

Wi-Fi 8 Vs. Wi-Fi 7 Vs. Wi-Fi 6 Vs. Wi-Fi 6E Specifications

[Wi-Fi 6](#) provides high concurrency and low latency, [Wi-Fi 6E](#) expands to the 6GHz frequency band to increase bandwidth, Wi-Fi 7 reaches speeds of 30Gbps and supports multi-link operation, and [Wi-Fi 8 \(expected\)](#) focuses more on connection reliability and user experience, with speeds of up to 100Gbps.

Wi-Fi 8

What is Wi-Fi 8? What are its specifications? When will it be released?

Wi-Fi 8, also known as [IEEE 802.11bn](#) or UHR ([Ultra High Reliability](#)) Wi-Fi, is the eighth generation of the Wi-Fi technology standard.



[WiFi Internet of Things](#)

Here is a brief introduction to Wi-Fi 8:

Definition and core features

Wi-Fi 8 aims to further improve the performance of wireless networks, especially to provide stable and high-speed network connections in high-density user environments. Its core features include significantly improving the effective throughput of the network and optimizing network performance by introducing a number of advanced resource management technologies.

Specifications and features

Bandwidth and rate:

Channel bandwidth: Like **Wi-Fi 7**, Wi-Fi 8 supports a maximum channel bandwidth of 320MHz.

Physical rate: The theoretical peak rate can reach 100Gbps, which is much higher than the 23Gbps of Wi-Fi 7, meeting the needs of future large-scale, ultra-high bandwidth applications.

Frequency band support: supports 2.4GHz, 5GHz and 6GHz frequency bands, compatible with current mainstream Wi-Fi standards.

Modulation mode:

Uses 4096QAM (Quadrature Amplitude Modulation) modulation mode to improve data transmission efficiency.

New features and technologies:

Coordinated spatial reuse (Co-SR): Enhances communication between access points, optimizes power output, and increases throughput by 15%-25%.

Coordinated beamforming (Co-BF): Enhances signal connection between access points and devices.

Multi-AP Coordination: More intelligent management of multiple access points and optimized resource sharing.

Distributed OFDMA scheduling/non-preemptive channel access (DOS/NPCA): Improves network efficiency and stability.

Dynamic resource unit (dRU): Provides more flexible bandwidth allocation for low-power indoor devices in the 6GHz band.

Millimeter wave technology: It is expected to achieve millisecond-level latency, suitable for applications with high real-time requirements such as online games, cloud computing and industrial automation.

Release time

According to the IEEE plan, the final specifications of Wi-Fi 8 are expected to be released around September 2028. However, it usually takes some time from technology research and development to market popularization, so the commercialization time of Wi-Fi 8 devices may be slightly later than the release time.

Wi-Fi 8 is an important upgrade of Wi-Fi technology. By introducing a number of advanced technologies and functions, it aims to provide users with a more stable, high-speed and reliable wireless network experience. With the continuous development and popularization of technology, Wi-Fi 8 is expected to play an important role in [smart homes](#), enterprise networks, [WiFi IOT](#), **XR** (extended reality) and other fields.

Wi-Fi 6

What is Wi-Fi 6? What are its specifications? When will it be released?

Wi-Fi 6, also known as [802.11ax](#), is the sixth generation of [wireless network technology](#) and a wireless network standard released by the Wi-Fi Alliance in September 2019.

WiFi Internet of Things



The following is a brief introduction to Wi-Fi 6:

Definition

Wi-Fi 6 is designed to provide faster speeds, higher capacity and better performance to meet the needs of modern high-density network environments. It is the successor of Wi-Fi 5 (802.11ac), and has achieved significant improvements in network performance by introducing a number of new technologies.

Specifications

Speed:

WiFi Internet of Things

The theoretical maximum speed of Wi-Fi 6 can reach 9.6Gbps, which is much higher than the 3.5Gbps of Wi-Fi 5.

It supports higher data throughput and can handle the data transmission needs of more devices at the same time.

Frequency band:

Wi-Fi 6 is compatible with 2.4GHz and 5GHz bands, and some high-end devices also support 6GHz band.

It covers low-speed and high-speed devices to meet network needs in different scenarios.

Technical features:

OFDMA (Orthogonal Frequency Division Multiple Access): allows different users to share the same channel at the same time, improving spectrum utilization and transmission efficiency.

MU-MIMO (Multi-User Multiple Input Multiple Output): supports simultaneous data transmission of multiple users in uplink and downlink, improving network capacity and response speed.

1024-QAM (Quadrature Amplitude Modulation): improves data transmission efficiency, and each symbol bit can transmit more data.

BSS Coloring (Basic Service Set Coloring): Reduce co-channel interference and improve network stability and reliability.

TWT (Target Wake Time): Allow devices to negotiate communication time, reduce the number of device wake-up times, and extend battery life.

WiFi Internet of Things



Release Time

Wi-Fi 6 was officially released by the Wi-Fi Alliance in September 2019. Since then, with the continuous maturity of technology and the popularity of devices, Wi-Fi 6 has gradually become the mainstream standard for wireless networks.

Wi-Fi 6 has achieved significant improvements in network performance by introducing new technologies such as OFDMA and MU-MIMO. It not only supports higher speeds and greater capacity, but also improves network stability and reliability by optimizing spectrum utilization and reducing co-channel interference. As more and more devices support Wi-Fi 6, it is becoming the mainstream standard for wireless networks, providing users with a smoother and more efficient network experience.

Wi-Fi 6E

WiFi Internet of Things

What is Wi-Fi 6E? What are its specifications? When will it be released?



Wi-Fi 6E is an enhanced version of Wi-Fi 6, which is described as follows:

Definition

Wi-Fi 6E is a wireless network standard launched by the Wi-Fi Alliance. It extends the functions of Wi-Fi 6 to the 6GHz band, providing users with higher concurrency, lower latency and greater bandwidth.

