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An Apple For Your Enterprise?

Whether it's a MacBook Pro or an iPhone, Apple is finding its way into the business world.

Incorporating Macs

They're coming. Are you ready?

BY JULIA KING

THE EITHER/OR option is off the desktop in corporate America. Macs have made their way out of the art department and into the offices of accountants, salespeople, manufacturing planners and top executives.

"We're seeing more requests outside of creative services to switch to Macs from PCs," notes David Plavin, operations manager for Mac systems engineering at the U.S. IT division of Publicis Groupe SA, a global advertising conglomerate.

For IT managers across all industries — even those with a well-established and stalwart Windows user base — the question is no longer whether you'll need to de-

sign and support a Mac computing strategy. The only question is how quickly. You may already be a little late to the game.

According to Forrester, business adoption of Macs tripled last year. What's more, this will surely accelerate as companies hire more Gen Y workers. Coming through the door in those backpacks are a slew of consumer technologies and wireless personal productivity tools — think iPhone.

Some users are finding that switching to Macs can even save money — lots of it. Auto Warehousing Co. (AWC) in Tacoma, Wash., is pulling the plug on all Windows-based PCs and powering up Macs to execute virtually all of its revenue-generating operations.

As the largest full-service auto processing company in North America, AWC has 23 sites across the U.S. and Canada and handles 5.5 million cars a year. Switching to Macs will save the company \$1.82 million over three years, according to CIO Dale Frantz. That's what it would have cost to upgrade software licenses if the company had stayed on PCs. In contrast, the total cost of switching to Macs was \$335,000.

"This is more of a strategic choice for the future," says Frantz. "By investing in the Apple platform, we pick up additional functionality that we don't have today," he says.

Frantz also says Macs are ready for business prime time. "On the whole," he adds, "what we're finding is this stuff just works. We're at a point where we can deploy it companywide." For all the details, see *AWC Switches to Mac* and *The Mac Switch Revisited*.

Other key factors driving Mac adoption include the rise of Web-based computing via software-as-a-service applications, which for the most part are platform-agnostic. The rise of virtualization, as well as Apple Inc.'s shift toward standardized PC components, has also cleared the way for greater corporate Mac use.

Indeed, experts say the Mac fits much better than it ever has before in the enterprise, and the trend toward cloud computing is reducing the importance of the client platform to access both internal and external resources.

In September, 2008, Apple Inc.'s Mac OS X market share passed the 8% mark for the first time, according to data collected by Net Applications.

Apple's operating system ran on 8.2% of the computers that accessed the 40,000 sites monitored for clients by Net Applications. The Mac's share of the operating system market was up over August's by nearly four-tenths of a percentage point, the biggest one-month gain since May. In the last two years, Mac OS X's share has increased by 3 percentage points, a gain of 58%.

Microsoft Corp.'s Windows, meanwhile, continued to slip in market share last month.

Overall, Windows accounted for 90.3% of the operating systems powering the machines that accessed Net Applications' metric network, a drop of 0.4 percentage points from August, when the operating system fell by nearly the same amount from July. That month was the last time that Windows maintained or grew its share. Since the beginning of this year, Windows has lost 1.5 percentage points in market share.

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Mac manageability is on par with Windows standards, so you can let users choose the equipment they prefer, without undue worry.

Still, IT needs to have a comprehensive strategy and the knowledge and experience to deal with Macs in the enterprise. The following pages are packed with actionable information on the subject, including hands-on tips about security and configuring, deploying and integrating iPhones into the existing computing environment.

Experts say learning how to manage security is perhaps the greatest of IT's challenges, since familiarity with the Mac is low. Users have typically managed the computers themselves. But Macs are not im-

mune to security threats. It's time for your IT staff to figure out where the Mac's security holes are so that you can plug them before your corporate knowledge starts bubbling out. In *Mac Insecurity*, we walk you through six of the major security threats and provide hands-on solutions for addressing them.

"The biggest danger is a sense of complacency: 'Oh, it's a Mac, we don't need to worry about this,'" says independent security researcher Dino Dai Zovi. "Because there is still very little malware in the wild targeting Apple, it's still a safe platform, and it is in a lot of ways safer than the Windows equivalent. But I think that time is rapidly changing."

The other key issue facing IT

departments is configuring and deploying iPhones for business. One of the biggest stories behind the release of the iPhone 3G and the iPhone 2.0 firmware update for first-generation iPhones was the inclusion of features designed for use in business environments. We bring you up to speed on managing the iPhone in an Exchange environment and provide options for developing and deploying in-house iPhone applications in *The iPhone Goes to Work, Parts 1 and 2*.

The bottom line: Given Macs' unstoppable infusion into the enterprise, a "no Macs" strategy is no longer defensible. Learn how to develop and implement a workable Mac strategy here and now. ■

 For more on integrating Apple products into your environment, visit Computerworld.com.

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The Time May Be Right

Concerns about complexity and support remain, but integration is getting easier.

BY ROBERT L. MITCHELL

APPLE INC. is the undefeated king of cool in the consumer electronics and home computer markets. It is rapidly gaining yardage in the broader personal computing market and is experiencing a resurgence of popularity in traditional Macintosh niches such as education, marketing and creative departments.

With all of this momentum, you'd think the Mac might be ready for a come-from-behind win in the enterprise. But on that field, Apple remains first and 10 at its own 10-yard line.

That's ironic, because corporate interest in a broader role for Macs is up dramatically among IT executives, driven by changes in what the Mac has to offer, by Apple's success in the consumer market and its other niches, and by corporate trends where, thanks to virtualization and a migration to Web-based applications, Windows' grip on the desktop may be starting to loosen just a bit.

"I'm getting more and more questions about bringing Macs into the enterprise and what it would take," says Tim Bajarin, president of strategic consulting firm Creative Strategies Inc. in Campbell, Calif.

There's just one problem. "Apple will tell you that they are focused on [the commercial business market], but at the end of the day, it's not a big priority for them," says David Daoud, an analyst at market research firm IDC.

An Apple spokesperson said the company does support corporate customers but declined to elaborate on Apple's enterprise strategy.

That ambivalence is a concern for IT managers such as Dale Frantz, CIO at Auto Warehousing Co., which last year

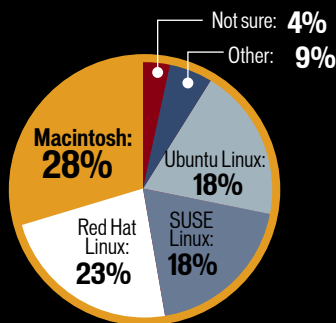
Hasta la Vista?

Could IT managers, facing a major Vista migration, be rethinking their commitment to Windows in favor of the Mac?

Although it's common for IT to be slow to adopt a new version of Windows, research shows that some organizations may be considering doing what was once unthinkable, abandoning Windows altogether rather than investing the time and money in a Vista migration.

More specifically, **44% of respondents** said they would consider an alternative to a Vista migration. Of those, **28% said the Mac would be their first choice.**

MOST LIKELY OPERATING SYSTEM TO DEPLOY IN PLACE OF WINDOWS



BASE: 961 IT PROFESSIONALS WORKING IN SMALL, MIDSIZE AND LARGE COMPANIES

SOURCE: KING RESEARCH, NOVEMBER 2007, FOR KACE NETWORKS INC.

began a corporatwide project to migrate to Macs across 23 locations. "The biggest weakness at this point I'd say is the lack of a cohesive enterprise strategy on the part of Apple," he says. (See [AWC Switches to Mac](#) and [The Mac Switch Revisited](#) for all the details.)

Apple's attitude is simple, says Charles Edge, director of technology at IT consultancy 318 Inc. in Santa

Monica, Calif. "Their strategy is to make a great computer that's standards-compliant. If enterprises want to use it, great, but if they don't, that's fine too."

But it takes more than a great product to succeed as the primary personal computing platform in large businesses. "To go after the major corporate accounts, you need a savvy direct sales force [and] a dedicated service organization to take care of enterprise accounts. That's not Apple's heritage," says Bajarin.

And on the record at least, it doesn't appear to be Apple's future either.

RETHINKING THE MAC

The Mac attraction is easy to understand. On the client side, the Mac's OS X is relatively easy to use. And Macs are considered more stable than Windows, with fewer spyware and virus problems, which translate into fewer help desk calls.

But that's not what has IT's attention.

The surge of interest in the Mac is a direct result of two developments from 2006: first, the evolution of more Windows-friendly, Intel X86-based Macs, and second, the introduction of Boot Camp, which allows a full Windows environment and its complement of applications to run natively in a separate hard-drive partition on any Mac.

Boot Camp garnered a lot of attention out the gate. According to Apple, 1.5 million copies of the beta version of Boot Camp were downloaded before the program's release as part of the Leopard version of OS X. The full integration of Boot Camp into Leopard has spurred some IT managers to actively review the potential of OS X

as an alternative for general business computing.

While most of 318 Inc.'s clients that use Macs extensively are in the video, sound and advertising realm, Edge says he is seeing more nontraditional customers willing to make a move. "We have two energy companies and a fountain design company that switched [from Windows] to Macs last year," he says. None of those, however, were companies with more than 500 employees.

Geiger Bros. already has 25 people in its marketing group using Macs, and that number could increase, says Joe Marshall, business analyst at the Lewiston, Maine-based promotional products company. While most of Geiger's 300 personal computers remain on Windows, a few Macs do use Parallels Inc.'s Parallels Desktop for Mac virtualization software to allow access to Windows business applications, Marshall says.

SERVER SIDE

Apple's constellation of server products — Xserve, Leopard Server and Xsan — are intended to service the small business and departmental islands of Macs in its core markets rather than corporations at large. Improvements in the operating system on the

“ I don't see [Apple] taking over the data center anytime soon.”

DON MONTABANA,
DIRECTOR OF CLIENT SUPPORT
SERVICES, MIT

desktop and server products have been mostly oriented toward consumers and small business. For example, Leopard Server focuses heavily on ease of setup for small business and offers a suite of workgroup-oriented tools.

But Apple has beefed up some features that are important to corporate users. Integration problems with Microsoft's Active Directory have been resolved in the Leopard release. Users can now update their own directory profiles, and digital signing is now supported, allaying the fears of security-minded IT folks.

Adding to its appeal with administrators is the fact that OS X is based on the Unix operating system and open standards such as Samba file and print

services, the NFS file-sharing protocol, RADIUS secure remote access and LDAP directory services.

"The biggest attraction for the Mac as a client machine is the stability of the Unix foundation for OS X as an operating system," says AWC's Frantz. And using Macs as clients on an OS X Server network offers several other benefits, he says, specifically in the areas of remote client administration and service, remote disk imaging and system configuration. Finally, improved communication tools like video iChat also make support easier, he says.

In his consulting practice, Edge still runs across a few lingering problems. "There's still no way to cluster file-sharing services, which is a biggie," Edge says, and he's had some issues with fail-overs in active/passive clustering configurations.

But on the whole, it's much easier to plug Macs into a corporate setting than it was just 12 months ago.

And it may be cheaper, too. On the server side, Apple has a licensing cost advantage over Windows. Apple's software licensing model was "a primary reason" why Frantz decided to standardize on Mac servers. (See [You do the Math.](#))

Still, Apple servers have made few inroads into larger organizations outside of serving Macs in traditional departmental niches. MIT has about 3,000 Macs on campus, but just a few isolated Apple servers. It mostly uses Dell hardware running Windows or Linux. "I don't see [Apple] taking over the data center anytime soon," says Don Montabana, director of client-support services at MIT.

SELLING HARD AND FAST

With its server and desktop products, Apple is now in a good position to tempt corporations. And it's got something else going for it: an incredible amount of goodwill among rank-and-file computer users.

Apple is selling plenty of hardware to prove it. Not long ago, its share of PC shipments in the U.S. hovered around 3%. In the third quarter of 2007, the Mac's share of PC shipments climbed to 6.9%, with year-over-year growth of 29%, according to IDC.

8 IN 10 BUSINESSES HAVE MACS

NEARLY 80% OF BUSINESSES have Macs in-house, nearly double the percentage that said they had users running Mac OS X two years previously, according to Yankee Group Research Inc.

"Then, we were talking about onesies and twosies," said Laura DiDio, a research fellow who conducted a survey of more than 700 senior IT administrators and C-level executives. "Now the number of actual users is very significant. A number of the businesses said that they had 50 or 100 or even several thousand Macs deployed."

