WIFI NETWORK ANALYZER

EEEN 464 – DIGITAL COMMUNICASTION

Friday, March 7, 2025

ABOUT WIFI ANALYZERS

What does a Wi-Fi Analyzer do?

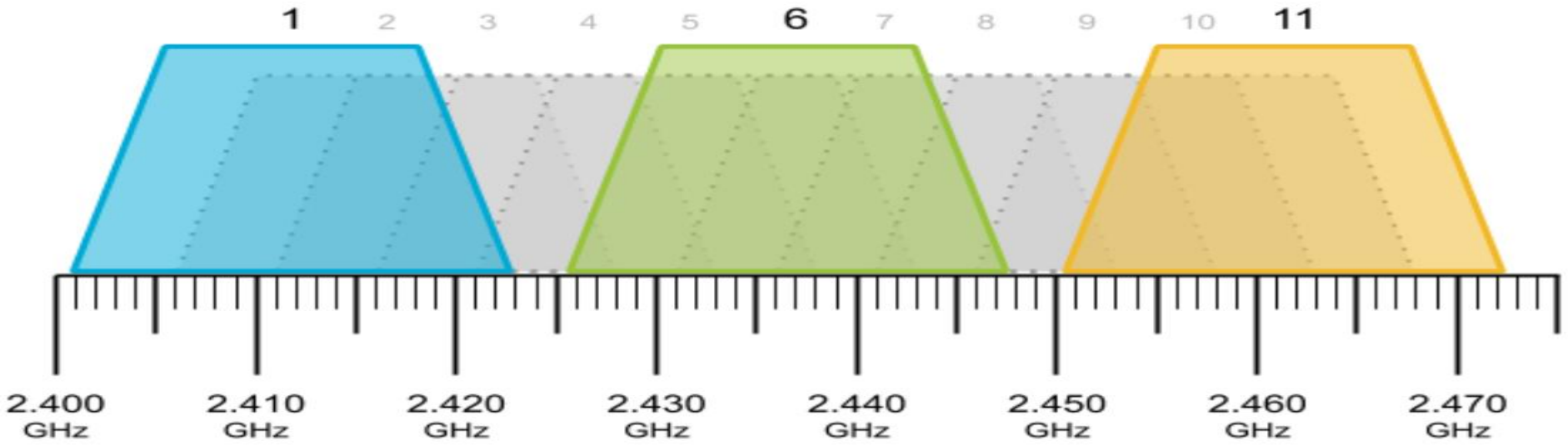
1. **Wi-Fi analyzer analyzes** the connections, collect the data, and identifies the problems responsible for a weak Wi-Fi signal.
2. **Wi-Fi analyzers collect information** from different access points and channels within your network and provide a clear overview with visual reports and dashboards.

What is the use of a network analyzer?

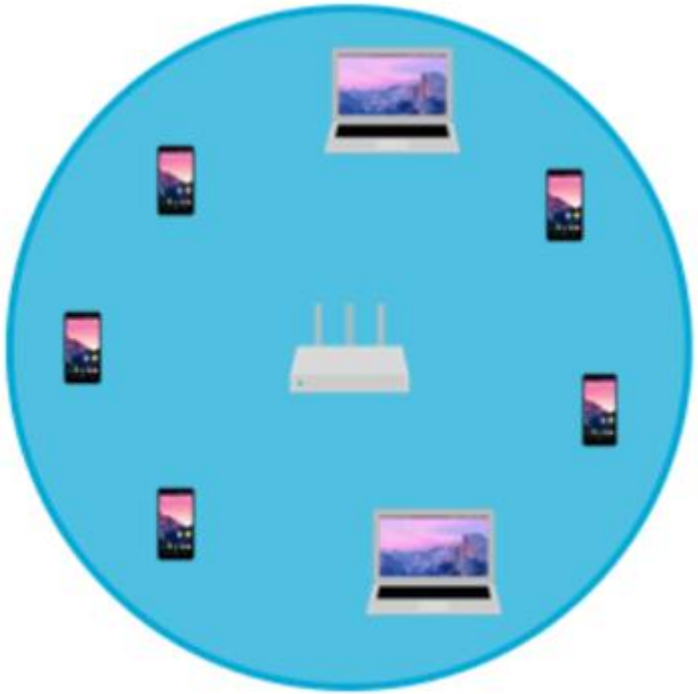
1. Wi-Fi analyzer helps network administrators can detect problems and perform root cause analysis to find troublesome nodes, endpoints, and more.
2. Network Administrators can troubleshoot the problem by considering the potential solutions like switching to another channel to reduce congestion.

