vocera

Voice Design Tips

Andrew McHale
@mac_wifi | mac-wifi.com

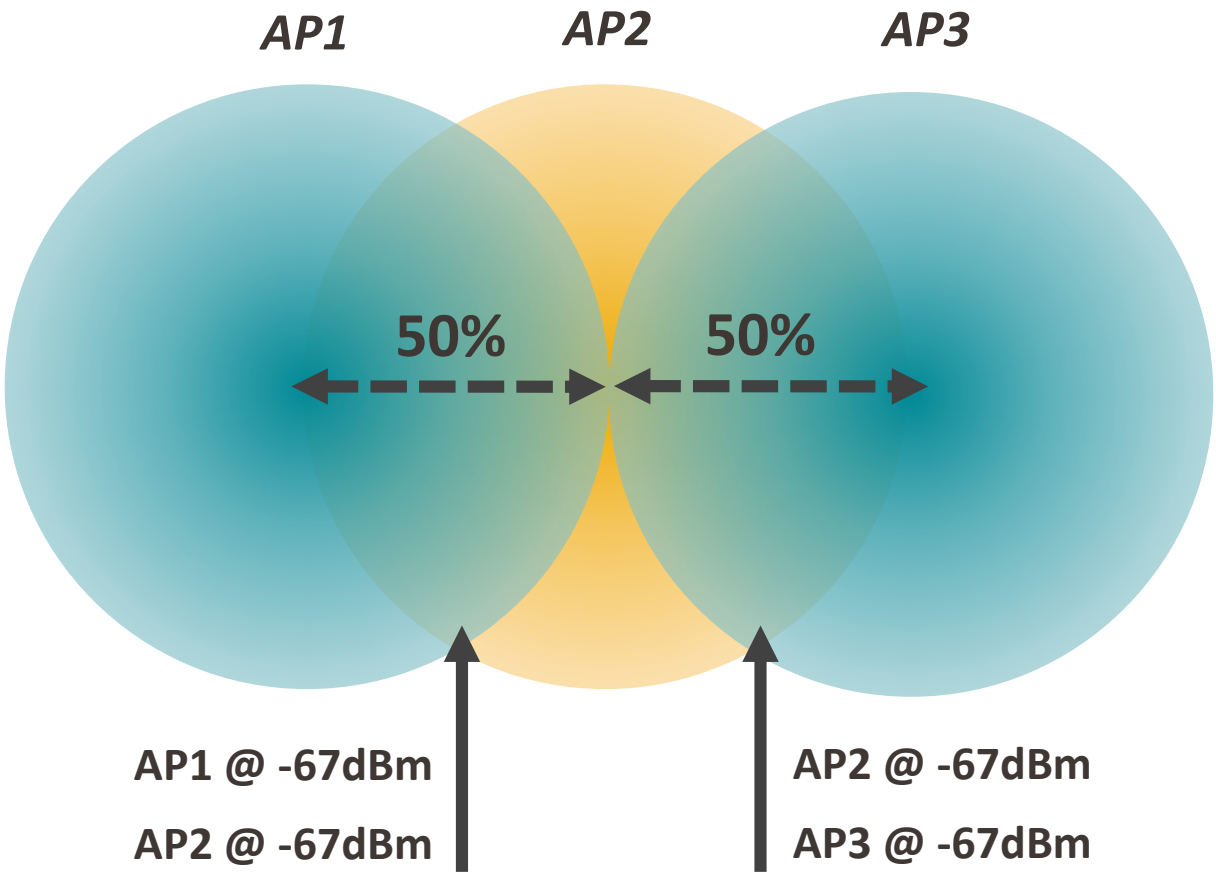
#WiFiDesignDay
by Ekahau and Open Reality

What do I know about Voice?

- 8+ years as Vocera Implementation Engineer
- Assess Vocera Badge and Smartphone performance
- Member of Vocera's internal Wireless Council
- Hospitals, Libraries, Hotels, Schools, Offices, and a Superyacht for Vo-WiFi quality
- Asia, Middle East, Europe, UK & North America

#1 Coverage

- At least 1 access point at a minimum of -67dBm everywhere.
- Ideally 2 access points greater than -67dBm everywhere.



