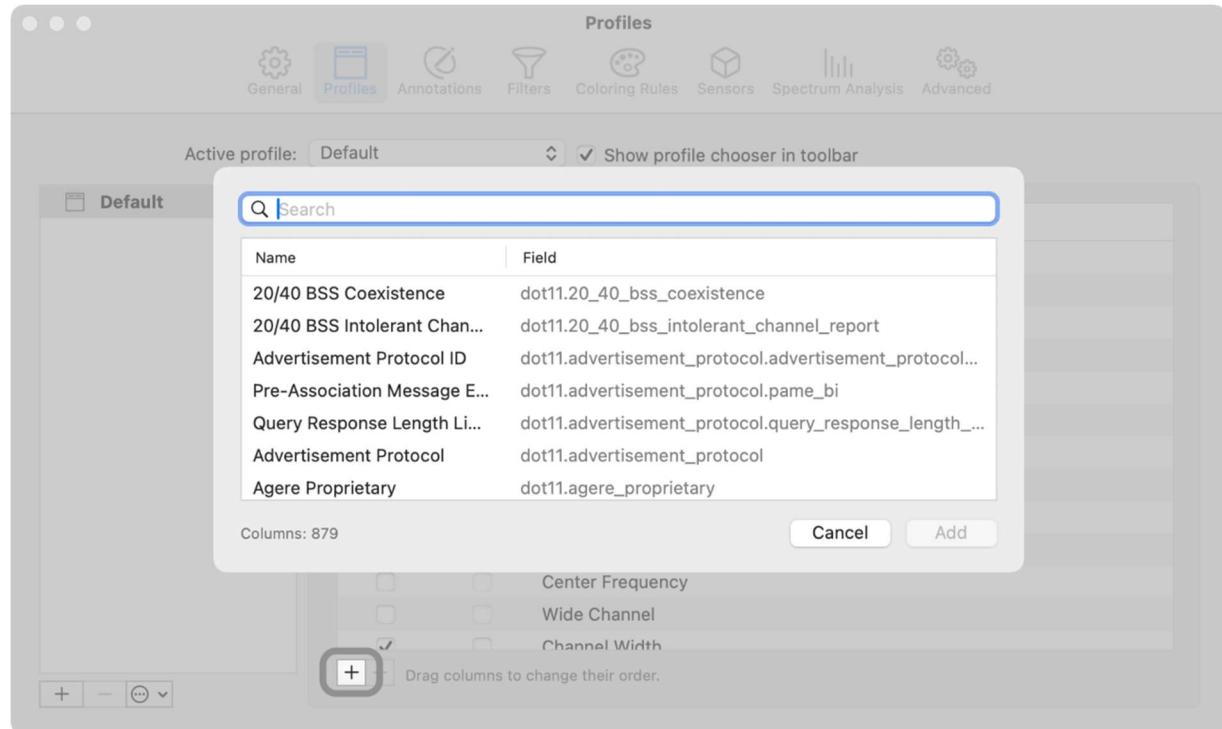


Figure 11-5 - Adding new columns to a profile

Network Name	BSSID	Channel	Center Frequency	Channel Width	Channel Utilization	Signal	Noise
BNL	94:18:65:B6:DC:48	48	5240 MHz	40 MHz	-49 dBm	-96 dBm	
VM6643873	94:18:65:B6:DC:47	48	5240 MHz	40 MHz	-49 dBm	-96 dBm	
VM202651-2G	36:23:03:1B:43:37	100	5500 MHz	80 MHz	-69 dBm	-92 dBm	
VM202651-5G	30:23:03:1B:43:37	100	5500 MHz	80 MHz	-69 dBm	-92 dBm	
VM202651-2G	36:23:03:1B:42:DF	100	5500 MHz	80 MHz	-72 dBm	-92 dBm	
VM202651-5G	30:23:03:1B:42:DF	100	5500 MHz	80 MHz	-73 dBm	-92 dBm	
Hidden Network	C6:06:C3:4F:EA:C3	36	5180 MHz	80 MHz	-78 dBm	-96 dBm	
VM6643873	18:35:D1:B9:71:DF	44	5220 MHz	80 MHz	-79 dBm	-96 dBm	
VM0108420	C0:06:C3:4F:EA:C3	36	5180 MHz	80 MHz	-81 dBm	-96 dBm	
Hidden Network	4E:17:44:F9:9C:FC	44	5220 MHz	20 MHz	-85 dBm	-96 dBm	
VM0108420	18:35:D1:A9:9F:CF	44	5220 MHz	80 MHz	-86 dBm	-96 dBm	
Hidden Network	1E:48:BE:25:44:CD	44	5220 MHz	20 MHz	-86 dBm	-96 dBm	
Hidden Network	C6:06:C3:4F:EB:DB	36	5180 MHz	80 MHz	-89 dBm	-96 dBm	
VM0108420	C0:06:C3:4F:EB:DB	36	5180 MHz	80 MHz	-90 dBm	-96 dBm	

Figure 11-6 - Networks Area with "Channels_Info" profile applied

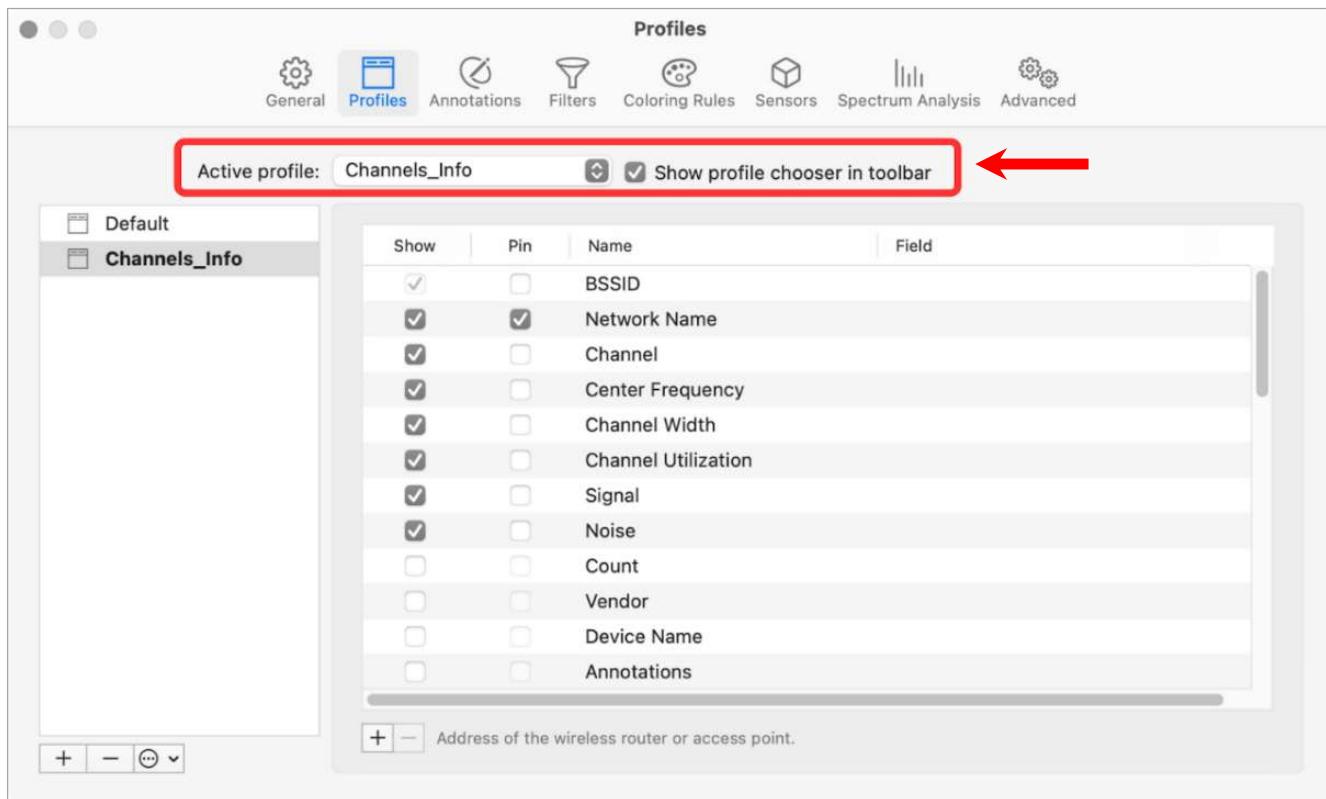
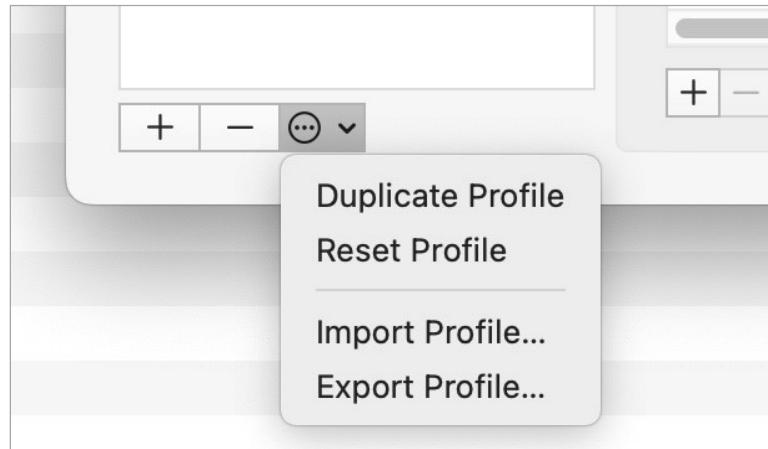


Figure 11-7 - Active profile selector in *Settings*

The screenshot shows the main scanning interface of WiFi Explorer Pro 3. At the top, it says 'Scanning: Wi-Fi | VM202651-5G'. Below that is a toolbar with icons for file operations and a dropdown labeled 'Active'. A red box highlights the 'Channels_Info' dropdown in the toolbar. The main area is a table of network results with columns: Network Name, BSSID, Channel, Center Frequency, Channel Width, and others. The row for 'VM202651-5G' is highlighted in blue.

Network Name	BSSID	Channel	Center Frequency	Channel Width
BNL	94:18:65:B6:DC:48	48	5240 MHz	40 MHz
VM6643873	94:18:65:B6:DC:47	48	5240 MHz	40 MHz
VM202651-2G	36:23:03:1B:43:37	100	5500 MHz	80 MHz
VM202651-5G	30:23:03:1B:43:37	100	5500 MHz	80 MHz
VM202651-2G	36:23:03:1B:42:DF	100	5500 MHz	80 MHz
VM202651-5G	30:23:03:1B:42:DF	100	5500 MHz	80 MHz
Hidden Network	C6:06:C3:4F:EA:C3	36	5180 MHz	80 MHz
VM6643873	18:35:D1:B9:71:DF	44	5220 MHz	80 MHz
VM0108420	C0:06:C3:4F:EA:C3	36	5180 MHz	80 MHz
Hidden Network	4E:17:44:F9:9C:FC	44	5220 MHz	20 MHz

Figure 11-8 - Profile chooser location

Figure 11-9 - The profiles list **More** button options

A screenshot of the WiFi Explorer Pro 3 software interface showing a list of wireless networks. A context menu is open over the 'Network Name' column header. The menu items include: 'Auto Size Column', 'Auto Size All Columns', a separator line, 'Show Text Only All Columns', 'Align Text', another separator line, 'Pin Column' (which is highlighted with a red box and arrow), 'Hide Column', 'Rename Column', a separator line, 'Advertisement Protocol ID', a checked checkbox for 'Amendments', an unchecked checkbox for 'Annotations', another checked checkbox for 'Auth Key Management Suite Type', and an unchecked checkbox for 'BSSID'. Red arrows point from the text 'Network Name' and 'Pin Column' to their respective menu items.

BSSID	Vendor	Network Name
94:18:65:B6:DC:25	Netgear Inc.	WFEPro3_Test
94:18:65:B6:DC:48	Netgear Inc.	BNL
30:23:03:1B:43:36	Belkin International Inc.	BNL_2G
18:35:D1:A9:9F:C9	ARRIS Group Inc.	VM0108420
36:23:03:1B:43:36	Belkin International Inc.	VM202651-2S
30:23:03:1B:42:DE	Belkin International Inc.	BNL_2G
3A:23:03:1B:42:DE	Belkin International Inc.	Hidden Network
36:23:03:1B:42:DE	Belkin International Inc.	VM202651-2G
3A:23:03:1B:43:36	Belkin International Inc.	Hidden Network
18:35:D1:B9:71:D9	ARRIS Group Inc.	VM6643873
C6:06:C3:4F:EA:C2	TP-Link Technologies Co....	Hidden Network
C0:06:C3:4F:EA:C2	TP-Link Technologies Co....	VM0108420
36:23:03:1B:43:37	Belkin International Inc.	VM202651-2G

Figure 11-10 - Pinning a column using a column header

Chapter 12 - Data Visualization: Scan Results Organization, Coloring Rules, Data Enhancements & Hidden Gems

File: Example_Networks | Sunday, 8 September 2024 at 20:26:35

Network Name	Count	BSSID	Vendor	Signal	Channel	Band	Channel Width	Mode	Amendments
ASMOBD	12	<Multiple Values>	Cisco Meraki	-54 dBm	1, 6, 11...	2.4, 5...	20, 80 MHz	a/b/g/n/ac/ax	d/e/h/i/k/v
ASMOBD		96:18:98:BF:F4:FA	Cisco Meraki	-66 dBm	40	5 GHz	20 MHz	a/n/ac/ax	d/e/h/i/k/v
ASMOBD		96:18:98:BF:F4:F9	Cisco Meraki	-90 dBm	48	5 GHz	20 MHz	a/n/ac/ax	d/e/h/i/k/v
ASMOBD		96:18:98:BF:F4:E1	Cisco Meraki	-61 dBm	40	5 GHz	20 MHz	a/n/ac/ax	d/e/h/i/k/v
ASMOBD		96:18:98:BF:F2:22	Cisco Meraki	-54 dBm	44	5 GHz	20 MHz	a/n/ac/ax	d/e/h/i/k/v
ASMOBD		96:18:98:BF:F1:33	Cisco Meraki	-68 dBm	36	5 GHz	20 MHz	a/n/ac/ax	d/e/h/i/k/v
ASMOBD		96:18:88:BF:F4:FA	Cisco Meraki	-67 dBm	1	2.4 GHz	20 MHz	b/g/n/ax	d/e/h/i/k/v
ASMOBD		96:18:88:BF:F4:F9	Cisco Meraki	-89 dBm	11	2.4 GHz	20 MHz	b/g/n/ax	d/e/h/i/k/v
ASMOBD		96:18:88:BF:F4:E1	Cisco Meraki	-60 dBm	6	2.4 GHz	20 MHz	b/g/n/ax	d/e/h/i/k/v
ASMOBD		96:18:88:BF:F2:22	Cisco Meraki	-62 dBm	11	2.4 GHz	20 MHz	b/g/n/ax	d/e/h/i/k/v
ASMOBD		96:18:88:BF:F1:33	Cisco Meraki	-73 dBm	6	2.4 GHz	20 MHz	b/g/n/ax	d/e/h/i/k/v
ASMOBD		22:3F:1B:ED:F1:30	Cisco Meraki	-90 dBm	140	5 GHz	80 MHz	a/n/ac/ax	d/e/h/i/k/v
ASMOBD		22:3F:0B:ED:F1:30	Cisco Meraki	-88 dBm	1	2.4 GHz	20 MHz	b/g/n/ax	d/e/h/i/k/v
ASCORP	11	<Multiple Values>	Cisco Meraki	-54 dBm	1, 6, 11...	2.4, 5...	20, 80 MHz	a/b/g/n/ac/ax	d/e/h/i/k/v

Networks Found: 23, Displayed: 23 (100%), Highlighted: 12 (52%)

Figure 12-1 - Networks organized by name

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

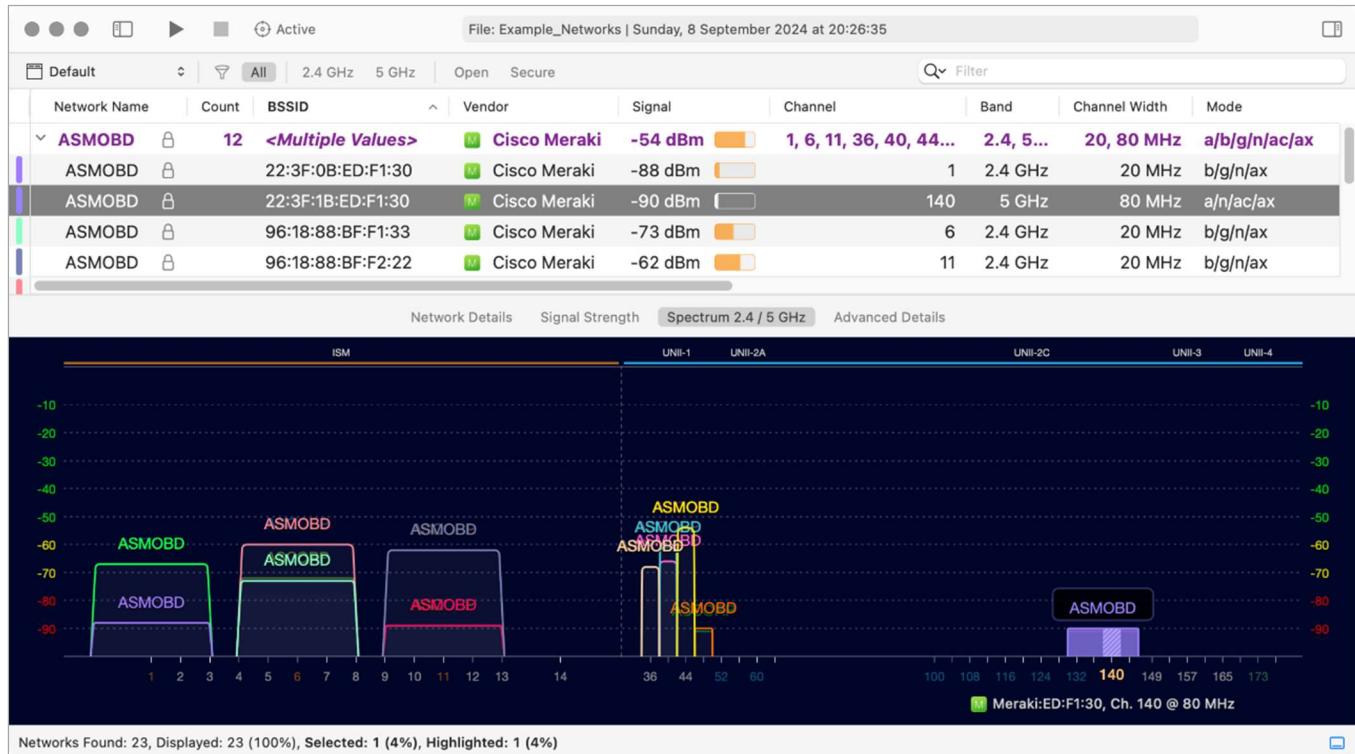


Figure 12-2 - Networks organized by name spectrum view

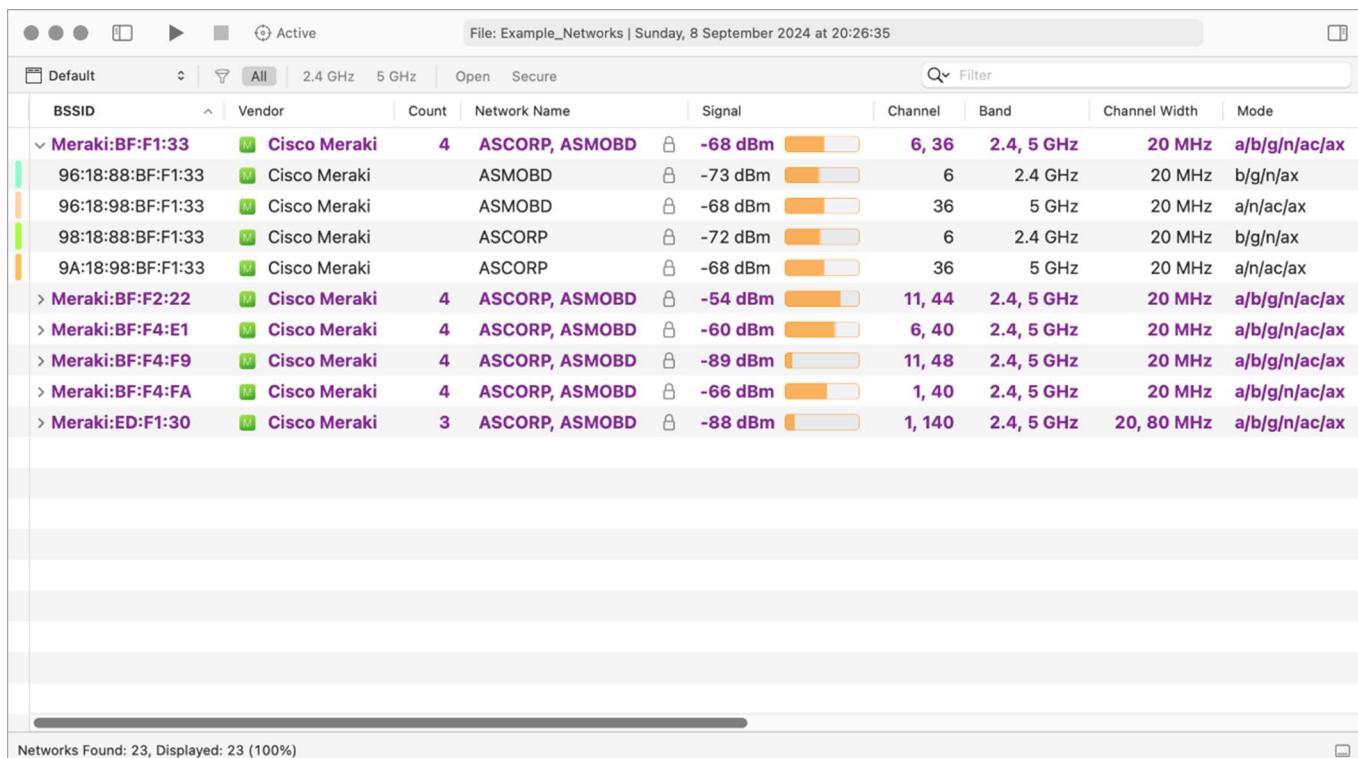


Figure 12-3 - Networks organized by access point

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

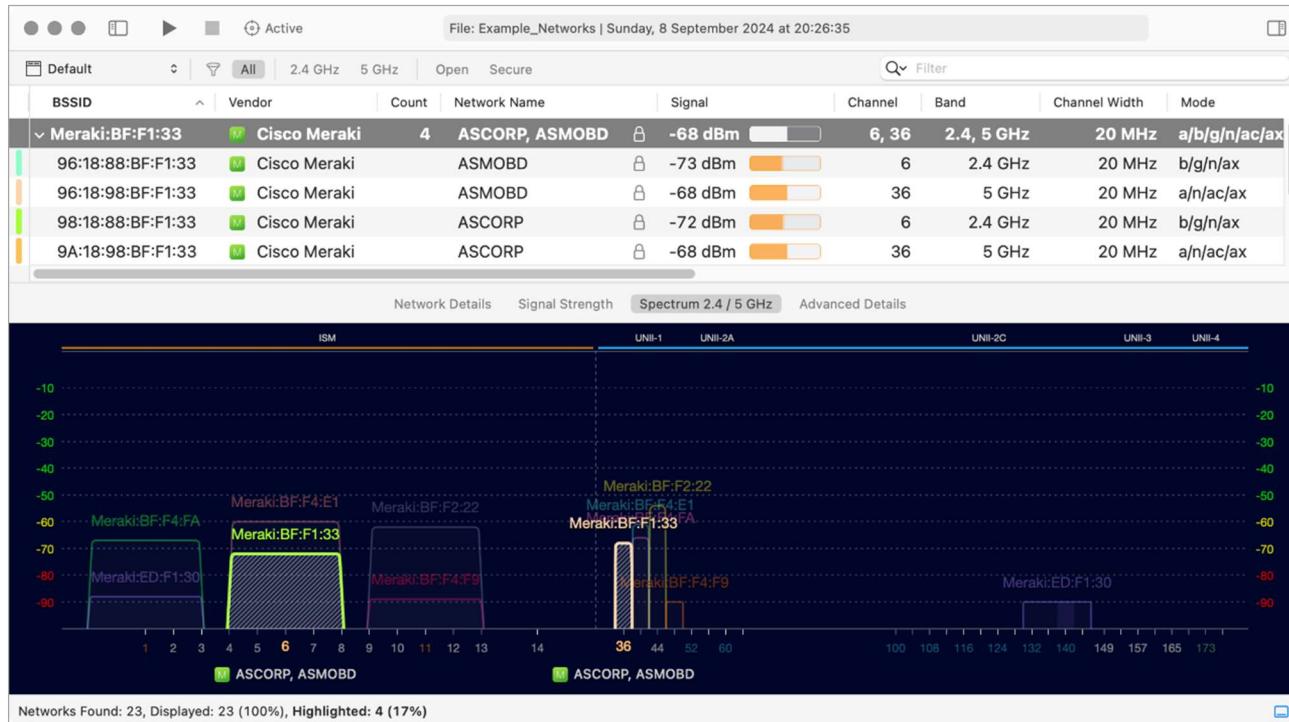


Figure 12-4 - Networks organized by access point spectrum view with a group selected

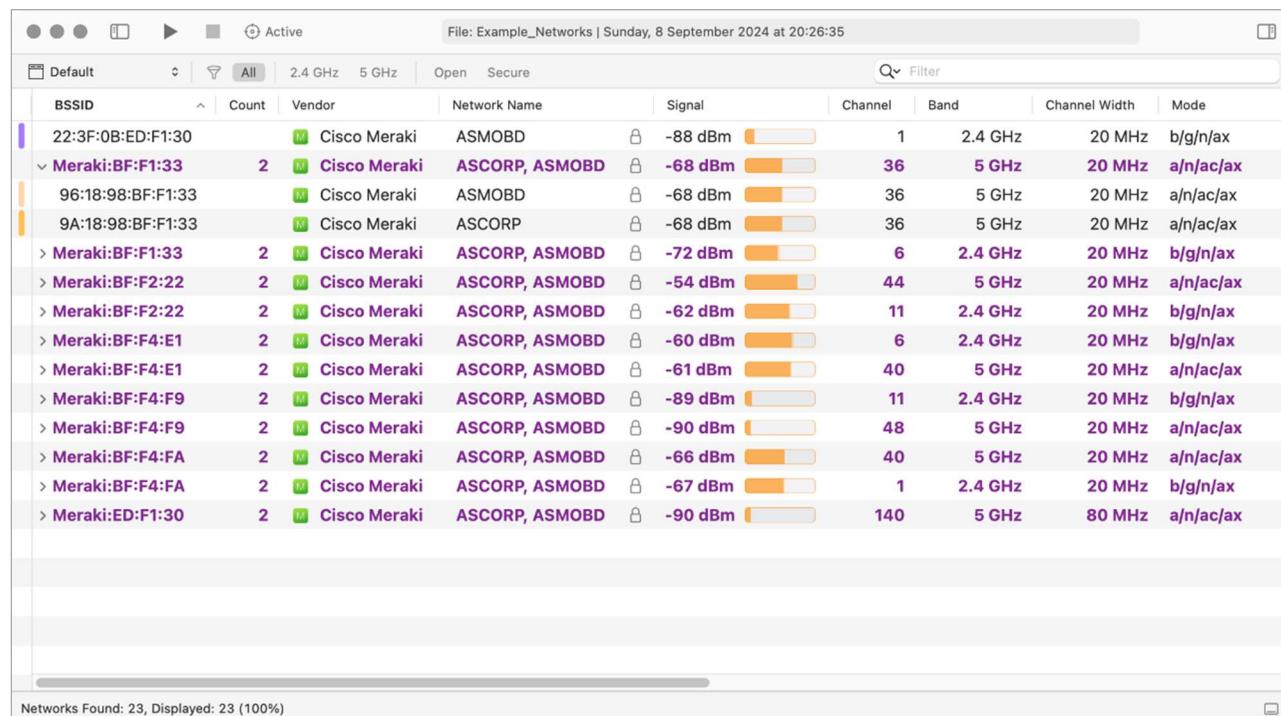


Figure 12-5 - Networks organized by access point radio

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

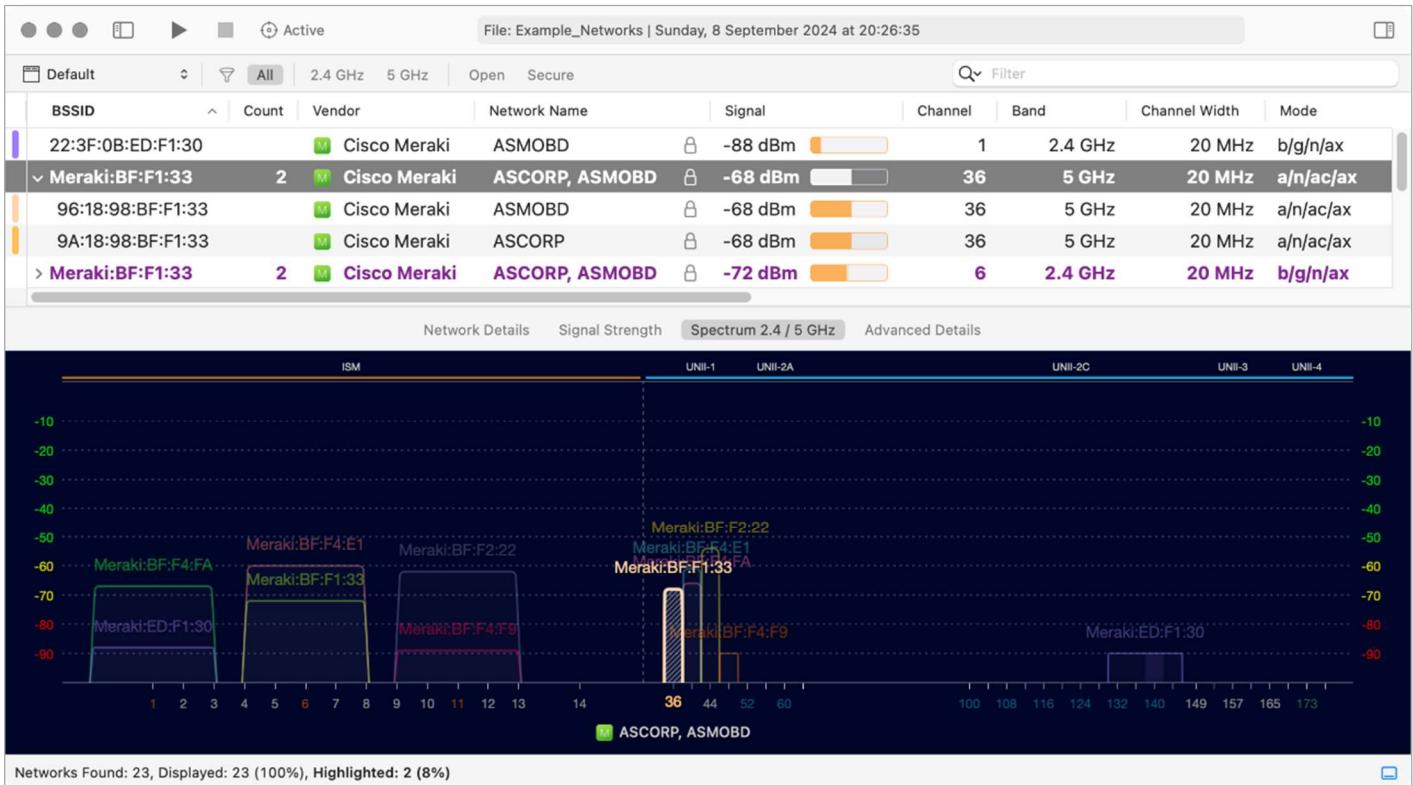


Figure 12-6 - Networks organized by access point radio in the spectrum view

The screenshot shows the WiFi Explorer Pro 3 interface with a table of network details:

Vendor	Count	BSSID	Network Name	Signal	Channel	Band	Channel Width
Cisco Meraki	23	<Multiple Values>	ASCORP, ASMOBD	-54 dBm	1, 6, 11, 36, 40, 4...	2.4, 5 GHz	20, 80 MHz
Cisco Meraki		22:3F:0B:ED:F1:30	ASMOBD	-88 dBm	1	2.4 GHz	20 MHz
Cisco Meraki		22:3F:1B:ED:F1:30	ASMOBD	-90 dBm	140	5 GHz	80 MHz
Cisco Meraki		2E:3F:1B:ED:F1:30	ASCORP	-91 dBm	140	5 GHz	80 MHz
Cisco Meraki		96:18:88:BF:F1:33	ASMOBD	-73 dBm	6	2.4 GHz	20 MHz
Cisco Meraki		96:18:88:BF:F2:22	ASMOBD	-62 dBm	11	2.4 GHz	20 MHz
Cisco Meraki		96:18:88:BF:F4:E1	ASMOBD	-60 dBm	6	2.4 GHz	20 MHz
Cisco Meraki		96:18:88:BF:F4:F9	ASMOBD	-89 dBm	11	2.4 GHz	20 MHz
Cisco Meraki		96:18:88:BF:F4:FA	ASMOBD	-67 dBm	1	2.4 GHz	20 MHz
Cisco Meraki		96:18:98:BF:F1:33	ASMOBD	-68 dBm	36	5 GHz	20 MHz
Cisco Meraki		96:18:98:BF:F2:22	ASMOBD	-54 dBm	44	5 GHz	20 MHz
Cisco Meraki		96:18:98:BF:F4:E1	ASMOBD	-61 dBm	40	5 GHz	20 MHz
Cisco Meraki		96:18:98:BF:F4:F9	ASMOBD	-90 dBm	48	5 GHz	20 MHz
Cisco Meraki		96:18:98:BF:F4:FA	ASMOBD	-66 dBm	40	5 GHz	20 MHz
Cisco Meraki		98:18:88:BF:F1:33	ASCORP	-72 dBm	6	2.4 GHz	20 MHz
Cisco Meraki		98:18:88:BF:F2:22	ASCORP	-62 dBm	11	2.4 GHz	20 MHz
Cisco Meraki		98:18:88:BF:F4:E1	ASCORP	-60 dBm	6	2.4 GHz	20 MHz
Cisco Meraki		98:18:88:BF:F4:F9	ASCORP	-89 dBm	11	2.4 GHz	20 MHz
Cisco Meraki		98:18:88:BF:F4:FA	ASCORP	-67 dBm	1	2.4 GHz	20 MHz

At the bottom left, it says "Networks Found: 23, Displayed: 23 (100%)".

