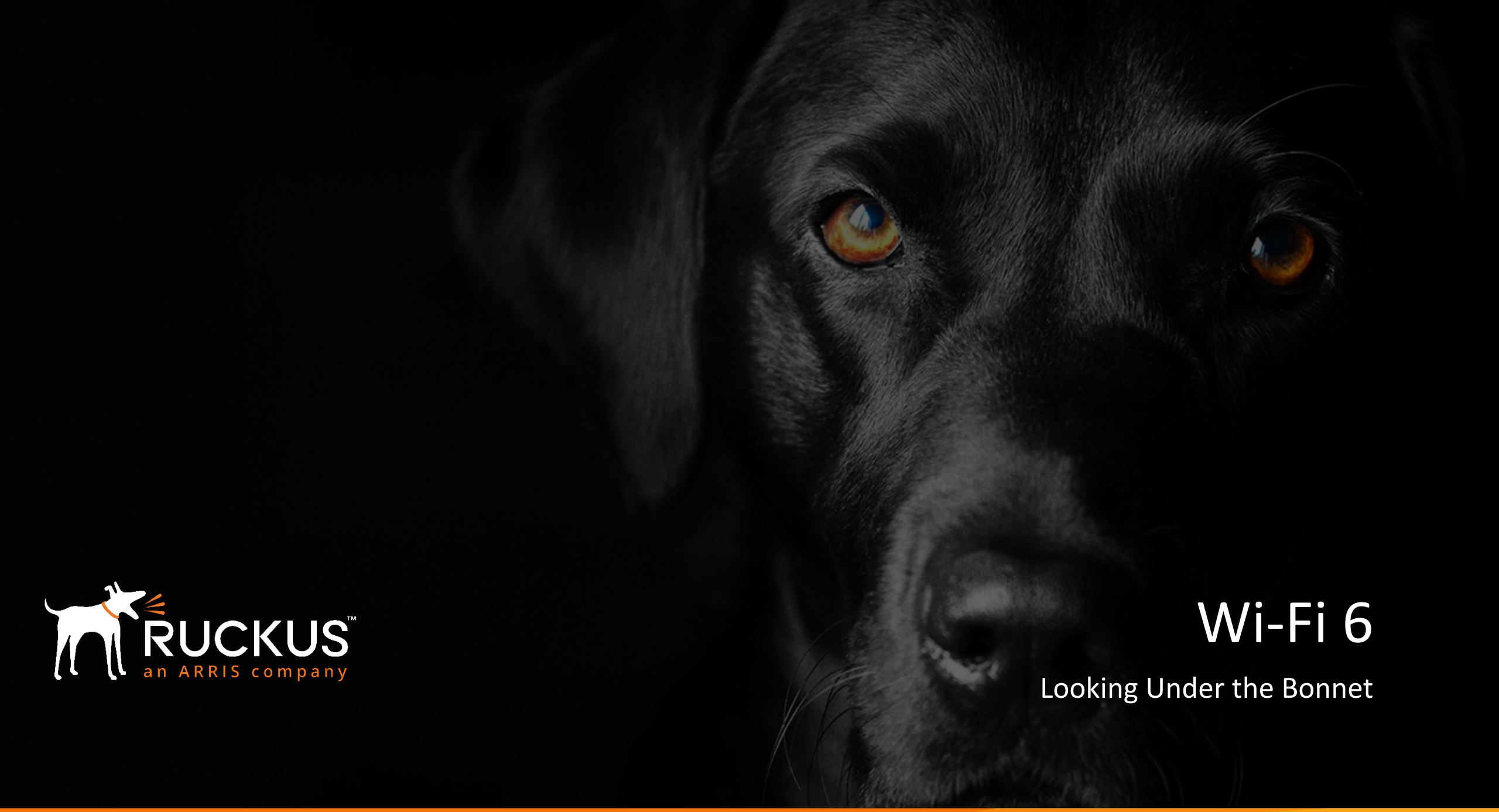


RUCKUS™
an ARRIS company

Wi-Fi 6

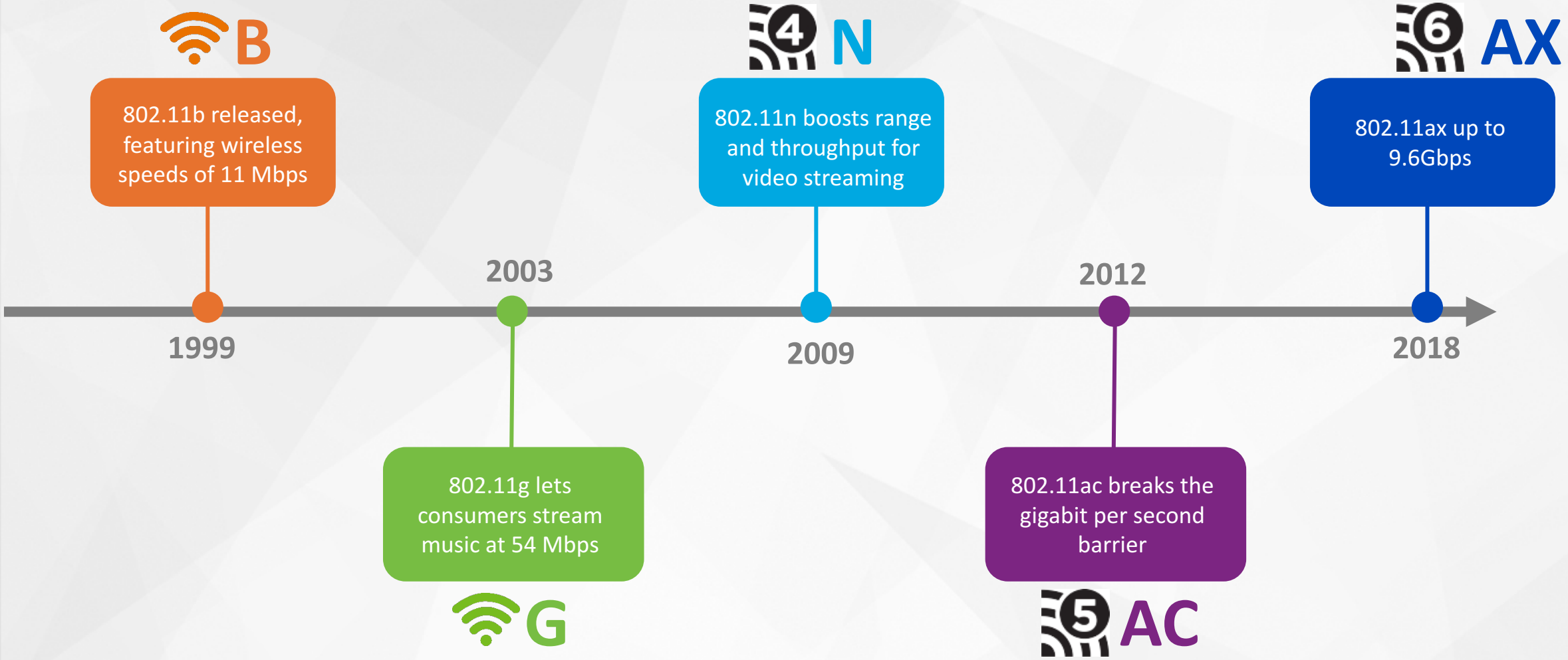
Looking Under the Bonnet

Wi-Fi Moving Forward >>>

Wi-Fi 6
802.11ax
HE (High Efficiency Wi-Fi)
Multi-User (MU)

WPA3
Replacement for WPA2
Enhanced Security
Encrypted Guest Networks

Wi-Fi Moving Forward >>>



What is Wi-Fi 6?

A new approach is needed

Today's Network

"Theoretical peak speed"

Tomorrow's Network

"Overall network capacity"

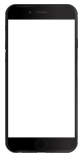
2.4GHz/ 5GHz

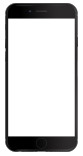
802.11 g/n | 802.11 ac | 11ac MU-MIMO | **802.11 ax**

11ax: Designed for High Efficiency, Density

Wi-Fi Today (Single User)

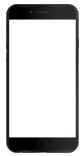
10101010

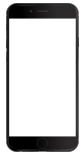




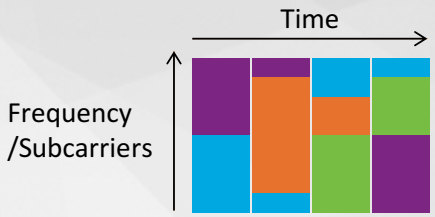
Wi-Fi 6 (Multi User)

