Improving wireless connectivity for your users

Connect with confidence with HP Wi-Fi Clear Connect
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Executive summary

The ubiquity of mobile devices is a boon to productivity and a step forward for flexible work. But the huge influx of laptops, tablets, and smartphones on your business’s wireless LAN (WLAN) is creating new challenges. The move to mobility, propelled by the bring-your-own-device (BYOD) movement, can impact the performance of your WLAN, and increase costs and security threats.

You seek a network solution that helps you ensure your employees remain productive while your business keeps pace with the demands of mobility. You want a solution that helps deliver WLAN services more quickly while reducing IT cost and complexity. HP Wi-Fi Clear Connect (MSM Firmware version 6.0) includes advanced radio resource management (RRM) capabilities that optimize WLAN performance. RRM helps ensure reliability, even with the growing number of mobile devices and the prevalence of performance-sapping sources of radio frequency (RF) interference. No matter your industry, an advanced network solution for WLANs can help you take charge of the complex mobility landscape, so you can focus on improving service delivery to your users.

The groundswell of mobile devices and applications in the workplace is driving organizations like yours to expand their wireless networks. In addition, the swift uptake of BYOD is putting new pressures on your WLAN. Your users, with their personally owned devices, are opting to connect to your network using Wi-Fi, rather than the comparatively sluggish 3G or 4G networks. Wireless networks are no longer a convenience: your WLAN is supporting more users and more essential business applications than ever.

The shift toward mobility is why a whopping 80 percent of enterprises plan to increase the capacity of their WLANs in 2013, according to Nemertes Research. The swift momentum of the WLAN market is evident in other measures as well. IDC predicts that the WLAN market will grow from 3.03 billion USD in revenues in 2011 to 5.6 billion USD in 2015—that’s a 16.6 percent compound annual growth rate.

The mobility boom can put stressors on your WLAN. To your users, this means unpredictable network performance, and erratic reliability because of RF interference. To you, it means rising operational costs that eat away at your IT budgets. You want to ensure that your organization has a WLAN that can deliver Wi-Fi services to support the growing number of users with mobile devices in a high-performance, reliable, secure, and cost-effective way.

With HP Networking WLAN solutions, your workers get a clear connection to the Wi-Fi, so they can work anytime, anywhere, even in crowded or noisy environments. HP Wi-Fi Clear Connect automatically optimizes WLAN performance and reliability, mitigates RF interference, detects security threats, and simplifies management to lower operating costs.

HP Networking WLAN solutions are part of the HP FlexNetwork Architecture, the industry’s only converged architecture for the campus, branch, and data center. With the HP FlexNetwork Architecture, you can align your networks with your business needs, even as they change, by segmenting your networks into four interrelated modular building blocks: FlexFabric, FlexCampus, FlexBranch, and FlexManagement.

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1 Mobile Application Trends, Nemertes Benchmark Report, Q3 2012
2 Market and Competitive Update, Enterprise WLAN, IDC, October 2012
Unwelcome interference

As Wi-Fi becomes pervasive across your business, you may see more problems with interference from other non-802.11 devices that use the same RF spectrum. That interference can impact the performance of your WLAN, which can result in a poor experience for users who depend on their laptops, tablets, and smartphones to be productive.

Industry standard 802.11 WLANs operate in the unlicensed 2.4 GHz and 5 GHz frequency bands, and these bands are shared with a variety of other RF devices. The older 802.11b and 802.11g technology operates in the 2.4 GHz band, which is also used by microwave ovens, cordless phones, Bluetooth headsets, baby monitors, and wireless video cameras. Cordless phones may also cause interference with 802.11a technology, which operates in the 5 GHz band, as well as newer 802.11n WLANs, which can use either the 5 GHz or 2.4 GHz band.

You may have noticed that troubleshooting RF interference can be difficult because RF conditions change quickly. Interference is often intermittent, such as when the microwave oven is used at lunchtime. Or interference may steadily increase and then suddenly end, such as when someone uses a cordless phone.

Industry standard 802.11 WLANs are designed to minimize interference, but overcoming the interference requires increasingly sophisticated techniques to ensure high performance and reliability for today’s mobile workers.

Optimize WLAN performance and reliability

Our Wi-Fi Clear Connect firmware uses advanced RRM to automatically monitor and tune the performance of your WLAN and adjust to the changing RF conditions present in your environment. These capabilities make it easier for you to deliver the Wi-Fi experience that your workers need today.

RRM automatically assigns and tunes the transmit power levels and RF channels on access points (APs) to optimize the system-wide performance and reliability of your WLAN. With HP, your WLAN is self-healing, so you don’t need to worry about users encountering dead spots or unpredictable performance when there is RF interference or if an AP or radio fails. The firmware will automatically adjust to changing conditions and deliver Wi-Fi service to your users.

RRM takes place in the background without burdening your administrators with more maintenance tasks or your workers with extra software. Each AP simply scans all of its available radio channels to monitor and identify RF interference from non-Wi-Fi sources. If an AP detects persistent interference, then it will choose the best alternative channel after verifying that the interference is not present on the alternative channel. Scanning happens quickly so that it does not impact the AP’s ability to service clients. For example, if an AP detects interference from a microwave oven on Channel 1, it will automatically change its clients over to Channel 11 (see Figure 1). The AP minimizes disruptions as Wi-Fi devices are moved to the new channel, so users’ IP voice and application sessions continue without pause.

