WiTuners' Rich Feature Set Makes WLAN Easier, Faster and Farther

"If software isn't easy to use, you're not going to use it." That's a lesson you've probably learned the hard way more than once. Worse yet, if your job requires that you perform efficiently, accurately, and at low overhead cost, you'd better make the right decision before committing to any one software product, no matter how feature rich it purports to be.

Looking at various means of going about deploying, auditing, optimizing, and automatically tuning large (and small) WLAN systems out of a wide variety of network deployment and management tools, WiTuners (available from www.wituners.com) stands out for many of its unique features including:

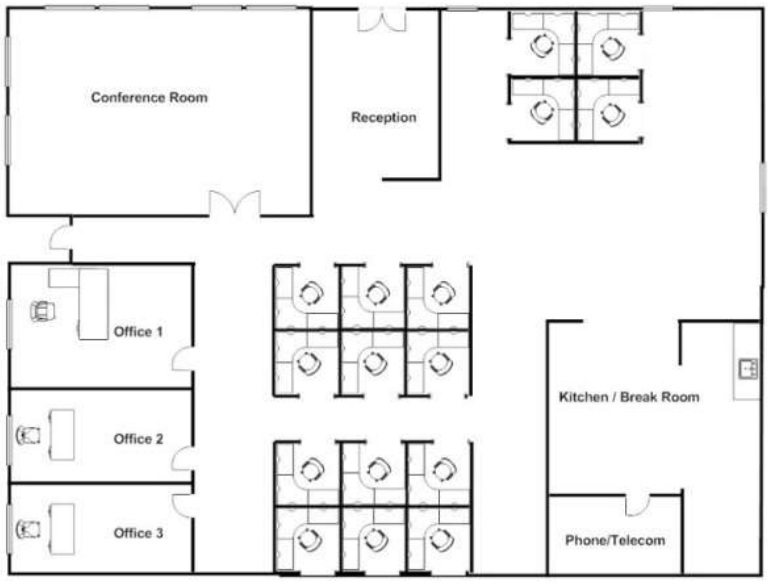
- Easy deployment planning and comprehensive characterization of the WLAN
- True performance based optimization
- Automated, real time, hands-off adaptive tuning of the network
- Automatic verification to preclude degradation to the WLAN

Let's take a look and examine how WiTuners provides all of these valuable strategic features in a user friendly fashion.

❖ Multi-Floor or Not, That is the Question

With any WLAN deployment (or management) tool, you have to capture the overall system architecture. The WLAN system is designed within a fixed operating area of a building, oroutdoors. The goal is to take into account real world conditions in such a way that a high fidelity view of the real world WLAN is retained when providing solutions for WLAN planning, tuning, and optimization. If the fidelity is high, the WLAN deployment and management software has a better chance to drive toward an optimal WLAN operational condition. To realistically take into account essential factors describing a WLAN in the real world, we need to have at least:

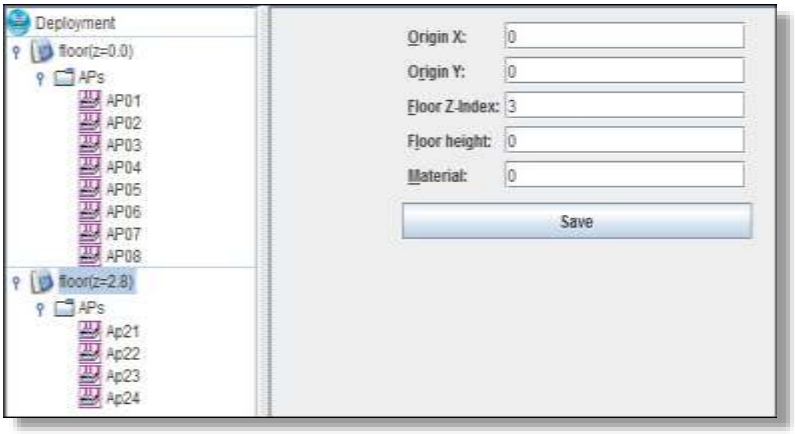
- Walls and Partitions
- Type of Area (Office, Warehouse, …)
- Area within which APs are Located
- AP Technology and Parameters



