TALK

Different Types of 802.11 Modulation Schemes

Keith Parsons · WLAN Pros channel · 2017-10-17

Keith Parsons shows how to visualize the different modulation schemes 802.11 uses.

Key points

- Shows how one radio wave carries data, starting with BPSK (binary phase shift keying): a sine wave for a 1 and an inverted sine wave for a 0, one bit per symbol.
- Explains error vector magnitude (EVM): how far a received point can drift from where it should be and still be read correctly. BPSK has the widest margin, so it holds up best against noise.
- QPSK (quadrature phase shift keying) adds cosine waves to carry two bits per symbol, with half the margin of BPSK.
- QAM (quadrature amplitude modulation) adds amplitude levels: 16-QAM carries four bits, 64-QAM six and 256-QAM (802.11ac) eight, each with a smaller margin.
- The faster schemes need a high signal-to-noise ratio (SNR), which is why data rates drop as signal falls or noise rises.

Chapters

1. 00:16 BPSK: one bit per symbol
2. 01:49 Error vector magnitude (EVM)
3. 03:19 QPSK: two bits per symbol
4. 05:33 16-QAM
5. 06:55 64-QAM
6. 08:03 Comparing the EVM boxes
7. 09:02 SNR and 256-QAM

Watch on YouTube (https://www.youtube.com/watch?v=W5DMfEuY2Vg). More conference talks: wlan-talks.net (index by Victor Gatuna).

By Keith Parsons, CWNE #3, Wireless LAN Professionals. Free to read and share. Facts