Driving Voice-over-WLAN In The Enterprise

Greg Collins

Despite the hype, don't expect the technology to go mainstream before 2008.

Although both consumers and enterprises show keen interest in voice applications supported by wireless LAN (WLAN) networks, development of voice-enabled 802.11-based WLANs currently remains in the very early stages. Widespread adoption of voice-over-WLAN (VoWLAN) will not occur until the costs of deploying this technology decrease—or the perceived benefits surpass these costs—and VoWLAN functionality is embedded in mobile handsets.

A look at the history of the data-centric WLAN market provides important clues as to how the industry might reduce VoWLAN costs in the present, as well as how the VoWLAN market may progress over the coming years.

Why VoWLAN?

First, a summary of what this technology offers. VoWLAN will enable many organizations to control the cost of communication while at the same time improving overall operations. For example, in retail environments, sales personnel currently use wired or cellular phones to communicate with the warehouse about the status of inventory. Imagine how much a company could save every year by having its personnel communicate over the company's existing WLAN instead. A VoWLAN system would allow an IT manager to minimize or eliminate calls made to numbers outside the retail establishment, curtailing personal calls and thereby improving productivity and reducing costs.

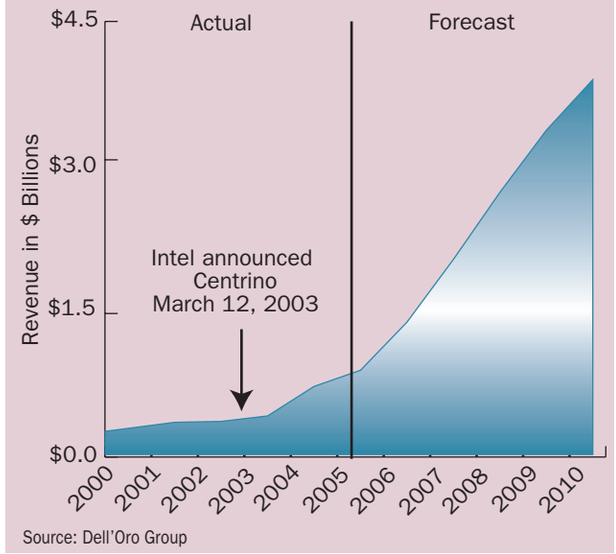
Or consider the hospital setting, and a scenario in which a radiologist working in the basement needs to relay urgent test results to a doctor making rounds on the floors. Cellular coverage is frequently unavailable and/or expensive in large, thick-walled buildings; however, if the hospital had a wireless LAN infrastructure, radiologist and doctor could communicate easily and reliably using the WLAN, and thus could provide more efficient, potentially life-saving patient care.

In the case of more generic office environments, VoWLAN could drive greater efficiency by enabling a greater number of customer-support or sales calls, easier collaboration between colleagues, faster access to information and faster decision-making. Yet the question of how VoWLAN adoption will progress outside the early-adopter vertical markets remains unanswered.

A Look Back—Reduced Implementation Costs Are Key

Prior to 2003, enterprise WLAN market revenue growth was relatively modest—increasing an average of 19 percent per year on a relatively small base. During this time, WLAN found success primarily in certain vertical markets—retail, health care, warehousing and logistics, for example—in which the productivity- and mobility-

FIGURE 1 Enterprise WLAN Market



Source: Dell'Oro Group

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related benefits were easily measurable and compelling for these enterprises.

However, the considerable cost of equipping client devices (i.e., computers) with WLAN functionality significantly inhibited WLAN growth. In 2002, an enterprise-class network interface card (NIC) for a laptop computer cost approximately $165. Moreover, the complicated and time-consuming process of installing the NIC added to the reluctance of most enterprises to deploy wireless LANs.

On March 12, 2003, Intel offered a large boost to the wireless LAN market by introducing its Centrino technology, which embedded WLAN functionality in notebook computers. Shortly after this announcement, WLAN capability became a standard feature on notebooks. We estimate that a mere 10 percent of notebook computers shipped with integrated WLAN functionality in 2002. This number increased to 90 percent by 2005, and WLAN-enabled notebooks carried little or no price premium over notebooks without WLAN. During the year following the Centrino announcement (2004), enterprise WLAN market revenues grew a staggering 77 percent (Figure 1).

We believe this acceleration in market growth resulted almost entirely from the movement of WLAN beyond traditional vertical markets into more mainstream office environments. Two key factors drove the shift: the declining costs of implementing the technology and the infiltration of WLAN capability into client devices.

Because the cost of upgrading client devices for WLAN capability effectively disappeared from the cost of deployment, an enterprise's return on WLAN investment improved significantly. In addition, because laptops increasingly included WLAN functionality—whether an IT department wanted it or not—the base of enterprise users began using the functionality at home and when traveling, and then began to request it at work.

