

Strategic Planning and Design for Application and Density Driven Wireless Local Area Networks

White Paper Series

Volume 4

A Strategy for Avoiding the “Rip and Replace” Scenario



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Introduction

The evolution of WLANs, from their initial status as a luxury or novelty to the current position as an essential element of a network architecture accommodating an ever-growing number of often very demanding applications were discussed in the first volume of this white paper.

This second volume of the series presented a process for determining an enterprise's WLAN requirements and the critical criteria that must be established in order to develop planning and design requirements necessary to implement a WLAN that will meet the enterprise's current and known future mobility requirements

The process of utilizing the criteria defined for the network's performance requirements and, delivering a plan and design for the wireless network, usually called a site survey, was examined in the third volume of the white paper series. The basic processes of a site survey, the methods and deliverables resulting from physical site surveys and the ability of predictive means to design and implement a WLAN capable of supporting the applications currently being wirelessly enabled in the enterprise were discussed in depth in this volume.

In this, the fourth and final volume of the white paper series, a strategic design plan for the implementation of a wireless network that provides a solid foundation for both current and future wireless applications with the lowest total cost of ownership will be presented. This plan allows for an enterprise to meet its current requirements while maintaining the ability to improve network performance without having to remove or physically alter any of its legacy WLAN when it needs to improve performance to meet the requirements of additional clients or applications.

First generation wireless LANs were designed using the best practices of the time, providing coverage for portable network access and the promise of supporting advanced capabilities like

About this White Paper Series

This educational series, Strategic Planning and Design for Application-Driven Wireless Local Area Networks, explores the evolution of wireless local area networks from their initial implementations to their current status as critical and necessary elements of IT networks and the planning and design process that is critical to developing a mobility platform that supports applications far beyond what were contemplated when the 802.11b specification was ratified in 1999.

The entire series is available at www.azuresol.com

voice over WLAN, real time location systems and business applications delivered by Citrix and other application delivery services for which session persistence is critical.

But, as attempts are made to enable additional applications over the WLAN, it is becoming increasingly apparent that first-generation Wi-Fi networks fall short of meeting the capacity, density and roaming requirements of advanced technologies, such as voice, and are not well-suited for the interruption-free addition of dual-mode 802.11a capacity, when and where additional capacity is required. These enterprises are now re-engineering their networks to support applications that the original networks fail to sustain.

For early adopters whose initial WLANs have run their course and enterprises now beginning to deploy a Wi-Fi network, Azure's innovative design offering, IntelliPlan, provides a strategic design plan for the implementation of a wireless network that provides a solid foundation for both current and future wireless applications with the lowest initial cost and lowest total cost of ownership. IntelliPlan provides a blueprint for developing a network that meets today's applications requirements and can be upgraded without interruption or obsolescence and minimal cost to meet future applications requirements

IntelliPlan allows enterprises to implement a WLAN that meets today's requirements, utilizing a portion of the infrastructure that will be required to support future applications, while ensuring an obsolescence- and interruption-free migration path to a WLAN that is capable of supporting voice or other challenging, high-capacity applications when required by the enterprise.

A keen understanding of radio frequency engineering, developed over almost 15 years of experience, enables Azure's engineers to design a WLAN that will support the enterprise's long-term applications and identify a subset of those access points that will support current requirements with modified configuration parameters. By doing so, the enterprise can deploy a WLAN to meet its current requirements, with minimal infrastructure investment, and, when appropriate, achieve performance to support future applications with adjustments to the initial infrastructure configurations and the addition of the infrastructure identified by IntelliPlan. No removal or relocation of initial infrastructure is required and there is no interruption to existing applications when the network is upgraded.

An IntelliPlan Example

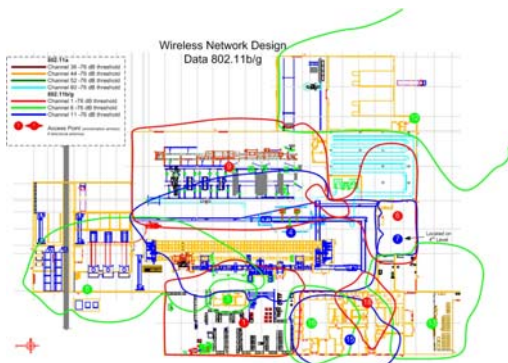
To further illustrate the IntelliPlan strategy, the design work performed for an actual client is provided below. This client, like many other early adopters of WLAN:

- recognized that its legacy WLAN would not support its growing wireless applications
- realized that it would want to use the WLAN for voice at some point in the future
- did not currently require or have the budget to build a voice-ready network
- wanted to avoid interruption to existing applications when enhancing the network to support voice or other capacity

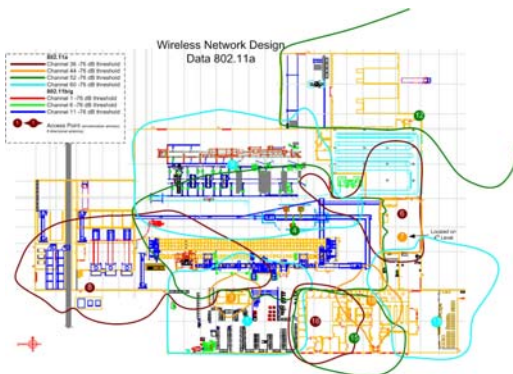
Specifically, this client wanted to initially implement a wireless network that would provide 24 Mbps of 802.11a and 802.11g capacity throughout its manufacturing and warehouse facility while maintaining the ability to increase capacity to an aggregate of 108 Mbps and add sufficient cell overlap to achieve fast-roaming capabilities at some point in the future without obsolescence or interruption to existing applications using the WLAN.