WI-FI CHANNELS

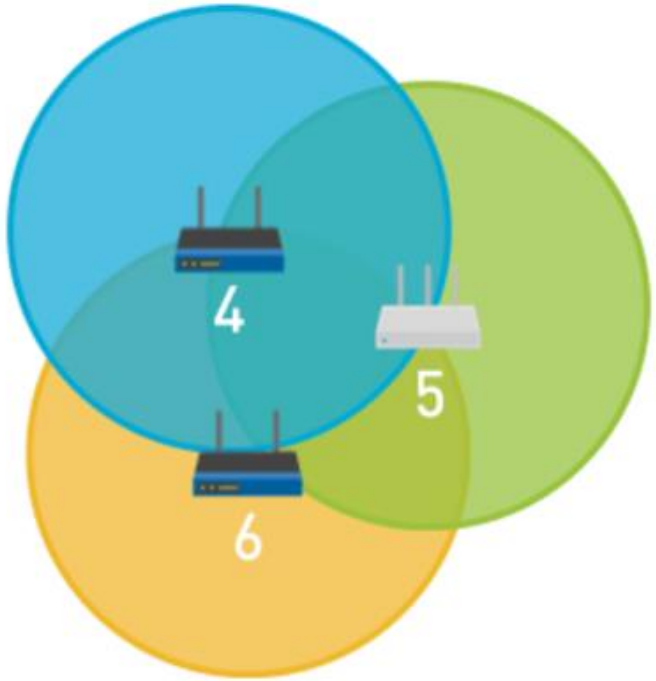
1. Each Wi-Fi channel in the 2.4 GHz spectrum is 20 MHz wide.
2. The channel centers are separated by 5 MHz, and the entire band is only 100 MHz wide.
3. This means the 11 channels have to squeeze into the 100 MHz available, and in the end, overlap.



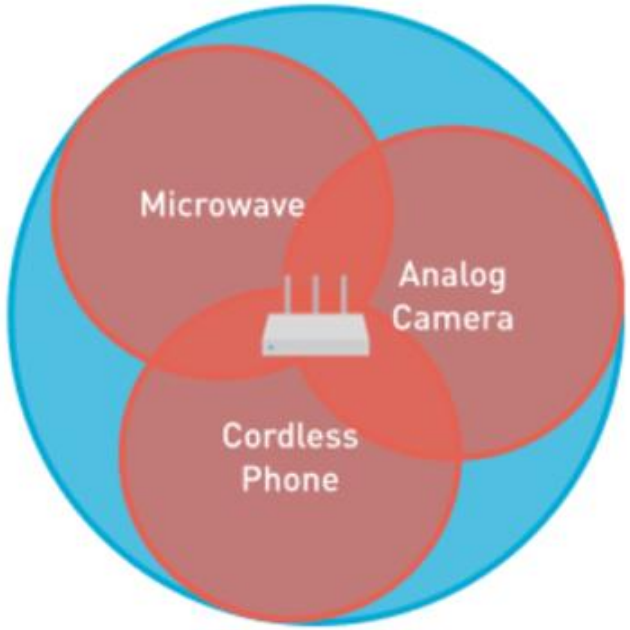
INTERFERENCE IN WI-FI NETWORKS



(a) Co-channel Interference: Devices in the same network compete for the same channel



(b) Adjacent-channel Interference: Devices in the neighbouring channels interfere with each other,s transmissions



