

Frequently Asked Questions WiFi 6

Table of Contents

1. WHAT IS WIFI 6?	3
2. WHAT ARE THE OTHER RATIFIED WIRELESS STANDARDS?	3
3. WHY IS WIFI 6 NEEDED?	3
4. WHAT BANDS WILL WIFI 6 USE?	3
5. WILL CUSTOMERS NEED TO UPGRADE THEIR WIRELESS CLIENTS TO USE WIFI 6?	3
6. WHAT TECHNOLOGIES ARE RESPONSIBLE FOR THE NEW FEATURES IN WIFI 6?	4
7. WHY DO I NEED TO UPGRADE TO WIFI 6 IF MY CURRENT WIFI 5 IS WORKING FINE?	4
8. HOW WILL WIFI 6 WORK WITH IOT AND OTHER WIRELESS DEVICES?	5
9. WHAT IS 2X2, 3X3, AND 4X4?	5
10. WHY DO MOST WIFI 6 ACCESS POINTS USE MULTI-GIG (2.5GBPS, 5GBPS) AND NOT JUST A REGULAR GIGABIT CONNECTION?	5
11. DO MY CURRENT WIFI 5 ACCESS POINTS WORK WITH THE NEW WIFI 6 ACCESS POINTS?	5
12. DOES WIFI 6 INCREASE RANGE AND SPEED?	5
13. WHAT FREQUENCY DOES WIFI 6 USE?	6
14. WHO SHOULD CONSIDER WIFI 6?	6
15. WHAT WILL WIFI 6 BRING TO MY BUSINESS WIFI NETWORK?	7
16. WHICH NETGEAR BUSINESS APS SUPPORT WIFI 6?	7
17. IS WIFI 6 SUPPORTED IN ALL COUNTRIES?	7
18. CURRENTLY, WHICH DEVICES SUPPORT WIFI 6?	8

1. WHAT IS WIFI 6?

WiFi 6 allows devices to send more data in one transmission, resulting in a 20% improvement in speed through higher order modulation (1024-QAM). This higher order modulation increases the efficiency and speed of data transmission on your network, providing an extra 25% improvement in speed and performance.

2. WHAT ARE THE OTHER RATIFIED WIRELESS STANDARDS?

- 802.11b – WiFi 1, first wireless standard to be widely adopted, ratified in 1999
- 802.11a – WiFi 2, first wireless standard to introduce OFDM, ratified in 1999
- 802.11g – WiFi 3, first wireless standard to combine wireless standards (802.11b, 802.11a), ratified in 2003
- 802.11n – WiFi 4, first brought to market by NETGEAR in 2006, ratified in 2009
- 802.11ac – WiFi 5, first brought to market by NETGEAR in 2013, ratified in 2014

3. WHY IS WIFI 6 NEEDED?

Newer, faster devices, high-resolution streaming videos and cloud-based applications all require high bandwidth, low latency and increased capacity to have maximum performance. In order for multiple devices to perform at their best requires businesses to move to the newest standard of WiFi.

WiFi 6 is the newest WiFi standard and builds on the already great WiFi 5 (802.11ac) technology. While WiFi 5 brought gigabit speeds to our WiFi connections, it falls short on delivering the best WiFi experience. Current SMB network infrastructure is getting smarter and has more devices on the network and needs WiFi 6 for optimum performance.

WiFi 6 uses OFDMA (Orthogonal Frequency-Division Multiple Access) to increase efficiency and lower latency for high demand environments. The addition of MU-MIMO (Multi-User Multiple-Input, Multiple Output) allows more data to be transferred at one time on WiFi 6. It also uses TWT (Target Wake Time) to significantly improve battery life in WiFi devices, including IoT (Internet of Things) devices.

4. WHAT BANDS WILL WIFI 6 USE?

WiFi 6 has 4 bands; 2.4Ghz, 5Ghz -1 (low), 5Ghz - 2 (high), and 6Ghz (WiFi 6E).