Figure 12-7 - Networks organized by access point vendor

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

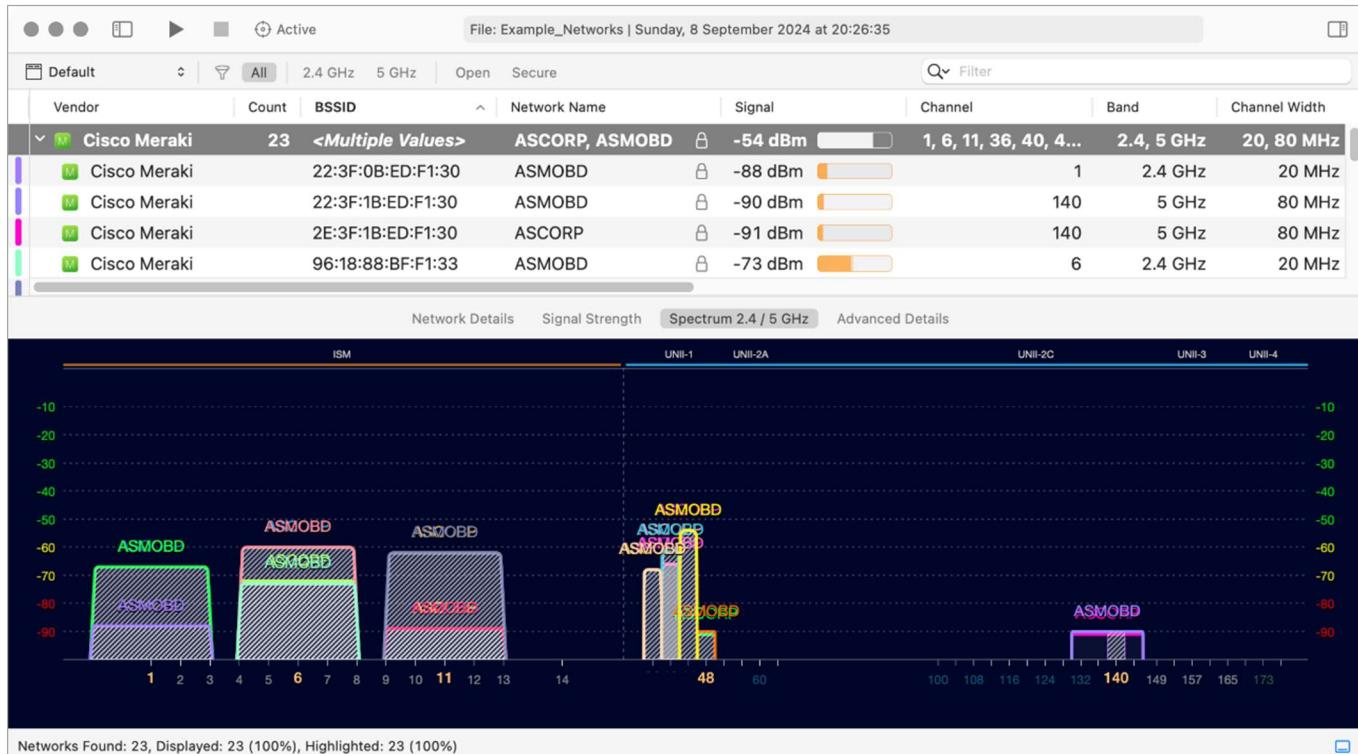


Figure 12-8 - Networks organized by vendor spectrum view with the vendor selected

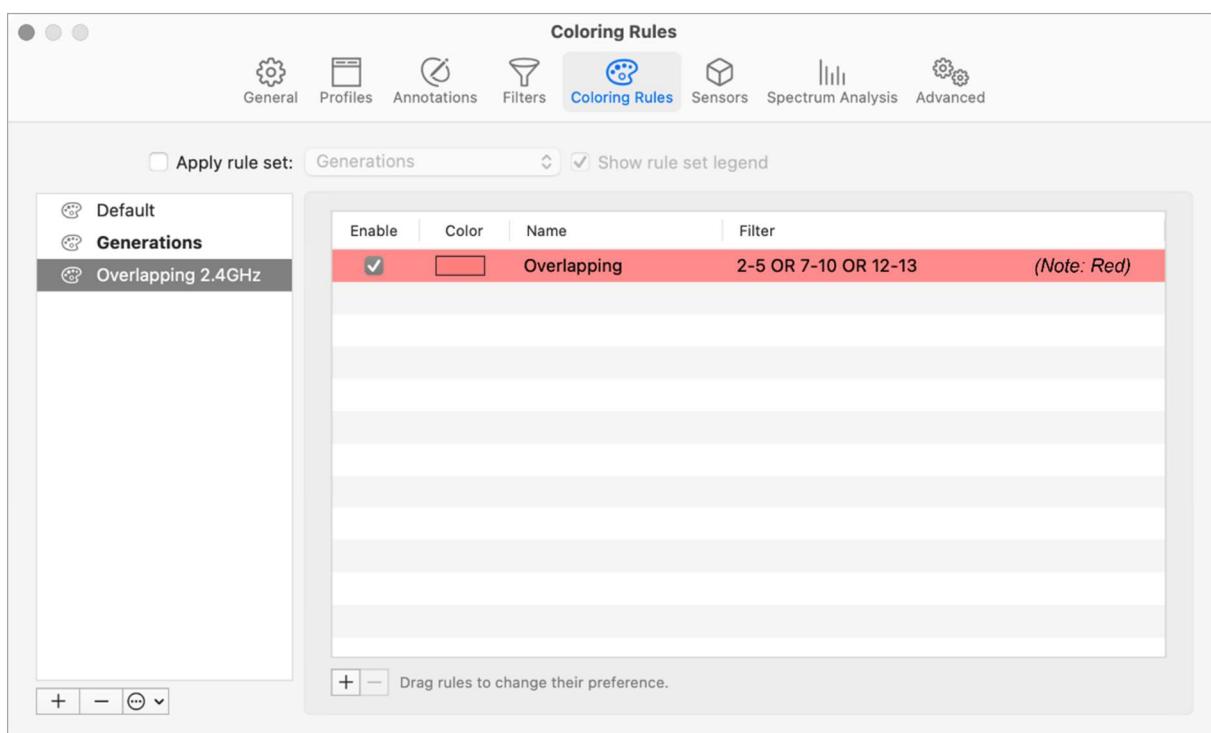


Figure 12-9 - Example coloring rule definition for 2.4 GHz overlapping channels

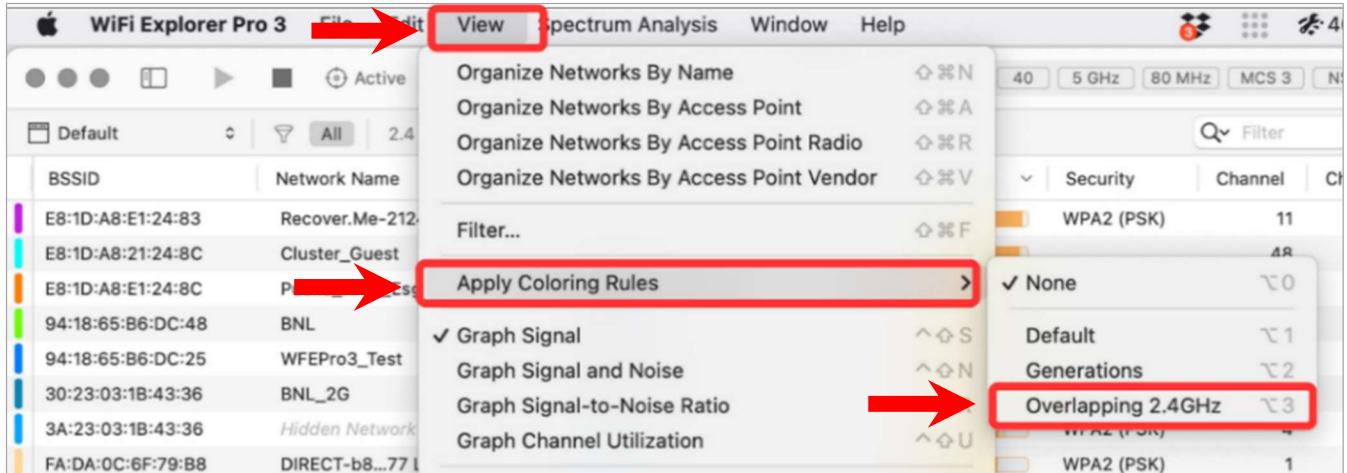


Figure 12-10 - Selecting coloring rule set for 2.4 GHz overlapping channels

The screenshot shows the main interface of WiFi Explorer Pro 3. At the top, there's a toolbar with icons for file operations. Below it is a menu bar with 'File', 'Edit', 'View' (which is highlighted with a red box), 'Spectrum Analysis', 'Window', and 'Help'. The main area is a table listing wireless networks (BSSIDs, Network Names, Vendors, Signal levels, Channels, Bands, Channel Widths, and Modes). A red box highlights the 'Overlapping 2.4GHz' button at the bottom right of the table area. The status bar at the bottom indicates 'Networks Found: 294, Displayed: 294 (100%)' and 'Overlapping 2.4GHz: Overlapping'.

Figure 12-11 - Coloring rule for 2.4 GHz overlapping channels applied to networks table

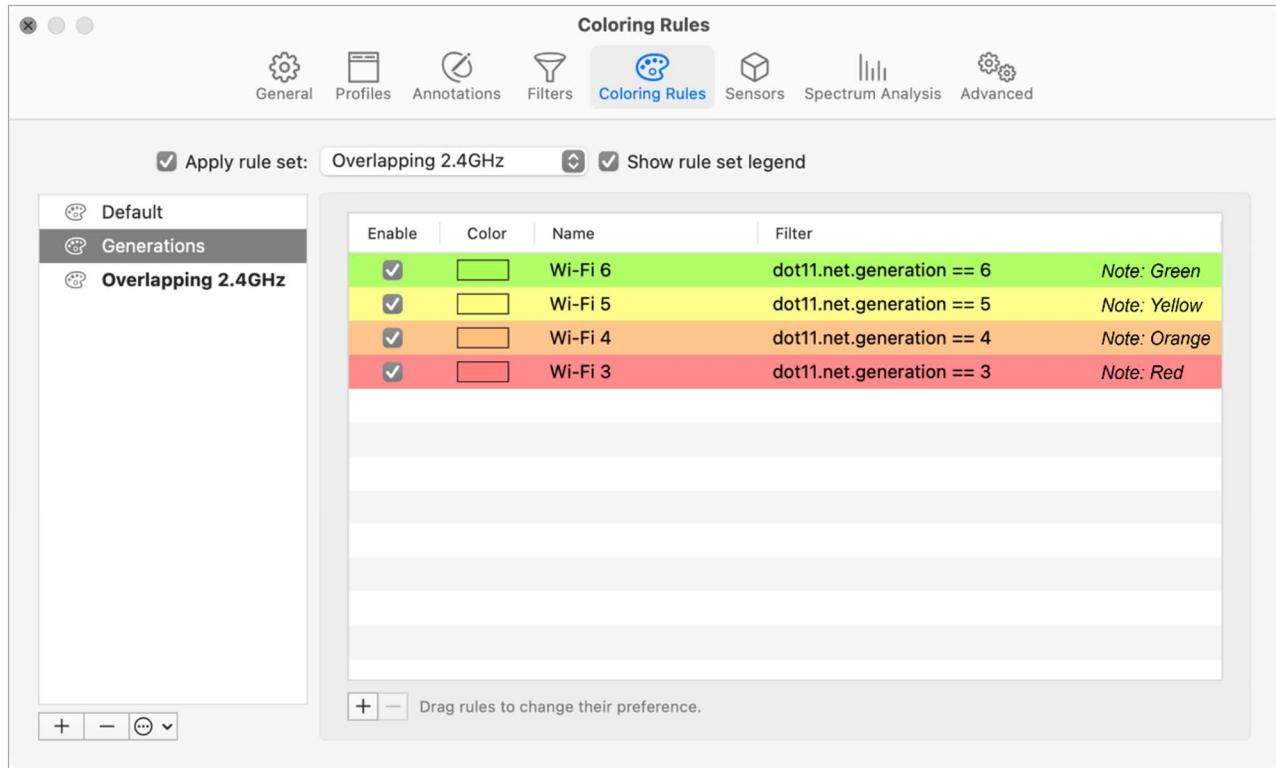


Figure 12-12 - The Coloring Rules settings tab

Default		Network Name	Vendor	Signal	Channel	Band	Channel Width	Mode
94:18:65:B6:DC:25	WFEPro3_Test	Netgear Inc.	-50 dBm	(Note:Green)	1	2.4 GHz	20 MHz	b/g/n/a
94:18:65:B6:DC:47	VM6643873	Netgear Inc.	-57 dBm	(Note:Green)	48	5 GHz	40 MHz	a/n/ac
94:18:65:B6:DC:48	BNL	Netgear Inc.	-57 dBm		48	5 GHz	40 MHz	a/n/ac
3A:23:03:1B:42:DE	Hidden Network	Belkin Internatio...	-64 dBm		4	2.4 GHz	20 MHz	b/g/n
18:35:D1:B9:71:D9	VM6643873	CommScope	-65 dBm		6	2.4 GHz	20 MHz	b/g/n
C6:06:C3:4F:EA:C2	Hidden Network	TP-Link Technol...	-65 dBm	(Note:Orange)	1	2.4 GHz	40 MHz	b/g/n
18:35:D1:A9:9F:C9	VM0108420	CommScope	-66 dBm		11	2.4 GHz	20 MHz	b/g/n
C0:06:C3:4F:EA:C2	VM0108420	TP-Link Technol...	-68 dBm		1	2.4 GHz	40 MHz	b/g/n
FA:DA:0C:6F:79:B8	DIRECT-...7 LaserJet	HP Inc.	-73 dBm		6	2.4 GHz	20 MHz	g/n
30:23:03:1B:42:DF	VM202651-5G	Belkin Internatio...	-74 dBm		108	5 GHz	80 MHz	a/n/ac
18:35:D1:B9:71:DF	VM6643873	CommScope	-75 dBm	(Note:Yellow)	44	5 GHz	80 MHz	a/n/ac
36:23:03:1B:42:DF	VM202651-2G	Belkin Internatio...	-75 dBm		108	5 GHz	80 MHz	a/n/ac
C0:06:C3:4F:EB:DA	VM0108420	TP-Link Technol...	-76 dBm		1	2.4 GHz	40 MHz	b/g/n
30:23:03:1B:42:DE	BNL_2G	Belkin Internatio...	-77 dBm		4	2.4 GHz	20 MHz	b/g/n
C6:06:C3:4F:EB:DA	Hidden Network	TP-Link Technol...	-79 dBm	(Note:Orange)	1	2.4 GHz	40 MHz	b/g/n
3C:45:7A:BD:90:1A	SKYMSRXQ 2.4	Sky	-81 dBm		11	2.4 GHz	20 MHz	b/g/n
C0:06:C3:4F:EA:C3	VM0108420	TP-Link Technol...	-84 dBm	(Note:Yellow)	36	5 GHz	80 MHz	a/n/ac
18:35:D1:9A:43:69	VM0802359	CommScope	-86 dBm	(Note:Orange)	6	2.4 GHz	20 MHz	b/g/n
00:00:00:00:00:00	VM1000000000	Belkin Internatio...	-90 dBm		6	2.4 GHz	20 MHz	b/g/n

Networks Found: 23, Displayed: 23 (100%)

Generations: Wi-Fi 6 Wi-Fi 5 Wi-Fi 4 Wi-Fi 3

Figure 12-13 - Networks Area with Generations coloring rule applied

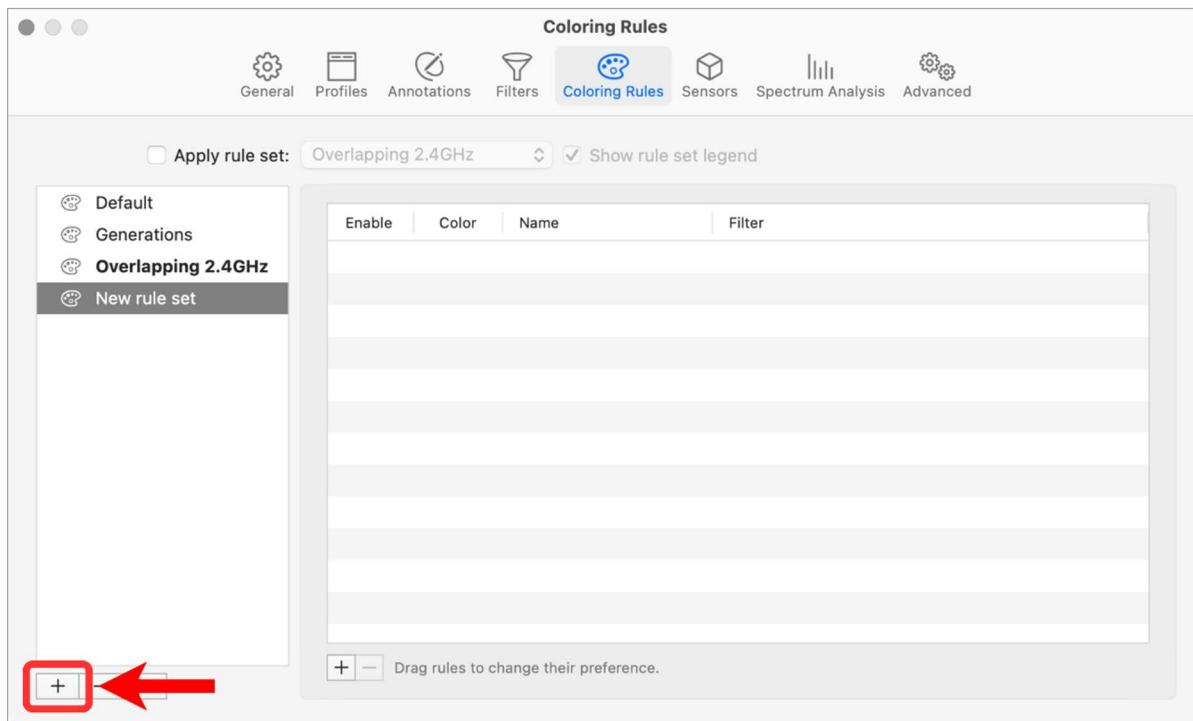


Figure 12-14 - Adding a new coloring rule set

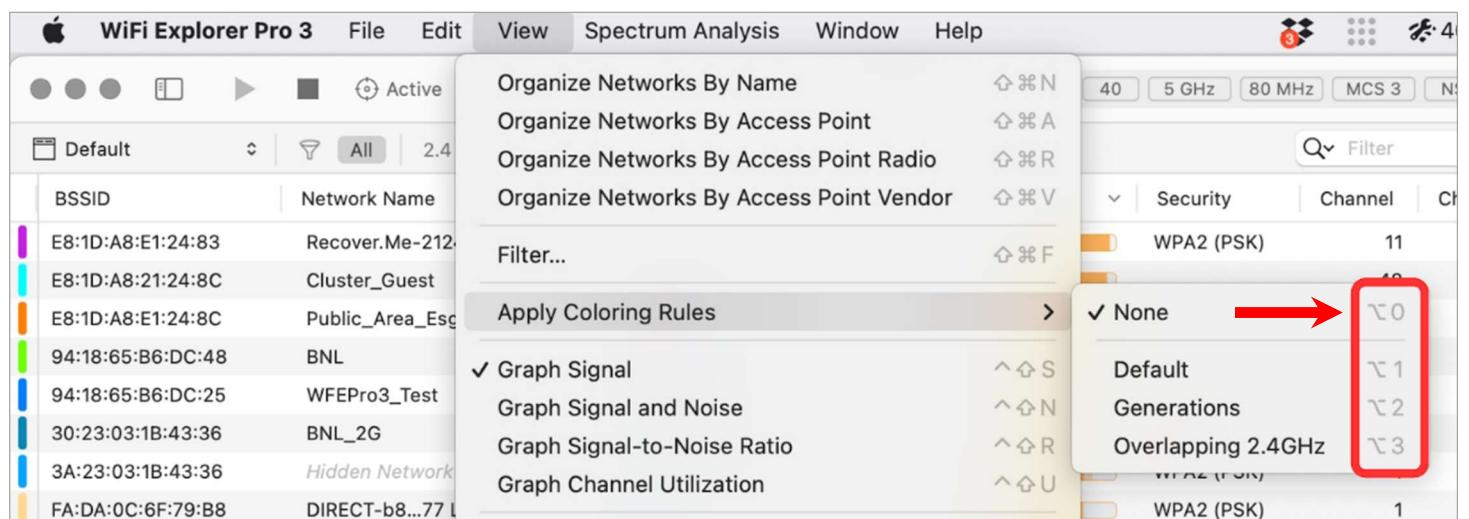


Figure 12-15 - Coloring rule set selection shortcuts

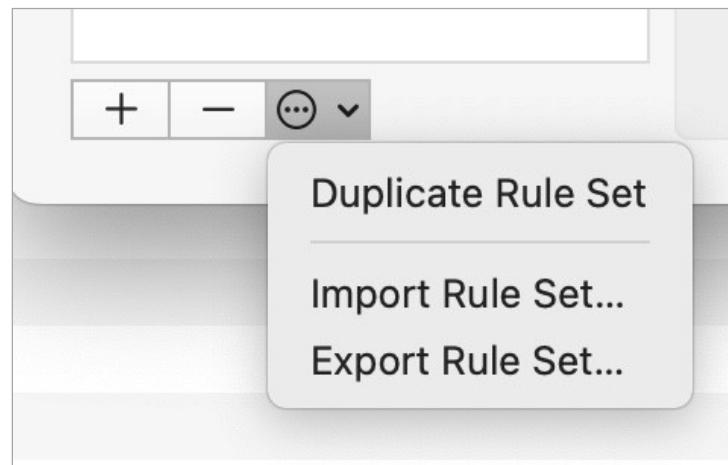


Figure 12-16 – The coloring rule sets list *More* button options

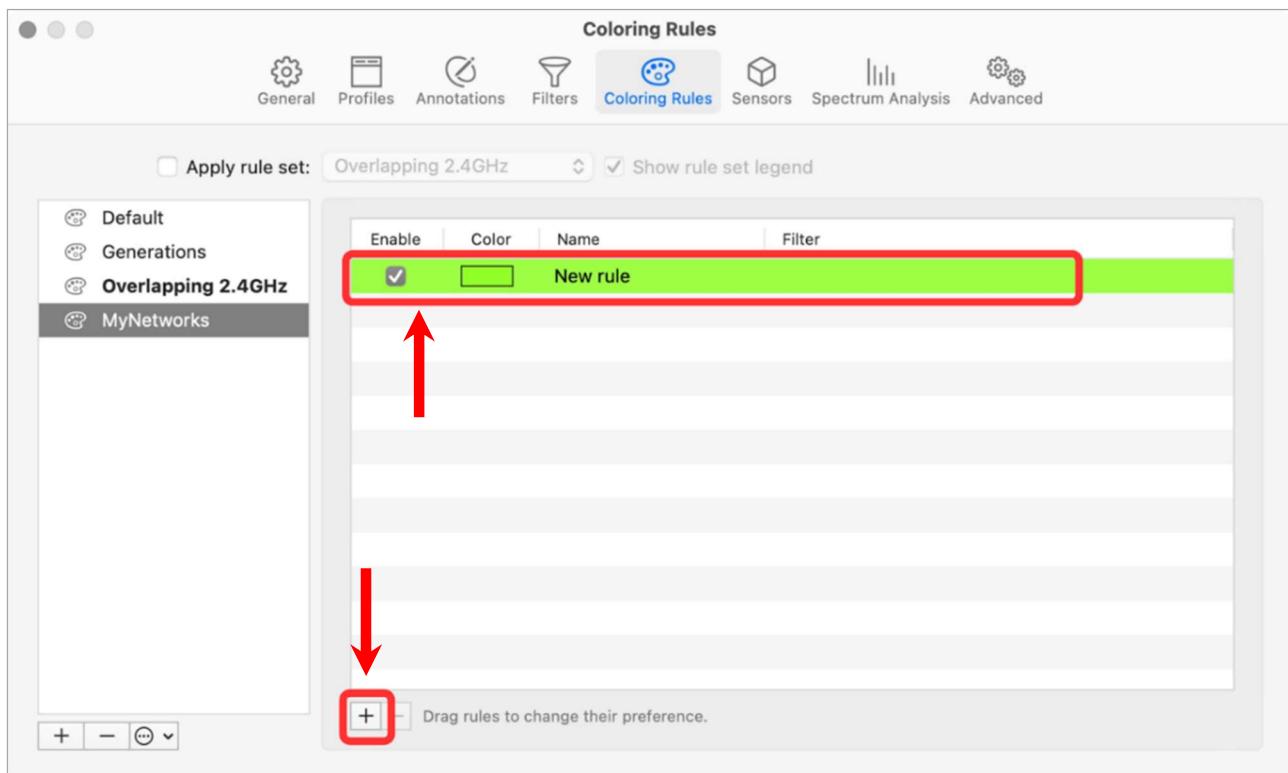


Figure 12-17 - Adding a new rule to a coloring rule set

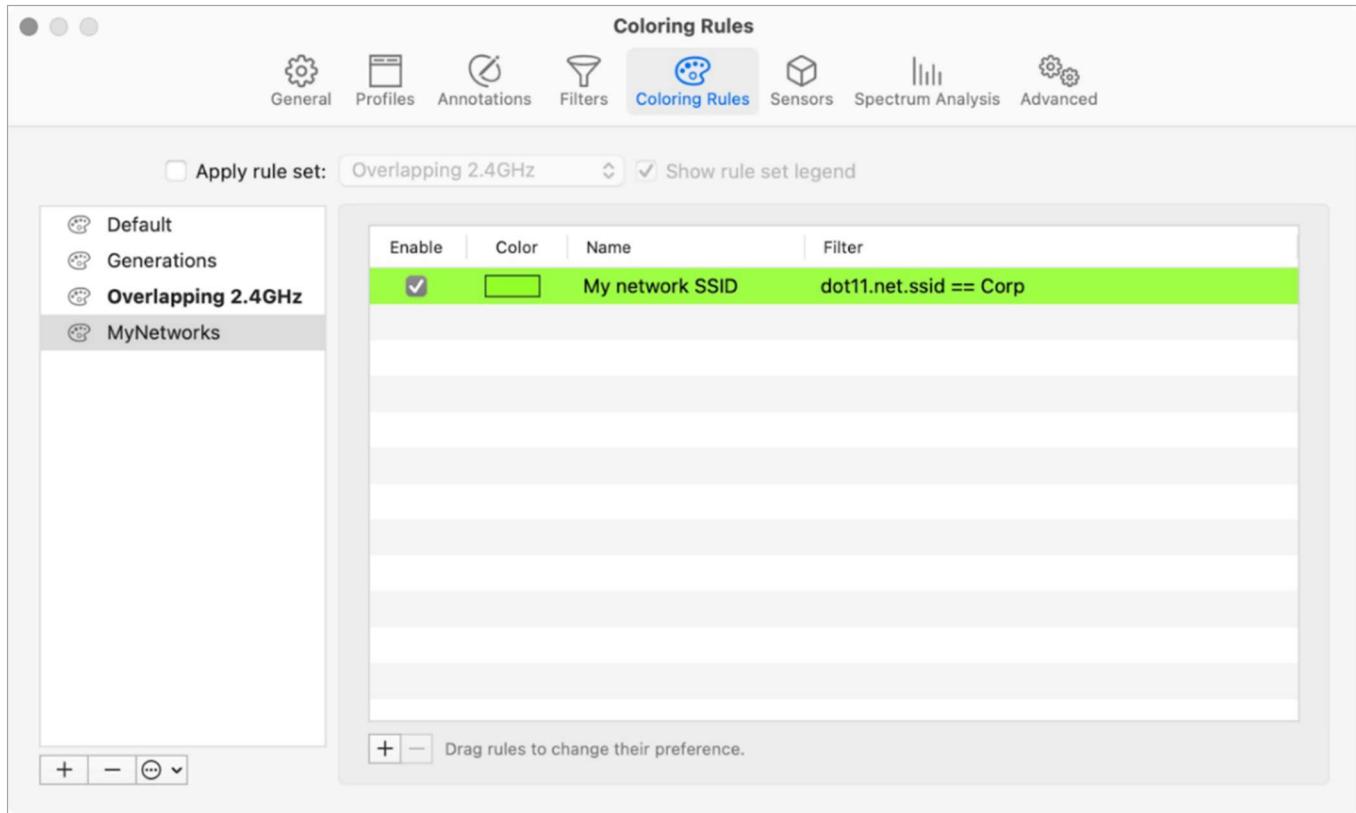


Figure 12-18 - A sample rule to colorize a specific SSID

Default		All	2.4 GHz	5 GHz	Open	Secure	Ne
BSSID	Vendor						Network Name
18:35:D1:B9:71:DF	ARRIS Group Inc.					VM6643873	
18:35:D1:A9:9F:CF	ARRIS Group Inc.					VM0108420	

Figure 12-19 - Networks table showing Arris Group Inc. devices



Figure 12-20 - Online lookup of the 18:35:D1 OUI details

Scanning: Wi-Fi BNL					
Default		Network Name	Vendor	Annotations	Signal
18:35:D1:B9:71:D9	VM6643873	ARRIS Group Inc.	MyNetwork, Slow	-70 dBm	<div style="width: 30%;"> </div>
18:35:D1:B9:71:DF	VM6643873	ARRIS Group Inc.	MyNetwork, Fast	-79 dBm	<div style="width: 10%;"> </div>

Figure 12-21 - Simple addition of annotations

Annotations	
	General
	Profiles
	Annotations
	Filters
	Coloring Rules
	Sensors
	Spectrum Analysis
	Advanced
<input type="text"/> Search	
BSSID	Annotation
18:35:D1:*	ISP_Network
FA:DA:0C:6F:79:B8	Printer
36:23:03:1B:42:D?	Legacy_Network
<input type="button" value="+"/>	<input type="button" value="-"/>
SSID may include * or ?, for example: 88:1F:A1:31:* or 88:1F:A1:31:E6:?E.	

