

Doing Wonders Without Wires

There are huge opportunities for wireless as the market is now maturing and growing, and people are realizing the benefits of a pervasive wireless network

The wireless LAN (WLAN) industry is one of the fastest growing segments in the worldwide communications industry. It provides a ray of hope to the rather gloomy global economic situation. Over the past decade, WLANs have gained wide acceptance among various different market segments, especially retail, manufacturing, warehousing, education, and healthcare. Furthermore, the rapid growth of the WLAN industry is drawing attention from systems integrators and wireless carriers.

New Technologies

Numerous new technologies are either available in the market or waiting in the pipeline. This includes unified wired and wireless switches for the SMB and enterprise markets, which make Wi-Fi networks more secure, and the administration of the network simpler.

Major companies are looking for maturing of the wireless market place and technology with some major enhancements and improvements. For instance, the launch of 802.11n, 2.0 Draft AP's from Cisco and D-Link, which allows the speed of up to 300Mbps and a strong signal strength because of the revolutionary MIMO technology, would redefine the wireless world. Dax Networks provides technologies like upgraded version of Wi-Fi Draft N for better coverage and speed.

Also, the launch of the fixed WiMax-802.16d and the promise of the early availability of Mobile WiMax-802.16e, which promises to deliver true mobile experience over large distances at a pretty good speed, would help usher in the availability of wireless broadband for the common citizen and bridge the digital divide. In future, WiMax would change the way people connect to the Internet with wire free high-speed Internet available on the move.

Challenges Ahead

Wireless devices work in half duplex. Large distances result in throughput drop. The reliability gets affected due to bad weather conditions. There are concerns over the issue of spectrum allocation from the government side. The government has allocated the entire 2.4 GHz frequency and only a part of the 5.8 GHz frequency as a free spectrum for Wi-Fi deployment whereas WiMax is still to be allocated a free spectrum. 2.4 GHz is getting congested and the availability of the single channel on



Experts Panel

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the 5.825-5.875 GHz does have its own set of challenges in terms of both urban and rural wireless connectivity.

Security is also one of the major concern coming from certain quarters of the Indian customers who are under the impression that wireless LAN is less secure than wired LAN, whereas the truth is that today a WLAN is probably more secure than the wired LAN. SMBs are comfortable with the built-in security features like WPA.

As the market for wireless gear and solutions becomes more mature and as there are more and more deployment of both indoor and outdoor Wi-Fi implementations, companies also see a more competitive scenario developing in the sizing and costing of projects. Still, deploying and setting up pervasive wireless networks is a complex task and well paying for the implementing agency.

The greatest challenge in wireless project implementation is the line of sight. Generally, radio signals require a clear path between antennas. Of course the first condition for an LOS link is that the two antennas can be connected with an imaginary straight string. No object should block this line. Achieving this with a short link is fairly easy. Moreover, in order to cover large distances, a great height is needed. So, tower erection increases implementation costs.

The second challenge is wireless management. As enterprises move to capitalize on the benefits of wireless networking, the need for cost-effective WLAN management tools becomes acute. Among the daunting tasks facing administrators are planning the wireless network, maximizing network performance and minimizing network downtime, maintaining security over wireless links and keeping device settings "in step" throughout the wireless network despite ever-changing requirements. Customer demand is another very big challenge.

As enterprises move toward capitalizing on the benefits of wireless networking, the need for cost-effective WLAN management tools becomes acute. As Wi-Fi becomes more mature and secure, there is a growing demand from customers to focus on a solution-led ap-



proach rather than just buying products. But the basic demand of the customer is still better speed throughput, Internet connectivity, and access on the move with less and less hassles.

Emerging Areas

A worldwide revolution is occurring in business. Wi-Fi enabled notebook computers are proliferating and driving the adoption of enterprise wireless LANs (WLANs), making business mobile. Unlike past technology advancements that were driven by technology professionals, the explosion of enterprise WLANs is being driven by mobile users, traveling executives, wireless applications, and mobility services like voice services, guest access, enhanced security, and location services.

The acceleration of enterprise adoption of WLAN technology is radically transforming business operations, network edge, data centers, and centralized IT control. Wi-Fi mini townships and residential complexes is an emerging area.

Technologies that drive Wi-Fi enabled business applications and devices for a variety of uses, including mobile



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healthcare, inventory management, retail point-of-sale, video surveillance, real-time data access, asset tracking and network visibility, will have an edge. The recent introduction of the 802.11n Draft 2.0 technology based on MIMO, which allows speeds of up to 300Mbps, will change the way the world perceives the wireless world in the near future.

There is a huge upside in the opportunities for the growth of wireless products and solutions since the market is now maturing and growing, and people are realizing the benefits of a pervasive wireless network, which allows QUAD play services and more mobile applications to be available for the consumer's benefit. This will allow the introduction of more products in the Wi-Fi space; a glowing example is the introduction of the latest 802.11n, 2.0 Draft version of Wi-Fi Alliance certified.

