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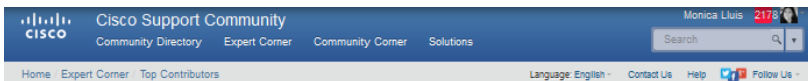
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Cisco Support Community Wireless Architect

George Stefanick
Cisco Designated VIP Alumni

Question Managers

Carlos Alcantara

Wireless Consulting Systems Engineer

Edgar Monroy

Cisco TAC, CCNP & CCNA

Carlos Alcantara   Edgar Monroy

Ask the Expert Event following the Webcast

Now through February 24th

https://supportforums.cisco.com/event/13223791/ask-expert-lessons-learned-deploying-all-wireless-office

Join the discussion for these Ask The Expert Events:
Link

Thank You For Joining Us Today!

If you would like a copy of the presentation slides, click the PDF file link in the chat box on the right or go to:

https://supportforums.cisco.com/document/13220361/webcast-slides-lessons-learned-deploying-all-wireless-office

Submit Your Questions Now!

Use the Q & A panel to submit your questions and the panel of experts will respond.

Please take a moment to complete the survey at the end of the webcast

Guest Speaker:

George Stefanick
Wireless Architect for
Houston Methodist Hospital

George M. Stefanick Jr.

Wireless Architect, Houston Methodist Hospital

Vendor and vendor neutral certifications

Blog: Aruba AirHeads, My80211, Cisco Support Forums

Twitter: @wiresssguru @my80211

Trainer: WiFiTraining.com

Cisco VIP 2012-2014, 2016 - Aruba MVP 2014-2016

\\ WiFi Training

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GEORGE STEFANICK
[AUTHOR/ SPEAKER]

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- WiFi Training™ is a provider of IT Training, Development, and Mentored Consulting services focused on Wireless (WiFi), Security, Cyber Security and related technologies.

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- **(11) Wireless Distributions**
  - **(14) WISM2**
  - **(4) 5508**
  - **(2) 8540**
- **(2) 5508 Office Extends**
- **(2) 5520 / Guest Anchor Controllers**
- **6,864 Access Points (802.11 a/g/n and 802.11ac)**
- **25k Concurrent Wireless Clients / 50k daily connections**

- **(2k Cisco 7925 / 400 Vocera Badges 20%)**
- **Cisco Office Extends**
- **Cisco Prime Infrastructure**
- **Cisco ISE**
- **Cisco MSE**
- **Location Grade Design**

- Cardiac Imaging
- Electronic Medical Record (EMR)
- Mobile Ultrasound
- Mobile Picture Archiving and Communications systems (PACS)
- RTLS
- Mobile Robots
- Infusion Pumps
- Cows (Computer on Wheels)
- Cisco 7925 Handsets
- Vocera Badges
- Mobile Cisco TelePresence VX Clinical Assistant

- Roche Diagnostics ACCU-CHECK
- Mobile EKG Carts
- Mobile Med Dispensing Carts
- WorkGroup Bridges (WGB)
- Mobile Deaf Response Devices
- Laptops
- Tablets
- Smartphones
- Crestron
- Point to Point Links
- Wireless Door Locks

5,000 client increase over 12 months
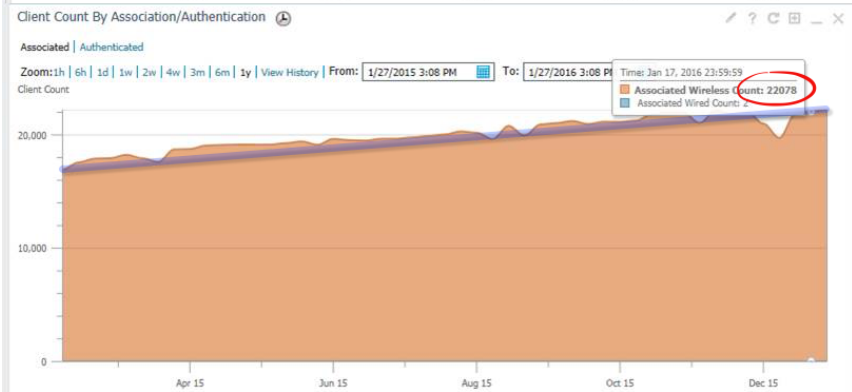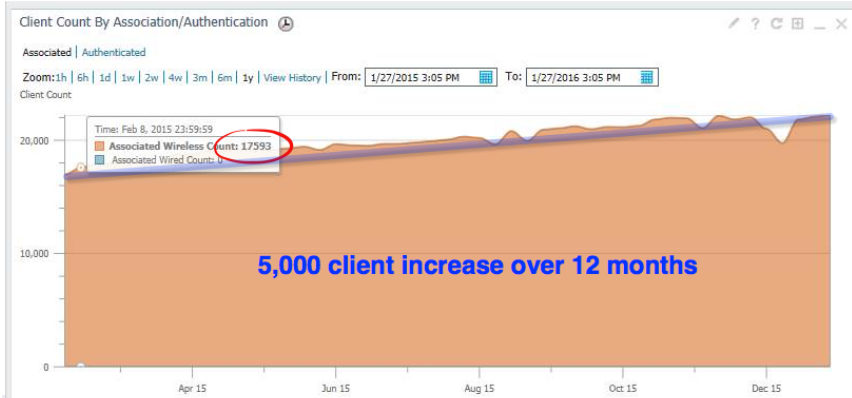
	Thu Jun 30 23:59:59 CDT 2016	47805	
	Weekday Average	46799	
	Weekend Average	23044	

