

# A Comprehensive survey of WiFi Analyzer Tools

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**Abstract**—A WiFi analyzer’s primary function is to examine the connection, gather data, and pinpoint the issues causing a poor WiFi signal. WiFi analyzer gathers data from various network channels and access points and presents a clear overview with dashboards and visual reports. It scans the spectrum to view networks, channels, and signal intensity. Simply put, a WiFi analyzer or scanner collects data on the network’s access points and channels and presents it in a clear, readable format. Planning the deployment of wireless networks requires careful consideration of line of sight analysis. The ideal situation for the best reception is a direct line of sight between the two antennas. Radio transmission can pass through, bend, or bounce around some objects while an optical line of sight cannot. Consumer and professional network administrators get in-depth knowledge about adjacent WiFi networks, making it easier for them to troubleshoot and improve even the most complicated WiFi deployments. By using in-app polls, they may engage with the audience and involve them in improving the app. Targeting customers while they are actively using an app instead of sending surveys via email can increase response rates and gain more insightful data. This article provides a thorough examination of the current WiFi analyzer tools, as well as their benefits and drawbacks.

**Index Terms**—Wi-Fi, Wi-Fi analyzer, network, channel, signal intensity

## I. INTRODUCTION

A wireless internet connection works via radio frequency transmission. There is a need for an antenna, and then transmitter circuitry, amplifier circuit and receiver module, the signal processing circuits, RF modulator and demodulator, output power amplifiers, etc. Antenna design and analysis play a vital role here. The radio waves travel through various obstacles before reaching the device, so accurate reception depends greatly on the accuracy of the path taken by the wave [1]. Therefore, proper selection of the site location becomes important. The WiFi Analyzer Tool helps us analyse data coming through Wi-Fi with different parameters to find out whether it is working effectively. To check connectivity, we select the source address and then scan the destination IP addresses available for communication. If a connection is present, the user will receive signal strength values showing its transmission power [2] . We can see detailed network maps, including device connections, by selecting a particular device name in the list of scanned devices. Once we connect to the internet, we will see the connected host details. Users can choose either the Android OS version or the iOS version. Wi-Fi Analyzer for Android and iOS [3]. Using the WLAN

Analysis Tool is an easy way to check if the connection between devices and a Wi-Fi network is safe or not. When connected to the Internet, the wireless router broadcasts its presence by sending messages called beacon frames. You could monitor whether the device receives beacon frame data correctly and receive real-time alerts based on your set rules. With the WLAN Analyzer app for both Android and iPhone smartphones, you can easily scan, analyze, view, and record all kinds of information about a given Wi-Fi network, including signal strength, MAC address, SSID name, BSSID, etc. A WiFi Analyzer Android App enables users to see their own Wi-Fi network name and signal strength. Users have the option to either connect directly through the device’s settings menu or search manually within the app for nearby network SSIDs [4]. Once connected, the user receives a list of data connections, including MAC addresses and IP addresses, as well as connection status information. It then chooses whether to disconnect from the current internet/WiFi connection or continue sharing the current connection with other devices. We can monitor the state of our wireless network with a WiFi analyzer. We can keep track of all our wireless devices with the aid of wireless network analysis. We may monitor each router’s device status, load, traffic, speed, WiFi consumption, and signal strength with the help of WiFi analysis software. This article gives a brief overview of the top Android, iOS, and Windows network analyzer tools that are available in the market. Currently, the sorting of these apps is done based on user ratings, customer reviews, and general feedback [5].

## II. WI-FI NETWORK ANALYZER TERMINOLOGIES

- **Frequency Range:**The radio transmissions are broadcast between 2.4 GHz and 5 GHz in frequency. The primary distinction between the two is that while the 5 GHz frequency covers the longer high-speed band, the 2.4 GHz link covers a larger region at slower speeds. While the 2.4 GHz frequency is the best option if you frequently use your smartphone in a large area, the 5 GHz band is preferable if your PC or laptop doesn’t need to move around much.
- **Network Standard:**The IEEE refers to wireless networking using the 802.11 wireless standard. The speed, range, and frequency of 802.11 wireless technologies can change.
- **802.11a:** It operates at 5 GHz at up to 54 Mbps.