More customers opt for unified wired and wireless networks. Additionally, SMB customers are increasingly deploying PoE-based implementation. More and more Wi-Fi enabled devices are fueling the popularity of Wi-Fi access technologies, laptops, handhelds like PDAs/mobile and gaming consoles. For enterprises, there are more and more managed wireless solutions available for easy deployment and management of Wi-Fi networks.

Tips on Improving Quality

The key to improve quality and achieve cost efficiency is a correct site survey and an efficient network planning and then proper deployment and implementation by skilled teams of RF engineers. Investments in quality products from premier vendors would be another alternative.

Before deploying Wi-Fi networks, proper RF spectrum analysis, site survey, network planning, and implementation is important. Hence, it is crucial for network managers to work with the company that has complete end-to-end technology, including management and location tracking solution and software, which makes the task of managing a complex network very easy for the

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system administration.

Dual Radio Solution

The dual-radio mesh architecture overcomes many performance limitations of the single-radio mesh solutions. In this approach, wireless client access is separated from wireless backhaul. One radio is dedicated to Wi-Fi client access in the 2.4 GHz band. A second radio is dedicated to the wireless mesh backhaul system and typically operates in the 5 GHz band, which is also unlicensed. Since the radios are in different bands, they can operate independently at full speed.

The dual-radio architecture delivers higher performance than single-radio mesh. There is more capacity available per square km. It is possible to build larger wireless mesh systems, thereby reducing the number of wired connections or fixed wireless backhaul links needed per square mile.

Dual-radio mesh systems offer improved performance to support more advanced applications by offering lower and more predictable packet latency throughout the network. These performance improvements enable new applications for municipal wireless mesh networks and deliver enough capacity to support multiple applications or even multiple service providers on the same network.

Point-to-point or point-to-multipoint solution for enterprises or connecting government networks is a very cost-effective alternative to leased circuits. Easy and quick to deploy Wi-Fi hotspot solutions for airport/bus/railway station, hotel/restaurants, and cafés are



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very popular and more and more service providers offer hotspot solutions to these public places.

Main Verticals

Retail, education, services, and logistics will be the main verticals in 2008-09.

The WLAN industry doesn't just want to focus on selling wireless products but also aggressively and effectively working toward building applications that run on the wireless platform. Their primary objective is to expand the market place and also talk about the benefits that wireless deployment can bring over wired deployment.

Wired media for any kind of telecommunication does still not cover most rural areas in India. The government initiatives to increase the spread of wireless broadband in order to bridge the digital divide and a major focus on rural connectivity to connect a large number of Indian villages so that the 'under privileged' also get included in the "digital inclusion". The WLAN industry is deeply engaged with these government initiatives.

Growth Scenario

The industry sees a substantial growth in the wireless market in India and this growth will be driven by all segments of industries as more wireless LANs are being set up by corporates to complement their wired infrastructure and more pervasive wireless networks are set up by many IT organizations.

This growth in the adoption of WLAN is being seen across all segments including commercial and SMBs. The growth of WLAN is directly proportional to the growth in the usage of laptops as more and more organizations are buying laptops for their mobile executives.

In recent years, various wireless technologies have shown promise for various futuristic public applications.

With the proliferation of devices like laptops, palm-tops, and PDAs, and the dropping costs of telecommunication devices, various wireless systems and concepts like wireless ad hoc networks, wireless sensor networks, ubiquitous computing, grid computing, etc have been introduced. These emerging technologies could effectively

be used for smartening the environment as well as for improving the socio-economic status of rural areas as well as government systems.

The primary driver for the growth and adoption of wireless by any organization is directly proportionate to the growth of laptop penetration, to the increase in the availability of mobile applications and also the solution-led focus, which includes third party applications on the wireless platform. All this ensures more deployment of wireless and this will keep on growing as we see increasing adoption of mobility solutions and laptops, and more third party application/solutions.

New applications and usage of wireless like voice over WLAN (VoWLAN) can be a driving factor. VoWLAN requires a voice-enabled wireless device, most commonly a PDA or a "Wi-Fi handset", which looks and operates like a cell phone but sends voice as discrete data packets rather than an analog voice stream. Callers can also use software-based phones, known as a Softphones, which reside on devices including laptop and desktop computers.

The VoWLAN system allows all regular functions and messaging applications available on wired phones to be available on the VoWLAN devices. Like VoIP, VoWLAN also contributes to cost efficiency.

Another growth driving factor would be WiMax, which can provide broadband wireless access (BWA) up to 30 miles for fixed stations, and 3-10 miles for mobile stations. WiMax operates on both licensed and non-licensed frequencies, providing a regulated environment and viable economic model for wireless carriers. Soon, WiMax will be a well-recognized term to describe wireless Internet access throughout the world.

The implementation of SWAN (State Wide Area Network) across all states will drive last mile wireless implementation in rural areas with e-governance initiatives. Increasing broadband penetration also allows Wi-Fi users to piggyback on cost effective Internet access.

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