

# Section Four: Trouble

*There's Always Trouble. Always.*

Trouble Comes In Many Forms

# Trouble Types

- ✦ Interference Trouble - Is Your Science Oven Broken?
- ✦ Network Trouble - Are You Monitoring?
- ✦ Controller Trouble - Is Your Controller Up To Snuff?
- ✦ Other Trouble - What Else Should You Look For?

What Does Trouble Look Like?

# Interference?

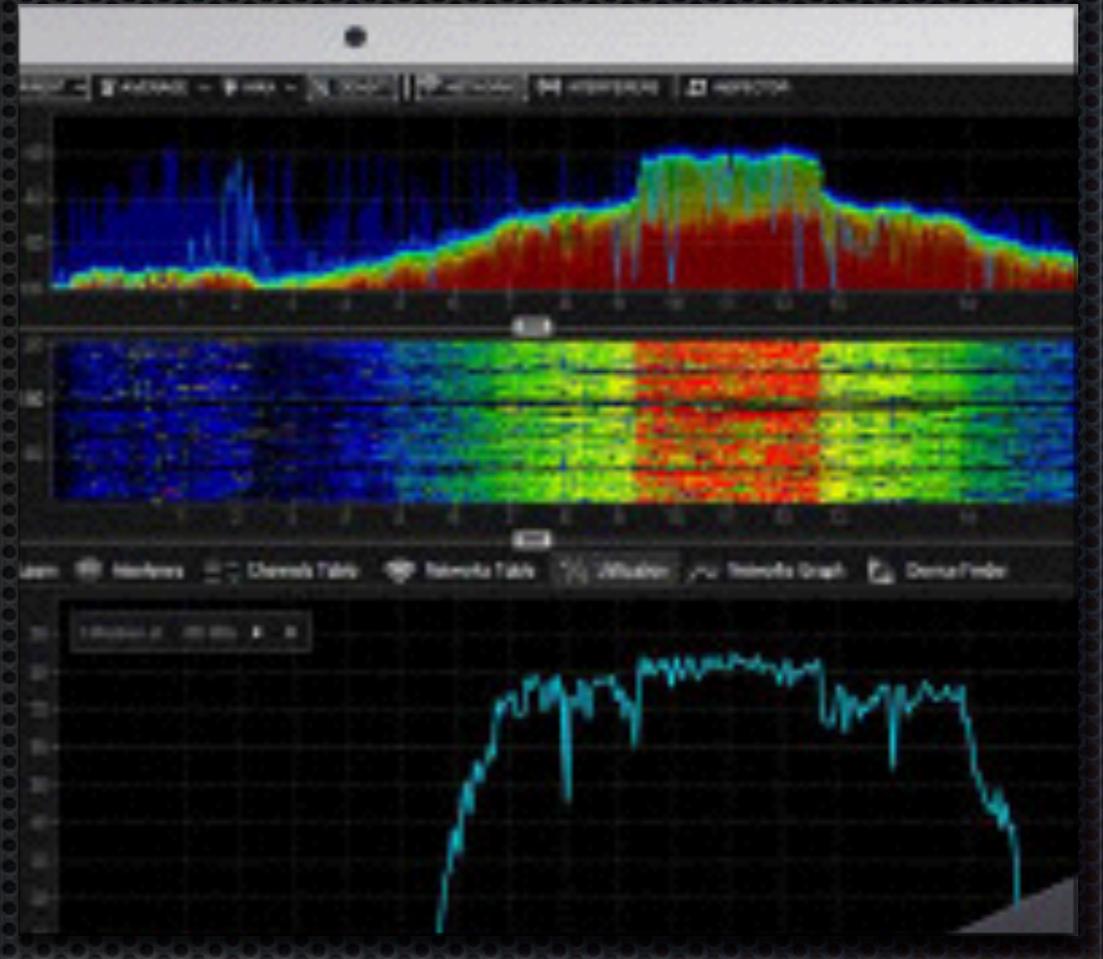
- ✦ Broad Spectrum Interference?
- ✦ Co-channel Interference?
- ✦ How can you tell?

# Useful Tools

- ✦ RF Signal Analyzer (Wi-Spy)
- ✦ Heat Mappers
- ✦ <http://www.metageek.com>
- ✦ <http://www.netspotapp.com>

# RF Analysis

Match the Pattern,  
Find the Source.



# Heat Mapper

Find Your Problems,  
Track the Changes.



Map Your Network.

# A Brief Aside About CoreWLAN

# Demo: NetSpot Visualization

# Network

- ✦ Throughput Problems
- ✦ Protocol Problems
- ✦ Latency Problems
- ✦ Other Problems

# Split-Half Testing for Wi-Fi

- ✦ Check Your IP Stack (Are you in the “right” place?)
- ✦ Check Traffic to the Access Point (Interference Check)
- ✦ Check Traffic to the Switch (AP Overload Check)
- ✦ Check Traffic to the Router (Network Overload Check)

# IP Stack Problems

- ✦ DHCP out of leases?
- ✦ VLAN Assignments correct?
- ✦ No Route To Host?
- ✦ IPv4/IPv6?

