

WiFi 8 Features - IEEE 802.11bn Ultra High Reliability PDF Download

WiFi 8 features include ultra-high reliability (UHR), faster transmission rate, lower latency, multi-access point coordination technology, higher device density support, spectrum utilization and expansion.

WiFi 8, as the **next generation of wireless communication standard**, has brought significant improvements in speed, bandwidth, network efficiency and latency, and has had a profound impact on smart home systems, industrial automation and other fields.



WiFi 8 Features - Ultra High Reliability (UHR)

The following is a detailed analysis of WiFi 8 features and technologies:

1. [Ultra-high reliability \(UHR\)](#)

WiFi 8 takes ultra-high reliability ([Ultra High Reliability](#), UHR) as its core goal, and is particularly suitable for highly demanding application scenarios such as industrial automation, telemedicine and smart home. The UHR standard will require [Wi-Fi networks](#) to

meet higher standards in throughput, latency and packet loss rate. By introducing a series of new technologies and algorithms, WiFi 8 can significantly improve the reliability and stability of data transmission and reduce the problems of connection interruption and signal loss. Ultra-high reliability (UHR) is one of the best features of WiFi 8.

Resource reservation and channel preemption: WiFi 8 can cope with the challenges of high-priority data traffic and ensure the reliability and stability of data transmission through improved MAC protocols and novel channel access mechanisms such as resource reservation and channel preemption.

Multi-access point coordination: WiFi 8 plans to introduce a multi-access point coordination framework to improve spectrum utilization efficiency and network reliability. This framework will support coordination between multiple access points (APs), reduce channel contention, and improve overall network performance.

2. Faster transmission rate

WiFi 8 has achieved a qualitative leap in speed, with a theoretical maximum speed of up to 100Gbps, far exceeding the 30Gbps of WiFi 7. This speed increase is due to more efficient use of the

Band Utilization: WiFi 8 makes more efficient use of the 2.4GHz, 5GHz, and 6GHz bands, increasing data transfer rates by reducing interference and channel contention.

Dynamic Power Adjustment: Access points may dynamically adjust power based on the network environment to avoid interference and ensure stable and efficient data transfer.



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3. Lower Latency

WiFi 8 pays special attention to reducing latency, which is especially important for scenarios such as AR and VR that require extremely low latency. WiFi 8 will introduce a mode that can reduce the latency of 95% of packets by 25%. This means that latency is not only improved on average, but also more stable, which significantly improves the smoothness of games and **AR/VR applications**.

Low Latency Mode: WiFi 8 introduces a mode that focuses on reducing packet latency to ensure real-time and stable data transfer.

Real-time Application Optimization: WiFi 8 is specifically optimized for real-time applications such as AR and VR to ensure smooth and responsive data transfer.

4. Multi-access point coordination technology

WiFi 8 will strengthen multi-access point coordination technology (multi access point coordination), based on 802.11be multi-link operation, to improve spectrum utilization efficiency and approach performance determinism. This enables effective management and

coordination of multiple access points in complex network environments, thereby improving overall network performance.

Multi-link operation: WiFi 8 achieves coordination between multiple access points through 802.11be multi-link operation, improving spectrum utilization efficiency.

Performance determinism: Through multi-access point coordination technology, WiFi 8 can approach performance determinism to ensure the stability and efficiency of network performance.

5. Higher device density support

The higher bandwidth and high throughput provided by WiFi 8 can support more devices online at the same time without reducing network performance, which is critical for the smooth operation of smart homes, high-definition video streaming, real-time monitoring and data-intensive applications.

High bandwidth support: WiFi 8 provides higher bandwidth, which can support more devices online at the same time without significantly reducing network performance.

Multi-user support: With improved **MU-MIMO** and **OFDMA** technologies, **WiFi 8** can more efficiently handle the data transmission needs of multiple devices and ensure the stability of network performance.



WiFi 8 New Features Standard

6. Spectrum utilization and expansion

Although there are proposals that WiFi 8 may use ultra-high millimeter wave frequencies, it is likely that this frequency band will not be touched in the early stage. WiFi 8 will continue to use the spectrum of WiFi 7 and improve performance through less congested frequency bands. In the future, WiFi 8 or its subsequent standards may support higher frequencies and provide wider open spectrum to reduce interference.

Existing spectrum optimization: WiFi 8 reduces interference and congestion problems by optimizing frequency band utilization on the basis of using WiFi 7 spectrum.

Future spectrum expansion: As technology continues to develop, WiFi 8 or its subsequent standards may support higher frequency spectrum to provide wider open spectrum resources.

