White Paper

Next Generation Wi-Fi

Wi-Fi 8: Connectivity for the AI Era

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Executive Summary

Wi-Fi 8 represents a significant advancement in wireless technology for the AI era. Unlike previous generations that focused primarily on peak speeds, Wi-Fi 8 is designed to deliver ultra-high reliability, intelligent and context-aware networking, and deterministic performance. As the demand for robust, low-latency, and high-throughput connections increases across both consumer and enterprise environments, Wi-Fi 8 addresses these needs by ensuring consistent performance—even in congested or mobile scenarios such as homes, offices, and airports.

By prioritizing critical traffic and supporting seamless coexistence with other technologies like Bluetooth, Wi-Fi 8 establishes a new standard for wireless reliability. This enables emerging applications, including wired-like wireless gaming and advanced virtual meetings, where reliability and intelligent traffic management are essential. Wi-Fi 8 is positioned to become the foundation for future connectivity, offering smarter and more dependable wireless solutions for all users. Wi-Fi 8 will also spur growing innovation around context-awareness, which will make extensive use of AI.

In summary, Wi-Fi 8 is where wireless meets AI. Wi-Fi 8 is not just about speed—it is about delivering reliability, intelligence, and security to meet the demands of tomorrow.

Introduction

Wi-Fi [1] is the most popular way to access the Internet in the world. It is embedded in everything, from smartphones and laptops to televisions, smart appliances, and industrial sensors. Few technologies have had such far-reaching and sustained impact. Wi-Fi is not just a convenience but is an essential utility that underpins the fabric of our digital lives.

But the story of Wi-Fi is not only one of societal diffusion; it is also a narrative of relentless technological evolution. The latest Wi-Fi generation available in the market today (late 2025) is Wi-Fi 7, which was made commercially available through a certification program available from the Wi-Fi Alliance in December of 2023. Wi-Fi 7 introduced major technological advances such as support for wider 320 MHz channels (double of what was supported with Wi-Fi 6), higher order 4K-QAM modulation, best-in-class security with WPA3, and multi-link operation which enables operation across multiple links (e.g., channels) in a concurrent or simultaneous fashion.

Looking ahead, the next decade of innovation centers around the need for ultra-reliable, deterministic, secure, and smart connectivity that will be largely driven by AI powered applications that will consume and generate large amounts of data. These new applications will also change how people behave and use technology.

This is where Wi-Fi 8 comes in: it is a technology designed from the ground up to address the evolving needs of users and of a new wave of intelligent applications that will be broadly used in homes, enterprises and beyond. Interoperable Wi-Fi 8 devices are expected to become available starting late 2027 [3]. Wi-Fi 8 is based on the IEEE P802.11bn standard amendment but expected to include capabilities that go above and beyond IEEE P802.11bn, such as ability to support features that will enable future context-aware experiences such as Wi-Fi sensing and Wi-Fi proximity ranging. Unlike Wi-Fi 7 which was primarily about breaking speed records, Wi-Fi 8 is about making your wireless link more reliable, deterministic, and smarter. The core aim is that your Wi-Fi works better in real-world conditions – in busy homes, congested apartments, large offices, airports, and even when you're moving around.

Value proposition of Wi-Fi 8

The Wi-Fi 8 value proposition is depicted in Figure 1 and is comprised of four main vectors [4].

Optimized networking: networking is the traditional value proposition of Wi-Fi in every new generation, whereby new features are introduced that improve on spectrum efficiency, decrease latency, lower power consumption on clients, increase capacity and/or data rates, and improve range. As described later, Wi-Fi 8 defines capabilities that will expand this vector further, such as by defining new channel access, power saving, modulation and coding schemes (MCSs), and extended range schemes.

Deterministic: this vector began with Wi-Fi 7 and is being expanded with Wi-Fi 8. It encompasses mechanisms that aim to deliver consistent, reliable and deterministic operation to Wi-Fi clients. In this context, deterministic operation means delivering data over the Wi-Fi link to an application with a required reliability (e.g., 95%) and within a given delay bound (e.g., 10ms). In Wi-Fi 8, new mechanisms are being defined to strengthen Wi-Fi's ability to be deterministic, such as prioritized enhanced distributed channel access (EDCA) and coexistence.