Total Client Count
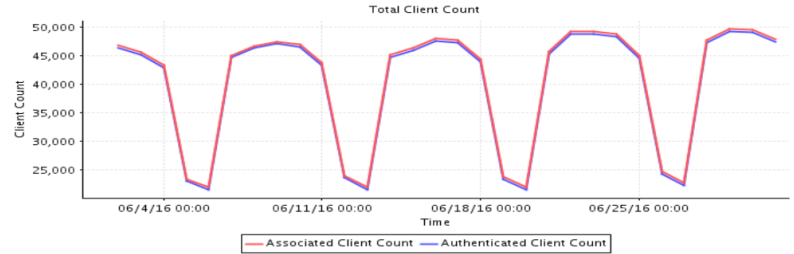
Polling Question 1

Have you considered deploying an all wireless office?

A. Yes

B. No

.

What does a Wi-Fi guy look like?
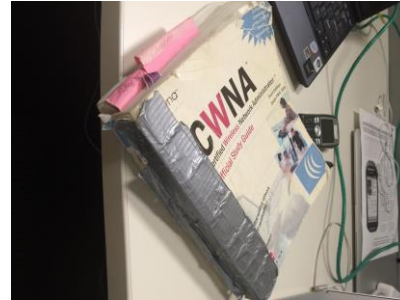
Goal

Take away 2 things you didn't know before and this session was a success!

What does Wi-Fi stand for?

"Wi-Fi doesn't stand for anything. It is not an acronym. There is no meaning.”

- Phil Belanger, a founding member of the Wi-Fi Alliance

The last 5 years Wi-Fi engineers roles have changed

BYOD, IoT, ISE, CLEARPASS, WAYFINDING and more ….

"Users are quick to blame your Wi-Fi network if a crappy application or devices doesn't operate to their expectations."

"The connection between the Wi-Fi client and the Wi-Fi access point is only a small part of the overall network *communication, but in terms of Wi-Fi reliability it is the most important."*

Designing prerequisites for effective Wi-Fi network designs

Defining requirements
User requirements
Device requirements
Application requirements
Data, voice, location
High density requirements
Ultra high density requirements
2.4 GHz / 5 GHz requirements
Future growth requirements

Understanding Basic Fundamentals

- Wi-Fi will get blamed for device and application short falls
- Wi-Fi is half duplex medium
- Anyone can deliver a green map for coverage
- Our own access points cause the most interference on todays wireless networks CCI/CCC
- 1st, 2nd, 3rd AP coverage
- Roaming 802.11
- Roaming 802.1X
- 2.4 / 5 GHz WLANS
- Mitigating neighboring access points

Understanding Basic Fundamentals

HALLWAY DESIGN "Why its bad"
Room Placement 25mW

Understanding Basic Fundamentals

1ˢᵗ, 2ⁿᵈ , 3ʳᵈ

| 1ˢᵗ AP coverage | 1ˢᵗ AP coverage | 1ˢᵗ AP coverage | 1ˢᵗ AP coverage | 1ˢᵗ AP coverage |

14 dBm   11 dBm   8 dBm   5 dBm   2 dBm

| 2ⁿᵈ AP coverage | 2ⁿᵈ AP coverage | 2ⁿᵈ AP coverage | 2ⁿᵈ AP coverage | 2ⁿᵈ AP coverage |

Understanding Basic Fundamentals

1st, 2nd, 3rd

| 3rd AP coverage
Power Level 1 (14dBm) | 3rd AP coverage
Power Level 2 (11dBm) | 3rd AP coverage
Power Level 3 (8dBm) | 3rd AP coverage
Power Level 4 (5dBm) | 3rd AP coverage
Power Level 2 (2dBm) |