10101010



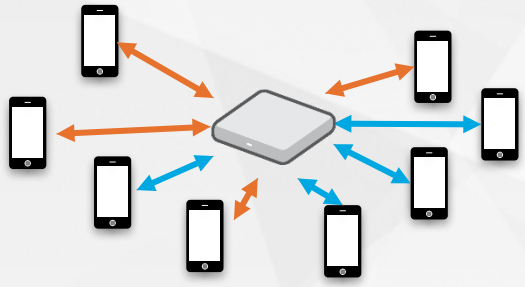


802.11ax Building Blocks & Benefits



OFDMA

- Network Capacity

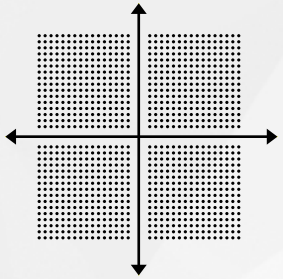


MU-MIMO

- Network Capacity

Power Efficiencies

- Device Battery Life

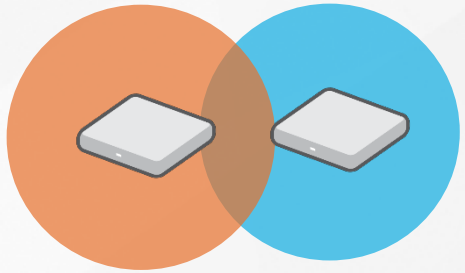


1024-QAM

- Peak throughput

Long OFDM Symbol

- Outdoor reliability
- Peak throughput

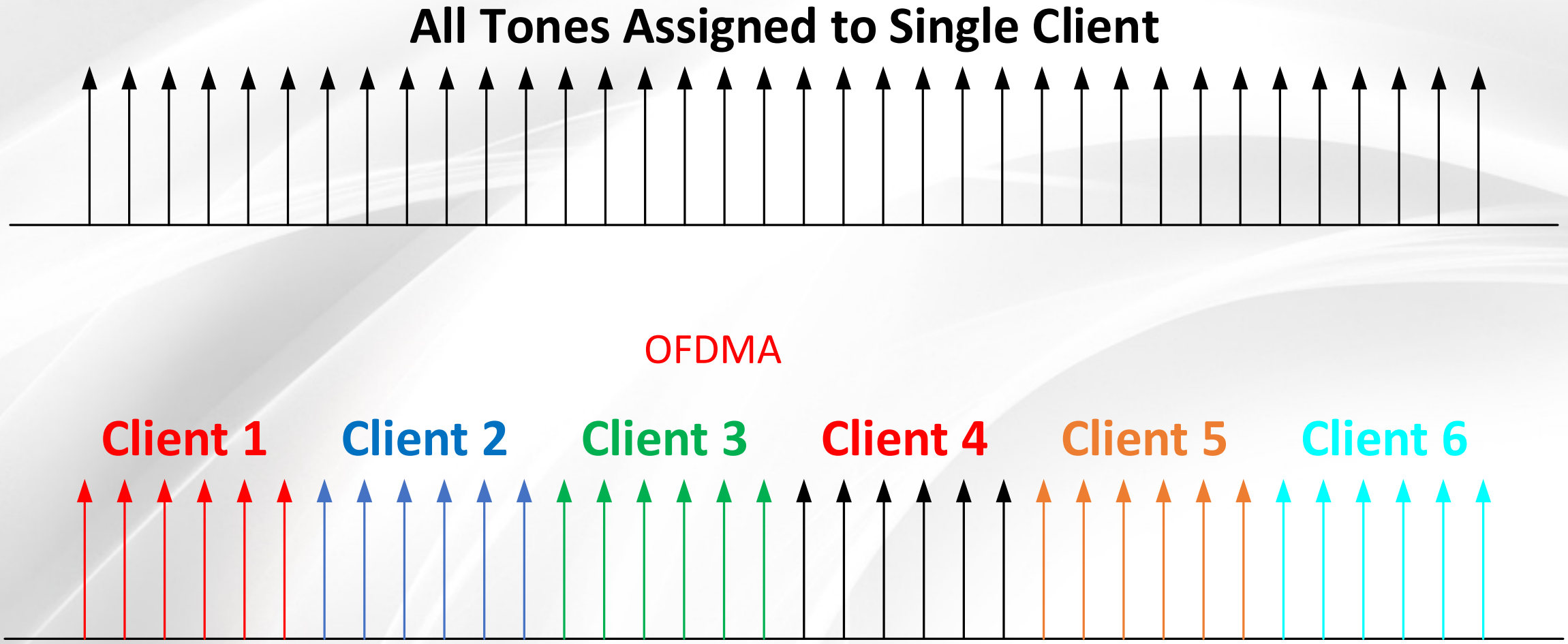


BSS Coloring

- Network Capacity
- Enhanced Wi-Fi Coexistence

Support for 2.4GHz and 5GHz