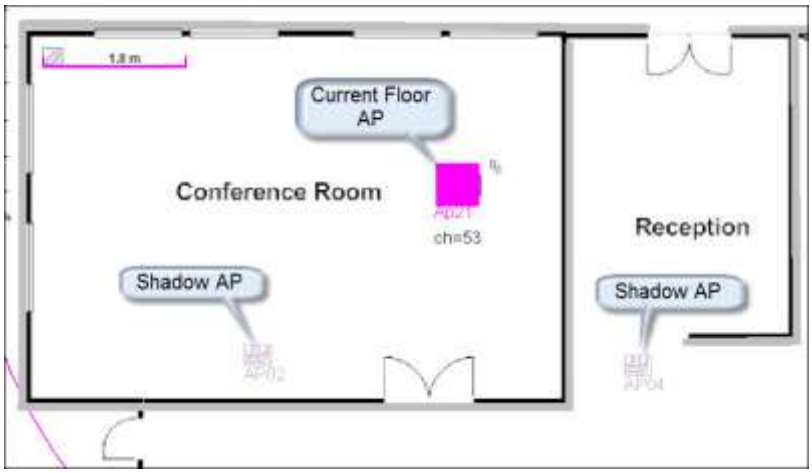
Most deployment planning tools provide a way (usually with a graphical interface) of capturing the majority of these definitions. We are comfortable with this concept since it matches a Cartesian view of the world. We see floor plans in two dimensional terms, since we navigate that way as we walk about on the floor of a building.

But it is this two dimensional thinking that gets us in trouble, since electromagnetic propagation is anything but two dimensional – antennas operate in three dimensions, always. Maybe we rely too heavily on WLAN connectivity maps as well. The familiar spider web of routers, APs, and solid and dotted lines imprint a 2D quality on a 3D world. However, for the real world WLAN, APs see not only their neighbors on the same floor but also those on the floor (or floors) above and below (or across an atrium). The possibilities for interference

and collision in their protocols are endless.
By using WiTuners, the full 3D nature of the network is captured. In this example, two floors are represented in a tree structure (8 APs on one floor and 4 on another). The floors are separated by 2.8m and all propagation characteristics are included in the connectivity (and interference) estimations.



The APs are placed within this 3D structure on a floor by floor basis, with different walls, partitions, and open spaces differing from floor to floor. WiTuners makes it easy to import the separate floor plans and work on them independently, but also collaboratively. The APs are easily added with drag and drop within the operational areas. Their frequencies and other operational characteristics are set to nominal values.



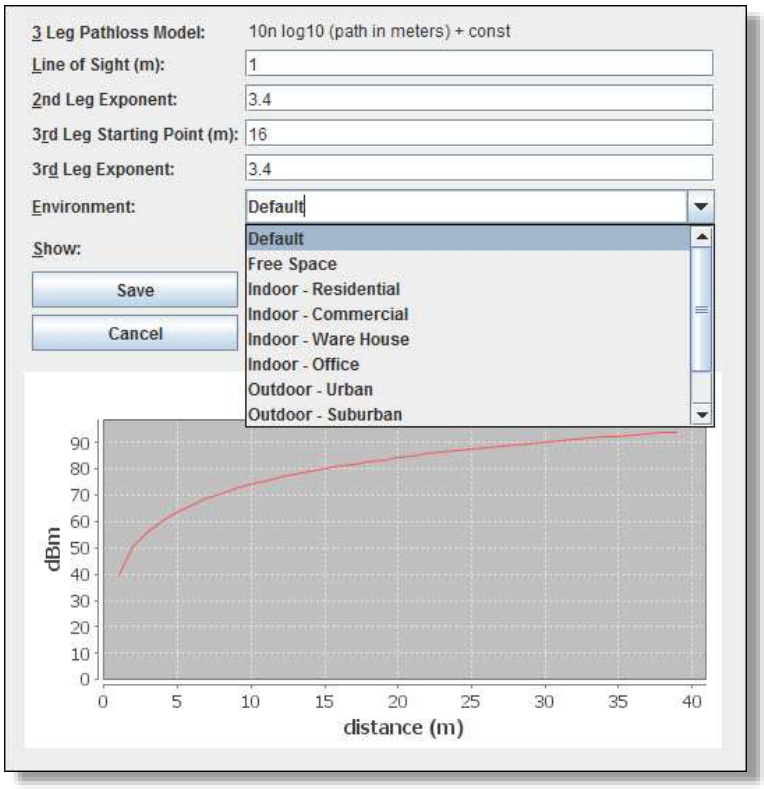
Connectivity and interference are affected not only by the APs on the current floor, but also by APs on floors above and below. These are shown as shadow APs. WiTuners surveys all equipment, floor by floor, taking into consideration its effect on the APs on the floor when assessing connectivity, interference, throughput, and all of the myriad system effects contributing to the operation of the WLAN. Most importantly, these effects are taken into account when auditing and optimizing the operation of the WLAN.

