WiTuners® for WLAN – What's So Unique about it?

"Software is never finished and the IT department can never keep everybody satisfied." So you've finally reached that point in your career where realism has set in. But that doesn't stop you from keeping your eye open for new tools that might make your job easier.
The network as a whole works pretty well. The routers keep up with traffic, the firewalls have kept the bad stuff out and the good stuff in, and security seems to be adequate for the commercial business you're in. But there's something that is slightly beyond your ability to get a grip on what's really happening in your LAN– wireless.

What Does Wireless Mean, Really?

It sure doesn't mean wires. It doesn't mean the plug and play simplicity of cable and jacks, nor the consistent data rates of cable as long as the router keeps up, and certainly not the slam dunk interoperability of Ethernet protocols.
But wireless does its best to supply an experience of "wires without borders" by implementing standard 802.11 RF and protocols. The Wi-Fi manufacturers really do make hardware that gets along independently of brand. It's just that the complexity and technology limitations add a level of uncertainty to the process. The user (server as well as client) must deal with the vagaries of propagation anomalies, time delay and collision behaviors, and protocol selection (802.11b/a/g/n/…). But the average user or IT professional seldom has the technical expertise to understand all of the protocols, implementation settings, and deployment subtleties associated with wireless.
Hence, if you're in charge of a WLAN (especially a decent sized deployment) you look to your network management system (NMS) to help you out. And it can. But the NMS typically treats only the top level concerns of the WLAN management problems – what frequencies to set for adjacent APs, traffic type, and security. However, there's a lot more that should be controllable (optimized, actually) for the WLAN to perform at its peak. Experience shows that the average WLAN is operating at between thirty to sixty percent of its potential capacity. So, would you rather throw more APs at your system or find a way to optimize what you've already paid for?

Search for Tools

There's quite a bit of software out there to help you accomplish your WLAN management tasks. They range from inexpensive (or free) to very pricey. So, how can you find the one that best meets your requirements? Easy: start with the one that fully addresses WLAN Deployment, Environment, Auditing, and Optimization. That should cover all of your bases, whether they need to be addressed now or in the future. For purposes of comparing features, we'll look at the only one available on the market that does a good job at all of these tasks – WiTuners (available at http://www.wituners.com). You can then evaluate what tools you already have or are thinking about using and do an apples-to-apples tradeoff.
Deployment tools abound. Sure, they're necessary, but they are primarily aimed at the need to estimate the amount of coverage, make preliminary frequency assignments, and configure the specified APs into your network. After the WLAN is in operation, the requirements become much more complex. Deployment tools still keep the APs in a nominal state of operation and the NMS monitoring can advise of bottlenecks and anomalous operation, but neither type of management tool is capable of truly optimizing the WLAN to be all that it's capable of being. To add another dimension to the problem of suboptimal operation, the traffic demands on a WLAN are almost always dynamic and as such, the illusive state of optimum operation becomes

a moving target in time.

What Needs to be Done?

You need to have two measurements of operation within your WLAN in order to have any hope of optimizing performance – *traffic demand* and *WLAN performance*. Traffic is pretty easy; it's the requested service for data, voice, and video applications as a function of time. Performance is more elusive; it's the end user's experience in the consumption of requested traffic, including latency, retries, distortion, and other quality of service (QoS) measures. Indeed, performance is what really matters to the end users of a WLAN so far as having a good experience.

Now, assume that you have somehow obtained measurements of traffic and performance (in real time). What do you do with it? Your NMS can pinpoint bottlenecks, give you histograms of demand versus time, and untold statistics showing which APs have high or low QoS measures throughout the day. Do you buy more APs if traffic is high? What level of traffic? What percentage of the time? Can you retune your APs?

The secret to answering any and all of these questions is to find a true **Performance Based Optimization** tool such as WiTuners. That means that performance is measured and then tuning is performed on the WLAN to optimize network throughput at a correspondingly high level of QoS.