14 dBm   11 dBm   8 dBm   5 dBm   2 dBm

Understanding Basic Fundamentals

1st, 2nd , 3rd
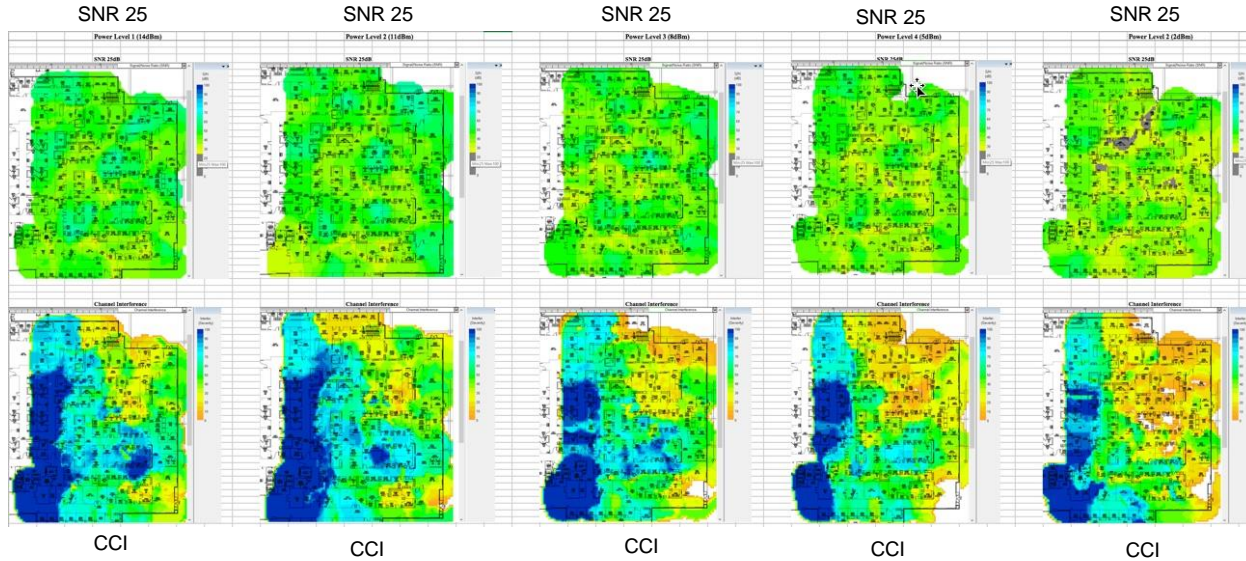
Understanding Basic Fundamentals

Floor to Floor Coverage Bleed -65 RSSI
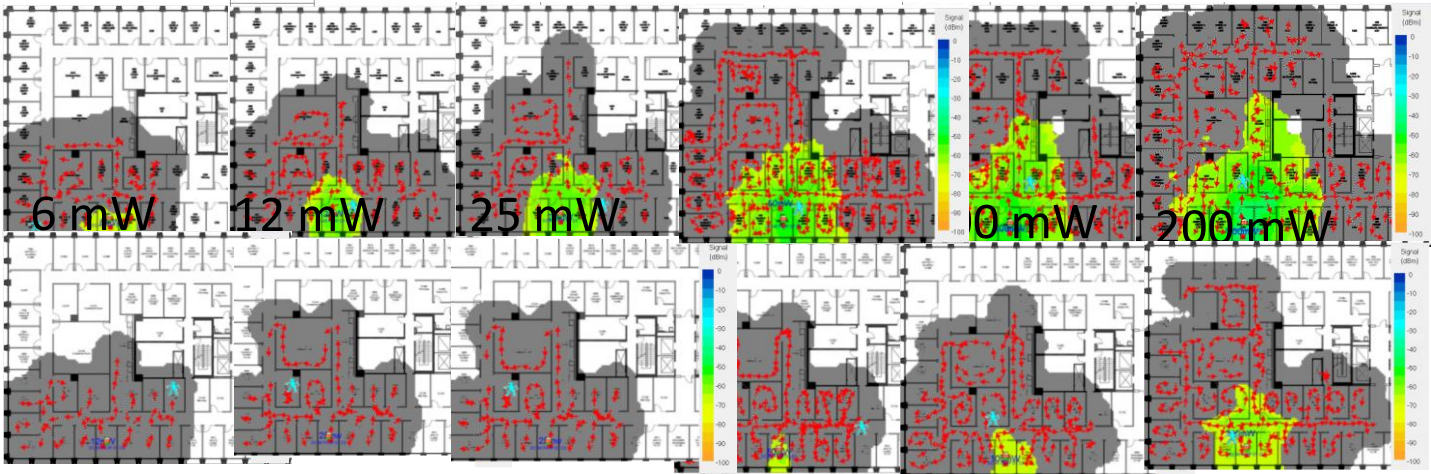
2 Floors Above

Polling Question 2

Do you standardize on wireless NICs for your production devices?

A. Yes.

B. B. No.

Approach on AWO

EPIC Implementation
Lessons Learned to Deploy in the Greater Enterprise
Director Level Directive
Enhance Troubleshooting Skills
Build Bridges with Vendors
Deploying New Tools
Voice and data network supported
* Printers and conference phones have cables

"There are no cables for backup"

AWO DETAILS

3700i
  Local
  Sniffer
  Monitor Mode
40 MH bonding
6205n / 7260ac / 7265ac NICs
Production SSID on 5 GHz
Guest SSID on 2.4 GHz

6 story building (Chase)
  Floor 5 / 6
  Surround by towers
40 access points
(2) 5508
Anchored guest to main enterprise
DMZ
50 cables pulled

