



# THE GLOBAL STATE OF BUSINESS WI-FI 2021

# Executive Summary

Every key initiative on your digital transformation list and every 2021 trend report sitting in your inbox is likely to share one common requirement: **they're all critically dependent on the reliability of your Wi-Fi network.** Remote working, virtual events, e-commerce, and automation aren't achieved through longer, thicker, sturdier cords — they're empowered by wireless connectivity.

Welcome to the first-ever Global State of Business Wi-Fi industry report. This report takes input from more than 3,000 Wi-Fi professionals around the world — the people who truly know the good, the bad, and what it takes to put together a reliable and high-performing wireless network — and highlights key considerations for any business decision dependent on the success of your wireless network. It shows you the work-stopping cost of a neglected network and leaves you with tips you can implement to ensure your Wi-Fi can continue to enable your business growth.

## When Wi-Fi is Down, Work Stops

Wi-Fi is everywhere. According to [Mary Meeker's Internet Trends report](#), there are approximately 600 million Wi-Fi networks worldwide. Wi-Fi is now a part of nearly every mission-critical technology used that powers businesses of every shape and size.

Our report takes a look at how issues with a wireless network aren't just inconveniences — they are work-stopping and costly blows to your bottom line. Survey respondents reported that one in three wireless networks are suffering from poor performance — that's 200,000,000 poor performing networks! This is a particularly high number when you consider that the majority of respondents claim that greater than 75% of all Wi-Fi networks require troubleshooting.

Stated together, 30% of networks are poor performing and more than 75% require troubleshooting — that's a whole lot of problem networks out there. Especially since we know that when networks aren't performing, employee connectivity and productivity suffers. This is certainly a reason to take a deeper look at your wireless network.

## #1 Problem with Wi-Fi is Poor Upfront Planning

Survey respondents reported that network design (the upfront planning around how many access points you need, where they should be placed, and how they should be configured) is the most important phase in determining the long-term success of a network. While all phases are important in the Wi-Fi lifecycle — design, validation, optimization,

and troubleshooting — getting your network design right is the biggest step you can take to ensure a high performing and reliable network. The good news is that — with the right Wi-Fi tools, a floor plan, and detailed business requirements — it is easy to prepare a highly accurate design that will serve your business, employees and customers well.

## 6 GHz Mass Adoption Expected 2022 and Beyond

6 GHz will continue to be a news driver in 2021 and a major shift in network requirements for future refresh cycles and network redesigns. While there is a lot of interest in 6 GHz, our respondents are saying it is unlikely to have a significant impact on many deployments within this calendar year, but will gain in momentum in 2022 and beyond.

## COVID-19 and the Increased Awareness of High-Performing Wi-Fi

Lastly, we couldn't consider this a true state of the state without touching on the impact of COVID-19. One positive of the pandemic is that it has made business decision makers more aware of the importance of Wi-Fi and Wi-Fi performance tools than ever before. From hospitals setting up mobile check-ins for patients, to restaurants and stores offering contactless ways to take and deliver orders, Wi-Fi is now center stage. And, despite a slowing global economy, several industries are projected to increase the number of Wi-Fi projects in 2021: healthcare, education, manufacturing, enterprise/corporate and industrial/energy rank among the top of the list.

Read on to learn in greater detail about the issues and concerns impacting wireless networks today and the required considerations for future Wi-Fi decisions.





# When Wi-Fi is Down, Work Stops

Wi-Fi is everywhere. It's in the mission-critical technologies that power businesses of every shape and size. It's in the life-sustaining medical devices we rely on for health and wellness. It keeps us connected when we need to communicate and collaborate, and it gives us an escape when we need to isolate. **For your business, Wi-Fi issues aren't just inconveniences — they're work-stopping and costly blows to your bottom line.**

## The Impact of an Outage on Your Business

There are numerous ways a Wi-Fi outage can impact your business. At over 50% of survey responses, employee connectivity and productivity was voted the #1 impact as more and more knowledge workers rely on their laptop's Wi-Fi to be productive. But employees aren't the only ones connected. Wi-Fi connected hardware and software applications may simply stop operating without a Wi-Fi connection and for many businesses in retail and hospitality, a drop in Wi-Fi can have a negative impact on your customer's experience.



