Datasheet: AirMagnet Wi-Fi Analyzer

AirMagnet Wi-Fi Analyzer PRO helps IT staff Troubleshoot, Analyze, and Audit their wireless network. Quickly solve end-user issues while automatically detecting security threats and wireless network vulnerabilities with a single mobile tool. The solution enables network engineers to easily test and diagnose dozens of common security and wireless performance issues, including throughput and connectivity issues, device conflicts and signal multipath problems by providing:

- *Comprehensive active troubleshooting toolkit*
- *Complete 802.11a/b/g/n/ac Wi-Fi packet and interference analysis*
- *Instant answers on wireless issues*
- *WLAN client roaming root cause analysis*
- *Audit the wireless network for rogue devices and security vulnerabilities*

AirMagnet Wi-Fi Analyzer PRO includes a full compliance reporting engine, which automatically maps collected network information to requirements for compliance with policy and industry regulations.

AirMagnet Wi-Fi Analyzer PRO is the industry's "de-facto" tool for troubleshooting enterprise 802.11a/b/g/n/ac and 4.9 GHz Wi-Fi networks. At the heart of AirMagnet Wi-Fi Analyzer PRO is the AirWISE® engine, which automatically detects the root cause of dozens of security and performance problems, explains problems in simple terms, and offers recommendations on how to solve or manage complex issues. It is a highly portable WLAN software tool that travels to the source of WLAN problems enabling faster and accurate fault finding without any AP downtime. With this dedicated Wi-Fi troubleshooting solution, users are guaranteed to find any WLAN faults compared to limited functionality built inside the WLAN infrastructure. The solution enables network managers to easily analyze dozens of common wireless performance issues, including throughput issues, connectivity issues, device conflicts and signal multipath problems. AirMagnet Wi-Fi Analyzer includes a full compliance reporting engine, which automatically maps collected network information to requirements for wireless network compliance with policy and industry regulations. With support for 802.11ac, AirMagnet Wi-Fi Analyzer is the industry's most accurate 802.11ac troubleshooting, analysis, and audit tool that never misses any Wi-Fi traffic and helps solve problems right the first time.

Comprehensive Troubleshooting and Analysis Solution

It is important to note that troubleshooting and analysis are not the same as monitoring and management, and when troubleshooting it is critical to solve problems right the first time, irrespective of the location of the problem and more importantly with no impact to the performance of the AP infrastructure. There is a huge misconception that by using freeware apps or basic management capabilities built inside the AP infrastructure, you can solve issues that impact the security and performance of a network. Freeware and many low cost apps provide only a basic monitoring view of the network, lacking the depth needed for real analysis or the tools to troubleshoot and solve real-world problems. They do not match the capabilities of a true network troubleshooting and analysis tool like AirMagnet Wi-Fi Analyzer PRO that can solve any problem in the Wi-Fi network. Many of the AP Infrastructure solutions provide integrated monitoring and management via partial scanning or full time scanning options. Both options have severe limitations for analysis and troubleshooting activities. Part time scanning methods lead to slower detection of problems in the network and can even miss the issue altogether. With full time scanning, you are taking the AP away from providing network services, which means impact to your users. Additionally when putting an AP into a dedicated scanning mode you have changed the complexion of the network, meaning that troubleshooting actions are invasive to the criteria you are trying to test. Moreover, the APs are fixed on the ceiling and cannot travel to the location of the problem. With AirMagnet Wi-Fi Analyzer PRO, all of these limitations are enabled with full featured dedicated on-site troubleshooting with zero AP downtime.