# Controller/Access Point

- ✦ AP Mis-Assignment
- ✦ Channel Problems
- ✦ Physical Interference
- ✦ Transient Interference

OS/Type	Host Name	User/IP	Role	Access Point	WLAN	Access VLAN	Channel	Radio	Signal
d:2b Android	Chromecast	10.1.10.11		SDupont1	wifi	1	8	802.11b/g/n	64%
9:19 iOS	coves-iPad	10.1.10.16		SDupont1	wifi	1	149	802.11a/n	47%
2:c0 Mac OS X	elainehcomputer	10.1.10.137		Front	wifi	1	149	802.11a/n	74%
d:d2 Android	android-eb4fe516050be56e	192.168.1.161		Rosslyn_1	wifi	1	36	802.11a/n/ac	54%
d:01 iOS	Hassans-iPhone	10.1.10.139		Front	wifi	1	149	802.11a/n	59%
5:6f Windows (Mobile) 8	coveHill	10.1.10.15		SDupont1	wifi	1	8	802.11b/g/n	77%
2:6b iOS	coves-iPad	10.1.10.16		1990 K St	wifi	1	36	802.11a/n	89%
6:91 iOS	jogi	192.168.1.244		Rosslyn_1	wifi	1	11	802.11b/g/n	94%
7:80 Mac OS X	joannas-MBP	192.168.1.245		Rosslyn_1	wifi	1	36	802.11a/n	99%
0:92 Mac OS X	coves-Air	192.168.1.7		Rosslyn_1	wifi	1	36	802.11a/n/ac	69%
2:bd Windows (Mobile) 8	cove	10.1.10.50		Front	wifi	1	3	802.11b/g/n	99%
a:aa Mac OS X		10.1.10.140		SDupont1	wifi	1	8	802.11b/g/n	94%
2:d1 Windows (Mobile) 8	cove-k-st	10.1.10.13		1990 K St	wifi	1	11	802.11b/g/n	77%
d:88 iOS	ElaineHnsiPhone	10.1.10.136		Front	wifi	1	149	802.11a/n	79%
9:76 iOS	coves-iPad	192.168.1.155		Rosslyn_1	Rosslyn 1	1	11	802.11b/g/n	99%
4:12 iOS	iPhone	10.1.10.139		SDupont1	wifi	1	8	802.11b/g/n	87%
c:23 Windows (Mobile) 8	JOHN-SANDERS	10.1.10.26		Rear	wifi	1	9	802.11b/g/n	72%
f:31 iOS	aPhone	192.168.1.34		Rosslyn_1	wifi	1	36	802.11a/n	87%
5:1b Windows (Mobile) 8	cove	192.168.1.154		Rosslyn_1	Rosslyn 1	1	11	802.11b/g/n	77%