❖ How Much Do I Need to Know?

We've been stressing the importance of fidelity to a real world WLAN. And we've made the case that a 3D or multi-floor representation is necessary. How can you make sure that what you define in the layout is close enough to reality to achieve the desired WLAN operational and optimization results?
WiTuners uses a philosophy of progressive fidelity:

- Define the deployment area and you get a generic layout (coverage)
- Define the environment and hence propagation is considered (office, warehouse, …)
- Define the walls and the losses are better characterized (drywall, concrete, …)
- Define the AP equipment and the protocol fidelity improves (802.11b/g/a/n …)
- Define the antennas and coverage can be fine-tuned (3D patterns, gains)
- Define specific customizable parameters and the WLAN representation is closer yet

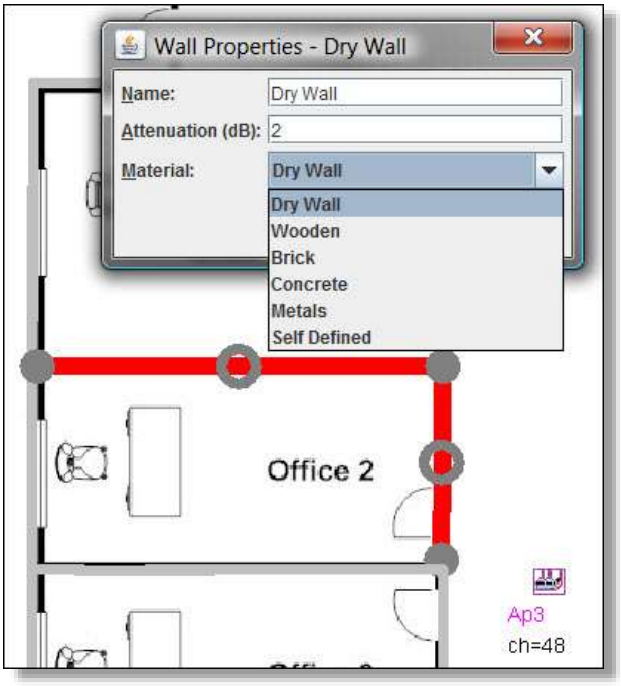
You can start at the top of the list and you have a generic deployment plan. In fact, for some areas (like outdoors) it would work quite well asis. Progress down the list and the deployment plan (as well as the result) gets better and better.



Going through this procedure is straightforward. In fact, WiTuners provides a network planning wizard that leads you through it step by step. Loading a floor plan, setting scale, defining deployment area, AP properties, and propagation environment are all handled by the wizard. And the resultant deployment is ready to be customized.

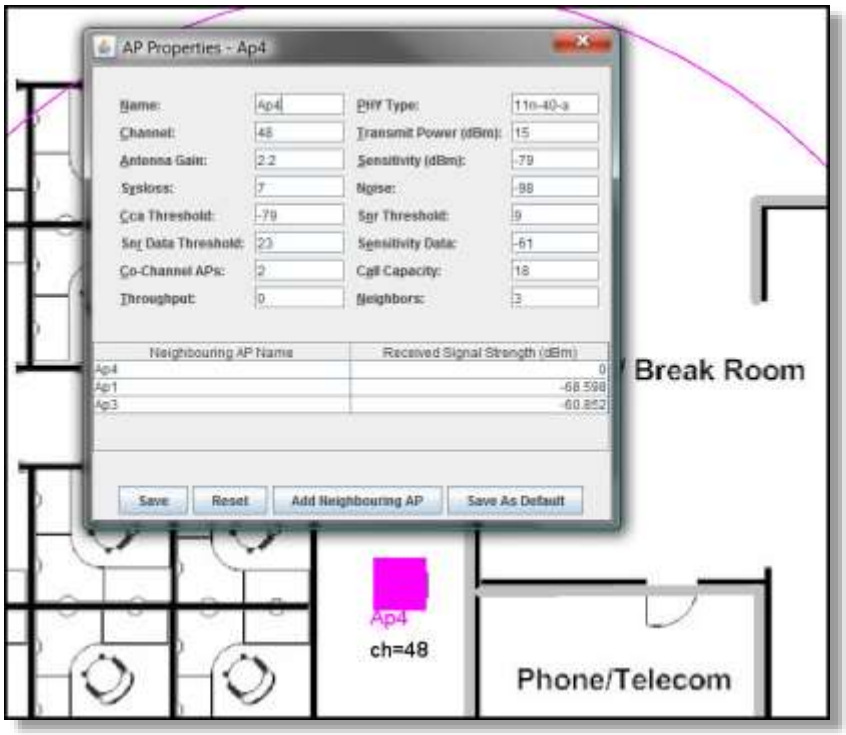
Select the environment and AP to AP propagation effects are captured. A default is chosen if you do nothing. This is what happens for each step in the design process, and the default has been selected by WiTuners to be representative of the most common WLAN operating environment. But, if you wish to choose a specific type of operational area you can pick from a list of common buildings. Finally, if you know the specific path loss parameters to use (don't worry, few people bother to learn this much) you can enter them explicitly.

