

How Cisco WLAN Became Primary Corporate User Network

Employees average nearly 90 minutes per day of additional productive time using wireless.

Cisco IT Case Study / Wireless / Wireless Usage and Productivity Survey: This case study describes Cisco IT's internal deployment of ubiquitous wireless access to the Cisco network, a leading-edge enterprise environment that is one of the largest and most complex in the world. Customers can draw on Cisco IT's real-world experience in this area to help support similar enterprise needs.

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– Oisín MacAlasdair, IT Program Manager, Wireless Strategy & Architecture, Cisco Systems

CHALLENGE

When Cisco® IT deployed a wireless network in 2000, the primary goals were to meet strong employee demands for wireless, and to support employee productivity through “anytime, anywhere” network access. At that time, the wireless LAN (WLAN) was intended to act as a secondary or backup network that would enable greater mobility and help increase productivity, rather than to replace the wired LAN.

In 2002, eighteen months after the WLAN's initial deployment in 2000, Cisco IT conducted a survey to measure adoption of the WLAN. According to the 2002 survey results, a surprisingly high 25 percent of Cisco employees were using the WLAN as their primary access medium. By 2005, Cisco IT believed that the 5-year-old wireless network was being used by an even greater number of Cisco employees, that its use significantly improved user productivity, and that the aging wireless infrastructure required an upgrade to support this additional use and increased productivity. But the team needed proof to

obtain management support for any significant (and expensive) wireless infrastructure upgrades. In 2005, Cisco IT conducted an additional survey to determine the primary benefits of the WLAN and to establish the foundation of a business case for upgrading and redesigning the network to be a primary access medium.

This document is a summary and analysis of the 2005 survey results and provides lessons learned and next steps based on the survey.

SOLUTION

Cisco IT sent the 2005 WLAN survey cross-enterprise to 25,000 employees worldwide, and more than 26 percent responded. This high response rate was attributed to the many perceived benefits of the wireless network, and respondents' investment in its success.

One important finding was that in 2005, more than 42 percent of the respondents used the WLAN as their primary or only mode of network access, almost twice the number seen three years earlier. Another important finding was that,

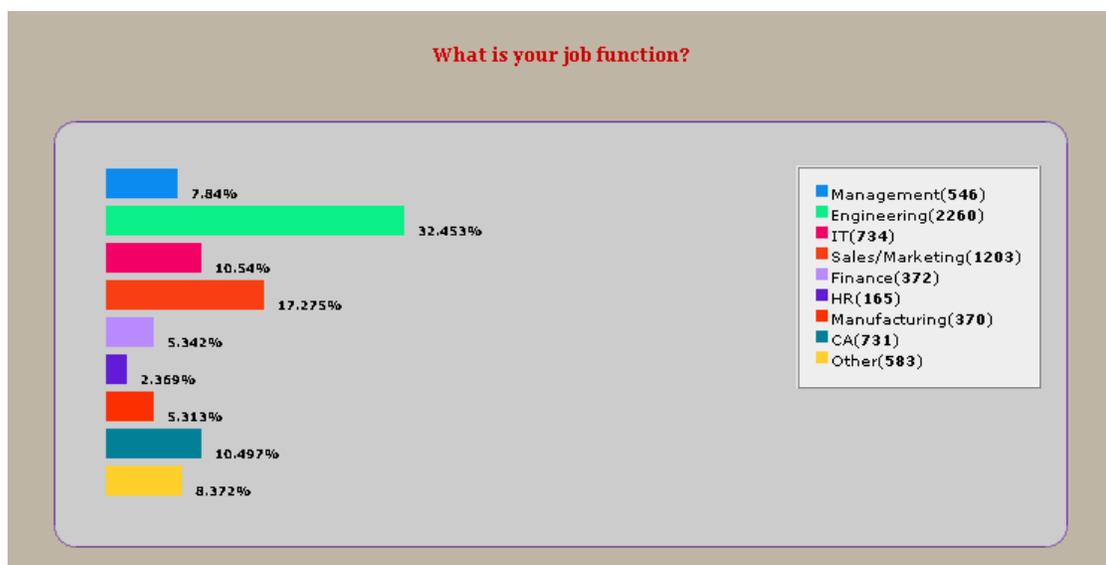
on average, Cisco employees gain almost 90 minutes of productive time every day, an enormous benefit to the company.