Figure 12-22 - The *Annotations* settings tab showing three annotation examples

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

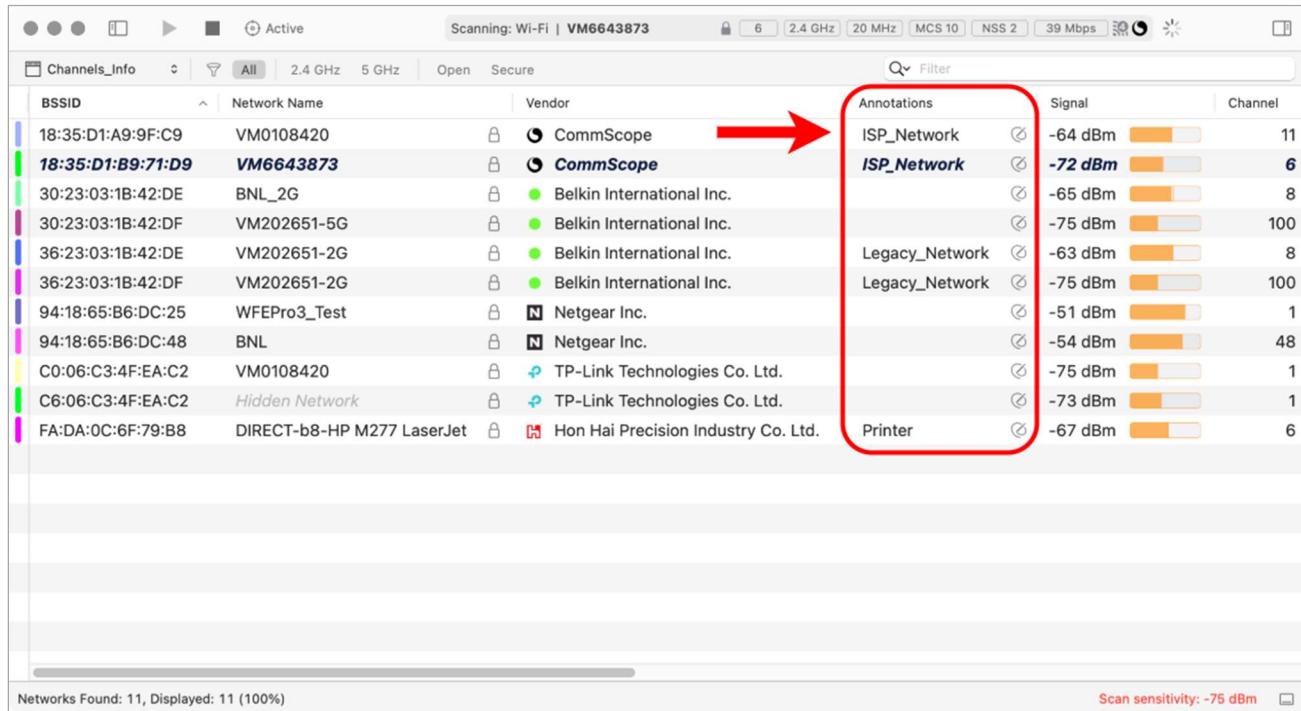


Figure 12-23 - Annotations example results in the networks table

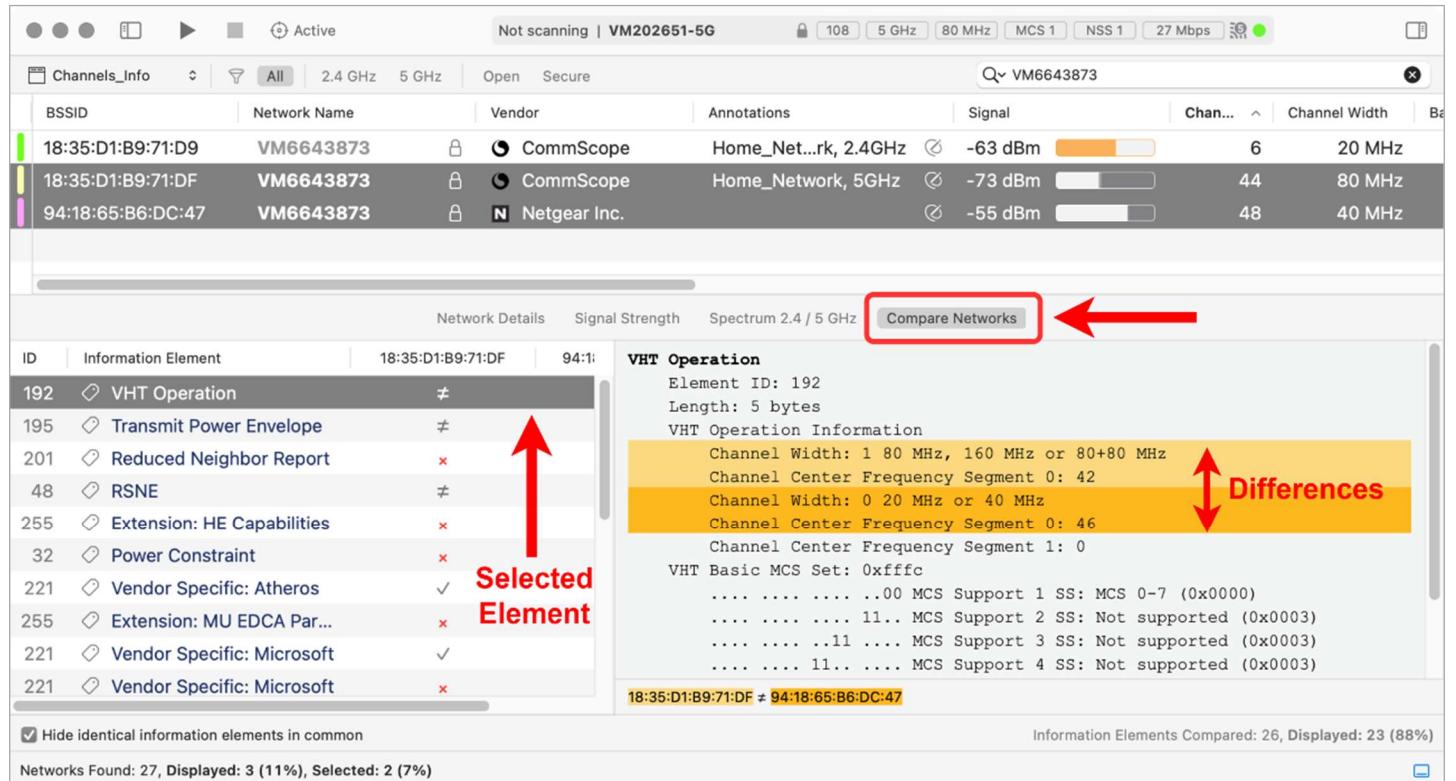


Figure 12-24 - Network Compare example

Chapter 13 - Inspectors

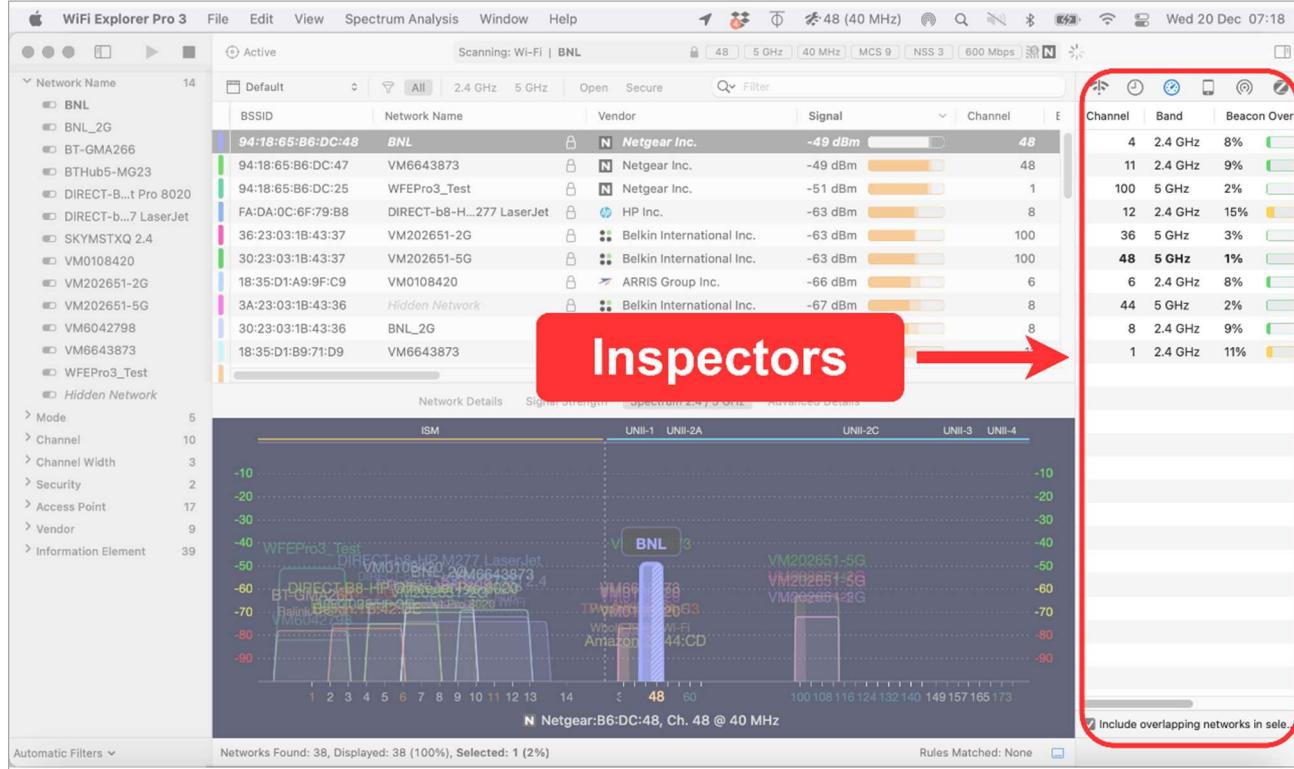


Figure 13-1 - Inspectors UI location

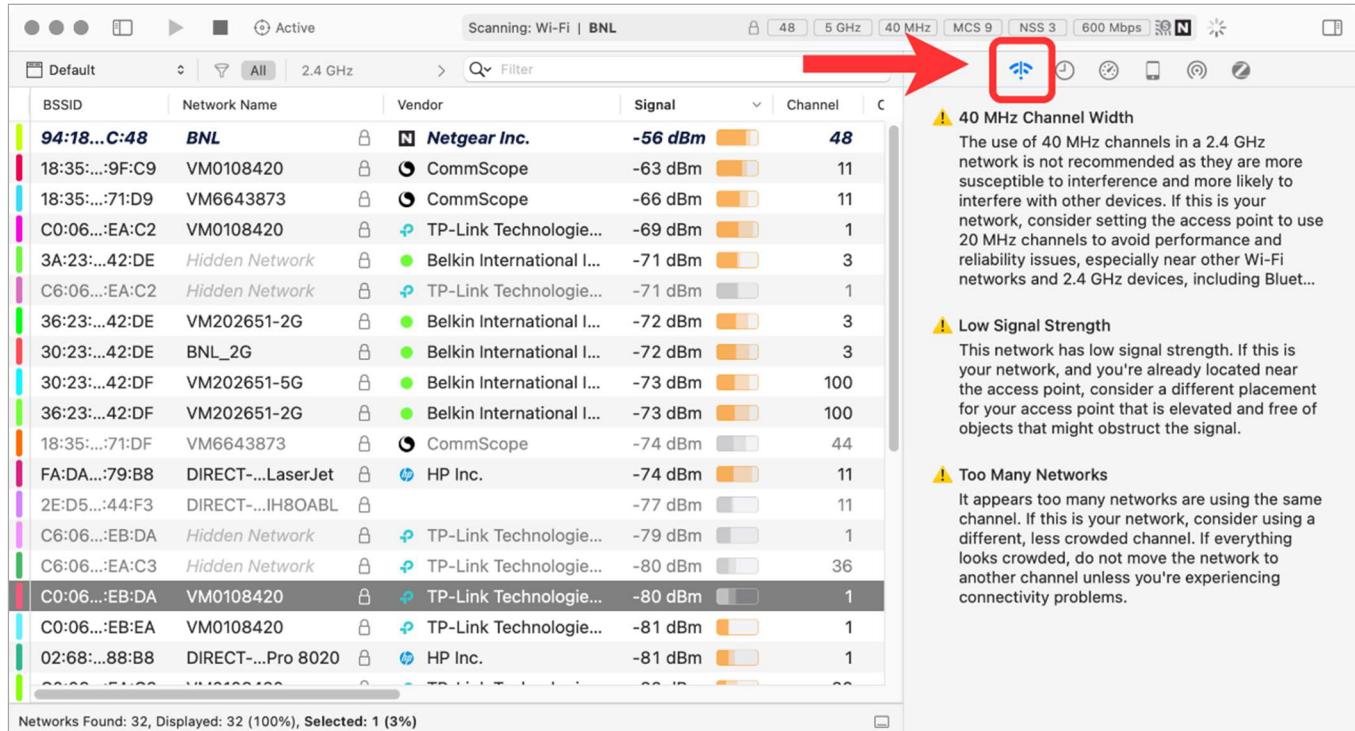


Figure 13-2 - Issues Inspector example showing multiple issues for a selected network

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

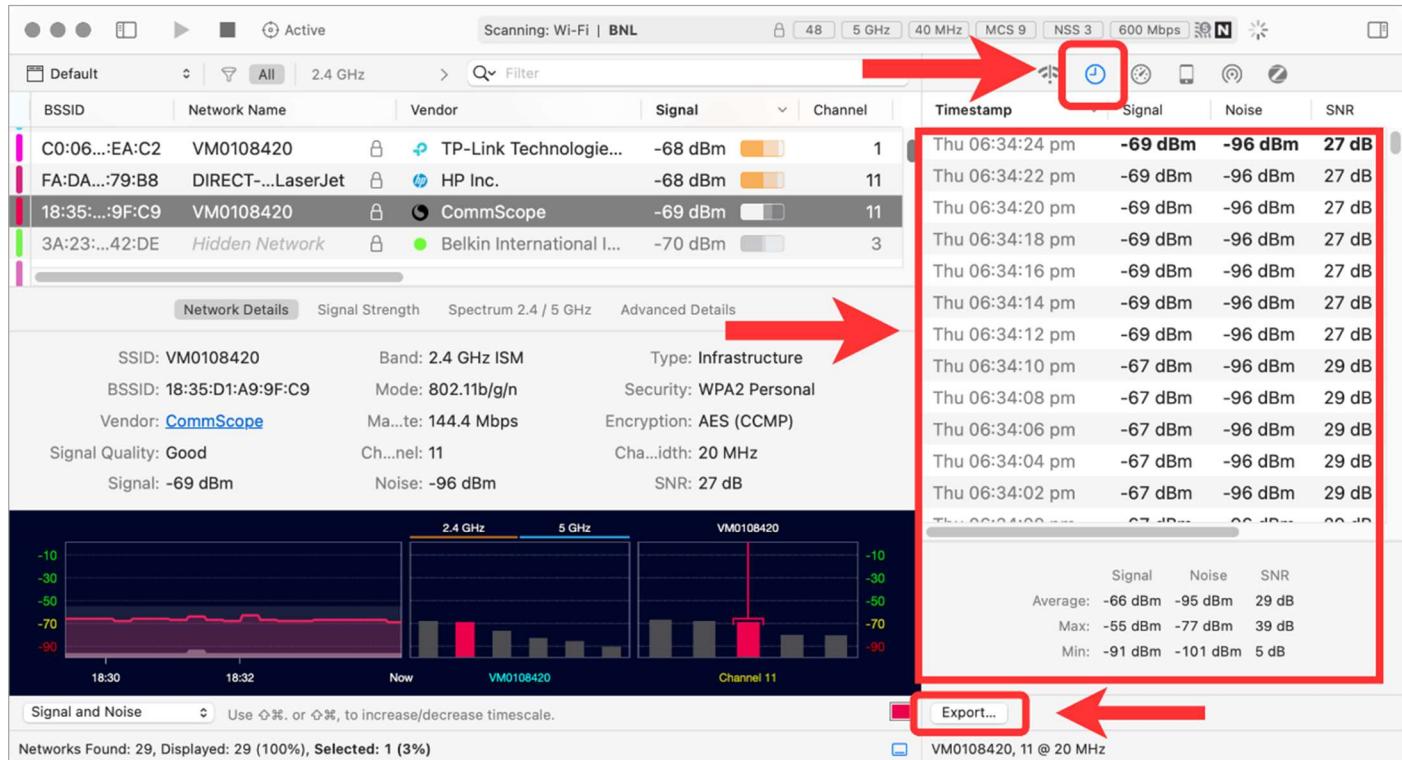


Figure 13-3 - *History Inspector* showing historical data for a selected network

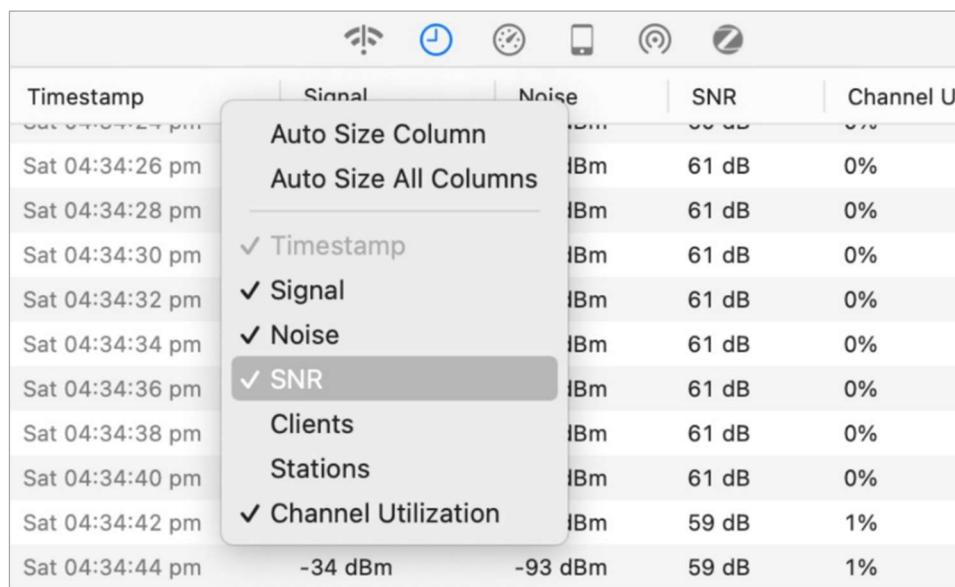


Figure 13-4 - *History Inspector* column display options

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

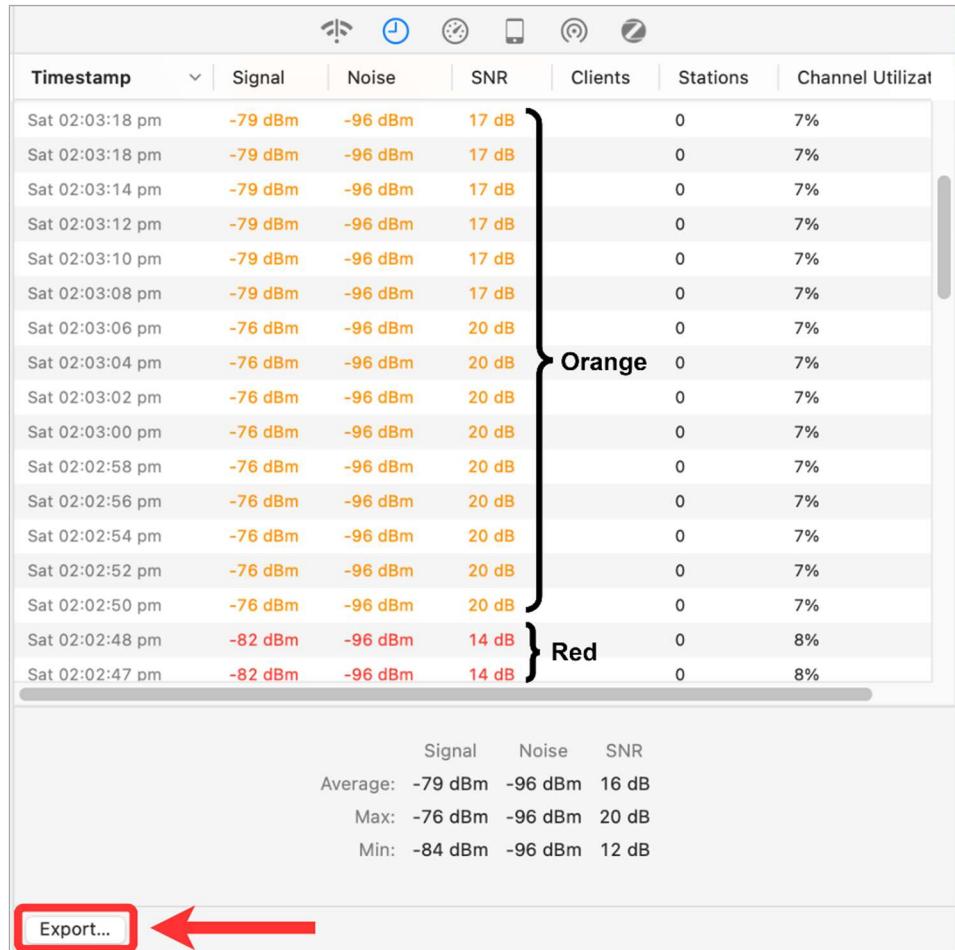


Figure 13-5 - *History Inspector* with all columns enabled

VM6042798_Cisco-1A-A6-9C									
Timestamp	SSID	BSSID	Channel	Channel Width	Signal (dBm)	Noise (dBm)	SNR (dB)	Stations	Channel Utilization (%)
Fri 05:52:48 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-83	-96	13	1	16
Fri 05:52:49 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-83	-96	13	1	16
Fri 05:53:02 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 05:53:03 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 05:53:06 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 05:53:27 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 05:53:29 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 05:53:31 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 06:06:38 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 06:06:43 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 06:06:44 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 06:06:46 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 06:06:48 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 06:06:50 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16
Fri 06:06:52 am	VM6042798	0A:1F:26:1A:A6:9C	11	20 MHz	-82	-96	14	1	16

