CLOUD COMPUTING

Web-Based Applications That Change the Way You Work and Collaborate Online

Includes coverage of Google collaboration tools, Apple's MobileMe, and much more!

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Michael Miller

Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online

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Introduction

Introduction

Computing as you know it is about to change: Your applications and documents are going to move from the desktop into the cloud.

I'm talking about cloud computing, where applications and files are hosted on a "cloud" consisting of thousands of computers and servers, all linked together and accessible via the Internet. With cloud computing, everything you do is now web based instead of being desktop based. You can access all your programs and documents from any computer that's connected to the Internet.

How will cloud computing change the way you work? For one thing, you're no longer tied to a single computer. You can take your work anywhere because it's always accessible via the web. In addition, cloud computing facilitates group collaboration, as all group members can access the same programs and documents from wherever they happen to be located.

Cloud computing might sound far-fetched, but chances are you're already using some cloud applications. If you're using a web-based email program, such as Gmail or Hotmail, you're computing in the cloud. If you're using a web-based application such as Google Calendar or Apple MobileMe, you're computing in the cloud. If you're using a file- or photo-sharing site, such as Flickr or Picasa Web Albums, you're computing in the cloud. It's the technology of the future, available to use today.

How does cloud computing work? What does cloud computing mean for the way you use a computer? What are the top cloud computing applications? Good questions all, and all answered in this book: *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online*. I don't pretend to answer every question you may have (the overly technical ones in particular), but I do try to give you a good solid overview of the cloud computing phenomenon, and introduce you to some of the more popular cloud applications—in particular, those that facilitate group collaboration.

And that's where cloud computing really shines. Whether you want to share photographs with family members, coordinate volunteers for a community organization, or manage a multifaceted project in a large organization, cloud computing can help you collaborate and communicate with other group members. You'll have a better idea of how this works after you read the book, but trust me on this one—if you need to collaborate, cloud computing is the way to do it.

How This Book Is Organized

Cloud computing is actually a pretty simple concept, but one with lots of variations and ramifications. To help you better understand what cloud computing is and what it does, I've organized this book into four major parts:

- Part I, "Understanding Cloud Computing," is the place for you to start learning about cloud computing. I explain how cloud computing works and examine which types of users can best benefit from this new technology.
- Part II, "Cloud Computing for Everyone," examines the practical benefit of cloud computing for users in three different scenarios: in the family, in the community, and in the large organization.
- Part III, "Using Cloud Services," is an overview of various types of web-based applications. You'll learn about cloud services for scheduling, contact management, project management, word processing, presentations, and other key applications.

- Part IV, "Outside the Cloud: Other Ways to Collaborate Online," moves beyond strict cloud computing to examine other Internet-based tools for group collaboration, including web email, instant messaging, social networks, online groupware, blogs, and wikis.

Taken together, the 20 chapters in this book provide an excellent overview of cloud computing. If you're not sure what cloud computing is yet, you will be when you get done reading this book.

Conventions Used in This Book

I hope that this book is easy enough to figure out on its own, without requiring its own instruction manual. As you read through the pages, however, it helps to know precisely how I've presented specific types of information.

Web Page Addresses

There are a lot of web page addresses in this book. They're noted as such:

www.molehillgroup.com

Technically, a web page address is supposed to start with http:// (as in http://www.molehillgroup.com). Because Internet Explorer and other web browsers automatically insert this piece of the address, however, you don't have to type it—and I haven't included it in any of the addresses in this book.

Cloud Services

I also list a lot of web-based applications and services in this book; after all, that's what cloud computing is all about. Know, however, that companies are constantly changing prices, coming out with new features, introducing completely new services, and discontinuing older ones. With that in mind, every service and URL listed in this book is valid as of June 2008; chances are, however, that something will change by the time you read the book.

Special Elements

This book includes two special elements that provide additional information not included in the basic text. These elements are designed to supplement the text to make it your learning faster, easier, and more efficient.