7. Technical challenges and solutions

Although WiFi 8 brings many improvements and advantages, it also faces a series of technical challenges. For example, network architecture optimization, resource management, security, and interoperability issues all need to be properly addressed.

Network architecture optimization: In order to meet the high performance requirements of WiFi 8, the network architecture needs to be optimized to improve data transmission efficiency and stability.

Resource management: WiFi 8 needs to efficiently manage spectrum resources to ensure that multiple devices can be online at the same time and maintain good network performance.

Security performance improvement: With the increasing number of network attacks, WiFi 8 needs to strengthen security performance to ensure the security and privacy protection of data transmission.

Interoperability guarantee: In order to ensure that devices of different brands and models can connect and communicate smoothly, WiFi 8 needs to formulate unified standards and protocols to ensure interoperability.



Application cases of WiFi 8 features

8. Practical application scenarios and impact

The improvements and advantages of WiFi 8 will have a profound impact on multiple practical application scenarios. For example, in the field of smart home, WiFi 8 will provide more stable connections, higher bandwidth, and lower latency, thereby significantly improving the performance and user experience of smart home devices. In the field of industrial automation, the ultra-high reliability and real-time performance of WiFi 8 will ensure

stable communication and data transmission between industrial machinery and sensors. In addition, WiFi 8 will also play an important role in areas such as telemedicine, autonomous driving and augmented reality.

Smart Home: WiFi 8 will improve the connection stability and bandwidth support of smart home devices, making high-definition video streaming, real-time monitoring and data-intensive applications smoother.

Industrial Automation: WiFi 8's ultra-high reliability and real-time performance will ensure stable communication and data transmission between industrial machinery and sensors, improving production efficiency and quality.

Telemedicine: WiFi 8 will provide stable network connection and low-latency data transmission, providing strong support for telemedicine surgery and real-time monitoring.

Autonomous Driving: WiFi 8's real-time performance and reliability will ensure stable communication and data transmission between autonomous driving vehicles, improving driving safety and efficiency.

Augmented Reality: WiFi 8's low latency and high bandwidth support will improve the fluency and user experience of augmented reality applications, bringing more innovative applications to games, education and other fields.

In summary, as the next-generation wireless communication standard, WiFi 8 has brought significant improvements in speed, bandwidth, network efficiency and latency. These improvements not only improve the performance of wireless networks, but also have a profound impact on smart home systems, industrial automation and other fields. With the continuous development and popularization of technology, WiFi 8 will bring more convenience and innovative applications to our lives and work.

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FAQs

What are the main features of WiFi 8?

The main features of WiFi 8 include ultra-high reliability (UHR), faster transmission rates, lower latency, multi-AP coordination technology, higher device density support, and optimized spectrum utilization.

How fast is WiFi 8?

The theoretical maximum speed of WiFi 8 can reach 100Gbps, far exceeding the 30Gbps of WiFi 7.

What is the latency of WiFi 8?

WiFi 8 pays special attention to reducing latency, and can introduce a mode to reduce the latency of 95% of packets by 25%, which is particularly important for scenarios that require extremely low latency such as AR and VR applications.

What is the multi-AP coordination technology of WiFi 8?

WiFi 8 will strengthen the multi-AP coordination technology (Multi-AP Coordination), based on 802.11be multi-link operation, to improve spectrum utilization efficiency and approach performance determinism. This enables the effective management and coordination of multiple access points in complex network environments, thereby improving overall network performance.

What is the device density support of WiFi 8?

The higher bandwidth and high throughput provided by WiFi 8 can support more devices online at the same time without reducing network performance, which is crucial for the smooth operation of smart homes, high-definition video streaming, real-time monitoring and data-intensive applications.

Does WiFi 8 use new frequency bands?

WiFi 8 will initially use the spectrum of WiFi 7, including 2.4GHz, 5GHz and 6GHz bands, to improve performance through less congested bands. In the future, WiFi 8 or its successor standards may support higher frequencies and provide wider open spectrum to reduce interference.

When will WiFi 8 be officially released?

The final specifications of WiFi 8 are expected to be released around September 2028, and the official commercial time may be after that.

What are the main upgrades of WiFi 8 compared to WiFi 7?

WiFi 8 has been optimized and improved on the basis of maintaining the 23Gbps bandwidth, 4096QAM modulation method, number of channels and frequency bands of the Wi-Fi 7 standard. The main upgrades include the introduction of ultra-high reliability (UHR), faster transmission rates, lower latency, multi-AP coordination technology (Multi-AP Coordination), distributed

OFDMA scheduling/non-preemptive channel access (DOS/NPCA) and dynamic resource units (dRU).