RESULTS

Survey Respondents by Job Function

Approximately 32 percent of survey respondents were part of Cisco's engineering staff; 17 percent were sales and marketing staff. Given the mobility demands of these job functions, it is not surprising that these groups displayed the highest levels of wireless network use. As expected, relatively "desk-bound" positions, such as finance and HR, showed much lower rates. Of the respondents, 10 percent were IT staff and could be considered early adopters or technology evangelists (Figure 1).

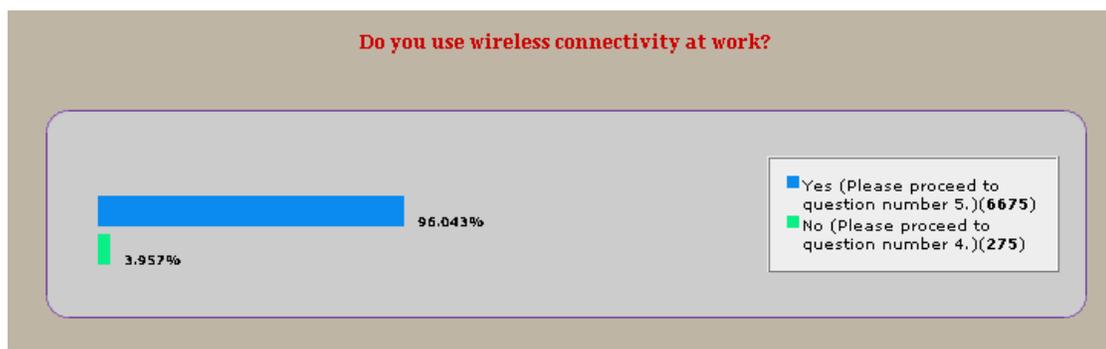
Figure 1. "What is your job function?"



Use of Wireless Connectivity at Work

Wireless has had a significant impact on the way employees connect to the network. 96 percent of survey respondents use wireless connectivity at least some of the time at work (Figure 2).

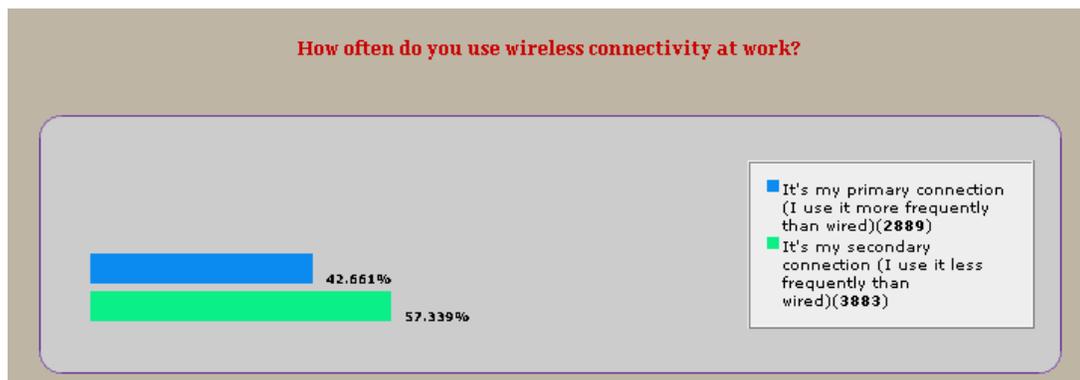
Figure 2. "Do you use wireless connectivity at work?"



Frequency of Wireless Connectivity Use

Many employees have come to depend on wireless. Nearly 43 percent of the survey respondents described the WLAN as their primary connection method (Figure 3). Wireless has significantly changed the way Cisco employees work together.