- 802.11b: It operates at up to 11 Mbps at 2.4 GHz.
- 802.11g: It supports 54 Mbps download rates at 2.4 GHz and has a 150-foot range.
- 802.11n: It provides speeds of up to 100 Mbit/s and supports both the 2.4 GHz and 5 GHz frequency bands. It was upgraded to 802.11ac. 802.11ax is the latest version.
- Security Protocols: WiFi security protocols safeguard from unauthorised access to Wi-Fi networks. In use now are WiFi Protected Access (WPA) and WiFi Protected Access II (WPA2). WPA3 has now supplanted WPA2 since it provides greater encryption and minimises security concerns.

### III. SURVEY OF WEB APPS

#### A. Solar Winds WiFi Analyzer [6]

- Features: Network monitoring across multiple vendors. It assists in monitoring and managing wireless networks. It provides network insights for increased visibility and helps to identify and fix WiFi problems using a customizable interface. For doing fundamental WiFi analysis, it is one of the best WiFi analyzers; these apps show network pathways and generate reports.
- Pros: Past performance issues for server application events/issues are visible. SQL thresholds are being monitored. In real-time monitoring of familiar OS and application metrics, Past performance issues for server application events/issues are visible. Quick, out-of-the-box setup Processing API requests and SQL thresholds are being monitored. DHCP pool monitoring, Windows server monitoring, application and service monitoring reports, alerts, and status updates in real-time.
- Cons: Licensing for each monitored application quickly depletes the purchased licence count. It is difficult to say what features are missing because user training and imagination are most likely bottlenecks in most deployments. When API Poller encounters problems retrieving information, it does not display friendly messages. Essential monitoring/visibility is provided. Visibility into fine-grained issues best suited for more specialized/expensive solutions. Licensing for each monitored application quickly depletes the purchased licence count. Given the product's target audience, more out-of-the-box templates or a more straightforward setup for monitoring less-common applications would make the solution more appealing. Include non-Windows applications.

#### B. Omnippeek Network Analyzer [7]

- Features: Visualization, intuitive graphical displays, and a good workflow for network analysis. It aids in proactively discovering all network faults, and integrated flow and packet-level analysis are provided. Enables remote monitoring of scattered networks and offers monitoring and troubleshooting for voice and video.
- Pros: possesses a substantial collection of graphs and charts to aid analysis; free roaming and multichannel aggregator plug-ins are offered by multichannel 802.

Once the Omnippeek software is purchased and allows for packet injection, 11n analysis is possible with a minimal additional cost.

- Cons: Even with a USB adapter, running Omnippeek seems to "hijack" the internal wifi card, making it impossible to use both interfaces simultaneously. Free, instantaneous filter swapping, strikingly beautiful. The dashboard, application performance, audio and video functionality, and a peer map are not included with OmniPeek Basic. Remote engine connections are not permitted with OmniPeek Basic. Due to its proprietary nature, the seller must create any extra functionality or plug-ins. Only for Windows, few choices for support. Several NICs are not supported.

#### C. Automated network device discovery NETSPOT [8]

- Features: Conduct a wireless site survey using NetSpot on the device. Survey any area, from a little apartment to a vast warehouse; utilize detailed visualizations in NetSpot PRO, Home, or Enterprise desktop to analyze WiFi coverage; Check the network's Internet speed; scan nearby and local wireless networks; Real-time monitoring of data chart updates; Compare networks based on WiFi channel and signal strength; Utilize the following filters while scanning networks: Name, Security protocol, Signal strength, and Band.
- Pos: Using it for simple WiFi analysis is free. For novice and expert users, personal information is not required to download, install, and use the product for free. It offers all the information required to comprehend the state of the WiFi in the neighborhood. It has a lot of charts and visual tools to help visualize the wireless spectrum. Its cost is lower than that of other comparable goods. Heatmaps aid in access point placement optimization, mapping a WiFi network expertly, Using a single access point, searching vacant offices, and Locating areas with poor signal or interference.
- Cons: The advanced network administration capabilities, zone mapping, visualization, and other glitzy bells and whistles are all absent from the NetSpot free trial version. The mapping feature can be a little difficult for people who are not particularly tech aware. In order to reduce the time spent learning, NetSpot provides a library of lessons and quick guides.