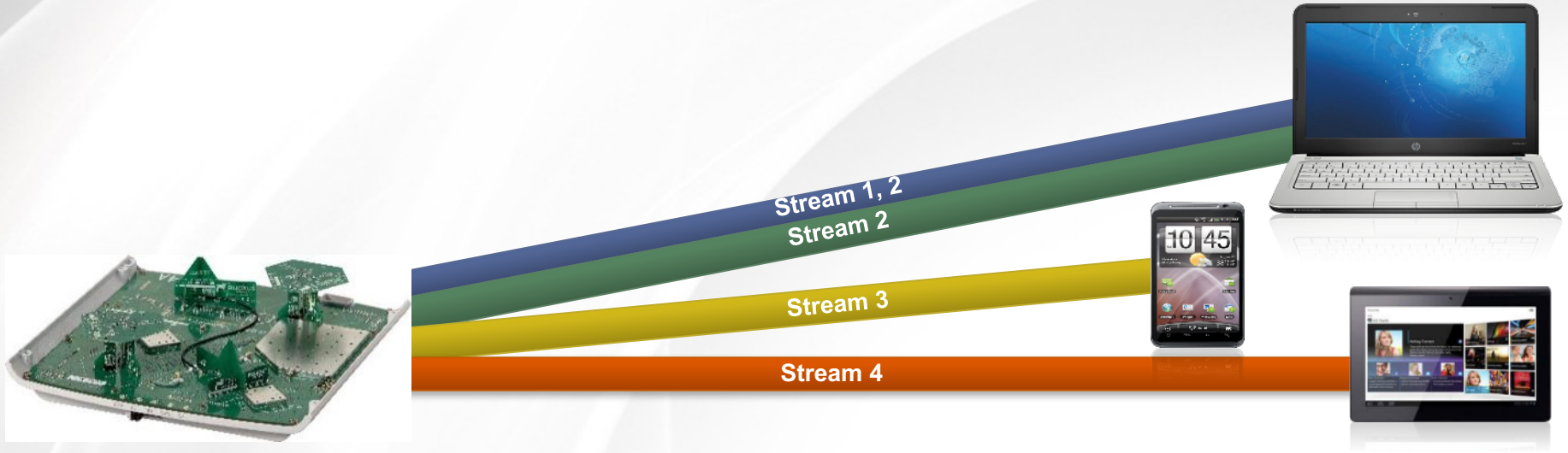
OFDM vs. OFDMA



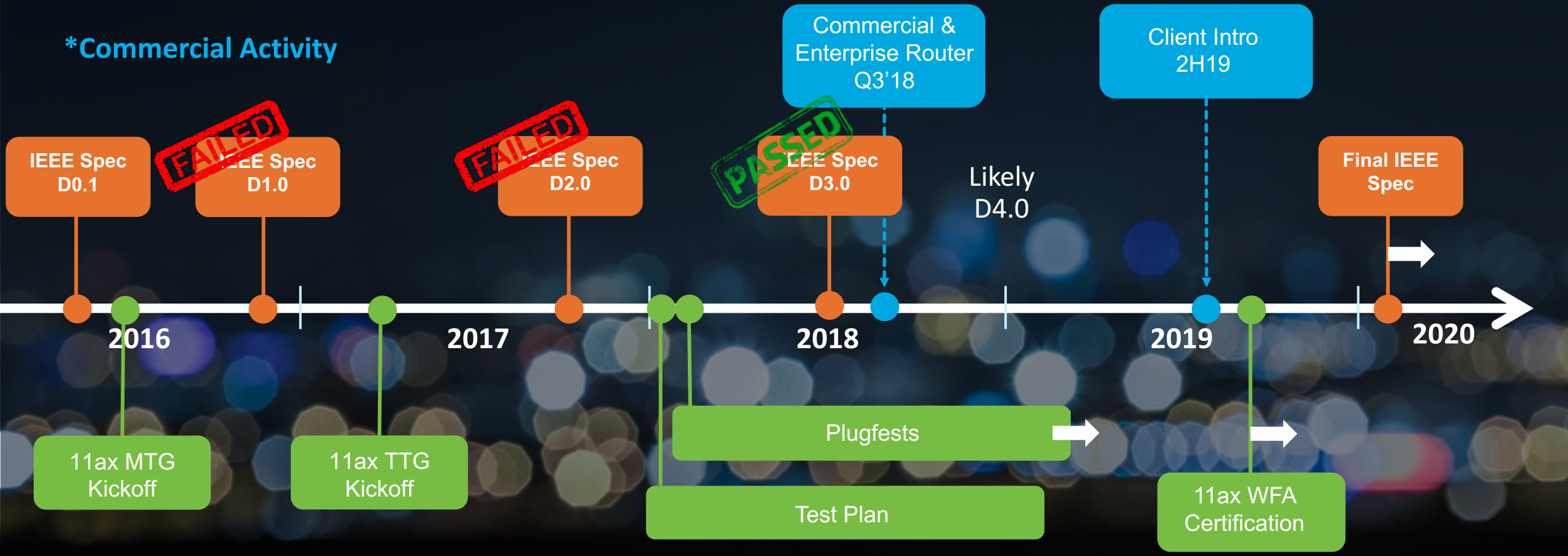
MU-MIMO

Single user MIMO

Multi-user MIMO



802.11ax Timelines – IEEE + WFA



Wave 1 and Wave 2

- It is established that 802.11ax will roll out in waves … similar to 802.11ac
- Exact feature split not clear yet … largely due to wrangling in WFA amongst vendors
- Wave 2 certification ~2 years after Wave 1 certification
- Here's a view

Wave 1	Wave 2
DL and UL OFDMA	UL MU-MIMO
DL MU-MIMO	Spatial re-use through BSS coloring