802.11ac Analysis and Troubleshooting

802.11ac is the latest WLAN standard that promises gigabit speeds, but with this great promise comes a lot of challenges that users are expected to deal with. With AirMagnet Wi-Fi Analyzer PRO network engineers are equipped with the critical data needed to quickly solve end-user issues and prevent costly rework and escalations. AirMagnet Wi-Fi Analyzer PRO is the industry's only wireless network analyzer that does not miss any 802.11ac traffic with full 3X3 support, and can solve any problems on the 802.11ac network. More importantly all of this is done at the location of the reported problem for more effective troubleshooting, with zero network impact compared to reusing the AP for the purpose or limiting visibility based on fixed APs for troubleshooting. It also plays a critical role in helping users optimize the migration path from legacy technologies with its unique 802.11ac Toolkit which provides clear direction and details on how to leverage new 802.11ac options to maximize throughput and performance. This toolkit includes:

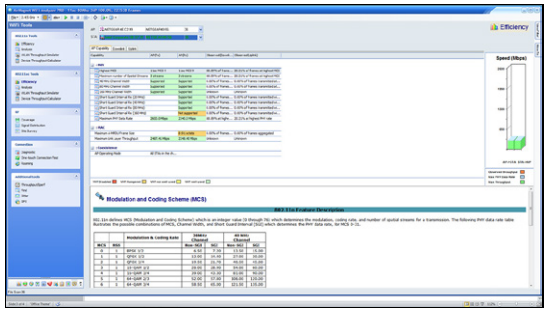

Figure 1: *802.11ac analysis and troubleshooting*

- **WLAN Throughput Simulator tool:** calculates network throughput, utilization and overhead under user-specified conditions by simulating the existing network or simulating the addition of new APs or stations in the network.
- **Throughput/Iperf tool:** allows users to run a performance test on any AP in the environment and measure the maximum WLAN bandwidth at a particular location; find the optimum configuration for maximizing WLAN throughput and test devices under various traffic stress scenarios.
- **Efficiency tool:** analyzes conversations between 802.11ac/n APs and stations, and indicates if the network is using 802.11ac and 802.11n to its full potential using simple color legends. The tool provides guidance on what option is not being well-used and how to better use it along with an independent visibility into the uplink and downlink performance.
- **Analysis tool:** provides detailed statistics for any AP Station conversation helping the user to pinpoint low throughput problems. These include 20/40/80/160 MHz channel usage, use of SGI, 802.11ac MCS index, PHY Data Rates & A-MPDU (802.11n only).
- **Device Calculator tool:** allows users to simply enter 802.11ac or 802.11n AP specifications and calculate the expected network performance taking into account the capabilities of the clients that would connect to it.

Fast and Accurate Troubleshooting

Traveling to the location of the problem gives AirMagnet Wi-Fi Analyzer PRO a key advantage for troubleshooting. Data collected and evaluated is a full reflection of the problem where it is occurring, and built-in wireless expertise saves valuable time by highlighting detected problems immediately. AirMagnet Wi-Fi Analyzer PRO's active toolkit allows the user to take deliberate steps as necessarily during the troubleshooting process.

Real-time Wi-Fi Troubleshooting

AirMagnet Wi-Fi Analyzer PRO provides in-depth frame statistics for every channel and device operating in the spectrum. With the channel utilization and throughput trending graphs, users can solve many of the issues that lower the overall performance of the WLAN network. Users can view trending graphs for signal strength, noise, frames, errors, retries, bandwidth and many more for every WLAN channel and device. These valuable graphs provide critical pointers to issues that are influencing the WLAN network performance. For example, graphs for packet retry and error rates reveal areas where WLAN communications are failing. On AirMagnet Wi-Fi Analyzer PRO's decode screen, users can view and analyze a list of real-time packets including 3X3 802.11n and 3X3 802.11ac packets, it also includes support for monitoring upperlayer protocols. AirMagnet Wi-Fi Analyzer PRO gives users the option to apply a filter in order to isolate particular packets of interest, based on a specific channel, SSID, node, IP address, or type of frame. WPA-PSK and WPA2-PSK encrypted packets can be decrypted. With the multi-adapter support in AirMagnet Wi-Fi Analyzer PRO, users can monitor multiple channels simultaneously using individual adapters inserted into the same PC.