#### D. Acrylic WIFI [9]

- Features: Asset Monitoring Capacity Inspection Asset Cloud Inventory Event Logs for Compliance Management Equipment Asset Inventory Budgeting for IT Information Management License Administration Inventory of Mobile Assets Patch Management for Multiple OSs and Remote Access Scheduling Software Asset Management Synchronization Troubleshooting for scheduling Monitoring of user activity.
- Pros: The Acrylic wifi application is secure to use, and Acrylic wifi offers good customer support. Acrylic wifi

operates effectively. Numerous gadgets are compatible with Acrylic wifi. Acrylic wifi provides impressive and helpful service. Acrylic wifi is available for free or possibly on a freemium basis; available for free, Perfect for a home wifi setting, and has great network performance.

- :Cons: The ubiquitous mode monitoring for Retry rates and SNR calibration still needs an external wifi adapter, is Unsuitable for business use, and Lacks advanced features.

#### *E. WiFi Heat Map [10]*

- Features: Find and fix wireless dead zones, Map locations of connected clients, Which network application consumes the most bandwidth can be determined, provides visual analysis for a delivery path-equipped device, The path has changed, and the fins service provider issue is visible. This tool must drag and drop performance measurements on a timeline. Keep track of the environment's logical SDN (Software Defined Networking) component.
- Pros: Automated Wi-Fi network assessments
- Cons: Heat maps do not represent real-time data

#### *F. Netgear Wifi Analytics [11]*

- Features: What level of WiFi signal do you have? Get sophisticated analytics to help you optimize your current or recently expanded WiFi network using the NETGEAR WiFi Analytics app. With the WiFi Analytics app from NETGEAR, you can check the health of your network, the strength of your WiFi signal, which WiFi channels are crowded, which channels are clear and have less interference, and much more.
- Pros: Simple setup; an excellent web interface
- Cons: Poor documentation, limited device capability, and high cost

#### *G. MetaGeek InSSIDer [12]*

- Features: Real-time search for the optimum 2.4 and 5 GHz channel, Drilldown by Network, AP, and Channel, When fresh APs join your environment, watch the visual signal. Analysis of the dual-band spectrum When fresh APs join your environment, watch the visual signal. With Snapshots, set benchmarks and monitor network data over time. View signal quality and use from the viewpoint of the client device. Assess connection quality expertly using the MCS Index, spatial streams, and channel width in real time. Utilize shared Snapshot data to collaborate with coworkers both on and off-site. Utilize real-time treepie charts to assess the quality of AP-to-client traffic.
- Pros: Free, Easy-to-use interface, Lots of help and tutorials, Supports Windows, Mac OS X, and Android, Live performance tracking, Simple yet efficient interface, Easy to use, even for non-technical users.
- Cons: It May not be robust enough for wireless networking professionals or larger deployments, Lacks enterprise functionality, reporting, robust alerts, etc.

#### *H. WiFi Analyzer [13]*

- Features: The Wifi Analyzer can provide you with helpful details about the nearby wireless signal. On other platforms, we have approximately a million installations. - aids in locating a better location for your wifi receiver It provides details about each wifi channel. Signal strength is displayed in a historical graph, and the optimum channel for new APs is suggested.
- Pros: Enables both a free and paid version The tool's user-friendly UI makes it suitable for beginners. When there are performance problems, the pro version provides an audio alert, Great for beginners, Free, and Available from Microsoft Store.
- Cons: Not enough detail for larger networks; better suited to home users and small networks, Technical measurements are given up to improve usability, Limited Features.

#### *I. PRTG Professional WiFi Analyzer [14]*

- Features: Measures wireless traffic flows and detects device issues quickly. When WiFi networking is disrupted, PRTG sensors quickly alert you and assist in network configuration. For your WiFi network, you can configure an alarm system. analyses all facets of your wireless networks, Built-in bandwidth sensors can identify heavy usage, and specialized SNMP sensors can track network security problems. notice of individual bandwidth.
- Pros: Very extensible, with extensive support for the majority of devices Maintain services while offering a history of events and the current state of the system.
- Cons: Licensing for sensors can get expensive. needs a dedicated, on-site server, and more capabilities for the dashboard creator, The configuration interface is outdated and occasionally difficult to use.