AWO DETAILS
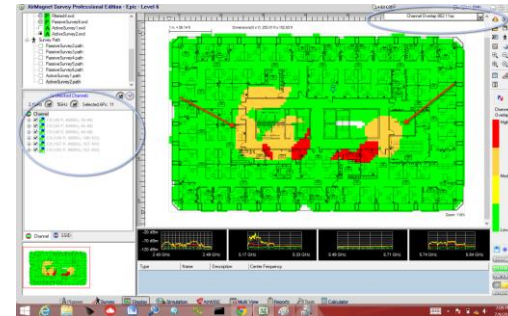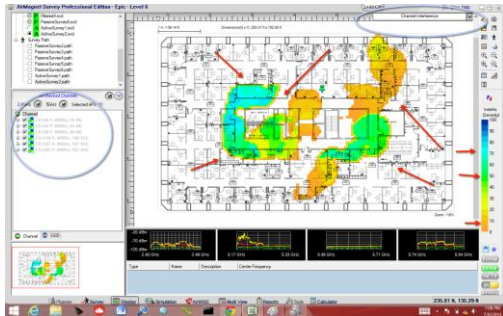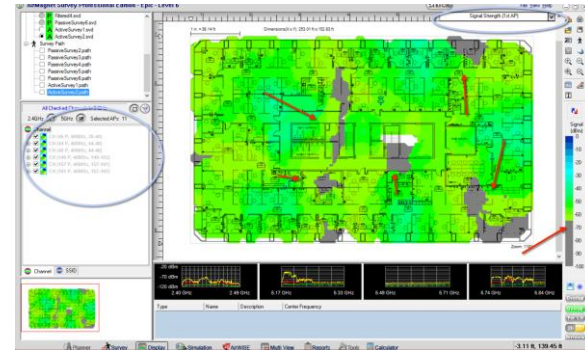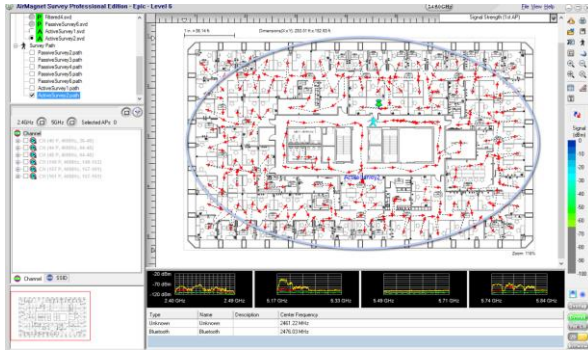
Challenges

User Perception

Management Buy In

Staying in front of issues
    Being visible to users (WiFi takes the engineer out of the cube)
    Take all concerns seriously
    Speak to issues in a way users understand
    Copy users on back and forth emails at times (not all the time; shows progress)
    Ask for feedback; ok to call my baby ugly

Keep management in the loop; no surprises

Cisco 7925 Cradle / Bluetooth issue
Intel (6205 / 7260) issues
Distinguishing WiFi issues from application issues
Setting User Expectations
Device Testing
Driver Testing

Management buy in and support

Management buy in is critical – Its easy to give up and pull a cable when people complain. And they will and they do and they will go to the top.

Initial user apprehension was high.

Communication is key to success. Voice your issues, bugs and concerns.

Staff Education

Critical to have staff that are dedicated to the initial AWO
How to capture and read 802.11 frames
Solid foundation deploying an RF network
Ability to communicate to end users

"WiFi takes the IT professional out of the cube"

Access Point Placement

Creative approach to access point placement to limit CCC/CCI

Initial deployment included typical ceiling mounted access points

- Client count was high on some access points

Limit CCC by limiting TX power and placing access points under desks

Disable respected 2.4 GHz radios

* Disable lower data rates – 12m,24s,36s,48s,54s.

Device Client Driver Issues

80% of WiFi issues are device client related

Standardize on Vendor NIC and Drivers. Control the mass of devices

- Intel
    - 7260
    - 7265
    - 8260
    - 18.20.0.9 driver
- Apple and Surfaces test drivers and understand any issues and set expectations
- Intel relationship
    - Debug driver
    - Quick and responsive to our issues
    - Provides us information about existing bugs and fixes

Device Client Driver Issues

Intel Yellow ! Issue

18.30.x reintroduced this bug. Was fixed in later releases.
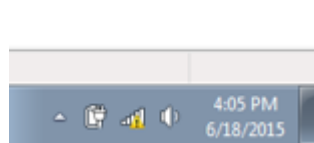
Device Client Driver Issues

Intel UAPSD issue
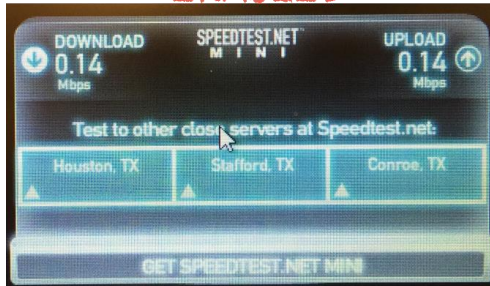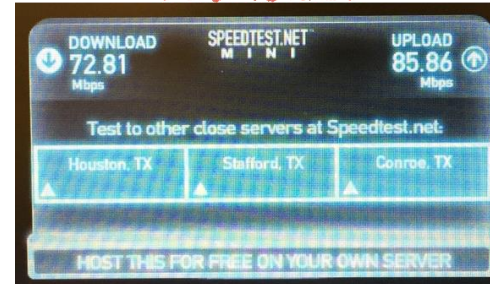
Device Client Driver Issues