# The Cost of Bad Wi-Fi

At the Enterprise level, **a single hour of network downtime can cost as much as \$540,000** according to the folks at [Gartner](#). But it doesn't take a full network outage to cause serious issues; Wi-Fi outages or just poorly planned and deployed networks are costly to businesses in every industry.



## Education

Density is critical in classrooms with students accessing course materials and digital textbooks on multiple devices. Schools and universities are seeing huge upticks in demand as students return to physical campuses. Without a proper capacity plan, technology issues can get in the way of learning and classes can fall behind schedule.



## Enterprise

With so many employees using cloud-based apps, productivity and billable hours are heavily reliant on a business's Wi-Fi functioning properly. It only takes one outage impacting executive conference calls to rack up thousands of dollars of lost productivity in salaries alone.



## Healthcare

Wi-Fi enables everything from mobile medical devices that help sustain and report on patient health, to staff communications, alert and alarm systems, and to guest networks deployed to improve quality-of-life for those receiving care. It's not hyperbole that Wi-Fi is life-critical in healthcare.



## Hospitality & Recreation

Hotels rely on return visits and brand loyalty from their customers. Even a single experience with a bad Wi-Fi network can tarnish your reputation for that customer and a bad review can have an exponential impact on future business.



## Manufacturing & Supply Chain

The impact of bad Wi-Fi can hit every stage of the supply chain. Production lines can go down if safety checks aren't registered online and warehouses grind to a halt if inventory systems can't be accessed.



## Retail

If your business uses an iPad or other wireless device at checkout, an outage can make it impossible to collect payment. And for every minute you and your customer waits to reestablish a connection, customer satisfaction and loyalty drop.

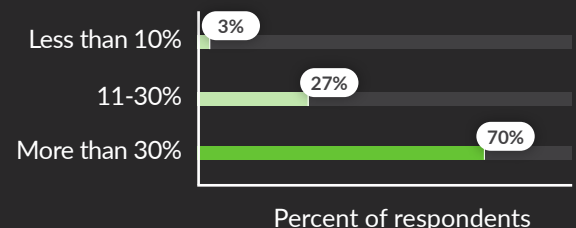
## Survey Respondents: 1 in 3 Networks are 'Poor Performing'


The majority of Wi-Fi pros polled believe that one in three Wi-Fi networks are poor performing — this means there are more than 200 million bad networks around the globe! Performance, in this context, is a measure of a network's ability to meet requirements for overall coverage and capacity with minimal interference. **This high number of networks operating at such a poor level of performance is concerning** — and it amplifies the cost of bad Wi-Fi discussed in the section above.

While the numbers look discouraging, there is an opportunity for both individual network owners (the people designated within an organization to have responsibility for the wireless network), as well as outside service providers, to drive significant improvement. By securing the right Wi-Fi tools, collecting data on a network, and evaluating areas for optimization, a poor performing network can be completely turned around.

### Wi-Fi Survey

#### What percentage of Wi-Fi networks have poor performance?



June 4, 2020 *Troubleshooting your Network to Drive Performance Improvements* | [Webinar On-Demand](#) 

# #1 Problem with Wi-Fi is Poor Upfront Planning

When you design your wireless network layout and configuration right — and you get it right the first time — you drastically improve overall Wi-Fi performance. You also reduce the likelihood of a work-stopping outage and your periodic troubleshooting becomes easier to diagnose and fix.

Wi-Fi is highly dependent on individual requirements, location, and environment. Teams equipped with the right tools and training create better designs. What makes a design better? Those that have **the right number of access points (APs) in the right locations and in the right configuration.**

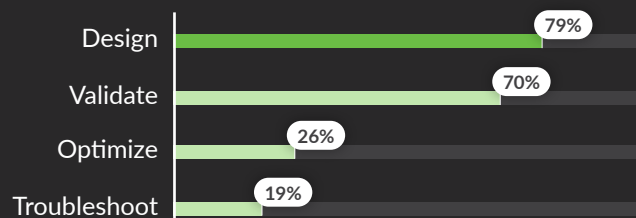
Too many APs will cause excessive co-channel interference. This is like having dinner at a crowded restaurant where you can barely hear what your date is saying — there are just way too many people talking at the same time. Installing too many APs also wastes money, as you have to both purchase the AP and pay to have it installed.