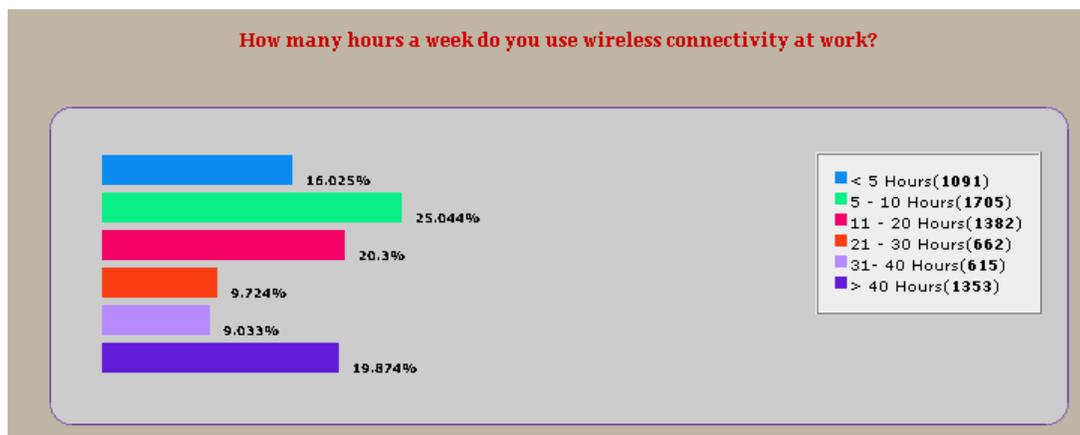
Figure 3. "How often do you use wireless connectivity at work?"



WLAN Use per Week

Slightly more than 38 percent of respondents used wireless connectivity 20 hours or more a week (Figure 4). Of those users, almost 20 percent used the WLAN more than 40 hours a week. One possible explanation is that users in positions with heavy time demands find ubiquitous access particularly valuable. A healthy 45 percent of respondents used wireless access from 5 to 20 hours per week.

Figure 4. "How many hours a week do you use wireless connectivity at work?"



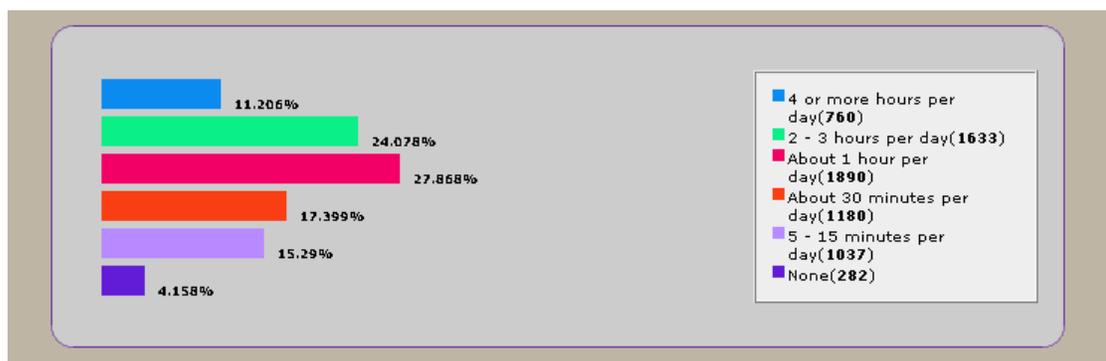
Increased Productivity

When asked how much extra productive time the WLAN provided, almost 28 percent of respondents said they gained about one hour per day; 24 percent said they gained an additional two to three hours (Figure 5). Average increase in productivity was 86 minutes per day, or the equivalent of 315 additional hours per user per year. The survey defined extra productive time as "the extra time that you work or save due entirely to the wireless network being available." Examples of this included time saved in moving about the building or moving to and from buildings on campus sites, ease of network access when traveling to other Cisco offices, time saved before and during meetings, improved

collaboration and access to information during meetings and ad-hoc working groups, and improved business agility and time to respond. .

Using Cisco's own internal financial costing model, this productive time savings equates to an annual productivity benefit of more than \$24,500 per employee. Alternatively, using a recent survey of U.S. IT salaries for 2006, Cisco accrues almost \$15,000 in productivity benefits per employee per year¹. Within the user comments were significant benefits that go beyond simply adding more hours of productive work each day. Employees found that by having access to the network and each other during meetings they were able to get the information they needed to make decisions right away. There was no way to quantify the business value of this quicker decision-making, but it is an advantage that few people were willing to give up.