#### *J. Vistumbler [15]*

- Features: Although the latest version is designed for Windows 10, it should still function on Windows 8, 7, and Vista. You need Net Framework version 4. find access sites and retrieve wifi information using the Windows Native Wifi API or netsh. GPS assistance COM-based NMEA receivers are supported. Access points can be exported or imported from Netstumbler TXT/Text NS1 or Vistumbler TXT/VS1/VSZ. Export access point GPS coordinates to a GPX or KML file for Google Earth (GPS eXchange format) Access points are automatically displayed in Google Earth when using Live Google Earth Tracking - Auto KML. Uses MIDI, Windows Sound API, or sound files to speak Signal Strength. GPLv2 License; AutoIt Scripting Language code; Open Source, Export data in several file types, GPS assistance, Live tracking on Google Earth. Acoustic error notification.
- Pros: Free-of-charge resource, supports built-in graphing that is generated automatically based on nearby devices. Vistumbler is a secure program to use. Vistumbler's support is good, its design is good, and it quickly encourages people to follow with interest. The Vistumbler performs



well and is compatible with a variety of devices. Vistumbler's service is outstanding and helpful. Vistumbler is available for free or possibly a freemium model.

- Cons: Interface is constrained and not suitable for networks of this size. Not as user-friendly for customers who are not technically savvy more difficult to learn than the majority of other WiFi analyzers.

#### K. Wireshark [16]

- Features: It offers offline analysis and live capturing, and captures network data that may be browsed with the TShark software in TTY mode. A conventional three-pane packet browser is available. Gzip-compressed files can be captured and instantly decompressed. You can add coloring guidelines to the packet list for a speedy and logical analysis. Windows, Linux, macOS, Solaris, FreeBSD, NetBSD, and a number of different operating systems are supported. Using color coding to quickly analyze data capture many file types for support from other parties, VoIP Evaluation.
- Pros: Live displays of captured packets, enables the sorting of packets, identifies the protocols responsible for producing the packets, allows for the filtering, grouping, and sorting of packets, as well as the relation of packets in a conversation, exporting packets for other tools' analysis Features that are extensive, support for plug-ins, freely accessible, superior features, Open-source community, and Supports plugins.
- Cons: Can't send packets, Can't alter packets or generate them, Wireshark just collects data; it does not permit data editing. This makes it impossible for me to change the payload. Functionality changes brought on by upgrades can occasionally occur without warning and can be annoying, Complicated user interface, and Very difficult to use.

#### L. Colasoft Capsa Network Analyze [17]

- Features: VoIP Analysis Notifying Alarms by Emails & Audio TCP Flow Analysis Network Security Analysis Network Protocol Analysis In-depth Packet Decoding Extensive Statistics of Each Host Automatic Expert Network Diagnosis powerful Conversation Analysis useful, Valuable Built-in Tools Task Scheduler Versatile Traffic & Bandwidth Statistics Versatile Traffic & Bandwidth Statistics Versatile Traffic & Bandwidth Statistics Quick & Intuitive Report.
- Pros: Dependable application capable of handling the volume of traffic that most enterprises will generate. simple to use Simple capture configuration and traffic type filtering. comparatively inexpensive for what it can do.
- Cons: Optional scaling to 10Gb/s networks is required. The performance threshold appears to be around 3Gb/s; API access is required to trigger captures; and Agents are required for remote captures.

#### M. Ekahau HeatMapper [18]

- Features: One of the greatest Wi-Fi analyzer apps, it enables you to see your network visually. enables you to obtain results you can act on. It aids in network design for your particular needs. It facilitates data collection and produces precise reports. Additionally, it offers a precise, plug-and-play Wi-Fi measurement and diagnostic tool.
- Pros: Great way to map small WLANs, relatively accurate, can't beat the price
- Cons: 15 limits, no pan/zoom, no result save (beyond snapshots), XP/Vista only

#### N. LizardSystems Wi-Fi Scanner [19]

- Features: Quick and simple wireless network search Support for 802.11ax and 802.11a/b/g/n/ac Support is provided for channel widths of 20, 40, 80, 160, and 80+80 MHz in the 2.4 and 5 GHz frequency bands. For wireless networks, a detailed display of the network name (SSID), signal level (RSSI), MAC address (BSSID), signal quality, channel, achievable and maximum data rate, encryption, channel use, clients, etc. is available. Show a thorough explanation of the data points (IE) Observe security standards You can utilise WEP, WPA, or WPA2 on wireless networks. interoperability between WPS 1.0 and WPS 2.0 Access points' model numbers and device names are identified. Graph the evolution of signal strength over time. The signal spectrum mask for each wireless network should be visible. The colour of the graph can be altered for any wireless network. Use the provided criteria to filter the list of wireless networks that have been found. Filter the list of discovered wireless networks using certain criteria (quality, network mode, security, etc.) Join any discovered networks Show the Wi-Fi radio status (software, hardware) the wifi connection's settings Display graphs and tables with wireless connection data.
- pros: Easily identifies all network devices; Offers significant information about each device
- Cons: Non-techies may be intimidated; At 40 dollars, it's not cheap.