Stronger security/privacy: security and privacy have become central themes of every new Wi-Fi generation. We expect Wi-Fi 8 to strengthen user and device privacy with the support for IEEE 802.11bi extensions [1] such as the encryption of the entire association process and the protection of many, otherwise unprotected, management frames. Wi-Fi 8 is expected to also include support for secure control frames and to define new security mechanisms to achieve low latency roaming between access points (APs).

AI Enabling: the ability to support mechanisms that are uniquely suited to enable AI application development is a new value proposition vector that will kick off with Wi-Fi 8. Besides expanding the QoS framework of Wi-Fi and enabling more flexible resource management, Wi-Fi 8 will enable the development of new AI applications that make use of the capabilities available within the Wi-Fi devices. More specifically, Wi-Fi 8 devices will be ideal to build new Wi-Fi sensing, based on IEEE 802.11bf, and Wi-Fi proximity ranging, based on IEEE 802.11az, applications that are context-aware and intelligent.



Figure 1. Wi-Fi 8: where wireless meets AI

Defining use cases

Wi-Fi 8 is designed to address the growing demands of both consumers and enterprises by delivering ultra-high reliability, lower latency, and greater throughput. The improvements in Wi-Fi 8 aren't just about achieving faster speeds—they're about making wireless connectivity smarter, more deterministic, and consistently robust, even in the most challenging environments. We now describe some of the use cases that will benefit significantly from Wi-Fi 8's new capabilities.

Wired-like Responsiveness: home environments will feature multiple devices with different Wi-Fi capabilities that will need to coexist. Back in 2023 a typical home in the U.S. had anywhere between 17-20 Wi-Fi connected devices, and this number is set to nearly double by the end of the decade [5]. Many of these devices will be exchanging traffic concurrently, which will lead to scenarios such as shown in Figure 2 where a high-end gaming PC using a Bluetooth headset, a virtual meeting, IoT devices, and older smartphones all share the network. Key benefits of Wi-Fi 8 in this scenario:

- Latency sensitive traffic such as from gaming and virtual meeting traffic receive highest priority.
- All devices work harmoniously, fairly coexisting with Bluetooth.
- Gaming experience is flawless and wired-like even when the network is busy.
- "Dead zones" will be a thing of the past. Wi-Fi signals will be able to go farther and connect more devices. Modern homes are filled with smart devices—thermostats, cameras, sensors, and entertainment systems—that demand reliable, always-on connectivity. Wi-Fi 8's ability to maintain usable connections at the edge of coverage and support a greater number of devices simultaneously makes it ideal for the connected home.

Enterprise: business scenarios like in Figure 3 are often characterized by a high-density of devices and APs, as in locations like airports, convention centers, and stadiums. In such environments, severe congestion is common given the density of devices using multiple wireless technologies over unlicensed spectrum. This can result in dropped connections and poor performance. Wi-Fi 8 will enable consistent connections for thousands of users and devices operating simultaneously, ensuring smooth streaming, responsive web access, and uninterrupted communications. Key benefits from Wi-Fi 8 include:

- APs coordinate to allocate resources and mitigate interference.
- Lower client power consumption extends device battery life.
- Improved video and voice quality for all users without needing more APs.
- As users walk through large office floors, or transition between APs in enterprises, Wi-Fi 8's improvements in roaming reliability and latency reduce interruptions. This is particularly important for real-time applications—such as industrial robots moving across a factory floor, voice and video calls—where even a brief disconnect can disrupt the user experience.



Figure 2. Wired-like responsiveness



Figure 3. Enterprise

AI Powered Context-Awareness: this is a new class of use cases which will be spurred by the availability of Wi-Fi 8. As depicted in Figure 4, imagine a meeting room where a presenter live-streams his or her presentation to attendees in the room and online and simultaneously projects slides. By just using gestures, the PC or conference system can use Wi-Fi sensing to detect the commands given by the presenter and, as such, control the presentation. When a new presenter comes onto the stage, their PCs automatically and securely detect their proximity using Wi-Fi, and both users are prompted with a

message asking if screen sharing control should be transferred to the oncoming presenter. When a presenter leaves the stage or room, his or her PC automatically disconnects from the conferencing system based on a pre-configured geofencing. Key benefits of Wi-Fi 8 include:

- Automatic proximity detection for seamless device joining.
- AI models use Wi-Fi sensing to detect gestures, determine room occupancy and device presence.
- Devices can automatically join or leave conferences based on user presence.