Big Potential Problems

OK, use the NMS to evaluate performance and then tune the APs in some fashion, manually or otherwise. A change is made and the performance either improves or degrades. Hopefully, your IT person has enough real-world experience that it improves more often than not and you're pretty happy. But not always.

There are huge potential problems looming in any WLAN environment. Dynamic traffic (like in a stock exchange or conference hall), interference sources that come and go, and propagation anomalies (such as cross traffic interference through an atrium) can wreak havoc on throughput and QoS. What you need is an estimate of how such effects will interact with your WLAN. Then you can choose a strategy to mitigate the problems and move the WLAN toward a more optimal state.

Yes, this is a real challenge hanging over the WLAN industry, but in the meantime it also provides an excellent opportunity for innovation and huge potential for big performance gains. WiTuners has an answer with its ***WiTuners Advanced Wi-Fi Tuning Technology,*** which provides an innovative solution for these issues.

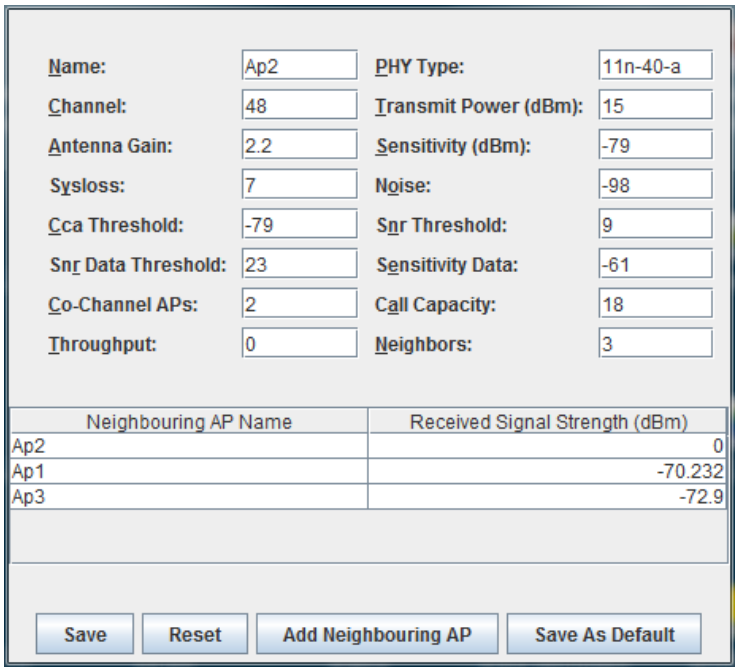
What is the Benefit?

WiTuners' solution ensures that the tuning process does not degrade the real world network. Changes are audited and performance measures are evaluated *before* tuning in the real world is performed. This process is entirely hands off, so it is timely and low cost in terms of labor.

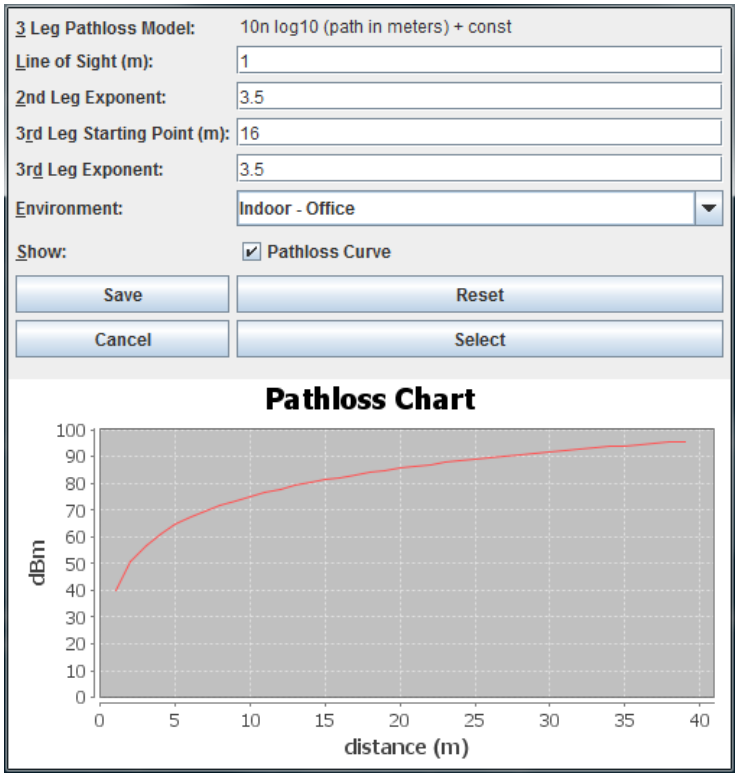
The value to the customer is immediate and of great value. Students streaming into a lecture hall will no longer bring the WLAN to its knees. Prompt adaptations to traffic and propagation effects are guaranteed because the WiTuners network is continuing to mimic the real world network in anticipation of tuning toward optimization. And best of all, your costs to own and maintain a WLAN are kept low. You'll not be as tempted to blindly throw hardware at your WLAN problems and you won't have to keep a WLAN specialist on call to fix glitches in the system.