Twenty-one percent of the firms surveyed reported that they had deployed more than 50 Macs. "This isn't Mickey Mouse," DiDio said. "Apple's graduated into the big league."

Among the reasons businesses cited for adopting Macs, the most surprising was the ability to virtualize other operating systems, primarily Microsoft's Windows, on Mac hardware. "That's clearly spurring some businesses," DiDio said. "A number of the respondents said, 'Oh, guess what, we're using the Mac to load Vista or XP on there and using Mac hardware.'"

In the laptop space, Apple is rushing ahead. In the same period, it ranked fourth in laptop shipments, with a 9.7% share in the third quarter and year-over-year growth of 43.6%.

To be sure, most of those machines did not ship to large businesses. “You have a really strong education market in the U.S., followed by a pretty good consumer market. The rest is pretty small,” says IDC analyst David Daoud.

That said, success in the home and educational markets is creating a grass-roots lobbying effort that is starting to hit some IT organizations from all sides.

More college grads are joining the corporate workforce with Mac experience — and expectations — in tow. At Georgetown University Law Center, nearly 50% of the college’s 30,000 students are using Macs — up from less than 1% just a few years ago, says CIO Pablo Molina. The same phenomenon is occurring at technical schools such as MIT, where Macs now represent 30% of all personal computers on campus, up from 20% last year.

“This incredible rise in the use of Macs by college students is going to put pressure on IT departments to support Macintosh PCs [in the workplace],” Molina predicts.

And it’s not just Macs that are turning employees into Apple fans: About 5% of the Law Center faculty has purchased iPhones. “I find that number shocking. I’ve had to modify our e-mail system so they could hook into it,” says Molina.

In some situations, IT organizations also face pressure from the top to support Macs and even iPhones. “You now have executives who have cut their teeth on Macs, and they’re coming in at relatively high levels,” Bjarin says. (See [iPhone Goes to Work](#).)

LEGACY CONCERNS

Aside from cost, the primary reason that IT executives are keeping Macs out of the corporate setting is that they don’t want to “break” the legacy environment, says analyst Doug Standley. Deloitte’s surveyed consultants estimate that 10% of its business clients are using Macs as a primary corporate tool, but if legacy issues were not a fac-

WHY CNBC CHOSE APPLE FOR NETWORK STORAGE

BY LUCAS MEARIAN

I VISITED CNBC’S HEADQUARTERS in Englewood Cliffs, N.J., recently to learn about why the broadcasting network was considering using the recently developed Fibre Channel over Ethernet protocol in order to make more efficient use of its extensive IP network.

What surprised me as I was touring the IT infrastructure with CNBC’s director of digital production and broadcast technology, Gary Kanofsky, and graphics engineer Rich Tallmadge was one of the broadcast giant’s storage-area networks. It was an Apple Xsan — one of the few I’ve come across in my travels. Most corporations simply don’t trust Apple enough — primarily because their infrastructure is Windows and Unix — to put it in their data center, much less to use it for primary network storage. But here was an Xsan in an enterprise that has a data center with 600 racks of equipment supporting hundreds of servers and editing stations and more than six television networks, including MSNBC, Bravo and the Sci Fi Channel.

I just have to note that Tallmadge is one of those Apple converts who — like many of us have experienced at one time or another in our careers — covertly evangelizes for Steve Jobs, professing the immense usability and effectiveness of Macs over PCs. But while CNBC’s graphics design team does mostly use Macs (40 Mac editing stations to be exact), there are a couple of PCs attached to the Xsan, proving that it can indeed support Windows. As you’ll see in this clip, there are two Xsans, each with 15TB capacity. The dual SANs replicate data between each other for business continuity.

Another thing to note about CNBC’s overall technology management team is its attitude about being on the cutting edge and its willingness to try new things. I was impressed by the sense of community, the competitive drive and the creative environment that was fostered by the leadership.

In this video clip, Tallmadge briefly talks about why he chose Apple for his primary SAN for graphics over better-known names in storage like EMC and NetApp, which do play a major role in CNBC’s central equipment room for the storage of online and near-line video, among other things.



tor, perhaps 50% to 60% of that group would at least consider the Mac as the primary personal computing platform for general business use.

Some legacy programs are being rewritten as Web-based applications. In other cases, the “fat” client that normally runs on a Windows computer is being moved to a virtual PC environment, such as Citrix Presentation Server. The latter executes the user’s desktop applications on back-end virtual PC servers and requires only a browser plug-in on the client for full access from any machine, be it a Windows, Mac or Linux client.

Geiger Bros.’ IT staff recently rewrote a shipping application to support a Web front end — the company’s

new standard. “Most of our internal applications, anything new, is being coded to a browser as opposed to [Windows] for cross-platform compatibility,” says Marshall.

In the future, some corporate applications may be encapsulated into platform-agnostic virtual machines — much like today’s virtual appliances — that can be distributed to and run on any personal computer that has a virtualization stack, says William Shelton, director of products and solutions at VMware Inc., a maker of virtualization software.

COST OF SUPPORT AND OWNERSHIP

Managers are concerned about

Mac supportability and total cost of ownership. “These issues will be the deal-killer,” predicts Guido Sacchi, chief information officer and senior vice president of corporate strategies at CompuCredit Corp. in Atlanta. “Can Apple make the case for itself, understand all of the CIO issues and help me solve them?” For now, says Sacchi, that answer is no for him.

Usually, Macs are more expensive when the purchase price and cost of support are factored in, he maintains. So while Sacchi has changed his philosophy about allowing Macs within his organization (currently, 15 of 3,500 employees have a Mac), he hasn’t changed his corporate purchase plans. “Because of the higher costs in an enterprise-level deployment, you have to have a justification in productivity. Right now, I see that only in specific niches.”

In terms of initial hardware costs, the price gap between Macs and PCs may be closing in some segments. Geiger Bros.’ Marshall says the Mac is much more cost-effective for graphics work, the classic Macintosh stronghold. But according to two *Computerworld* comparisons, one looking at hardware and the other looking at software and reliability, the Mac can be a better value in some other areas as well, particularly the higher-performance Mac laptops.

Even if that’s so, Charles Smulders, an analyst at Gartner Inc., cautions corporations to think carefully about large-scale Mac deployments. “There are three things enterprises require to be comfortable with deploying an operating system, and none of those have been addressed,” he says. These include lagging support from middle-ware and corporate software vendors; the complexities of adding another client’s hardware and software to the mix; and the lack of a second source for system hardware and parts.

MIT’s Montabana confirms the first point. “For Oracle, SAP and [other corporate software], the Mac clients always lag behind,” he says. “The piece that’s left is to get all of the ERP packages compatible with the Mac.”

Limited availability of Mac versions of the software FedEx Corp. needed was a key reason why the shipper aban-

doned the Mac in its sales organization in the mid-’90s, says David Zanca, senior vice president of e-commerce technology at FedEx Services, and he doesn’t think much has changed since.

Edge says the third-party software situation has improved, but only somewhat. “There’s more software available today, but it’s still a problem,” particularly in the case of some applications used in large businesses, he says.

“Complexities are introduced by having yet another operating system in your environment,” says Smulders. These range from management and integration issues to training and support.

Like many other shops, Geiger Bros. uses Microsoft’s Systems Management Server to manage its Windows PCs, but SMS doesn’t support Macs.

“It’s not the cost of the software

“This whole ‘If you want to talk to a genius, you have to make an appointment’ thing irritates me to no end.”

JIM QUINLAN
PRESIDENT, JAX INC.

license, but the complexity of maintaining all of those environments” that’s of concern, he explains. “I don’t see that as a viable mainstream option. You either stay in Windows or you switch to Macs,” he says.

NO SECOND SOURCE

Second sourcing gives the buyer competitive leverage and a second avenue for equipment and parts if the primary vendor is having trouble meeting demand — something Apple has been noted for in the past. And Apple’s forays into licensing its hardware to third parties — first with the Mac and more recently with its iPod — have not fared well.

Sacchi says having a second source

is not a big deal with just a few Macs in one department. “But if somebody is thinking about a complete enterprise replacement, that would be a concern.”

When deploying Macs at scale, IT can’t afford to be held hostage to a single vendor’s supply chain problems. “Compared to where they were five years ago, [Apple’s] supply chain and manufacturing is much tighter,” says Bajarin. But those improvements still might not be enough to allay the fears of corporate-level organizations.

SERVICE AND SUPPORT

On the support side of the equation, small and large companies with just a few Macs can find themselves caught in between Apple support offerings. Apple does offer enhanced support for larger customers. “There is an enterprise agreement where you pay \$50,000, and you get stellar support, including a dedicated support guy,” says Edge. “They really go all out.”

But that kind of money may not fit into the budget of companies with just a few dozen Macs in the marketing department or that of smaller companies like sporting goods retailer Jax Inc. in Fort Collins, Colo., which runs its business on Mac hardware and software.

With just 80 Macs to support, president Jim Quinlan says Jax is forced to stick with the less-expensive Apple-Care plan rather than fork out for enhanced support.

“In my mind, [that] service level has dropped from what it used to be,” says Quinlan. With no local Apple reseller, Jax must either ship equipment back to Apple or, if he needs it sooner, travel 70 miles to the nearest Apple store and then wait to speak with an Apple genius. “This whole ‘If you want to talk to a genius, you have to make an appointment’ thing irritates me to no end,” he says.

Most large businesses will probably remain on the sidelines for the foreseeable future. “I don’t think you’ll see a significant penetration into the traditional enterprise until Apple makes the strategic decision to go after that,” says Bajarin.

Then again, Apple does like to play its cards close to the vest. It wouldn’t be the first time that Steve Jobs has surprised the skeptics. ■

AWC Switches to Mac

Near Redmond, an enterprise shop plans its move from PC to Mac.

BY JULIA KING

JULY 16, 2007

IT'S LITTLE things like the small silver Apple logo on CIO Dale Frantz's crisp white shirt that signal the sea change in the works at Auto Warehousing Co. Over the next 60 days, AWC will begin systematically pulling the plug on all Windows-based PCs in its cavernous auto processing shop and power up Macs to execute virtually all of its revenue-generating operations. The move comes on the heels of a quiet, wholesale replacement of Windows-based servers for data storage and Web operations, which are now running on Apple Inc.'s Xserve RAID machines.

"This is not a vengeance case," Frantz says, referring to his 2006 tangle with Microsoft over threatening letters from the vendor that made false accusations about unlicensed software.

Instead, AWC's new strategic enterprise technology plan is the direct result of proof-of-concept testing that indicated that the company can cut costs, increase system reliability and security, and provide expanded IT support services by porting a major portion of its IT infrastructure to Apple. Extricating itself from its exclusive dependence on Microsoft is simply the cherry on top.

For Apple, which declined to comment for this story, the move represents a feather in its enterprise computing cap. It also gives the vendor a toe in the door of the Microsoft-heavy automotive industry. AWC is the largest full-service auto processing company in North America, with 23 sites across the U.S. and Canada.

“I got off the Microsoft file store we were using and moved everything to the Apple server, and it worked phenomenally.”

MIKE COLLISON,
DIRECTOR OF IS OPERATIONS,
AUTO WAREHOUSING CO.

"As a mainstream, big platform, we haven't seen a lot [of Apple] in automotive," says Gartner Inc. analyst Michael Silver. "Apple is still very niche-y. Its niches are in the media creation and the scientific communities."

AWC's plan calls for the retention of some Microsoft technology. AWC's main client/server software, VIPS (Vehicle Inventory Processing System), will continue to run on Microsoft SQL Server on the back end. "The SQL server runs well; it's a solid product. There's no business case to change that," Frantz says. But function by function, AWC will rewrite all VIPS client software in Java 6.0 or higher so it can run at the front end on Apple Macs. VIPS currently runs client software on Windows XP, which AWC will not upgrade to the newer Vista operating system.

"From what I've observed, Windows Vista is the same [as XP], but with prettier icons and a little pret-

tier user interface," Frantz says. "At the end of the day, our users are not going to do their work any differently with Vista than with Windows XP."

But it will take 12 to 18 months to rewrite the VIPS client software to run on Macintosh machines, and Frantz doesn't want to delay the cost savings and efficiency enhancements tied to the migration to Apple hardware. So in the interim, AWC will continue to run VIPS on Windows using software from Renton, Wash.-based Parallels Inc. that lets Macs run Windows applications in a virtual environment.

THE ROAD TO HERE

AWC's IT staff has been testing this configuration along with integrating Apple servers into its Windows-based network for the past four months.

