

802.11 Comparison

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What is 802.11ac?

The IEEE 802.11ac (draft 3.0) is a wireless networking standard that is designed to support bandwidth-intensive activities better, such as multiple high-definition video streaming. At Very High Throughput (VHT), the new 802.11ac standard can achieve a speed of up to 1.3 Gigabit per second as it takes advantage of advanced modulation techniques that allow the technology to cram more bits of data into every transmission.

Although the 802.11ac standard is backwards compatible with all 802.11a/n clients, 802.11ac devices will operate exclusively on the **5 GHz frequency**.

NOTE: The 2.4 GHz band can support 802.11b/g/n devices. For a video overview of the Wireless-AC and the Linksys EA6500 Router, click [here](#).

This article lists the differences between the Wireless-AC and Wireless-N technologies. Check the table below to learn more:

- **Throughput** – Average rate of successful data transfer over a network Channel.
- **Channel Width** – This is where data travels. The wider the Channel, the faster data can be transferred.
- **Modulation** – Process of transmitting an information signal (e.g. digital bit stream) by using another type of signal capable of being transmitted over a Channel.
- **Number of Spatial Stream** – Number of streams of data being transmitted. The higher the number of spatial streams, the higher the throughput.
- **Beamforming Mechanism** – Provides directional signal transmission and reception. The relative direction of the wireless device is known and the signal is correspondingly strengthened in that direction.

- **Radio Frequency (RF) Band** – Frequency of the wireless signal that it operates on.

	802.11ac	802.11n
Throughput	Up to 1.3 Gbps	Up to 450 Mbps
Channel Width	80,160, 80+80 MHz Channels	20 MHz and 40 MHz Channels
Modulation	256 QAM	64 QAM
Number of Spatial Stream	1-8**	1-4*
Beamforming Mechanism	Yes	No
RF Band	5 GHz only	2.4 GHz and 5 GHz

**Multi-user MIMO uses spatial multiplexing to direct spatial streams in the same Channel to different receivers, allowing for more efficient use of the Channel. Two (2) 1x1 802.11ac device will each have its own 433 Mbps data rate spatial stream, bringing the total network data rate to 866 Mbps.

*In a single-user MIMO environment, devices compete for Channel use in a non-cooperative manner. The clients will have 1x1 802.11ac radios, limiting them to 433 Mbps. In single-user MIMO, the total data rate of the network will be 433 Mbps.

Improving wireless connection speed

There are many factors that affect the wireless network connection between your router and wireless device. An example would be the wireless adapter and router's compatibility.

Wireless standards such as 802.11ac and 802.11n are created to specify wireless connection information like throughput and the achieved range if you connect devices compatible with these standards.

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