Figure 2: *Trending graphs for detailed analysis*

Built-In Wireless Expertise

AirMagnet Wi-Fi Analyzer PRO reduces the complexity with instant answers from its real-time analysis engine called AirWISE®. This engine automatically detects the root cause of hundreds of security threats and performance issues before they impact the network. It goes a step further and also guides the user on how to solve the issue and avoid its occurrence in the future. All of this leads to faster and more accurate troubleshooting, thus saving costly internal resources. It can also automatically alert and notify you on more than 150+ threats and issues including:

1. Security issues such as rogue devices, denial of service attacks, security penetration attacks, authentication and encryption issues, configuration vulnerabilities for your infrastructure.
2. Performance issues such as channel or device overload, deployment and operation errors, RF management issues, traffic problems, and QoS and VoWLAN issues.

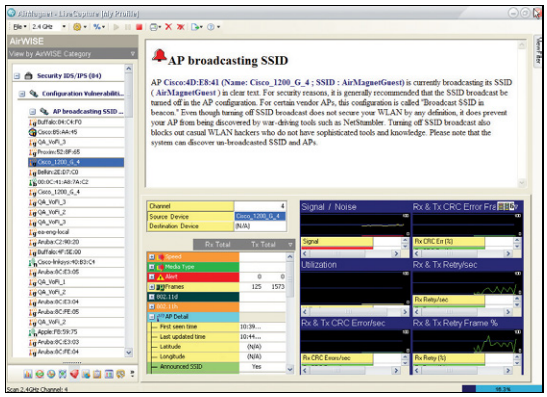

Figure 3: *AirWISE Expert screen*

AirMagnet Wi-Fi Analyzer PRO includes "How-To" guides to walk IT administrators through the identification of an issue, including security, performance, interference, device configuration issues, and guides them to solving the issue. The library also includes information on the solutions major functions and how to use them in
identification and resolution of WLAN issues.

Active Troubleshooting Tools

AirMagnet Wi-Fi Analyzer PRO is the industry's only wireless network analyzer that includes a suite of active Wi-Fi troubleshooting tools to quickly pinpoint and solve wireless network problems. This includes users not being able to connect to the network, users experiencing slower connections to the network or WLAN applications, 802.11n and 802.11ac misconfigurations, traffic/infrastructure overloads, hardware failures, roaming problems, multipath interference problems and more. With these tools available at the users' fingertips, they can solve any kind of problem that are impacting the network performance. These tools include:

- Device locator: geiger-counter tool that helps physically locate any unauthorized or policy violating device.
- Connection test: single-click end-to-end network connectivity (DHCP, ping, trace) and application performance (HTTP, FTP, audio, video) measurement tool.
- Signal distribution tool: detect any multipath issues in the network.
- Roaming tool: measures roaming times for clients between APs.
- Performance/Iperf tool: measures uplink and downlink throughput performance of the network.
- 802.11n and 802.11ac throughput calculator tool: compare vendor AP performance based on specifications and capabilities of those devices.
- 802.11n and 802.11ac efficiency and analysis tool: analyzes conversations between APs and stations, and indicates if the network is using 802.11ac and 802.11n to its full potential using simple color legends.
- 802.11n and 802.11ac throughput simulator tool: the simulator tool calculates the network throughput, utilization and the overhead under user-specified conditions by simulating the existing infrastructure or simulating the addition of new APs or stations in the network.