### IV. SURVEY OF MOBILE APPS

#### A. NetSpot Wifi Analyzer

- Features: Three modes, namely: discover, survey and internet speed test, Discover mode: capture real-time details on surrounding Wi-Fi networks, Survey mode: provides colour-coded visual heatmaps The Internet speed test: calculates ping, upload speed and download speed.
- Pros: Easy to use for beginners Free, No ads
- Cons: Survey mode available only for the paid version; includes only min details for advanced users

#### B. Opensignal- 5G, 4G speed test [20]

- Features: Includes speed and video test Network availability- shows the networks available in terms of

1G/2G/3G/4G/5G. Network status- provides a map showing different networks in the surroundings and the nearest cell tower to the mobile device.

- Pros: Easy and straightforward to use for beginners, Simple UI, No ads, Free version.
- Cons: No channel-based information/data Nearest cell tower detection is not accurate.

#### C. WiFi Monitor [21]

- Features: Connection shows connected wifi network, speed, ping, and configuration. Networks list the network in the vicinity giving SSID, BSSID, channel, frequency, and RSSI parameters. Channels visualization of different networks categorized into 2Ghz and 5GHz bands, signal strength plots, Downlink & Uplink plots.
- Pros: Free version, Detailed app with basic and advanced level features.
- Cons: Presence of ads.
- Features: Gives detailed info on active, wifi, and cell connection along with wifi and cell details, LAN scan, It also has an inbuilt tool which provides parameters to calculate, such as ping, route, and ports.
- Pros: Simple and clean UI, Useful for beginners and advanced users.
- Cons: Ads, No particular speed test feature, Security features require a subscription.

#### D. Fing-Network tools [22]

- Features: Provides info on network-managed devices, access points and network setup. Troubleshoot options include wi-fi scanner, ping, traceroute and wake on LAN.
- Pros: User-friendly UI, No ads.
- Cons: Device visibility in the network is inaccurate; ads cannot be stopped.

#### E. AirMagnet WiFi Analyzer PRO [23]

- Features: Full WiFi interference scanner is available. Highlights difficulties with network security, WiFi coverage, performance, and wireless network connectivity. Testing can be made from the client's perspective, regardless of the network infrastructure. It offers an exhaustive list of the active devices in the environment; With a live snapshot and built-in wireless expertise features, it draws attention to issues requiring rapid action.
- Pros: Complete WiFi network management and information solution; contains data to help maintain regulatory compliance.
- Cons: Rich feature set could be too much for people just learning about WiFi network management, and there are not many WiFi listening devices officially supported.

#### F. Wi-fi SweetSpots [24]

- Features: surveys wifi connection speed and locates the fastest and slowest wifi spots

- Pros: Easy and straightforward to use, Adequate for beginners
- Cons: Not valid for advanced users

#### G. Network signal info [25]

- Features: Mainly used for mobile communication, provides details on mobile, wifi, cell location and system info.
- Pros: Simple UI, Provides cell and system info
- Cons: Ads block visibility of certain functions

#### H. Speed Test Wifi Analyzer by analiti [26]

- Features: Provides services such as coverage, speed, network visibility, channels, devices, Timely analysis and survey of active wifi connections, Unique: compares multiple location's wifi speeds, Channel plots of different networks in the vicinity
- Pros: In-depth app packed with a lot of data, No ads
- Cons: Full functionality of the app only possible via subscription

#### I. nPerf [27]

- Features: nPerf speed test is compatible with all broadband and mobile connections: ADSL, VDSL, cable, optical fiber FTTH / FTTB, satellite, wifi, WiMAX, cellular 2G / 3G / 4G (LTE), 5G, Type of the network -4G/3G, Provide ISP, Network & server details, It measures signal strength, location details, Download bitrate(max, average), upload bitrate (max, average), latency(max, average), jitter, Measure browsing performances for Google, FB, yahoo, wiki, LinkedIn websites with time, weight(kilobits) and performance rate, Measure streaming performance for YouTube with 360p, 720p, and 1080p videos and it will measure buffering time and data used.
- Pros: nPerf is collecting several million tests and billions of mobile network coverage measures per year. The nPerf server network is made up of more than 1400 servers worldwide with a total bandwidth of more than 5 Tb/s, This app can compare the performance with previous measurements in history. It can compare the performance with other network providers. When a user moves, it maps the coverage in accurate time. No installation is necessary. Available on mobile devices, Simple options, Display site metrics, and good mobile application.
- Cons: Privacy concerns, Display of IP address, the Premium version in the app would be significant compared to the accessible version of nPerf.