Conversely, installing too few APs won't provide enough primary coverage or redundancy coverage for business critical deployments. It's important that you take both the physical and radio frequency (RF) environment into account when configuring the right number of APs.

Starting with the right Wi-Fi tools is critical to getting your Wi-Fi project off on the right foot.

## Wi-Fi Survey

Which two stages of the Wi-Fi Lifecycle are the most impactful for long term success? (Pick 2)




November 19, 2020 Fireside Chat with the Ekahau Product Team  
Webinar On-Demand 

## The Challenges Facing Wi-Fi Network Owners

Challenges among Wi-Fi professionals are split almost evenly. While there isn't a clear answer that suggests, "fix this one thing to fix your network design," issues related to channel interference, signal strength, capacity, and # of APs all lead back to poor planning.


**What is the biggest thing you've overlooked with your design that negatively impacted your network?**

- 30% | Too many/few APs
- 26% | Capacity Planning
- 25% | Channel Interference
- 19% | Signal Strength

July 23, 2020 Back to Basics: Lessons Learned  
Webinar On-Demand 


**What is your biggest challenge when designing a network for a high density environment?**

- 28% | Physical mounting challenges
- 25% | Channel utilization
- 23% | Capacity
- 22% | Multiple client device types
- 2% | Aesthetics

October 8, 2020 Wi-Fi at Large Public Venues  
Webinar On-Demand 

**How confident are you that you could implement a capacity plan that would accommodate future needs?**

- 16% | Less than 30% confidence
- 56% | 31-60% confidence
- 28% | More than 60% confidence

August 20, 2020 The Dos and Don'ts of Capacity Planning | Webinar On-Demand 

# 6 GHz Mass Adoption Expected 2022 and Beyond

On April 23, 2020, the Federal Communications Commission (FCC) approved the draft rules that would allocate 1,200 MHz of spectrum available in the 6 GHz band for unlicensed use in the U.S., with EMEA to follow with their allocation later this year.

The need for additional spectrum has been driven by more demanding applications and rising user expectations. As enterprise offices shift from audio to video conferencing, healthcare facilities produce and share higher resolution X-rays and MRI images, and students engage in more e-learning courses, legacy networks are going to have a hard time keeping up with the increase in demand. And while making the entire 6 GHz band available is a huge step towards being able to accommodate the increasing capacity on networks, we're still in the very early stages of 6 GHz.

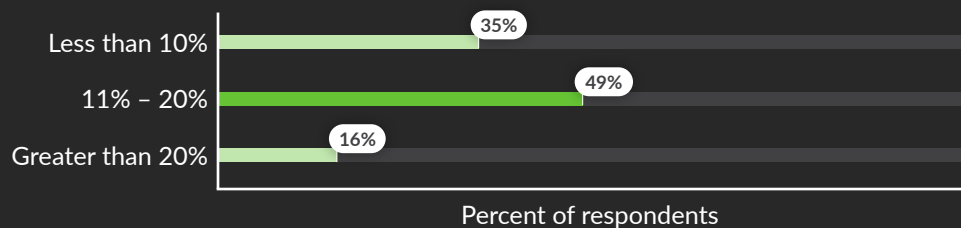
The majority of businesses will wait for their next network refresh before incorporating 6 GHz capabilities. According to our poll of Wi-Fi professionals, **84% of respondents believe that fewer than one in five networks will be equipped with 6 GHz even a full year after it is readily available in their region.** Although momentum will likely pick up in the second half of 2022 in the U.S., other regions will be further behind. 6 GHz is not likely to have serious traction for several more years.

As our world continues to consume and innovate using wireless technologies, this expansion plan will increase the amount of available spectrum for Wi-Fi by almost a factor of five. Chipsets are starting to roll out now, but it's likely that we won't see mass adoption until client devices, such as iPhones and the latest Samsung Galaxy phones, are ready to make use of them.

## Wi-Fi Survey



One year after 6 GHz is widely available, what % of networks do you think will have 6 GHz?