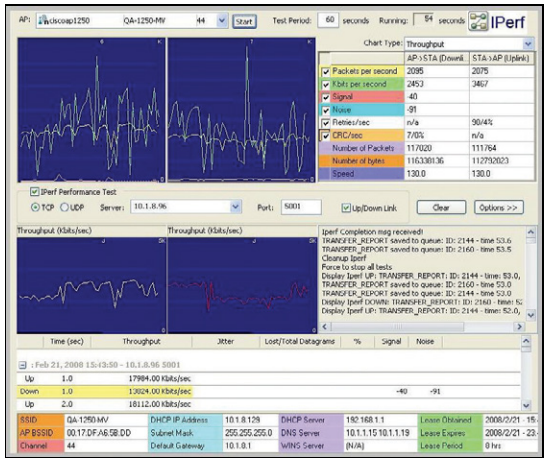

Figure 4: *Throughput measurement tool*

Sophisticated Wireless Attack Detection

In addition to the unauthorized device and stumbling tools detection, AirMagnet Wi-Fi Analyzer PRO detects sophisticated attacks launched against the corporate wireless network, aimed at disrupting the wireless services. These include Denial of Service attacks against the corporate AP/STA/Infrastructure, such as RF Jamming attacks, association and encryption-based DoS attacks, wireless disconnection attacks, and many more. AirMagnet Wi-Fi Analyzer PRO also detects penetration attempts against the wireless infrastructure, including a variety of dictionary attacks, fake access points, WEP cracking tools, man-in-the-middle attacks, illegal wireless frames attack, hotspot attacks, honeypot attacks, etc.

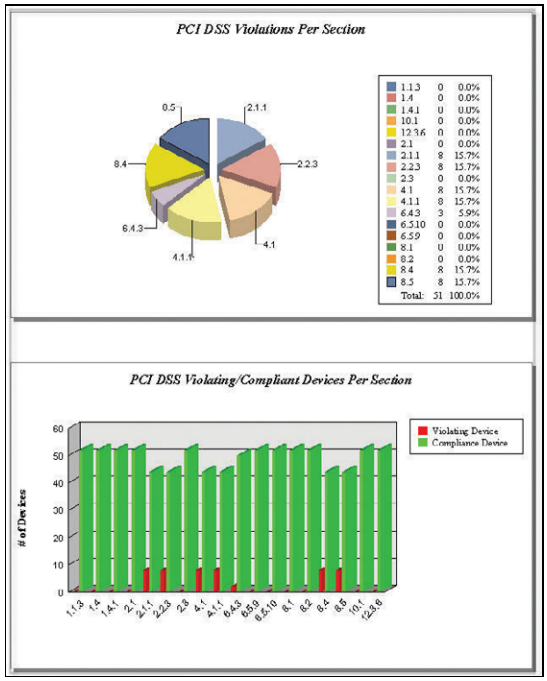

Figure 5: *AirMagnet Wi-Fi Analyzer compliance reports*

In-Depth Analysis

AirMagnet Wi-Fi Analyzer PRO offers in-depth analysis of wireless issues across a breadth of topic areas including roaming and interference. With the explosion of BYOD, a whole new series of challenges face the IT professional, and AirMagnet Wi-Fi Analyzer PRO is equipped to deal with them.

WLAN Network Health Summary

AirMagnet Wi-Fi Analyzer PRO provides users with the complete inventory of devices, including APs, clients and smart devices that are operating in the environment. For each device, users are powered with detailed configuration information and traffic statistics for each device. AirMagnet Wi-Fi Analyzer PRO also includes a dashboard that provides a live snapshot into the overall health of the WLAN network and helps users focus on top issues that need immediate attention to ensure maximized WLAN security and performance. Users are powered with a variety of charts, including the ones for channel utilization, top talkers in the network, WLAN interference levels, mismatched configurations, overloaded APs, security and performance problems, etc. Users can drill down for deeper investigation into WLAN statistics for every device, channel and wireless frame.

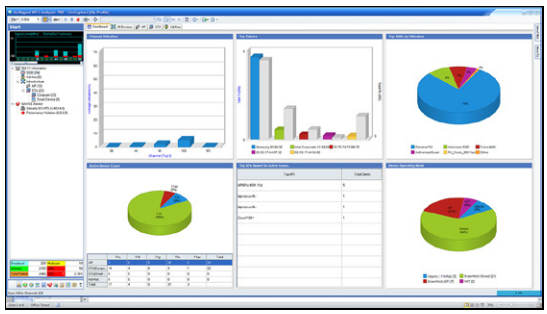

Figure 6: *Network health summary*

WLAN Client Roaming Analysis

AirMagnet Wi-Fi Analyzer PRO leverages support for multiple WLAN adapters plugged into the computer to troubleshoot client roaming problems – one of IT staff most commonly reported problems for WLAN networks. Smooth coordinated client roaming is key to providing users with the mobility and seamless connectivity expected from a wireless deployment for any application, including data, voice and video.