What is the approximate transmission rate of WiFi 8?

The theoretical transmission rate of WiFi 8 can reach up to 100Gbps.

How is the transmission rate of WiFi 8 improved compared with the previous generation?

Compared with the 30Gbps of WiFi 7, the transmission rate of WiFi 8 has been significantly improved to 100Gbps.

What is the actual impact of the increase in the transmission rate of WiFi 8 on users?

Faster transmission rates mean that users can download and upload large files faster and enjoy smoother HD video streaming and online gaming experience.

Does the increase in the transmission rate of WiFi 8 depend on specific hardware?

Yes, to achieve the high transmission rate of WiFi 8, hardware devices such as routers and network cards that support this standard are required.

Are there any devices that support WiFi 8 on the market?

As of now (please note that this answer will change over time), there are no devices on the market that support WiFi 8. It is

expected that related devices will be launched in the future as the standard is finalized and commercialized.

Does the increase in WiFi 8 transmission rate mean shorter charging time?

The increase in WiFi 8 transmission rate is not directly related to the charging time of the device. The charging time mainly depends on factors such as the battery capacity of the device and the charging technology.

Will the transmission rate of WiFi 8 be affected by network congestion?

Although the transmission rate of WiFi 8 is very high, the actual transmission rate may be affected to a certain extent in the case of network congestion. Therefore, good network planning and optimization are still important.

Does the increase in WiFi 8 transmission rate mean higher energy consumption?

Although faster transmission rates may bring a certain increase in energy consumption, the WiFi 8 standard will also consider energy efficiency issues during the formulation process, striving to reduce energy consumption while maintaining high performance.

How to ensure that the transmission rate of WiFi 8 achieves the best effect in actual use?

To ensure that the transmission rate of WiFi 8 reaches the best effect in actual use, the following measures can be taken: use hardware devices that support WiFi 8, optimize network layout, avoid interference sources, and regularly update firmware and software.

What is the difference between the WiFi 8 standard and 802.11ac?

The main differences between the WiFi 8 standard and 802.11ac are as follows:

Transmission rate:

WiFi 8: The theoretical transmission rate can reach up to 100Gbps, far exceeding 802.11ac.

802.11ac: The theoretical transmission rate is usually between 1Gbps and several Gbps, and may be reduced in actual use due to various factors.

Frequency band usage:

WiFi 8: In the initial stage, the spectrum of WiFi 7 will be used, including 2.4GHz, 5GHz and 6GHz bands, and higher frequencies may be supported in the future.

802.11ac: It mainly works in the 5GHz band, which is relatively pure, with fewer interference sources, and can provide a more stable transmission environment.

Technical Optimization:

WiFi 8: Many optimizations and improvements have been made on the basis of maintaining the Wi-Fi 7 standard, such as the introduction of ultra-high reliability (UHR) and multi-access point coordination technology.

802.11ac: Adopts and expands the air interface concept derived from 802.11n, including wider RF bandwidth, more MIMO spatial streams, etc.

Device Compatibility:

WiFi 8: As a new generation standard, its device compatibility may be limited in the early stage, but with the promotion of the standard and the update of equipment, compatibility will gradually improve.

802.11ac: Backward compatible with all existing and upcoming standards and specifications of the full range of 802.11, with good compatibility.

Application Scenarios:

WiFi 8: It is expected to be widely used in scenarios requiring high bandwidth, low latency and ultra-high reliability, such as AR/VR, smart home, high-definition video streaming, etc.

802.11ac: It has been widely used in homes, enterprises and other places to provide high-speed wireless LAN communications.

What is the theoretical transmission rate of the WiFi 8 standard?

The theoretical transmission rate of the WiFi 8 standard can reach up to 100Gbps.

What are the main improvements of WiFi 8 compared with the previous generation standards (such as WiFi 7)?

WiFi 8 has made many optimizations and improvements on the basis of maintaining the Wi-Fi 7 standard, such as introducing ultra-high reliability (UHR) and multi-access point coordination technology to provide faster and more stable wireless network connections.

Does the WiFi 8 standard support new frequency bands?

Initially, WiFi 8 will continue to use the spectrum of WiFi 7, including 2.4GHz, 5GHz and 6GHz bands. In the future, as technology develops, WiFi 8 or its subsequent standards may support higher frequency bands.

When will WiFi 8 standard devices be available on the market?

It is expected that WiFi 8 standard devices will gradually be available on the market within a few years after the standard is finalized. The specific time depends on factors such as the standard formulation process, hardware technology development and market demand.