June 4, 2020

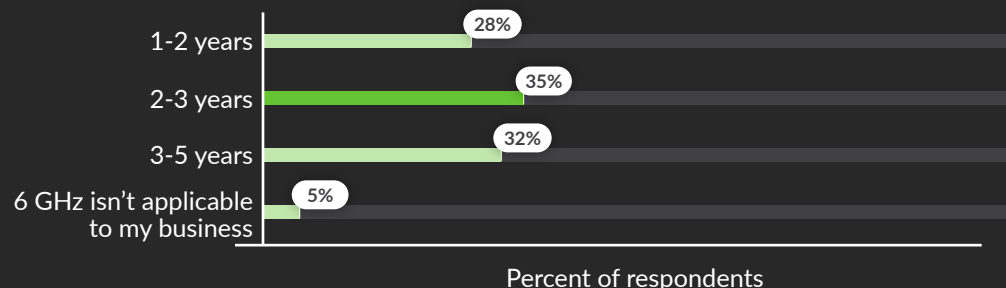
The Impact of 6 GHz on the Wi-Fi Market

[Webinar On-Demand](#)

## Wi-Fi Survey



When do you think you will deploy 6 GHz in your business network(s)?



June 4, 2020

The Impact of 6 GHz on the Wi-Fi Market

[Webinar On-Demand](#)

Another way of saying, "sometime in the next 5 years, when we do our next refresh."

# COVID-19 and the Increased Awareness of High-Performing Wi-Fi

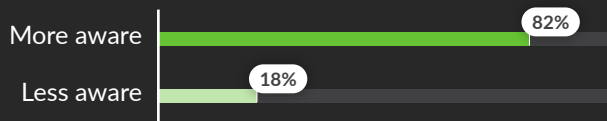
“The pandemic pushed companies to accelerate their digital transformation initiatives from years-long plans into months, weeks, and days.” – [Ram Chakravarti, CTO at BMC Software](#).

2020 was not a typical year for most businesses. But challenges can lead to some really creative problem solving. For example, with travel restrictions in place, remote Wi-Fi professionals could enlist the help of anyone able to get on site to survey the area and collect the necessary data for the Wi-Fi pro to then analyze and provide recommendations. This type of service was usually reserved for wireless experts, but the ability to offload data collection to an onsite colleague has emerged as a useful approach — **not only in COVID times, but as a way to manage a network and save time and money overall.**

It's a fair assumption that COVID-19 had an impact on your business. For some businesses in industries like hospitality and large public venues, that impact was likely a massive reduction in the number of guests accessing the network. For others in healthcare and manufacturing, the impact could have also been a massive increase in requirements for throughput and reliability.

## Wi-Fi Survey

### Has the pandemic made business decision makers more or less aware of Wi-Fi?



**November 5, 2020** The Similarities, Differences & Lessons Learned in Enterprise & Industrial Wi-Fi Networks | [Webinar On-Demand](#) 


Business Wi-Fi isn't a luxury or a nice-to-have anymore. The devices connecting to our networks, ranging from personal phones and laptops to connected machinery and handheld scanners, are Wi-Fi-first and many times Wi-Fi-only. According to our poll, 82% of respondents believe the pandemic has made business decision makers more aware of Wi-Fi. With the increased awareness and increased pressure on high performing wireless networks, Wi-Fi professionals need the education and tools to help them do their job at the highest possible level.

Across the board, Wi-Fi projects are expected to have a big return in 2021 as increased requirements for video and contact tracing are added or modified to reflect new user behaviors related to COVID-19. In our poll, responders ranked Healthcare, Education K-12, Higher Education, and Manufacturing at the top 4 spots.