With reduced deployment costs and increased user demand, more and more enterprises installed WLANs. Many now have begun to use WLAN for other applications, such as providing guest-access for their contractors, consultants, lawyers and others. If the cost of deploying VoWLAN can be reduced, and if client devices (phones, in this case) automatically ship with VoWLAN functionality, the market for VoWLAN will likely experience growth similar to what the WLAN market enjoyed after Intel's introduction of Centrino technology.

Handsets will remain the major cost

Current Cost Of Deploying VoWLAN

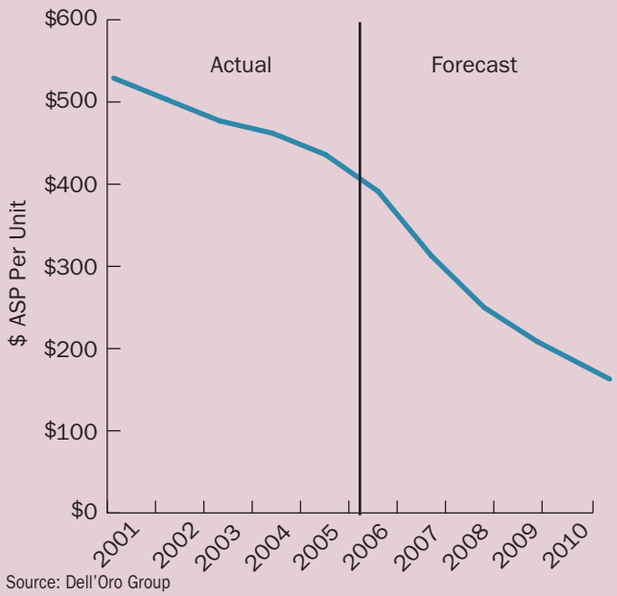
Deploying VoWLAN services today carries a hefty price tag. For example, installing the technology in an enterprise of 1,000 users would cost approximately $700,000, more than half of which ($400,000) would go to purchasing the single-mode (WLAN-only) handsets (Figure 2). If an enterprise already has a WLAN with voice capability, it could deploy VoWLAN for approximately 11 percent less ($620,000). This would increase the relative cost of VoWLAN handsets to 65 percent (from 57 percent in the first example) of the total cost of implementation. One may certainly change other assumptions to help lower the overall cost of the infrastructure, but the cost of the handsets will remain the major element in the cost of a VoWLAN deployment today.

We do, however, expect the cost of single-mode (WLAN-only) handsets to decline steadily over the coming years, from approximately $400 today to $200 in 2009 (Figure 3). The cost of

FIGURE 2 The Cost And Cash Flow Associated With A 1,000-User VoWLAN Network

VoWLAN Cash Flow Analysis	Year 0	Year 1	Year 2	Year 3	Total	% total Cost
Capital Costs						
WLAN Infrastructure	-$80,000				-$80,000	11%
IP PBX Licenses	-$160,000				-$160,000	23%
Installation/Site Survey/PoE/Other	-$58,000				-$58,000	8%
Handset/Client	-$400,000				-$400,000	57%
Total capital costs	-$698,000	$0	$0	$0	-$698,000	100%
Cost of operating and maintaining VoWLAN Network (assuming costs are 10% of total capital costs)		-$69,800	-$73,290	-$76,955	-$220,045	
Productivity Gains/Cost Savings (assuming $30 per month per user)		$360,000	$360,000	$360,000	$1,080,000	
Cash Flow	-$698,000	$290,200	$286,710	$283,046	$161,956	
Financial Metrics						
Capital cost per user	$698					
Discount rate	10%					
Net Present Value (NPV)	$14,023					
Internal rate of return (RR)	11%					

FIGURE 3 Average Selling Price For Single-Mode WLAN Phone



Source: Dell'Oro Group

WLAN phones that operate with voice-over-broadband (VoBB) services—Vonage, Verizon's VoiceWing service or Skype—should decline as these voice services expand and user demand for VoBB phones increases.

VoBB-enabled phones generally target consumers; however, as consumer- and enterprise-class phones often contain similar components, enterprise-class phones should likewise experience price declines. In addition, enterprises could potentially save even more on handsets as devices found more and more frequently in the enterprise environment—mobile handsets, personal digital assistants (PDAs) and paging devices—start to incorporate WLAN functionality.

We are beginning to see more dual-mode VoWLAN handsets on the market. Nokia recently announced the E-Series, a new line of mobile devices targeted at the enterprise market that integrates VoWLAN into the mobile handset. Conveniently for enterprises, Nokia's E-series can also integrate with a number of vendors' IP-PBX systems. RIM's BlackBerry 7270, a WiFi-only device, also targets the enterprise market. On the other hand, Motorola's A910 and Samsung's T709 products incorporate WLAN but seem designed more for consumer applications. Nevertheless, all these phones will surely find their way into enterprise WLAN environments, and all are scheduled to begin shipping in the first half of 2006.

