



SMART RF: Secure RF Deployment Made Easy

EXECUTIVE SUMMARY

Enterprise workforce is becoming increasingly mobile and reliant on wireless networks. Until now, network administrators have lacked the tools to optimize wireless networks for guaranteed uptime and reliable end-user application performance. SMART RF technology, built into the innovative Wireless Next Generation (Wi-NG) switch architecture, automates complex wireless network optimization tasks to ease the burden of network administration. SMART RF dynamically selects channels and power levels on an access port, thus eliminating the coverage gaps that can result from sub-optimal planning, stringent client requirements and changes in usage patterns or the RF environment itself.

Unlike some solutions, that can disconnect clients while adjusting power or changing settings too frequently, Motorola SMART RF uses field tested default values and a measured approach while making adjustments to minimize the impact on voice calls and in-progress data sessions. Additionally, SMART RF increases capacity in dense areas such as conference rooms and lecture halls, allowing architects to simply plug-in new access points and allow SMART RF to automatically self tune the network for optimal performance.

SMART RF has the unique ability to automatically determine the optimal location for detector radios for security monitoring. SMART RF not only helps with initial channel, power level and detector radio selection, it also makes automatic or on-demand adjustments to catastrophic events such as access point failures. The day to day management of wireless networks is thus greatly simplified.



Business Challenges

Business operations are being conducted more and more by wirelessly mobile employees. Network IT administrators are challenged to deploy business critical applications across multiple geographic locations accessible via both wired and wireless networks. Each enterprise location, whether the headquarters, branch office, warehouse or a distribution centre presents a unique challenge in respect to their unique RF characteristics. Network administrators are faced with an increasingly complex task of designing, deploying and operating wireless networks that meet capacity and performance requirements while ensuring user satisfaction. As new users and applications are added, managing and operating a wireless network becomes increasingly difficult.

Motorola's wireless portfolio meets this challenge by offering powerful tools to help network administrators plan, design, deploy and monitor their wireless infrastructure. Motorola's planning software enables an administrator to deploy a well planned wireless network that meets capacity, coverage and quality of service requirements.

Even in a well planned network, AP RF settings will need to change in response to changes in the RF environment. For example, an adjacent business could introduce an interfering wireless AP or a new cubicle deployment could create RF barriers not present at the time of the original network design and site survey. SMART RF provides insurance against dynamic changes in RF that result in network and application performance degradation.

SMART RF: Self Monitoring At Run Time

Self Monitoring at Run Time (SMART) RF technology provides a simple and easy method to configure and operate the RF network, so applications deliver

reliable and stable performance. One of the goals of this tool is to minimize the burden of tuning RF algorithms by trial and error. This is achieved through a conservative approach in reacting to RF events and minimizing the thrashing (and ripple effects) experienced throughout the network.

Motorola's Approach to Dynamic RF Management

First, Motorola believes a well planned RF network is a necessary first step in creating a highly reliable and high performance network. This is based on Motorola's rich experience in deploying large indoor and outdoor wireless networks.

Second, the WLAN industry has recently witnessed too many automated RF algorithms that react excessively and aggressively to transient RF changes. Some of these solutions also expose too many configuration knobs. The burden of tuning the RF algorithm now rests with network administrators. Motorola's SMART RF technology keeps configuration knobs to a minimum and relies on high level metrics (like retry counts and data rates) better understood by network administrators. In most cases, the conservative default value programmed in SMART RF yields a stable and reliable RF performance.

Countering real time RF changes

Loss of coverage due to sudden AP failure

Sudden AP failures, though rare, can cause significant disruption to an enterprise. An AP failure can result from a defective access point, loss of power to the AP or dislodged antennas. SMART RF automatically assigns a set of APs that participate in the recovery process by increasing the transmit power to compensate for the loss of coverage in the affected area. SMART RF ensures coverage is restored to the levels reported prior to the failure. This action provides uninterrupted RF coverage, while the defective AP is either repaired or replaced.

Eliminating Dead Zones

The quality of experience and service (QoE/QoS) of applications running on a laptop or a mobile handheld depends on the signal to noise ratio (SNR) received by the wireless client. SMART RF monitors the performance of every wireless client and compares it with a desired level. When the performance drops below the desired level, SMART RF ramps up the radio power in gradual increments until the desired performance is restored. SMART RF slowly increases and decreases access point transmit power as a measured response to RF dead zones experienced by the mobile user. The SMART RF dead zone algorithm avoids the power thrashing behavior observed in other implementations in the market today. SMART RF delivers optimal power to clients and maintains reliable application performance.