Intel sleep issue

AWO – Grading user feedback

Name	17.12.0.4	18.20.0.8	+/-	Cisco WiFi Phone 2014	Cisco WiFi Phone 2015		
	5	9	4	10	10		
	5	8	3	9	9		
	3	8	5	9	9		
	5	9	4	10	10		
	5	9	4	10	10		
	4	8	4	8	8		
	5	9	4	10	10		
	9	9	0	10	10		
	7	9	2	10	10		
	6	10	4	8	8		
	4	8	4	9	10		
	4	8	4	9	10		
	4	8	4	10	10		
	4	7	3	10	10		
	3	10	7	10	10		
	4	10	6	doesn't use phone	doesn't use phone		

Mental Check Box

- Is the RF designed correctly
- Is the configuration optimal
- Was there changes in the network
- Are there access point down

- ASSUME IT'S A DEVICE CLIENT ISSUE

Rounding

ROUNDING IS KEY TO YOUR SUCCESS
Wanted to hide initially
Ask users for first hand accounts
Reproduce the issues
Educate the users on issues and problems found
Distinguish between WiFi, network and application issues

Example – Guest Profile Ordering
Example – Mixed drivers

Blocking Guest On Production Devices

Production 2.4 / 5 GHz WLAN

2.4 GHz – Legacy Clients
5 GHz – 802.11r/k/v support

Planning is key
Testing is important
Educate IT staff
GPO Pushing
Imagining
Good feeling pushing this out to the larger enterprise

Distinguishing Wi-Fi issues from device and application

WiFi engineers need to understand users applications

Build bridges to in-house application experts

Omnipeek and NetScout AirMagnet critical to our success

- Flows
- OTAC
- Omnipeek WiFi Appliance

Device Testing

AVERAGE of Distance UNII 1 : 15dBm		
Device	Client to AP Avg	AP to Client Avg
Cisco 7925	-44.85	-53.45
Zebra MC40	-49.75	-50.75
Honeywell	-53.05	-53.6
iPhone 6 Plus	-55.5	-52.95
Sonim XP700	-53.5	-56.4
iPhone 6s	-56.25	-58.45

Mobile Device Avg (10 ft to 100 ft): UNII -1: 15 dBm
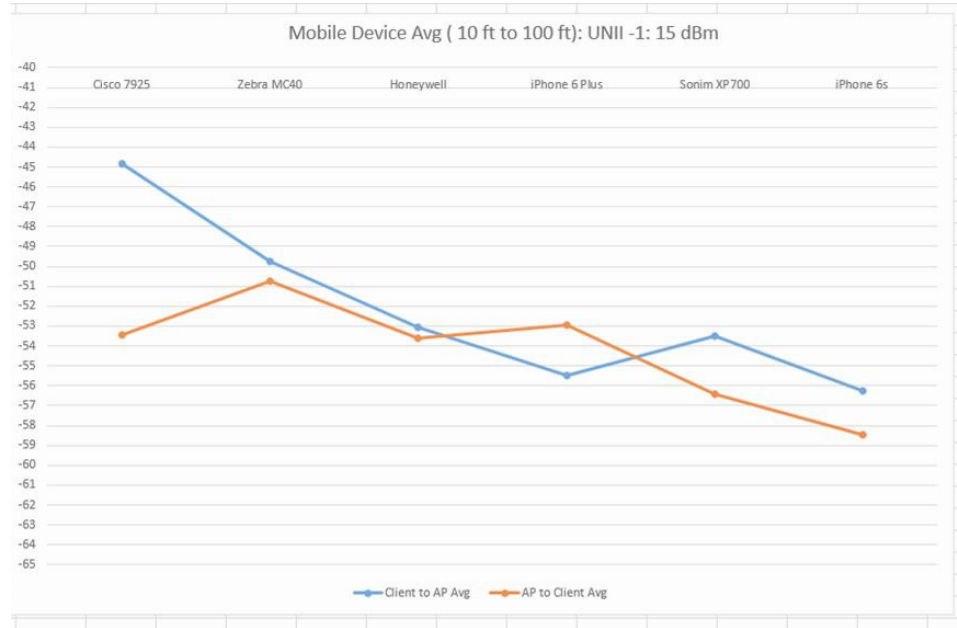
Device Testing