Figure 13-6 - History Inspector exported CSV data shown in a spreadsheet app

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

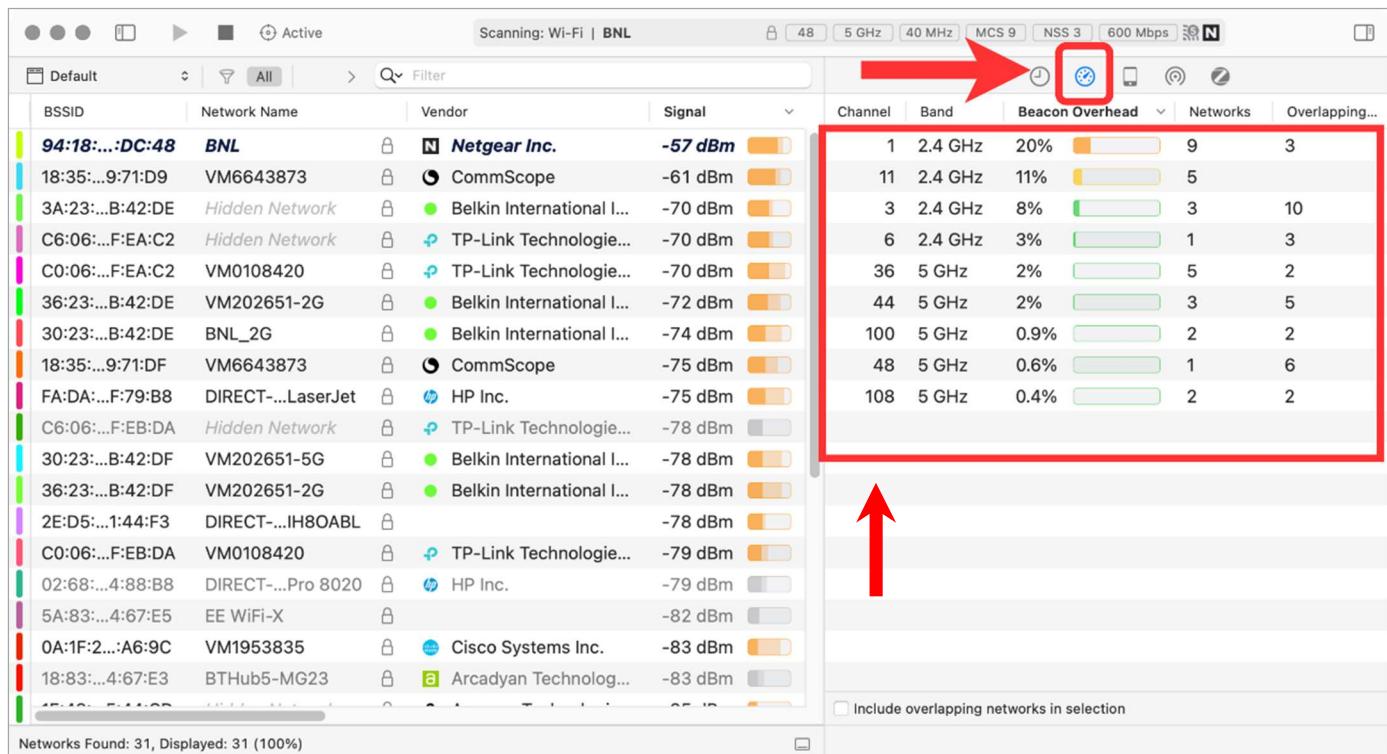


Figure 13-7 - Utilization Inspector summary data

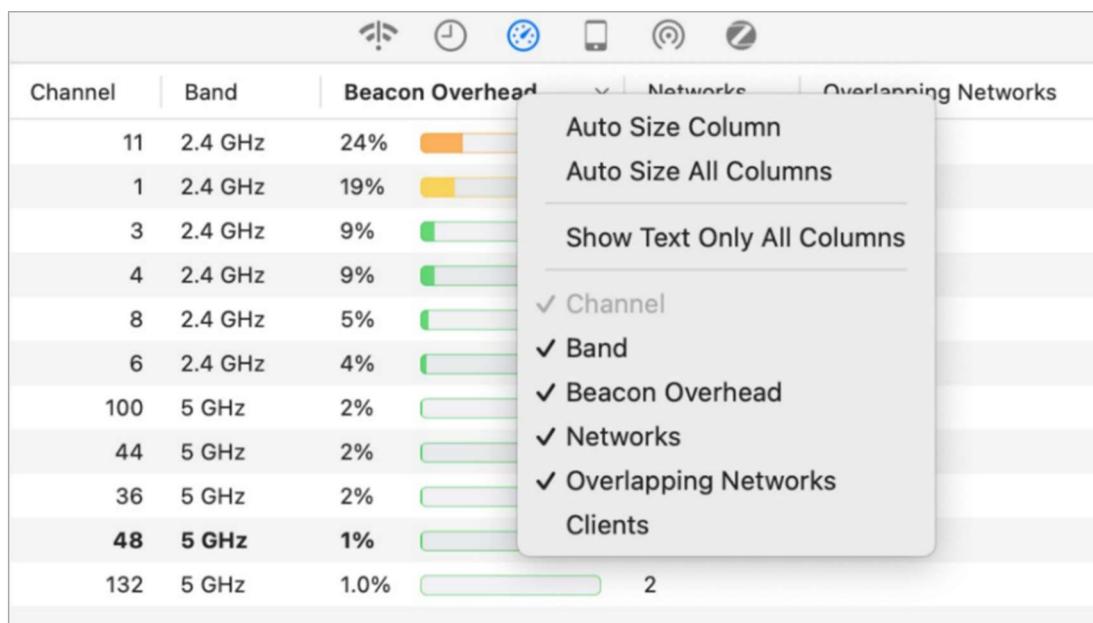


Figure 13-8 - Utilization Inspector column display options

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

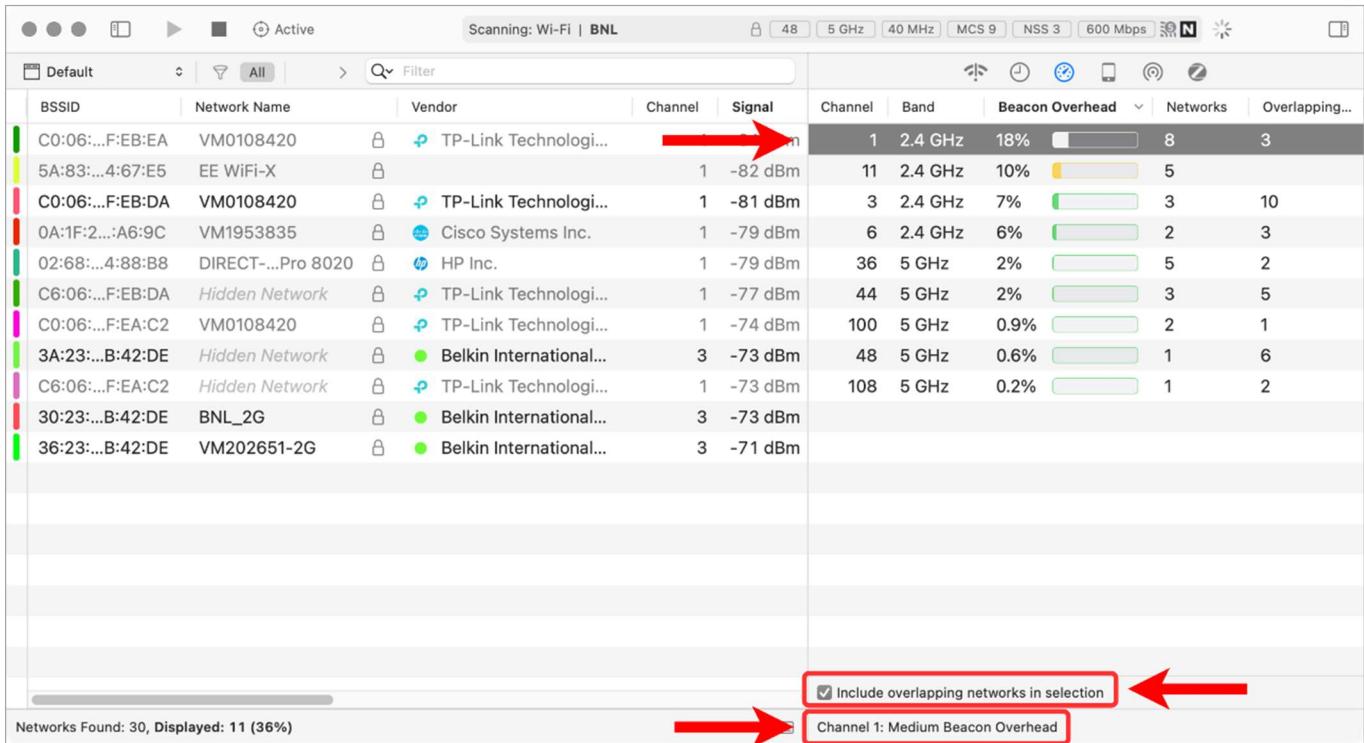


Figure 13-9 - Utilization Inspector with selected entry

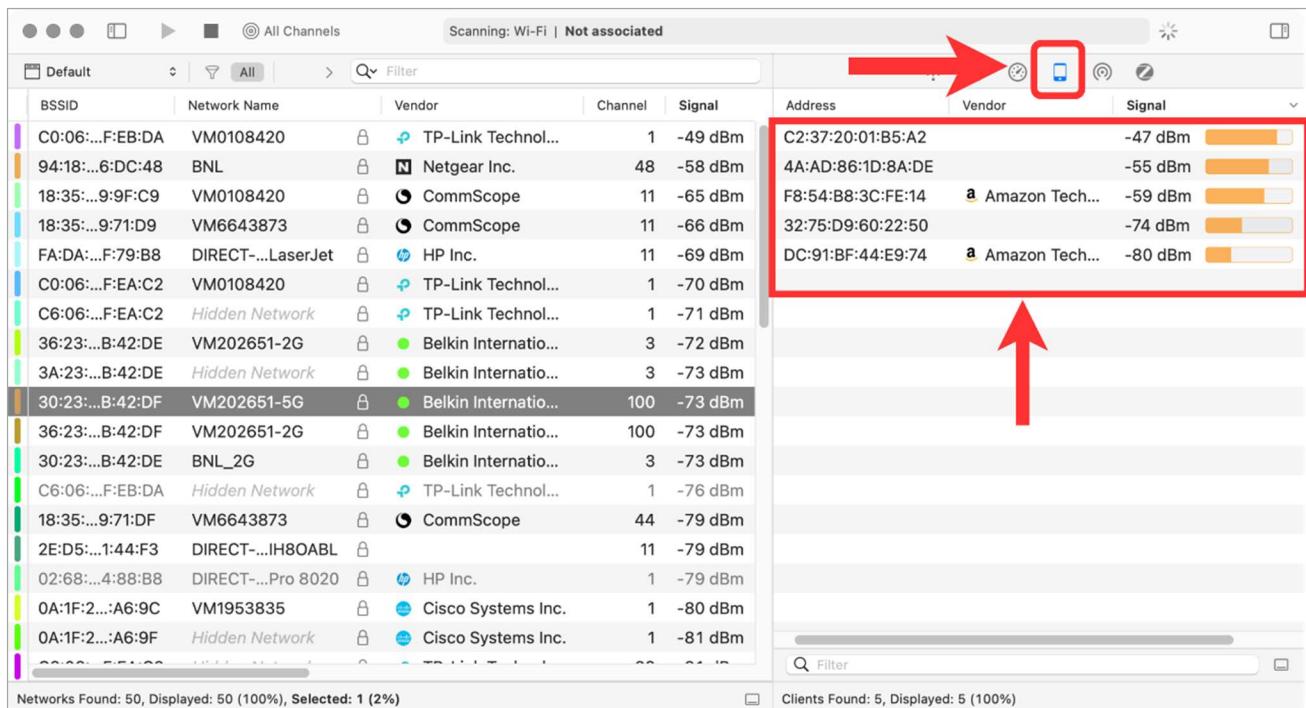
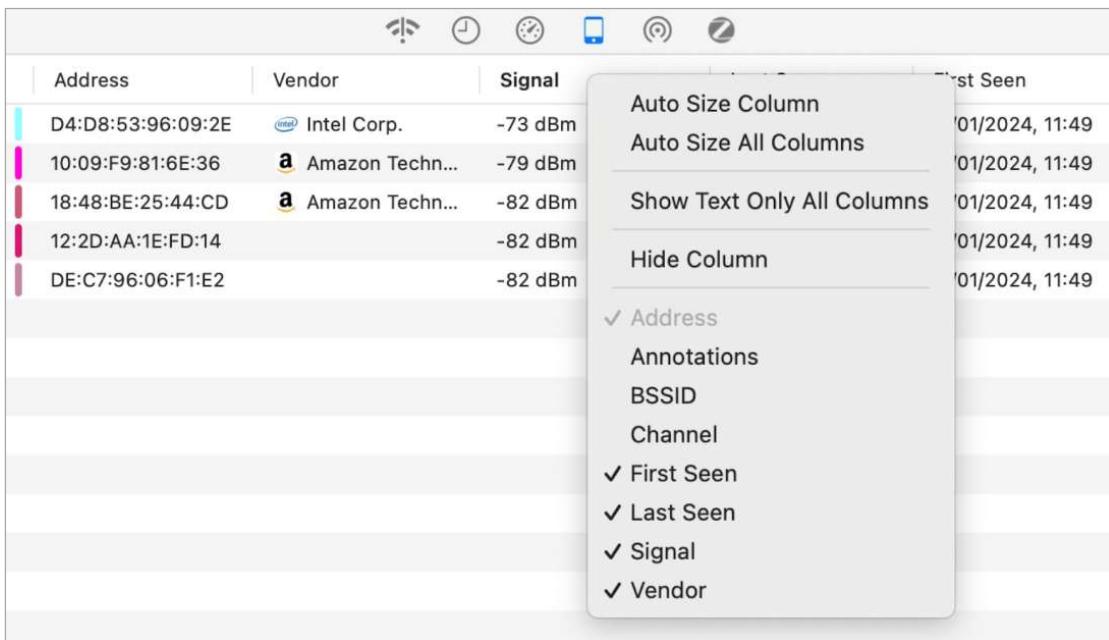
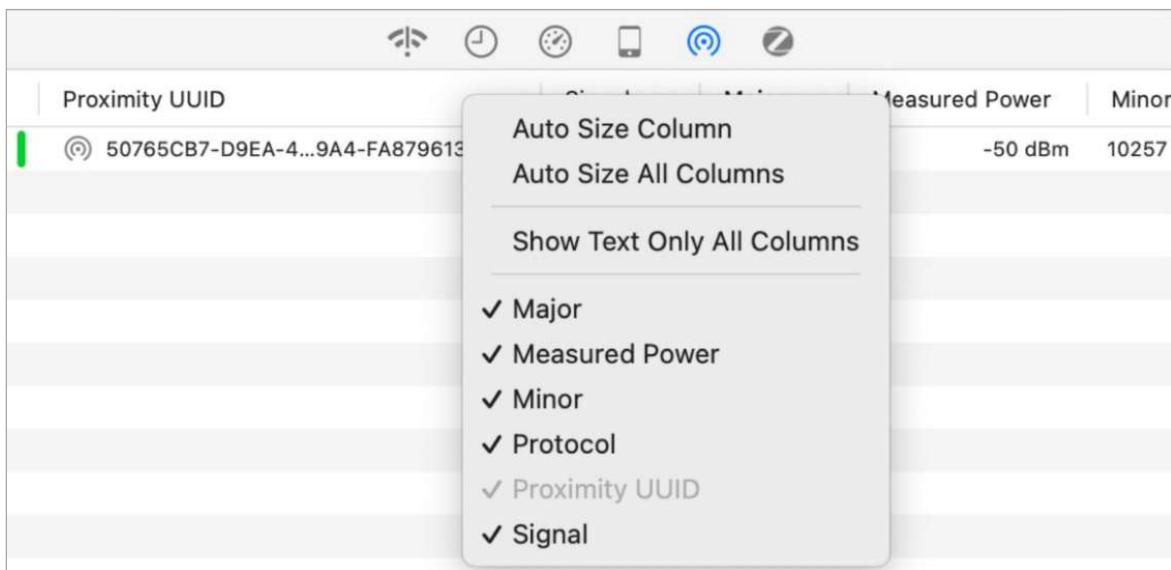


Figure 13-10 - Clients Inspector showing client data for a selected network

Figure 13-11 - *Clients Inspector* column display optionsFigure 13-12 - *Proximity Beacons Inspector* column display options

PAN ID	Channel	Signal	Link Quality	Frequency
BE1D	25	-39 dBm	58%	2475 MHz
B373	25	-40 dBm	100%	2475 MHz

Figure 13-13 - Zigbee network discovery

Chapter 14 - Troubleshooting Workflow

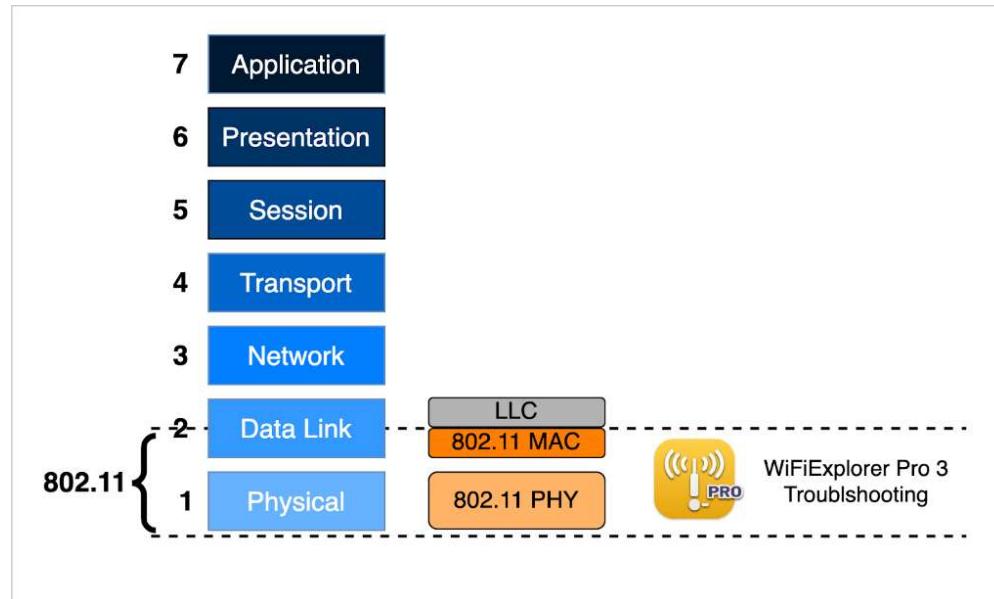


Figure 14-1 - WFE Pro 3 capabilities within the OSI seven-layer model

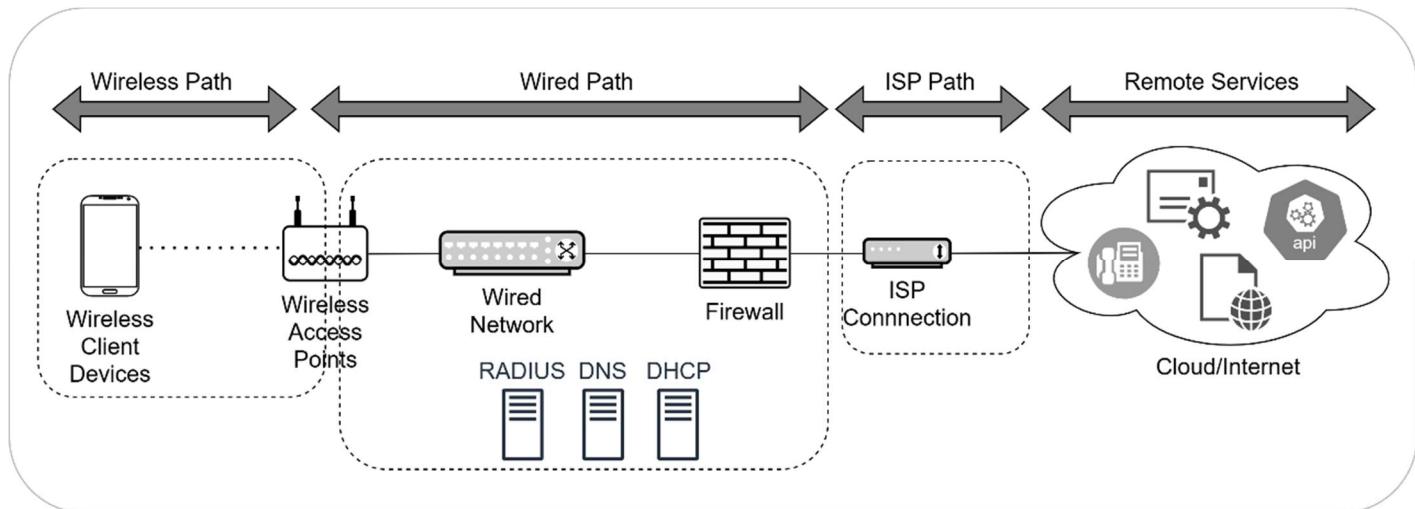


Figure 14-2 - Simplified network model

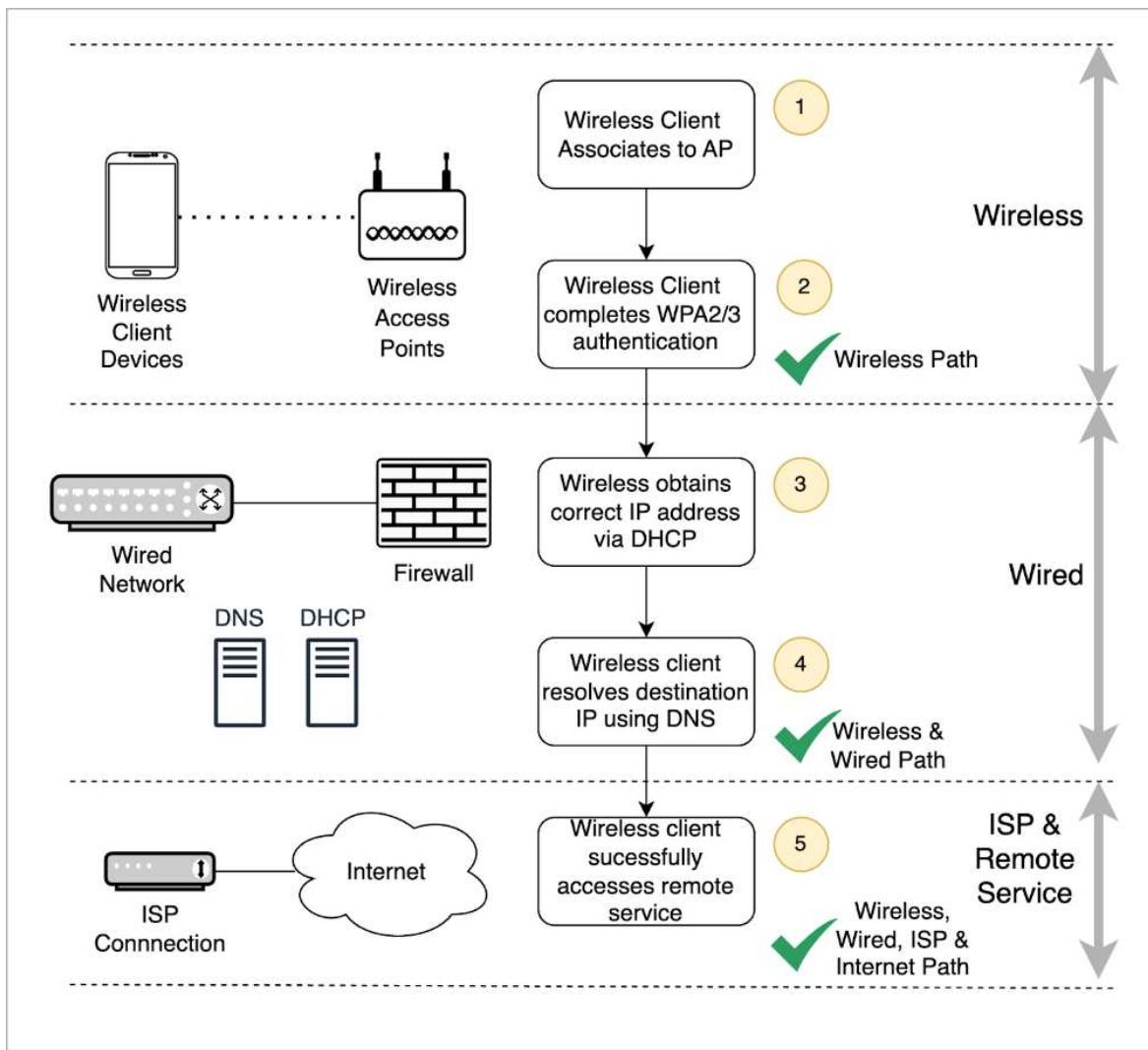


Figure 14-3 - Connectivity flow & dependencies

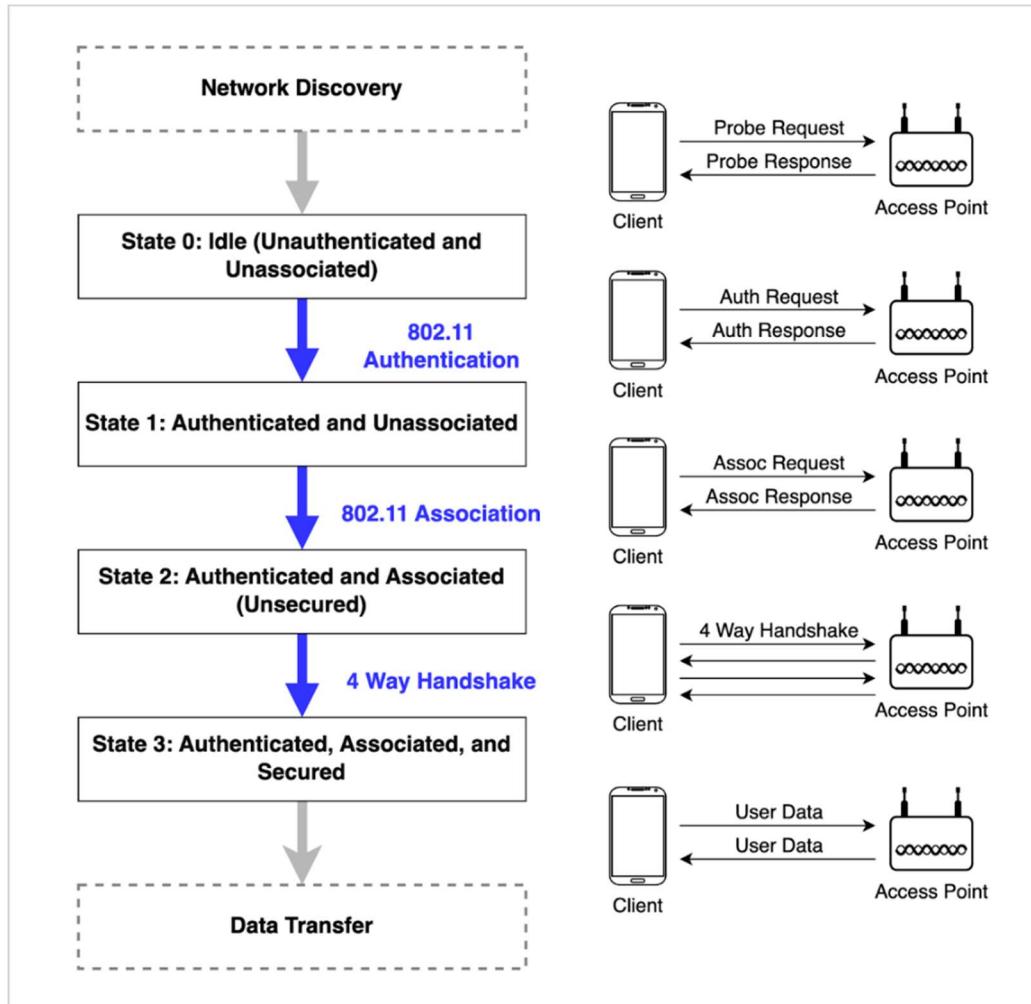


Figure 14-4 - 802.11 state machine

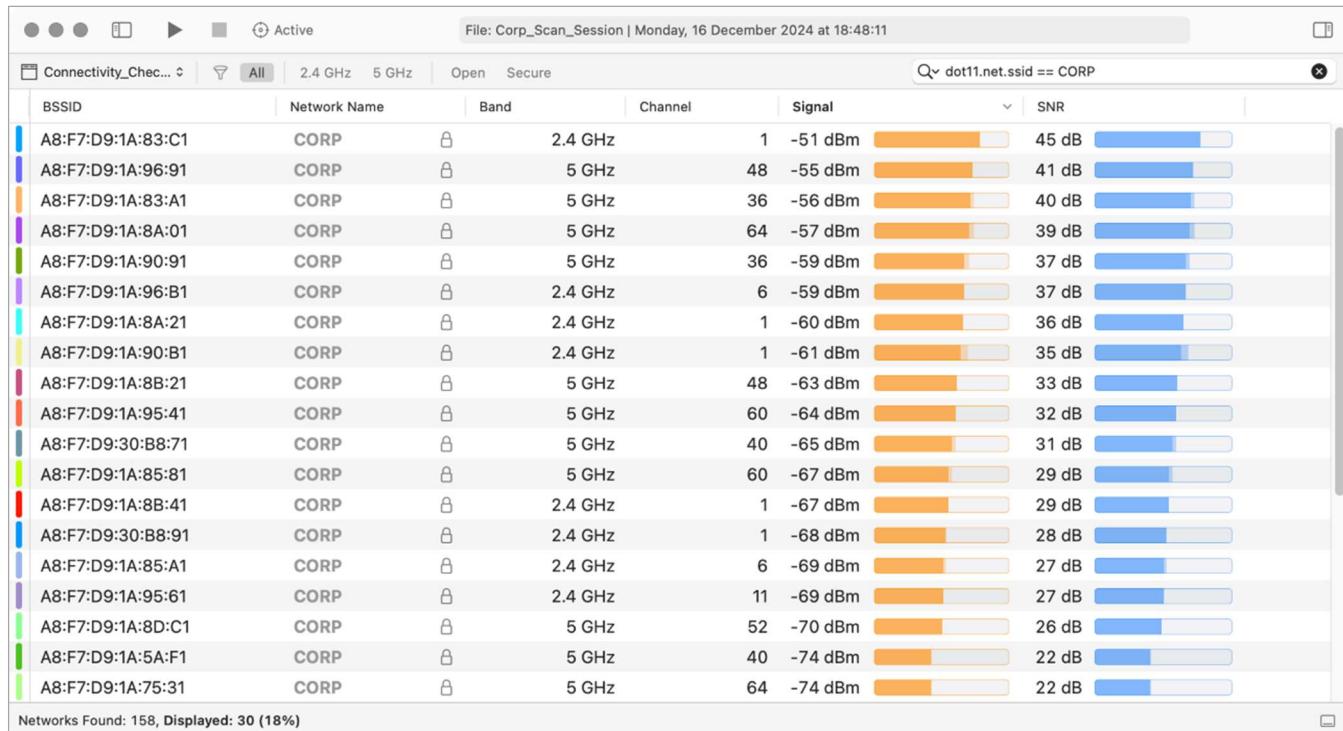


Figure 14-5 - CORP SSID checking

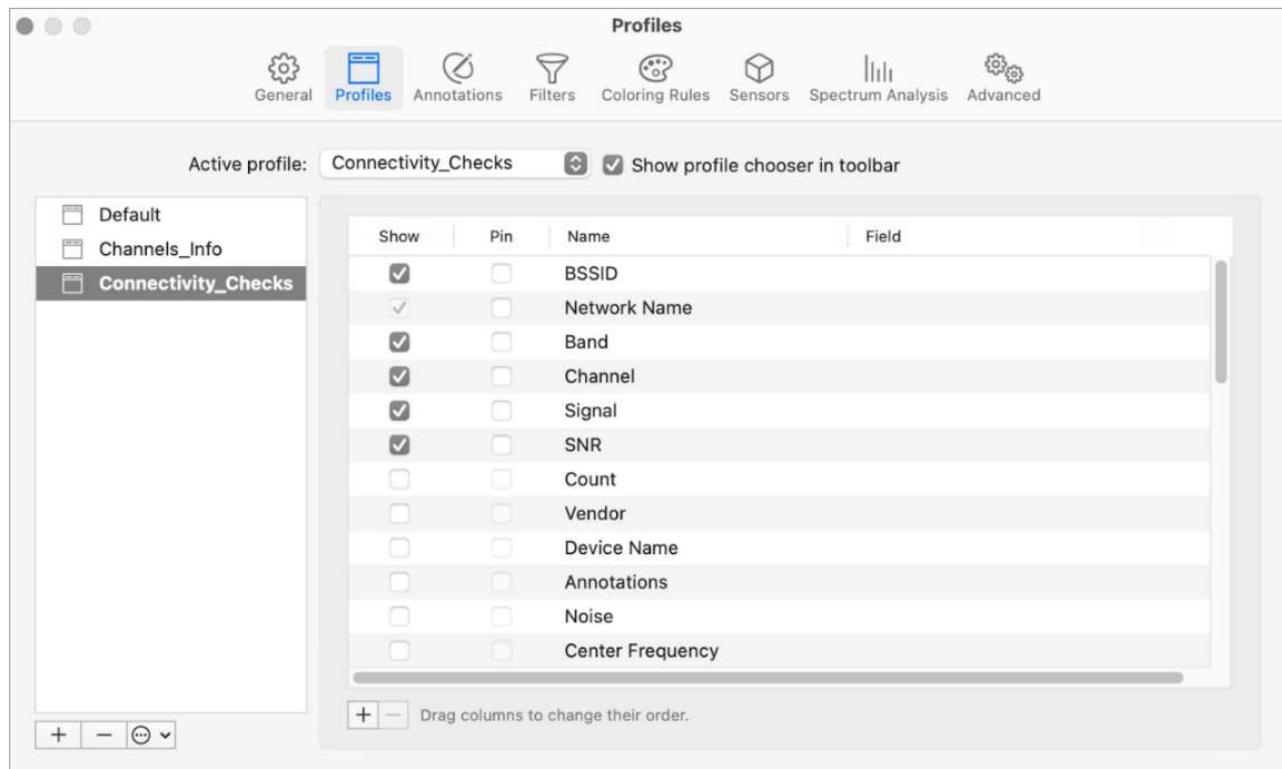


Figure 14-6 - Connectivity checks profile

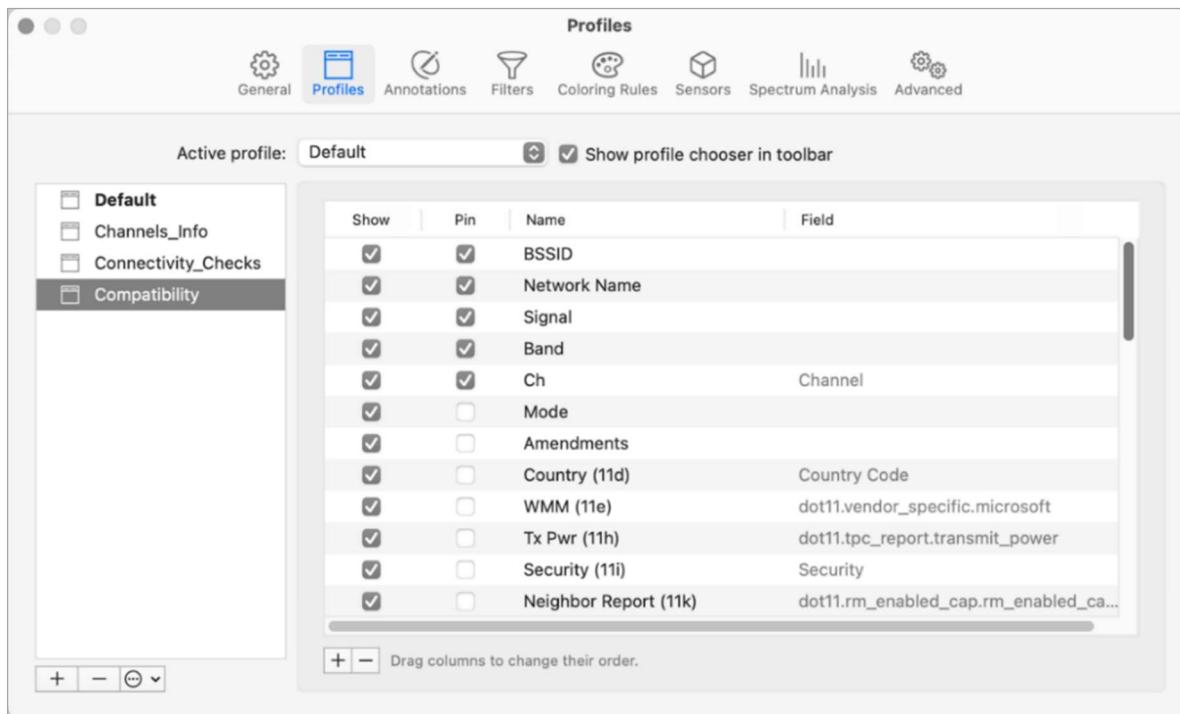


Figure 14-7 - Compatibility profile (1/2)