Auto Warehousing Co.

BUSINESS

Largest full-service auto processing company in North America, with 23 sites in the U.S. and Canada.

HEADQUARTERS

Tacoma, Wash.

SERVICES

Installation of new car accessories, such as alarms, air conditioning and luggage racks; preparation and loading of vehicles for rail and truck transport; body shop repair; dealer delivery; warehousing; logistics; export/import.

VOLUME

5.5 million cars a year.

KEY CUSTOMERS

Hyundai, Kia, Mazda, Ford, Isuzu, Honda, Mitsubishi, GM, DaimlerChrysler

“We began down this road independent of Apple,” Frantz emphasizes. “We bought some Apple gear and began to try to make it work on our own.”

In late February, Frantz gave a MacBook Pro to senior programmer/analyst Robert Mullen with a simple directive. “Play with it for 30 days, and if at the end of the 30 days you don’t like it, bring it back to me,” Frantz recalls.

“I never went back,” Mullen says. “And then I started begging for an Apple desktop.”

Mullen also experimented with Linux as an operating system alternative to Windows. “I transitioned my full desktop from a Windows Vista enterprise desktop to a SUSE Linux desktop and was using the MacBook Pro as a laptop and SUSE Linux enterprise as my main desktop so we could see how well things worked,” he explains.

In the end, system stability and available support were the deciding factors.

“We went out on the Linux boards to begin cultivating support, and the message we got back was that the Linux community would love to work with us and wanted to know how many man-hours of development we could put toward the overall Linux project,” recalls Frantz. “That didn’t give me a lot of confidence about Linux as the production environment for what we do.” Meanwhile, the Apple testing was going extremely well. On the storage front, “I got off the Microsoft file store we were using and moved everything to the Apple server, and it worked phenomenally,” says Mike Collison, AWC’s director of IS operations.

As for the VIPS application, Frantz says, “Windows on my Mac runs faster than any PC I’ve ever seen. It’s blazingly fast. One of the main things that stunned me is just how well the Mac hardware runs Windows.”

On the whole, “what we’re finding is this stuff just works,” says Frantz. “We’re at a point where we can deploy it [companywide].”

In his own spacious office, Frantz has a PC running Vista stowed on a back table. “It’s pretty, but from a pure functionality point of view, I’m not using it any differently than I’m

“**What we’re finding is this stuff just works.**”

DALE FRANTZ,
CIO, AUTO WAREHOUSING CO.

using Windows XP,” he says. So front and center on his desk is a 20-in. Apple iMac running XP in virtual mode.

NO STAFF LEFT BEHIND

AWC’s 16 IT employees have also been training on the Apple hardware and operating system. Frantz emphasizes that he has no plans to change people because AWC is changing technology.

“We are not intending to leave anyone in the [IT] department behind as part of this development project. We’re going to be very, very careful as we step forward that we do everything to bring everyone along,” he says.

“These folks have dealt with Windows-based PCs and servers for their entire careers,” notes Collison. “But now, all of our techs are using Mac PowerBook Pros to support the enterprise. It’s a fairly fast learning curve.” The group has worked out a series of early integration glitches, including streamlining virtual private network connections and integrating firewall software.

Collison recalls a time when WatchGuard Technologies Inc.’s firewall software had “hung” and was snagging all access to AWC’s VPN. Using a MacBook Pro and VPN Tracker software from Equinux USA Inc., the network manager logged on and solved the problem in minutes. “He got it restarted, and everything was good,” Collison says. “It was poetry.”

“You run up against a series of go or no-go decisions when you’re doing a proof of concept,” adds Mullen. “But there seem to be no major

barriers to stop the show.”

Ironically, “where it gets fuzzy” is over the issue of licensing, says Frantz, who is meticulous about licensing records and software compliance. The question, he says, is, “What do you need to be legal if you’re running Windows XP in a virtual environment on Mac hardware?”

“We are running a copy of XP, so Microsoft deserves revenue for that,” Frantz acknowledges. “It’s just that it’s in a virtual workspace, so how do you handle the virtual workspace?”

A potential solution is to purchase and apply reseller licenses for Windows XP. This should allow AWC to legally run XP in a virtual environment on Mac hardware, according to the Microsoft OEM System Builder License that comes with Windows XP Professional software, Frantz says.

Still, to be sure, Frantz says he

THE TECHNOLOGY PLAN

VIPS, the monolithic client/server system that runs most of AWC’s revenue-generating operations, was developed in Sybase Inc.’s PowerBuilder in the late 1980s. It will be redesigned, function by function, and written in Java 6.0 or higher to run in native mode on Apple hardware.

VIPS client software now runs on Windows XP on Intel-based PCs. For the next 12 to 18 months, it will run on Intel-based Macs running Windows XP in virtual mode, enabled by virtualization software from Parallels. Once rewritten in Java, VIPS will run in native mode on Macs, eliminating the need for Parallels software.

VIPS’s server software will continue to be Microsoft SQL and Windows Server, running on Hewlett-Packard servers. But AWC will consider replacing the HP servers with Apple Xserve servers running server virtualization software from Parallels.

AWC will still use Microsoft Exchange as its e-mail software.

called Microsoft twice in May, requesting clarification on the licensing issue, but he has yet to receive a call back from the vendor.

Microsoft declined to answer questions for this story about licensing Windows to run in a virtual environment. After several requests, the vendor, through its public relations firm, referred customers to a Web site: www.microsoftvolume-licensing.com.

Pressed for more, it offered this statement: "Microsoft has reassessed the Windows virtualization policy and decided that we will maintain the original policy announced last fall."

As Gartner's Silver sees it, another potentially fuzzy area is the return on investment that AWC can expect by switching from PCs and Windows to Apple hardware and its Mac OS X operating system. "I'm skeptical about the ROI and how much it will cost in the end," says Silver. "Running Windows on a Mac is the most expensive way to run Windows," he notes. "You have to buy the Parallels software, buy more memory and buy a Windows XP license. It's not an inexpensive way to do things."

But Frantz is crystal clear on the issue: "This is more of a strategic choice for the future. If we look toward a return on investment to Windows Vista, there is no direct return

other than we continue business the way we always have. By investing in the Apple platform, we pick up additional functionality that we don't have today." ■

WHAT TO DO WHILE THE CODE IS COOKING

PARALLELS INC.'S PARALLELS DESKTOP is virtualization software. It lets users boot one operating system and simultaneously run a second one as a "guest." AWC has been testing Parallel's new coherence technology, which lets Windows applications run as if they were native to the Mac. The retail price for Parallels is \$79 per desktop.

While IT staffers at AWC are rewriting the company's main VIPS application in Java, Parallels Desktop will enable the company to boot Apple's OS X operating system on Intel Macs and run Windows XP as the guest.

"In coherence mode, everything looks exactly as it does in the Windows environment, but the underlying OS is the Mac," says AWC CIO Dale Frantz. "That's what attracted me. For the people on our shop floor, this doesn't look any different at all."

In testing so far, "our experience has been flawless," says senior programmer/analyst Robert Mullen. "But I would imagine that as we stress the system and associates on the floor use it, things will come up."

Running a second operating system in a virtual environment raises licensing issues that have yet to be definitively settled, so Parallels recommends that users running its software buy a full retail copy of Windows.



DALE FRANTZ

The Mac Switch Revisited

Proving more painful than expected.

BY JULIA KING

MARCH 3, 2008

HINDSIGHT, as they say, is always 20/20.

Less than five months after going public with plans to start replacing its Windows-based PCs with Macs, Auto Warehousing Co. was forced to push back the project by more than a month. That was in December 2007. The reason was not a lack of money, manpower or executive support. Rather, what stymied the project were protests from workers and objections from customers who perceived the technology switch as unnecessarily costly.

"I didn't see this coming at all," says Dale Frantz, CIO of the Tacoma, Wash.-based company. "We never before had any of the workforce question our technological initiatives." But with the Mac project, "there was a perception that the equipment was much more expensive than traditional Windows PCs and that we were purchasing Lamborghini-level equipment with the company's profits," he says.

AWC's customers had similar concerns, raising questions about whether the technology migration might trigger increases in service rates.

In fact, Frantz says, within hours after a July 16, 2007, *Computerworld* story about AWC's technology migration plans was published, both he and CEO Stephen Seher received a flood of phone calls and e-mails with questions, positive and negative comments, and even an anonymous death threat.

"Because of the breadth and scope of the project, our customers, workforce and financial institutions had a lot of questions," Frantz says.

Employees wanted to know whether money that could go toward salary increases or other benefits was being

“ Because of the breadth and scope of the project, our customers, workforce and financial institutions had a lot of questions.”

DALE FRANTZ,
CIO, AUTO WAREHOUSING CO.

diverted to what they perceived as a pricey high-tech project. Customers worried that the cost of the project would be passed on to them. AWC's bankers wanted more details to determine whether switching to a new technology made sound business sense.

Customers' and suppliers' reactions didn't really surprise AWC Chief Financial Officer Dennis Matteo. His biggest surprise had come earlier, when Frantz first expressed a serious interest in switching to Apple technology.

"Dale is a very savvy CIO [and] was a committed Microsoft advocate. So when [he] started to look at Apple in a very serious way, it implied he had seen some fundamental changes in the business services direction of Microsoft and Apple," Matteo says. "Obviously, he likes the direction Apple is moving."

On all fronts, the concern was widespread enough that AWC executives decided to push back the rollout of the client computers and instead build support for the project.

FULL DISCLOSURE

As Frantz saw it, fully disclosing costs was the best way to do that. He spent the next month explaining to everyone who would be affected the many reasons for the technology swap. Among those is the more than \$1.82 million the company calculates it will save over the next three years. That's what it would cost to upgrade software licenses if the company remained on PCs; in contrast, the total cost of switching to Macintoshes is \$335,000. The real kicker, though, is that AWC would continue to do business on the upgraded software in the same way it had always done business with the software already in place.

Frantz set up "town meetings" with about 450 workers on all three shifts and laid out the licensing math. "I talked about the fact that Microsoft requires up to five client licenses for just one PC, just so we have the legitimate right to attach to the network. With Apple, that's all included," Frantz notes. "Yes, it looks like the equipment is more expensive — until you stack on all the client licenses to run Microsoft [software]."

According to Frantz, AWC workers are aware that 2008 is going to be a very tough year in the auto industry, given the housing crisis and a looming recession. Disclosing the licensing details to workers helped them understand that "we weren't [spending] millions of dollars on new computers when we could have instead put the money into employee benefits or their payroll," he says.

Frantz also brought a Mac to the shop floor and demonstrated AWC's main Vehicle Inventory Processing System (VIPS) on its 20-in. screen — which was noticeably larger than the existing 16- and 17-in. PC screens.

And he demonstrated the iChat feature in the Mac OS X operating system. Using iChat, an AWC tech-support staffer took remote control of the Mac on the shop floor to show how computer problems there could be quickly fixed by an IT person located remotely. "That was a real 'wow' factor," Frantz says.

But not everyone was sold.

"We knew we were going down an entirely new road," Frantz says, "but we didn't anticipate the huge emotional response that we got back."

"People are passionate on both sides of the aisle," he says. "There's a lot of talk about the cult of Macs, but there's just as strongly a cult of Microsoft. It's just not as widely publicized."

A few key people were very anti-Apple, though they couldn't articulate why. "They just didn't want to switch," Frantz says.

Executives and IT staffers worked with the dissenters to win them over.

On the customer front, Frantz met one on one with various port managers and manufacturers' representatives in Tacoma and Detroit, again explaining the licensing math. "Customers just wanted to know how this was going to affect their rates,"

he says. He showed them that switching to Macs would result in lowering AWC's costs, which over time would result in lower rates.

Frantz says AWC had calculated "significant savings" associated with migrating to Apple software during the proof-of-concept testing last summer. "We knew we would have sufficient ROI for the change based on some broad generalizations, and the savings were enough to green-light the project," he says.

But the real focus of the early testing was to make sure VIPs could continue to run on Microsoft SQL Server on the back end with Macs on the client side. "The SQL server runs well; it's a solid product. There's no business case to change that," Frantz says.

MOVING AHEAD

Once the interoperability issue was resolved, Frantz's team began integrating Apple servers into AWC's Windows-based network. As of Feb. 1, of a total of 40 non-SQL servers to be converted to Mac servers, 14 had been changed over. The remainder will be swapped out according to AWC's three-year equipment-refresh schedule.