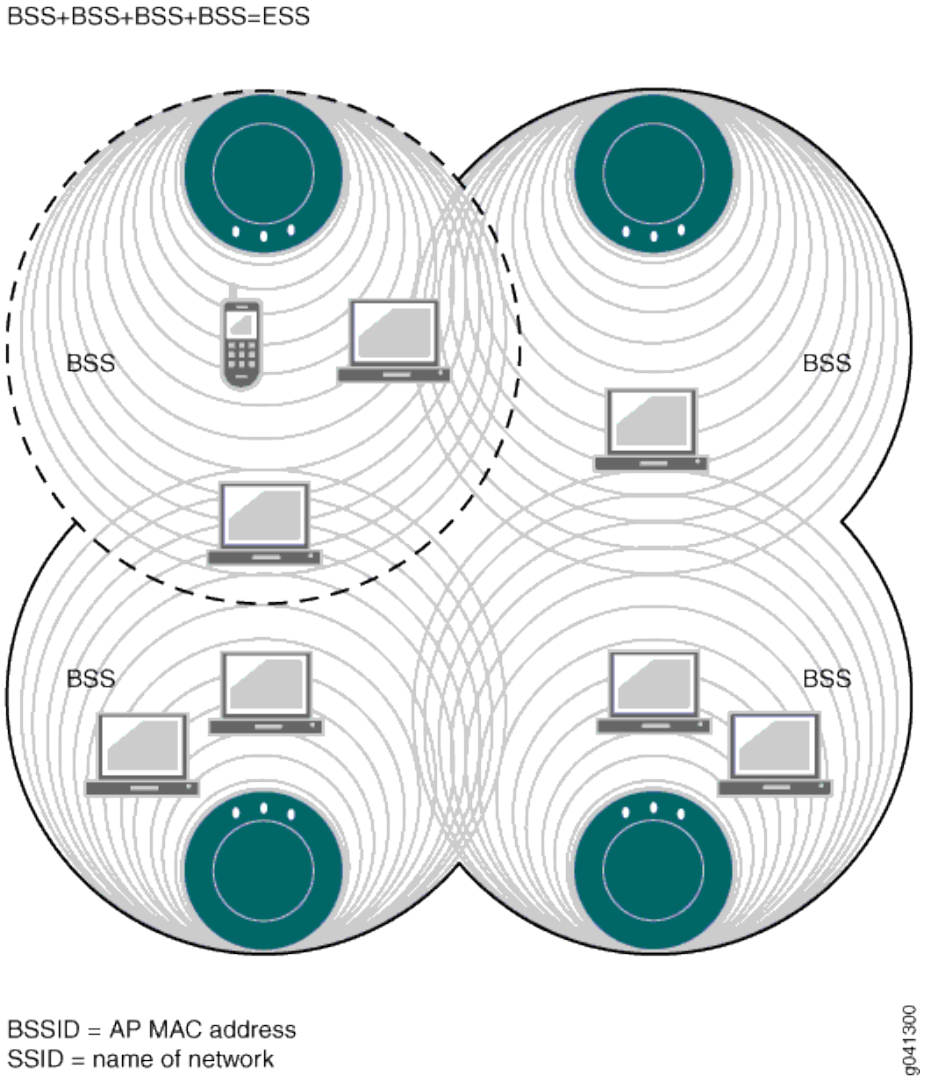
(c) Non-WiFi Interference Wi-Fi devices are affected by transmissions from other ISM devices such as Bluetooth.

INFORMATION PROVIDED BY A WIFI ANALYZER /01

WiFi analyzers provide the following information:

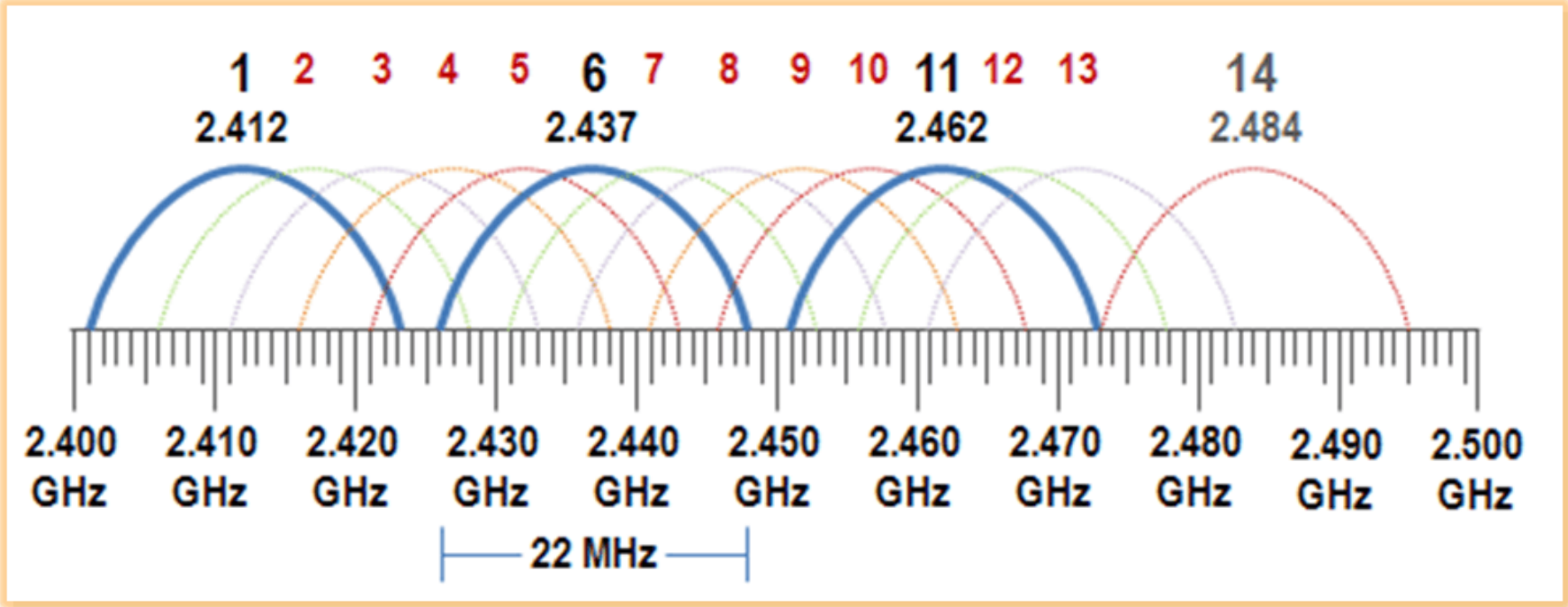
1. **Service Set IDs (SSIDs):** Every Wi-Fi network is assigned a name for identification. **These names are known as Service Set IDs (SSIDs).**