Target Wake Time	160 MHz
	6 GHz!!!

- 6 GHz will open 1.2 GHz of unlicensed space (5.925 GHz – 7.125 GHz)

More Speed

Speeds Beyond
1gb/sec

More Power

More Power Than
802.3at (PoE Plus)

2.5GBASE-T and 5GBASE-T

Why:

- Wi-Fi Speeds now exceeding 1Gb/sec
- 10Gb/sec technology up to 30 metres

Supported Modes of Operation:

- 2.5 Gb/sec – Cat5e (100 Metres)
- 5Gb/sec – Cat6 (100 Metres)

802.3bt

Why:

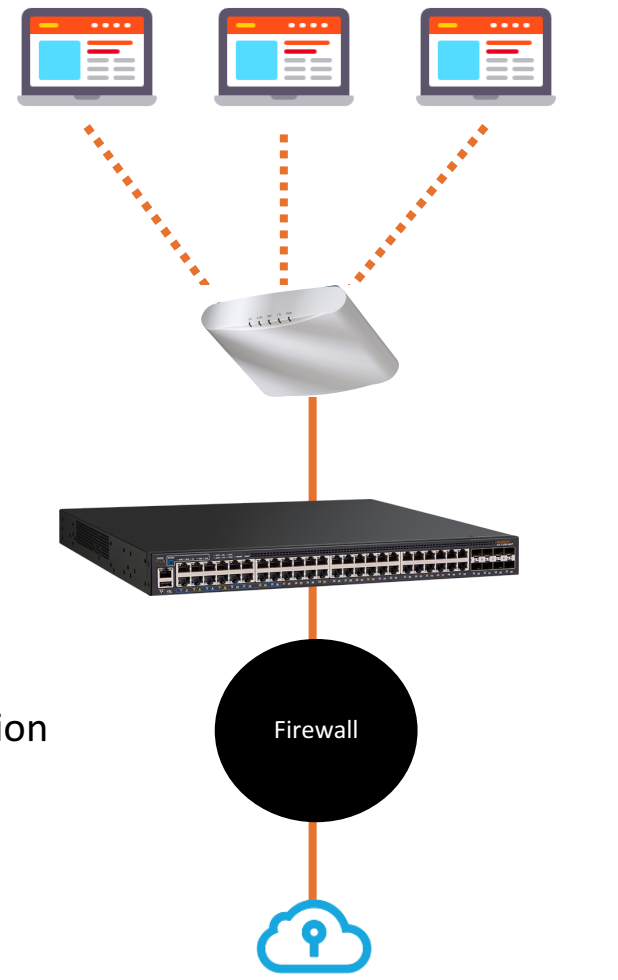
- 8x8 Access Points require more power to drive more radio chains.