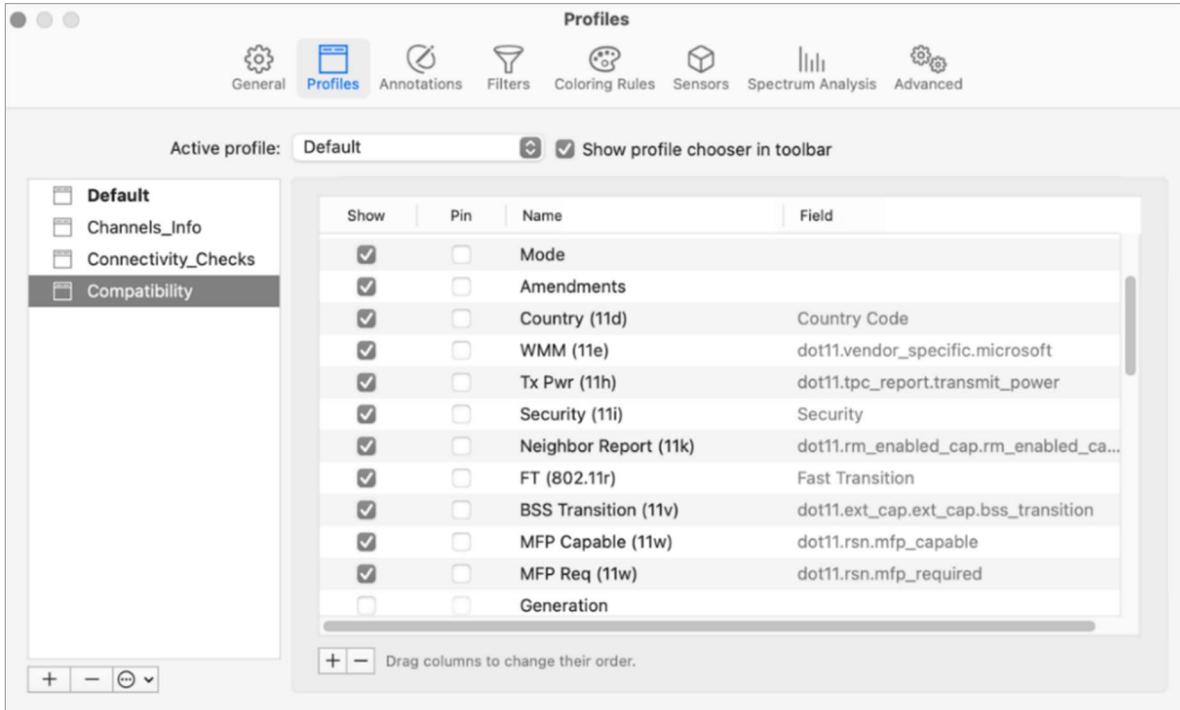


Figure 14-8 - Compatibility profile (2/2)

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

File: Corp_Scan_Session Monday, 16 December 2024 at 18:48:11											
Compatibility		Network Name	Signal	Ch	Band	Mode	Amendments	Country (11d)	WMM (11e)	Tx Pwr (11h)	Security (11i)
A8:F7:D9:1A:83:C1	CORP	Open	-51 dBm	1	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:1A:96:91	CORP	Open	-55 dBm	48	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:83:A1	CORP	Open	-56 dBm	36	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:8A:01	CORP	Open	-57 dBm	64	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:90:91	CORP	Open	-59 dBm	36	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:96:B1	CORP	Open	-59 dBm	6	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:1A:8A:21	CORP	Open	-60 dBm	1	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:1A:90:B1	CORP	Open	-61 dBm	1	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:1A:8B:21	CORP	Open	-63 dBm	48	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:95:41	CORP	Open	-64 dBm	60	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:30:B8:71	CORP	Open	-65 dBm	40	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:85:81	CORP	Open	-67 dBm	60	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:8B:41	CORP	Open	-67 dBm	1	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:30:B8:91	CORP	Open	-68 dBm	1	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:1A:85:A1	CORP	Open	-69 dBm	6	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:1A:95:61	CORP	Open	-69 dBm	11	2.4 GHz	g/n/ax	d/e/h/i/k/r/v	GB	✓	13	WPA2 (802.1X)
A8:F7:D9:1A:8D:C1	CORP	Open	-70 dBm	52	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:5A:F1	CORP	Open	-74 dBm	40	5 GHz	a/n/ac/ax	d/e/h/i/k/r/v	GB	✓	18	WPA2 (802.1X)
A8:F7:D9:1A:75:31	CORP	Open	-74 dBm	64	5 GHz	WPA2 (802.1X)

Figure 14-9 - 802.11 feature (amendments) checks (1/2)

File: Corp_Scan_Session Monday, 16 December 2024 at 18:48:11											
Compatibility		Network Name	Signal	Ch	Band	Neighbor Report (11k)	FT (802.11r)	BSS Transition...	MFP Capable (11w)	MFP Req (11w)	
A8:F7:D9:1A:83:C1	CORP	Open	-51 dBm	1	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:96:91	CORP	Open	-55 dBm	48	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:83:A1	CORP	Open	-56 dBm	36	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:8A:01	CORP	Open	-57 dBm	64	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:90:91	CORP	Open	-59 dBm	36	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:96:B1	CORP	Open	-59 dBm	6	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:8A:21	CORP	Open	-60 dBm	1	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:90:B1	CORP	Open	-61 dBm	1	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:8B:21	CORP	Open	-63 dBm	48	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:95:41	CORP	Open	-64 dBm	60	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:30:B8:71	CORP	Open	-65 dBm	40	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:85:81	CORP	Open	-67 dBm	60	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:8B:41	CORP	Open	-67 dBm	1	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:30:B8:91	CORP	Open	-68 dBm	1	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:85:A1	CORP	Open	-69 dBm	6	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:95:61	CORP	Open	-69 dBm	11	2.4 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:8D:C1	CORP	Open	-70 dBm	52	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:5A:F1	CORP	Open	-74 dBm	40	5 GHz	Enabled	OTD	Supported	No	No	
A8:F7:D9:1A:75:31	CORP	Open	-74 dBm	64	5 GHz	WPA2 (802.1X)

Figure 14-10 - 802.11 feature (amendments) checks (2/2)

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

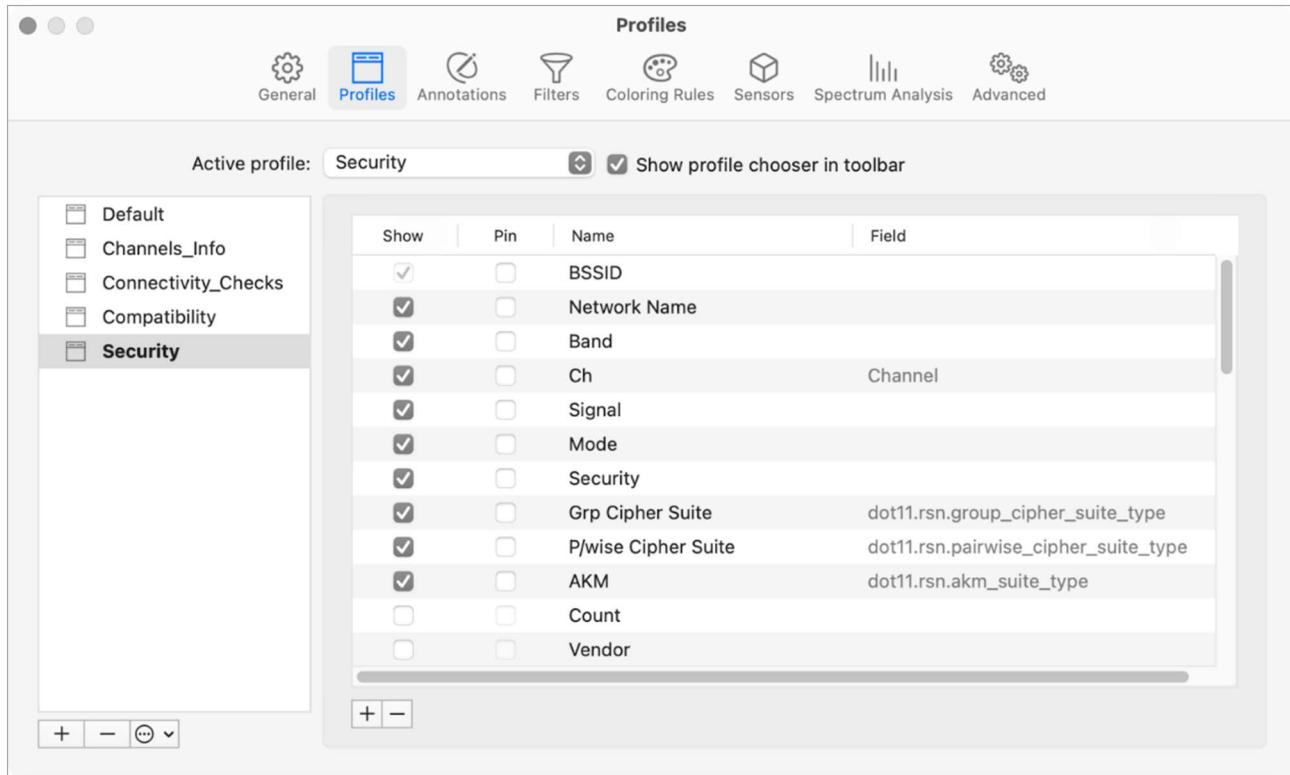


Figure 14-11 - Security profile

Security		Network Name	Band	Ch	Signal	Mode	Security	Grp Cipher...	P/wise Cipher...	AKM
A8:F7:D9:1A:83:C1	CORP	CO...GUE	2.4 GHz	1	-51 dBm	g/n/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:83:C2	Tes...iFi	_BTWi-fi	2.4 GHz	1	-51 dBm	g/n/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:83:C3	CO...GUE	CORP	5 GHz	48	-55 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:96:91	CO...GUE	Tes...iFi	5 GHz	48	-55 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:96:92	CO...AYS	CORP	5 GHz	48	-55 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:96:93	CO...AYS	Tes...iFi	5 GHz	48	-55 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:96:94	CO...AYS	_BTWi-fi	5 GHz	48	-55 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:83:A1	CORP	Tes...iFi	5 GHz	36	-56 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:83:A3	CO...AYS	_BTWi-fi	5 GHz	36	-56 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:83:A4	Tes...iFi	CORP	5 GHz	36	-56 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:83:A5	_BTWi-fi	CO...GUE	5 GHz	36	-56 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:96:95	_BTWi-fi	Tes...iFi	5 GHz	48	-56 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:8A:01	CORP	CORP	5 GHz	64	-57 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:8A:02	CO...GUE	CO...GUE	5 GHz	64	-57 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:83:A2	CO...GUE	CO...GUE	5 GHz	36	-58 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:8A:03	CO...AYS	CO...AYS	5 GHz	64	-58 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE
A8:F7:D9:1A:8A:04	Tes...iFi	Tes...iFi	5 GHz	64	-58 dBm	a/n/ac/ax	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X, FT over IEEE

Figure 14-12 - Security check #1

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

File: Corp_Scan_Session2 | Monday, 16 December 2024 at 19:14:40

Security	All	2.4 GHz	5 GHz	Open	Secure	Filter			
BSSID	Network N...	Band	Ch	Signal	Mode	Security	Grp Cipher Suite	P/wise Cipher Suite	AKM
84:24:8D:BD:9F:00	L...NO	5 GHz	40	-50 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BD:9F:01	B...NA	5 GHz	40	-50 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BD:9F:02	V...IUS	5 GHz	40	-50 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BD:9F:03	LIPARI	5 GHz	40	-50 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BD:9F:04	M...RE	5 GHz	40	-50 dBm	a/n/ac	WPA/WPA2 (PSK)	TKIP	TKIP, CCMP-128	PSK
84:24:8D:BD:9F:05	S...NA	5 GHz	40	-50 dBm	a/n/ac	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X
84:24:8D:BD:9F:06	C...NO	5 GHz	40	-50 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BD:9F:07	M...ZO	5 GHz	40	-50 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BB:15:83	_...ree	2.4 GHz	1	-57 dBm	g/n				
84:24:8D:BB:15:80	M...RE	2.4 GHz	1	-58 dBm	g/n	WPA/WPA2 (PSK)	TKIP	TKIP, CCMP-128	PSK
84:24:8D:BB:15:81	B...NA	2.4 GHz	1	-58 dBm	g/n	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BB:15:82	C...RA	2.4 GHz	1	-58 dBm	g/n	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BE:A5:B0	L...NO	5 GHz	44	-60 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BE:A5:B1	B...NA	5 GHz	44	-60 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BE:A5:B2	V...IUS	5 GHz	44	-60 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BE:A5:B3	LIPARI	5 GHz	44	-60 dBm	a/n/ac	WPA2 (PSK)	CCMP-128	CCMP-128	PSK
84:24:8D:BE:A5:B4	M...RE	5 GHz	44	-60 dBm	a/n/ac	WPA/WPA2 (PSK)	TKIP	TKIP, CCMP-128	PSK
84:24:8D:BE:A5:B5	S...NA	5 GHz	44	-60 dBm	a/n/ac	WPA2 (802.1X)	CCMP-128	CCMP-128	802.1X

Networks Found: 177, Displayed: 177 (100%)

Figure 14-13 - Security check #2

Profiles

- General
- Profiles**
- Annotations
- Filters
- Coloring Rules
- Sensors
- Spectrum Analysis
- Advanced

Active profile: Performance Show profile chooser in toolbar

Show	Pin	Name	Field
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	BSSID	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Network Name	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Signal	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	SNR	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Band	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Channel	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Channel Width	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Channel Utilization	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gen	Generation
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mode	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Stations	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Streams	

+ - ⓘ Drag columns to change their order.

Figure 14-14 - Performance profile (1/2)

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

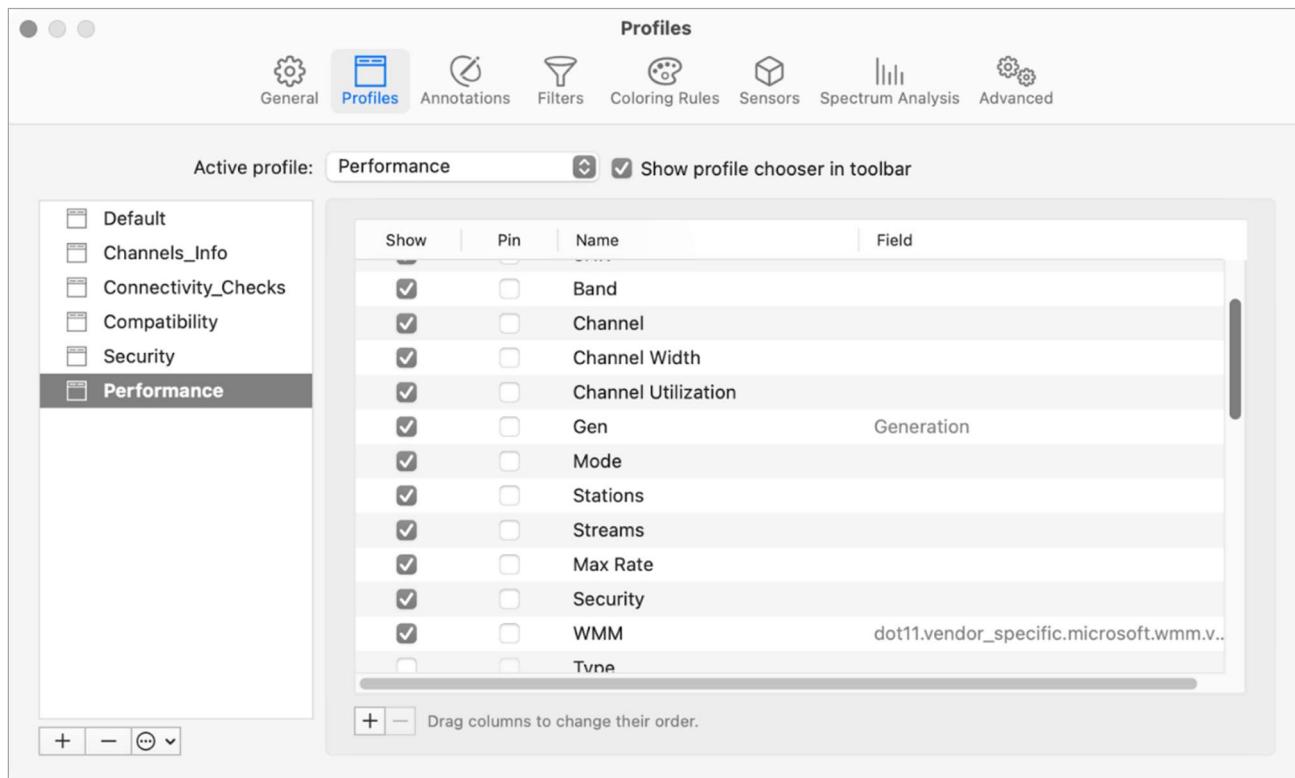


Figure 14-15 - Performance profile (2/2)

Performance		Network Name	Signal	SNR	Band	Ch...	Channel Width	Channel Utilization	Stations	Gen	Mode
A8:F7:D9:1A:83:C1	CORP	-51 dBm	45 dB	2.4 GHz	1	20 MHz	44%	1	6	g/n/ax	
A8:F7:D9:1A:83:C2	CO...UE	-51 dBm	45 dB	2.4 GHz	1	20 MHz	44%	0	6	g/n/ax	
A8:F7:D9:1A:83:C3	Te...iFi	-51 dBm	45 dB	2.4 GHz	1	20 MHz	44%	2	6	g/n/ax	
A8:F7:D9:1A:83:C4	_B...i-fi	-51 dBm	45 dB	2.4 GHz	1	20 MHz	44%	0	6	g/n/ax	
A8:F7:D9:1A:96:91	CORP	-55 dBm	41 dB	5 GHz	48	20 MHz	33%	1	6	a/n/ac/ax	
A8:F7:D9:1A:96:92	CO...UE	-55 dBm	41 dB	5 GHz	48	20 MHz	33%	0	6	a/n/ac/ax	
A8:F7:D9:1A:96:93	CO...YS	-55 dBm	41 dB	5 GHz	48	20 MHz	33%	2	6	a/n/ac/ax	
A8:F7:D9:1A:96:94	Te...iFi	-55 dBm	41 dB	5 GHz	48	20 MHz	33%	4	6	a/n/ac/ax	
A8:F7:D9:1A:83:A1	CORP	-56 dBm	40 dB	5 GHz	36	20 MHz	15%	1	6	a/n/ac/ax	
A8:F7:D9:1A:83:A3	CO...YS	-56 dBm	40 dB	5 GHz	36	20 MHz	15%	1	6	a/n/ac/ax	
A8:F7:D9:1A:83:A4	Te...iFi	-56 dBm	40 dB	5 GHz	36	20 MHz	15%	2	6	a/n/ac/ax	
A8:F7:D9:1A:83:A5	_B...i-fi	-56 dBm	40 dB	5 GHz	36	20 MHz	15%	0	6	a/n/ac/ax	
A8:F7:D9:1A:96:95	_B...i-fi	-56 dBm	40 dB	5 GHz	48	20 MHz	33%	0	6	a/n/ac/ax	
A8:F7:D9:1A:8A:01	CORP	-57 dBm	39 dB	5 GHz	64	20 MHz	11%	0	6	a/n/ac/ax	
A8:F7:D9:1A:8A:02	CO...UE	-57 dBm	39 dB	5 GHz	64	20 MHz	11%	1	6	a/n/ac/ax	
A8:F7:D9:1A:83:A2	CO...UE	-58 dBm	38 dB	5 GHz	36	20 MHz	11%	0	6	a/n/ac/ax	
A8:F7:D9:1A:8A:03	CO...YS	-58 dBm	38 dB	5 GHz	64	20 MHz	11%	2	6	a/n/ac/ax	
A8:F7:D9:1A:8A:04	Te...iFi	-58 dBm	38 dB	5 GHz	64	20 MHz	11%	11	6	a/n/ac/ax	
A8:F7:D9:1A:8A:05	_B...i-fi	-58 dBm	38 dB	5 GHz	64	20 MHz	11%	0	6	a/n/ac/ax	

Figure 14-16 - Performance profile example (1/2)

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

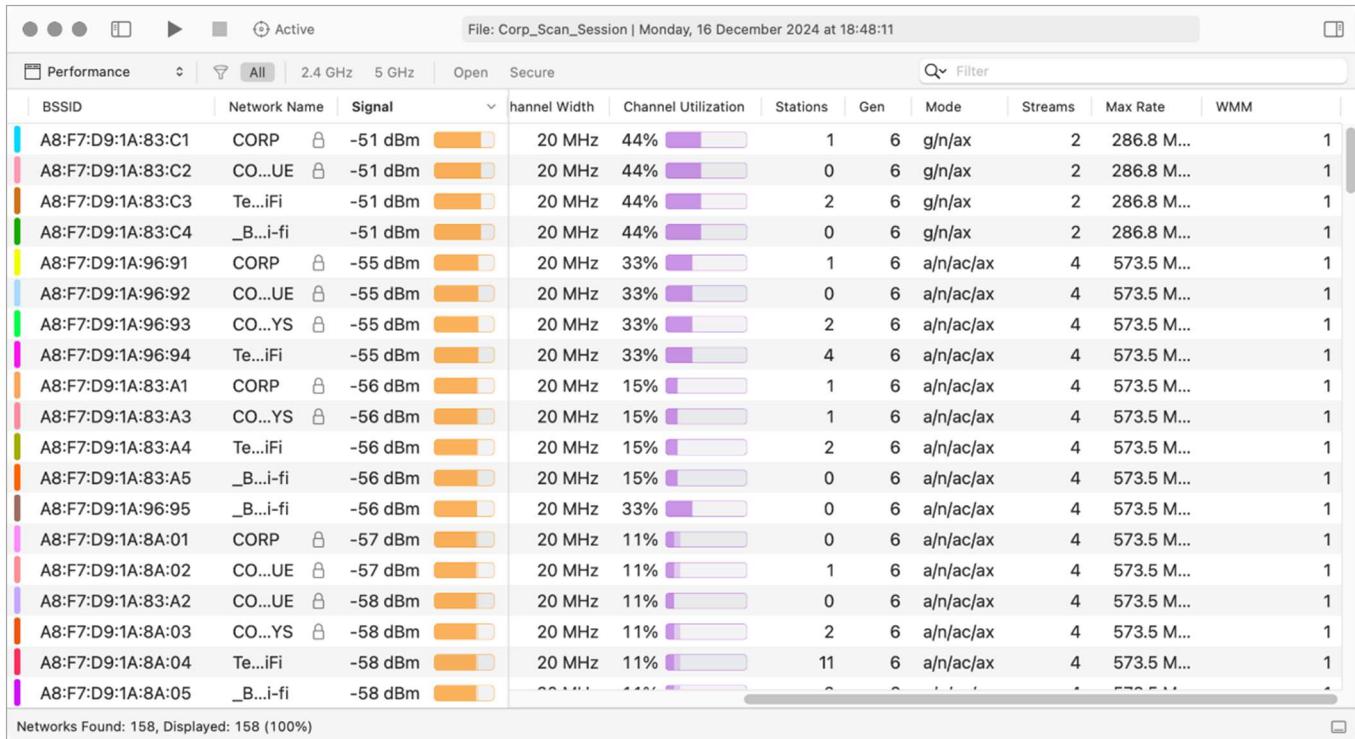


Figure 14-17 - Performance profile example (2/2)