#### J. WiFi Analyzer and Surveyor [28]

- Features: Monitor and scans your wifi networks, Supervise the wifi networks of your enterprise/home, Know

the strengths of the available signals, Get a graphical view/charts of all the channels carrying the wifi signals, Keep a tab on channel interference, Get the widget that shows the channel graphs on your device's home screen, If we upload the floor plan, we can measure the Wi-Fi performance for the project.

- Pros: Surveyor is easy to use (user friendly), Monitor all the wifi networks within the range, Generate and export survey reports from your device, The Signal graph filters out the weakest signals by default, Monitor the wifi channels and their interference; simple, solid GUI.
- Cons: Heat map view is Lacking.

#### K. *WiFi Analyzer by Olgar* [29]

- Features: wifi Optimizer for Interference Issues, Channel Analyzer for Nearby Apps, Real-time data and distance calculations, History of signal strength, Supports 2.4GHz/5GHz, View Hidden WiFi, Copy MAC address, Channel Optimizer, Displays channel width by default, Best channels for connected AP, Remembers your preferences, Export Graphs, View information about your connection, Connect to open wifi networks within the app
- Pros: You can use this app to choose a channel that is not being used by other wifi routers to get the best signal in your location, It indicates the best channel for the wifi networks in the area, Monitor all the wifi networks within the range
- Cons: It automatically enables ads.

#### L. *TP-Link Tether* [30]

- Features: Configure your devices' SSID, password, and Internet or VDSL/ADSL settings. Block people who are using your devices without authorization, controlling client device permissions, a parental control feature that manages Internet access based on a schedule and URLs, Locate the ideal spot for your range extender, switches off the LED's automatically at a particular time, and controls the majority of TP-Link devices at once.
- Pros: You can control your router/xDSL router from anywhere at any time with a unique, exclusive TP-Link ID. The owner can see who connects to the network and instantly block anyone who shouldn't be there. Parental controls guarantee that each family member has individualized and appropriate internet access. You may block specific URLs and set time restrictions using filters to control how often your kids' devices can connect to the internet.
- Cons: There is no remote-management capability. Parental controls lack blacklists. It allows only five TP-Link routers.

#### M. *Net Monster* [31]

- Features: logging of cells that the phone connects, guessing transmitter's location based on publicly available data,

manual editing of cells, post-processing of logged data, bringing more data to neighboring cells, downloading precise location data for transmitters in supported countries and regions, and manual uploading your data to location managers.

- Pros: The app shows the information on neighbor carriers and the aggregated carriers
- Cons: There is a huge battery drain while running in the app background.

#### N. *NETGEAR WiFi Analytics* [32]

- Features: Signal strength, Home Testing -It measures the network speed in each room of your home/Business, Network status- It measures the dBm value of all the wifi networks, Channel Interference, Channel graph -plot each wifi network signal strength graph, Signal graph- It measures the signal strength vs. real-time in all the wifi networks.
- Pros: NETGEAR Insight delivers unified remote management covering select NETGEAR access points, switches, and storage for a complete network solution for small businesses.NETGEAR Insight business owners or MSP and VARs resellers can remotely manage small business networks across multiple locations
- Cons: Pro version of the Netgear gives more priority than the free version.

### V. BENEFITS OF A WiFi NETWORK ANALYZER

- Look for networks that might disrupt your WiFi connection.
- WiFi information such as the access point, bandwidth, BSSID, IP address, MAC address, and security type are scanned and detected.
- On the basis of signal strength, choose the optimum channel.
- On the control panel, information about WiFi speed and other indicators are displayed.
- It also reveals unfamiliar connections and access points from a security perspective.