Include all terms
  Include any of these terms

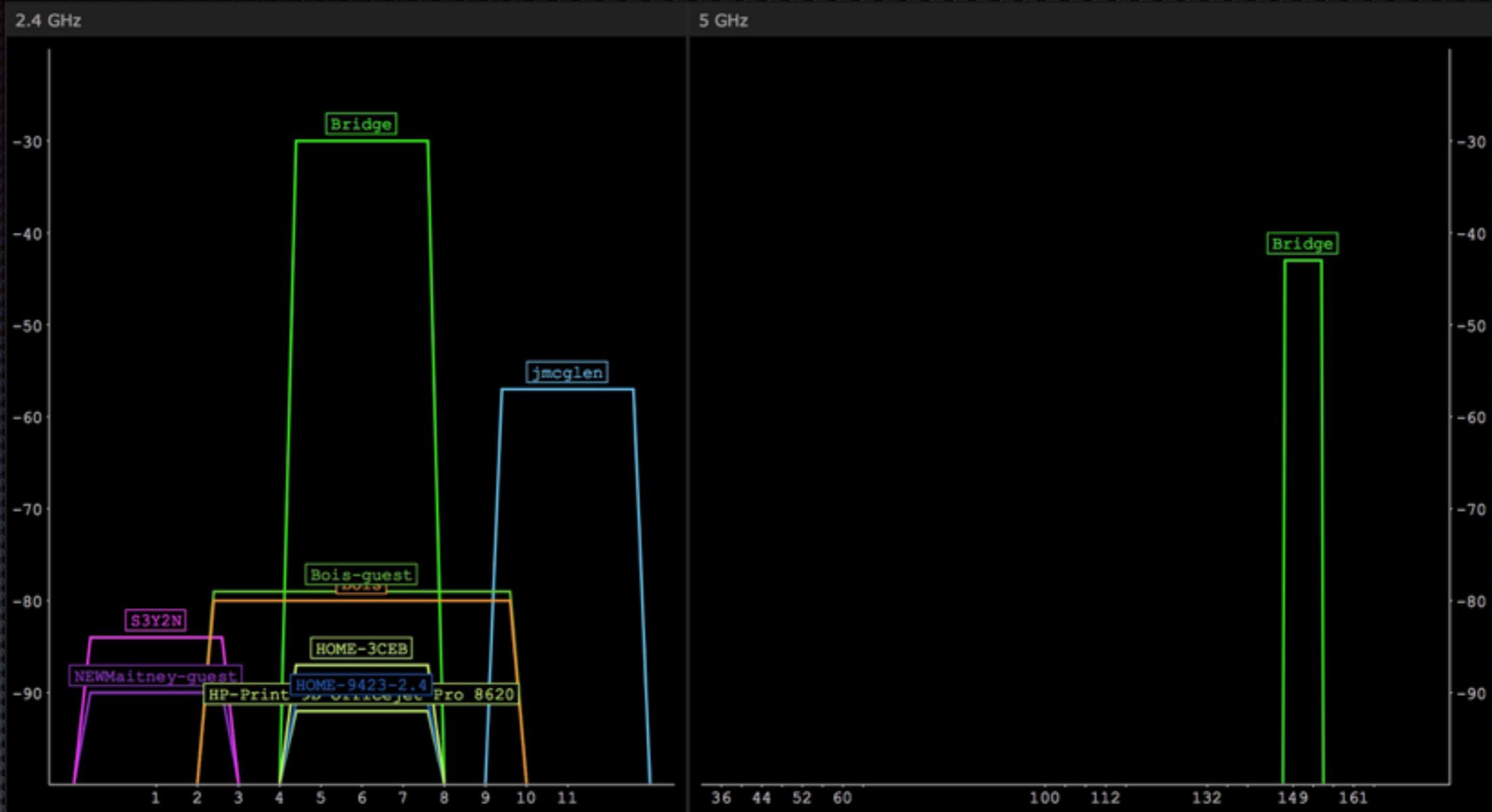
# Use Your Controller

It's a tool designed to help you manage your clients and access points

Network Name	BSSID	Vendor	Signal
Bridge	24:C9:A1:00:...	Ruckus Wireless	89%
Bois	48:F8:B3:75:...	Linksys	33%
S3Y2N	18:1B:EB:C2:...	Actiontec Electroni...	25%
Bois-guest	4E:F8:B3:75:...		33%
jmcglen	20:AA:4B:E1:...	Linksys	62%
xfinitywifi	8A:F7:C7:D2:...		
HOME-3CEB	88:F7:C7:D2:...	Technicolor USA Inc.	11%
HP-Print-9D-Officejet Pr...	6C:C2:17:1C:...	Hewlett-Packard C...	11%
Bridge	24:C9:A1:00:...	Ruckus Wireless	14%
xfinitywifi	74:85:2A:BF:...	PEGATRON CORP...	
NEWMaitney-guest	48:F8:B3:1C:...	Linksys	41%
NEWMaitney	48:F8:B3:1C:...	Linksys	11%
HOME-9423-2.4	74:85:2A:BF:...	PEGATRON CORP...	

# Wireless Scanning

See who else is broadcasting, without big bucks



Visual Representations Matter  
 See the networks you're up against.

# AP Position Matters

# AP Position Guidelines

- ✦ They vary by antenna type and provider, so read your manuals and think about the physics
- ✦ Up is better
- ✦ Unobstructed is better
- ✦ Closer to your people is better
- ✦ Omnis aren't *\*always\** omni.

# Demo: Materials Attenuation

# Demo: Distance-based Attenuation

# Demo: Co-Channel Interference

# Demo: Contention & Cooperation

# Vendor Open Forum

# Resources

- Capacity Planner: <http://www.revolutionwifi.net/capacity-planner/?rq=capacity%20planner>
- Density Design Guide: [http://www.aerohive.com/330000/docs/help/english/documentation/Aerohive\\_High-Density\\_Wi-Fi-Design-Config-Guide\\_330073-02.pdf](http://www.aerohive.com/330000/docs/help/english/documentation/Aerohive_High-Density_Wi-Fi-Design-Config-Guide_330073-02.pdf)
- WLAN Pros: <http://www.wlanpros.com/>

# Resources

- ✦ Tom's Hardware: <http://www.tomshardware.com/picturestory/571-wi-fi-beamforming-networking.html>
- ✦ Tom's Hardware: <http://www.tomshardware.com/reviews/wi-fi-performance,2985.html>
- ✦ Wi-Fi Stress Report: <http://wlanpros2.project.ihelphosting.com/WiFiStressTestReport>
- ✦ CWNA Guide to Wi-Fi: <http://www.amazon.com/CWNA-Guide-Wireless-LANs-Ciampa/dp/1133132170>

# Resources

- Apple iOS Deployment Guide: [https://manuals.info.apple.com/MANUALS/1000/MA1685/en\\_US/ios\\_deployment\\_reference.pdf](https://manuals.info.apple.com/MANUALS/1000/MA1685/en_US/ios_deployment_reference.pdf)
- Apple Mac OS X Deployment Guide: [http://training.apple.com/pdf/tg\\_osx\\_tech\\_deploy\\_reference.pdf](http://training.apple.com/pdf/tg_osx_tech_deploy_reference.pdf)