5. WILL CUSTOMERS NEED TO UPGRADE THEIR WIRELESS CLIENTS TO USE WIFI 6?

No, WiFi 6 is backwards compatible to older WiFi standards which means that older devices will still work but they won't be able to achieve the speed and efficiency of a purpose built WiFi 6 device.

6. WHAT TECHNOLOGIES ARE RESPONSIBLE FOR THE NEW FEATURES IN WIFI 6?

What Feature?	What Does it do?	What's the Benefit?
Multi-user Multiple Input Multiple Output (MU-MIMO)	Decreases the time each device has to wait for a signal and dramatically speeds up your network.	Increases the capacity and efficiency of the access point, allowing it to handle more WiFi activities and devices.
Orthogonal Frequency-Division multiple access (OFDMA)	OFDMA takes a Wi-Fi channel and divides it into smaller frequency allocations known as resource units (RUs). This enables an AP to communicate with multiple clients by assigning them to specific RUs.	Allows multiple clients with varying bandwidth requirements to be connected to a single AP simultaneously.
Target Wake Time (TWT)	TWT is a negotiated agreement, based on expected traffic activity between the access point (AP) and clients, to specify a scheduled target wake-up time for WiFi 6 clients in powersave (PS) mode.	Improve battery life and reduce power consumption for Wi-Fi devices and IoTs
Basic Service Set Coloring (BSS Coloring)	This mechanism color-codes shared frequencies with a number that is included within the PHY header that is passed between the device and the network.	Enables the WiFi network to more effectively - and concurrently - transmit data to multiple devices in congested areas.
1024-quadrature Amplitude Modulation (1024-QAM)	Higher-order modulation scheme (1024-QAM), more subcarriers, and lower inter-frame space overheads.	A higher modulation scheme means higher data throughput and capacity.

7. WHY DO I NEED TO UPGRADE TO WIFI 6 IF MY CURRENT WIFI 5 IS WORKING FINE?

Older WiFi standards, like WiFi 5, have two common problems: channel interference and wireless efficiency - problems which are solved by WiFi 6. Many wireless client devices try to communicate at the same time causing collisions.

In areas that have a high density of wireless access points, such as hotels, tradeshow etc. WiFi 6 can really play to its own strengths. In fact, WiFi 6 provides enhancements to capacity and efficiency issues which improves the overall operation in limited frequency bandwidths. For businesses, embracing the latest WiFi 6 technology is a smart choice for future-proofing.

8. HOW WILL WIFI 6 WORK WITH IOT AND OTHER WIRELESS DEVICES?

The Internet of Things (IoT) is a revolution, connecting all kind of devices to the cloud to make them smart, which in turn means that the average home or office requires an extra 2 or 3 connections. To help with this extra capacity requirement, WiFi 6 includes a technology called Target Wake Time (TWT) which essentially enables and disables devices by determining when and how frequently they will wake up to send or receive data.

This feature is particularly good for IoT, because it can help conserve battery life and help optimize efficiency by reducing overlap between wireless users. In addition, features like multi-user multiple input multiple output (MU-MIMO) and orthogonal frequency -division multiple access (OFDMA), provides WiFi 6 wireless clients with enhanced coverage in high-density locations.

9. WHAT IS 2X2, 3X3, AND 4X4?

2 x 2 means 2 transmitting and 2 receiving streaming antennas - offering two spatial streams of wireless traffic transmitting and receiving data on the same channel or frequency. The access point can simultaneously connect a maximum of two clients, one on each stream.

3 x 3 means 3 transmitting and 3 receiving streaming antennas - offering three spatial streams of wireless traffic transmitting and receiving data on the same channel or frequency. The access point can simultaneously connect a maximum of three clients, one on each stream.

4 x 4 means 4 transmitting and 4 receiving streaming antennas - offering four spatial streams of wireless traffic transmitting and receiving data on the same channel or frequency. The access point can simultaneously connect a maximum of four clients, one on each stream.