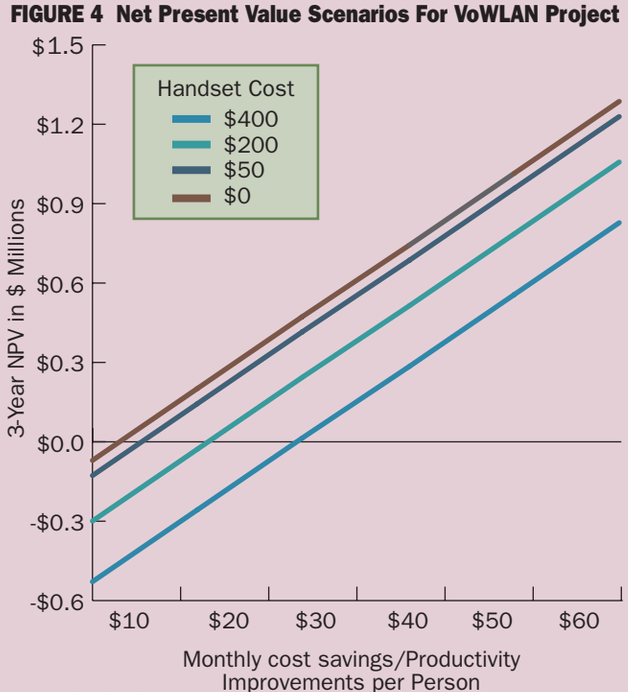
The availability of VoWLAN handsets and the costs of VoWLAN deployments remain by far the most important obstacles to mainstream adoption of VoWLAN, though some secondary issues also must be resolved. For example, any integration of WLAN with mobile handsets will require some level of cooperation between the enterprise and the mobile service provider to ensure seamless handoffs of calls between the corporate WLAN and the cellular WAN. Also, corporate IT departments will need to maintain access to the handsets they issue their employees in order to manage security and configuration settings. However, VoWLAN handsets must rapidly proliferate and costs of deployment must steadily decline, before these other factors even become priorities at all.

Generating Cost Savings From VoWLAN

VoWLAN has the potential to generate significant savings for enterprises; if realized, these savings could overcome the high cost of the handsets. The monthly bill per corporate cellular phone averages $60–100, and approximately 30 percent of that usage occurs in the office. Therefore, an enterprise with VoWLAN could save $18–30 per user per month.

According to the assumptions in Figure 2 (and figuring the cost of handsets in the $400 range, likely their peak price), an enterprise would need to save approximately $29 per user per month to recoup the costs of installing VoWLAN in three years on a net present value basis (Figure 4).

FIGURE 4 Net Present Value Scenarios For VoWLAN Project



Source: Dell'Oro Group

If the monthly cost-savings or productivity improvement is less than $29 per user, then VoWLAN becomes significantly less compelling for an enterprise unless the price of the handsets also declines. If handset prices decline to $50 per unit, then the monthly savings needed for breakeven over three years on a net present value basis become $15 per user per month, a more realistic goal when productivity or cost-savings might be hard to measure.

Similar to the patterns of WLAN adoption, early adoption of VoWLAN applications currently offers considerable cost savings in certain vertical markets, like health care and retail, where savings and productivity gains are obvious and easily tracked. Enterprises outside the vertical markets mentioned above will likely not display VoWLAN's potential savings so readily.

In these other instances, however, beyond the potential to reduce a company's mobile phone costs, VoWLAN systems also can offer better quality of service than cellular when in-building coverage is a problem. VoWLAN can integrate with corporate PBX systems, providing benefits to both IT managers and users. IT managers will gain more control over enterprise telecommunications infrastructure, services and costs.

For users, the integration of the corporate PBX system and the WLAN network will provide access to telephony applications like voice mail, messaging applications, conference calling and contact databases. In addition, coordination between mobile phone and enterprise PBX systems will designate a single telephone number for both mobile and desk phone—both phones will ring with an incoming call, and the user may decide which phone to answer.

The Bottom Line

Broad enterprise deployment of VoWLANs depends on two factors:

- The significant deployment cost of the VoWLAN being outweighed by the benefits of this new technology.
- The proliferation of VoWLAN handsets.

Because of the high cost of handsets, VoWLAN currently best suits specific vertical markets like retail and health care—early adoptors of WLAN technology—and environments structurally suited to measuring and quickly recognizing the strong cost savings and improvements in productivity that VoWLAN offers. As the cost of the handsets declines, and potentially even disappears as mobile phones integrate WLAN, enterprises will more widely adopt VoWLAN to manage costs and improve productivity.

From our vantage point at the very early stages of this integration, we expect to see the VoWLAN market remain isolated in certain vertical market segments through 2007. We expect VoWLAN to begin to spread to more mainstream enterprise and office environments sometime around 2008, the same time-frame (not coincidentally) in which we expect to see a larger base of dual-mode WLAN and cellular handsets in the marketplace□

VoWLAN will likely emerge first in the traditional wireless early-adopter markets