Immersive Real-time XR Collaboration: in this scenario, co-workers collaborate remotely using immersive XR systems, with devices wirelessly connected to APs or PCs as is shown in Figure 5. Determinism in traffic delivery is paramount to ensure a smooth user experience, particularly when the XR system is operating in an area served by an infrastructure Wi-Fi network. Key benefits of Wi-Fi 8 include:

- Deterministic low latency and high Wi-Fi capacity ensure real-time responsiveness.
- Multi-AP scheduling coordinates devices efficiently.
- Sensors (e.g., using Wi-Fi sensing, vision) enable full-body tracking and interaction for smooth XR experiences.



Figure 4. AI powered context-awareness

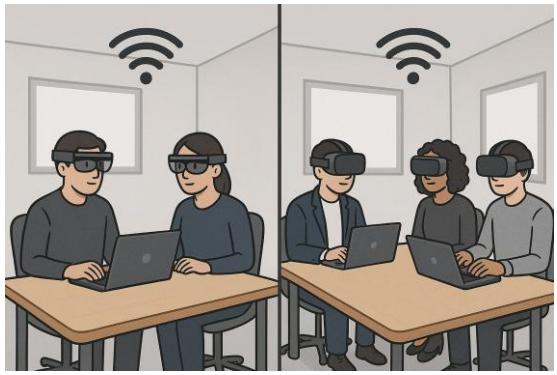


Figure 5. Immersive real-time XR collaboration

In summary, Wi-Fi 8 is engineered to make wireless networking more resilient and efficient, especially in scenarios where reliability, range, and consistent performance are essential. Its benefits will span everyday home use, enterprise operations, smart infrastructure, and emerging applications that demand more from wireless technology.

Technology overview

To deliver on its value proposition and meet the anticipated use cases, Wi-Fi 8 introduces a suite of new features. The IEEE P802.11bn task group [2] is defining the PHY and MAC changes to the IEEE 802.11 standard that will serve as the basis of Wi-Fi 8. In defining the IEEE P802.11bn project goals, the task group agreed to the following improvement targets for 802.11bn [3]: at least 25% better throughput (especially at range or under interference), 25% lower latency (quicker response under load), and 25% fewer dropped packets during things like roaming between APs.

Those may sound like nerdy metrics, but for users that translates to smoother streaming, more responsive gaming, and more reliable video calls – even in scenarios where earlier Wi-Fi might struggle. Wi-Fi 8 will make connections more "wired-like" – stable, low-latency, and efficient – while still increasing speed.

Advanced Wi-Fi 8 devices are expected to also support capabilities that are defined outside the IEEE P802.11bn standard amendment. These devices will support Wi-Fi sensing and Wi-Fi proximity ranging to enable context-awareness that will be the basis of new AI enabled usages.

In this section we will break down the major new capabilities and what they mean for end users.

Faster and Stronger Connections

One big focus of Wi-Fi 8 is improving link reliability and performance when devices are at the edge of the network and in less-than-perfect conditions such as in dense environments with channel congestion. Wi-Fi 8 addresses this with several enhancements:

- **Smarter modulation and coding (MCS) per spatial stream**: If a device supports multiple streams (MIMO technology), previous Wi-Fi made all streams use the same MCS. Wi-Fi 8 introduces unequal MCS, meaning

each stream can use the best possible encoding for its condition. In plain terms, if one stream has a slightly weaker signal, it can send data in a more robust way while the other stream uses a faster MCS – instead of all slowing down to match the weakest. This leads to better combined throughput and range. For example, a laptop with 2x2 MIMO might maintain higher speeds at the far end of the house because it is not held back by the poorer antenna's condition.

