



# WLANs = Counterintuitive

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This week we'll be talking about some of the counter intuitive issues concerning Wireless LANs.

### counterintuitive

**A** *adjective*

**1** **counterintuitive**

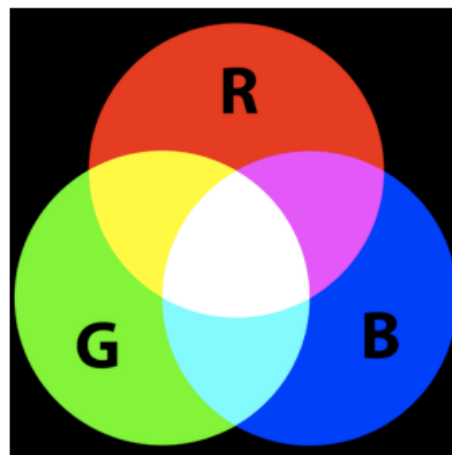
*contrary to what common sense would suggest*

Many things in life are simple, easy, and just make sense. Take simple arithmetic. Two plus Two will equal Four. Easy to understand, a simple calculation. In our world of computer networks, there are other simple ideas. For example, look at the 'Link Light' on an Ethernet NIC. If the link light is off, we know where to look to solve the problem. (Physical Layer) But if the Link Light is on, we know to look up the stack for the issue causing a networking problem.

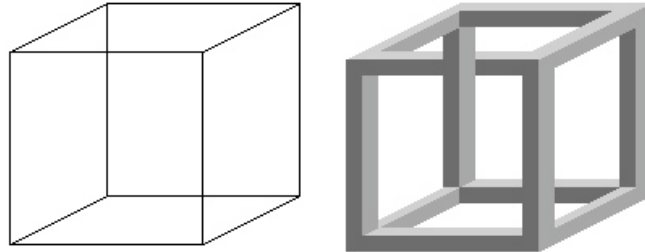
Our minds like to think about simple things. Things that can be easily understood. But all things in our lives aren't always as easy or as understandable as we'd like.

Our minds like to think about simple things. And so often times our initial, or intuitive, reactions are wrong.

On the surface, we think one thing, then as we come across empirical evidence, we soon learn our initial, might I say "intuitive" reactions were wrong. Check out the following graphic of 'additive' colors. Without actually seeing the results, your first reaction might not be that White is the result of mixing all those other colors together.



Other times, in other situations, our perceptions can tend to distort reality. We have to look hard, and study well to make sure we really understand what is going on. The 802.11 protocols can be quite complex, and vendors have been given lots of latitude in their implementations, so a strong background in the fundamentals will help see through the vendor-hype. In the following graphic, the line drawing on the left suggests a box that is coming toward the viewer, or perhaps the box has its opening on the top. What do you see? (the box on the right is there just to mess with your mind)



You must be prepared for counterintuitive aspects within Wireless LANs.

There are many things that are counterintuitive with respect to Wireless LANs and Wireless LAN Professionals need to be prepared for them. The initial first intuitive reactions will lead you to failure. So pay attention, and let's talk through some of these counter intuitive issues.

This is by no means an exhaustive list, just something to get you started.



By the way, it's not just Wireless LANs that have counter intuitive issues...

### **On to our lists of counter intuitive issues with Wireless LANs -**

- Add more overhead, decrease throughput
- More RSSI the better
- I can see 16 APs from here, I've got great signal
- VLANs on Wireless LANs separate collision domains
- The Noise function in Wireless NICs will show us ambient RF issues
- We need a different SSID for each purpose in our network, our system supports up to 16
- If you point your antenna right at the signal source it will work better
- We designed our Wireless LAN for Voice, Video, Data, Bar-Code Scanners, and Location Tracking

- 802.11n actually typically decreases collisions and retries to get higher throughput
- We just installed 802.11n, we'll get 300Mbps throughput
- Multipath is good
- Multipath is bad
- We use Windows Zero Config, it gives us everything we need
- The latest wireless drivers is all you need to fix the problem
- The wireless network is responsible for clients deciding to roam
- PoE is just PoE – they are all the same
- They wouldn't have let us configure AP to Channel 2 if it wasn't alright
- APs are just wireless switches
- We've got great (-65dBm) RSSI everywhere, Voice over IP will run fine on our WLAN
- Those little bar measurements actually reflect reality
- Bigger is better with respect to antennas
- I have four bars, I have good signal, right?
- Its better to have our APs using all channels than 'sharing' only 1, 6, and 11
- The SSID is unsecure so I can use it right?
- AP Power settings from 1 through 10, from LOW to HI, right?
- -90dBm is stronger than -40dBm — 90 is bigger than 40!
- Mb or MB what's the difference... They mean the same thing
- APs route packets on the network
- I turned on QoS so our voice will work on our WLAN
- All our APs are on one channel
- All our APs are on 1, 6, and 11 only
- We like to use channels 1, 4, 8, and 11 to get more throughput
- We're in Europe, so we use 1, 7, and 13 to stay away from all the 1, 6, and 11 people
- By using Wireless Range Extenders we'll share our throughput with more people
- But we have to buy all our equipment from the same vendor
- We can force our neighbors to go to different channels and turn down their power
- More power, more throughput
- We had a problem in this one location, so we added APs to fix it
- Getting RF coverage is hard to do

If you've said any of the above statements, or still believe any of them, I recommend going back to your studies. Setup small lab configurations and try it. I'm a firm believer in empirical evidence. Try these yourself until you can prove to your self the validity or non-validity of the statements.



*Wireless LAN Training/Consulting*

**Keith R. Parsons, CWNE #3**

Managing Director

Institute for Network Professionals

281 South Vineyard Road - #104

Orem, UT 84058-2005

+1 801 223 9444 - office

[keith@inpnet.org](mailto:keith@inpnet.org)

<http://WirelessLANProfessionals.com>

<http://twitter.com/keithrparsons>