## Wi-Fi Survey

### Which industries do you see having the biggest growth of Wi-Fi projects in 2021? (Pick 3)



**November 5, 2020** The Similarities, Differences, and Lessons Learned in Enterprise & Industrial Wi-Fi Networks | [Webinar On-Demand](#) 

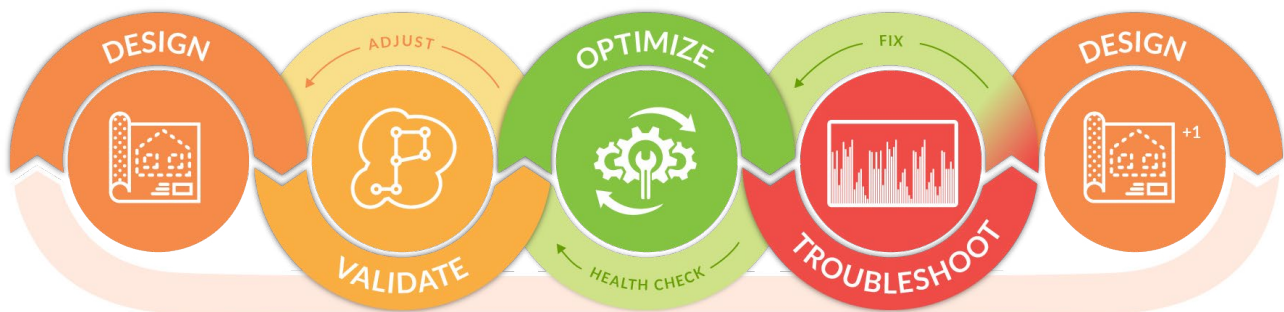
As the global leader in Wi-Fi performance tools, Ekahau's technology has been involved in designing and troubleshooting thousands of networks. Our community of Wi-Fi enthusiasts and certified experts have developed countless best practices for every stage of the Wi-Fi lifecycle. The following sections provide an overview of the Wi-Fi lifecycle including key considerations for identifying network requirements and tools for overcoming common challenges and deploying network improvements as your requirements evolve over time.



# Wi-Fi Best Practices and Tools for Every Step of the Wi-Fi Lifecycle

The Wi-Fi lifecycle encompasses all of the stages you see with deploying and managing a healthy wireless network. It includes the initial predictive design and validation, as well as ongoing optimizations and troubleshooting. **Designing and managing an enterprise wireless network is a continuous process; it is not set it and forget it.**

The good news is that it's easy to equip your business with the right Wi-Fi tools to significantly increase the reliability and performance for your network. Let's review best practices.

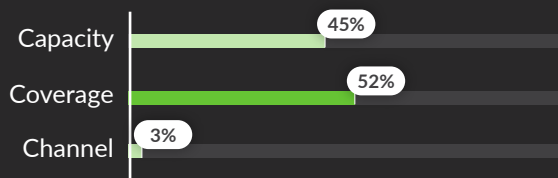


## Design

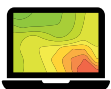
Wi-Fi design is the ability to translate network requirements into a high-performing reliable network for your business. When identifying requirements, take into account information about your location's layout, building materials, network infrastructure, devices that will be on the network and how they will be used, and neighboring networks that will share your airspace. These can each have a major impact on your network design — don't just think of design as a measure of APs per square foot.

### Wi-Fi Survey

#### Which do you prioritize first when planning your network design?



September 17, 2020 *Turning Requirements Into Wireless Designs*  
Webinar On-Demand



**Coverage** is a basic requirement easily achieved with most modern APs. Ekahau Pro also excels at optimizing for the more difficult challenges of modern Wi-Fi networks such as **capacity** planning.

When starting a design, begin by importing your map and establishing your wall materials (or input custom wall materials with data gathered using the Sidekick and Ekahau Survey app). From there, input your requirements and start adding APs for coverage.

The AP and antenna database included with Ekahau Pro will help you design with known hardware and test out a variety of different configurations to see what will give you the best coverage, capacity and channel utilization for your unique environment.

Check out our webinar, [Turning Requirements into Wireless Designs](#) for a full breakdown of best practices when designing a wireless network.

#### Ekahau Connect Components for Wi-Fi Design

1. Ekahau Pro
2. Ekahau Sidekick
3. Ekahau Survey mobile app
4. Ekahau Cloud

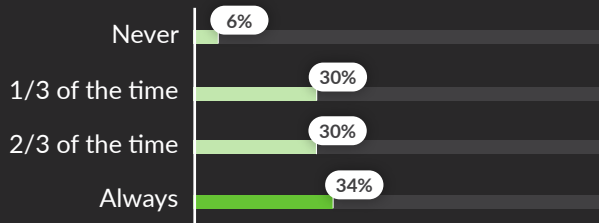


# Validate

The Validation phase sits between Design and Optimize in the lifecycle and is used to both test simulated predictive design choices against the live environment, as well as to verify that changes or additions are installed correctly and perform as expected.