- **Finer MCS grid**: Wi-Fi 8 adds new intermediate modulation steps, namely, QPSK rate 2/3, 16-QAM rate 2/3, 16-QAM rate 5/6, and 256-QAM rate 2/3. Rather than a device having to drop from a super-high rate MCS to a much lower one when signal dips, it has more "in-between" options. That means at a medium signal strength you get a better rate than you would with Wi-Fi 7, which had to choose a less optimal rate. Bottom line: the average speeds throughout a home will improve.
- **Better error correction**: Wi-Fi 8 defines longer LDPC codewords that are double the length of those in Wi-Fi 7, i.e., 3888 bits. This provides a stronger error-correcting code, effectively doubling up on error checks. This makes the link more reliable and efficient when the signal is weak or noisy. In everyday use, that means fewer retransmissions and a connection that holds on better as you move farther away.
- **Extended range mode**: For those extreme cases at the very edge of connectivity, typical of IoT use cases, Wi-Fi 8 introduces an enhanced long-range mode that will primarily be used in the 2.4 GHz band. This mode is not about providing high performance, but about keeping edge devices connected where previously they would have very poor connectivity. It is not so much extending range but extending useful range by maintaining a link before it completely drops. So, your device might hold on to Wi-Fi in that distant corner of the yard where Wi-Fi 7 would have given up.
- **Stronger uplink from devices**: Often an AP can transmit with enough power for client devices to "hear", but client devices might not be able to make themselves "heard" due to issues such as transmit power constraints, regulatory rules, and so on. This exacerbated by the regular RU (RRU) scheme available in Wi-Fi 7, which requires a client to concentrate the transmit power on a subset of the channel bandwidth. However, Wi-Fi 8 offers a new uplink mechanism called distributed RU (DRU) that allows a client device to spread its uplink signal across the channel bandwidth to maximize power use within legal limits. This means a laptop or phone's Wi-Fi can not only download from afar but can also upload or communicate reliably from further away. In addition, Distributed RU can also improve the uplink link budget of devices that are on the edge of the network, thereby improving the data rate that they use to communicate with the AP.

All these enhancements mean that Wi-Fi 8 is faster and more reliable over distance. In a multi-room environment, you should see higher speeds at the same faraway locations compared to Wi-Fi 7. If Wi-Fi 7 gave you 50 Mbps in the upstairs bedroom, Wi-Fi 8 might give you, say, 65–70 Mbps in the same spot (25% or more improvement). It also means your connection will not suddenly plummet or drop as easily – it degrades more gracefully, maintaining usability. This is great news for large homes and offices, and even modest homes with lots of walls or interference. Figure 6 summarizes the main improvements Wi-Fi 8 brings to wireless links.

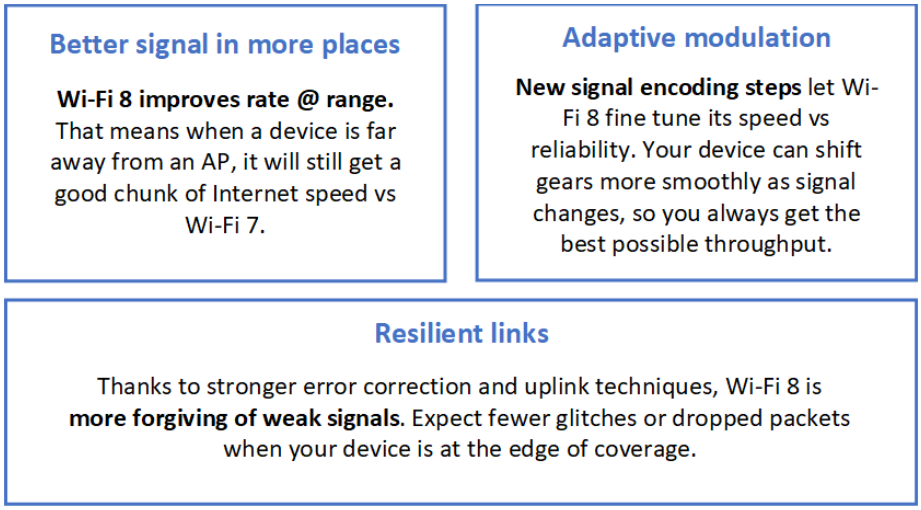


Figure 6. Wi-Fi 8 improvement to wireless links

Less Interference & More Capacity with Multi-AP Coordination

In environments with many devices or multiple APs – like a mesh Wi-Fi system or an office with APs on each floor – Wi-Fi 8 brings coordination features, so devices are not stepping on each other's toes by causing interference to each other. The idea is to treat multiple APs as a team rather than isolated units. Here are the major features and benefits:

- **Coordinated AP transmissions**: Imagine two Wi-Fi APs in adjacent rooms. In Wi-Fi 7, they operate independently and might interfere. Wi-Fi 8 defines a new mechanism known as coordinated beamforming which allows APs to sync up and use their antennas together in a clever way. One AP can direct its signal and even form "nulls" (tiny dead spots in its antenna pattern) towards the other AP's location. Essentially, the APs avoid interfering with each other – one will shape transmissions to not hit the other's clients. For users, this means if you have a multi-AP setup, you'll get higher combined capacity. Neighbors' networks can also benefit if they support this – less mutual interference means everyone's Wi-Fi works better in a dense apartment building.
- **Time-scheduled transmissions (Coordinated TDMA)**: Wi-Fi 8 APs can coordinate to ensure they do not transmit at the same time on the same channel. For example, in an enterprise network with two APs on the same channel, they might take turns millisecond by millisecond. This avoids collisions and back-off delays. The upshot is more efficient use of airtime and lower latencies – devices spend less time waiting and retrying.
- **Spatial reuse coordination (Coordinated spatial reuse)**: Wi-Fi 6 introduced "coloring" to help devices decide if the channel was free enough to send. Wi-Fi 8 extends this by letting multiple APs plan their power and usage so that two transmissions can happen at the same time if they do not interfere much. Think of two far-apart corners of an office – those APs could actually transmit simultaneously on the same channel in Wi-Fi 8, because the APs have agreed to limit power or because their clients are separated enough. This means more parallel transmissions in large networks, boosting total network capacity in busy scenarios.
- **Seamless roaming**: Another feature is improved roaming and multi-link operation across APs. Wi-Fi 8 introduces the concept of a Single Mobility Domain (SMD), where your device can be connected to two APs at the same time during a handoff. When a user moves around with a Wi-Fi 8 laptop or phone, the network cooperates to shift the device to the best AP with no interruption (make-before-break). This cooperation includes both security key pre-establishment and transfer of in-transit packets addressed to the device from the source AP to the target AP. The concrete benefit of seamless roaming is that moving between APs is virtually lag-free – a video call or game will not stutter as it switches. This vastly improves enterprise and mesh Wi-Fi experience.

Overall, these multi-AP coordination abilities mean Wi-Fi 8 thrives in device-dense environments. In an office floor with dozens of APs, Wi-Fi 8 can deliver higher capacity and more stable performance for everyone. At home, Wi-Fi 8 will make mesh Wi-Fi systems more efficient and cohesive. Even if a user just has one AP, these features can help when neighboring networks overlap, particularly when the APs are under the control of the same entity (e.g., service provider).

Lower Latency & Better QoS (Quality of Service)

Wi-Fi 8 makes big strides in reducing latency (delay) and jitter (variation in delay), which is great for gamers, video calls, AR/VR, and really anything interactive. Some key features contributing to this:

- **Prioritized access for critical traffic**: Wi-Fi has something called EDCA that gives different priority to voice, video, etc. Wi-Fi 8 enhances this with Prioritized EDCA – essentially a super-priority class for mission-critical packets. If a device marks some traffic as high priority (e.g., game data or VR headset data), the network will let those packets through first even in crowded conditions. No more getting your game controls delayed because someone is downloading a big file on the same network. This helps achieve that 25% latency reduction goal in worst-case scenarios by cutting down queue times for critical data.
- **Low-latency indication**: Wi-Fi 8 devices can signal to the AP that a particular stream or application needs low latency. For instance, your laptop might flag "this data is for an online game" and the AP will treat it with extra care (perhaps pairing it with that priority access or scheduling). This end-to-end awareness helps the network make smarter decisions to keep latency down for the things that need it.
- **Group transmit opportunity (TXOP) sharing**: Wi-Fi 8 introduces finer control in how the radio channel is used. For example, there is a mechanism for an AP to loan some time to a group of devices to communicate directly with each other ensuring that their communication does not interfere with the infrastructure traffic. Like two laptops transferring a file directly while, at the same time, one of them projects its display wirelessly on a bigger monitor.

What a user will experience with Wi-Fi 8 is that even when the network is under heavy use, activities that need quick response (gaming, voice chat, interactive apps) remain snappy. For example, if a user ever had a video call where

suddenly someone starts a download and the call gets choppy – Wi-Fi 8 is designed to minimize that kind of disruption. Wi-Fi 8 manages the Wi-Fi airtime far more intelligently to honor the needs of different applications simultaneously.

