What is Beamforming Technology? How does it optimize WiFi networks?

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What is beamforming?

Simply put, Beamforming is a radio wave technology that directs waves into a specific target instead of spreading across an area. Typically, routers broadcast WiFi in all directions. With Beamforming, it determines where the device is and transmits the wave in that direction. Beamforming is already in the new generation IEEE IEEE 802.11ac router standard.

802.11ac and 802.11n

Previously Beamforming was part of 802.11n, requiring both the router and the device to support the same type of Beamforming. Since there is no common standard, device manufacturers are free to change their will, it is difficult to get compatibility.

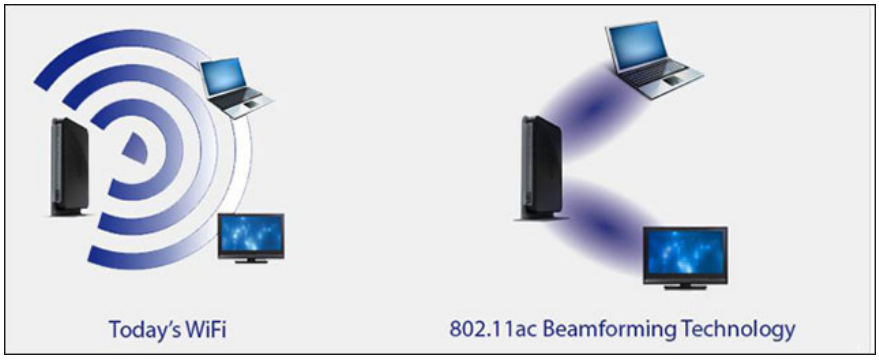
But with 802.11ac, this problem has been fixed. There is a common standard for Beamforming and 802.11ac devices, such as your router or laptop, that can run together easily.

Beamforming is part of 802.11ac does not mean that all 802.11ac devices support Beamforming, but if they are, they will be in standard form.

Beamforming can be operated by transceivers and transmitters using MIMO technology. Data is sent and received by multiple antennas to increase the number and distance of data transmission. MIMO was first introduced in 802.11n and is still an important feature in 802.11ac.

How does beamforming work?

Wireless routers (or access points) and wireless adapters do not support data beamforming in many directions, but if the Beamforming is supported, the signal will be directed to each device, focusing on data transmission. whether to reach the destination instead of emitting it around. Imagine it being like a normal light bulb and a light bulb to capture light into one place.



Illustrated images of Beamforming technology and regular WiFi

If the WiFi receiving device also supports Beamforming, the two parties will exchange location information to find the optimal transmission line. The transmitter is called a beamformer, the receiving device is called beamformee.

Direct and indirect beamforming

The description above is Direct Beamforming, with indirect Beamforming (or hidden Beamforming) routers that will try to use Beamforming technology to improve the wave quality for older devices - not 802.11ac. In theory, it may be useful, but in practice, this cannot be the same as the communication between 802.11ac devices together.

Practical Hidden Beamforming is just an auxiliary part, added to support more devices. Each manufacturer calls this feature in a way, with Netgear, it is the Beamforming +.

Benefits of Beamforming

1. Optimize WiFi network, minimize dead spots
2. Provides a stable WiFi connection for HD video calling
3. Better WiFi quality
4. Reduce unnecessary RF interventions

Is it necessary to have Beamforming?

Beamforming becomes standard on 802.11ac wireless routers along with new features like tri-band WiFi, so if the router has Beamforming it is still better. Except that you have to spend more money, this will not cause any loss.

Beamforming is most useful when used with 802.11ac devices that support Beamforming, so the old device may not be of any benefit, or a little useful (depending on whether it supports hidden Beamforming). So rely on your needs to make decisions.

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