## Wi-Fi Survey

### How often do you do a pre-deployment site survey as part of your Wi-Fi planning?



September 17, 2020 *Turning Requirements Into Wireless Designs*  
Webinar On-Demand



A best practice from **34%** of our polled audience is to always perform a pre-deployment site survey as part of your wireless planning.

Conducting a survey of the premises where the wireless network will be installed can help reveal any potential fine-tuning needed for your design before running the final cabling and installing the APs. It's the "measure twice, cut once" phase of the lifecycle.

A post-installation floor walk, on the other hand, is key for validating that the AP mounting was done correctly and that you have the desired coverage. Don't rely on network users to test the network for you. Inspecting the network after any deployment or change allows you to validate that the Wi-Fi meets or exceeds your requirements for performance and reliability.

### Ekahau Connect Components for Wi-Fi Validation

1. Ekahau Pro
2. Ekahau Sidekick
3. Ekahau Survey mobile app
4. Ekahau Cloud

# Optimize

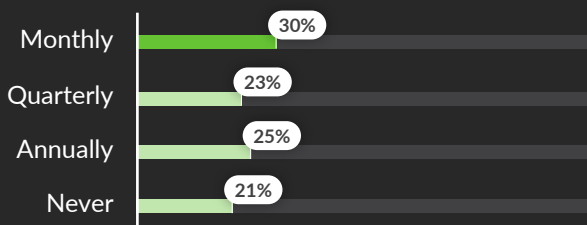
Wi-Fi optimization is the ongoing monitoring and maintenance required for a high-performing reliable wireless network. For many networks, the optimization phase is the longest in duration as the network is continuously tweaked to account for changes in

usage levels and number of client devices, or changes in the physical environment such as fluctuating inventory levels in warehouses or changes to office space layouts.

Regularly performing an RF assessment survey of your network will provide the valuable data needed to make smart Wi-Fi adjustments, and the process of performing regular health check surveys, troubleshooting issues and implementing fixes will give you a high-performing network that will last. 30% of the Wi-Fi pros in our survey recommend a monthly site survey as a baseline during times of healthy network performance and an increased cadence during periods of change or when troubleshooting issues.

## Wi-Fi Survey

### How often do you perform a site survey to gather data for ongoing network performance?



September 3, 2020 *Understanding Wireless Network Validation and Data Gathering* | Webinar On-Demand



When validating or collecting survey data, **39%** of webinar attendees selected **tablet** as their device of choice for connecting to the Ekahau Sidekick.

### Ekahau Connect Components for Wi-Fi Optimization

1. Ekahau Pro
2. Ekahau Sidekick
3. Ekahau Survey mobile app
4. Ekahau Analyzer mobile app
5. Ekahau Cloud

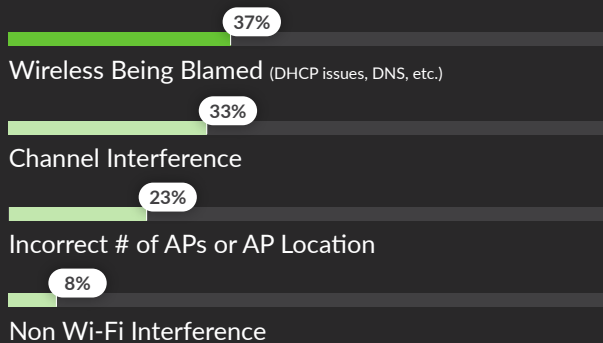
# Troubleshoot

The majority of survey respondents claim that greater than 75% of all Wi-Fi networks require troubleshooting. As reported earlier in this report, one in three networks are poor performing. These two data points taken together certainly indicate that if you are not already using Wi-Fi tools to optimize and troubleshoot your network, that is the best next step to move your network to a high performer.