Specifications

Frequency band:

[WiFi Internet of Things](#)

Wi-Fi 6E supports 2.4GHz, 5GHz and 6GHz bands.

The 6GHz band is a new band from 5.925GHz to 7.125GHz, providing an additional 1200MHz spectrum for Wi-Fi 6E.

Channel:

In the 6GHz band, Wi-Fi 6E supports up to 7 160MHz channels or 14 80MHz channels. Compared with Wi-Fi 6, Wi-Fi 6E provides more channel options in the 6GHz band, reduces interference between channels, and improves network performance.

Technical features:

Wi-Fi 6E inherits all the technical features of Wi-Fi 6, including OFDMA, MU-MIMO, 1024-QAM, etc.

These technical features enable Wi-Fi 6E to provide higher data throughput and lower latency in the 6GHz band.

Release time

The Wi-Fi 6E standard was released around the end of 2020, and then devices such as routers and wireless network cards that support Wi-Fi 6E appeared on the market.

By extending the functions of Wi-Fi 6 to the 6GHz band, Wi-Fi 6E provides users with a wider network bandwidth and less channel interference. It supports a higher number of concurrent connections and lower latency, and is suitable for high-density, high-bandwidth network environments. With the gradual opening of the 6GHz band around the world, Wi-Fi 6E is expected to become one of the mainstream standards for future wireless networks.

Wi-Fi 7

What is Wi-Fi 7? What are its specifications? When will it be released?

Wi-Fi 7 is the seventh generation of wireless network technology.

WiFi Internet of Things



Here is a detailed introduction to Wi-Fi 7:

Definition

Wi-Fi 7 is the next generation of Wi-Fi standard, corresponding to the IEEE 802.11be standard, also known as "Extreme High Throughput (EHT)" Wi-Fi. It is designed to provide higher data transmission rates, lower latency and wider coverage to meet the needs of future wireless networks.

WiFi Internet of Things



Specifications

Speed:

The theoretical peak rate of Wi-Fi 7 can reach 30Gbps, or even higher, which is more than three times that of Wi-Fi 6.

By introducing technologies such as 320MHz bandwidth, 4096-QAM modulation and multi-link operation, Wi-Fi 7 can achieve a significant increase in the maximum theoretical rate of a single link.

Frequency band:

Wi-Fi 7 supports 2.4GHz, 5GHz and 6GHz frequency bands, and realizes a three-band concurrent working mode.

The 6GHz frequency band provides Wi-Fi 7 with a wider spectrum resource, supporting higher data transmission rates and lower latency.

Technical features:

320MHz bandwidth: Wi-Fi 7 increases the maximum bandwidth to 320MHz, which has a higher data transmission rate than the 160MHz bandwidth of Wi-Fi 6.

WiFi Internet of Things

4096-QAM modulation: Wi-Fi 7 uses 4096-QAM modulation, and each symbol can carry 12 bits. Compared with the 1024-QAM modulation of Wi-Fi 6, the data transmission efficiency is higher.

Multi-link operation (MLO): Wi-Fi 7 supports multi-link operation, which can transmit data simultaneously on different frequency bands, improve throughput and reduce latency.

Enhanced MU-MIMO: Wi-Fi 7 supports simultaneous transmission of more spatial streams, improving network capacity and response speed.

Multi-AP Coordination: Wi-Fi 7 supports collaboration between multiple access points, optimizes spectrum resource utilization, and improves overall network performance.

Release time

The Wi-Fi 7 standard is expected to be officially released at the end of 2024. At present, some manufacturers have launched prototypes or test equipment that support Wi-Fi 7. It is expected that commercial devices that support Wi-Fi 7 will gradually become popular in the next few years.

WiFi Internet of Things



Wi-Fi 7 is a major upgrade of wireless network technology. By introducing a number of new technologies, it has achieved a significant improvement in network performance. It not only supports higher data transmission rates and lower latency, but also provides broader spectrum resources and more flexible transmission methods. With the release of the **Wi-Fi 7 standard** and the popularization of commercial devices, users will be able to enjoy a smoother, more efficient and convenient wireless network experience.

Wi-Fi 8 Vs. Wi-Fi 7 Vs. Wi-Fi 6 Vs. Wi-Fi 6E Specifications

WiFi Internet of Things

Parameter	Wi-Fi 6	Wi-Fi 6E	Wi-Fi 7	Wi-Fi 8 (Expected)
Frequency Bands	2.4/5 GHz	2.4/5/6 GHz	2.4/5/6 GHz	2.4/5/6 GHz, mmWave
Maximum Data Rate (Theoretical)	9.6 Gbps	9.6 Gbps (2x2 MIMO)	30 Gbps (4x4 MIMO)	100 Gbps
Modulation	1024-QAM	1024-QAM	4096-QAM	8192-QAM
MIMO	8x8	8x8	16x16	16x16
Spatial reuse	OFDMA	OFDMA	MU-MIMO + OFDMA	Multi-link MU-MIMO + OFDMA
Target wake time (TWT)	Supported	Supported	Enhanced TWT	Enhanced TWT

About IoT Cloud Platform

[IoT Cloud Platform \(blog.iotcloudplatform.com\)](https://blog.iotcloudplatform.com) focuses on [IoT solutions](#), low-altitude economic IoT, WiFi modules, sensors, smart homes, smart cities, IoT design, RFID, lora devices, [IoT systems](#), IOT modules, embedded development, IOT circuit boards, Raspberry Pi development and design, Arduino programming, new energy, semiconductors, WiFi IoT, photovoltaic solar energy, lithium batteries, chips and other scientific and technological knowledge and products.