Device Testing
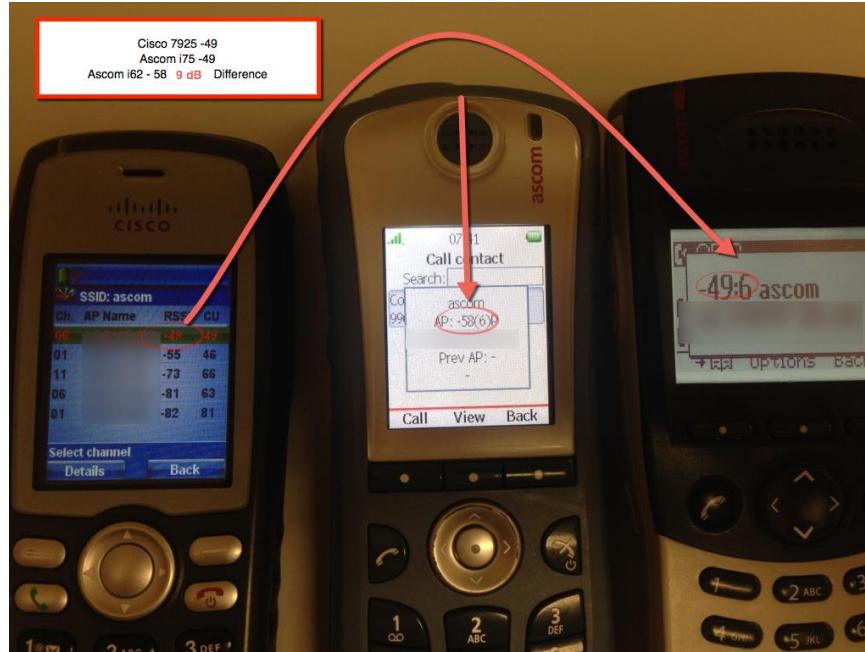
Picking power users

Keep Your Config Simple

Limit your menu selection to help your troubleshooting efforts
- Did not enable band select / band steering
- Disabled session timeout (1800 sec)
- 20 MHz channel widths initially
- Disabled IE (Aironet)
- Lock down RRM (limit channel and power moves)
- Know the impact of what you are enabling. Just because you can doesn't me you should.

Cost savings deploying AWO

P/N	DESC	QTY	EACH COST	TOTAL
WS-C3850-48U-S	Cisco Catalyst 3850 48 Port UPOE IP Base	2	$14,000.00	$28,000.00
CON-SNT-WS3548US	SNTC-8X5XNBD Cisco Catalyst 3850	2	$882.00	$1,764.00
PWR-C1-1100WAC/2	1100W AC Config 1 Secondary Power Supply	2	$1,500.00	$3,000.00
C3850-NM-2-10G	Cisco Catalyst 3850 2 x 10GE Network Module	2	$2,500.00	$5,000.00
AIR-CAP3702I-B-K9	802.11ac Ctrlr AP 4x4:3SS w/CleanAir; Int Ant; B Reg Domain	35	$1,495.00	$52,325.00
AIR-CT5508-50-K9	5508 Series Controller for up to 50 APs	1	$22,495.00	$22,495.00
CON-SNT-CT5508	SNTC-8X5XNBD 5508 Series Controller for up to 50 APs	1	$2,924.00	$2,924.00
L-PI2X-LF-N-50	Prime Infrastructure 2.x - Lifecycle - 50 Device Lic-NNL	1	$5,295.00	$5,295.00
CON-ECMU-LPI2XL50	SWSS UPGRADES Prime Infrastructure 2.x - Lifecycle - 5	1	$1,059.00	$1,059.00
R-PI22-SW-K9	Prime Infrastructure 2.2 Software	1	$25.00	$25.00
CON-ECMU-P122SW	SWSS UPGRADES Prime Infrastructure 2.2 Software	1	$5.00	$5.00
L-PI2X-N-BASE	Prime Infrastructure 2.x Base License, No Node Lock	1	$95.00	$95.00
CON-ECMU-LPI2XNBS	SWSS UPGRADES Prime Infrastructure	1	$19.00	$19.00
				$122,006.00
Cable Cost	Cable Runs	45	$325.00	**$14,625.00**
				$136,631.00

P/N	DESC	QTY	EACH COST	TOTAL
WS-C3850-48U-S	Cisco Catalyst 3850 48 Port UPOE IP Base	7	$14,000.00	$98,000.00
CON-SNT-WS3548US	SNTC-8X5XNBD Cisco Catalyst 3850	7	$882.00	$6,174.00
PWR-C1-1100WAC/2	1100W AC Config 1 Secondary Power Supply	7	$1,500.00	$10,500.00
C3850-NM-2-10G	Cisco Catalyst 3850 2 x 10GE Network Module	7	$2,500.00	$17,500.00
AIR-CAP3702I-B-K9	802.11ac Ctrlr AP 4x4:3SS w/CleanAir; Int Ant; B Reg Domain	35	$1,495.00	$52,325.00
AIR-CT5508-50-K9	5508 Series Controller for up to 50 APs	2	$22,495.00	$44,990.00
CON-SNT-CT5508	SNTC-8X5XNBD 5508 Series Controller for up to 50 APs	1	$2,924.00	$2,924.00
L-PI2X-LF-N-50	Prime Infrastructure 2.x - Lifecycle - 50 Device Lic-NNL	1	$5,295.00	$5,295.00
CON-ECMU-LPI2XL50	SWSS UPGRADES Prime Infrastructure 2.x - Lifecycle - 5	1	$1,059.00	$1,059.00
R-PI22-SW-K9	Prime Infrastructure 2.2 Software	1	$25.00	$25.00
CON-ECMU-P122SW	SWSS UPGRADES Prime Infrastructure 2.2 Software	1	$5.00	$5.00
L-PI2X-N-BASE	Prime Infrastructure 2.x Base License, No Node Lock	1	$95.00	$95.00
CON-ECMU-LPI2XNBS	SWSS UPGRADES Prime Infrastructure	1	$19.00	$19.00
				$238,911.00
Cable Cost	Cable Runs	335	$325.00	**$108,875.00**
				$347,786.00