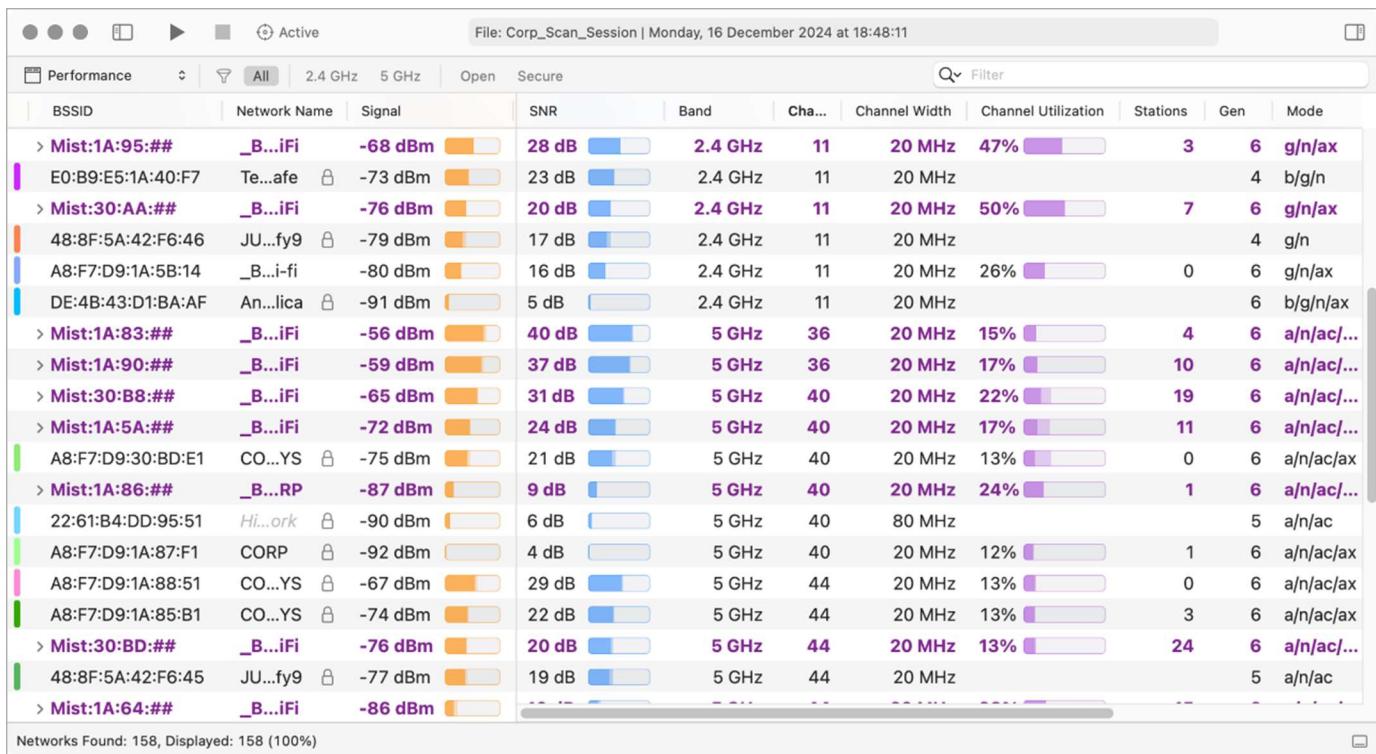


Figure 14-18 - Performance profile example - consolidated, per radio view

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

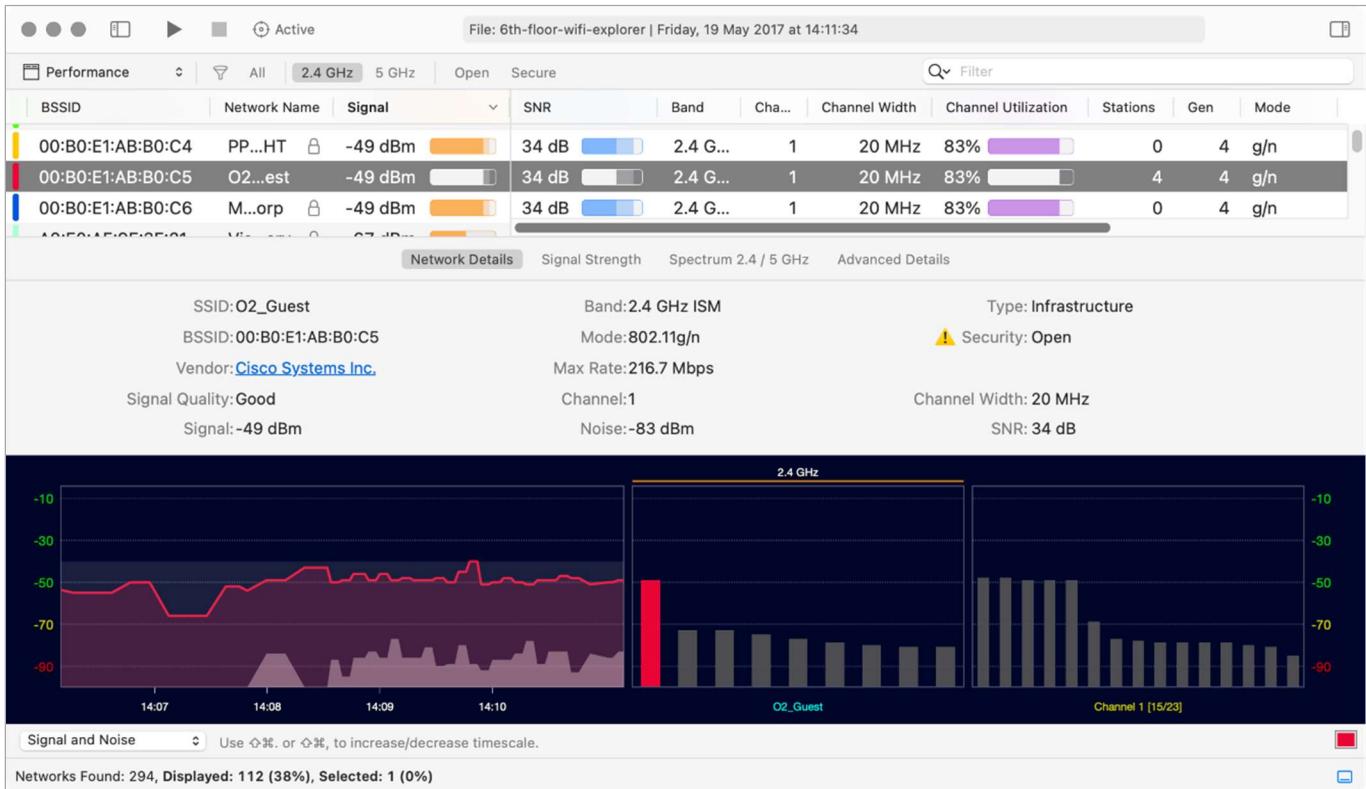


Figure 14-19 - Network Details view for an SSID under investigation

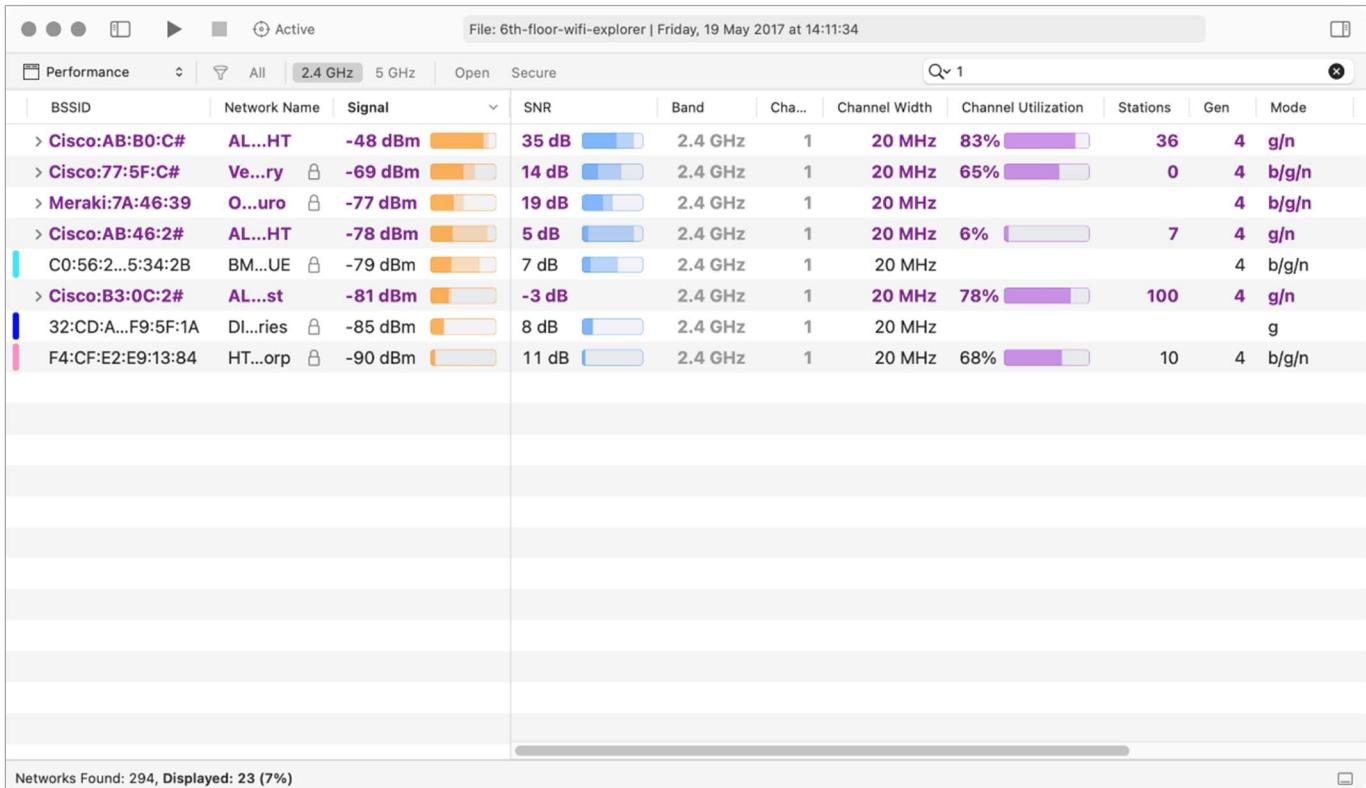


Figure 14-20 - Consolidated view using View > Organize Networks By Access Point Radio

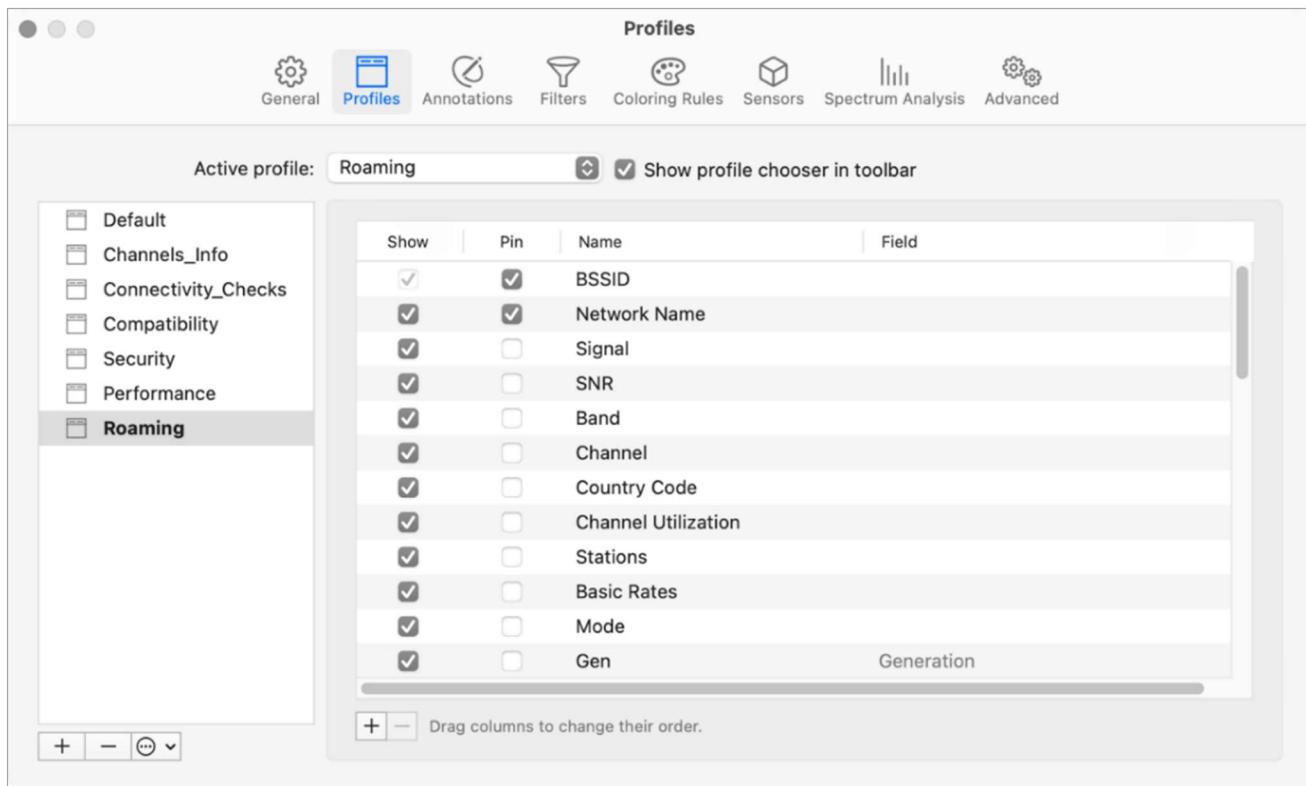


Figure 14-21 - Roaming profile (1/2)

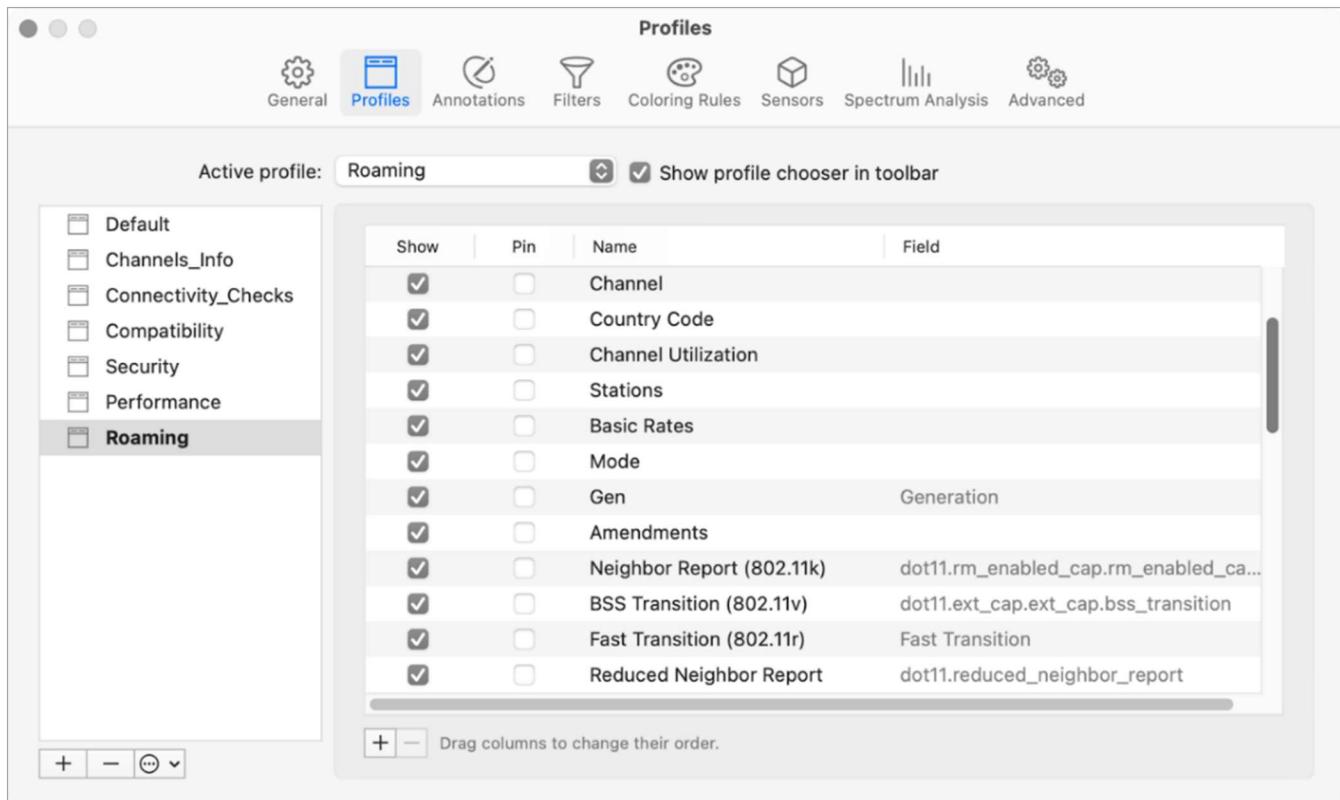


Figure 14-22 - Roaming profile (2/2)

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

File: Corp_Scan_Session Monday, 16 December 2024 at 18:48:11													
Roaming	Network Name	Signal	SNR	Band	Ch...	Country...	Channel Utilization	Stations	Basic Rates	Mode			
BSSID													
A8:F7:D9:1A:96:91	CORP	-55 dBm	41 dB	5 GHz	48	GB	33%	1	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:83:A1	CORP	-56 dBm	40 dB	5 GHz	36	GB	15%	1	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:8A:01	CORP	-57 dBm	39 dB	5 GHz	64	GB	11%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:90:91	CORP	-59 dBm	37 dB	5 GHz	36	GB	17%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:8B:21	CORP	-63 dBm	33 dB	5 GHz	48	GB	34%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:95:41	CORP	-64 dBm	32 dB	5 GHz	60	GB	29%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:30:B8:71	CORP	-65 dBm	31 dB	5 GHz	40	GB	22%	1	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:85:81	CORP	-67 dBm	29 dB	5 GHz	60	GB	24%	4	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:8D:C1	CORP	-70 dBm	26 dB	5 GHz	52	GB	15%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:5A:F1	CORP	-74 dBm	22 dB	5 GHz	40	GB	17%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:86:D1	CORP	-74 dBm	22 dB	5 GHz	56	GB	5%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:75:31	CORP	-74 dBm	22 dB	5 GHz	64	GB	12%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:30:AA:91	CORP	-75 dBm	21 dB	5 GHz	48	GB	39%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:90:F1	CORP	-76 dBm	20 dB	5 GHz	36	GB	15%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:30:BD:51	CORP	-76 dBm	20 dB	5 GHz	44	GB	13%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:30:BC:01	CORP	-76 dBm	20 dB	5 GHz	52	GB	13%	0	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:81:91	CORP	-83 dBm	13 dB	5 GHz	52	GB	16%	19	12, 24 Mbps	a/n/ac/ax			
A8:F7:D9:1A:86:41	CORP	-87 dBm	9 dB	5 GHz	40	GB	24%	0	12, 24 Mbps	a/n/ac/ax			

Figure 14-23 - Networks table with Roaming profile applied (1/2)

File: Corp_Scan_Session Monday, 16 December 2024 at 18:48:11													
Roaming	Network Na...	Ons	Basic Rates	Mode	Gen	Amendments	Neighbor Repor...	BSS Transition...	Fast Trans...	Reduced Neigh...			
BSSID													
A8:F7:D9:1A:96:91	CORP	1	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:83:A1	CORP	1	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:8A:01	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:90:91	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:8B:21	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:95:41	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:30:B8:71	CORP	1	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:85:81	CORP	4	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:8D:C1	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:5A:F1	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:75:31	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:86:D1	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:30:AA:91	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:90:F1	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:30:BC:01	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:30:BD:51	CORP	0	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:81:91	CORP	19	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				
A8:F7:D9:1A:86:41	CORP	1	12, 24 Mbps	a/n/ac/ax	6	d/e/h/j/k/r/v	Enabled	Supported	OTD				

Figure 14-24 - Networks table with Roaming profile applied (2/2)

File: Corp_Scan_Session | Monday, 16 December 2024 at 18:48:11

BSSID	Network Na...	Signal	SNR	Band	Ch...	Country...	Channel Utilization	Stations	Basic Rates	Mode
> Mist:1A:96:##	_B...iFi	-55 dBm	41 dB	5 GHz	48	GB	33%	7	12, 24 Mbps	a/n/ac/..
> Mist:1A:83:##	_B...iFi	-56 dBm	40 dB	5 GHz	36	GB	15%	4	12, 24 Mbps	a/n/ac/..
> Mist:1A:8A:##	_B...iFi	-57 dBm	39 dB	5 GHz	64	GB	11%	16	12, 24 Mbps	a/n/ac/..
> Mist:1A:90:##	_B...iFi	-59 dBm	37 dB	5 GHz	36	GB	17%	10	12, 24 Mbps	a/n/ac/..
> Mist:1A:8B:##	_B...iFi	-63 dBm	33 dB	5 GHz	48	GB	34%	9	12, 24 Mbps	a/n/ac/..
A8:F7:D9:1A:85:51	C...AYS	-63 dBm	33 dB	5 GHz	56	GB	6%	7	12, 24 Mbps	a/n/ac/ax
> Mist:1A:95:##	_B...iFi	-63 dBm	33 dB	5 GHz	60	GB	29%	8	12, 24 Mbps	a/n/ac/..
> Mist:30:B8:##	_B...iFi	-65 dBm	31 dB	5 GHz	40	GB	22%	19	12, 24 Mbps	a/n/ac/..
A8:F7:D9:1A:80:11	C...AYS	-66 dBm	30 dB	5 GHz	52	GB	15%	14	12, 24 Mbps	a/n/ac/ax
A8:F7:D9:1A:88:51	C...AYS	-67 dBm	29 dB	5 GHz	44	GB	13%	0	12, 24 Mbps	a/n/ac/ax
> Mist:1A:85:##	_B...iFi	-67 dBm	29 dB	5 GHz	60	GB	24%	17	12, 24 Mbps	a/n/ac/..
A8:F7:D9:1A:82:51	C...AYS	-67 dBm	29 dB	5 GHz	64	GB	14%	51	12, 24 Mbps	a/n/ac/ax
> Mist:1A:8D:##	_B...iFi	-68 dBm	28 dB	5 GHz	52	GB	15%	2	12, 24 Mbps	a/n/ac/..
> Mist:1A:5A:##	_B...iFi	-72 dBm	24 dB	5 GHz	40	GB	17%	11	12, 24 Mbps	a/n/ac/..
A8:F7:D9:1A:85:B1	C...AYS	-74 dBm	22 dB	5 GHz	44	GB	13%	3	12, 24 Mbps	a/n/ac/ax
> Mist:1A:86:##	_B...iFi	-74 dBm	22 dB	5 GHz	56	GB	5%	10	12, 24 Mbps	a/n/ac/..
> Mist:1A:75:##	_B...iFi	-74 dBm	22 dB	5 GHz	64	GB	12%	5	12, 24 Mbps	a/n/ac/..
A8:F7:D...30:BD:E1	C...AYS	-75 dBm	21 dB	5 GHz	40	GB	13%	0	12, 24 Mbps	a/n/ac/ax

Networks Found: 158, Displayed: 108 (68%)

Figure 14-25 - Networks table organized by AP radio with Roaming profile applied

Chapter 15 - Data Export & Reporting

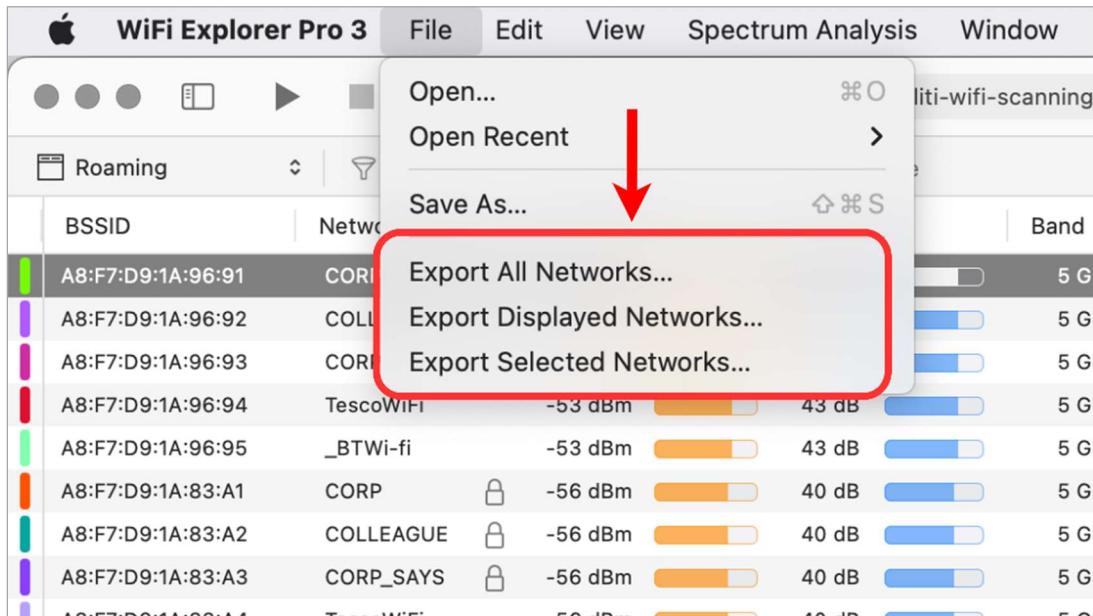
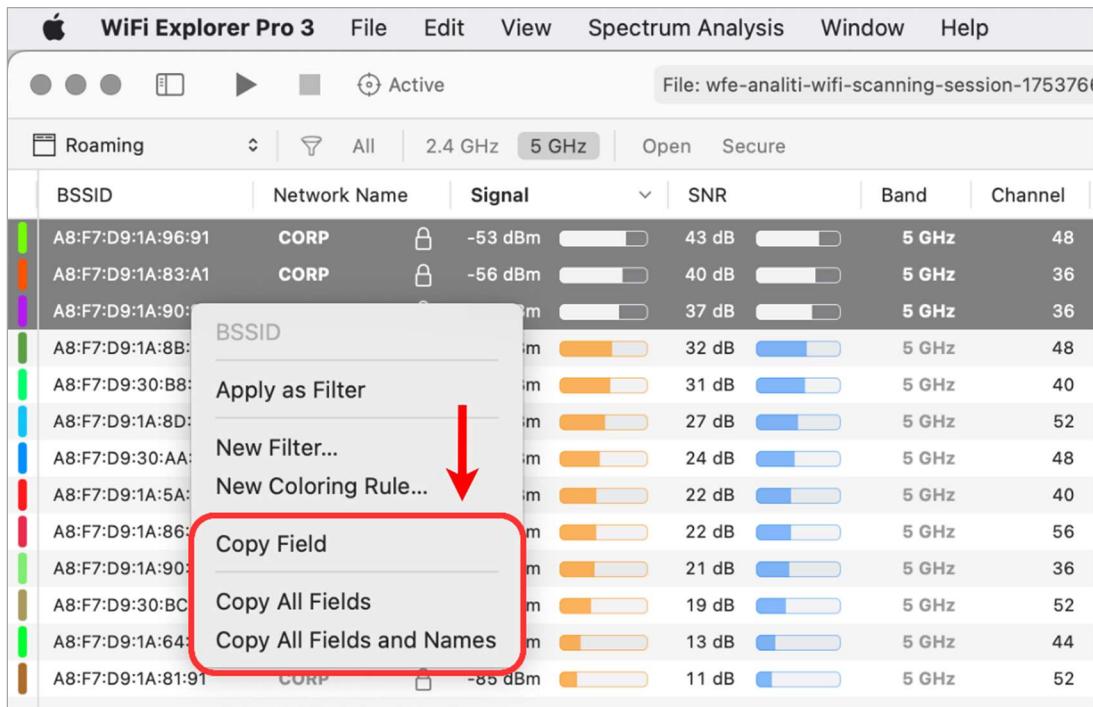
Figure 15-1: Export options available via the *File* menu

Figure 15-2: Copy options available via Control-click

WiFi Explorer Pro 3: The Definitive User Guide (Screenshots)

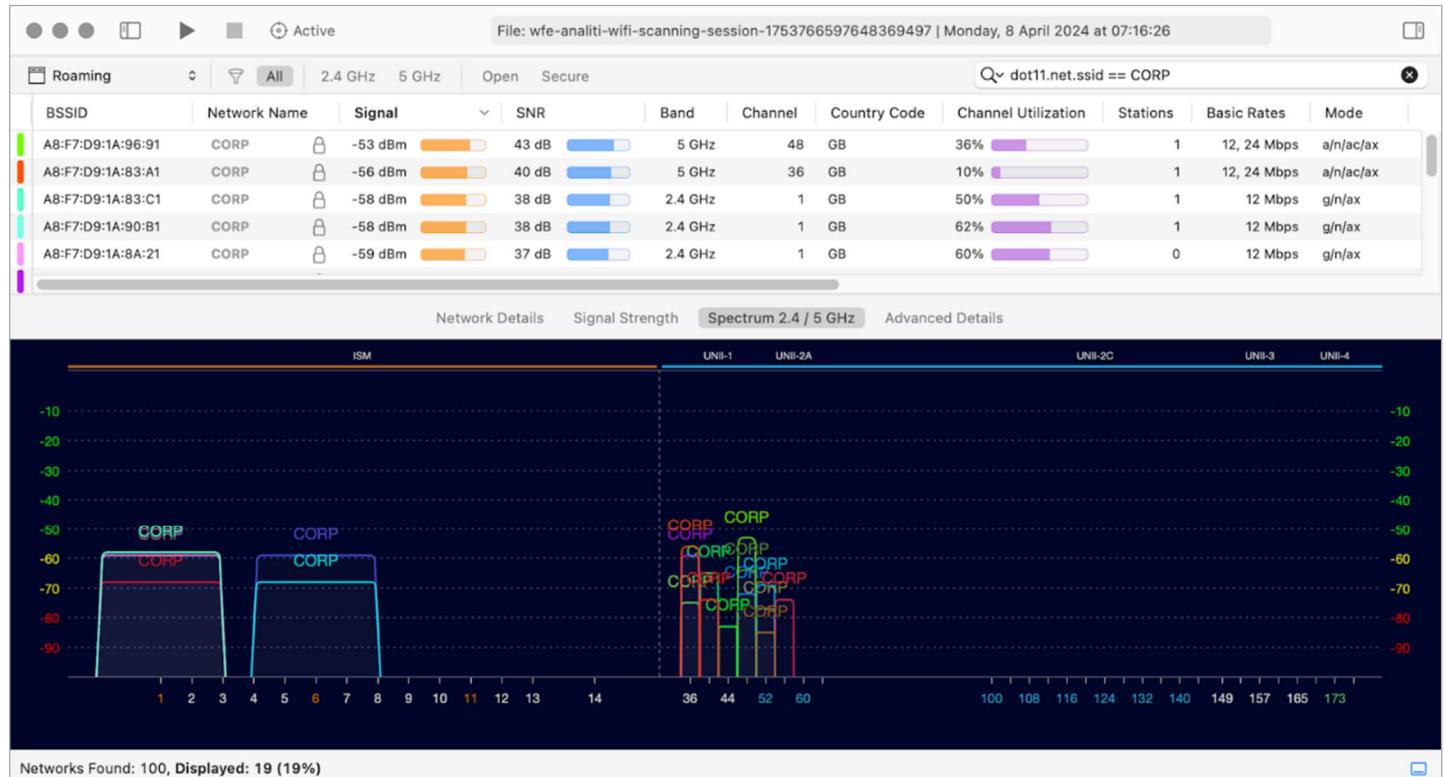


Figure 15-3: Spectrum 2.4/5 GHz panel used for drag and drop



Figure 15-4: Resulting image from panel image drag and drop

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The screenshot shows the WiFi Explorer Pro 3 interface. At the top, there's a performance summary table for a scan session named 'Corp_Scan_Session' from Monday, December 16, 2024, at 18:48:11. Below it is a detailed list of BSSIDs, including their SSID, Network Name, Signal strength, SNR, Band, Channel, Channel Width, Channel Utilization, Stations, Gen, and Mode.

In the center, the 'Information Element' details pane is open for a selected entry (ID 54). It shows the 'Mobility Domain' element with fields like Element ID (54), Length (3 bytes), and MDID (26807 0x68b7). A red arrow points to the 'Mobility Domain' section. To the right, a context menu is displayed for the 'dot11.mobility_domain' item, with options like 'Copy Element' and 'Copy All Elements' highlighted with a red box and arrow.

At the bottom, there's a search bar and a message indicating 158 networks found, 30 displayed, and 1 selected.

Figure 15-5: Information element data copy options

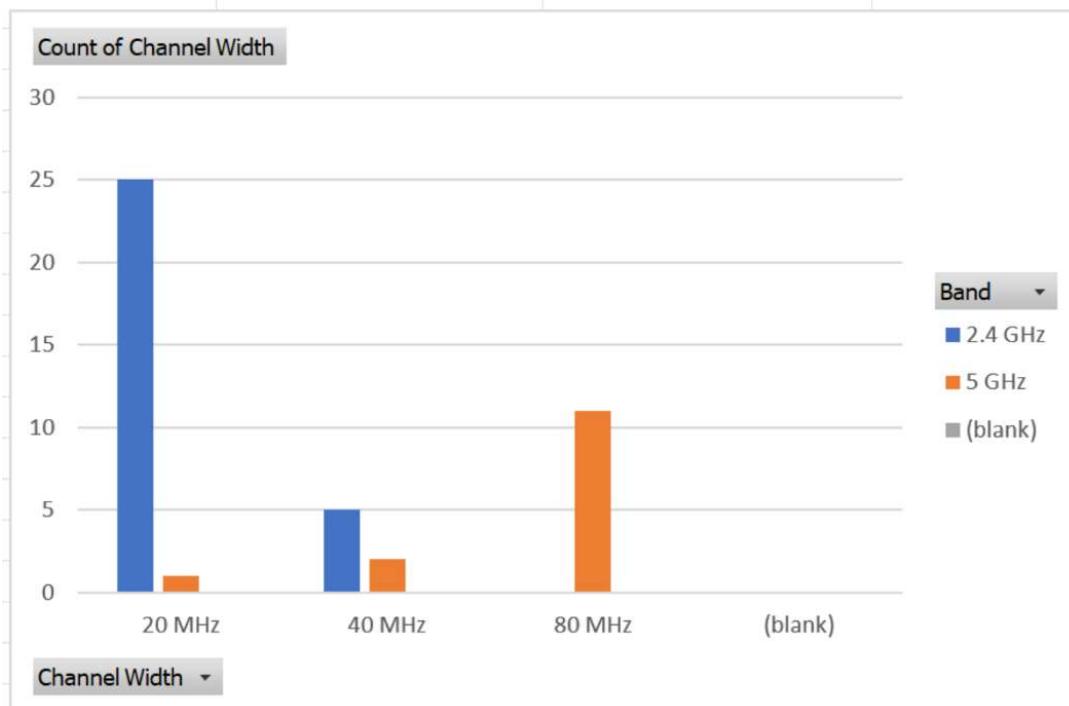


Figure 15-6 - Sample report created from CSV data using Excel

Chapter 16 - RF Environment Auditing

No screenshots.