### VI. REQUIREMENTS OF WiFi ANALYZER & SURVEYOR

- A good price that is worth paying or a free tool that is worth installing auto discovery which includes wireless AP's and covers all networks
- A graphical representation that shows all of the channels within range
- An indicator of signal strength
- Analysis functions that indicate signal overlap
- Alerts to indicate the loss of signal or performance problems
- Identifiers for each access point transmitting signals

- It should detect bluetooth and WiFi as well
- Customized and expandable with plugins
- Data in list and graphical format
- Automatically spots surrounding
- WiFi heat maps
- Signal footprints
- Graphical signal display
- Free for home use
- Free and paid versions
- GPS option
- plot onto Google Maps
- track of moving signals
- Saves to file option
- Analysis for VoIP
- Signal channel analysis
- Cover 2.4 GHz and 5 GHz channels
- Identifies signal origin
- Should identify hidden signals

## VII. LACKING FEATURES OF WiFi ANALYZER TOOLS

The prevalence of mobile devices has led to a need for WiFi analyzer tools to determine the quality of a network. The industry has seen the emergence of different WiFi analyzer tools over the years to suit different needs and user arsenals. However, many WiFi analyzer tools do not meet the needs of users today. This is mainly due to a number of reasons, including the complexity of the tools, the cost of the tools and the inability to accurately identify devices. Many WiFi analyzer tools are too complex for novice users. The complexity of these tools makes it difficult for users to learn how to use them. This makes it hard for users to effectively perform network analysis. In addition, complex tools are also likely to be less reliable. A complex tool is likely to have more errors and take longer to process data than a less complex tool. For these reasons, it is necessary to create simple wifi analyzer tools that novice users can easily use. WiFi analyzer tools are crucial when diagnosing network issues. Accurate, reliable measurements are crucial to the success of any wifi analyzer tool. All signals and channels should be detected when calculating network health. This enables the user to identify all network connections in a device or network. Identifying all signals and channels enables the user to identify all network ports. This is important when trying to determine which ports are being used. Knowing which ports are being used enables the user to identify potential security threats. It is also important to identify all channels to identify any available bandwidth. Accurate, reliable measurements are also crucial when identifying security threats. Knowing the type of security threats enables the user to take action before they are able to cause harm. Security threats can come in many forms including but not limited to: physical access, unauthorized users, and network attacks. Physical access can include devices being accessed through ports, accessing removable media, or directly accessing the device. Unauthorized users can be defined as people who are not supposed to have access to the

network. They can also include bots that are trying to access networks for malicious purposes. Network attacks can come in many forms including but not limited to: ARP Poisoning, Man-in-the-middle attacks, and Denial of Service attacks. These are just a few of the many security threats that can affect networks. The apps could be improved in the following ways to make it more user-friendly and less intrusive.

- The app should send a notification whenever it starts scanning the wifi. This way, users would not feel uncomfortable or intrusive.
- The app should allow users to choose which wifi networks they would like to scan. This would help those who do not want the app to scan their entire wifi.
- The app should provide more detailed information about the devices that are detected. This would make it easier for users to identify malicious devices.

## VIII. CONCLUSION

The goal of a WiFi analyzer is to give consumers the capacity to identify, troubleshoot and fix any problems in their house or workplace. Users can diagnose issues with their wireless networks using these tools, then fix them so that they can access the internet without any hassles. Additionally, you can also find out who is accessing your confidential information and find out which devices are connected to your network without authorization. Existing windows and mobile Wi-Fi analyzers or monitoring apps offer basic requirements to users, although the major issue lies in the subscription part. Developers frequently keep the important app features for the pro version, which is only accessible to users that subscribe to their services. This leaves just a small number of features that can be accessed in the free edition. The majority of apps have advertisements that clog up the user interface and reduce the overall user experience. Furthermore, some apps access sensitive data from end user devices, which is not at all necessary for WiFi analytics. The developers should make sure that only the necessary permissions which are relevant with respect to WiFi monitoring and analysis are requested. Net Spot is the best mobile app for evaluating WiFi, compared to other apps. In conclusion, WiFi Analyzer Tools are crucial for anyone looking for quick and simple ways to boost their wireless connectivity.

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## REFERENCES

- [1] T. Arampatzis, J. Lygeros, and S. Manesis, "A survey of applications of wireless sensors and wireless sensor networks," *Proceedings of the 13th Mediterranean Conference on Control and Automation*, pp. 719 – 724, 07 2005.