vocera

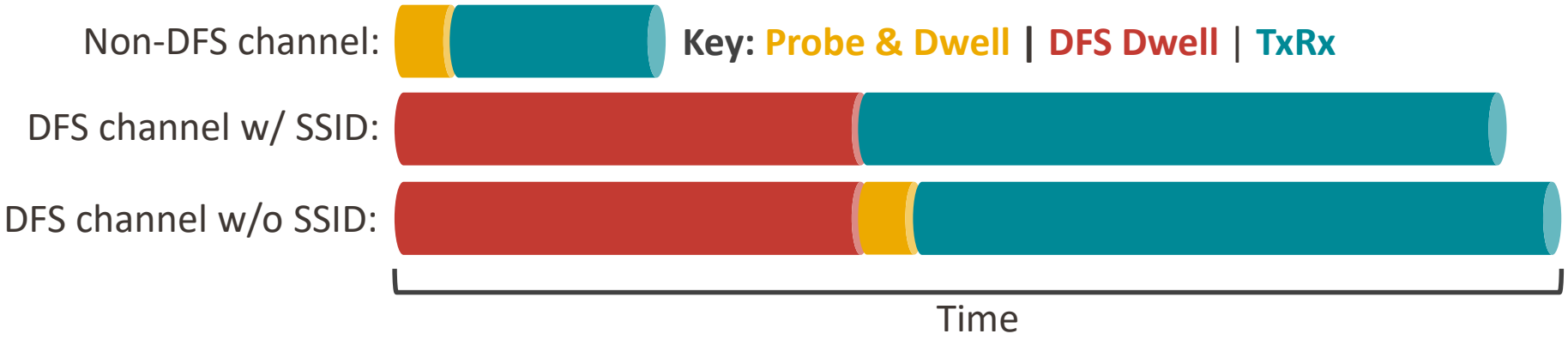
#2 Channel plan

- We used to manage with 3 - 4 channels in a very crowded 2.4GHz band
  - » 5GHz is a lot cleaner band
- Voice devices often scan all configured channels
- Europe/UK only has 4 non-DFS channels
- 36-64 if indoor only, 36-48 + 100-112 if supporting outdoors
- Sharing is Caring - use 11k.

#3 Avoid DFS

https://mac-wifi.com/why-i-dislike-dfs-channels-and-you-might-too

- DFS channels add a LOT of time to scanning



- 11k only helps partially
- Advertise SSID in Beacons

vocera

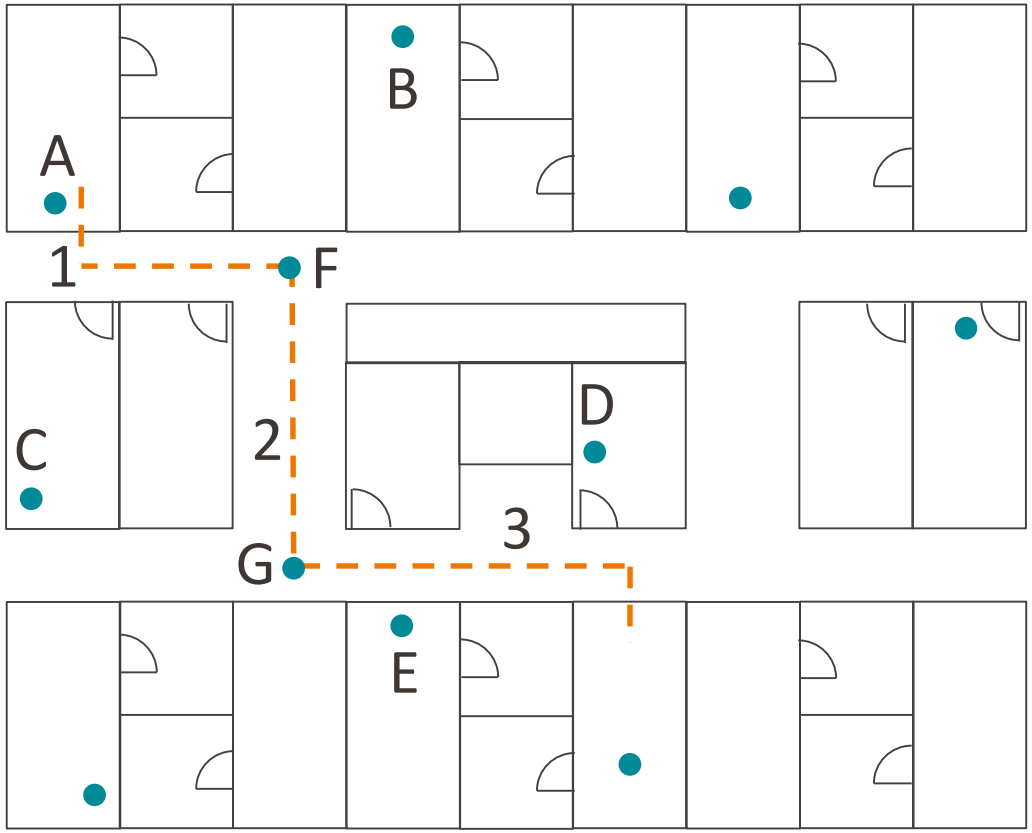
#4 20MHz channels

- Only using 8 channels (right…!), we can’t afford to bond them.
- Voice doesn’t need 20MHz, let alone 40MHz.
- 25 SNR everywhere is challenging, why take a 3-6dBm Noise hit because you’re bonding channels.