Supported Modes of Operation:

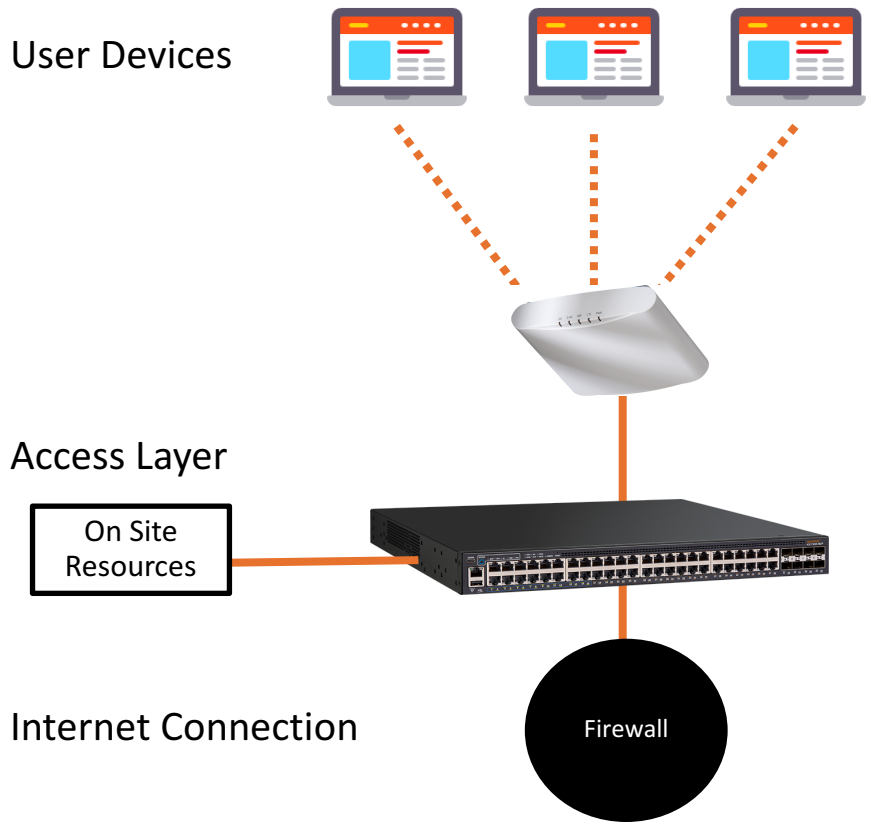
- 60W – Cat5e / Cat6 (100 Metres)

Wi-Fi 6…. Do We Need It?

Cloud Based Customer:



On Premise Resources:



Introducing Ruckus R730

High Density 802.11ax-Compliant Indoor Wireless Services Platform with Multi-Gig Backhaul

Highlights

- Dual band concurrent access point
- 2.4 GHz radio: 4x4:4 802.11b/g/n/ax
  - 1148 Mbps max PHY rate
- 5 GHz radio: 8x8:8 802.11a/n/ac/ax
  - 4800 Mbps max PHY rate
- Multi-User MIMO support
- Orthogonal Frequency Division Multiple Access (OFDMA)
- BeamFlex+ adaptive antennas with Polarization Diversity (PD-MRC)
- Ruckus SmartMesh
- Support for onboard IoT radios, BLE & ZigBee
- Up to 512 client associations
- 1x 1000/2500/5000Base-T, 1x10/100/1000Base-T Ethernet Ports
- 802.3bt PoE input, 48VDC input
- 1x USB Port
- Mounting support for hard wall & ceiling, desktop, Kensington lock security
- Control & Management: ZoneDirector, SmartZone (see appendix for Unleashed and Cloud availability)

Available Now

WPA3

Enhancements to the Existing Standard

WPA2+

A New Standard

WPA3

WPA2 Enhancements WPA2+

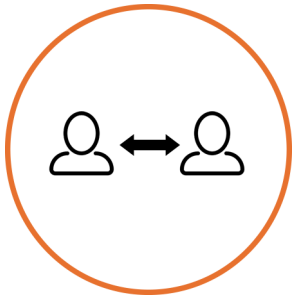
Protocol Validation
Preventing a repeat of Krack

PMF (802.11w)
Protected Management Frames Mandatory

Enforcement of AES128
Deprecating the use of TKIP

Compatible with all WPA2 devices (Requires Software Update)
Implementation 2019 (Immediate)

WPA3 New Standard WPA3



Opportunistic Wireless Encryption (OWE)
Providing Encrypted Guest Networks

New Handshake (SAE)
Preventing Brute Force Attacks

AES192 Encryption Support
Harder to Factor

*Requires Next Generation Chipset (802.11ac W2)
Implementation Mandatory by 2020

SIMPLY BETTER EXPERIENCES