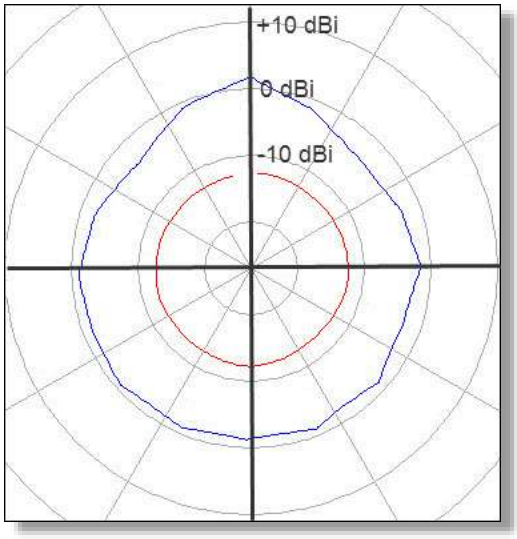
A similar methodology applies to walls and partitions. Simple drag and drop procedures are followed to match walls atop your floorplan. They are easily moved, stretched, and slanted.



As you place walls, preselected loss characteristics are available to be chosen (drywall, wood, brick, concrete, metals). If you want to add a user defined value, you're free to do so. But you don't need to know the vagaries of propagation to develop a reasonably complex (and accurate) representation of your WLAN propagation environment. Just use the preselected or default values. Special materials, such as tall metal cabinets or screens, can also be characterized by using metal or wood walls in their stead.

Last but not least are the characteristics of the APs themselves. Nothing in WLAN is more arcane than the parameter definitions for 802.11. Fortunately, WiTuners takes care of all of it for you. First, the type of service that you're looking for might require a particular standard (b/a/g/n). Or, existing availability of hardware may force this decision upon you.
In any case, WiTuners sets the AP properties (and can optimize them as well). You are, of course, free to customize their values if you wish (and we hope you know what you're doing). The settings will be suitable for both the traffic and interference environment that is encountered. And if automatic tuning of the network is used, they will change on the fly to provide you with an optimized WLAN.





In addition to the AP properties that were shown, 3D directional antenna patterns can be used with WiTuners. This is a unique capability that is provided in order to help make the WLAN software the most realistic and functional available. By providing 3D antenna patterns, the AP characteristics are fully integrated into the 3D deployment capabilities of WiTuners.
These 3D antenna patterns are able to take into account not only 2D coverage but also back-lobe interference from above and below the AP. Omnis, patches, and high gain antennas can be selected from a predefined list. The user is also free to input a custom coverage pattern. Picking from such a list of available antennas, placing them on the deployment map, and pointing them in desired directions, the user can fully customize and optimize the traffic to cover hotspots and awkward topologies.

❖ Conclusion

OK, you have seen how WiTuners accurately captures essential factors determining the performance of a WLAN in the real world. You have also seen how it offers optimal solutions by providing a rich suite of user friendly features. And better yet, you have seen how these planning, tuning, and optimization features can save a huge amount of effort while delivering top notch service to wireless clients.
It should be noted, however, that WiTuners is not designed to be an all encompassing WLAN management product. It leaves the conventional network management tasks, such as handling of security, physical site survey, rogue APs, and other operational needs to typical WLAN network management systems. Nevertheless, WiTuners' focus offers extremely valuable strategic solutions to key aspects of a WLAN that are not available anywhere else. Its WLAN representation is easy to define; characterized by high fidelity environmental, propagation, and equipment characterizations. Its 3D capabilities literally add another

dimension to your WLAN management toolbox. The WiTuners Advanced WLAN Tuning Technology is the only one that captures the traffic and the performance of the physical network, providing network management feedback to optimize the operation in real time. That performance driven optimization is hands off and verified on the fly. Verification ensures that the network is precluded from the inevitable degradation that occurs with the typical trial and error approach of manual tuning when attempted by an operator.

WiTuners is a must have for anyone who manages a WLAN. It lowers the workload and enhances the quality of the wireless user's experience.