#5 AP Power 11-14dBm

- 2011: *"Please turn your AP's Down, they're on Max power"*
  - » Too much CCI/CCC
- 2019: *"Please turn your AP's Up, they're on Min power"*
  - » Too much roaming
- Put a leash on RRM.
  - » Don't leave -125dBm/30dBm defaults, we're better than that.

#6 Access points in corridors… bad?



Credit to Jerome Henry for image concept

vocera

#7 PSK, OKC or 11r

- What do we want? FAST ROAMS! When do we want them? EVERYTIME!
- Pre-shared key 4 way handshake is quick + consistent
- What is quicker than 4 way handshakes? No handshakes!
  - » CCKM/OKC/11r can save the client performing the 4-way handshake
- DO NOT make a voice client perform RADIUS authentication every time.

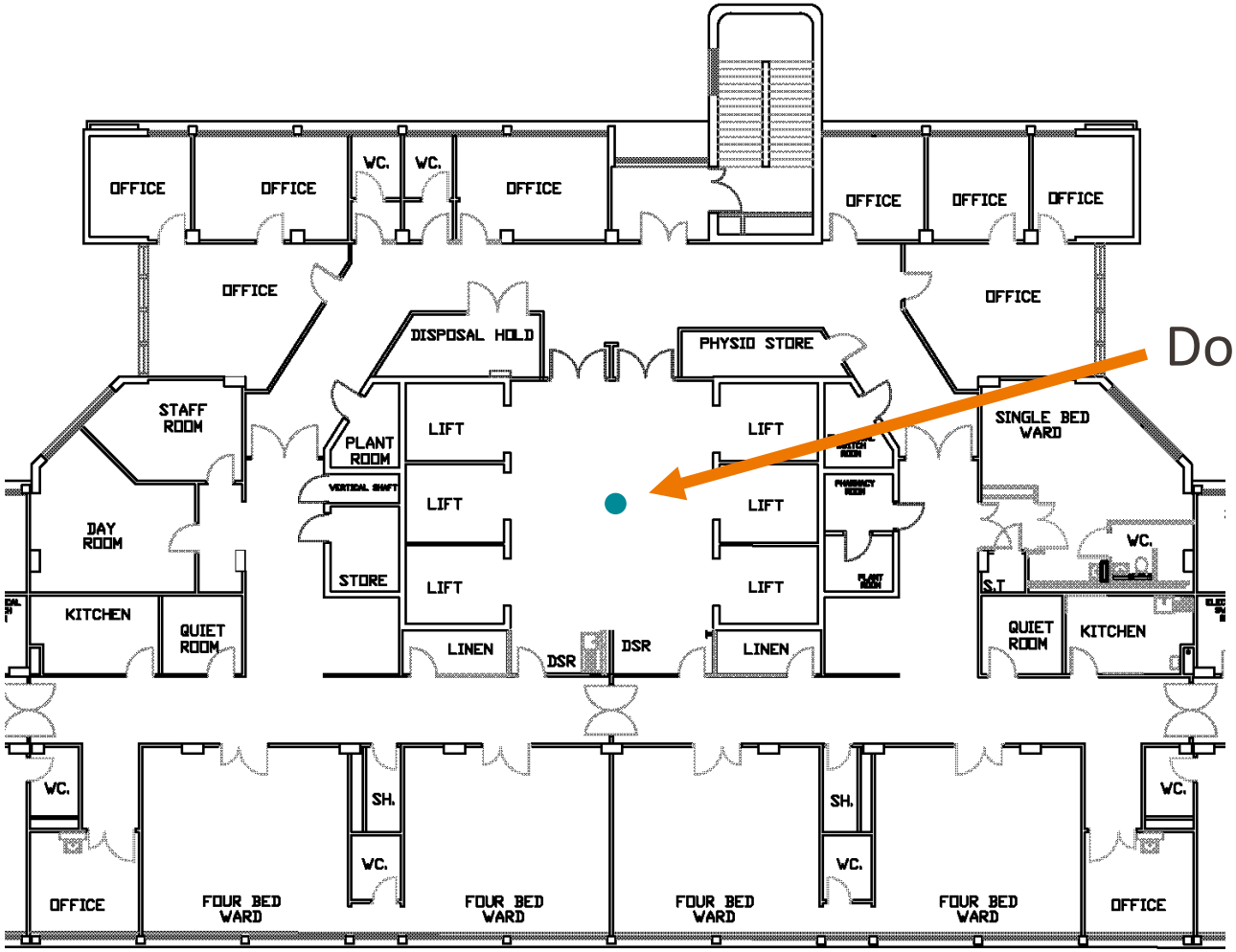
#8 No subnet roaming

- 400ms is a quick DHCP exchange. No biggie right?
- Voice needs delay below 150ms.
- 400-800ms (DHCP) + 100-200ms (Roam) = sad faces!
- Ensure voice clients only perform DHCP at Association
- Set lease renewal to an entire shift (8hr in business, 12hr in Hospitality/Healthcare)