Troubleshooting can be a high-stress phase of the Wi-Fi lifecycle, but with the right tools you can identify if Wi-Fi is in fact the issue (according to our poll, a little more than 1/3 of issues reported aren't actually Wi-Fi related) and implement a fix and be back to the optimization phase.

## Wi-Fi Survey

### Which of the following issues do you see most while troubleshooting Wi-Fi?



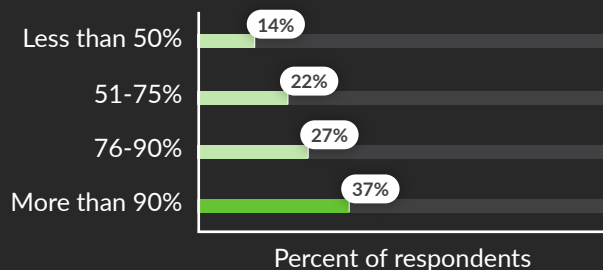
October 22, 2020 Troubleshooting: How to Answer the Call  
[Webinar On-Demand](#)

A spectrum analyzer is critical in the troubleshooting process. It measures the energy of both Wi-Fi and non-Wi-Fi signals that exist in (and sometimes outside of) your network environment. This allows you to quickly identify potential interferers such as wireless cameras, cordless phones, or other wireless devices that are negatively impacting the network. In addition, a spectrum analyzer can show the channel of measured energy, allowing you to optimize your network channels for peak performance while avoiding interference.

The need to troubleshoot isn't always a direct reflection of the design. External and non-Wi-Fi interference can exist on even the most well planned and thought through designs. All networks require troubleshooting at some point or another, and having the right tools onsite are critical for identifying and fixing issues that can down your network.

## Wi-Fi Survey

### What percent of Wi-Fi networks require troubleshooting?

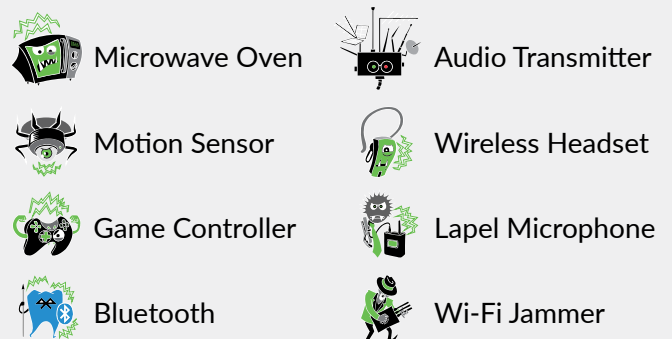


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Announcements for 2020! | [Webinar On-Demand](#)

## Ekahau Connect for Wi-Fi Troubleshooting

1. Ekahau Pro
2. Ekahau Sidekick
3. Ekahau Survey mobile app
4. Ekahau Analyzer mobile app
5. Ekahau Capture
6. Ekahau Cloud

