

Next Generation Wi-Fi - 802.11ac

The Advantages of 802.11ac

802.11ac has many advantages over 802.11n, the most apparent one is its ultra fast speed, breaking the gigabit barrier. The more antennas a router has, the higher speed it will get. 802.11n data rates reach up to 150Mbps with one antenna, 300Mbps with two and 450Mbps with three. While 802.11ac can reach 433Mbps with one, 867Mbps with two and 1.3Gigabit with three, roughly three times over 802.11n.

Implementation of High Speed

802.11ac reaches its extremely high speed through advanced technologies and new transmission parameters, like more bandwidth, more spatial streams, channel bonding, new modulation and so on.

- First, the 802.11ac has 80MHz wide channels (even can be doubled to 160MHz), compared to 802.11n's 40MHz. That means, the spectral bandwidth of 802.11ac is much wider and can deliver more data. It's like driving at 2 am in the morning, there are less cars than usual, so you can go fast and even reach the limit speed.
- Second, 802.11ac providing more spatial streams. It supports 8 spatial streams, compared to 802.11n's 4 spatial streams. More spatial streams means more antennas to transmit and receive data, leading to faster delivering speed. Theoretically, 802.11ac with single spatial stream can reach 433Mbps speed, and unbelievable 6.9Gbps with 8 spatial streams.
- Third, 802.11ac utilizes 256-QAM modulation, compared to 64-QAM of 802.11n. In theory, this quadruples the spectral efficiency of 802.11ac over 802.11n. 256-QAM provides nearly 30% increase of throughput over 64-QAM, which means it allows 802.11ac transmit more data in the finite space.