P/N	DESC	QTY	EACH COST	TOTAL
WS-C3850-48U-S	Cisco Catalyst 3850 48 Port UPOE IP Base	13	$14,000.00	$182,000.00
CON-SNT-WS3548US	SNTC-8X5XNBD Cisco Catalyst 3850	13	$882.00	$11,466.00
PWR-C1-1100WAC/2	1100W AC Config 1 Secondary Power Supply	13	$1,500.00	$19,500.00
C3850-NM-2-10G	Cisco Catalyst 3850 2 x 10GE Network Module	13	$2,500.00	$32,500.00
AIR-CAP3702I-B-K9	802.11ac Ctrlr AP 4x4:3SS w/CleanAir; Int Ant; B Reg Domain	35	$1,495.00	$52,325.00
AIR-CT5508-50-K9	5508 Series Controller for up to 50 APs	2	$22,495.00	$44,990.00
CON-SNT-CT5508	SNTC-8X5XNBD 5508 Series Controller for up to 50 APs	1	$2,924.00	$2,924.00
L-PI2X-LF-N-50	Prime Infrastructure 2.x - Lifecycle - 50 Device Lic-NNL	1	$5,295.00	$5,295.00
CON-ECMU-LPI2XL50	SWSS UPGRADES Prime Infrastructure 2.x - Lifecycle - 5	1	$1,059.00	$1,059.00
R-PI2X-SW-K9	Prime Infrastructure 2.2 Software	1	$25.00	$25.00
CON-ECMU-P122SW	SWSS UPGRADES Prime Infrastructure 2.2 Software	1	$5.00	$5.00
L-PI2X-N-BASE	Prime Infrastructure 2.x Base License, No Node Lock	1	$95.00	$95.00
CON-ECMU-LPI2XNBS	SWSS UPGRADES Prime Infrastructure	1	$19.00	$19.00
				$352,203.00
Cable Cost	Cable Runs	635	$295.00	**$187,325.00**
				$539,528.00

Taking what we learned at AWO and deploying to the greater enterprise

Polling Question 3

Do you have a mental check box that your wireless design and configuration is optimal?

A. Yes

B. No

Ready To Deploy AWO?

Management support
Standardize on your device clients and drivers
Golden config (keep it simple)
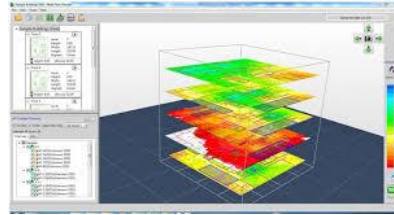Proper RF design
Test your network
Get in front of issues
Pick power users
Education

Tools!

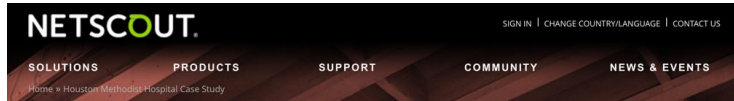# Tools!

Clients and what they support

WiFi Client Capabilities : List

Device/Chipset	Version	CC	36	40	44	48	52	56	60	64	100	104	108	112	116	120	124	128	132	136	140	144	149	153	157	161	165	SS	.11	MU-MIMO	Max Tx (dBm)	.11w	Cap.Chan.	Notes/Exceptions
Amazon Echo		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	n	N/A	11	N	36	
Amazon Fire Phone		US	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	1	ac		30	N	149	Unlocked
Amazon Fire TV		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac		7	N	52	
ATV 3rd Gen		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y							
Centrino7260AC	Windows	EU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac		15	N	100	Measured in EU domain. A
Chromebook - Acer C7	C710-2847	US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	2	n	/	20	N	36	
Chromebook - Lenovo 11e		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac		22	N	112	
Chromecast 2		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y*	Y	Y	Y	Y	Y	1	ac		20	N	36	Advertised 144 as not supp
Chromecast Audio		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	1	ac	N	20	N	?	
Dell Venue 8	7840	US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	1	ac	N	/		48	
HP EliteBook Folio	9470m	US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	2	n	/	15	N	36	
HP zBook 15inch		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	2	n	/	10	N	36	
HTC One		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	?						
HTC One(M8)		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	1	ac		17	?	36	Does not advertise RSN ca
Intel 7265	3.16.0-49-gene	US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac		22	N	36	Linux OS
Intel 7260	3.16.0-49-gene	US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac		22	N	26	Linux OS
iMac 5K		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	3	ac			?	36	Advertises max Tx of 224
Ipad2 (Retina)	8	EU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	/	/	/	/	/	/	/	/	1	n	/	25	N	100	
iPad 3		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	1	n	/	24	?	36	Does not advertise RSN C
iPad Air		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	2	n	/		?	36	Advertises max Tx of 230
iPad Mini 2		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y							
iPad Pro		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac	?		N	157	Advertises max Tx of 224
iPhone 5s		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	1	n	/	22	N	149	
iPhone 6		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	ac		18	?	149	Does not advertise RSN ca
iPhone 6S		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac	N	19	N	52	
iPhone 6S+		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac	N		N		
LG G3		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	1	ac		30	N	149	
MBA (Mid-2011)		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	2	n	/	15	?	36	Does not advertise RSN ca
MBA (Early-2014)		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac			N	112	Advertises max Tx of 224
MBP-Retina (Mid-2012)		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	3	n	/		?	36	Advertises max Tx of 224
MBP-Retina (Mid-2014)		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	3	ac				36	
Microsoft Lumia 950		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	ac	Y	25	N	52	
Microsoft Surface Pro2		US	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	2	n	/	12	N	149	this article sais "no" but as

https://docs.google.com/spreadsheets/d/1qwsQgTKH1lSD3AVRVpifWDKLmWvVsCDo1F-VmINX9f8/pubhtml