- [2] Yadav and Nisha, "A survey paper on wireless access protocol," *International Journal of Computer Science and Information Technologies*, vol. 6, pp. 3527–3534, 07 2015.
- [3] C. Gujjar, S. Sunil, and A. Mukhopadhyay, "A survey on wireless ad-hoc implementations in android-based smartphones," in *2017 International Conference on Communication and Signal Processing (ICCSP)*, 2017, pp. 0894–0899.
- [4] V. S. Anusha, G. Nithya, and S. N. Rao, "Comparative analysis of wireless technology options for rural connectivity," in *2017 IEEE 7th International Advance Computing Conference (IACC)*, 2017, pp. 402–407.
- [5] A. Viswanathan, N. B. Sai Shibu, S. N. Rao, and M. V. Ramesh, "Security challenges in the integration of iot with wsn for smart grid applications," in *2017 IEEE International Conference on Computational Intelligence and Computing Research (ICCIC)*, 2017, pp. 1–4.
- [6] Solarwinds alternative. [Online]. Available: <https://tinyurl.com/3nburnjv/>
- [7] Omnippeek Network Analyzer. [Online]. Available: [tinyurl.com/r9x78n63](https://tinyurl.com/r9x78n63)
- [8] Automated network device discovery netspot. [Online]. Available: <https://docs.netapp.com/us-en/ontap-cli-98/network-device-discovery-show.html>
- [9] Acrylic WIFI. [Online]. Available: [tinyurl.com/2s67wbx8](https://tinyurl.com/2s67wbx8)
- [10] WiFi Heat Map. [Online]. Available: <https://www.ekahau.com/solutions/wi-fi-heatmaps/>
- [11] Netgear Wifi Analytics. [Online]. Available: [tinyurl.com/yvay689m](https://tinyurl.com/yvay689m)
- [12] MetaGeek InSSIDer. [Online]. Available: <https://www.metageek.com/inssider/>
- [13] WiFi Analyzer. [Online]. Available: <https://www.paessler.com/wifi-monitoring>
- [14] PRTG Professional WiFi Analyzer. [Online]. Available: <https://www.paessler.com/wifi-monitoring>
- [15] Vistumbler. [Online]. Available: <https://www.vistumbler.net/>
- [16] Wireshark · Go Deep. [Online]. Available: <https://www.wireshark.org/>
- [17] . [Online]. Available: <https://www.colasoft.com/capsa/>
- [18] Wi-Fi Heatmap Software - Visualize Coverage and Capacity — Ekahau. [Online]. Available: <https://www.ekahau.com/solutions/wi-fi-heatmaps/>
- [19] LizardSystems Wi-Fi Scanner. [Online]. Available: <https://lizardsystems.com/wi-fi-scanner/>
- [20] Opensignal - 5G, 4G Speed Test. [Online]. Available: [tinyurl.com/mrevmhce](https://tinyurl.com/mrevmhce)
- [21] WiFi Monitor: network analyzer – Apps on Google Play. [Online]. Available: [tinyurl.com/mwtpm5cs](https://tinyurl.com/mwtpm5cs)
- [22] Fing - Network Tools. [Online]. Available: [tinyurl.com/3weaybmv](https://tinyurl.com/3weaybmv)
- [23] AirMagnet® WiFi Analyzer PRO — NetAlly. [Online]. Available: [tinyurl.com/yc879psx](https://tinyurl.com/yc879psx)
- [24] Wi-Fi SweetSpots . [Online]. Available: [tinyurl.com/2p85mhxm](https://tinyurl.com/2p85mhxm)
- [25] Network Signal Info . [Online]. Available: [tinyurl.com/2uta48zz](https://tinyurl.com/2uta48zz)
- [26] Speed Test WiFi Analyzer – Apps on Google Play. [Online]. Available: [tinyurl.com/2p9d337j](https://tinyurl.com/2p9d337j)
- [27] . [Online]. Available: <https://www.nperf.com/en/nperf-applications/>
- [28] WiFi Analyzer and Surveyor. [Online]. Available: [tinyurl.com/486xwtrb](https://tinyurl.com/486xwtrb)
- [29] WiFi Analyzer Premium . [Online]. Available: [tinyurl.com/ykk7h25r](https://tinyurl.com/ykk7h25r)
- [30] TP-Link Tether. [Online]. Available: [tinyurl.com/y6jy3bae](https://tinyurl.com/y6jy3bae)
- [31] NetMonster. [Online]. Available: [tinyurl.com/4c7zxe8s](https://tinyurl.com/4c7zxe8s)
- [32] NETGEAR WiFi Analytics . [Online]. Available: [tinyurl.com/yvay689m](https://tinyurl.com/yvay689m)