What is 802.11?

ARRIS

Institute of Electrical and Electronics Engineers

1980, IEEE has the first meeting on the 802 family of standards for Local and Metro area networks

802.3 working group for Ethernet

**802.11 working group for Wireless LAN**

21 other working groups

1999 Wireless Ethernet Compatibility Alliance (WECA) was formed by manufacturers to test & certify 802.11 compliant equipment.

2002 WECA was renamed WiFi Alliance… they trademarked the "WiFi" name and the "certified" logo

Note: Practices and standards created by the 802.11 working group take on additional letters… i.e. 802.11e covers QOS, 802.11g created a 54Mbps standard, etc…

Convergence Enabled.

The A, B, G's (& N's & ACs) of Wireless

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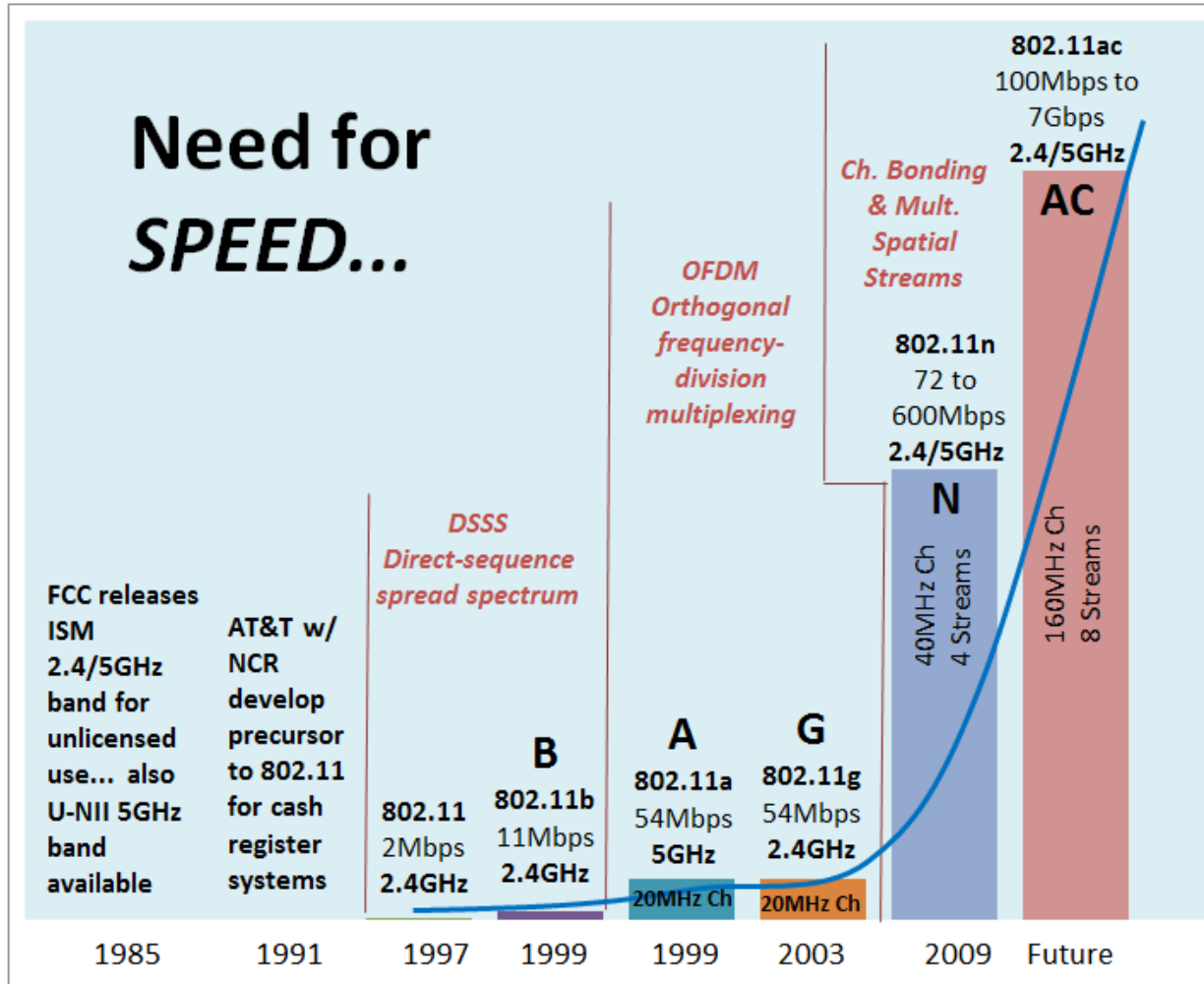
802.11a & g: uses <u>OFDM modulation</u> to improve throughput from 11Mbps to 54Mbps

802.11n: adds <u>channel bonding</u> (<u>40Mhz</u> ch vs 20Mhz ch) and <u>MIMO</u> antenna technology with <u>up to 4 spatial streams</u> to achieve up to 600Mbps

802.11ac: will increase channel width to <u>160Mhz</u> and <u>up to 8 spatial streams</u>

Note: since the 2.4GHz bands offer only 3 non-overlapping channels, the wider channels and multiple streams leveraged w/ 802.11n & ac can be used almost exclusively in the 5GHz band which offers 20+ non-overlapping channels.

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What's Next for WiFi?

- Dynamic Antennas for noisier environments
  - Increase signal gain, Decrease noise, Improve SNR
- 802.11u (foundation for Hotspot 2.0)
  - Automates the negotiation/authentication/connection between clients and WiFi hotspots to create a "3G/4G like feel" for WiFi
- 802.11ac
  - Increases theoretical aggregate wireless speed from 600Mbps tenfold to >7Gbps
    - Higher modulation (256QAM vs 64QAM)
    - Wider Channels (160MHz vs 40MHz)
    - More spatial streams (8 vs 4)
- More 5GHz traffic
  - 5GHz offers **20+** non-overlapping 20MHz channels
  - 2GHz offers 3 non-overlapping 20MHz channels

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