WLAN Auditing & Tuning Done Right with WiTuners®

In Part One of this series, "WLAN Planning Done Right with WiTuners", we looked at what's involved in planning a WLAN and how WiTuners can help to easily generate a WLAN deployment plan. Now, how is your WLAN performing? How do you keep it operating optimally, adapting in a timely manner to the changes in your network conditions?

Why is WLAN Performance Auditing and Tuning Needed?

The previous job that we discussed resulted in the acquisition, placement, and setup of enough APs to meet the needs of a small town's school and administration building. You, the volunteer school board member, started out by simply buying a bunch of equipment. WiTuners (available at http://www.wituners.com) helped you to set the WLAN up, providing a layout and settings for the wireless equipment. All you had to do was customize the deployment area, set the environment definition, and WiTuners' auto-planning wizard did the rest. A little more work was required to define the building walls and reposition the APs to move them to acceptable spots in the rooms, avoiding HVAC components and so forth. Another optimization and the network was ready to install and get into operation.

So, things seemed to be working OK … they thought you were a genius … and if an area seemed to have poor coverage you just popped in another AP. You keep the APs separated, position them away from walls, set them on different frequencies, and the WLAN delivers what was promised (primarily, it delivers connectivity, but the ugly word *throughput* is about to come up).

Did you know that you're about to receive a rude awakening to the fact that you are ill-prepared to make the deployment work properly on an ongoing basis?

Many things can go wrong after a WLAN is installed and up and running. Patterns of traffic that the WLAN is carrying can change, and they can change quite often. The radio environment changes (and it can change quite frequently) due to unexpected interference, new obstructions (doors open and close, you know), the introduction of new equipment, and so forth. Constant performance monitoring is necessary to ensure that the WLAN is operating to meet throughput demands.

What does Wi-Fi really promise beyond connectivity? The performance of WLAN is straightforward to measure, and it's often provided by a Network Management System (NMS). You look at the NMS report for a couple of days and get a feeling for the average and peak traffic load for the classrooms and offices. But how much traffic load can the WLAN accommodate – what's its design throughput? That's the number that you're really interested in. If the volume of traffic consistently approaches and exceeds what the WLAN can support, the complaints start rolling in.

Trouble on the Horizon

Connectivity for the network seemed to be fine. Students could download off the internet, administrators' smart phones could roam on the network, and email could be read and answered during boring school board meetings.

But then they had a two-for-one sale on Android phones at the mall, Apple fired back with the same offer, and most of the teachers stopped handing out notes in class, preferring to use a projector and posting a link to their PowerPoints®. Before, only the nerds carried laptops, but now everybody else could get their notes on inconspicuous smart phones (along with YouTube®, music, and whatever else was available to saturate their senses).

The complaints began to pour in as frustrated students couldn't get their class notes without interrupting their streaming video. Teachers crowded into their lounge on Friday and brought the network down as they called their spouses (or sports lines) to plan for the weekend game.

What is needed is a WLAN auditing service that not only keeps track of traffic load, but also compares it to what should be the expected capacity of the system. When the traffic reaches a predetermined boundary based on the capacity, it should send out alert. Triggering the attention of the WLAN administrator, it's saying, "The WLAN is under performing, do something, quick!"