It provides advanced details on all roaming transactions for any WLAN client including stations, phones, and handheld scanners. Users are powered with AirWISE® expertise to get detailed reasons for the roaming event taking place, device and channel parameters that influence the roam, and visibility into whether the roam was good or not.

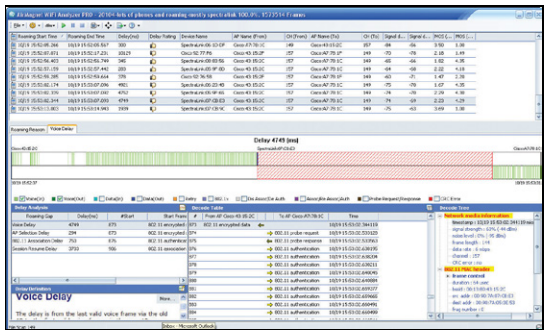

Figure 7: *Roaming analysis screen*

For VoWLAN phones, users can monitor voice delays and other statistics as the phone roams from one AP to another in the middle of a conversation. The application provides VoFi-specific data (such as WiMOS, signal strength, etc.) leading up to the attempt, and packet transmission rates for the conversation. With this root cause analysis on roaming problems, users can minimize the likelihood of any roaming problems recurring in the WLAN network.

Complete Wi-Fi Interference Detection and Analysis

Interference is one of the leading causes for poor connectivity and performance problems in the network. This interference can be from other Wi-Fi devices due to poor channel planning (adjacent or co-channel interference) or could be from non Wi-Fi interference sources. AirMagnet Wi-Fi Analyzer PRO's interference status indicator lists the overall interference status for each Wi-Fi channel, calculated based on the Wi-Fi interference score for the devices contributing to the interference; a list of hidden nodes and non Wi-Fi devices (non Wi-Fi detection requires AirMagnet Wi-Fi Analyzer PRO and RF spectrum analyzers installed on the same machine) operating in the channel. This enables users to plan future Wi-Fi deployments or modify their existing deployment to increase network performance.

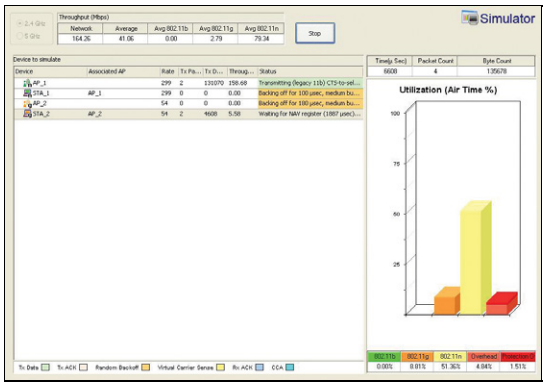

Figure 8: *Simulate performance of the network*

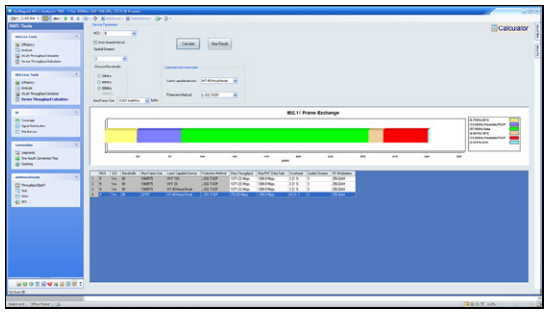

Figure 9: *Analyze 802.11n conversations*

BYOD Classification

With the recent Wi-Fi explosion and the ever growing BYOD (Bring Your Own Device) phenomenon, IT groups within organizations face the constant challenge of both supporting these devices as well as troubleshooting issues caused by these devices. AirMagnet Wi-Fi Analyzer PRO instantly detects and classifies smart phones and tablets that connect to the network. This capability allows IT professionals to authorize these devices, quickly troubleshoot and resolve issues caused by these devices as well as determine performance and security impact to the WLAN network. For example, users can very quickly see rogue smart devices that connect to the network and determine whether a specific smart device is consuming a lot of bandwidth by accessing the Top Talkers graph in the dashboard.