Data-only Design

This network utilizes a subset of 12 of the voice-ready network design's access point infrastructure that provides 24 Mbps of capacity on both the 802.11a and 802.11g networks, while providing the ability to enhance the network's ability to support voice and location service without obsolescence or interruption to existing applications. Each access point location utilizes both 802.11a and 802.11g, with antenna system and power level design providing mirrored coverage between the 802.11a and g cells.



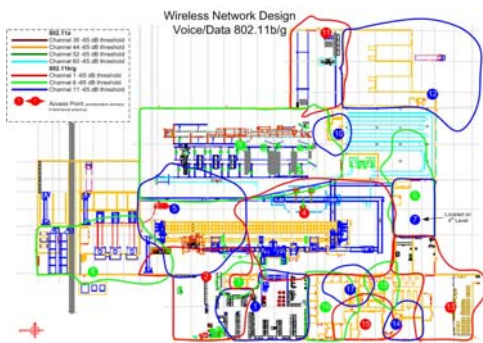
802.11b/g Data Grade Coverage Contour



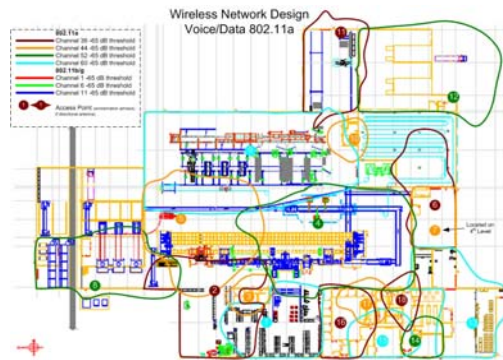
802.11a Data Grade Coverage Contour

High Capacity, Voice-ready Design

The voice-ready IntelliPlan design for the site utilizes 6 additional access points and antenna systems, which, when added to the data-only design, will provide fast roaming and 54 Mbps capacity on both of the 802.11a and 802.11g networks. When ready to implement this network, all that is required is the addition of the access points and antennas and the adjustment of power levels and channels of the original 12 access points. This network enhancement can be achieved with no obsolescence or interruption to existing applications utilizing the network.



802.11b/g Voice Grade Coverage Contour



802.11a Voice Grade Coverage Contour

By selecting IntelliPlan for the design of its current and future network, this customer eliminated additional costs equivalent to 30% of its data-only network implementation cost when upgrading to a voice-grade network when compared to the traditional cost of upgrading a network that was not designed to support advanced applications. These additional costs typically include resurveying and designing the network, network reconfiguration and the cost of moving and or/reinstalling cabling, access points and antennas.

Perhaps even more important and significant are the costs associated with network downtime incurred during the process of attempting to improve a legacy network designed to support basic data connectivity to one that is capable of supporting voice and other advanced applications. Lost production and end-user dissatisfaction result from the network downtime that accompanies traditional WLAN enhancement efforts. And, although difficult to believe, since such efforts typically are of an extended duration, the costs associated with lost production and end-user dissatisfaction almost always exceed the cost of the original wireless network deployment.

Conclusion

Wireless LANs have become an essential element of IT network architectures, and enterprises rely on the wireless network to provide mobility for an increasing number of applications.

Most enterprises deploy wireless networks to satisfy immediate, known applications and uses and, with the increased burden on the network, eventually come to realize that the network will require enhancement in order to support additional users or applications. At that time, the enterprise is faced with the choice of replacing the network or attempting to improve the network's performance, both of which will interrupt network function and disrupt operations, decreasing production and causing user and customer dissatisfaction.

There is an alternative to this costly and time-consuming experience that eliminates both the dreaded "rip and replace" scenario and the accompanying disruption to mobility-enabled applications that is associated with any attempt to improve the performance of a network built to support general data connectivity to one that is capable of supporting demanding, advanced applications like mobile voice.

This alternative, IntelliPlan, provides a strategic design plan for the implementation of a wireless network that provides a solid foundation for both current and future wireless applications with the lowest initial cost and lowest total cost of ownership. IntelliPlan provides a blueprint for developing a network that meets today's applications requirements and can be upgraded without interruption or obsolescence and minimal cost to meet future applications requirements.

About Azure Solutions

Azure Solutions is an IT systems integrator that specializes in providing its clients and partners with wireless networking solutions that include wireless local area networks, point to point and point to multipoint wireless links and wireless wide area networks, as well as applications like telephony, video, real time location systems and manufacturing control systems that are enabled for mobility by wireless networks. Services include planning, site survey, design, spectrum analysis, project management, implementation, testing, support, maintenance and troubleshooting.

Providing solutions and services to across the US, Canada and Mexico, Azure's clients include such enterprises and organizations as General Motors, Honda America Manufacturing, Kellogg Company, Whirlpool Corporation, Trinity Health, Ann Arbor Public Schools, Spectrum Health, Toyota Motor Corporation, SC Johnson, the University of Michigan, the American Cancer Society and the United States' Departments of Treasury, Defense and Energy.



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