10. WHY DO MOST WIFI 6 ACCESS POINTS USE MULTI-GIG (2.5GBPS, 5GBPS) AND NOT JUST A REGULAR GIGABIT CONNECTION?

Due to extra capacity, speed, and efficiency of WiFi 6, more bandwidth is required as the theoretical WiFi 6 speed surpasses the traditional gigabit speed. Hence, 2.5 or even 5 gigabit speeds are required.

11. DO MY CURRENT WIFI 5 ACCESS POINTS WORK WITH THE NEW WIFI 6 ACCESS POINTS?

Yes, WiFi 5 access points can be in the same network with WiFi 5 access points but only WiFi 6 clients and devices will be able to utilize WiFi 6 capabilities. All other WiFi clients and devices will default to their appropriate WiFi standard.

12. DOES WIFI 6 INCREASE RANGE AND SPEED?

In short, yes. The speed improvement in WiFi 6 is significant compared to WiFi 5 but not as big as the move from WiFi 4 to WiFi 5. However, WiFi 6 allows for an increase to the number of transmit streams to eight, increasing network range and throughput.

13. WHAT FREQUENCY DOES WIFI 6 USE?

WiFi 6 addresses frequency bands between 1 GHz and 6 GHz. Therefore, unlike WiFi 5, WiFi 6 will also operate in the unlicensed 2.4 GHz band.

14. WHO SHOULD CONSIDER WIFI 6?

The uses cases for WiFi 6 can be plentiful. In most cases, WiFi 6 can be a future-proof technology upgrade from WiFi 5 or a full wireless upgrade from older legacy technologies.

Typical use cases for WiFi 6 is shown in this chart below.

Vertical	Use Case
Retail	As the technology advances with Point of Sales (POS) devices and the high bandwidth requirement may require an upgrade in the wireless infrastructure to meeting the new demands.
Manufacturing	From AI assembly line robots to autonomous delivery trucks, most or all the of new machinery or IoT will require high bandwidth and capacity. An upgrade to WiFi 6 will meet new requirements and capacity.
Healthcare	As the healthcare clinic and hospitals moves towards more innovated technologies in x-ray, digital charting, and virtual doctor visits all require a large amount of bandwidth and wireless efficiency. Upgrading to the latest WiFi 6 technology would help ease the high bandwidth demands and expected wireless efficiency.
Public Sector	As the public sector become more technologically modernized, the demand for high bandwidth, wireless capacity, and better WiFi efficiency is a more of a requirement. An upgrade to WiFi 6 would answer majority of the new technology advancements.
Financial	As financial companies become more entuned in high bandwidth and zero delay streaming to meet the daily stock market trader demands. An upgrade to WiFi 6 can provide high bandwidth, better efficiency, and provide an increase wireless capacity for the financial market.
Non-Profit	The non-profit industries have become more technological. With the increase in digital signage, 4K streaming, and even managing voting booths can require a large requirement in bandwidth and wireless capacity. Upgrading to WiFi 6 can meet the new increase in requirements and future-proof the wireless technology at the same time.
Law Firms	As the industry became more prevalent in video conferencing, digital research, and cloud-based applications, law firms required WiFi to have faster bandwidths and better efficiency. Upgrading to WiFi 6 checks off all the new requirement boxes and also future-proofs the WiFi service for years to come.
Hospitality	Due to the huge demand in technology and internet connectivity, the older or legacy WiFi systems incur slow bandwidth, lack of device connectivity, and a less secure internet connection. An upgrade to WiFi 6 with hospitality, would answer majority of the above concerns.
House of Worship	Houses of worship increasingly depend on having great network connectivity, whether to help the worship team make sure everything runs smoothly, or to improve the congregation's experience. Above all, connectivity needs to be reliable, simple, affordable and reach every corner of the site. The latest in wireless technology meets all those needs.
Education	We see an increase in video streaming, online classes, and other internet-based instruction. These require a huge demand in bandwidth and capacity; which the older and legacy WiFi technologies, cannot always meet. Future-proofing the schools or institutions with WiFi 6 will greatly increase the ability of being ready for the high demand in bandwidth and also a part of the digital revolution.