AWC has also finished migrating from Microsoft's Active Directory to Apple's Open Directory for controlling the network. This is especially significant, Frantz says, because the controlling operating system architecture determines licensing costs.

"By getting off of Microsoft Active Directory and onto Open Directory, each individual server becomes separate, and Microsoft can no longer view [and charge for] a broad enterprise network. This was a very significant change," Frantz says.

AWC has completed migrating to a Mac OS X mail server and is currently migrating users from Exchange to Mac OS X's Mail application. "This requires a little bit more [time and effort], because we have to convert each user's mailbox, one at a time, making sure that all folders and calendar items import properly," he explains. The project is about 50% completed.

AWC's in-house IT team has been working alongside five consultants from Apple's professional services unit to work through networking, security and other engineering issues, Frantz says.

Running two different mail systems in parallel is especially compli-

BECOMING A BELIEVER

BRAD WIELAND is facilities and project manager at AWC, and his first reaction to CIO Dale Frantz's Mac plan was "quite a bit of skepticism," he says.

First, there was the cost: "I had financial concerns, because one of my responsibilities at the Tacoma facility is to keep costs down," he says.

AWC had completed upgrading all of its Windows 95 machines to Windows XP machines over the previous three to four years. "My initial thought was, 'Why spend all of this money when we just upgraded to new computers?'" Wieland says. "This was not a cost savings in my mind.

"But once Dale explained to me all of the savings on the back end, it really began to make sense," he says.

Wieland also had productivity concerns, however. "I am a Windows person through and through," he says. "I know how to tweak things on a Windows machine.

"There was also a bit of fear of the unknown," Wieland admits.

But those concerns have largely abated since he began working on a Mac laptop a little more than a month ago.

It's an interim machine to replace a PC that died, he says. He will get a Mac of his own shortly. "Things are much more user-friendly on the Mac," he says of the office productivity applications.

He has also seen a demo of the company's main VIPs application running on a Mac in the warehouse. It will be up and running on his Mac laptop once he receives it. VIPs "looks almost identical, but it seems to work a lot quicker," he says. "There is not as much of a delay time when you hit the Search button."

Overall, Wieland says, he is about 75% sold on the switch to Apple, "which is a lot better than a month ago."

What would it take to make him a full-blown, true-blue Apple convert?

"Once I get a laptop that is mine and I can customize it the way that I want to," Wieland says. "I'm even kind of thinking about a Mac for my next home computer."

cated. “We didn’t want to do a wholesale swap in a weekend, because that would require getting IT people to every facility to help assist users with the migration, and that wasn’t possible,” Frantz explains.

Working with the Apple consultants, Frantz says, AWC’s network administrator devised an “elegant solution” to continue using a single mail domain, even though the users are temporarily on two different mail systems.

On the client side, AWC has so far installed 25 of 28 Macs to run its mainstay VIPS application on the shop floor at its Tacoma facility. The other three clients remain on PCs because the Macs don’t fit into the weatherproof cabinets on AWC’s outdoor lots — “a little pain point” that’s being resolved, Frantz says.

By December of this year, all VIPS client software will have been rewritten from PowerBuilder to Java 6.0 so it can run at the front end on Macs. The rewriting project is about 10% complete at this point, Frantz says.

Over the next year, “we’ll upgrade to Macs on a shop-by-shop basis, because it doesn’t make sense to sunset brand-new PCs,” Frantz says. He estimates that by 2010, all 28 of AWC’s facilities will be completely switched over to Apple technology. By then, all remaining PCs will be fully depreciated and will be able to be cost-effectively replaced with Macs. ■

YOU DO THE MATH

HERE’S WHAT A TYPICAL AWC executive uses and what it costs under Microsoft:

| DEVICE | MS OFFICE | MS OUTLOOK |
|------------------------------|-------------------|-------------------|
| Office desktop | \$371.40 | +\$129.87 |
| Home desktop | \$371.40 | +\$129.87 |
| Travel laptop | \$371.40 | +\$129.87 |
| E-mail-enabled cell | | 129.87 |
| Totals: | \$1,114.20 | +\$519.48 |
| Grand total per exec: | | \$1,633.68 |

In contrast, with Macs, when you buy the hardware, the software is included. “With Apple, the e-mail client is included on all Macs and on the iPhone, with no additional licensing of any kind,” Frantz says.

This appeals to him because it makes costs more predictable and it makes software license management simpler and less expensive.

“Apple includes their full server suite of software in the price of every Xserve that you buy. Whether it’s a file server, a wiki server or something else, you get their full server software suites included in the price of the Xserve. There’s no additional software cost,” Frantz notes.

“There’s no doubt that Apple’s approach resonates with enterprise IT in that you buy it once and deploy it everywhere without getting into lots of individual additional license fees,” says Michael Gartenberg, an analyst at JupiterResearch and a *Computerworld* columnist. In addition, Apple’s simpler licensing scheme “comes at a time when Apple is very focused on being standards-based, and its clients are Intel-based. What that means is they can always run Windows,” he says.

The bottom line, says Gartenberg: “We’ll see a greater emphasis on Apple focusing on the enterprise in 2008.”

Mac Insecurity

Macs are immune, right? Wrong.

BY GLENN FLEISHMAN, INFOWORLD

MACS ARE immune from security threats, right? It's Windows we have to worry about. That water-cooler wisdom needs to be flipped on its head, security experts and IT managers warn. Microsoft has gotten its security act together with Vista and its current security-response program; meanwhile, Apple is fast becoming the company most in need of getting its security mojo going.

Many IT and security managers who have focused on securing Windows need to turn their attention to Mac OS, as these six security flaws attest. And with Macs increasingly making their way into the enterprise, they shouldn't wait: According to a recent Yankee Group Research Inc. study, 80% of senior managers at 700 companies had Macs in house, with 21% boasting 50 or more Macs in use.

A few security holes in Mac OS X are already known, such as the unpatched ARDAgent vulnerability. But that's not where the principal Mac security threat lies. From interviews with security experts and corporate IT managers, it's clear that security concerns and potential risks are much more quotidian. That's exactly the kind of bread-and-butter stuff that is easy to ignore, especially for Macs, where IT's familiarity with the Mac is slight because users have typically managed the computers themselves.

It's time for IT to figure out where the Mac's security holes are so that you can plug them before your corporate knowledge starts bubbling out. Here are the six main flaws you should focus on.

SECURITY FLAW NO. 1

UPDATE MANAGEMENT

Across the board, IT and security folks peg patch and update management as Apple's biggest lacuna. The problem is not that the Apple doesn't release security patches, bug fixes and functionality upgrades on a continuous basis. Instead, the issue is with four flaws in Apple's update process:

1. Unlike Microsoft's Patch Tuesday, Apple offers no predictable schedule for the release of critical updates.
2. There's no simple rollback or uninstall provision.
3. Many updates don't fully document the set of changes involved.
4. Apple doesn't provide hooks for third-party software to assist in managing patch installation or rollbacks, although such software does exist. (Apple does allow configuration so that software updates are downloaded from an intranet server, however.)

"Apple just goes ahead and issues an update without anyone knowing it's coming, and no one knows what's inside it," says Rich Mogull, an independent security consultant, formerly of Gartner Inc.

This demonstrates Apple's newness to the enterprise environment with Mac OS X, despite the operating system's many years on the market and its growing adoption rate. For single users and midsize offices, these patch policies raise few eyebrows. But for large corporations, they're insufficient.

Third-party patch management

software for Mac OS X is available, such as LANrev, Bigfix, and Patch-Link. However, only a few suites are designed for anything but Mac OS X — which makes it hard to have a unified suite for Windows and Mac patch management.

The danger here is in allowing individual users to manage their patches, which could lead to systems — especially laptops carried by mobile users — being far out of patch compliance and, thus, vulnerable to long-fixed security holes.

SOLUTIONS

Install an intranet proxy for Apple's software updates.

Review Mac-oriented patch management; these suites also include options for distributing other software updates and corporate documents, as well as auditing settings and installed software. Check with your patch management vendors about plans to add Mac support if your suites do not. Send reminders to Mac-using employees whenever critical patches appear to install the updates as soon as possible.

Schedule patch sessions for laptops that are primarily out of the office because they're most vulnerable to proximity attacks via Wi-Fi or Bluetooth, as well as attacks from untrusted networks on which they are located.

SECURITY FLAW NO. 2

THIRD-PARTY SECURITY FLAWS ARE SLOW TO BE FIXED

Most of Apple's most serious security updates, ones in which remote or arbitrary code execution are possible, typically involve third-party

software — often open-source or free software components. (Notable exceptions are Safari and QuickTime, Apple-developed products that have had dozens of serious flaws, none of which have so far been exploited by attacks prior to being patched.)

While the project running the software often patches such vulnerabilities in hours or days, Apple often lags in releasing such updates. For example, Apple included version 2.2.6 of the Apache Web server in Mac OS X 10.5 (Leopard) in October 2007. Apache was updated to 2.2.8 to fix several security flaws in January 2008, but Apple didn't ship an update until March 2008.

But other times, Apple is speedy. For example, an Apple researcher discovered a set of flaws in the Ruby language and environment,

which were documented and patched on June 20, 2008. In this case, Apple took only 10 days to release its security patch.

In both cases, it's critical to note that neither Apache nor Ruby is used by default in Mac OS X. Apache must be enabled either through the Sharing preference pane's Web Sharing service checkbox or at the command line. Ruby isn't used for any native Apple products, and it must be wired in at the command line or through third-party packages.

Locking down this sort of access would prevent the most likely security flaws from being exposed, but that's problematic with the current operating system. Configuration management software does exist to help such a lockdown, but Mac support may not exist in the software

you're running companywide.

That should change. "We are starting to see early signs that some vendors are supporting Mac as a platform for those configuration management systems," Mogull says.

SOLUTION

Consider limited deployment of third-party software to restrict configuration by administrative users if your current solution doesn't include Mac support.

SECURITY FLAW NO. 3

EVERYBODY'S AN ADMINISTRATOR (OR NOT)

Apple has a binary attitude when it comes to modifying system settings, gaining access at the command line to its Unix underpinnings, and installing software: You're either an administrator — or you're not.

For home users and small businesses, the distinction is probably enough. An unprivileged or normal user can be restricted via parental controls and typically can't create user accounts, enable file-sharing services or install certain kinds of software. For that, an administrative-flagged account is needed.

But with administrator privilege set, a user can turn on features through switches in System Preferences, such as enabling **Samba** — "the Mac version is typically three to six months out of date," Mogull says — or using the Terminal application to activate any of the thousands of Unix daemons and servers that ship as part of a stock Mac OS X system.

"It's hard to enable those things on Windows," says Thomas Ptacek, a principal consultant at security firm Matasano Chargen, noting that even when such settings are available in Windows, the settings are typically obscure or complicated enough to deter average users. By contrast, a single click might be enough in Mac OS X.

SOLUTION

Limit administrative accounts to users who require them.

THE PATCHING PROCESS

APPLE INC.'S PATCHING PROCESS

proves that the company isn't serious about moving Macs into the enterprise, according to some security researchers.

One dissenting expert, however, says it was unfair to compare Apple's patching procedures with, say, Microsoft Corp.'s.

"You have to evaluate the patching performance of the company if you're looking at Macs," says Andrew Storms, director of security operations at vendor nCircle Network Security Inc. "And the last two weeks hasn't been a gold star for Apple."

"You get an update from Apple, and it's always a surprise," says Storms. "The first thing you do is sit down with your team, look at the update, set priorities and assign resources. And then the next day, another update arrives, and you have to do it all over again."

"If you can't properly plan for this, you're in a constant firefighting mode," Storms continues. "Now it's affecting the management of the IT team."

And that has to spook businesses, whose

administrators are used to pinning Microsoft's updates to specific dates on the calendar. "Even if you realize that the Mac may be an effective tool, it's going to have a greater impact on the infrastructure because of the way Apple patches," Storms says. "The question is, can your infrastructure withstand it?"

However, another researcher, Swa Frantzen of the SANS Institute's Internet Storm Center, disagrees with Storms. Frantzen argues that it was, no pun intended, an apples-and-oranges comparison to pit Apple's patching procedure against Microsoft's.

"If Apple should be compared with other vendors, take the other Unix vendors," Frantzen urges. "Sun, HP, FreeBSD, OpenBSD, the different Linux distributions — very few of them group together patches in a monthly cycle."

