



Microsoft Corporation: 35,000 Employees Go Wireless with WLAN

SOLUTION SUMMARY

Microsoft's wireless local area network (WLAN), serving 35,000 users internationally, is believed to be one of the largest such solutions in the world. Providing an estimated \$6.1 million return per year due to improved productivity, the WLAN demonstrates the profitability and security of using wireless notebooks throughout an organization's corporate offices.

Challenge: Provide Secure, Wireless Connectivity

In May 1999, Microsoft Chairman and Chief Software Architect Bill Gates issued an executive challenge to the IT department: Install a WLAN within a year throughout Microsoft's corporate campuses in Redmond, Washington. Gates believed that enabling everyone at the office to more easily access and act on information would significantly boost employee productivity and satisfaction. Another key objective was to take a leadership role in deploying the advanced wireless features of Microsoft Windows XP. Most Microsoft employees — both traveling professionals and those at the corporate campuses — already used mobile PCs in their daily work. The challenge for Microsoft's IT group was to make the wireless network secure, manageable and easy to use in order to gain the desired ROI.

Solution: WLAN Enables Multi-Million Dollar Productivity Returns

By the summer of 2001, Microsoft's IT group had exceeded Gates' expectations by installing the WLAN not only in 70 buildings in Redmond, but also in 23 remote locations internationally. To achieve this large-scale deployment, they began with a pilot program for more than 600 users. This test case paved the way for a full implementation by confirming the team's technology choices and establishing productivity metrics.

According to Jawad Khaki, corporate vice president of Windows networking and communications technologies, introducing a sophisticated wireless infrastructure proved to be a fairly straightforward process. "Microsoft has found WLAN technologies to be secure, easy to deploy and manageable. Every day, we have 35,000 people throughout the world using wirelessly enabled notebooks."

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Further, Microsoft estimates that the \$9 million invested to bring wireless to its employee base will yield a positive payback within 18 months. (See Measuring the Success of the WLAN on page 2.)

*Jawad Khaki
Corporate Vice President
Windows Networking and
Communications Technologies*

Planning the Pilot Program

The Microsoft IT group decided to build its wireless network based on the IEEE 802.11b standard. The objective was to achieve coverage over the entire campus, even hallways and outdoor spaces, to ensure there were no dark zones. To test the model for this large-scale deployment and to determine user requirements, the IT group

chose to conduct a pilot program for two months for more than 600 users in three buildings, including a cafeteria. The planning phase for the pilot required careful definition of scope, participants, zones and training.

Setting up a wireless network requires that each client computer and peripheral be equipped with an appropriate adapter. This is typically a NIC or PCMCIA PC card, although new mobile PCs offer integrated WLAN capability.

Enterprises should also consider upgrading to notebooks with increased processing power and longer battery life for a better wireless experience.

Because Microsoft already used notebooks based on the latest Intel® mobile processors running Windows XP, the company did not need to upgrade their mobile PCs. Further, since October 2001, Microsoft has purchased all new laptops with integrated wireless capabilities.

A WLAN also requires the use of access points (APs) that serve as the wireless equivalent of a LAN hub. To accommodate future growth and avoid dark zones on the campus, Microsoft deployed a dense network of 4,000 APs.

From Pilot to Full Implementation

With the hardware infrastructure and security measures in place, the pilot was deployed. IT quickly identified the importance of requiring client and infrastructure tools, as well as offering educational seminars for technical staff and users.

To define the authentication and encryption of the wireless link, Microsoft relied on 802.1X security standards and certificate-based authentication. These standards produced a WLAN so reliable that David Field says, "Our wireless LAN is just as secure as our wired network." Jawad Khaki affirms Microsoft's confidence about its approach to security. "We're totally comfortable with our wireless security; otherwise, we would not have deployed it on such a large scale."

"We invested \$9 million to bring our WLAN to 35,000 users. We estimate that the return is \$6.1 million per year; therefore, we are realizing payback after 18 months."

Matthew Lehman
Senior Program Manager
Network Engineering

From the start, the program was a huge success in terms of accessibility and usability. According to David Field, "Pilot users wholeheartedly embraced the WLAN. They said it was the greatest thing since sliced bread."

David's team quantified this by conducting a survey of pilot users at the conclusion of the pilot. Key findings of the survey:

- Usage Models
90% used their wireless notebooks for e-mail, 15% for enterprise applications and another substantial portion for Web access.
- Productivity Gains
50% saved 1/2 hour to 1 1/2 hours per day due to the WLAN connection.
- Increased Flexibility
24% used the WLAN for more than six hours per day, and 93% used their laptops in new locations.

This information was central to providing IT with a proof of concept. As David said, "The pilot validated the design of our solution and gave us a way to concretely measure its benefits."

At the conclusion of the pilot program, the WLAN was rolled out throughout Microsoft's corporate campuses in 70 buildings in Redmond, Washington, and 23 international locations.

Measuring the Success of the WLAN

The Microsoft WLAN proved to be an economical investment. Its \$9 million in capital costs were concentrated in the materials and labor involved in installing the AP infrastructure and the individual access points. (The costs of wireless laptops were not included, because they are treated as departmental expenses.)

When measured against these costs, the productivity gains for the user base were tremendous. According to Matthew Lehman, a senior program manager in network engineering, "We invested \$9 million to bring our WLAN to 35,000 users. We estimate that the return is \$6.1 million per year; therefore, we are realizing payback after 18 months."

This gain of \$6.1 million is based on 35,000 users saving one-half hour weekly — a very conservative estimate — at an average full-time employee rate of \$67.30/hour for 52 weeks.

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David Field
Program Manager
Global Client Hardware

Significant Productivity Gains

A key objective for the WLAN was to provide the workforce with enhanced productivity. With wireless laptops, people can send or respond to e-mails, retrieve or share

documents and take notes in any location on a Microsoft campus, including a conference room, lunchroom, hallway, lounge, colleague's office, even a courtyard.

Dina Madson, a team manager in beta technical support, found that, "with my wireless laptop, I'm 10 to 15 percent more productive than before. I save about five hours per week."

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Some of these savings result from the ability to be productive during otherwise dead time, such as when waiting for a meeting to begin. For Jon Browning, a global help desk business manager, wireless connectivity helps him get out of the office at a reasonable hour. "Our WLAN lets us take care of urgent issues during meetings, so conversations don't get bottlenecked at someone's desk."

More Convenience and Flexibility

In order for the solution to be embraced by employees, wireless laptops had to be as convenient to use as wired ones. Dina Madson attests to the success of IT in delivering optimal usability. "Our WLAN makes everything so easy, it's like water. When you need something, you just hop on your laptop and get it right away."

Alan Withers, a program manager in the Microsoft IT group, identifies another major benefit of the WLAN. "With wireless, you can work in any room in any building, even a remote office in another country, and you don't have to worry about finding a network cable that's long enough or rebooting your computer."

LESSONS LEARNED

- A wireless local area network (WLAN) can be effectively installed in a large-scale organization with tens of thousands of users.
- Deployment of a pilot program ensures the success of full-scale implementation by providing proof of concept and a way to measure value.
- Tremendous, measurable productivity gains result from giving office workers wireless laptop connectivity.
- Today's security measures — including 802.1X standards and certificate-based authentication — offer proven protection against intruders and interference.
- The costs of installing a WLAN can be quickly offset by the productivity gains it provides.
- To take full advantage of a WLAN, wireless laptops should be outfitted with maximum processing power and long battery life.



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