

# Challenges and Solutions in High Density Networks

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# Agenda

Define the Problem

Technological Solutions

Layer 8 Solutions

Additional Resources

Q&A (time permitting)

Define the Problem

# Everyone expects an ethernet like experience everywhere

- Any time a user has to wait on “the network” they are unhappy.
- The magic of wireless is gone.
- Wi-Fi is easy, high density Wi-Fi that performs well is not easy.
- Spectrum is a finite resource.

# Technological Solutions

# Trim your data rates

- Your goal should be to disable 802.11b rates (turn off 1, 2, 5.5, and 11mbit/s)
- But make sure you don't have old devices that this will break.
- Disabling data rates might require a new validation site survey.

# Channels and Channel Widths

- 1, 6, 11 and always 20MHz on 2.4GHz
- 40MHz channel widths where you can on 5GHz
- 20MHz channel widths where you need extra density

# Engineer your networks

- Don't let your salespeople design your network via spreadsheet.
- “One AP per X” is where you end up, not where you begin.
- The answer to network issues isn't always “add more APs”



# Layer 8 Solutions

# Wired is always the first choice

- If a device doesn't move, it is going to have a power cord already, so get it plugged into a switch.
- Common request, usually driven by some Department trying to push networking costs off to whoever pays for the wireless.
- You can buy more switch ports, you can't buy more Wi-Fi spectrum.

# Buy better devices

- It is finally getting hard to buy 2.4GHz only devices, but not impossible.
- It is easier to tell your purchasing “make sure all devices support 802.11ac” than it was to try to explain why not all 802.11n was equal.
- Make sure you define a device lifecycle so legacy devices get retired.

# Take on the role of Spectrum Coordinator

- Fight for the ability to approve the purchase of any device that uses any wireless technology. Non-Wi-Fi devices are moving from 2.4GHz to 5GHz because of how crowded 2.4GHz has become.
- Remove people that are interfering with your network.

# Additional Resources

Wireless LAN Design Guide for High Density Client Environments in Higher Education

[https://www.cisco.com/c/en/us/products/collateral/wireless/aironet-1250-series/design\\_guide\\_c07-693245.html](https://www.cisco.com/c/en/us/products/collateral/wireless/aironet-1250-series/design_guide_c07-693245.html)

Very High Density 802.11ac Networks Validated Reference Design

[http://www.arubanetworks.com/assets/vrd/Aruba\\_VHD\\_VRD\\_Planning\\_Guide.pdf](http://www.arubanetworks.com/assets/vrd/Aruba_VHD_VRD_Planning_Guide.pdf)

CWNP - Certified Wireless Network Administrator

Questions