Making the Most of Spectrum

Wi-Fi 8 introduces several features to use Wi-Fi channels more flexibly and efficiently, especially in the new 6 GHz band and crowded environments:

- **Non-primary channel access (NPCA)**: Traditionally, Wi-Fi picks a 20 MHz primary channel and everything revolves around it. If that primary is busy (say a neighbor on the same channel), the whole network bandwidth (e.g., 80/160 MHz channel) can be hindered even if the other parts of the channel are clear. Wi-Fi 8 solves this with NPCA, which lets devices temporarily use a different 20 MHz channel as the primary channel, known as NPCA primary channel. If the primary channel is busy, the device can hop to the NPCA primary channel dynamically. This means that a Wi-Fi 8 network is less affected by interference – it will gracefully dodge around a congested frequency rather than getting stuck. It is like having detour routes during traffic jams.
- **Dynamic sub-band operation (DSO)**: Think of common scenarios where not all devices in a network support the same channel bandwidth that is in use by the AP. Say an AP operates a 320 MHz wide network and two other associated devices support up to 160 MHz operation. In Wi-Fi 7 and earlier, when one of the devices exchanges data with the AP, the remainder network bandwidth is underutilized. Wi-Fi 8 can avoid that. With DSO, the AP can communicate with one device on 160 MHz while in parallel still using the remaining 160 MHz for the other 160 MHz device. DSO is ideally suited for dealing with devices with mixed supported bandwidth capabilities, ensuring that smaller bandwidth devices no longer drag the whole network down.
- **Dynamic bandwidth expansion (DBE)**: DBE allows a Wi-Fi 8 AP to adjust the channel bandwidth of the network without operational disruption to connected devices. If an adjacent part of the band is clear, it can expand the channel bandwidth; if it becomes noisy, it can drop it. This capability is particularly useful in enterprise deployments, since it creates an ability to dynamically make more efficient use of the spectrum on the basis of AP density, capability of connected devices, traffic pattern, and so on.

For users, these spectrum features mean Wi-Fi 8 is more self-optimizing. Users will experience more consistently higher speeds because the network mitigates interference and less capable devices better. In a crowded RF environment (many networks around), Wi-Fi 8 is better at finding a “lane” to use effectively. Users will not have to fiddle with AP or client settings – devices will automatically avoid that neighbor’s noisy channel without sacrificing your whole network’s performance.

Coexistence & Power Efficiency

Our devices today have Wi-Fi, Bluetooth, maybe UWB, maybe 802.15.4, maybe 5G – a lot is going on in the airwaves. Wi-Fi 8 introduces new measures to continue to be a good citizen in this crowded space and also save energy:

- **Better coexistence**: Many of us have experienced how using Bluetooth (like a headset or mouse) can sometimes interfere with Wi-Fi or vice versa, since they share the 2.4 GHz band. Wi-Fi 8 devices can now coordinate with the AP about this. There are coexistence mechanisms like Dynamic and Periodic Unavailability Operation (DUO/PUO) where a device can inform the AP about periods of unavailability, such as due to intermittent and real-time traffic (device is unavailable for, say, the next 2ms due to Bluetooth) or periodic (device unavailable for, say, 5ms every 50ms). The AP then will not engage the device at those times. The result is you can use Wi-Fi and other wireless radios simultaneously with much less degradation. A Bluetooth audio stream will not crackle when Wi-Fi is busy and Wi-Fi will not pause due to a Bluetooth burst, because coexistence is negotiated.
- **Adaptive operation**: Similarly, a device can inform the Wi-Fi 8 AP of dynamic changes to its operating characteristics – e.g., maximum duration of packet the device can receive or transmit, maximum supported MCS, number of spatial streams and bandwidth, and so on. The AP will adjust how it engages the device based on this. This can improve reliability when, for example, devices have multi-radio or battery constraints. For end-users, it simply means more robust connectivity even when devices have a lot going on internally.
- **AP power save**: Wi-Fi 8 actually allows APs themselves to save power through an AP PUO mode. This mode lets an AP go into a low-power state on a schedule without disconnecting devices. This could slightly reduce energy usage and also RF noise. In practical terms, a Wi-Fi 8 AP might consume less electricity and generate less interference to neighbors when idle.
- **Client power management**: On the device side, Wi-Fi 8 refines sleep modes and multi-link power saving. A new feature called dynamic power save (DPS) allows a client to temporarily go into a low-power, low-capability mode (trading performance for battery). For example, a device using Wi-Fi 8 might maintain two links during heavy use but drop to one link to save power when possible, go into power saving on one of the bands or go

into low power listen mode. Ultimately, this means battery life will improve for Wi-Fi 8 devices, especially when they are connected but not transmitting.