WLAN Performance Auditing and Tuning With WiTuners

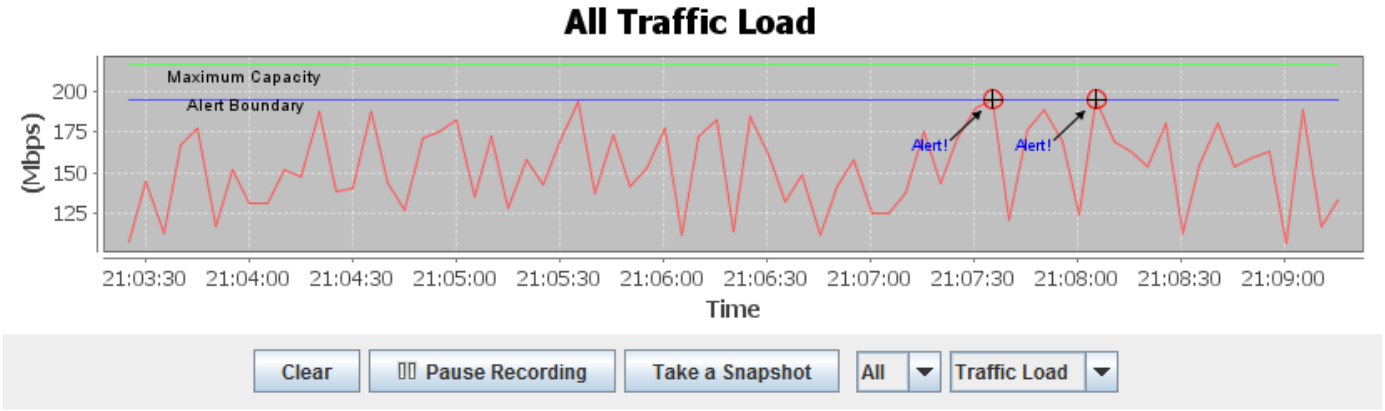
This isn't an easy task. You can't just look on the box the APs came in, read: ***It's the newest 130 Mbps AP on the Market***, multiply 130 Mbps by the number of APs that you have, and use that as the expected capacity of the network. Many factors will affect the throughput capacity of your network: interference, overlapping coverage, propagation anomalies, poor configuration selections, quality of service (QoS) policies, *ad infinitum*.

To make it even harder, the capacity must be determined in real time and accurately. The traffic changes (people move around, the mix of voice/video/data changes continuously), so the auditing service must run in near real time in order to accurately predict when the performance of the network is in jeopardy.

By using WiTuners Advanced Wi-Fi Tuning Technologies, real time estimation of performance can be achieved. First, the configuration of WiTuners captures the physical environment of the network. Second, the traffic mix of the real network is assimilated as a driver to the estimation process, and third, a real time profile of the network operation is captured.

The audit is started and time progresses. The WiTuners Audit accurately runs all of the environment and performance variables of the traffic, data, protocols, modem, propagation, and clients. WiTuners thereby "knows" how the network behaves and it generates the upper bound performance metric for auditing. Likewise, a level can be set slightly below this upper bound to serve as a warning that there is a high probability that things may start to go bad in the real world. In the sample audit shown, the maximum

network capacity is shown as a green line at the top of the real-time graph. The alert boundary in blue is slightly below the maximum. The network performs fairly well for about two-thirds of the time shown on the chart and then alerts are generated as the demand bumps into the alert line.



WLAN Optimization with WiTuners

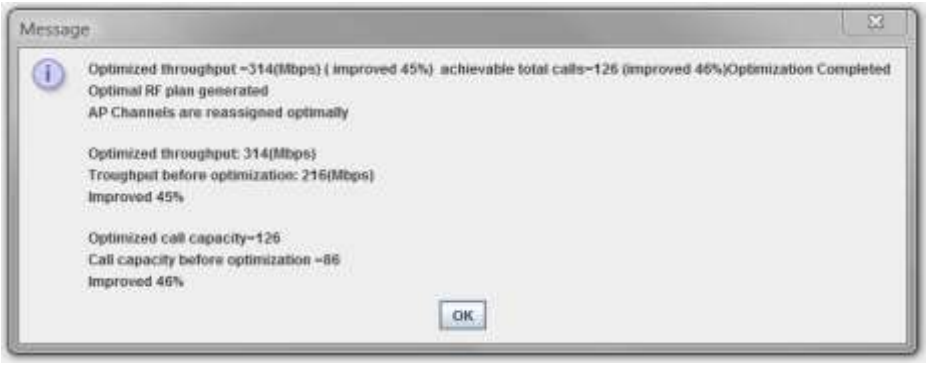
You may then ask, what can I do as a WLAN administrator when I get an alert generated by the auditing service, since the network can probably be tuned up to raise its capacity? Good question. You might think: “Ok, let me tune the settings of each AP one by one. There aren’t too many, only 20 APs for my organization and each AP only needs to tune 5 configurable parameters.” But wait, that's a total of 20^10 permutations of configurations.

I can tune 1000 settings a day since I’m experienced, that will take me ... years. Not going to happen, even if you cut down the number by making coarse adjustments. And how in the world are you going to keep track of what helps, what doesn’t, and how do the settings of an AP on one side of a room affect those of another across the room? Would the trial-and-errors devastate the WLAN performance before it gets any better? Manually tuning isn't the way to go.