In fact, argues Frantzen, Apple's process of patching when the patch is ready reduces the window of vulnerability for users. "[Microsoft's] monthly cycle adds an average of half a month of unnecessary vulnerability while the patch is fully finished and not being offered to customers," says Frantzen. "It's like Ford would know your Explorer will have trouble and has a solution to prevent your tire from blowing up, but decides for the ease of the dealers not to tell you or give you the solution for another few weeks."

SECURITY FLAW NO. 4

NAÏVE USE OF
BACK TO MY MAC

Mac OS X includes one special service that sounds alarming at first glance — and can be a real security hole in unmanaged environments. Back to My Mac, a remote access system built into Mac OS X 10.5, requires both a **MobileMe** account (formerly **.Mac**) from Apple and administrator privileges. Back to My Mac operates like the **GoToMyPC** familiar to Windows administrators, although it's less insistent about working around intentional blockades.

While Apple uses IPv6 tunnels, IPsec encryption and Kerberos tickets to secure connections, starting up such a connection from anywhere on the Internet requires just the password to someone's **MobileMe** account. With that password, all computers with Back to My Mac enabled can have their files examined or screens remotely controlled.

In a managed enterprise, security experts don't believe that Back to My Mac creates any real risk, despite its feature set. "No enterprise is going to allow something like Back to My Mac unless it's running through a VPN tunnel," Mogull says, at which point it would conform to the enterprise's policy. If users are running Back to My Mac on their own, "it would mean that [IT] royally screwed up" the firewall, he adds.

Matasano Chargin's Ptacek says that Back to My Mac will eventually fall under the category of services that businesses ban their employees from using in the office. "Enterprise users are not allowed to use Gmail or Yahoo Mail," he notes, and Back to My Mac should be treated the same.

SOLUTION

Confirm that Back to My Mac won't work in your environment. Establish a policy that bans its use.

WHY DOES APPLE
GET A BREAK?

BY STEVEN J. VAUGHAN-NICHOLS

WANT TO KNOW A DIRTY LITTLE SECRET? We Linux and open-source users love Apple's devices.

I was at LinuxWorld recently. By my estimate, I'd say about a third of the laptops were from Apple, with about half of the rest either running Linux natively — largely Asus EEE mini-notebooks, Lenovo ThinkPads and Dell laptops — or had Linux installed on them by their owners. Only about 10% of the computers at the show were running Windows. None of these, I might add, were running Vista.

Of course, not all those Macs were running Mac OS X exclusively. I noticed many of them were running Ubuntu. Still, we're always ready to throw bricks at Microsoft, but we do tend to give Apple a free pass.

What Apple really has going for it is a matchless integration of form and function. Apple controls everything on a Mac, and the result is an attractive, seamless combination of power and performance. Macs are, in a word, compelling.

The irony is that the Mac is based on open source. You don't need to look very deep into Mac OS X to find its open-source roots. It's built from the open-source operating systems Mach 3.0 and FreeBSD 5. Hiding right underneath Mac OS X's glossy Aqua interface are all of Unix's shell interfaces, the Emacs and vim text editors; the gcc and make development tools, and open-source favorites like Apache 2.0, PHP 5 and Ruby on Rails.

The same is also true with the iPhone. The operating system is, once more, a descendant of Mach and FreeBSD, by way of Darwin, and the Web browser is built from WebKit.

Someone needs to coordinate a Linux distribution with a specific set of PC models, keep only the best open-source programs in each software category and throw out the rest, and then pound and polish on what's left until, like with Macs, they have a system that just works.

Until that happens, we're still going to be tempted by Macs, iPhones and iPods. After all, in a way, these most proprietary of all platforms are also the most successful of all open-source platforms.

SECURITY FLAW NO. 5

COMPLACENCY OVER
MALWARE

The recent appearance of a kit that lets malicious parties install Trojan horses in legitimate software to in turn obtain root access to a Mac seems to run counter to the widely held view that Macs are immune from many of the exploits that once plagued Windows (and that Vista has ameliorated).

But that Trojan horse doesn't meet the smell test: Like a few other "con-

cept attacks," the exploit requires that someone download and install software, although no password is required for the malware to run.

The exploit relies on the escalated privileges available for the Apple Remote Desktop agent, or ARDAgent, even when it's turned off. An AppleScript command can be sent to the agent, which is handed off as a root-level shell command.

A survey of security experts and the buzz among the Mac enterprise management community shows that this threat is a nonstarter.

The fact is that the Mac has not been a malware target, and it is safer than

Windows from such threats. And that's where the risk lies: The Mac is safer from malware today, and there's very little concern about the Mac being a gateway to infecting Windows users.

But that may not be true in the future, and there is some concern that IT won't be ready to protect Macs from malware when that day comes.

Today, most of those who follow Mac security closely seem to abjure antivirus software. "It's not unreasonable to use antivirus in an enterprise, especially if compliance is an issue," says Mogull — but "I wouldn't necessarily recommend that for a consumer," he adds, because today's antivirus apps don't address Mac OS X's actual risk profile today. "Antivirus is an industry failure," Ptacek says. Because of this, he can't recommend that companies install antivirus software at all.

Dino Dai Zovi, an independent security researcher, is concerned about acceleration in this area. "Because there is still very little malware in the wild targeting Apple, it is still a safe platform, and it is in a lot of ways safer than the Windows equivalent. But I think that that time is rapidly changing," he says.

Mogull cautioned that the worst could be yet to come. "It isn't that the Mac is immune or even more resistant to these attacks; there just hasn't been very much interest in them," he says, a sentiment echoed by security experts and IT managers. With more Macs in the enterprise, it's likely that attacks designed to extract information or take over Macs to use them as zombies will hit the wild.

While the Mac OS itself is fairly safe from malware, at least for now, the Mac OS X's default Safari browser is not. "We've long since moved into

this place where it's about the browser and about JavaScript," Ptacek says.

Even security experts unconcerned over operating system-level malware threats are worried about browser-based threats. The fears center on as-yet-undiscovered flaws in the Safari browser and on Apple's use of the Webkit, a browser engine that's both employed throughout OS X and available to third-party developers. The concerns are not theoretical: A flaw in Safari on the iPhone found in a TIFF library module lets an iPhone forfeit root control just by visiting a Web page. (This was briefly a popular way of jail-breaking iPhones to install third-party software.)

SOLUTIONS

Keep abreast of security updates and security news related to Macs.

Make sure the same outgoing firewall monitoring tools cover Macs as other platforms to identify hallmarks of hijacked systems.

SECURITY FLAW NO. 6

APPLE'S SECURITY IS HALF-BAKED

The strongest concerns over Mac OS X security have to do with improvements introduced in Mac OS X 10.5 (Leopard) that fall short of what's fully needed. "Nothing in Leopard is completely implemented," says Mogull. "They finished enough to get their marketing bullet point, but not a real strong level of defense," concurs Dai Zovi.

Leopard has a strong foundation on which more enterprise-oriented features should be built, as well as a greater extension of integrity and

attack resistance for individual users on their own or in companies. For example, Apple added library randomization to Mac OS X 10.5, which prevents virus writers from finding code at specific places in memory each time. However, unlike with Vista, only a subset of what can be protected is actually protected.

Some suspect that Apple will finish building enterprise-class security in Snow Leopard, the next major Mac OS X, slated for summer 2009. While Apple is scant on details related to Snow Leopard, it's clear that with the "pause button" pressed, as Apple CEO Steve Jobs put it, security and enterprise support will be two of the big improvements expected. (Better use of multiple cores and processors and a push toward optimized software such as JavaScript and QuickTime will be two of the other pillars.)

SOLUTION

With Snow Leopard a year away, security-conscious enterprises may choose to delay serious Mac deployments until they know precisely what security improvements Apple commits to for that release.

Don't be complacent about Mac security. It's vital that security planning takes place before holes appear, and that the IT staff is ready to handle the differences between the Windows, Unix and Linux systems they may be accustomed to and what Mac OS X brings with it.

Dai Zovi says, "The biggest danger is a sense of complacency: 'Oh, it's a Mac, we don't need to worry about this.'" ■

This article originally appeared on InfoWorld.com on July 14, 2008 and is reprinted with permission.

The iPhone Goes To Work, Part 1

How to activate and configure the iPhone 3G for business.

BY RYAN FAAS

ONE OF the biggest stories behind the release of the iPhone 3G — and the iPhone 2.0 firmware update for first-generation iPhones — was the inclusion of features designed for use in business environments. While many analysts and enterprise users have argued in recent weeks about whether the iPhone can replace Research In Motion Ltd.'s BlackBerry as the prevailing smart phone for business, little has been said about the tools and processes that Apple offers systems administrators to actually deploy and manage iPhones at work.

ACTIVATION AND ITUNES

One of the first steps in deploying the iPhone in any environment is the activation process. This involves both the purchase and business account setup, which is done with AT&T in the U.S. or with other carriers in other countries where the iPhone is sold. Working with a carrier directly makes sense for developing necessary business plans, and it's required for any business iPhone activation, whether you're at a mom-and-pop operation or a big company.

As with any GSM smart phone, activation requires associating a SIM card with a business account and a specific phone number. This is handled by the carrier, which may provide already-active SIM cards (much like the in-store activation for consumers), or you may need to activate the iPhone after inserting the SIM card and before deployment.

The specific route you take will depend on both the carrier and whether

you're re-using existing SIM cards. In general, assume that you will need iTunes to activate the iPhone, particularly if you're buying more than a handful.

Note: With the iPod Touch 2.0 update, the iPod Touch can offer several of the iPhone's enterprise features, although it can't make or receive calls and needs Wi-Fi access for any data service. The iPod Touch is also activated with iTunes.

Although iTunes should be considered an activation requirement, it's not required for enterprise functionality. Once activated, an iPhone can be configured and used without iTunes, allowing users access to many of the iPhone's data features such as Web

browsing, e-mail and other Exchange features — including calendars and the Global Address List — and applications. They can also send and receive calls. Without iTunes, however, users will not be able to sync music, video, photos or Web browser bookmarks.

That means you have two major options when it comes to activating and deploying iPhones: You can manage the activation within your IT department, where all iPhones are activated with a limited number of computers using iTunes and then distributed to users, or you can give users access to iTunes and allow them to activate and sync their phones on their own (or activate them with the guidance of an IT staff member).

Each choice has merit, and each has potential problems. Allowing employee access to iPhones via iTunes is a questionable move in a business environment. Even if users plan only to build and sync media libraries to a company-provided iPhone, iTunes could still be used to update or restore the phone without IT supervision or test newly released updates.

On the other hand, iTunes backs up the contents of an iPhone, including all of its settings, during each sync. That can provide a safety net for users in case of problems or if the phone is lost or stolen. And it provides a convenient sync of mail accounts, calendars and contacts in a non-Exchange environment, and Web browser bookmarks in any environment.

Note: In predominantly Mac environments, Apple's managed preferences architecture



makes it possible to restrict some individual iTunes features. Similar options for doing this in Windows environments are available by editing the appropriate Registry keys. If your organization opts for user activation and syncing, these offer better options than wide-scale access to all of iTunes. But there is still no way to limit iTunes solely to sync functionality for the iPhone.

For many enterprises, the ideal option is likely to be centralized iPhone activation, particularly in an Exchange environment where user e-mail and calendar data is synced directly to the Exchange server rather than requiring sync with a workstation. (See Part 2 of this series for more on working with Exchange.)

This allows more control over data on the iPhone, avoids the need to install iTunes on workstations and positions IT as the contact for any iPhone-related issues. It also helps a company stop users from associating their phones with an Apple ID and iTunes Store account, making it

harder for them to make purchases through the App Store for iPhone or the iTunes Wi-Fi Store.

IPHONE CONFIGURATION

Apple provides some automated configuration of iPhones for the workplace through the use of configuration files, or profiles, that can be used to establish a number of typical configuration options. These could include requiring a passcode to access the phone, configuration of Exchange or IMAP/POP e-mail accounts, VPN configuration (for PPTP, L2TP and IPsec/Cisco VPNs), some configuration for access to Wi-Fi networks and the installation of certificates on the phone.

How the iPhone connects to a carrier's network using Access Point Name settings is also supported, although these settings should ideally be coordinated with your carrier if they're needed.

iPhone profiles are XML property-list files that can be generated with either a Mac OS X application — the iPhone Configuration Utility — or a

Web-based tool that can be installed on either a Mac or a Windows PC.

While either tool can generate configuration files, the application interface also allows you to build a library of iPhones within your network — complete with installed application and user information. And the Console viewer offers easy access to log files on the iPhone when it is connected to a computer, which is useful for troubleshooting problems and testing in-house applications. The application environment also allows for management and deployment of in-house applications.

