WLAN promises mobility in this fast-paced world

The residential market is the fastest growing segment of the wireless LAN business, with residential WLAN chipsets accounting for 47 percent of all WLAN chipset sales

The constraints of a wired world

Interoperability, increased data rates, and lower cost are all working together to bring Wireless LANs (WLANs) and their promises of mobility, flexibility, and scalability to both enterprise and home users. Despite a world-wide economic slowdown, WLAN continues to be a high growth application.

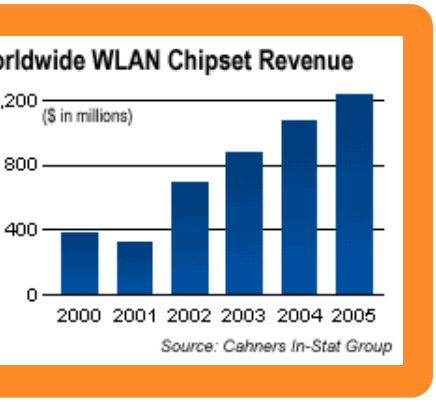
What is WLAN?

As a simple explanation, WLANs are an extension to or a replacement for wired LANs, such as Ethernet or IEEE 802.3, that offer network access anywhere, anytime. To be specific, WLAN is a high bandwidth, two-way data communication network. WLAN operates over a limited distance, up to approximately 300 feet, and uses radio as the transmission medium rather than copper cable or optical fiber.

By eliminating the physical constraints and installation of wires—which can be expensive, time-consuming, and often disruptive—WLANs offer a variety of benefits:

- Ease of installation
- Flexibility
- Scalability
- Cost savings
- Mobility

Installing a WLAN network is as simple as connecting an access point to a wired network and plugging network interface cards (NICs) into all PCs, laptops, PDAs, printers and other devices that require access to the network. No new network cables need to be installed in walls, floors, and/or ceilings to connect the different devices, saving on labor and minimizing disruptions. Furthermore, changing the location of network devices—or adding devices such as additional printers—is quick and easy. Those users with WLAN-equipped portable computers can roam around the building, and will have continuous access as they are handed off from one access point to another.



A Wireless LAN success story

One major attraction of WLAN is cost savings, as the University of Michigan Business School has discovered. The school spent just $50,000 to set up its seven buildings. “Doing the same with cables would have cost seven figures,” says Edward Adams, director of computing services.

Conventional networking means bringing cables in underground, then stringing them through walls and ceilings to every desk or cube where a personal computer sits. “One estimate for wiring a 170-seat classroom in an older building ran $200,000,” says Adam.

Source: Business2.com

The future of WLAN

WLAN chipsets are expected to have a high growth rate, with 31 percent CAGR from 2001 to 2005. A key driver for the growth will be applications for the home user. According to Cahners' *In-Stat*, the residential market is the fastest growing segment of the wireless LAN business, with residential WLAN chipsets accounting for 47 percent of all WLAN chipset sales by 2005, a total of more than 21 million units.

As WLAN grows in popularity, many different public facilities are installing access points to provide Internet services in a variety of locations outside of the home. Whether you're waiting at the airport or train station—or getting coffee on a Monday morning—you can pull the latest information you need from the Internet. Even Starbucks and other commercial establishments are becoming WLAN-equipped—ensuring you have network access anytime, anywhere.

Multitude of WLAN standards

The numerous standards for WLAN have gone through many changes in specifications and requirements. As can be seen in the table on the right, there are basically 2.4 GHz and 5 GHz standards. Today, IEEE 802.11b is the most popular.

"We expect that 802.11b will be the predominant wireless home networking protocol over the next few years," says Navin Sabharwal, ABI vice president of Residential and Networking Technologies. Five GHz standards, such as IEEE 802.11a, with higher data rates and a less crowded spectrum, are rapidly gaining popularity. IEEE 802.11a devices will be available in the next year and are expected to surpass sales of 2.4 GHz devices in 2005.

WLAN chipset

A typical chipset partitioning today for a WLAN module is shown below. As with all other wireless markets, integration levels continue to increase. The chipset has already been reduced from five chips to four with the integration of the baseband processor and medium access controller onto a single chip. In the future, some WLAN chip manufacturers will use direct conversion technology to combine the RF/IF and Modulator/Demodulator chips into one, reducing the number of chips even further. But it does not stop there—more integration is expected. A single chip solution (excluding the power amplifier) is anticipated by the industry. Also, support for multiple modes—such as 802.11a and 802.11b—in a single chipset will be offered. In fact, such chipsets are available today—ensuring the ultimate in coverage. Increasing functionality on fewer chips ultimately results in unprecedented chip complexity.

The evolving standards, increasing chip complexity and price erosion are challenging the semiconductor industry. However, WLAN has a bright future if these hurdles can be overcome. ◆

Standard	Frequency	Data Rates	Volume Ship
IEEE 802.11b	2.4 GHz	1, 2, 3,5, 11 Mbps	1999
IEEE 802.11g	2.4 GHz	22 Mbps	Pending FCC decision
HomeRF 1.0	2.4 GHz	1 or 2 Mbps	2000
HomeRF 2.0	2.4 GHz	10 Mbps	2002
IEEE 802.11a	5 GHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	2003
ETSI HiperLAN 2	5 GHz	6, 9, 12, 18, 27, 36,54 Mbps	2003