Chapter 17 - Raspberry Pi Sensor



Figure 17-1 - microSD reader (USB-A) with microSD card

Install Raspberry Pi OS using Raspberry Pi Imager

Raspberry Pi Imager is the quick and easy way to install Raspberry Pi OS and other operating systems to a microSD card, ready to use with your Raspberry Pi.

Download and install Raspberry Pi Imager to a computer with an SD card reader. Put the SD card you'll use with your Raspberry Pi into the reader and run Raspberry Pi Imager.

[Download for macOS](#)

[Download for Windows](#)

[Download for Ubuntu for x86](#)

To install on **Raspberry Pi OS**, type
`sudo apt install rpi-imager`
in a Terminal window.

The screenshot shows the Raspberry Pi Imager software interface. The title bar says "Raspberry Pi Imager v1.8.1". The main area has a red background with the text "Raspberry Pi" and a green Raspberry Pi logo. Below this are three buttons: "CHOOSE DEVICE", "CHOOSE OS", and "CHOOSE STORAGE". At the bottom right is a "NEXT" button.

Figure 17-2 - Screenshot of Raspberry Pi Imager download page

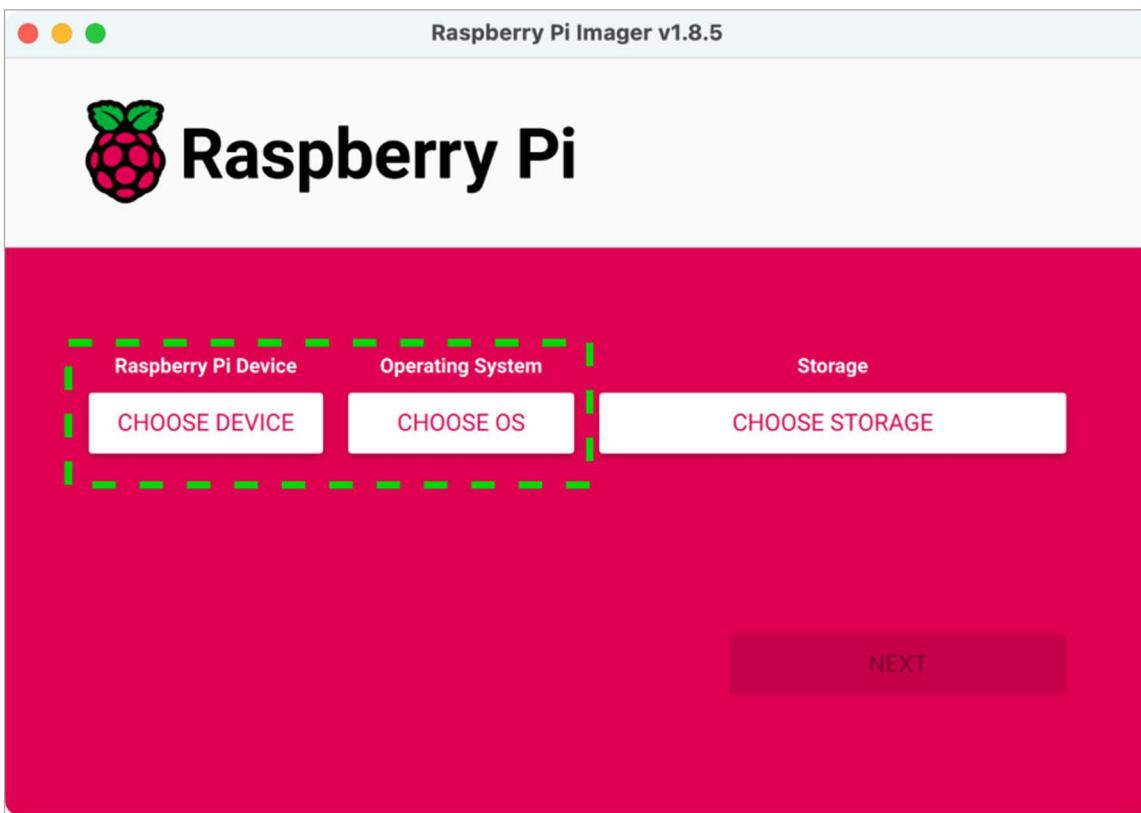


Figure 17-3 - Choose device & OS

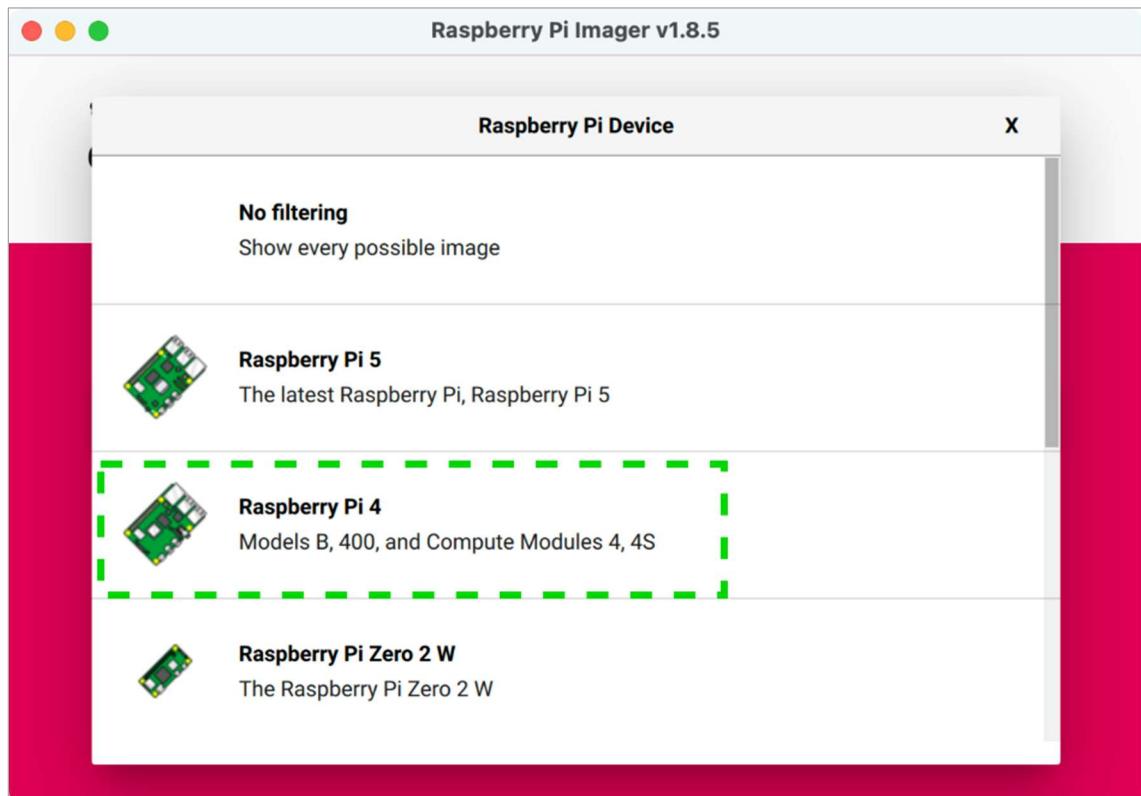


Figure 17-4 – Select the RPi4 (or your particular model)

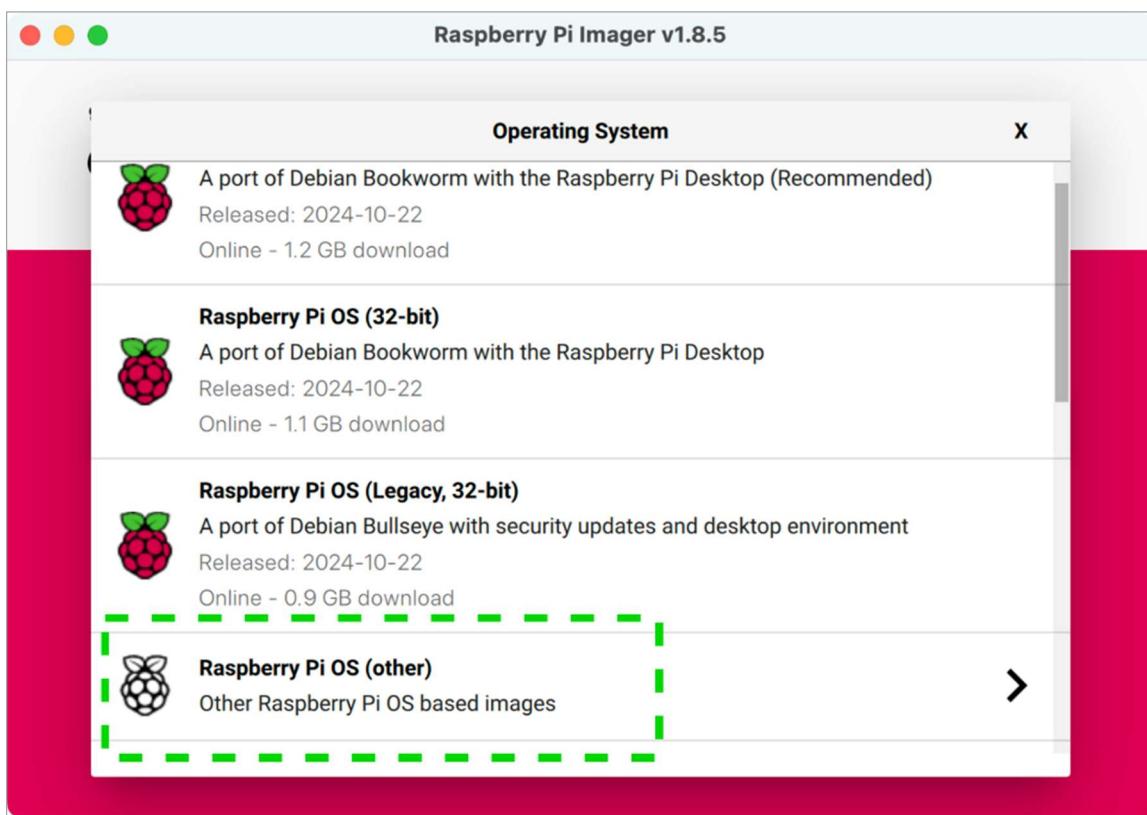


Figure 17-5 – Select the “Raspberry Pi OS (other)” option

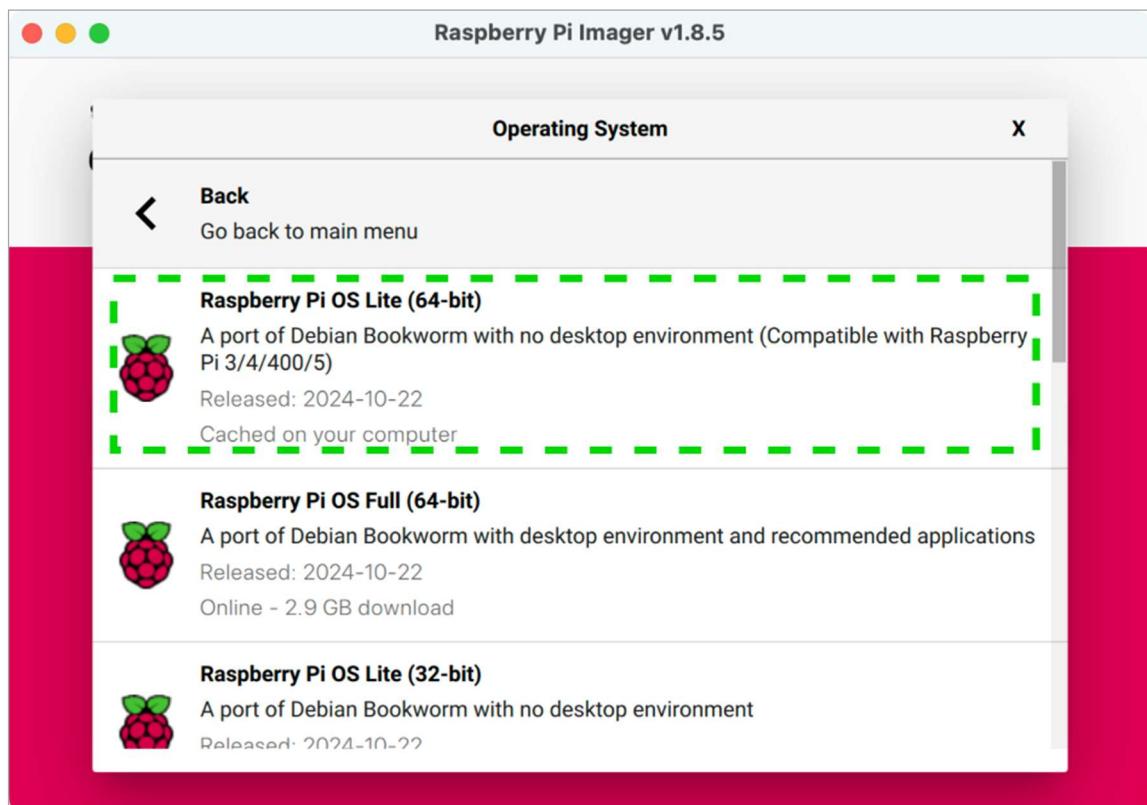


Figure 17-6 – Select the “Raspberry Pi OS Lite” option (no desktop required)

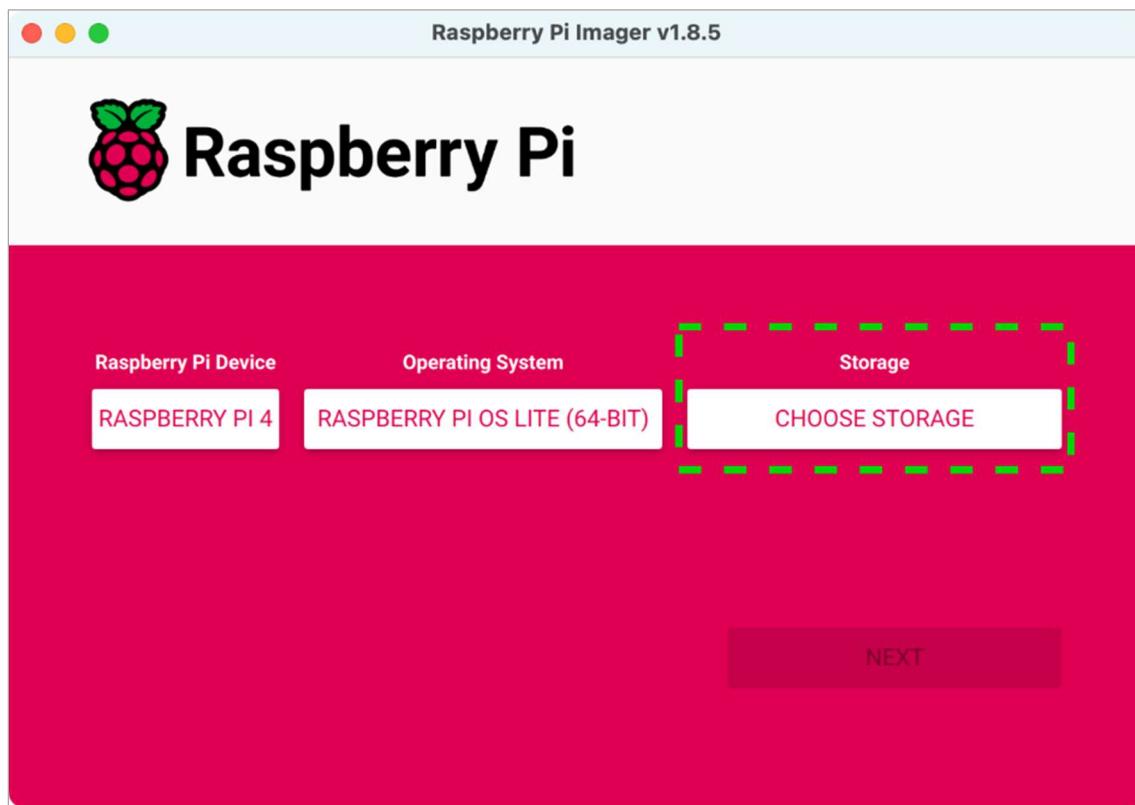


Figure 17-7 – Identify location of microSD to burn

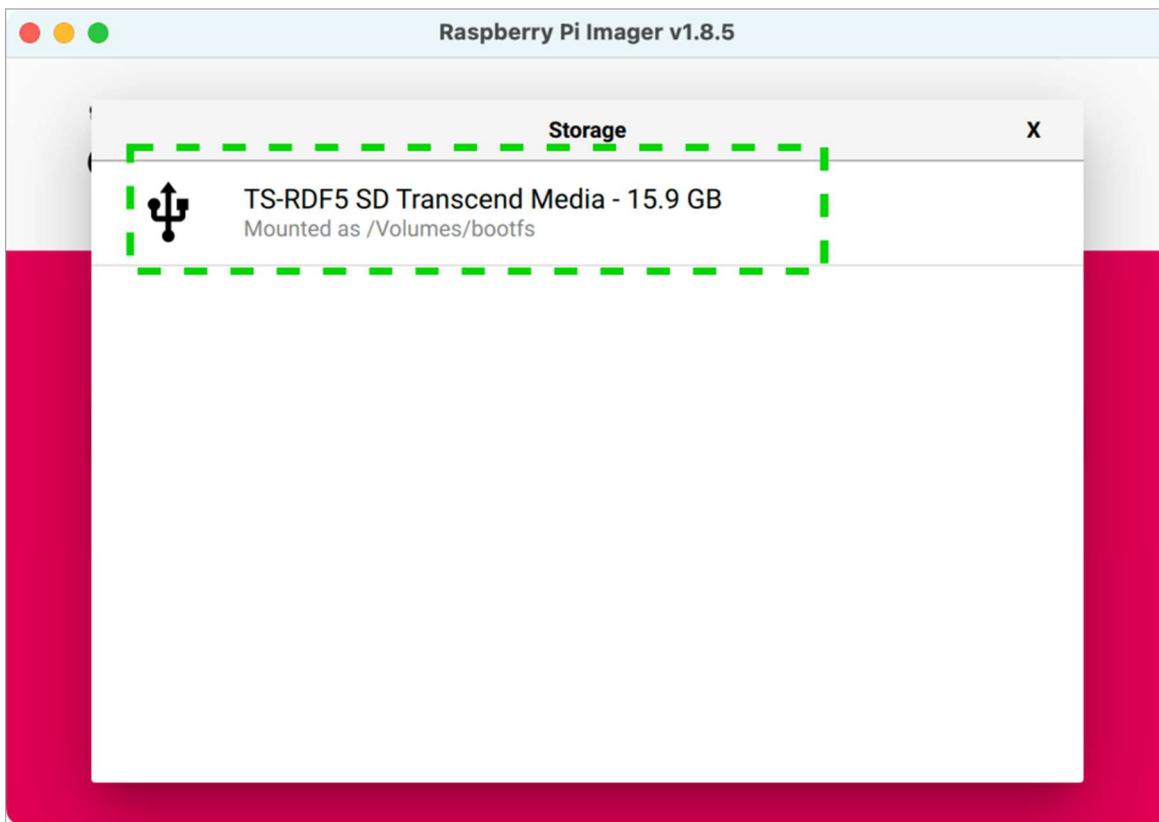


Figure 17-8 – Select the microSD card

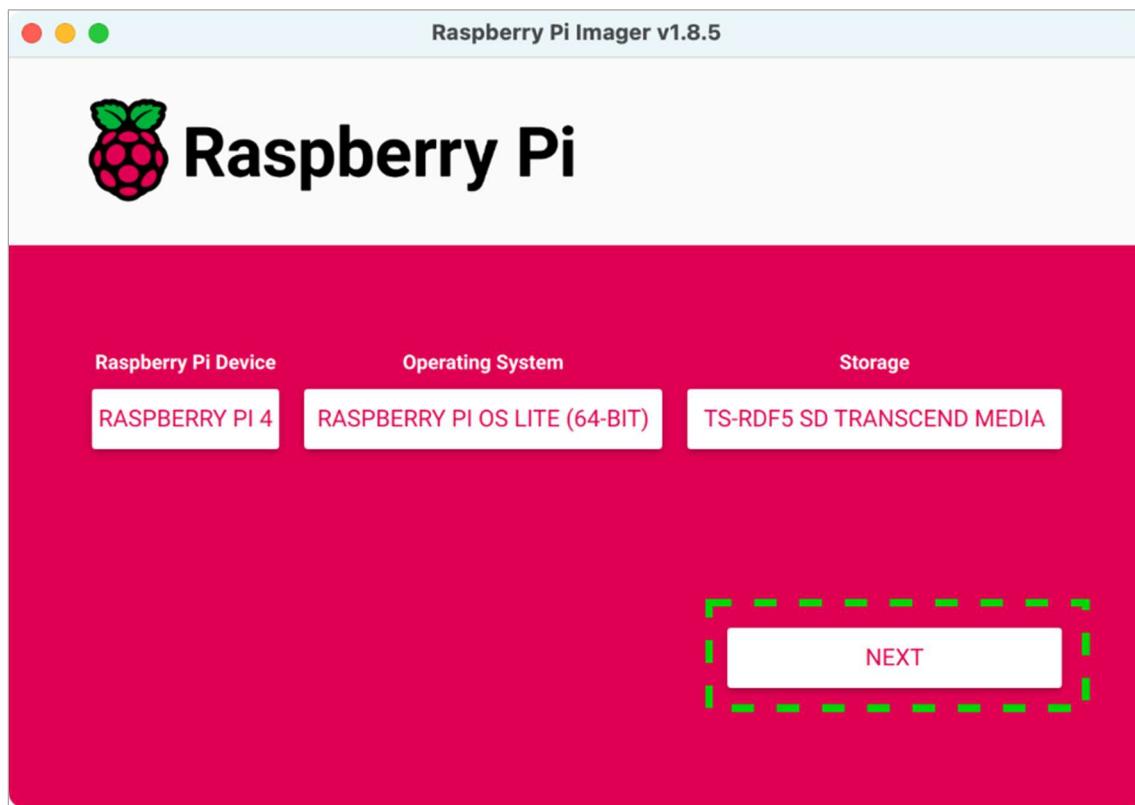


Figure 17-9 – Hit next

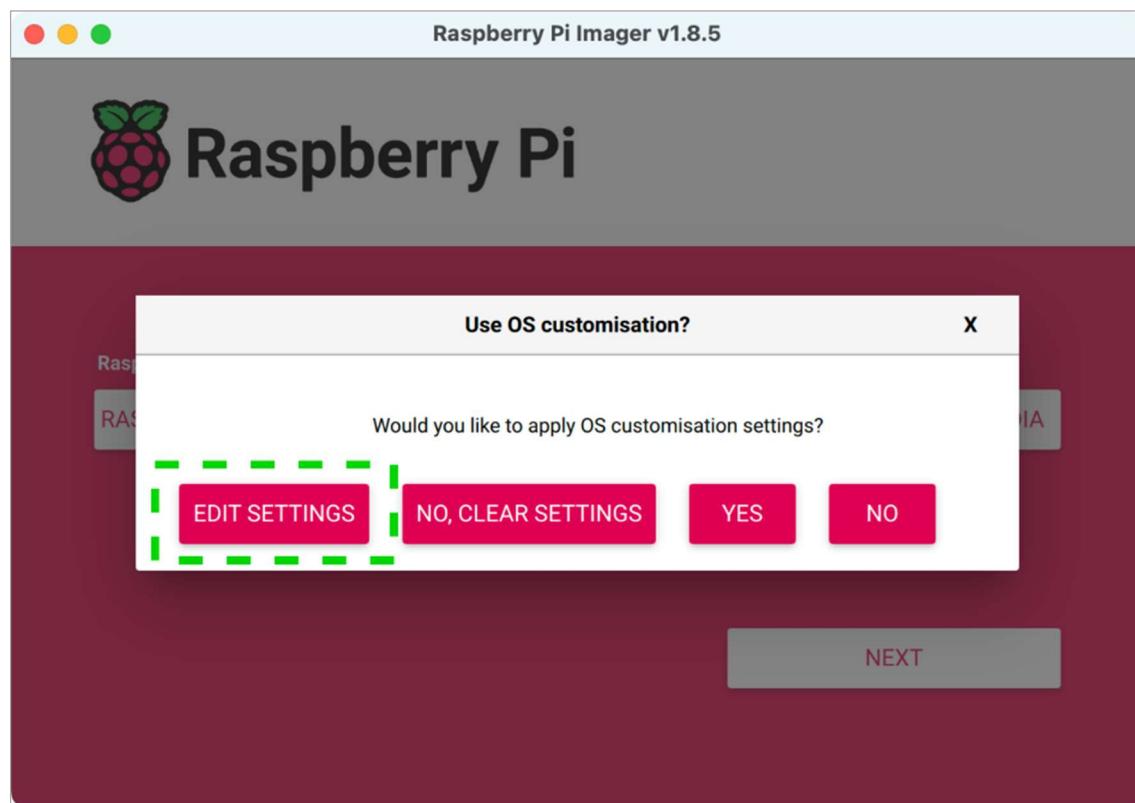


Figure 17-10 – Edit the OS customization settings

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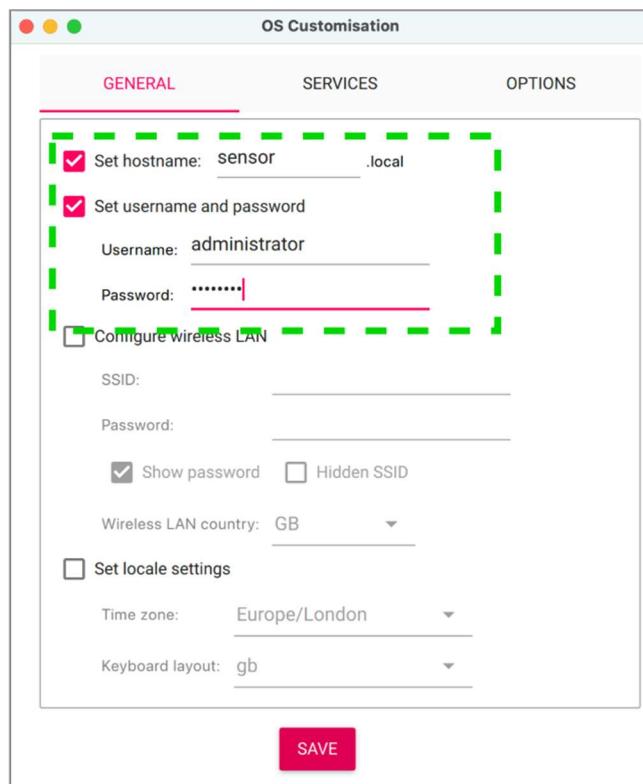


Figure 17-11 – Give the sensor a name and an administrative username and password