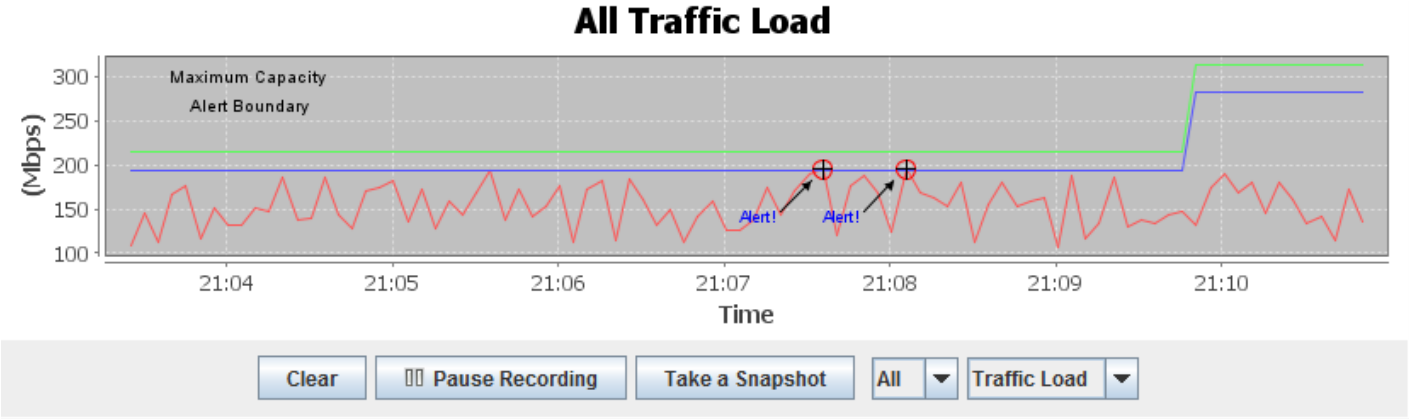
So, I’ve been warned with an alert message from the audit, I know I have to change things, and the task is impossible in a reasonable amount of time? Yes, it is, if it’s done manually. But the answer is already in front of you. While WiTuners generates the upper bound performance metric for auditing, it is also capable of optimizing the WLAN settings to raise the performance bound. It optimizes just as it did that first time when you set up the network and moved the walls around, but this time it will do it iteratively in real time on a dynamic real world network by using automation.

Yes, automation is the way to go. However, it doesn't imply it is easy by any means. You need to know how to yield an optimal group of settings given so many changing variables. You also need to determine the optimal settings fast … fast enough in near real time to keep pace with the dynamic nature of a wireless network. Using WiTuners, you can either click on the “Optimize” button in response to an alert box or, better yet, let WiTuners perform the optimizations iteratively and in near real-time.

The people move around, students buy wiz-bang feature phones, and the principal forces the staff to attend large boring meetings. But WiTuners keeps an eye out, optimizing the network as needed to keep everybody happy (or at least entertained). In the case of our example scenario, throughput was improved by almost fifty percent.



Thanks to its Advanced Wi-Fi Tuning Technology, WiTuners' performance auditing and tuning services take on this tedious and error-prone task, providing the high rate, high fidelity automation that you need. Now you are free from worrying about the formidable task of manually tuning the WLAN (or about the damage you are likely to make while trying to).



With WiTuners, organizations owning WLANs will make fewer unnecessary equipment purchases, get improved worker productivity, and maintain a smaller IT team. Since WiTuners acts as the WLAN expert for the IT department, the WLAN administrator's job becomes easier. WLAN operation disruption is greatly reduced and there will be many fewer customer complaints. With WiTuners, the end users experience better connectivity, have a better wireless experience with faster connects, and less WLAN outage.

What's Next

So, how does this kind of Auditing and Tuning service maintain a WLAN in an optimal fashion? WiTuners (available at http://www.wituners.com) has many unique features in its approach to Planning, Auditing, Optimization, and Reporting, fully backed by its WiTuners Advanced Wi-Fi Tuning Technology. Stay tuned and we will have Part Three of this series: "What's Unique about WiTuners WLAN Services". You are also welcome to visit WiTuners website at http://www.wituners.com and try WiTuners' SaaS for yourself, for free.