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TechTopics

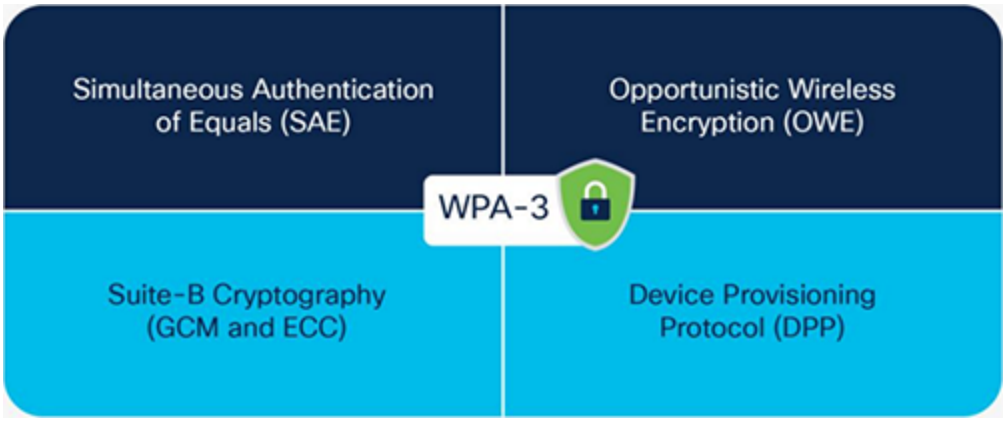
WITH DSI ENGINEERS
DISYS Solutions Inc.

Welcome to Tech Topics!

This newsletter is brought to you by the DSI Engineering Team and will focus on technical topics. The goal is to share information about important updates, new partner products & solutions, and current industry news. We hope you enjoy the newsletter and feel free to send feedback anytime!

In This Issue:

Cisco Supports WPA3



Platform Support

- Cisco Catalyst wireless platforms: 9800-40, 9800-80,
- 802.11ac Wave 1 and Wave 2 access points: Cisco Aironet®1800 Series, 2802,

9800-L and 9800-CL

- Cisco Unified Wireless Network wireless controllers: 3504, 5520 Series, 8540 Series, and Virtual Wireless Controller

3802, 4800, and the 1540, 1560, 1700, 2700, 3700, and 1570 Series

- 802.11ax access points: Cisco Catalyst 9115AX, 9117AX, and 9120AX Series

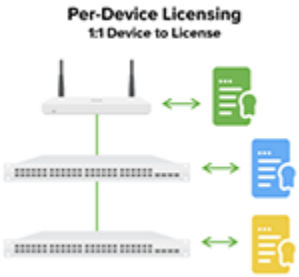
Supported Releases

- Cisco IOS XE Release 16.12 and higher

- AireOS Release 8.10 and higher

Learn More

Meraki New Licensing Model



Meraki is introducing a new licensing model called “Per-Device Licensing”, which essentially allows you to have different expiration dates for different devices instead of one expiration date for all devices used for the entire organization.

Learn More

Is 802.11ax right for me?

Here are some points to get you started:

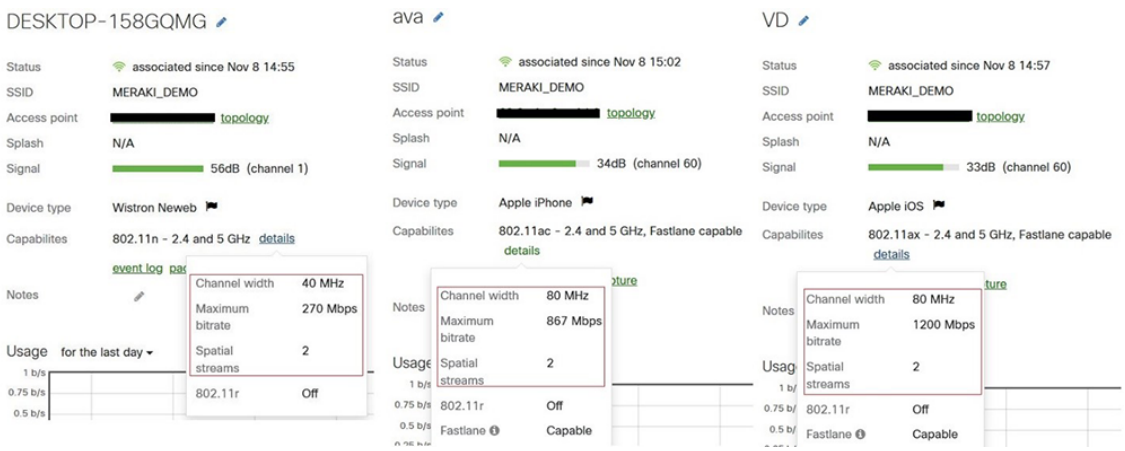
OFDMA for Wireless LAN

OFDM modulation has been used on wireless since 802.11a. While enhancements were made in 802.11g, 802.11n, and 802.11ac, 802.11ax finally adopts OFDMA for the first time for use within Wireless LAN. This is kind of a big deal and here is why:

- With an increase symbol time of 12.8 nano seconds compared to 3.2 nano seconds in OFDM, OFDMA provides smaller subcarrier.
- 1cycle/0.0000128 (one cycle every 12.8 nano seconds) = 78125 cycles/sec = 78.125 KHz (which is subcarrier width).
- For a 20 MHz channel we get 20000/78.125 = 125 subcarriers.
- For a 40 MHz channel we get 40000/78.125 = 250 Subcarriers. These subcarriers are grouped into groups of 26 called resource units.
- 1 RU = 78.125X26 = 2031.25 Khz or 2.031 Mhz, so with a 40MHz channel I can have roughly 19 RU. Unlike in OFDM, each RU can carry data for individual clients connected to Access Points. So, theoretically, 18-19 clients can communicate with an AP operating in 802.11ax operating at 40MHz channel width. For more bandwidth hungry clients, RU can also be larger (e.g. multiple of 52,106 or 242 subcarriers).

Higher QAM

802.11ax uses 1024 QAM (a reciprocal of how many bits conveyed per symbol) which is a 25% increase in speed over Wireless. 802.11ac supported 256 QAM (8 bits per symbol) and 802.11ax supported 10 bits per symbol. Example vendor shown here:



Uplink MUMIMO

While 802.11ac wave 2 introduced Multiuser MIMO, it was limited to downlink from AP to clients. 802.11ax introduces Uplink MUMIMO in addition to downlink MUMIMO with 8X8 radio on the AP side.

Compatibility

802.11ax provides compatibility with existing standards, so even if your clients do not support 802.11ax today and you are at refresh cycle, you should consider 802.11ax and future proof your network.

Target Wake Time

Target Wake time, although introduced in 2017 with 802.11ah standards, made a few enhancements in 802.11ax. APs and devices can negotiate specific time to access the medium and in-between devices can sleep, effectively helping to conserve battery life and reduce contention on the medium. This makes 802.11ax suitable for IOT devices with limited power sources or regular devices with high antenna elements like a 4X4 or 8X8 radio laptops.

BSS Coloring

BSS coloring in 802.11ax is a 6-bit field in PHY header that provides 63 different values in the preamble of an 802.11ax PHY header. When too many APs and clients hear each other on the same channel, it’s called an Overlapping Basic Service Set (OBSS) or Co-Channel Interference. BSS color information is used to apply adaptive clear channel assessment (CCA) thresholds for detected OBSS frame transmissions, thus ignoring transmissions from an OBSS and therefore able to transmit at the same time, increasing efficiency in transmission and better usage in a high-density environment.

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