After switching to an alternative channel, the AP will continue to monitor the channel quality of the non-operating channels. Most interference sources are temporary, so if the interference goes away, the AP will inform the controller, which can decide whether the AP should switch back to the original channel.
RRM is available on MSM720, MSM76x Controllers as well as MSM410, MSM430, and MSM46x APs. You can take advantage of these next-generation features by upgrading to MSM controller Firmware v6.0.

In addition, MSM720 and MSM76x Controllers in combination with the MSM430 and MSM46x APs perform spectrum analysis to measure noise from non-802.11 sources, such as Bluetooth devices, cordless phones, baby monitors, and wireless cameras. Such data can be used to make intelligent channel-switching decisions.

Table 1. Wi-Fi Clear Connect Firmware v6.0 platform support

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<th>MSM720, MSM76x</th>
<th>MSM410</th>
<th>MSM430, 46x</th>
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<tr>
<td><strong>Radio Resource Management</strong></td>
<td>X</td>
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<tr>
<td><strong>Spectrum Analysis</strong></td>
<td>X</td>
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<td>X</td>
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<tr>
<td><strong>Integrated IDS</strong> (requires Premium Mobility option)</td>
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Our RRM technology uses an “intensive sampling” mode of operation to classify an RF interference source, when a channel-switch is needed because of significant RF interference. Different RF sources, such as Bluetooth, cordless phones, and microwave ovens, have different frequency and duty-factor characteristics.

Having an integrated spectrum analyzer simplifies management and lowers IT costs by eliminating the need to buy an additional license or integrate a third-party product.

Figure 1. Wi-Fi Clear Connect Interference Mitigation

RRM improves performance and reliability of the wireless LAN by automatically assigning and tuning the transmit power levels and channels on access points. For instance, if an AP detects interference from a microwave on Channel 1, it will automatically move its clients to a channel with no interference (Channel 11, for example).
Enhance your users’ Wi-Fi experience

We help you improve your users’ Wi-Fi experience by using dynamic client load balancing and airtime fairness. Dynamic client load balancing is especially important in dense environments, such as classrooms or conference rooms, as well as for supporting BYOD initiatives and the accompanying influx of mobile devices.

With intelligent client load balancing, HP Wi-Fi Clear Connect determines the client load of its neighboring APs, or the average number of clients per radio per band that the AP supports. It then balances the client load among APs by adjusting the transmit power for beacon and probe response frames.

For example, if the MSM Controller sees that one AP’s radio is supporting a larger number of mobile devices, then a neighboring APs radio, it can gracefully move the clients to the less crowded AP, which gives users greater performance and a better experience. Your administrators can configure the number of client associations for each APs radio, if they desire.

Airtime fairness enhances the user experience for 802.11n devices in particular. In a mixed network where 802.11a/b/g clients transmit at lower speeds than 802.11n devices, the performance of the faster 802.11n laptops, tablets, and smartphones can suffer. But with airtime fairness built into the HP WLAN system, all Wi-Fi clients are ensured equal transmit time over the air. This way, one client can’t hog the bandwidth and none of the Wi-Fi devices starve. And older, slower Wi-Fi devices do not hold up the faster 802.11n laptops, tablets, and smartphones.

Airtime fairness is aware of the underlying quality of service (QoS) policies, ensuring that voice and other high-priority traffic is never delayed by low-priority traffic.

Simplify WLAN management

Most organizations are increasing their wireless network capacity, but that doesn’t mean that administrative overhead can increase as well. IT departments must continue to do more with less. That’s why we at HP continue to simplify network deployment and management.

With HP Wi-Fi Clear Connect, it’s even easier to support complex applications such as IP voice and video. You can follow a simple workflow to ensure that voice calls and video conferences come through loud and clear, even over Wi-Fi. Clear Connect firmware automatically optimizes WLAN performance, detects security threats, mitigates RF interference, and simplifies management. You get a better performing, more reliable Wi-Fi network at a lower cost.

Advanced RF performance analysis and management gives you greater visibility into the RF and enhances detection, mitigation, and reporting of RF conditions and interference. You can view the current channel and power settings as well as the planned settings for a group of APs as well as across the enterprise system. Administrators can review the channel and power plan before it is applied to the production network, or roll back to the old plan if desired.

A new events and alarm framework in MSM Firmware v6.0 provides an at-a-glance view of all critical, major, and minor conditions in real time. Administrators can quickly drill down into probable causes to remediate trouble spots.
Connect with confidence

It’s clear that workers have embraced the mobile lifestyle and want the freedom to conduct business anywhere, anytime. But many businesses find it increasingly difficult to deliver a WLAN service that will meet their workers’ expectations. With our solutions, you can be confident that you can meet your workers’ needs with a high-performance, reliable WLAN service while simplifying your IT administrator’s job by reducing complexity and cost.

How HP MSM solutions can help your business

• K–12 schools and higher education can support dense client environments and reduce the difficulties and cost associated with troubleshooting RF interference.

• Healthcare organizations can mitigate RF interference and ensure reliable performance for mobile access to patient medical records, medical images, and care team collaboration tools.

• Hospitality providers can ensure a reliable connection for guests and minimize interference in high-density areas such as conference rooms.

• Manufacturers can maintain production deadlines by mitigating interference from metal racks, handheld devices, and moving vehicles.

For more information

To learn more about HP MSM Firmware 6.0 features such as Wi-Fi Clear Connect, please contact your HP account manager or reseller, or consult the following resources:

Wi-Fi Clear Connect
HP Mobility Solutions
HP Networking Wireless Home Page