There are two overall disappointments to Apple's implementation of configuration files for enterprise environments. First, the files are not pushed out over the air and automatically applied to iPhone clients. They must be sent to a client by e-mail or hosted on a Web server and loaded using the mobile Safari browser on the iPhone. This makes distribution a bit more cumbersome, both for the initial deployment and for later updates.

WILL THE IPHONE CAUSE AN 'ENTERPRISE HALO EFFECT'?

BY SETH WEINTRAUB

THE OFT-CITED BUT HARD-TO-PROVE "Halo Effect" of iPods in the consumer space over the past five years has arguably caused a rise in Macintosh purchases. Certainly, areas like education have seen significant rises in Macintosh purchases among iPod-toting students. But the enterprise is a different situation entirely.

Or is it?

According to Wikipedia, the halo effect is a "cognitive bias whereby the perception of a particular trait is influenced by the perception of the former traits in a sequence of interpretations."

In the case of iPods, the owners liked them so much that their perceptions of other Apple products were (rightfully?) inflated. The chances of an iPod owner buying a Macintosh increased. By extension, the Macintosh market share grew and continues to grow overall.

If the iPhone is a success in business, a similar halo effect could occur. Initial satisfaction reports from ChangeWave show that iPhone owners in business are significantly more satisfied with their iPhones than they are with other devices, even BlackBerries. And this is without iPhone 2.0 enterprise features.

Once Apple has its foot in the door of business, more opportunities will arise.

- Apple's software developer's kit will have IT developers hammering away on Macs as it is not available on Windows.
- Deploying iPhones will likely require some Apple software — perhaps an enhanced Apple Remote Desktop — putting Apple enterprise software in IT workers' hands.
- Satisfied Apple users will encourage IT departments to expand Apple's product line inside the organization.
- Having Apple enterprise accounts at large companies opens doors for Apple sales. A free MacBook with every 100 iPhones?
- The direct halo effect on IT workers who will likely want iPhones — and perhaps Macs — for themselves.

So will the iPhone cause an enterprise halo effect? It's too early to tell. However, if Apple executes the iPhone 2.0 well, every opportunity exists for an enterprise halo effect to open the door to Macintosh sales in the enterprise.

Second, users must choose to install profiles or updates. You can't enforce an updated profile. When an updated profile is received via e-mail or accessed via a Web server, users can choose whether to install the profile. Users can also delete profiles using the iPhone's Settings application, so there's no guarantee that profiles will be kept up to date — or used at all.

Note: If you are hosting configuration files on a Web server other than Mac OS X Server 10.5.3 or higher, you will need to add support for the .mobileconfig extension MIME type of application/x-apple-aspen-config.

Similarly, with the exception of a passcode requirement, profiles don't do much to restrict iPhone features. For example, there's no way to limit the installed applications users can access, and no way to restrict them to Wi-Fi networks specified in a profile (such as ones that are known to be secure). Profiles exist only to simplify the iPhone setup and enforce policies.

At least profiles can be digitally signed, thus ensuring that a user who gets a new or updated profile gets one that's legitimately issued by a company's IT staff. Profiles can be signed using certificates issued by a public certificate authority (such as Veri-Sign) or with a self-signed certificate, provided that you deploy a copy of the certificate to iPhones (which can be done using a profile).

Another note: Passcode policies can be enforced over the air using Exchange ActiveSync. When both profiles and Exchange policies define passcode requirements, the strictest combination of the two is enforced by the iPhone.

One particularly useful feature is that a single iPhone can maintain multiple profiles. This allows you to configure and deploy different profiles for different functions. For example, all iPhones will likely need the same series of certificates installed, and that can be done with one profile. Only a specific group of users, however, may need VPN access configured, which can be done as a separate profile. This also allows you a bit more ease and

flexibility in updating configurations, since you don't need to make changes to every existing profile and option.

CREATING PROFILES

When using OS X's iPhone Configuration Utility, a list of available profiles (as well as their creation date) can be viewed and edited by selecting Configuration Profiles in the sidebar. The sidebar also has options for Provisioning Profiles and Applications — both of which are used to deploy in-house



applications and will be discussed in Part 3 of this series — as well as a Devices list of all iPhones that have been connected to the computer.

The Web-based configuration tool allows you to create profiles and export or e-mail profiles to users. It also lets you import and modify existing profiles. It does not, however, allow you to work with in-house applications or maintain a library of iPhones that have been connected to a computer.

By default, once the Web-based tool is installed, it can be accessed via the IP address of the computer on which it's running using Port 3000 (for example, <http://127.0.0.1:3000>). A default username of "admin" with a password of "admin" allows access. Both the port and the username/password combination can be changed if needed. Apple's documentation ([download PDF](#)) explains how to do this in either Mac OS X or Windows.

The following eight tabs — along with their options — are available for creating a profile using either tool:

GENERAL

This provides overall information about the profile, the ability to digitally sign it, the options to export it for storage or hosting on a Web server, the options for importing an existing profile for editing, and the information on how to e-mail the profile directly to users. Specific options include the following:

Name: The profile name displayed to users (required).

Identifier: A unique alphanumeric string used to identify the profile for updates provided to iPhones in which the profile is already installed. The format is similar to that used for applications and Dashboard widgets in the form of `com.example.profile` (required).

Organization: The organization for which the profile is being created.

Description: A short description for users.

Signature: A dialog used to select a certificate and private key used to digitally sign the profile.

Delivery: Buttons for importing, exporting and e-mailing profiles.

PASSCODE

As the name implies, this defines passcode policies for an iPhone. Options include:

Require passcode on device:

Prompts users to create a passcode to unlock the iPhone.

Allow simple value: Permits basic repeated characters as a passcode.

Require alphanumeric value: Requires passcode to include numbers and letters.

Minimum passcode length

Minimum number of complex characters: Required number of non-alphanumeric characters.

Maximum passcode age: Number of days after which a user must change the passcode.

Passcode lock: Number of minutes (one to five) of inactivity after which the iPhone locks automatically.

Maximum number of failed attempts: The number of failed attempts permitted when entering the passcode after which the iPhone will need to be authorized with iTunes to be used again.

Note: For more than six attempts, a time delay before each following attempt will be imposed and increased with each failed attempt.

WI-FI

Allows you to define one or more Wi-Fi network configurations for the iPhone. Options include network

SSID, whether the network is hidden, and the security type for the network, including support for any security (or none), WEP and WPA/WPA2.

Distinctions are made between personal and enterprise security types, with the latter allowing configuration of authentication technologies, specification of usernames and use of certificates. Supported authentication protocols include TLS, LEAP, TTLS, PEAP and LEAP-FAST.

Note: The passwords for Wi-Fi networks can't be included in profiles.

VPN

For establishing VPN configurations, the iPhone supports L2TP, PPTP and IPsec (Cisco) VPN protocols. The options for the protocols available in the profile configuration mirror those in most VPN clients.

For L2TP and PPTP, the iPhone supports authentication using both passwords and RSA SecurIDs, as well as the option to designate whether all traffic should be routed through the VPN connection or

only traffic intended for destinations within the remote network. Apple's documentation explains more options for additional VPN support.

E-MAIL

Allows configuration of POP/IMAP e-mail accounts. You can opt to specify all settings, with the exception of a password (server settings, username, displayed e-mail address) for a user, or you can simply populate server settings. If you do not specify user details, users will be asked to enter them on the iPhone itself.

EXCHANGE

Allows configuration of Exchange ActiveSync. You must provide information for the server hosting Exchange ActiveSync.

Optionally, you can enter a custom name for the account to be displayed on the iPhone (the default is Exchange ActiveSync). You can also specify the use of SSL for communication. As with the E-mail tab, you can specify user account information (in the form of *domain\username*)

and e-mail address, or you can just enter the server information.

CREDENTIALS

Used to deploy certificates to iPhones. You will need to specify a certificate file. You can specify either PKCS1 (.cer, etc.) or PKCS12 (.p12) formats.

ADVANCED

Used to configure APN settings. You'll want to contact your carrier for detailed instructions if you need to use these options.

DEVICE OPTIONS IN THE IPHONE CONFIGURATION UTILITY

As noted earlier, the iPhone Configuration Utility offers more than its Web-based counterpart. One is the ability to view information about iPhones currently connected to a computer and to build a library of information about all iPhones that have been connected to that computer. While these features are most useful for deploying or testing in-house applica-

IPHONE HACKING'S NEGATIVE EFFECT

BY SETH WEINTRAUB

PREVIOUS, I TALKED ABOUT a positive effect that the iPhone could have on the enterprise adoption of Macs. Unfortunately, there is an uglier side of Apple's iPhone that it should really be concerned with as far as reputation and security goes. There is a real danger of it spilling over to the Mac Platform as well – the “horn effect.”

Hacking.

About a week after its launch, the iPhoneDev team hacked the iPhone Version 2 software. That's the one with all of the enterprise features. Things like:

- Certificates and identities
- WPA2/802.1x
- Enforced security policies
- More VPN protocols
- Device configuration
- Remote wipe
- Your kids can SSH into your device and hijack your corporate information

What is this saying to enterprise IT? When 13-year-olds are hacking into the devices that are supposed to hold all of their corporate information, how are users going to feel secure that their data is protected?

A reputation for easy hacking isn't going to get you Apple into the enterprise very quickly, if at all. At the very least, it will give competitors and naysayers an easy excuse to pass over the platform. If the Apple brand is identified with easy hacking, reputation that could extend to the Mac platform as well, that's the opposite of the halo effect. This is unfortunate because one of the great things about the Mac OS is that it is very secure and the security doesn't come at a usability cost like Vista.

What to do?

If Apple wants to sell lots of phones (10 million by year's end) and wants to sell to a security-conscious enterprise, it has to lock down its platform – for real. This will leave all of the one million unlocked iPhone users out in the cold and kill unlocked iPhone sales – 25% to 33% of Apple's business, depending who you ask. This is something I don't think Apple is prepared to do.

Up until this point, Apple has had its cake (carrier revenue) and ate it, too (unlocked iPhone sales).

What Apple REALLY should do is open up the iPhone to be available on any carrier that supports it. All of the unlocked iPhones would still work, and Apple could still earn revenue off of them through the App Store. Additionally, they could open up the development platform more so that developers aren't forced to make hacked applications.

tions, they have other benefits.

The Connected Devices list in the sidebar provides easy access in its Summary tab to information about an iPhone that's similar to information displayed in an iPhone's Summary tab in iTunes: the iPhone name, storage capacity, firmware version, serial number, a unique identifier (beyond what shows in iTunes), the date it was last connected and the phone number associated with it. As an option, you can associate a user's name and e-mail address with an iPhone.

The Provisioning Profiles tab allows you to see what provisioning profiles — used to allow installation and use of in-house applications — are installed on the phone. The Applications tab provides a view of all installed applications, including name, application identifier and version number. Both of these tabs are primarily related to the development and installation of in-house applications rather than those purchased from the App Store.

Finally, when an iPhone is connected, you can view its log file using the Console tab. While this is mainly used to address issues with the development of in-house applications, it also

provides a wide range of information about general use of the iPhone and any problems that crop up. The log can be filtered to find specific search terms — typing “Wi-Fi” into the search box, for example, shows information about networks the iPhone has accessed — and can be saved as a file for later review. The Console is available only while a device is connected.

Although these features are useful for maintaining information about iPhones in your environment, particularly if they were centrally activated while the iPhone Configuration Utility was running, or for troubleshooting, their primary use revolves around in-house applications, *which I'll cover in Part 3 of this series.*

OVERALL IMPRESSIONS: ACTIVATION AND CONFIGURATION

Although this isn't intended as a review, I can't help but make a couple of observations about the ways that Apple has chosen to implement iPhone enterprise activation and configuration.

The adoption of configuration files and the ability to use iTunes solely as a mechanism for activating or restoring an iPhone has answered

some of the concerns about its use as an enterprise device. IT staffers can manage the general activation process and rely on configuration files to configure network settings like Wi-Fi and VPN use and e-mail/Exchange access. The setup also allows company-specific security certificates to be used.

These are both good first steps. The fact that configuration files allow for the configuration of features outside of Exchange allows companies not running Exchange to still benefit from some automatic setup options. The downside: Apple's implementation of configuration files still leaves their ultimate use up to the user and doesn't provide a way of enforcing either their use or updates.