Can existing devices support the WiFi 8 standard?

Most existing devices do not support the WiFi 8 standard because they are designed based on the old version of the standard. To enjoy the high-speed network connection brought by WiFi 8, users need to purchase new devices that support this standard.

Is the WiFi 8 standard backward compatible with the older standards?

Generally, the new generation of wireless network standards is backward compatible with the older standards to ensure a smooth transition for users. Therefore, it is expected that the WiFi 8 standard will also be backward compatible with older standards such as 802.11a/b/g/n/ac/ax (WiFi 5/6/7). However, the specific compatibility situation still needs to wait for the official explanation after the standard is officially released.

What impact will the WiFi 8 standard have on home networks?

The WiFi 8 standard will significantly improve the transmission rate and stability of home networks, allowing users to download and upload data faster, enjoy smoother HD video streaming and online gaming experience. At the same time, multi-access point coordination technology will also help improve signal coverage and connection quality in home networks.

Should enterprises consider upgrading to the WiFi 8 standard?

For enterprises that require high bandwidth, low latency and ultra-high reliability, upgrading to the WiFi 8 standard will be a wise choice. This will help improve the network performance of enterprises, improve work efficiency and meet the needs of future business development. However, enterprises also need to consider factors such as upgrade costs, device compatibility, and network planning.

Will the WiFi 8 standard affect network security?

The new generation of wireless network standards usually introduces more advanced encryption technology and security mechanisms to improve network security performance. Therefore, it is expected that the WiFi 8 standard will also improve in this regard. However, users still need to remain vigilant and take necessary security measures to protect their network and data security.

How to learn about the latest progress of the WiFi 8 standard?

Users can learn about the latest progress of the WiFi 8 standard by paying attention to the official website of wireless network standard organizations (such as IEEE), participating in seminars and forums in related industries, and paying attention to reports from technology media.

What is the theoretical maximum transmission rate of WiFi 8 in gigabits?

The theoretical maximum transmission rate of WiFi 8 is **100 gigabits per second (Gbps)**.

What is the theoretical maximum transmission rate of China's WiFi 8 technology?

The theoretical maximum transmission rate of China's WiFi 8 technology can reach 100Gbps.

What are the main improvements of WiFi 8 technology compared with the previous generation?

WiFi 8 technology has significantly improved transmission rate, reliability, spectrum utilization efficiency and other aspects compared with the previous generation, and has introduced new technologies such as multi-access point coordination.

Did China participate in the formulation of WiFi 8 standards?

Yes, as an important participant in wireless network technology, China has actively participated in the formulation of WiFi 8 standards.

When will China be able to commercialize WiFi 8 technology?

It is expected that China will gradually commercialize the technology within a few years after the official release of the WiFi 8 standard. The specific time depends on factors such as the standard formulation process, hardware technology development and market demand.

Can existing Chinese wireless network equipment support WiFi 8 technology?

Most of the existing wireless network equipment does not support WiFi 8 technology because they are designed based on the old version of the standard. To enjoy the high-speed network connection brought by WiFi 8 technology, users need to purchase new equipment that supports this standard.

What progress have Chinese companies made in the research and development of WiFi 8 technology?

Chinese companies have made positive progress in the research and development of WiFi 8 technology, including participating in standard formulation, developing chips and devices that support WiFi 8 technology, etc. However, specific progress and results still need to wait for more official news and public reports.

Is WiFi 8 technology suitable for home networks in China?

Yes, WiFi 8 technology is suitable for home networks in China, and can significantly improve the transmission rate and stability of home networks, meeting high-bandwidth requirements such as high-definition video streaming and online games.

How can Chinese users learn about the latest developments in WiFi 8 technology?

Chinese users can learn about the latest developments in WiFi 8 technology by following professional media in the field of wireless network technology, participating in seminars and forums in related industries, and paying attention to the official websites of domestic and foreign wireless network standard organizations.

Will WiFi 8 technology affect China's network security?

While improving network performance, WiFi 8 technology will also introduce more advanced encryption technology and security mechanisms to improve network security performance. Therefore, it is expected that WiFi 8 technology will not have a negative impact on China's network security. However, users still need to remain vigilant and take necessary security measures to protect their network and data security.

Does China have plans to promote WiFi 8 technology?

As one of the important markets for wireless network technology, China has plans to gradually promote WiFi 8 technology after it matures to meet users' needs for high-speed and stable wireless networks. However, the specific promotion plan and timetable still need to wait for official news and public reports.