## Common Wi-Fi Interference Sources



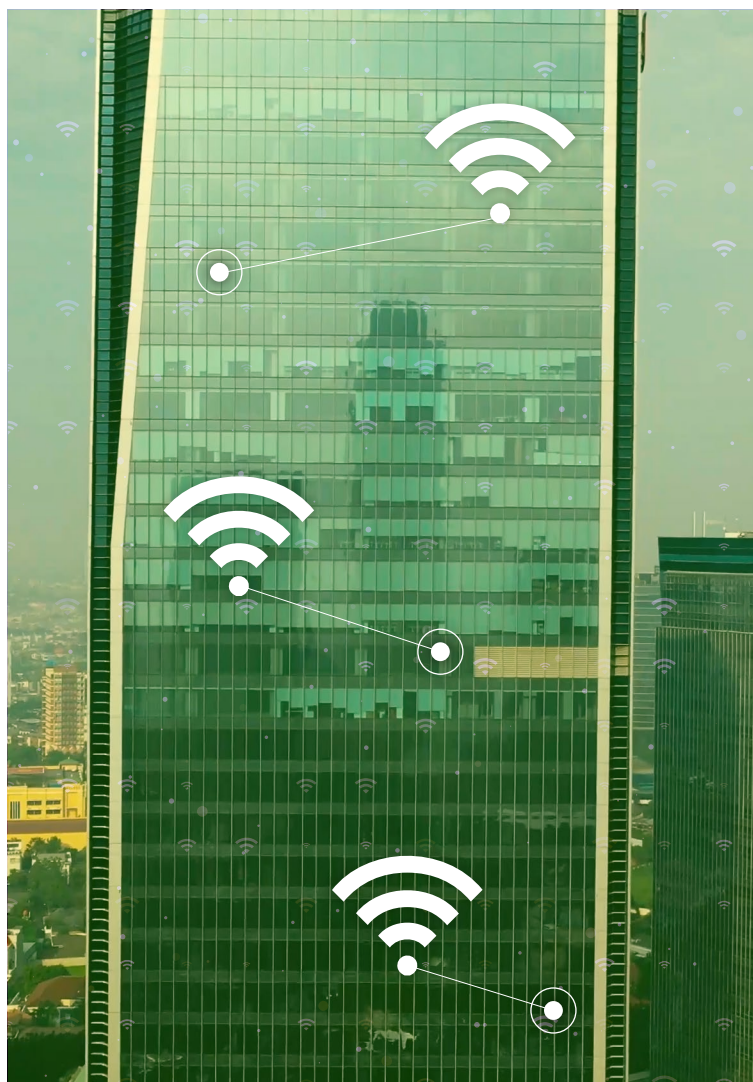
# Conclusion

For businesses today, Wi-Fi is an expected technology with real business impact that can cost millions of dollars in work-stopping downtime if not properly deployed and managed. Like electricity, Wi-Fi needs immediate attention when there are issues and they need to be resolved with the urgency of any other mission-critical technology. But unlike electricity, there is no central authority to maintain high performance. Without expertise and the right toolset, requirements can be under-implemented and lead to performance and reliability issues throughout the Wi-Fi lifecycle. Here are three key takeaways for your Wi-Fi in 2021:

**Wi-Fi is business-critical.** It is the technology enabling connectivity for the modern and mobile workplace. Connectivity for your employees to be productive in their day-to-day tasks. Connectivity for your machinery and applications to sync and transfer information. And connectivity for your customers to conduct their own business in as frictionless a way as possible.

**Wi-Fi is not 'set it and forget it.'** Managing the lifecycle of an enterprise wireless network is a continuous process. Devices are constantly being updated and added to the network, building layouts change to accommodate needs, inventory levels fluctuate drastically impacting the way the signal behaves, and requirements themselves are fluid and need to be adjusted to account for new technologies (like the 6 GHz chipsets that are on the horizon) and changes in worker preferences.

**Wi-Fi tools are required.** Even the most seasoned Wi-Fi professional is going to have a hard time optimizing the number of APs and placements to meet coverage and capacity requirements without the necessary tools. With remote collaboration and the right tools at every business location, Wi-Fi experts can collaborate with non-experts onsite to collect the survey assessment data required for the remote Wi-Fi professional to analyze and make recommendations. Having the right tools to design, validate, optimize and troubleshoot your network is, in and of itself, a requirement.



# World-Class Wi-Fi for Business

When Wi-Fi is down, work stops. That's why the world's biggest brands and most important events trust Ekahau for their mission-critical wireless networks.



Google

NETFLIX

verizon

Microsoft



jetBlue



HARVARD  
UNIVERSITY

## The Solution to Build and Maintain High-Performing Wi-Fi

Ekahau Connect enables you and your team to design, validate, optimize and troubleshoot any Wi-Fi network faster and easier than ever before. Get actionable results to build and maintain a high performing and reliable Wi-Fi network capable supporting your mission-critical business applications.



### Fast & Accurate

Precise Wi-Fi diagnostics paired with mobile-optimized apps deliver significantly faster site surveys, faster spectrum analysis, and more accurate and reliable data.

### Easy to Use

Robust, professional gear that anyone can use, developed by Wi-Fi enthusiasts who consistently innovate and redefine industry-standard.

### Peace of Mind

Well-designed and optimized networks reduce business-stopping downtime, giving you assurance that your Wi-Fi is always high-performing.

**Schedule your personalized Ekahau Connect demo.**

[www.ekahau.com/request-a-demo](http://www.ekahau.com/request-a-demo)

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