Another feature that would be helpful in future iPhone updates is the ability to automatically install free or site/volume-licensed third-party applications such as those available via the App Store. As applications aimed at business use and productivity emerge, this will become increasingly important, and it seems only logical that Apple should eventually address it. ■

The iPhone Goes To Work, Part 2

Integrating the iPhone 3G with Exchange.

BY RYAN FAAS

THE BIGGEST new business-oriented feature available on the iPhone, thanks to the iPhone 2.x firmware (included with the iPhone 3G and available for free to users of first-generation iPhones or for \$9.95 for iPod Touch users), is the addition of ActiveSync for accessing Microsoft Exchange.

ActiveSync allows for automatic over-the-air push updates of new e-mails, calendar events and personal contacts to the iPhone (functionality that was already available to Windows Mobile, Palm and Symbian devices). ActiveSync also lets iPhone owners search a company's Global Address List (GAL) using the included Contacts application. It also allows administrators to enforce some security policies on the iPhone, including the ability to remotely wipe the contents of a phone if it is lost or stolen.

But getting iPhones to connect and sync with Exchange servers can be tricky. In this story, I'll provide tips for integrating and managing iPhones in an Exchange environment. (See [Part 3 of this series covering the options for developing and deploying in-house iPhone applications.](#))

HOW IT WORKS

Unlike push services for BlackBerry devices, which rely on an intermediate server (RIM's BlackBerry Enterprise Server) that receives update notifications from an e-mail server and then provides push notification to remote devices, ActiveSync manages communication with an Exchange server. For those new to working

with over-the-air syncing via direct push in Exchange, the following is a brief introduction. Understanding the basic concept can help in both planning and troubleshooting iPhone access to Exchange.

Direct push between an Exchange server and remote client devices relies on communication between the server and the device. When the device is powered on or configured, it sends an HTTP/HTTPS request (known as a "ping" request) to the server to establish a connection.

The ping request identifies the device, the user and folders on the Exchange server to be monitored. (The iPhone supports monitoring of in-box, calendar and contacts, but unlike other devices that implement ActiveSync, it does not support monitoring of Tasks at this time.) Additionally, the request identifies a time limit for the session — also known as a "heartbeat interval."

Upon receipt of the client request, the Exchange server monitors the specified folders until changes occur or the heartbeat interval is reached. If the server detects changes to a folder being monitored (such as incoming e-mail or a new calendar item), it notifies the device that the folder(s) have been updated. This causes the client to issue a sync request for those folders and thus update appropriately and alert the user if the update contains new e-mail.

If the server doesn't detect changes within the heartbeat interval, it responds to the client device with an "HTTP 200 OK" message, which causes the client to generate a new

ping request. A new ping request is also generated after a successful sync.

The heartbeat interval is dynamically determined by the client device, such as an iPhone or Windows Mobile phone. ActiveSync clients maintain a log of interactions with the server and choose intervals that utilize the longest possible time before a network timeout — the time at which the server, the mobile carrier or any network devices between the client and the server will drop the connection.

By using the longest possible heartbeat interval, the server can maintain the connection for the client without requiring active use of the communication channel and thus conserve battery life on the device.

EXCHANGE REQUIREMENTS

As anyone who has administered Exchange knows, there are a number of variables and options in determining the best configuration for an Exchange environment. Factors such as firewall and proxy server configurations, internal and external Domain Name System, the optional use of front-end and back-end servers, the Active Directory forest and domain topologies, and the versions of Exchange and Windows Server used all affect the ultimate design of an Exchange environment.

Other major factors include the use of SSL, whether self-signed certificates or a certificate authority are used — and how they're implemented — which authentication options are used, and which virtual directories on the Exchange server are secured.

In many cases, the variations

among unique Exchange environments don't have a huge impact on clients. However, the iPhone is not a particularly forgiving Exchange client. There are numerous threads on Apple's discussion forums about issues preventing successful communication or sync between the iPhone and Exchange servers. In some cases, administrators report problems trying to integrate iPhones even in environments that already include other ActiveSync mobile devices such as Windows Mobile phones.

Although some admins have pointed fingers at Apple, saying that the company has created a buggy implementation of ActiveSync, the problems in many cases appear to relate to overall network and Exchange environment configuration, or environments that don't meet the requirements that Apple has listed for the iPhone. Apple also seems to have designed its ActiveSync implementation to require rather strict adherence to Microsoft's guidelines for mobile device support.

Unfortunately, Apple's documen-

tation contains very limited details about those guidelines, so a very solid understanding of and experience with Exchange and its support for mobile devices is a must. Before trying to add iPhones to your network, do your homework and ensure that your Exchange environment meets Apple's stated requirements as well as Microsoft's.

It is also important to ensure that your environment is running either Exchange 2003 with SP2, or Exchange 2007 with SP1 or higher. Apple has specifically listed these as requirements, and the iPhone will not function properly, if at all, with earlier versions.

If you are working with Exchange 2003, you will need to download and install the [Exchange ActiveSync Mobile Administration Web Tool](#). The Mobile Administration Web Tool can be used with Exchange 2007 as well, though it's not required; Exchange 2007 has a built-in Exchange Management Console. However, you might opt to use the Mobile Administration Web Tool if you

want to give nonadministrators (such as help desk staff) remote-wipe or other administration capabilities without giving them full access to the Exchange Management Console.

MANAGING USER ACCESS

From an administrator's perspective, managing access and policies for iPhone users is largely the same as managing access for any other mobile device. Exchange direct push and ActiveSync are enabled by default for all users. Unless you have explicitly changed things, all iPhone users with existing accounts should be able to access their accounts without requiring per-user configuration. (If you rely on iPhone configuration profiles, you should also be able to deploy iPhones to users so that they need only to enter their Exchange usernames and passwords — see [Part 1](#) for details.)

If you are running Exchange 2007, the iPhone also supports Exchange Autodiscovery based on a user's e-mail address.

As with other devices, you can ad-

IPHONE GOES ENTERPRISE AT AWC

BY JULIA KING

AUTO WAREHOUSING CO. CIO Dale Frantz spent the July 4, 2007, on his deck, fooling around with his brand-new iPhone. First, he tried pulling up a few of his favorite Web sites. No problem. Then, just for kicks, he tried accessing the company's Web-based VIPS application, which runs virtually all of AWC's auto processing operations.

"I keyed in the URL, and it presented the log-on page. Because VIPS was written for [Internet Explorer] 6, I wasn't expecting functions to work," Frantz recalls. But after he typed in his user ID and password, up popped the application's regular menu of options, and Frantz was off and running.

"I got live production data on my iPhone without having made any modifications to the application, all while I was sitting at home on my deck on the Fourth of July," he says, still pleasantly stunned by what he labels "a happy accident."

AWC's regional managers now log onto VIPS from their laptops, usually accessing the Internet from their hotel rooms. They also carry Treo handheld devices, but Frantz says that AWC could never get VIPS to work properly on the Treo units.

After his little backyard experiment, Frantz has another plan in the works: order iPhones for the 50 or so traveling managers and give them anywhere/anytime access to VIPS data via Internet access furnished under an enterprise contract with AT&T Inc.

Some modifications will be necessary for 100% VIPS functionality on the iPhone, and Frantz has already charged AWC developers with making them. They include modifying certain automated buttons and hover capabilities developed with presentation layer software from East Windsor, N.J.-based Infragistics Inc. to make them compatible with Apple Inc.'s Safari browser.

On a second development front, Robert Mullen, an AWC programmer/analyst is working with Java and NetBeans to develop an iPhone-specific application to access the same VIPS data.

"We're dealing with Safari compatibility, not iPhone compatibility," Frantz notes. "Essentially, the Web site and the majority of VIPS functionality work with no modifications. It's usable today. What doesn't work today doesn't prevent the Web site from being useful [on the iPhone] to us today."

just the organizationwide policies or user-specific policies to grant or deny mobile device access. Once a user has configured an iPhone with his account information and connected to Exchange, you will be able to use either the Exchange ActiveSync Mobile Administration Web Tool or the Exchange Management Console to view additional information about the device, including the last time the iPhone was synced with Exchange, the last time Exchange policies were updated on the iPhone, and the time of the last ping request. You can also use these tools to initiate a remote wipe of a lost or stolen device and view the status of a remote-wipe request.

PASSCODE POLICIES

The only Exchange policies (other than allowing users to access their accounts from mobile devices) that you can enable for the iPhone via Exchange are passcode policies. You can require users to create a passcode that must be entered to unlock the iPhone, specify a minimum passcode length, require an alphanumeric passcode and specify a period of inactivity after which the iPhone locks automatically.

Apple's iPhone configuration profiles include the same options plus some stricter ones, such as the number of passcode attempts before the iPhone must be resynced with iTunes to re-establish access. Passcode policies configured via Exchange are automatically pushed to the device over the air and enforced as long as the iPhone is associated with an Exchange account. (iPhone configuration profiles, on the other hand, must be e-mailed or hosted on a Web server, and users must choose to install them and can delete them at any time.) If both a configuration profile and Exchange passcode policy are in place on an iPhone, the strictest options will be enforced.

REMOTE WIPE

The ability to remotely wipe confidential data from a smart phone is one of the most important features in a business device. In the event that an iPhone associated with an Exchange account is lost or stolen, administrators

can remotely wipe it from within the Exchange ActiveSync Mobile Administration Web Tool or the Exchange Management Console. If Outlook Web Access is enabled, as it is in most environments, users can also initiate a remote wipe of an iPhone using the mobile device management features available in Outlook Web Access.

When a remote wipe command is issued, the iPhone will revert to an Apple-logo screen and remove all user data and settings. This includes user account information (both Exchange accounts and other e-mail accounts) and associated e-mails, contacts and calendar items. It also includes all media (music, photos and videos), applications and Web browser bookmarks.

Because a remote wipe of an entire iPhone may take considerable time and battery power, an iPhone may power down before completely erasing if its battery becomes depleted. If this happens, the iPhone will continue erasing data when (or if) it is connected to a power supply. Once an iPhone has been wiped, it will need to be activated in iTunes again before use. To ensure successful future use, you may need to remove any residual association between the phone and a user in Exchange if the phone is recovered and reactivated within your network.

CONNECTING TO EXCHANGE

Associating an iPhone with an Exchange account is designed to be a relatively simple process. As indicated by Apple's instructions, users simply need to create a new e-mail account on the iPhone, select Exchange as the account type and enter their account information (e-mail address, server address, username and password, and an optional account description). You can also automatically configure all components of these settings or just the server-specific ones using configuration profiles.

Apple does not take a firm stand on whether the username should be entered in *domain\username* format or with only the username, but in most environments, *domain\username* is required. Typically, this depends

on the default domain option for an Exchange environment (as well as whether or not the environment exists in a multidomain network), but in some situations, the full domain name may be needed even if the default doesn't use it. It's wise to test with an iPhone before developing instructions for users or support staff.

The iPhone prefers connections that encrypt all communications using SSL. If it can't establish an SSL connection to the server (or in some environments to a Windows ISA Server), it is designed to attempt to connect without using SSL. Ideally, you should configure an environment that requires SSL.

If you are using SSL, you will also need to ensure that any certificates used to sign communications are installed on the iPhone. The iPhone ships with root certificates for a number of common certificate authorities. If you use certificates signed by these authorities or certificates that build an effective chain of trust, you will not likely need to install additional certificates on the iPhone. If you choose to use self-signed certificates or are relying on certificates signed by an authority other than one available via the installed root certificates, you can use a configuration profile to install the certificates on each iPhone that will access your environment.

Once an iPhone is associated with an Exchange account, users will be prompted to enter a passcode that conforms to any policies established in Exchange. They will also have the option of choosing which types of data to sync — Mail (in-box), Calendar and/or Contacts. Once the iPhone has established a connection to Exchange, it should initiate a first sync. For performance issues, you may wish to have users establish their initial connection using Wi-Fi within your network. By default, the iPhone will sync only three days' worth of Mail items, though this can be changed using the Settings application on each iPhone.

Note: An iPhone can be associated with and sync to only one Exchange account.

LIMITATIONS

Although Apple has implemented a number of Exchange functions on the iPhone, it has not included all the features found in Outlook or on Windows Mobile devices. As mentioned earlier, the iPhone will sync a user's in-box, calendar items and personal contacts using direct push and ActiveSync. It will not sync tasks created in Outlook, provide management of folders available in Outlook, support the opening of links to Microsoft SharePoint server sites, let users set out-of-office autoreplies, create meeting invitations using the Calendar application, or support flagging of messages (such as for later follow-up).