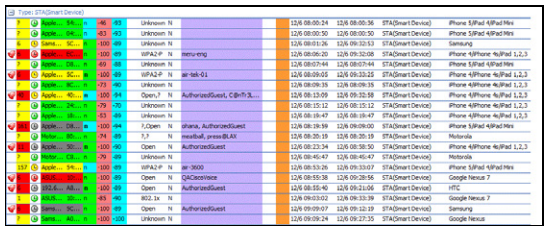

Figure 10: *Smart Devices*

Wireless Network Auditing

AirMagnet Wi-Fi Analyzer PRO acts as an independent tool for auditing WLAN deployments. With a fully mobile tool, IT staff can rest assured that a site audit has found everything, not just devices that are within ear-shot of an Access Point.

Find Rogues on the Network

AirMagnet Wi-Fi Analyzer PRO automatically detects and alerts the user to dozens of wireless intrusions, penetration attempts and Wi-Fi hacking strategies that can be employed by rogue devices on your network. Rogue devices do not necessarily have to be malicious in nature, many times well-meaning users plug in their own devices in an attempt to improve performance in an area. These devices often present easy ingress for hackers looking for access to the enterprise network. The AirMagnet Wi-Fi Analyzer 'Find' tool locks onto rogue or policy violating APs or stations and guides the user to their physical location.

It scans 200+ extended channels in the 5 GHz spectrum. Since wireless hackers won't necessarily restrict a planted rogue device to the commonly used channels, the ability to scan a wider range of the spectrum is becoming increasingly necessary.

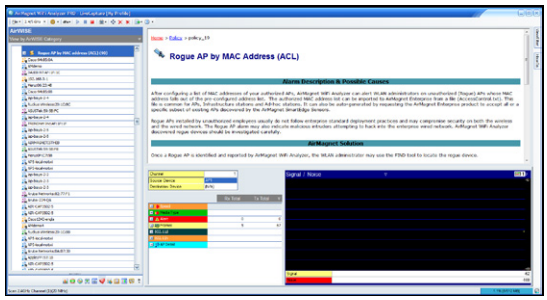

Figure 11: *Find rogues on the network*

Configuration Vulnerabilities

AirMagnet Wi-Fi Analyzer PRO's AirWISE alarm system makes it easy to validate a network is configured correctly for secure operation. The AirWISE engine can detect and alert on a host of potentially damaging wireless security configurations that would go undetected or unrecognized otherwise. Network infrastructure monitoring can't reliably catch these security holes because the infrastructure can only compare against its own settings, if they're weak then it's validating against an incorrect baseline.

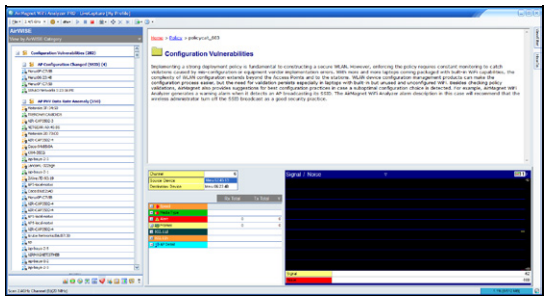

Figure 12: *Catch Configuration Vulnerabilities*

Misconfigured Devices

AirMagnet Wi-Fi Analyzer PRO can catch configuration mismatches and errors that can negatively impact network performance through the AirWISE system. The AirWISE engine looks for settings that will result in poor network performance and alert the user to the configuration issue. Having an independent audit mechanism ensures that mistakes are caught and addressed rather than having such a mistake become the new established baseline for the network.