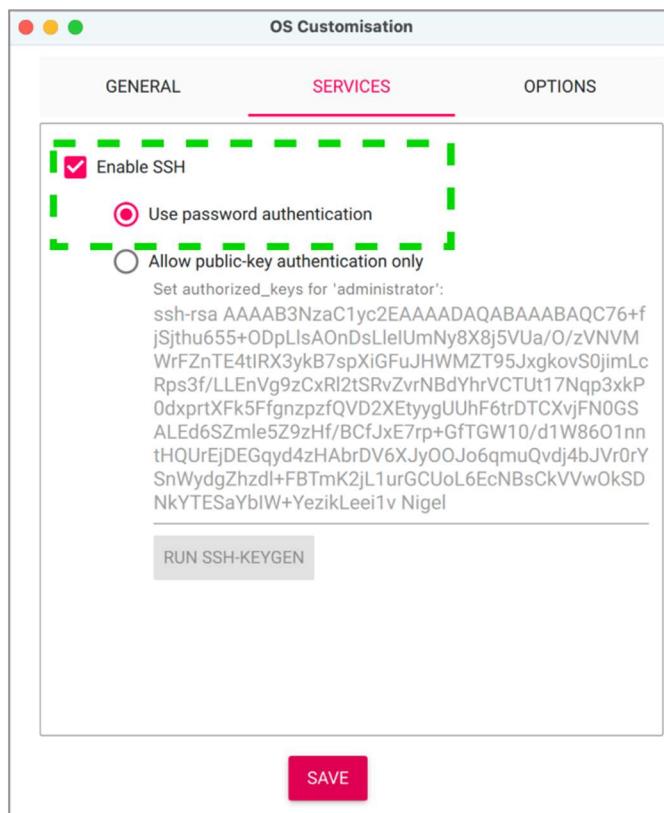


Figure 17-12 – Enable SSH for remote access to the sensor

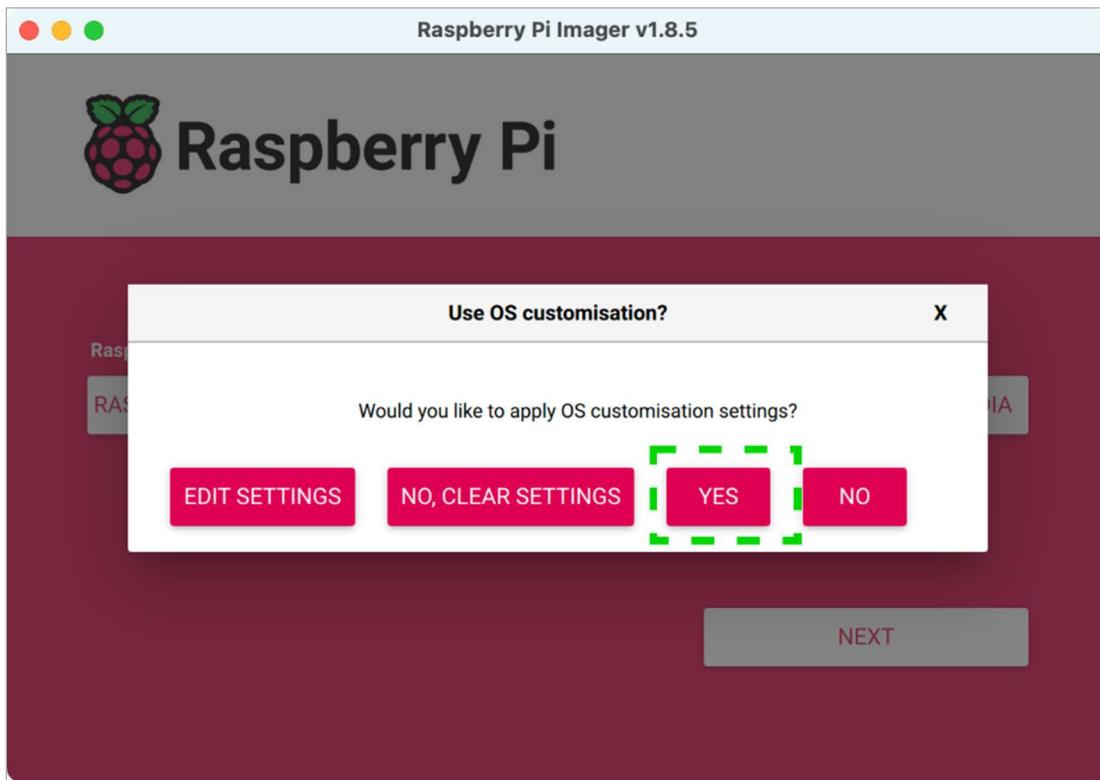


Figure 17-13 – Apply the OS settings updates

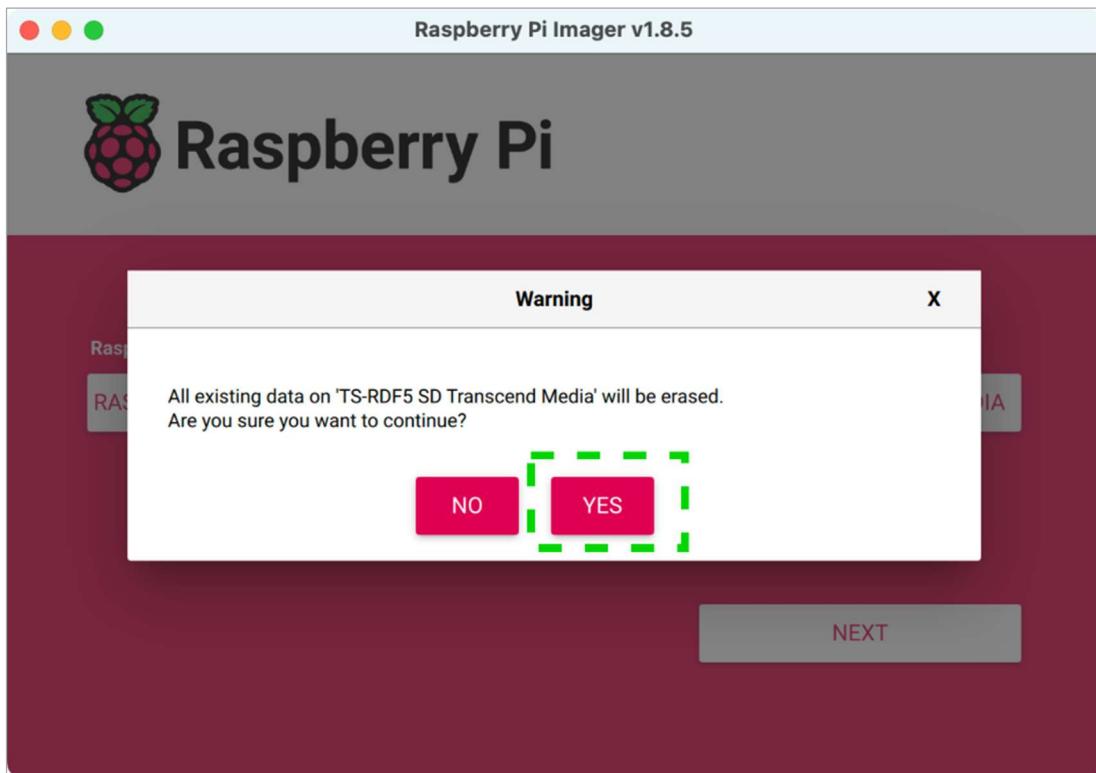


Figure 17-14 – Confirm that the burn process can begin

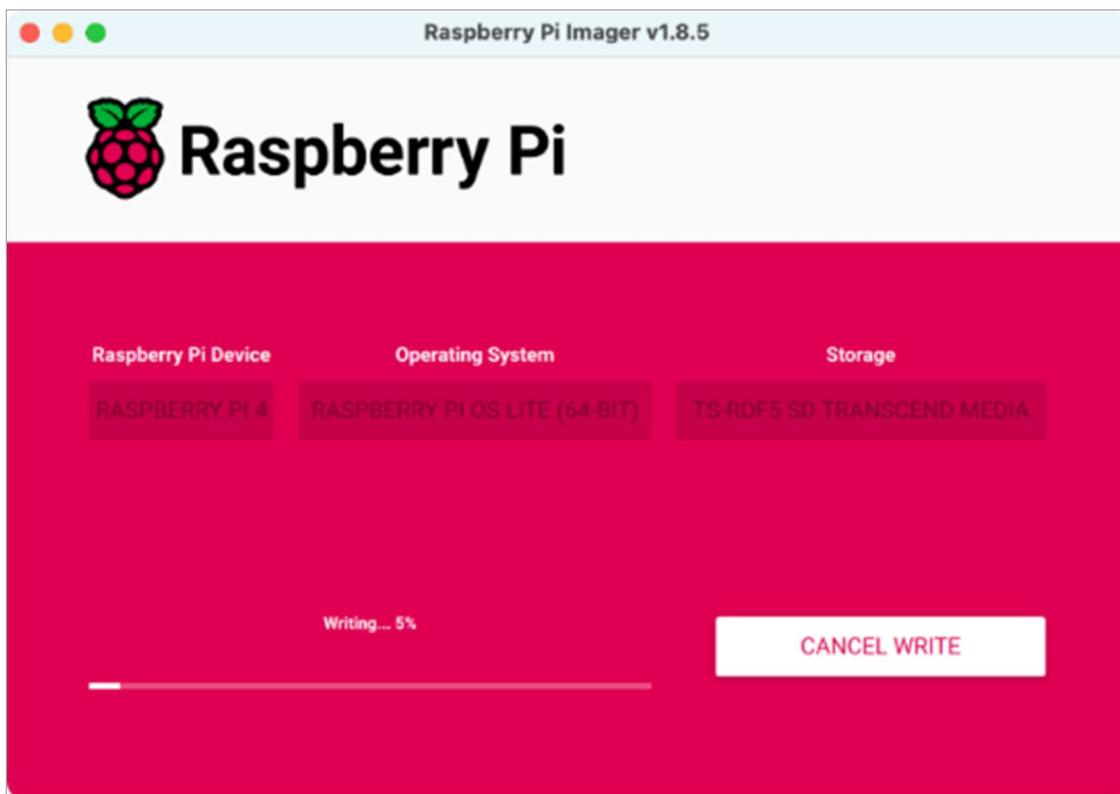


Figure 17-15 – The image is written to the microSD card

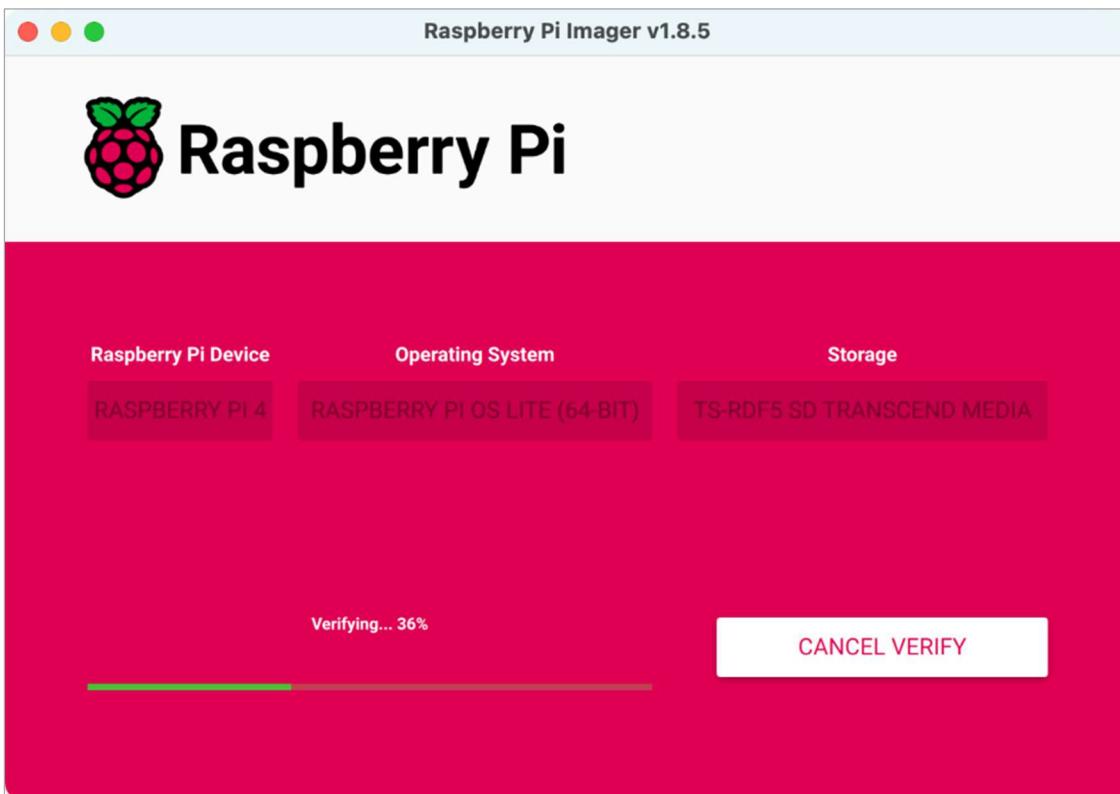


Figure 17-16 – The new image is verified to ensure it was correctly written to the microSD



Figure 17-17 – Final confirmation that the burn process is complete

```
nigelbowden@nigel ~ % ping sensor.local
PING sensor.local (192.168.1.90): 56 data bytes
64 bytes from 192.168.1.90: icmp_seq=0 ttl=64 time=7.004 ms
64 bytes from 192.168.1.90: icmp_seq=1 ttl=64 time=7.330 ms
64 bytes from 192.168.1.90: icmp_seq=2 ttl=64 time=4.296 ms
64 bytes from 192.168.1.90: icmp_seq=3 ttl=64 time=7.265 ms
64 bytes from 192.168.1.90: icmp_seq=4 ttl=64 time=3.246 ms
64 bytes from 192.168.1.90: icmp_seq=5 ttl=64 time=2.702 ms
64 bytes from 192.168.1.90: icmp_seq=6 ttl=64 time=7.256 ms
64 bytes from 192.168.1.90: icmp_seq=7 ttl=64 time=3.202 ms
^C
--- sensor.local ping statistics ---
8 packets transmitted, 8 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 2.702/5.288/7.330/1.971 ms
nigelbowden@nigel ~ %
```

Figure 17-18 – Verify that the sensor is reachable over its Ethernet port using ping

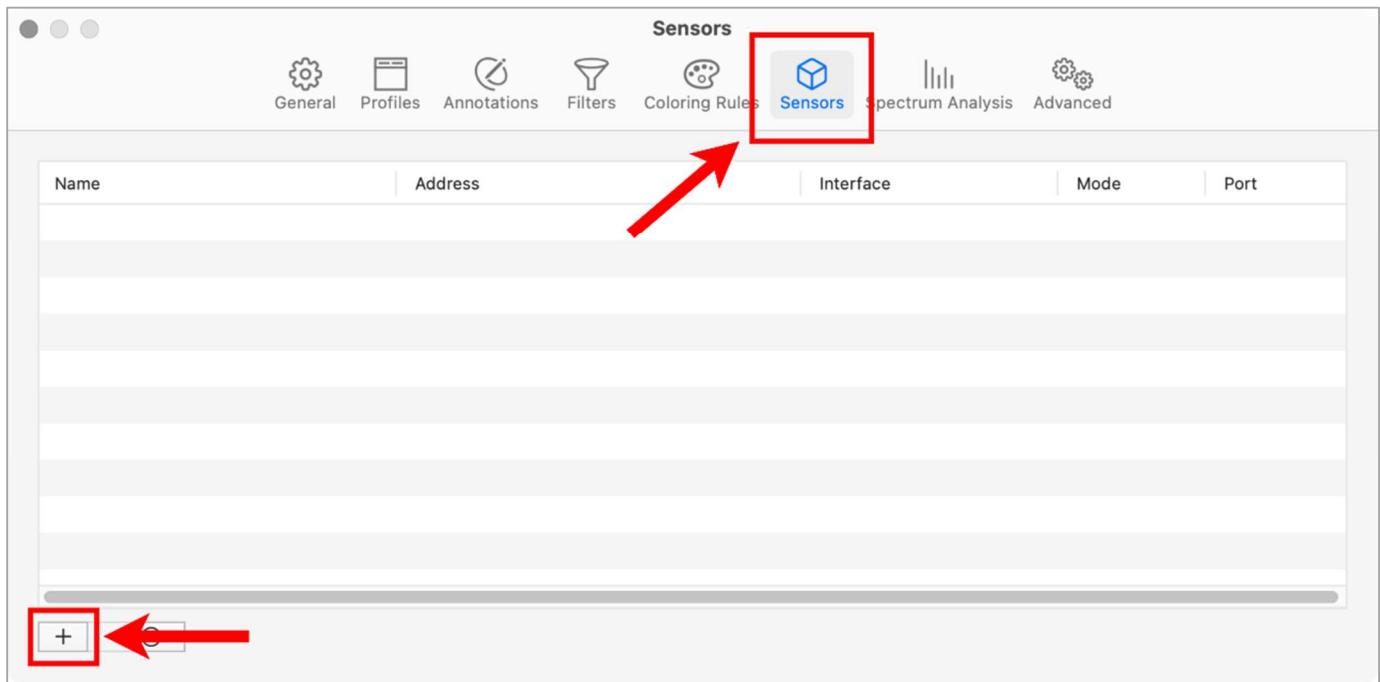


Figure 17-19 – Hit the “+” button on the *Sensors* settings tab

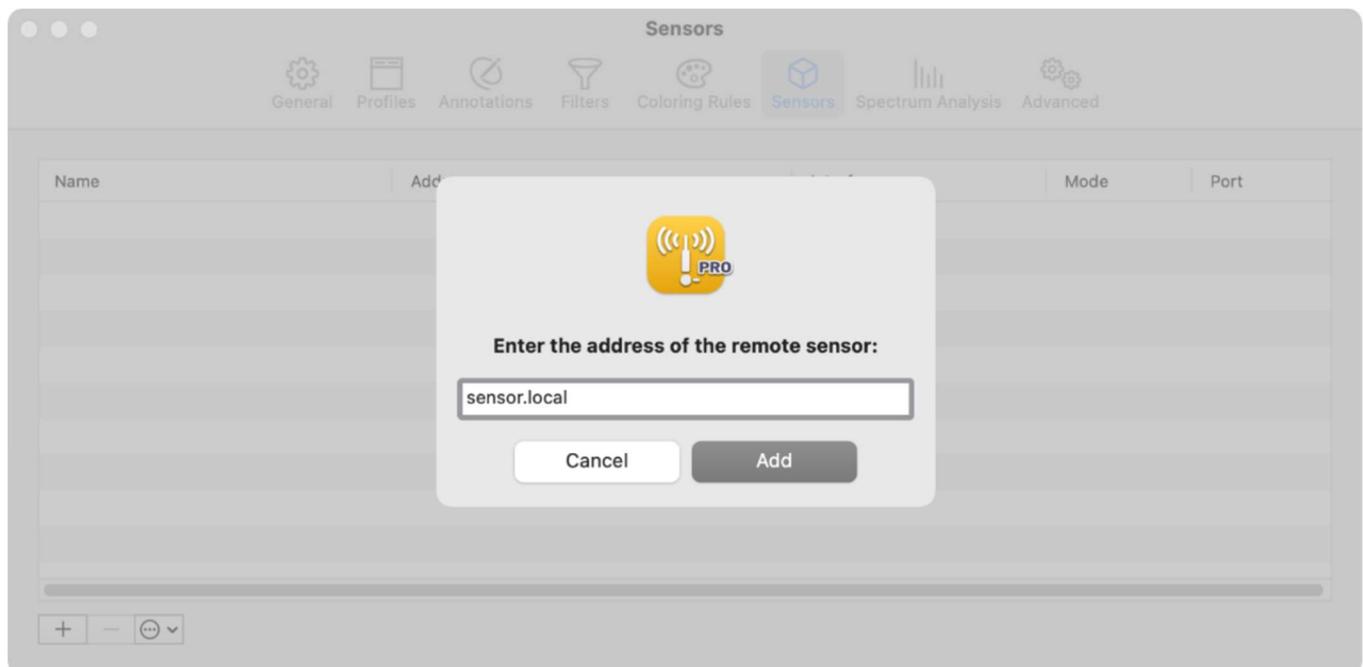


Figure 17-20 – Enter the sensor’s name or IP address

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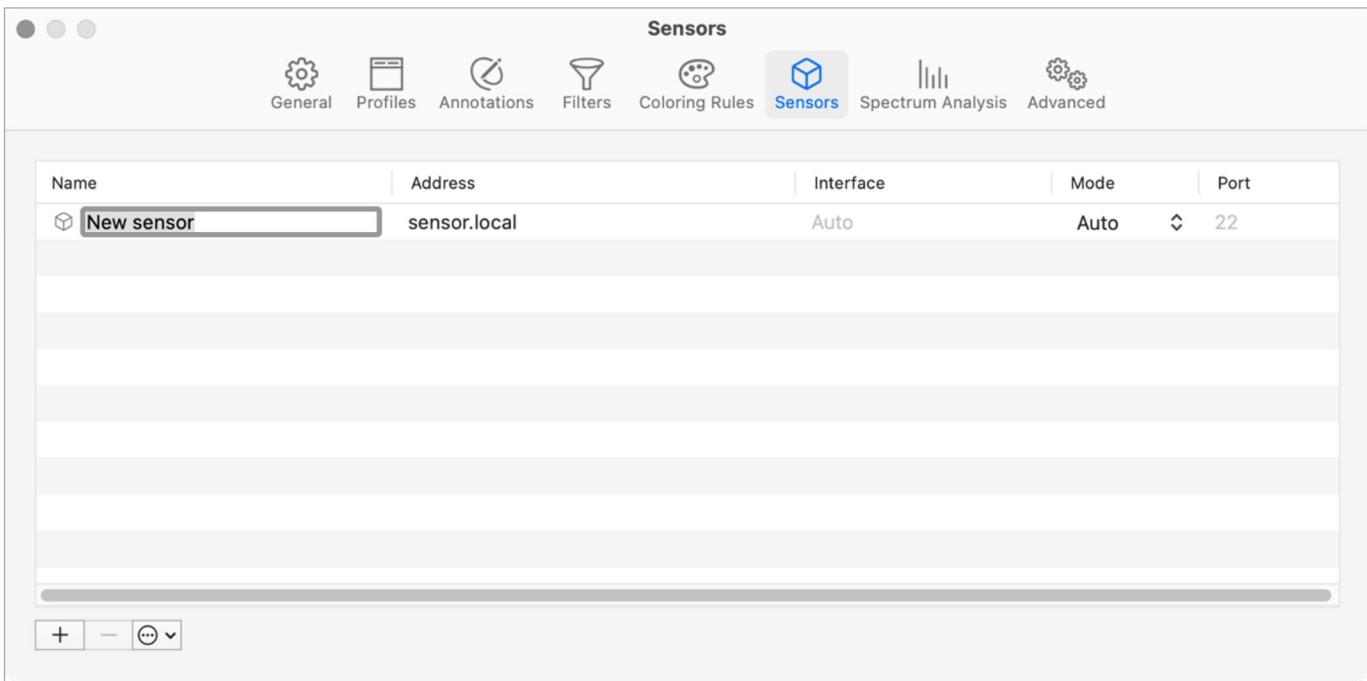


Figure 17-21 – Click on the Name field and enter the chosen name for the sensor

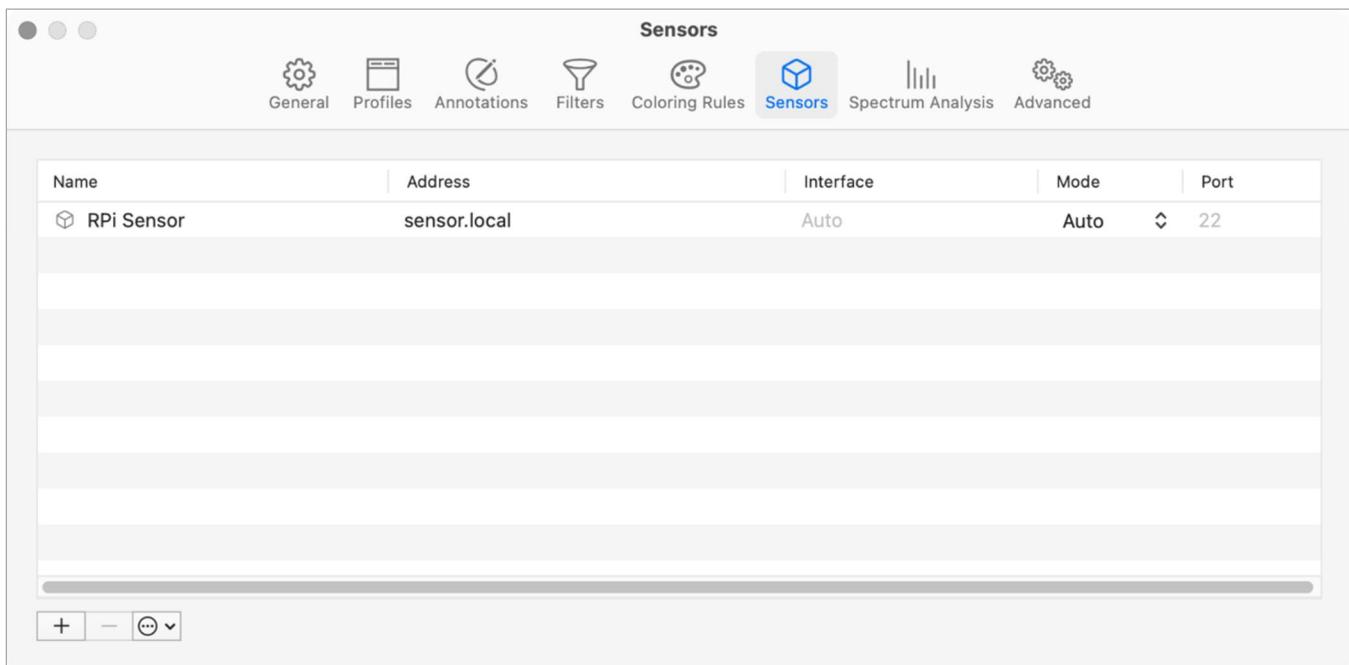


Figure 17-22 – The final sensor name

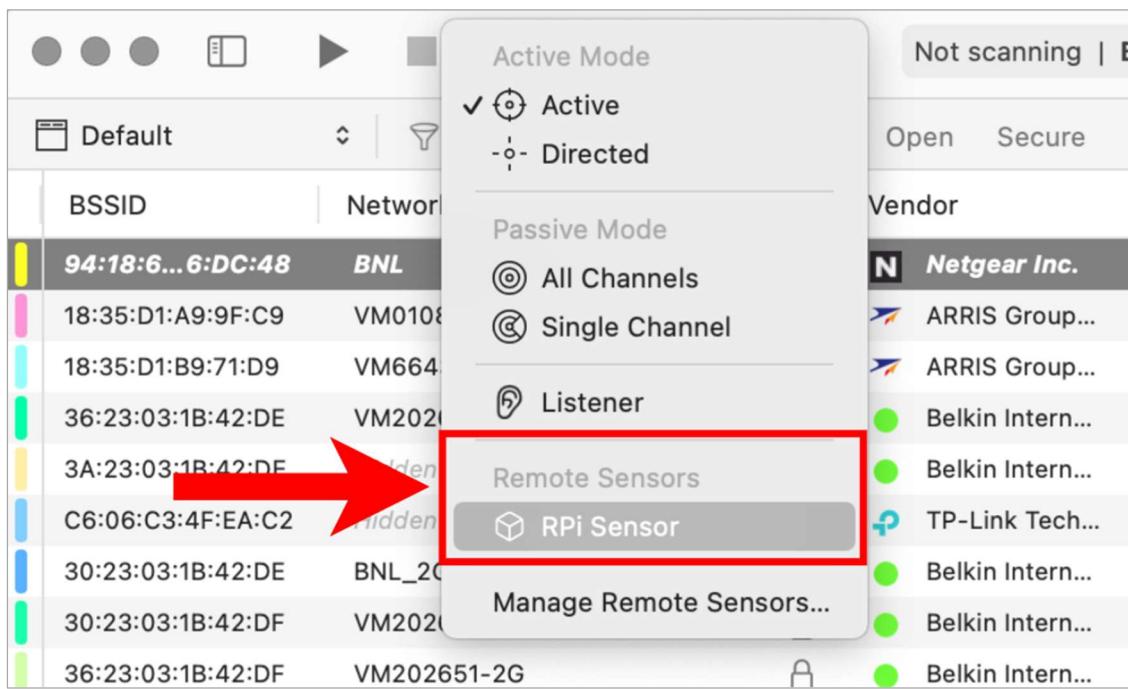


Figure 17-23 – Choose sensor in scan selector

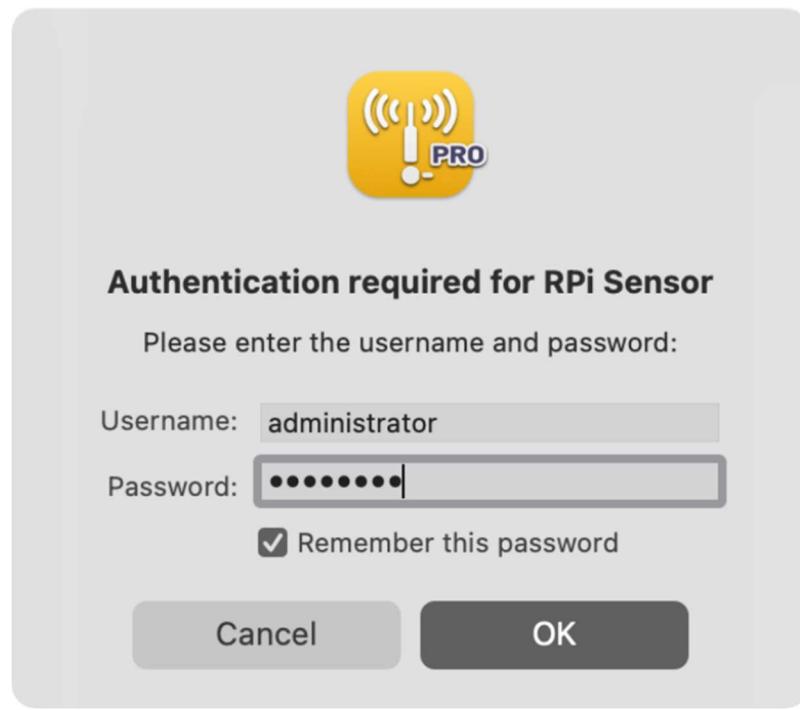


Figure 17-24 – When the sensor is chosen in the scan selector, enter the login credentials

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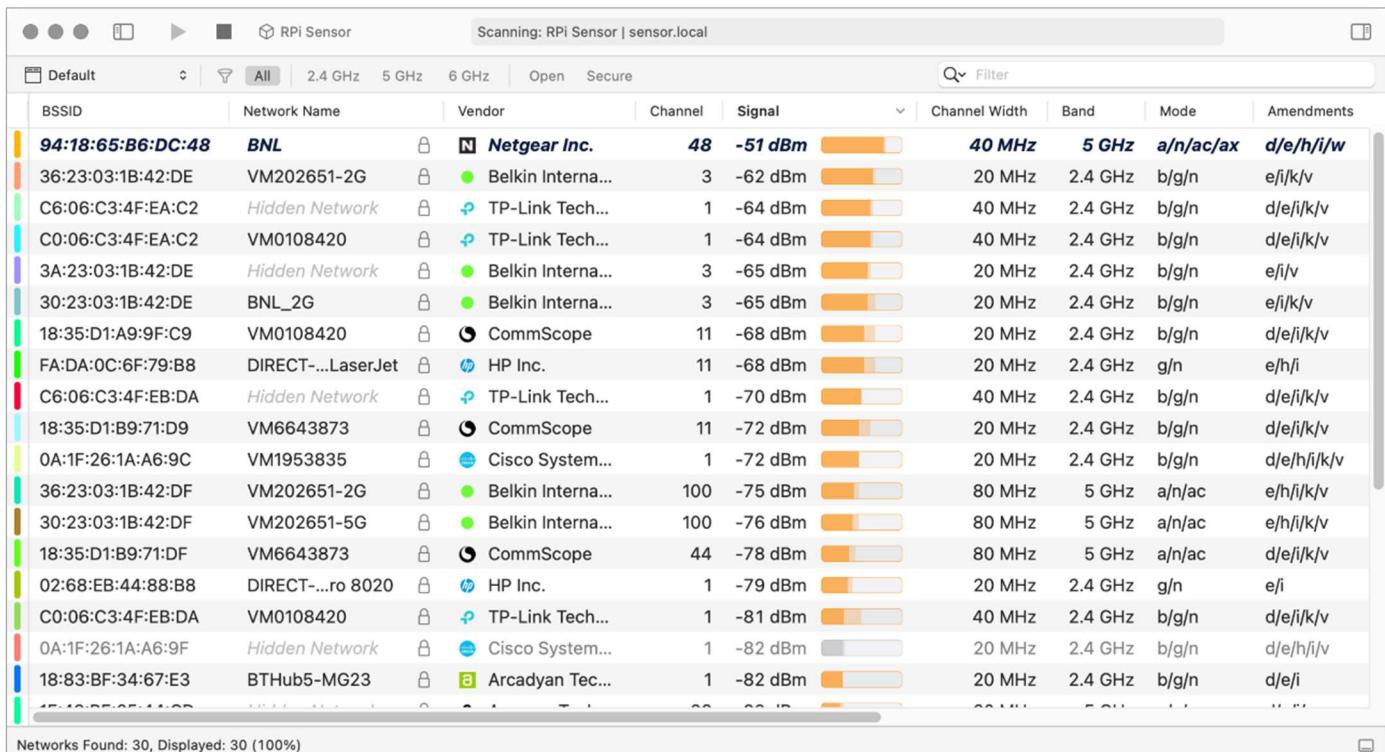


Figure 17-25 - Observe the RPi sensor scan results after a few seconds