What Confidence do we have in the Process?

Experience is a great teacher, and WiTuners exhibits it in every aspect of its structure. The developers have implemented a comprehensive suite of elements into the application, based on physical, electromagnetic, media access, and network control principles.



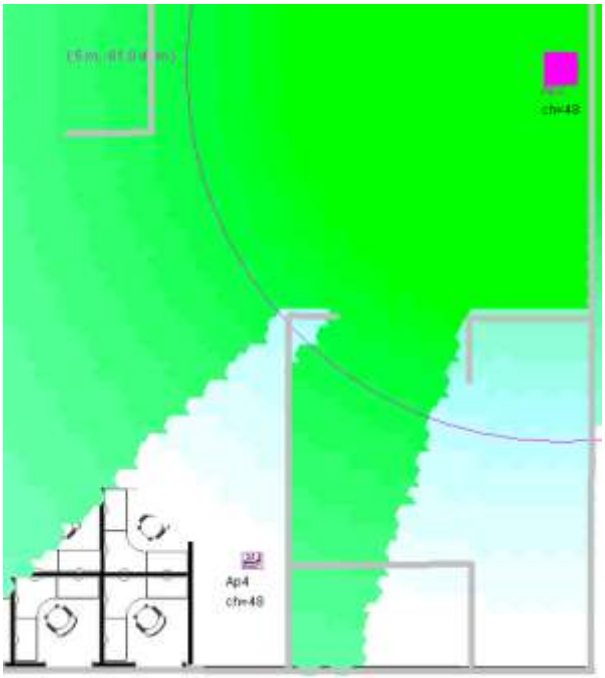
The choices by which the user captures the WLAN design indicate the depth of understanding that contributes to the accuracy of the technology. For example, APs are defined not only by the RF and system definitions, but also by the 3D antenna characteristics and sensitivities.



Likewise, traffic characterization includes data, voice, and video patterns as well as density distributions through the deployment region. The deployment region itself can be specified by a wide variety of propagation characterization, including outdoor, industrial, and office scenarios (all customizable by the user, if desired).

Finally, the deployment map itself is the most comprehensive in the industry. Multi-floors completely characterize AP-to-AP interactions when intervening floors (or no floors at all, such as in an atrium) impose real-world interference on the WiTuners network.

Floors, walls, and architectural obstructions define the propagation (and interference) attributes of the Wi-Fi environment. Desired effects as well as interfering effects are all captured in a realistic manner.



❖ Conclusion

Hence, you can see the uniqueness of WiTuners:

- Easy deployment planning and comprehensive characterization of the WLAN
- True performance based optimization
- Automated, real time, hands-off adaptive tuning of the network
- Automatic verification to preclude degradation to the WLAN

This approach results in a true performance based optimization in real time. It is based on a comprehensive and realistic characterization of the WLAN and its traffic. The solutions are based on physical descriptions of the WLAN environment and verification ensures that the WLAN will not be degraded as tuning is performed.