Integrated Reporting

AirMagnet Wi-Fi Analyzer PRO's integrated reporter makes it easy to turn Wi-Fi analysis sessions into professional customized reports. Choose from a library of pre-built reports or generate targeted reports by selecting specific items of interest from the user interface. Reports cover all areas of troubleshooting and analysis with RF statistics, channel reports, device reports, security/performance issue reports. Wi-Fi Analyzer PRO also features auditor ready compliance reports for a variety of regulatory standards including HIPAA, PCI, SOX and more. Reports provide a step-by-step pass/fail assessment of each section of the standard.

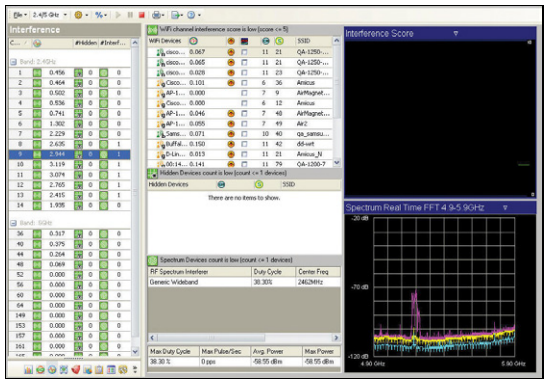

Figure 13: *Wi-Fi and non-Wi-Fi interference analysis*

NETSCOUT

Ordering Guide	
Product Name	Model
AirMagnet Wi-Fi Analyzer PRO	AM/A1150
AirMagnet Spectrum XT (optional)	AM/B4070
AirMagnet Multi-adapter kit for Wi-Fi Analyzer PRO (US, World Mode and Japan versions available)	AM/C1090
PROXIM ORINOCO 8494 802.11A/B/G/N USB Adapter (US, World Mode and Japan versions available)	AM/C1080
NetScout 802.11 A/B/G/N/AC 3X3 Express Card Adapter	AM/C1097

Minimum System Requirements – Laptop / Notebook / Tablet PC
Application Operating Systems: Microsoft® Windows 7 Enterprise/Professional/Ultimate 64-bit or Microsoft Windows 8.1 Pro/Enterprise 64-bit or Microsoft Windows 10 Pro/Enterprise 64-bit
Intel® Core™ 2 Duo 2.00 GHz (Intel® Core™ i5 or higher recommended)
4 GB memory or higher
800 MB free hard disk space
An ExpressCard slot or USB port; or an AirMagnet-supported internal WLAN adapter
Multiple slots in the PC for using multiple adapters. AirMagnet recommends the use of its multi-adapter kit
AirMagnet-supported wireless network adapter(s)
Optional spectrum adapter and license (required for viewing spectrum data and non-Wi-Fi devices; AirMagnet WiFi Analyzer Pro only). Integration supported with AirMagnet Spectrum XT Note: **AirMagnet Spectrum XT adapter is in the USB form factor**

Minimum System Requirements – Apple MacBook PRO
Operating Systems: MAC OS X v10.9 (or higher) running a supported Windows OS (as noted under Laptop/Notebook PC/Tablet PC section) using Boot Camp®
Intel®-based CPU 2.0 GHz or higher
4 GB memory or higher
800 MB free hard disk space
An internal Broadcom 802.11ac WLAN adapter (MacBook 2013 and 2014 models), an Atheros-based Airport Extreme 802.11n WLAN adapter, or a USB port (whichever applicable)
Multiple slots in the PC when using multiple adapters. AirMagnet recommends the use of its multi-adapter kit
Optional spectrum adapter and license (required for viewing spectrum data and non-Wi-Fi devices; AirMagnet WiFi Analyzer Pro only). Integration supported with AirMagnet Spectrum XT Note: **AirMagnet Spectrum XT adapter is in the USB form factor**

Minimum System Requirements - NETSCOUT OptiView XG Network Analysis Tablet
NETSCOUT OptiView XG Network Analysis Tablets running Microsoft® Windows® 7 Professional SP1 64-bit operating system or Microsoft Windows 10 Professional 64-bit operating system

Please visit the website for more detailed information on minimum system requirements. **www.enterprise.netscout.com**

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