- **Sensing and proximity ranging**: While not exactly coexistence, it is worth noting Wi-Fi 8 devices are expected to support sensing (based on IEEE 802.11bf) and proximity ranging (based on IEEE 802.11az) to enable new context-aware usages. This means Wi-Fi 8 devices could measure distance very accurately and even detect motion via Wi-Fi. Those capabilities are beyond networking – they cater to indoor positioning (finding a device or user location) and smart home presence detection, all using the same Wi-Fi signals.

In summary, Wi-Fi 8 is designed to play nicer with the rest of the wireless ecosystem. It will cause and suffer less interference to and from other technologies. And it brings power-saving improvements that contribute to efficient operation.

Stronger Security and Privacy

Every new Wi-Fi generation tightens security. Wi-Fi 8 is no exception, with enhancements ensuring safer wireless:

- **Secure control frames**: Previous Wi-Fi versions left some control frames (like trigger frames) unencrypted, which opened avenues for spoofing attacks. Wi-Fi 8 introduces secure control frames which overcome this problem. This means attackers cannot fake disconnect messages or eavesdrop on certain Wi-Fi frames. It makes your connection more robust against disconnection attacks.
- **Privacy**: Wi-Fi 8 is expected to include support for IEEE P802.11bi, which extends protection to the association process and other management frames that were not otherwise protected. This provides end-to-end encryption handshakes – increasing privacy and security from the moment you try to join a network. Combined with WPA3, Wi-Fi 8 will offer the most secure Wi-Fi connections yet.

For the user, these improvements mean Wi-Fi 8 will become more secure and privacy-preserving, especially in sensitive environments. Public and enterprise networks will be safer since Wi-Fi 8 closes some niche exploits such as device fingerprinting, which is the ability to track a device based on what it transmits.

Conclusions

Wi-Fi 8 is poised to make wireless connectivity more robust, user-centric and become the wireless connectivity technology for the AI era. Instead of just dialing up peak speeds, it focuses on ensuring those speeds and connections hold up in real-life scenarios:

- Users will get more consistent performance across the home, fewer dead zones, and less performance hit when lots of devices or neighbors are using Wi-Fi.
- Applications using AI will be improved by Wi-Fi 8, such agentic AI, AI-enhanced video collaboration, AI-enhanced XR, real-time video editing, advanced 3D modeling, and the use of AI in fields such as cybersecurity, healthcare, engineering, aerospace and financial.
- Gamers will especially appreciate the latency reductions. Wi-Fi 8 is another leap towards making wireless viable for competitive gaming by slashing jitter and prioritizing traffic.
- Wi-Fi 8 will improve mesh systems more effectively. It will feel more like one seamless network, without the typical mesh throughput penalties. As a device moves around a house, the device will roam without a hiccup.
- In congested enterprises/apartments/condos, Wi-Fi 8 APs will automatically cooperate and mitigate interference, so upgrading to Wi-Fi 8 in a busy building could significantly boost your Wi-Fi quality.
- New applications that need highly reliable Wi-Fi (e.g., AR glasses, industrial IoT) will be improved by Wi-Fi 8. Its ability to maintain low latency and coordinate multiple links makes it suitable to deliver high reliability.

It is worth noting that Wi-Fi 8 will be backwards compatible – Wi-Fi 5/6/7 devices will work with Wi-Fi 8 APs (and vice versa), just without the new benefits. By around 2028, users that operate in a Wi-Fi 8 capable network and employ Wi-Fi 8 devices will notice:

- The Wi-Fi “just feels better” – high speeds in more corners of your home, and latency-sensitive apps running without hiccups.
- Client device battery lasts longer on Wi-Fi, and you spend less time troubleshooting connectivity issues.
- Calls and music over Bluetooth devices become glitch-free, whether you are in your home, in a busy airport or at work.
- Devices are smarter and adapt their operation based on what is happening around them, such as turning screens on/off, detecting your presence and the presence of your devices, and even detecting some gestures.

In short, Wi-Fi 8 takes the raw speeds of Wi-Fi 7 and adds brains and brawn to deliver those speeds consistently. It aims to make wireless networking truly fade into the background, as a reliable and intelligent utility, so users can focus on the experience (e.g., gaming, streaming, working, IoT) without worrying about the connection.



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