



Migrating to Wi-Fi 6: An Enterprise Guideline

Introduction

The networking requirements of today's enterprises are nothing like they used to be, even compared to just a few years ago. Megatrends such as increased access to cloud services, the growth of mobile devices and apps in the workplace, requirements for faster response times, and the emergence of the Internet of Things (IoT) continue to put enormous strain on networks.

This strain is certainly true for Wi-Fi, and it is also the reason that Wi-Fi 6, the newest standard from the Wi-Fi Alliance based on the 802.11ax protocol, has become so vital for enterprises working toward a digital transformation of their operations.

Unlike earlier iterations of wireless networking technology, Wi-Fi 6 provides the critical capabilities that organizations need to compete in today's fast-paced business environment.

The Wi-Fi Alliance, a worldwide network of companies that promotes Wi-Fi technologies and drives global adoption and evolution, says Wi-Fi 6 provides the capacity, efficiency, coverage, and performance needed by users today in the most demanding networking environments.

The new standard is designed to deliver quality connectivity in locations with hundreds or thousands of connected devices, as well as corporate networks that use time-sensitive, high-bandwidth applications. Networks using this latest technology ensure that each connected device performs at an optimum level.

Because Wi-Fi 6 devices meet the highest standards for security and interoperability and allow lower battery consumption, the Wi-Fi Alliance says that Wi-Fi 6 can support virtually any type of environment, including IoT.

The benefits of the technology include:



Higher data rates



Increased capacity



Performance in environments with many connected devices



Improved power efficiency

Wi-Fi provides the foundation for a host of current and emerging use cases, such as critical business applications requiring high bandwidth and low latency.

The higher performance comes from higher per-device peak speed in high-throughput environments. Higher capacity is through better resource utilization with better efficiency and lower latency.

Wi-Fi 6 is complementary with the new wireless telecommunications standard, 5G, but Wi-Fi 6 will continue to be the primary wireless access mechanism in the enterprise.

The new Wi-Fi 6 standard is especially well-suited to the fast-growing IoT environment at many organizations because of its power characteristics and broad coverage. This makes it ideal for use cases such as factory automation, where it can support extremely rapid motion control response times, or asset tracking and process control in many different industries.

Various classes of IoT devices that could rely on Wi-Fi for connectivity and to deliver the desired outcomes span everything from



Rudimentary sensors



Highly sophisticated factory equipment



Robots



Lighting, heating, and air conditioning

The rise of IoT is contributing to what has been a gradual shift toward wireless devices within enterprise networks.

For years, organizations have seen wireless devices in the network surpass wired devices. This all contributes to a need for better Wi-Fi technology.

The opportunities: Organizational benefits of Wi-Fi 6

Organizations can benefit in many ways from a shift to Wi-Fi 6. For one thing, it can help them address the modern challenges of IT, including:



Managing software across the lifecycle



Responding to change



Keeping solutions updated



Enhancing the user experience



Reducing costs



Making IT more predictable

The specific benefits vary by industry.



Education

In education, for example, faster and more secure networks can support emerging technologies such as augmented and virtual reality, 4K video streaming, e-learning, and digital education.



Healthcare

In healthcare, it helps institutions provide telemedicine, robotics, and wearable asset tracking.



Retail

In retail, Wi-Fi 6 helps deliver self-service checkout and digital price tags.



Manufacturing

And in manufacturing, it can support automated and digitized operations and supply chains.

In November 2020, the Wireless Broadband Alliance (WBA) declared in a new report that Wi-Fi 6 was ready for full network deployment. It noted that Wi-Fi 6 has wider channels up to 160 MHz and capacity up to 9.6 Gbps (compared with 3.5 Gbps in Wi-Fi 5) and can enable nearly three times faster gigabit data rates.¹

The worldwide industry body dedicated to improving Wi-Fi services and standards said Wi-Fi 6 is now proven to deliver better reliability, lower latency, more deterministic behavior, and better network efficiency, especially in environments with many connected devices.

Wi-Fi 6 will also aid in congestion and increase client density on the network, helping to connect more devices and enable new use cases. The WBA has concluded five trial deployments of Wi-Fi 6 across diverse markets, covering a range of different verticals and deployment scenarios. These demonstrate the key capabilities of Wi-Fi 6 in live networks, establishing its readiness for carrier Wi-Fi deployments around the world.

This lays a foundation for the deployment of Wi-Fi 6 in enterprises and other settings.

The WBA report described several vertical use cases. For example, in industrial manufacturing, Mettis Aerospace worked with Broadcom, Cisco, iBwave, and Intel to deploy Wi-Fi 6 in a dense industrial environment with heavy metal, high temperatures, and moving machinery. Previous generations of Wi-Fi did not perform well in such an environment, the report said, but the Wi-Fi 6 trial demonstrated greatly improved reliability, coverage, throughput, and lower latency for supporting critical applications.¹

Another use case was for education in rural areas. C-DOT and Intel deployed Wi-Fi 6 in a rural school trial in India to enhance new learning technologies and improve signal coverage and streaming performance, the study said. Wi-Fi 6 improved throughput by more than 50%.¹



A recent WBA survey found that **more than 65% of organizations will have deployed Wi-Fi 6 by the end of 2021.**¹

The challenge: Migrating to Wi-Fi 6

Whenever an organization shifts to a new technology platform or architecture, challenges are inevitable. The same is true with Wi-Fi networks. Before deploying Wi-Fi 6 technologies, enterprises must address these considerations for a smooth and successful migration:



Network access points



Underlying infrastructure



Network security



Streamlined IT operations capabilities



Optimal network performance



Network access points

One thing to keep in mind is that not all network access points are the same. For instance, IT teams need to consider radiofrequency (RF) footprint, device capabilities, number of radios, and client capacity before moving to Wi-Fi 6. Teams should conduct an RF assessment to see how Wi-Fi 6 access points will function within their environment. Keep in mind that many of the client device types — and even the structural elements of facilities — could have changed since the organization initially designed the wireless infrastructure.