15. WHAT WILL WIFI 6 BRING TO MY BUSINESS WIFI NETWORK?

WiFi 6 will bring speed, enhanced wireless security, more coverage in populated areas, lower latency and overall wireless efficiency.

16. WHICH NETGEAR BUSINESS APS SUPPORT WIFI 6?

NETGEAR Business Access Point	Description
WAX610	WAX610 is a Dual Band AX1800 WiFi 6 Access Point built to provide your business with the ultimate WiFi experience. Throughout your entire office, enjoy next level WiFi speeds, coverage and connection capacity with less congestion. Fully compatible with existing WiFi 5 Access Points and devices.
WAX610Y	WAX610Y is a Dual Band AX1800 WiFi 6 Access Point built to provide your business with the ultimate WiFi experience outdoor. Enjoy next level WiFi speeds, coverage and connection capacity with less congestion. Fully compatible with WAX610 indoor WiFi 6 AP and existing WiFi 5 Access Points and devices.
Orbi Pro WiFi 6	Orbi Pro WiFi 6 is a Tri-band mesh system built to provide your small business or home office with the ultimate WiFi coverage, improved speeds, and enhanced network security.

17. IS WIFI 6 SUPPORTED IN ALL COUNTRIES?

Yes, WiFi 6 is supported worldwide but shares a common set of regulations as referred to in the 802.11 specification as regulatory domains.

- Federal Communications Commission (FCC)
- European Telecommunications Standards Institute (ETSI)
- Telecom Engineering Center (TELEC)
- Korea Communications Commission (KCC)

Each of these domains has different parameters for antenna gain, transmit power, channel selection etc. that must be followed.

18. CURRENTLY, WHICH DEVICES SUPPORT WIFI 6?

WiFi 6 is months or a year away from a full adoption of the new wireless technology. However, some vendors are already supporting WiFi 6 as shown in the table below.

WiFi6 Device	Vendor	Model
Smart Phones	Huawei	P40 Pro
	Apple	iPhone 11, 11 Pro, 11 Pro Max, SE
	LG	V60 ThinQ
	Motorola	Edge Plus
	OnePlus	8 and 8 Pro
	Samsung	Galaxy S10, S10E, S20, Note 10 and Fold
Laptops and PC (Built-in)	Asus	Chromebook Flip c436
	Dell	XPS 13 (2020)
	HP	Spectre x360
	Lenovo	Yoga c940
	LG	Gram 17
	Apple	iPad Pro (12.9-inch)
	Microsoft	Surface Pro 7
	MSI	Prestige 14
	Acer	Aspire 5
WiFi 6 Laptop Modules	Intel	WiFi 6 AX200
	OKN	Wi-Fi 6 11AX WiFi Module
	Killer	Wi-Fi 6 AX1650 Module
Desktop PC WiFi 6 Adapter	Fenvi	FV-AX3000
	Ubit	AX200
	OIU	Wi-Fi 6 AX200
	Gigabit(+)	WiFi 6 AX200
	UFON	Wi-Fi 6 AX200 WiFi Adapter
	Tonyasa Intel	AX 200NGW Network Card

WiFi6 Device	Vendor	Model
WiFi 6 Chipset Vendors	Broadcom	BCM4375, BCM43698, BCM43684
	Cypress	CYW 89650
	Intel	WAV600 series
	Marvell	88W9064, 88W9064+ 88W9068
	Qualcomm	Networking Pro 1200, FastConnect 6800
	MediaTek	MT7915
WiFi 6E Chipset Vendors	Broadcom	BCM4389
	Qualcomm	610, 810, 1210, and 1610
Other IoT Devices	Samsung	Q900, Q950