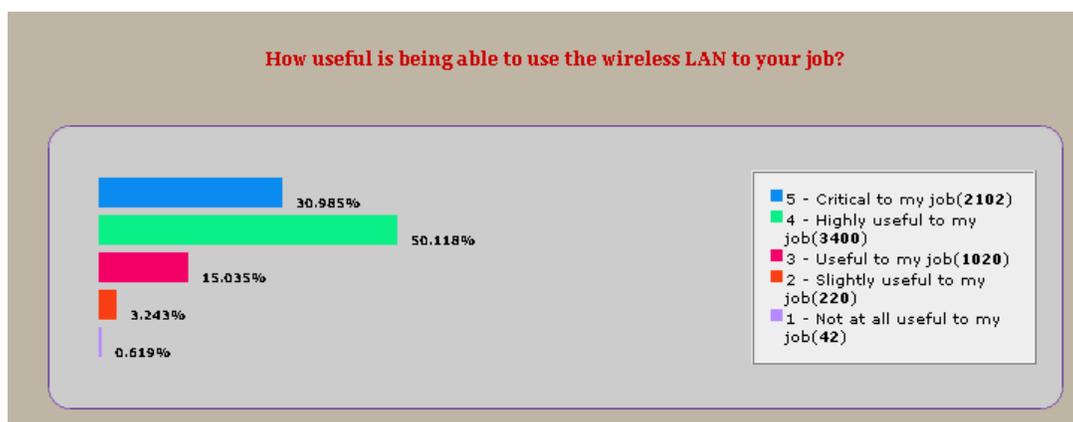
Figure 5. "How much extra productive time does the wireless LAN provide you?"



Usefulness of the WLAN

More than 80 percent of survey respondents said that the WLAN was either critical or highly useful to their jobs (Figure 6). This further emphasizes the importance of on-demand, ubiquitous network access to users. What was originally deployed as a secondary network has now become a fundamental business tool to Cisco employees.

Figure 6. "How useful is being able to use the wireless LAN to your job?"

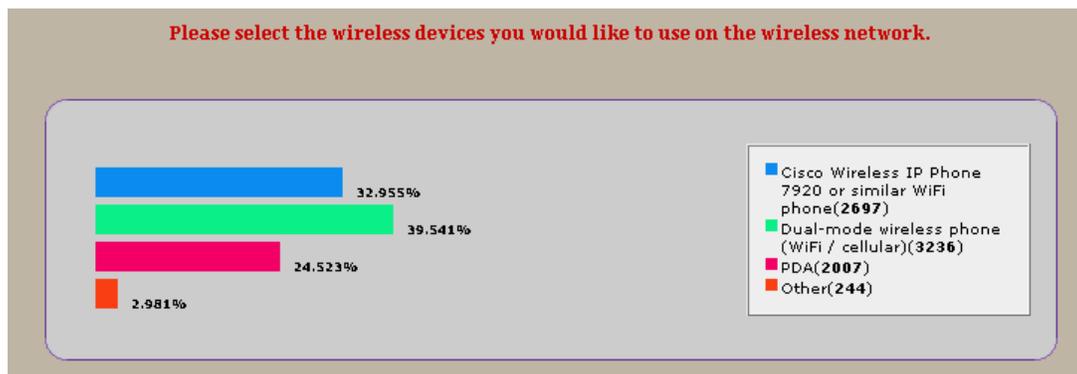


¹ <http://www.informationweek.com/news/showArticle.jhtml?articleID=186500737>
\$73,000 / 96,600 minutes (7 hours a day, 230 days a year) = \$14,835

Wireless Device Preferences

When asked to choose the wireless devices they wanted on the WLAN, almost 73 percent of respondents opted for a Cisco Unified Wireless IP Phone 7920 (or a similar Wi-Fi phone) or a dual-mode (Wi-Fi/cellular) phone (Figure 7). Almost 25 percent wanted to use their PDAs.

Figure 7. "Please select the wireless devices you would like to use on the wireless network."



A related question asked if respondents used the WLAN for voice; 25 percent of respondents said they did use the WLAN for voice, and approximately 58 percent indicated that they would be interested in using the WLAN for voice in the future. Today there is no real quality of service (QoS) support for voice over wireless (although the Cisco 7920 Wireless IP Phone works with Cisco access points to provide some level of call admission control). Despite that, many Cisco employees use Cisco IP Communicator, a software-based IP phone on their laptops, over the wireless network to provide them with phone connectivity when they are away from their regular office (or if they are in one of the newer mobile collaborative offices and are not sitting near a hardware phone).

Increasing Productivity over Time with Wireless

"The WLAN is vital to our users," says Oisín MacAlasdair, Cisco IT Program Manager for the Wireless Strategy and Architecture team. "Over time, adoption has been practically universal, and more than forty-two percent of our employees now use the WLAN as their only or primary access medium. Cisco staff reports more than 86 minutes of additional productive time per employee per day, which equates to more than \$24,000 in productivity benefits per user annually. The WLAN really has become critical to how Cisco does business."