Underlying infrastructure

With the advent of Wi-Fi 6, there undoubtedly will be greater demands on enterprise networks as a whole because Wi-Fi 6 supports much higher capacity and throughput. Companies must ensure that their legacy network switches and routers can support a potential four times increase of throughput demands to avoid unintended network bottlenecks.



Network security

The security provisions of Wi-Fi 6 include Wi-Fi Certified WPA3, which is the latest generation of Wi-Fi security certification for protecting enterprise networks.

While WPA3 provides improved security over its predecessor WPA2, including enhanced encryption mechanisms, it is still a relatively new standard and will take some time for wireless device manufacturers to incorporate the technology. This means that network teams will continue to support WPA2 clients but should also begin planning to accommodate WPA3 client devices that are trickling into the market. By doing so, they can take advantage of the enhanced security benefits as WPA3 reaches higher levels of market maturity.



Streamlined IT operations capabilities

Managing access points and wireless controllers individually can be challenging. There are solutions available to help teams gain efficiencies and free up more time to deliver the latest innovations and services to users rather than maintaining and troubleshooting networks.



Optimal network performance

Finally, organizations must validate that the network is performing optimally through RF evaluations and client performance after migrating from legacy Wi-Fi technologies. Depending on the organization's requirements for the design of the network and other factors, technicians might need to fine-tune the network to derive maximum benefits.



The solution: A Cisco-centric architecture

Companies such as Cisco offer solutions to help organizations take advantage of the benefits of Wi-Fi 6. For example, Cisco's Catalyst® 9100 Series Access Points (APs) with Wi-Fi 6 is the next generation of enterprise wireless.



With varying ranges of hardware and capabilities that meet individual business needs, these APs are designed for hyperconnectivity with steady performance in demanding use cases and environments, such as fast-growing IoT devices and next-generation applications. They support wireless networks that are resilient and have integrated security with advanced classification and containment.

The new generation of APs feature innovations in RF performance, security, and analytics, and enable end-to-end digitization that can help organizations accelerate the rollout of business services.

Catalyst 9100 Series APs are designed with scalability in mind to meet the growing demands of IoT. The APs can be paired with the Cisco® Digital Network Architecture (Cisco DNA™) to address both current and future networking needs, providing network assurance for device and client health throughout your network.

Leveraging secure Cisco wireless solutions, organizations can secure remote workers, which is vital for hybrid workforces. Any Catalyst Access Point can function as an OfficeExtend Access Point (OEAP), which allows individuals either working from home or at micro-offices to access corporate networks without setting up a VPN.

The Catalyst Series APs are part of Cisco Remote Workforce Network solutions, which are designed to securely connect users' wired and wireless devices to enterprise networks via identity-based policies. These flexible solutions extend enterprise network connectivity to remote workers at home and micro-offices at scale.

Conclusion: Leveraging trusted network experts

Wi-Fi 6 is the latest development in networking technology — and demands on network performance and capacity continue to increase. This development challenges enterprise IT and business leaders to think about when and how they must prepare for a migration. And the sooner they do this, the better.

Insight Cloud + Data Center Transformation (CDCT) is an IT services and solution provider and long-time Cisco partner. Insight CDCT helps organizations transform technology, operations, and service delivery to meet business challenges — and is ready to help.

Insight CDCT is an industry leader in the design, implementation, and optimization of wireless networks across all verticals and for organizations of all sizes. It helps clients with current state assessments, strategy development, and selecting the right products and services.

Insight CDCT offers specific Wi-Fi service offerings, including:

- **Assessment:** Radiofrequency and/or infrastructure, spectrum analysis, general recommendations, and roadmap development
- **Design:** Access point placement diagrams, channel/power settings, capacity planning, wireless architecture designs, and multiarchitectural integrations
- **Implementation:** Configuration, on-site or remote support, cutover migrations, multisite deployment, cabling equipment, and staging
- **Optimization:** Radiofrequency/network tuning, spectrum analysis, detailed recommendations, remediation activities, monitoring tools, and managed networks

With solutions from Cisco and expert help from Insight CDCT, organizations can experience a successful move to Wi-Fi 6 and reap the benefits of the latest networking technology.

For more information on how to approach a transition to Wi-Fi 6 as part of your transformation strategy, contact us at: insightCDCT.com/contact-us

¹ Wi-Fi 6 Project Team. (October 2020). Wi-Fi 6 Trials Report. Wireless Broadband Alliance Next-Gen Work Group.

Meaningful solutions driving business outcomes

We help our clients modernize and secure critical platforms to transform IT. We believe data is a key driver, hybrid models are accelerators, and secure networks are well integrated. Our end-to-end services empower companies to effectively leverage technology solutions to overcome challenges, support growth and innovation, reduce risk, and transform the business.

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