#9 QoS End-to-End

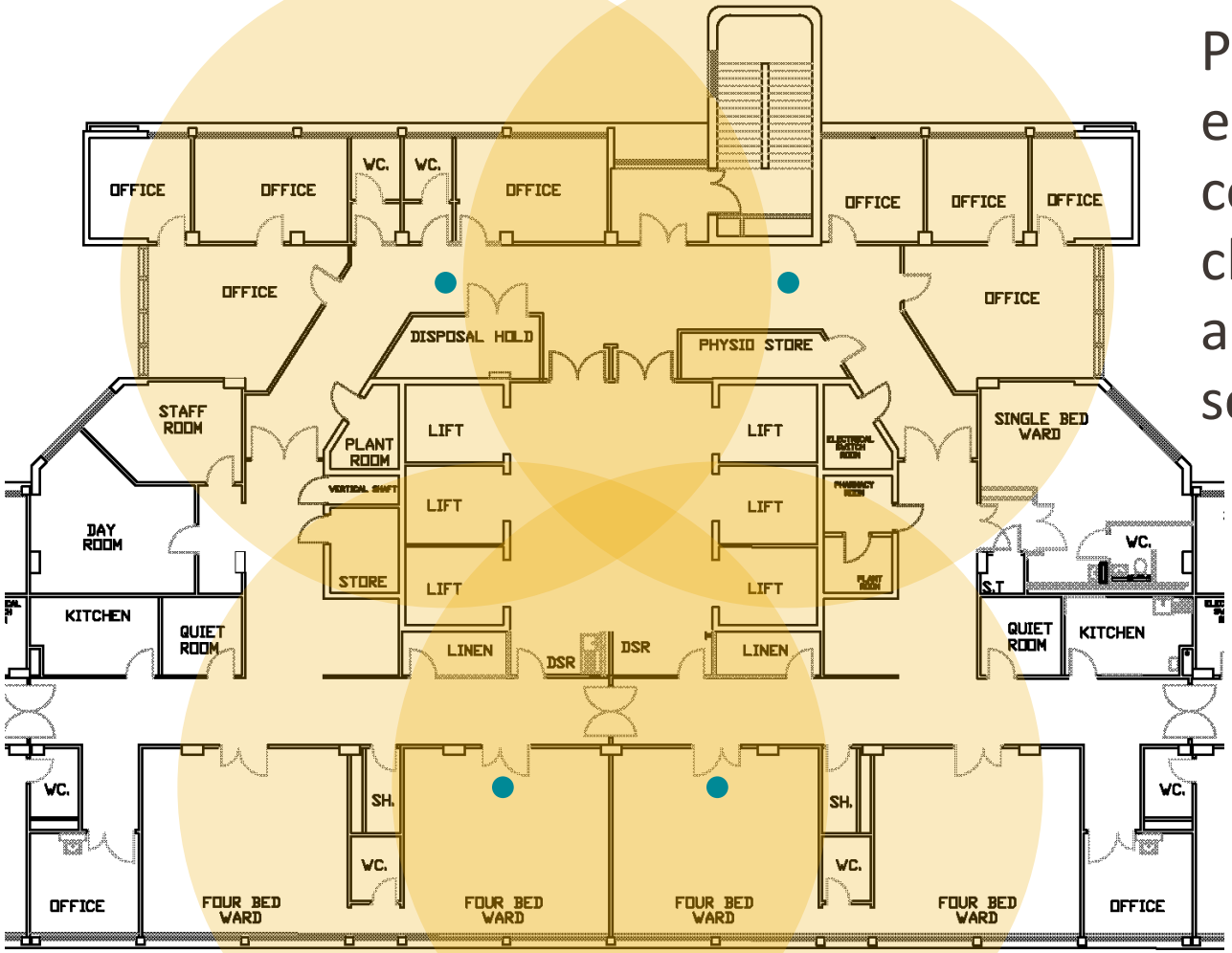
- End-to-End QoS is complex.
- Suck it up buttercup - this is why you get the big bucks!
- Peer-to-peer voice clients need it to avoid voice packets skipping along holding hands with Facebook status updates.

#10 Design for lifts/elevators transitions



Don’t do this

#10 Design for lifts/elevators transitions



Provide edge-of-cell coverage so client is already scanning

vocera

Thank You!

Andrew McHale
@mac_wifi | mac-wifi.com