In the mid-1990s, all Cisco employees had desktop computers, which were not mobile and required these users either to work from their desk in the office or to carry their work around with them in handwritten notebooks or in printed form if they were working in meeting rooms, at home, traveling, or at customer sites. Working from home was difficult and required having two company-provided computers, one at home and one at work (as security requirements kept Cisco employees from using personal home computers to do work). This all started changing by the late 1990s, when the price and availability of portable laptops made them more accessible both to individuals and to companies. Recognizing the value of a mobile workforce, Cisco invested in mobility by providing all employees with the option to use laptops instead of desktop computers; however, access to the network, and therefore to many productivity tools and services, was still restricted to the wired network. With laptops, users had the ability to work from a single workstation from the office, the home, or while traveling, but connectivity to the Cisco network still required a wired network connection either through a remote-access solution or physically plugging into the corporate network. Employees were gaining the ability to be more mobile, but for many purposes these users were still effectively "tethered" to their desks.

By 1999 many Cisco employees recognized the value of connecting wirelessly to the company network. This wireless connectivity freed them to work in any environment, which significantly improved their productivity. This value recognition led many people to set up small wireless LAN access points in their work areas, and to share this WLAN

access with their teams. Unfortunately, many of these non-IT (or “rogue”) access points were not secure, and offered people outside Cisco an easy way to break into the network. It took about a year, from 1999 to 2000, for Cisco IT to build a secure WLAN production service; until that point, Cisco IT spent a good amount of time shutting down useful but insecure employee-built wireless LAN deployments. Because of the popularity of wireless LANs in many locations (and the danger of insecure rogue access points), when building the secure WLAN, Cisco IT decided to deploy wireless LAN access points in every Cisco building around the world.

Cisco IT architects had originally expected employees to use wireless only occasionally. This was true at first, because employees had to request and get approval for wireless access from their managers. During the initial WLAN planning stages, this process changed when Cisco IT made the decision to provide comprehensive entitlement. They purchased 40,000 wireless adaptor cards to wireless-enable every Cisco employee’s laptop. Given a mobile, dynamic workforce that spends increasingly less time desk-bound, the company’s decision to “untether” its employees made good business sense.

LESSONS LEARNED

Today, the WLAN is fundamental to how Cisco does business. Cisco has enjoyed considerable success, both in productivity improvements and employee empowerment and mobility. At the same time, wireless adoption has outpaced the solution’s original architecture and business goals. Users have stretched the capabilities of the existing infrastructure and have communicated the desire for increased bandwidth, coverage, and support for wireless voice and video.

NEXT STEPS

Although the initial WLAN deployment was originally designed as a secondary network, the positive survey responses and the high rate of wireless use as a primary mode of network access have proven the business case behind the initial WLAN deployment, the major 2006 upgrade, and the next generation of the WLAN program. Based on the results of the 2005 user survey, Cisco has begun to invest time and money to completely replace the original WLAN with a more robust and more functional next-generation wireless network that will be suitable as a primary access medium.

The new network will be based upon a combination of the centralized WLAN controller-based solution (using Lightweight Access Point Protocol [LWAPP] access points) for most sites, and the distributed autonomous access point solution (using Cisco IOS® Software-based access points) at smaller locations. This solution is composed of five interconnected elements that work together to deliver a unified enterprise-class wireless solution. These elements are client devices, access points, network unification via Cisco wireless LAN controllers, world-class network management via the Cisco Wireless Control System (WCS), and mobility services. One of the main benefits of this new wireless network currently being deployed within Cisco is a 600 to 700 percent increase in aggregate bandwidth (based on doubling the number of access points at each location, and using higher-bandwidth protocols).

The Next Generation WLAN program includes a major redesign of the global network and substantial solution improvements. The architecture of this new WLAN will ensure that wireless is suitable as a primary access medium. Support for wireless voice and video will be intrinsic to the network. Stability, coverage, and availability will be improved through the use of the Cisco Unified Wireless Network. Finally, the new WLAN will introduce major improvements in management and security with integrated intrusion prevention systems (IPSs) as well as its self-configuring, self-optimizing, and self-healing network features, dedicated wireless management capabilities, and location-based services.

FOR MORE INFORMATION

To read the entire case study or for additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT www.cisco.com/go/ciscoit

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