

ProSAFE® WAC740, NETGEAR Business 802.11ac Wave 2 Access Point

Frequently Asked Questions



1. What is 802.11ac?

802.11ac is the newest generation of WiFi standard. Sometimes referred to as the 5th generation (after 802.11b, 802.11a, 802.11g, and 802.11n). Within the 802.11ac standard, there are 2 waves (or stages) of implementation. Wave 1 is generally available today, and Wave 2 products are slowly coming to the market. Wave 2 builds on wave 1 and includes MU-MIMO and support for 4 streams (over 3 in wave 1) as well as higher throughput. NETGEAR WAC720 and WAC730 products are Wave 1 products. WAC740 is a Wave 2 product.

2. What are the key differences between 802.11ac Wave 1 and Wave 2?

NETGEAR Wave 1 products (WAC120, WAC720 and WAC730) have been shipping since 2015. Wave 2 builds upon Wave 1 with the following key additional functionalities:

- Higher speed with up to 2.3 Gbps (1.7 Gbps in the 5 GHz range)
- Supports multiuser multiple input, multiple output (MU-MIMO) for better use of frequency
- More robust signal encoding with 256 QAM enabling 33% improved signal integrity
- Support a fourth spatial stream for greater performance

3. Which product in NETGEAR product family supports Wave 2 of 802.11ac?

The NETGEAR® Premium Business 802.11ac 4 x 4 Wave 2 Wireless Access Point (AP) delivers high performance with maximum client density for enterprises requiring ubiquitous and reliable wireless for all business applications. The WAC740 is a controller managed Access Point with ease of centralized management with all NETGEAR wireless controllers from small (WC7500) to mid-size (WC7600) and large-size (WC9500) deployment. The WAC740 operates with Multi-User MIMO and can achieve speeds up to 600 Mbps for 2.4 GHz and 1.7 Gbps at 5 GHz. The WAC740 has two Ethernet ports, including one port that can handle up to 2.5 Gbps of throughput, enabling a single wire to connect to 2.5 Gbps capable switch for ease of wiring installation. The WAC740 is PoE powered enabling ease of deployment when connected to a 802.3at capable PoE switch port.

4. When do the customers need to use Wave 2 of 802.11ac?

The following characteristics are indicative of customers suitable for 802.11ac Wave 2:

- High adoption of videos in enterprise application
- High density of clients need of WiFi
- Crowded RF environment, in particular in 2.4 GHz requiring more usage in 5 GHz band
- Desire in the "all wireless" enterprise user experience

5. Can I convert my existing Wave 1 802.11ac AP's to Wave 2 AP's?

Existing Wave 1 AP is not upgradable to Wave 2 AP. However, wireless controllers (WC7500, WC7600, and WC9500) can centrally manage a mix of both Wave 1 and Wave 2 802.11ac AP's.

6. Why the standard body created two 802.11ac "waves"?

The 802.11ac WLAN standard was introduced to the market in a series of waves as new products and technology. The new technology of 802.11ac is delivered in multiple phases allowing the industry to take advantage of this new capability without having to wait for all capabilities to be available. Furthermore, as vendors such as NETGEAR receive feedback from customers, we continue to improve our solution to meet the needs of the customers.

7. Will 802.11ac Wave 2 be backward compatible to 802.11ac Wave 1 and other 5-GHz protocols such as 802.11n?

Yes, 802.11ac Wave 2 AP's will interoperate with 802.11ac Wave 1, 802.11n, and 802.11a client devices. However, to take advantage of the new Wave 2 features, both the AP's and the connected clients must be 802.11ac Wave 2 capable.

8. What is MU-MIMO, and how will this technology be useful in the customer's network?

MU-MIMO stands for Multi-User Multiple Input, Multiple Output, and is a new feature in 802.11ac Wave 2. Wave 2 MU-MIMO support is required on both the AP's and client device to work. MU-MIMO operates in the downstream direction (AP to client), and allows an AP to transmit to multiple client devices simultaneously. A good reference is the switch vs. hub analogy in the wired switching world, where the switch (wave 2, 802.11ac) allows simultaneous transmission of data to multiple clients vs. hub (wave 1, 802.11ac) which allows transmission to only one client at a specific time.

9. What is the combination of MU-MIMO clients that WAC740 can support simultaneously?

WAC740 can at a given time simultaneously communicate to a maximum 3 MU-MIMO capable devices. The minimum number of clients required to kick-start MU-MIMO operations is 2 MU-MIMO capable devices. The WAC740 is a 4x4 AP, future software enhancements will increase the number of simultaneous clients to 4 MU-MIMO capable devices.

10. Does the WAC740 support explicit beamforming as defined by the 802.11ac standard?

The WAC740 AP is compliant with 802.11ac explicit beamforming requirements.

11. What is explicit beamforming?

Explicit transmit beamforming is an advanced signal processing technique with multiple antenna communication. This technique utilizes the knowledge of the MIMO channel information to improve received signal quality at the receiver/client which results in better reception and hence throughput.

Explicit beamforming involves the clients sending beamforming information based on the AP's request. This request involves the AP sending channel training information which the client processes and feeds back to the AP. This processed information helps the AP achieve better transmission results.

12. How will 802.11ac Wave 2 access points handle throughput greater than 1 Gbps?

The potential throughput of a wireless client is dependent upon a number of factors, including number of spatial streams supported (in the case of WAC740, four spatial streams), distance from the AP, quality of signal established between the client and AP, environmental RF interference and signal path obstruction, and the quality of the client device and AP.

13. How can the wired network support wireless throughput higher than 1 Gbps?

The WAC740 can support multiple gigabit throughput in two options:

- Use the 2.5 Gbps Multi-gigabit Ethernet port with single Ethernet wire to a Multi-Gigabit capable Ethernet switch such as the NETGEAR ProSAFE M4200
- Use two 1Gbps Ethernet port LAG into a 2 Gbps Ethernet port

The WAC740 Multi-gigabit Ethernet is based on the NBASE-T Alliance. This technology is also available on the NETGEAR M4200. The standard adds support for 2.5-Gbps and 5-Gbps speeds to Fast Ethernet, 1 Gbps, and 10 Gbps over standard copper cabling.