It is also worth noting that at this point, direct-push notification and sync occur for new e-mails only if they are delivered to a user's in-box. If users create filtering rules in Outlook that filter incoming mail into other mailboxes, the iPhone will not receive push notification of their delivery because only the in-box is monitored. (However, opening the mailbox in the iPhone's Mail application will cause it to be synced manually.) As a result, users should either remove such rules or configure them to be run manually when they are at their computers.

COMMON PROBLEMS

As I mentioned earlier, the iPhone can be a rather picky device when it comes to getting it working with Exchange. The following is a list of common issues that prevent the iPhone from reliably accessing or synchronizing Exchange accounts. This isn't a complete list of all known problems, but being aware of the most likely problems and their causes should help ensure a smoother iPhone implementation.

CERTIFICATES

One potential cause for problems with iPhone/Exchange access is certificate management and SSL. As noted earlier, the iPhone prefers SSL and will attempt to connect to Exchange using SSL during setup as well as when sending ping requests. Microsoft suggests using SSL for all mobile devices with Exchange (which relies largely on HTTP/HTTPS as a communications protocol) because

it ensures that casual sniffing of packets will not easily identify ping or sync requests for Exchange.

If you are using SSL, however, the certificate being used to sign communications must be either installed on the iPhone or signed by a certificate authority trusted by the iPhone. If a certificate can't be verified, users will receive alerts when attempting to configure access to an Exchange account and when accessing the account. The inability to verify a certificate may also lead to additional connection and sync problems. Although disabling the use of SSL might appear to be one solution, it raises serious security concerns, particularly if users are connecting via unsecured Wi-Fi networks (which there is no feasible way to prevent).

INTERNAL AND EXTERNAL DNS

One of the challenges that the iPhone presents is that it can connect to network resources using a variety of mechanisms: a carrier's mobile net-

work, a Wi-Fi network within your organization, or external Wi-Fi hot spots or home networks. Depending on how DNS and namespaces are implemented in your network, DNS lookups for the name of your Exchange server(s) may return different IP addresses when iPhone users are connected to an internal Wi-Fi network and when they attempt to connect from external Wi-Fi networks or via a carrier's mobile network. (This doesn't typically present a problem for mobile devices that rely solely on a carrier's network, since they will rely on external DNS servers for DNS resolution.)

This can result in situations where users can interact with Exchange while at work but not at other times. To avoid this problem, you can either use a VPN configuration on the iPhone or require the DNS records accessed from the iPhone to routinely receive an external IP address for your Exchange server(s). This may require review of your Exchange configura-

THE IBM iNOTES OPTION

A VERSION OF LOTUS NOTES from IBM is at last available for Apple's iPhone as a free download from the AppStore, allowing users to check their Notes e-mail and view their calendar and contacts, IBM announced recently.

The iNotes Ultralite download comes with IBM's Lotus Notes 8.0.2 software. The AppStore version also offers an update of Lotus Symphony, the free alternative to Microsoft Office for preparing documents, spreadsheets and presentations. According to IBM, the newer version of Symphony provides improved compatibility with Office.

Once the AppStore download is completed, IBM iNotes can be accessed via the iPhone's Safari browser. Users can also add the Lotus Mobile Connect VPN for better security.

Curtis Pogue, a systems administrator at Vladimir Jones, said he is testing iNotes on

about 10 iPhones. "If this works well, and with the cost of iPhones dropping, I can see more use in the future," he said.

Pogue said he would eventually like to see Notes as a native iPhone application instead of a Web application. "You could replicate as needed and not have a constant connection," he explained.

In contrast, Jason Michels, the lead system engineer for Notes at Aurora Health Care in Milwaukee, is glad iNotes is a Web-based application, since it doesn't require installing back-end servers, which can be "prohibitively expensive" to support.

"iNotes is really exciting," Michels said. "You just take the Safari browser on that iPhone and put in a URL and connect." He said there are already dozens of iPhone users in his company, and "they are coming out of the woodwork all the time."

While Notes is still behind Exchange in popularity with business e-mail users, IBM claimed strong sales of Notes and Domino over 15 consecutive quarters – and a 21% increase in sales in the second quarter, compared with the same quarter a year ago.

tion as well as your overall network planning and perimeter devices (firewalls, ISA servers, etc.).

NEEDED PORTS AND FRONT-END/BACK-END SERVER CONFIGURATION

Exchange communication requires configuration of appropriate ports for computers and devices that are outside your network. You should ensure that you have configured ports to allow traffic and to forward that traffic to the appropriate server(s). As an additional layer of security when configuring mobile device access, Microsoft recommends using Windows ISA Server and Exchange front-end and back-end servers (in which devices outside your network communicate only with the front-end server and not directly with the server that processes internal transactions). Refer to the Microsoft documentation listed at the end of this article for additional details on all of these configuration variables.

You will also need to verify that all network devices that will process communication between your Exchange servers and iPhones outside your network are configured with timeout limitations that won't interfere with the heartbeat interval used for direct push. Using too-short timeouts for network communication devices (such as routers, firewalls and other security appliances) could result in overall notification and sync failures for mobile devices, including the iPhone.

FORMS-BASED AUTHENTICATION, SSL AND SINGLE-SERVER ENVIRONMENTS

Environments where Exchange is configured using a single server (as opposed to a front-end/back-end server configuration) can present their own challenges. As documented by Microsoft (along with details of the cause and potential resolutions), such environments will not properly support mobile device access if Secure Sockets Layer is used to secure the related virtual directories used by Exchange and forms-based authentication is enabled.

Similarly, forms-based authentication can require additional configura-

tion in any Exchange environment in relation to virtual directories, SSL and the use of a default domain. These issues can be resolved by implementing a front-end/back-end environment or by creating a secondary virtual directory for Exchange and adjusting the server's Windows registry to point to it.

VIRTUAL DIRECTORY PERMISSIONS

Exchange relies on virtual directories in Internet Information Services for several pieces of functionality, including the implementation of Outlook Web Access, Outlook Mobile Access (a variation of OWA intended for mobile browsers) and ActiveSync with mobile devices. Altering the permissions or security properties of these virtual directories can result in problems or failures for accessing Exchange services from the iPhone.

CASE SENSITIVITY IN E-MAIL ADDRESSES

Typically, usernames in e-mail addresses are not case-sensitive, but they are case-sensitive when configuring an Exchange account on the iPhone. As a result, if the e-mail address entered as part of an Exchange account has case differences from the way the address is entered in the Exchange Global Address List (GAL), users will receive calendar events as if they were event invitations to which they need to respond. This can be avoided by ensuring that the GAL entry and the e-mail address entered on the iPhone match in their use of capitalization.

THE IPHONE 2.1 UPDATE AND EXCHANGE

Apple's 2.1 firmware update for the iPhone — released on Sept. 12 — included a wide range of bug fixes, security updates, and improvements for

Resources

The following are additional resources that you should review if you are planning to implement the iPhone in an Exchange environment or if you are trying to resolve problems with iPhone access to Exchange. Many of these resources are mobile device guidelines from Microsoft; also included are resources from Apple and relevant discussion threads from Apple's iPhone in the Enterprise forums.

- **MICROSOFT'S** Exchange 2003 mobile device documentation.
- **MICROSOFT'S** step-by-step guide to mobile device deployment with Exchange 2003 SP2 (solid and helpful, although it only specifically references Windows Mobile devices)
- **MICROSOFT'S** Exchange 2007 mobile device documentation
- **MICROSOFT'S** guide to deploying mobile devices using Exchange 2007 (again, very helpful but specifically geared toward working with Windows Mobile devices)
- **MICROSOFT EXCHANGE TEAM BLOG:** iPhone 2.0, Welcome to Exchange!
- **THE IPHONE BLOG:** Walkthrough: Exchange ActiveSync On Your iPhone 2.0
- **APPLE'S** iPhone and iPod touch Enterprise Deployment Guide (download PDF)
- **APPLE'S** iPhone enterprise support site
- **APPLE'S** iPhone in the Enterprise discussion forum
- **APPLE KNOWLEDGE BASE ARTICLES:**
 - Setting up a corporate e-mail server for iPhone and iPod touch
 - iPhone 2.0 software: Exchange ActiveSync e-mail attachments do not download
 - iPhone and iPod touch: Very large Exchange attachments can cause Mail to quit
 - iPhone 2.0 software: Troubleshooting iPhone or iPod touch Exchange ActiveSync "Push" issues

overall performance and reliability with 3G networks. It has also generated its own series of ActiveSync issues for some users. The problems seem to occur only on iPhones running the earlier iPhone 2.0.x firmware that were configured and able to successfully communicate with Exchange before the update.

Following the update, some users reported being unable to access items on the Exchange server with a “Connection to the server failed” error message being displayed when trying to access Exchange items stored on the server. Over-the-air syncing also may be affected. Detailed reports of problems can be found in a [thread on Apple’s discussion forums](#).

While the problems appear to affect a number of users, it’s not universal and some of the posters to the forum reported no issues after the update. Although the exact cause isn’t clear from the informa-

tion available so far, there do seem to be a couple of consistent points. First, problems seem to occur when an iPhone with an existing Exchange configuration is updated. Restoring rather than upgrading the firmware may be one way to avoid the problem.

Even some of those experiencing a problem have found that performing a restore operation and activating the restored phone as a new iPhone in iTunes — rather than restoring settings from a backup of the iPhone made prior to the restore — resolves problems completely. Note that this will require configuring the Exchange account on the iPhone again. Some users have also suggested that a full restore may not always be required and that simply resetting the iPhone can be effective. To reset the iPhone, power it off by holding the sleep button down until the Slide to Power Off display

appears, then restart it.

Another tip noted by several users to help resolve the situation is to adjust the use of the domain in a username for an Exchange account (adding it if it wasn’t there originally or removing it if was). Why the update would have changed the iPhone’s behavior in this area compared with previous firmware versions isn’t clear, but multiple users have reported this as a workable solution.

As I noted earlier, a full understanding of and experience with Exchange will go a long way toward making the integration of the iPhone as seamless as possible, and I strongly suggest reviewing all of the listed Resources before beginning such an integration. Smaller organizations or less-experienced Exchange administrators may also want to consider hiring a consultant who specializes in Exchange to ensure optimal configuration. ■

I HATE MACS

BY DAVID RAMEL

MY BOSS JUST SAID we’re moving to Macs. I don’t know if he was serious, but it might really happen — he’s a **bona-fide, born-again Mac zealot**, after decades of using real computers (he even had his own, successful **Windows-centric newsletter**).

I joked that I’ll switch to a Mac after they pry the PC from my cold, stiff fingers. In reality, I’ll just go along with the program and lose about 30% in productivity.

I hate Macs.

I hate everything Apple — starting with rock star wannabe Steve Jobs in his black turtleneck and jeans on his big, lavish stage, telling the world every three weeks or so how Apple’s newest

overpriced gizmo will change the world. Snake oil, anyone? Snarky, sleazy sliminess, anyone?

And I hate the products themselves. Overpriced, overhyped and underwhelming. Oh, I forgot, they have such “elegant” design. They just “feel right.” All the stubble-cheeked, pony-tailed, black-clad hipsters in the design department get it, but us dweeby drones doing the real work are just out of touch.

Gag me. I’ve always been a function-over-form guy. I don’t give a rat’s, uh, tail, if my computer is smooth and white and shiny. I just want to crank out the next project.

And don’t give me those phony cost comparisons that try to make the case that, all things considered, **Macs are cheaper than PCs in the long run**. Just look at the price tags.

And innovation? Take the blinders off. I remember sitting right here several years ago, when Apple came out with the great

new feature on their iPods called “shuffle.” I couldn’t believe it. Before then, you couldn’t play your songs in random order? I had been doing that for years, literally. But then, I was into MP3s early on — my first music player was a Rio PMP300, one of the very first on the market. I didn’t have to wait for Apple to tell me they were cool. It took them a few years to catch on. Gee, where was the bleeding-edge innovation there?

And here’s one for you: **iMovie**. Enough said. Too easy of a target. Wouldn’t be iFair.

And what took them so long to **jump on the Intel platform**? That move (just the latest attempt to catch up to everyone else) was another iShaft of their so-loyal camp followers. Didn’t they just release shiny new iMacs or iBooks or iSomethings shortly before that, which instantly became so iYesterday and — the biggest sin of all — iUncool?

If we do make the switch, I’m going to be iSick.