Mitigating Co-channel Interference

SMART RF provides an effective tool to automatically compute AP channel and power settings in a high density environment where small cell sizes or micro-cell design is desired. It also allows users to retune the wireless network at periodic intervals of their choosing. This flexibility provides a hassle-free mechanism to counter RF changes caused by adding, moving or changing cubicles in an office space or warehouse inventory. SMART RF results in an AP channel and power settings such that APs on the same channel have minimal overlapping coverage, if any.

Countering Non-Wi-Fi Interference

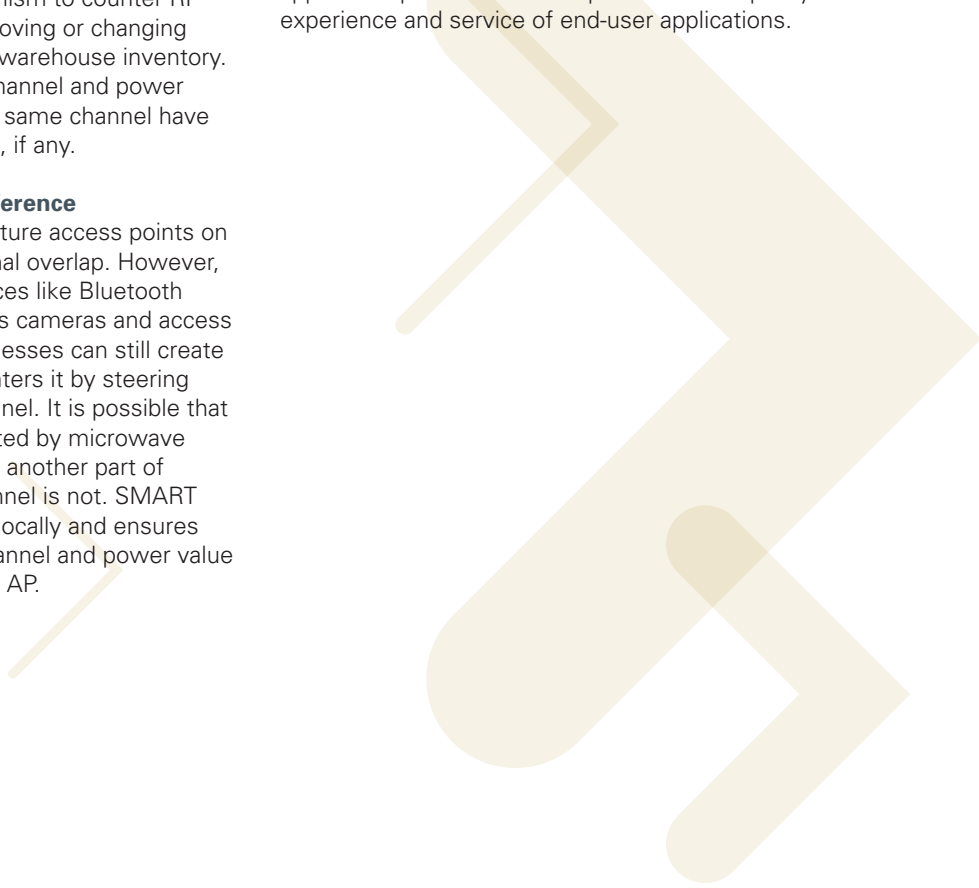
SMART RF ensures infrastructure access points on the same channel have minimal overlap. However, non-802.11 interference sources like Bluetooth devices, microwaves, wireless cameras and access points from neighboring businesses can still create interference. SMART RF counters it by steering the AP to the least noisy channel. It is possible that an AP in the cafeteria is affected by microwave interference and that an AP in another part of the building on the same channel is not. SMART RF counters the interference locally and ensures minimal disruption. A new channel and power value is established for the affected AP.

Secure RF Deployment Made Easy

Motorola provides industry leading plug and play architecture for deploying wireless LANs. SMART RF extends its existing deployment sophistication a step further by automatically selecting rogue AP detectors and ensuring the wireless infrastructure is protected 24 x 7 against rogue APs in all parts of the facility. Motorola's access points offer simultaneous operation in detector and access mode, with one radio dedicated to client access and another to rogue detection and mitigation. This capability takes the guesswork out of choosing optimal detector placement and the number of detectors required for secure RF deployment.

Conclusions

SMART RF technology makes it easy for enterprises to deploy a secure RF infrastructure. By automatically selecting the channel, power, number and placement of detector radios, SMART RF takes the guesswork out of designing high performance, secure wireless networks. SMART RF also provides protection against dynamic RF changes impacting application performance and preserves the quality of experience and service of end-user applications.





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