A Wi-Fi network analyzer tool should be able to discover all public SSIDs in a network along with the hidden SSIDs.



INFORMATION PROVIDED BY A WIFI ANALYZER /02

2. **Band and Channels:** Every Wi-Fi network has channels. However, usually, only one channel is used for transmission at any time. Wi-Fi analyzers tool should identify if multiple Wi-Fi networks are using the same channel for transmission. The tool must also suggest an alternative channel to divide the traffic.



INFORMATION PROVIDED BY A WIFI ANALYZER /03

WiFi analyzers provide the following information:

3. **Security Settings:** There are generally three types of security settings available for the protection of Wi-Fi networks. These include:
   a) Wired Equivalent Privacy (WEP),
   b) Wi-Fi Protected Access (WPA),
   c) WPA2 wireless security technologies.

   WPA2 is considered most secure to safeguard your data during transit.

   A Wi-Fi analyzer tool should identify the security settings and help you understand the current security level of your Wi-Fi network.

INFORMATION PROVIDED BY A WIFI ANALYZER /04

WiFi analyzers provide the following information:

4. **Signal Strength:** A Wi-Fi analyzer tool can display the strength of the signal in decibels and allow the admins to identify where the signal is low and high throughout your coverage area.

5. **Reporting:** A good Wi-Fi analyzer tool must provide the flexibility to export data to files for later analysis.

COMMERCIAL WIFI NETWORK ANALYZERS

- There are many commercial WiFi Network analyzers include:

1. Solarwinds Wi-Fi Network Analyzer: Wi-Fi Analyzer - Wireless Network Analysis Software | SolarWinds

EXPERIMENTS USING WPS FREE WIFI TESTER

ECE 2515 – WIRELESS COMMUNICATIONS

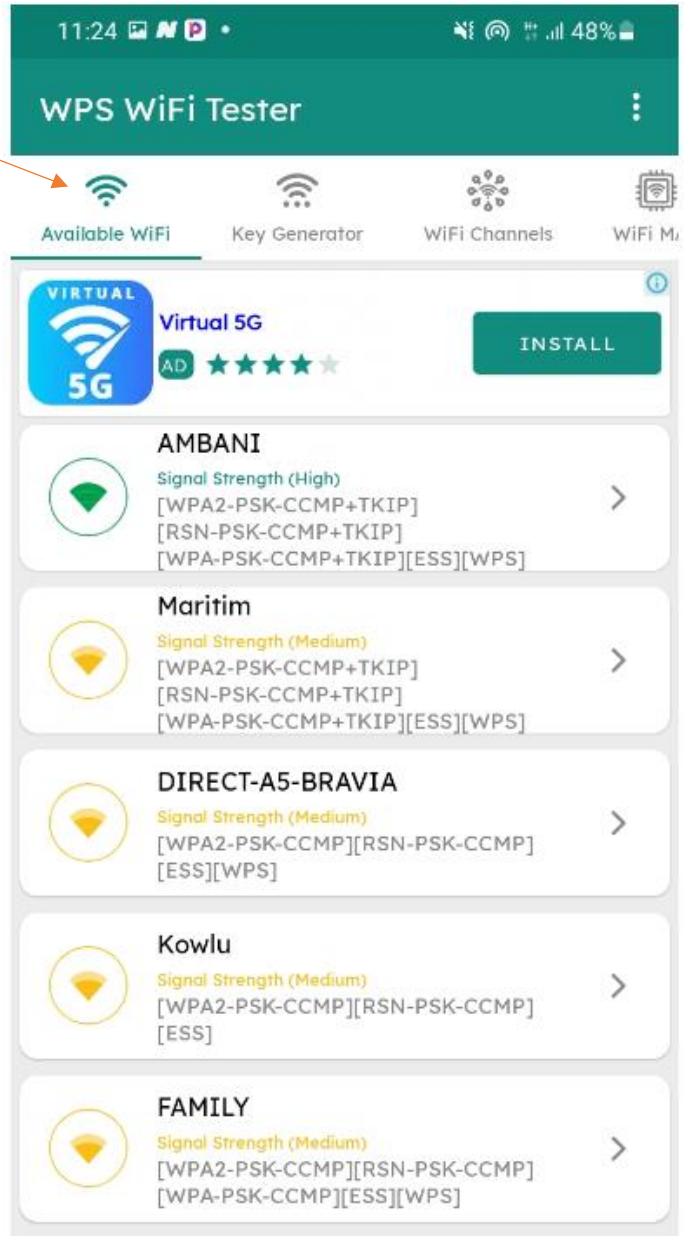
Monday, February 28, 2022

1. Download WPS Wi-Fi Analyzer

Available Networks

Write down and discuss the following:

1. Service Set IDs
2. Signal strength
3. Security Settings while giving a brief description of each setting.

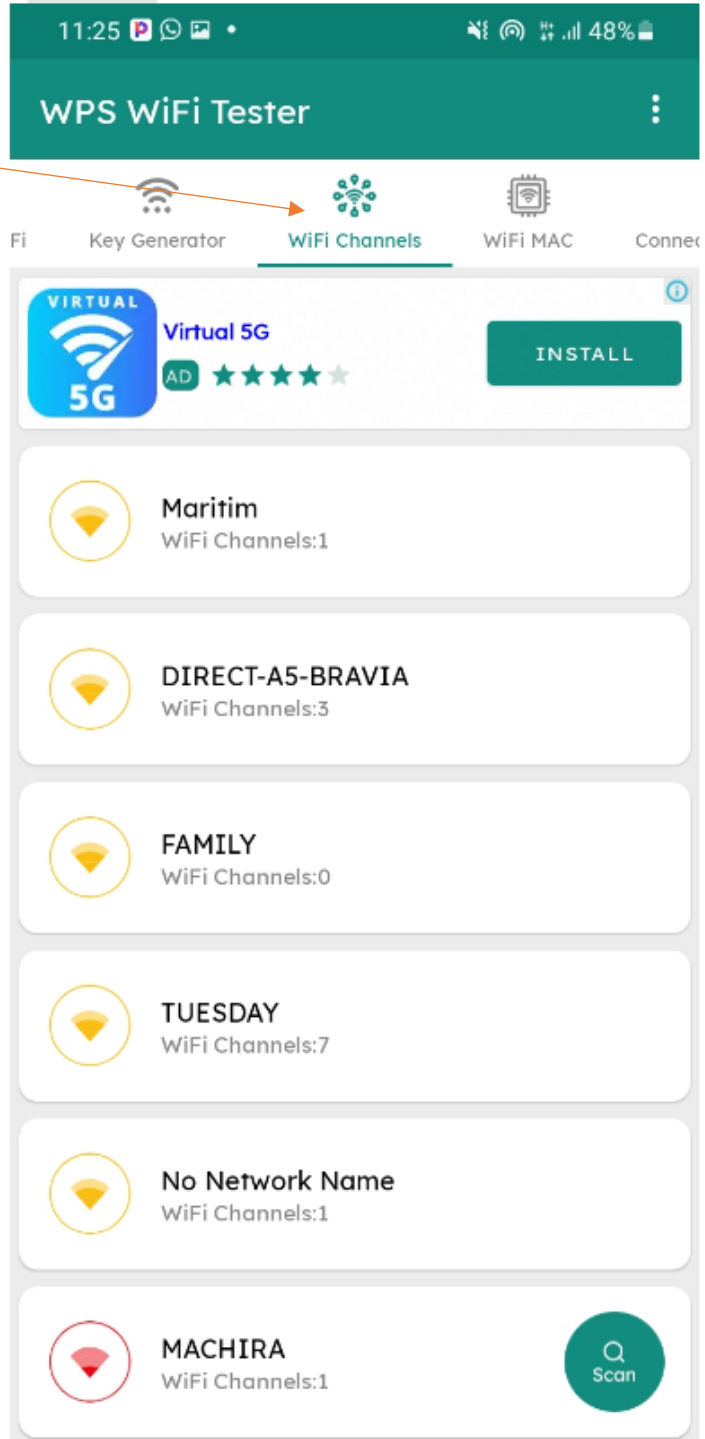


WI-FI CHANNELS

1. Write down the Wi-Fi channels available in your neighbourhood. Specify the frequency range of each channel.

2. Which frequency bands are being used? Why?

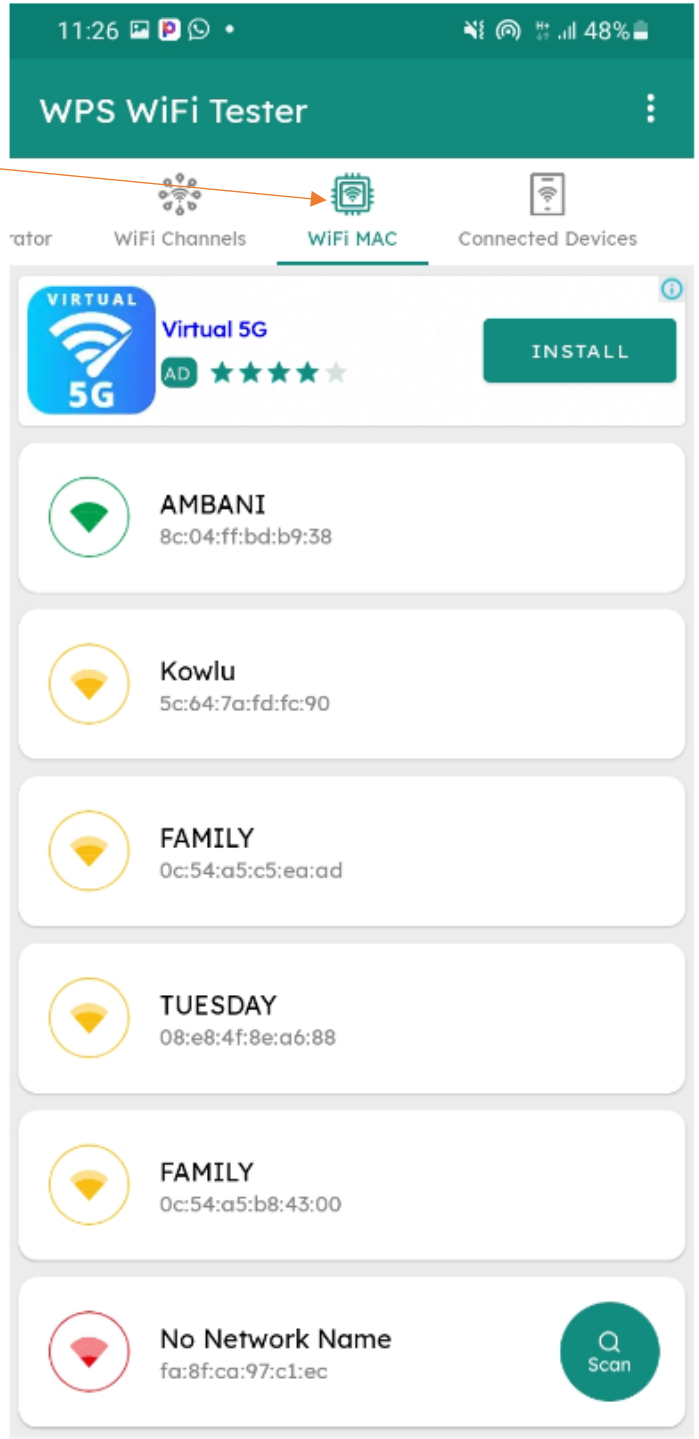
3. Specify the minimum and maximum frequency of each band.



WiFi MAC Address

- Write down the Media Access Control (MAC) address of each Wi-Fi device in your neighbourhood.

- How many bits are in the Wi-Fi MAC address?



REVIEW QUESTIONS

1. Which are the best Wi-Fi channels in the 2.4GHz band. Why?
2. Name and discuss three types of interference in Wi-Fi networks
3. Name and discuss different generations of Wi-Fi