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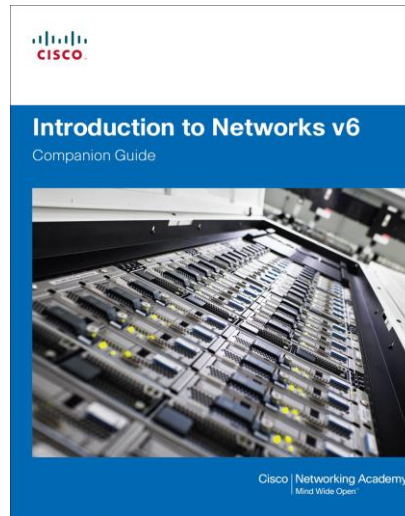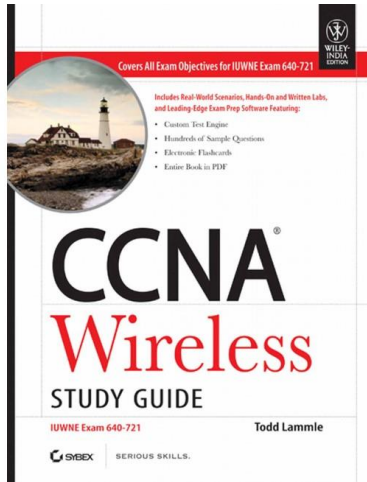https://cisco.com/go/techseminars

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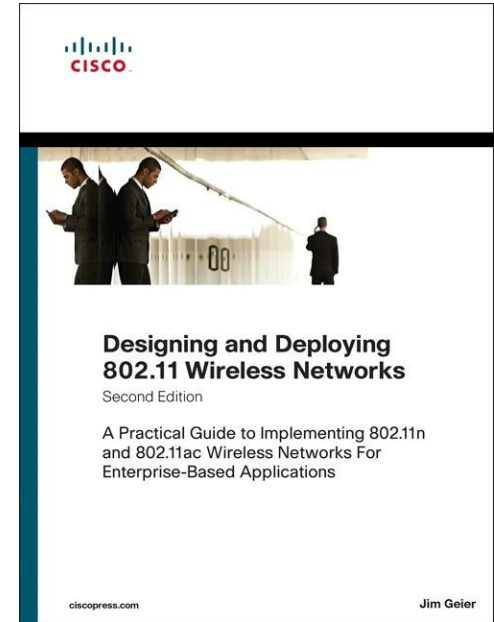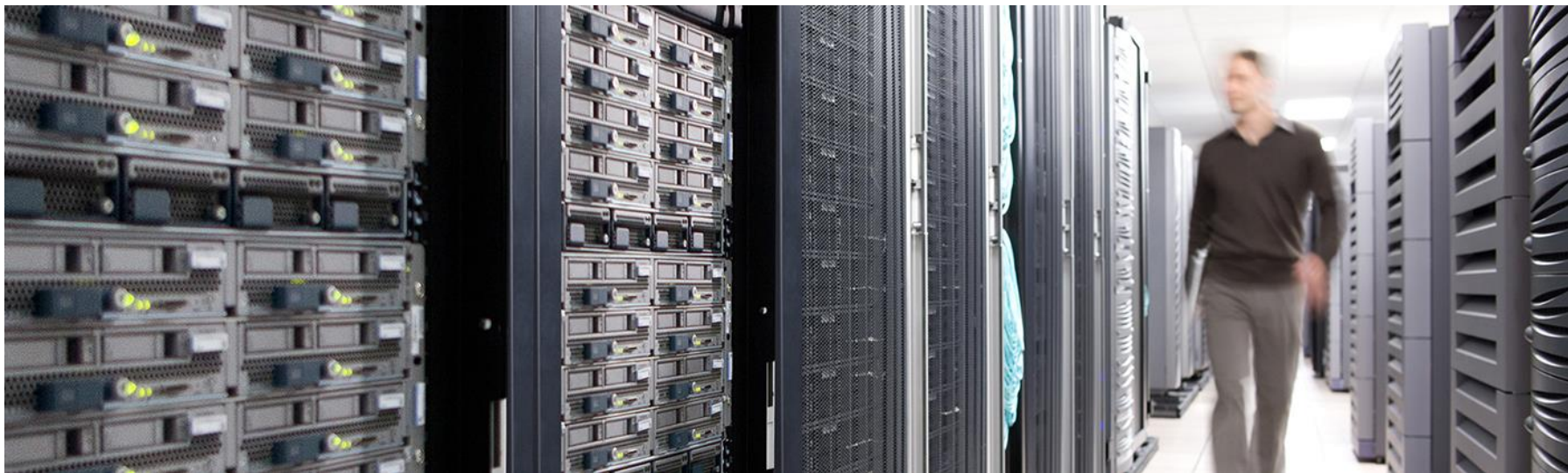. **Redeem your 35% discount offer** by entering **code: CSC** when checking out:

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