In addition, I end each chapter with a sidebar—a chunk of text that goes beyond what is presented in the normal chapter text to provide additional information that may be of interest to you. I find these sidebars interesting but not necessarily essential; you may or may not feel the same.

note A note is designed to provide information that is generally useful but not specifically necessary for what you're doing at the moment.

tip A tip offers additional advice that might prove useful to the task at hand.

caution A caution warns you of a particular situation—be alert to the warning!

Let Me Know What You Think

I always love to hear from readers. If you want to contact me, feel free to email me at cloud@molehillgroup.com. I can't promise that I'll answer every message, but I do promise to read each one!

If you want to learn more about me and any new books I have cooking, check out my Molehill Group website at www.molehillgroup.com. Who knows—you might find some other books there that you'd like to read.

CHAPTER

2

Are You Ready for Computing in the Cloud?

Cloud computing might be the next big thing, but that doesn't make it the best thing for everyone. Knowing what we know about cloud computing and how it works, how do you know whether cloud computing is right for you?

To answer that question, we must first examine the pros and cons of cloud computing, as well as analyze what types of users benefit most from what cloud computing offers. Then, and only then, can you determine whether you want to jump onto the cloud computing bandwagon.

IN THIS CHAPTER

- The Pros and Cons of Cloud Computing
- Who Benefits from Cloud Computing?
- Who Shouldn't Be Using Cloud Computing?

The Pros and Cons of Cloud Computing

Any serious analysis of cloud computing must address the advantages and disadvantages offered by this burgeoning technology. What's good—and what's bad—about cloud computing? Let's take a look.

Cloud Computing: Advantages

We'll start with the advantages offered by cloud computing—and there are many.

Lower-Cost Computers for Users

Here's a quantitative financial advantage: You don't need a high-powered (and accordingly high-priced) computer to run cloud computing's web-based applications. Because the application runs in the cloud, not on the desktop PC, that desktop PC doesn't need the processing power or hard disk space demanded by traditional desktop software. Hence the client computers in cloud computing can be lower priced, with smaller hard disks, less memory, more efficient processors, and the like. In fact, a client computer in this scenario wouldn't even need a CD or DVD drive, because no software programs have to be loaded and no document files need to be saved.

Improved Performance

Let's look further at what results when a desktop PC doesn't have to store and run a ton of software-based applications. (The apps are run from the cloud, instead.) With fewer bloated programs hogging the computer's memory, users will see better performance from their PCs. Put simply, computers in a cloud computing system will boot up faster and run faster, because they'll have fewer programs and processes loaded into memory.

Lower IT Infrastructure Costs

In a larger organization, the IT department could also see lower costs from the adoption of the cloud computing

note This concept of a lower-cost cloud computing client mirrors the New Internet Computer (and the company of the same name) championed by Oracle's Larry Ellison way back in 2000. Ellison's NIC was essentially a workstation with just a processor, keyboard, and monitor—no hard drive or CD/DVD drive—that would be connected via the Internet to a central supercomputer that hosted applications in files. Replace the NIC's single supercomputer with a supercomputer-like grid of computers and you have cloud computing today.

paradigm. Instead of investing in larger numbers of more powerful servers, the IT staff can use the computing power of the cloud to supplement or replace internal computing resources. Those companies that have peak needs no longer have to purchase equipment to handle the peaks (and then lay fallow the rest of the time); peak computing needs are easily handled by computers and servers in the cloud.

Fewer Maintenance Issues

Speaking of maintenance costs, cloud computing greatly reduces both hardware and software maintenance for organizations of all sizes.

First, the hardware. With less hardware (fewer servers) necessary in the organization, maintenance costs are immediately lowered. As to software maintenance, remember that all cloud apps are based elsewhere, so there's no software on the organization's computers for the IT staff to maintain. It's that simple.

Lower Software Costs

Then there's the issue of software cost. Instead of purchasing separate software packages for each computer in the organization, only those employees actually using an application need access to that application in the cloud. Even if it costs the same to use web-based applications as it does similar desktop software (which it probably won't), IT staffs are saved the cost of installing and maintaining those programs on every desktop in the organization.

As to the cost of that software, it's possible that some cloud computing companies will charge as much to "rent" their apps as traditional software companies charge for software purchases. However, early indications are that cloud services will be priced substantially lower than similar desktop software. In fact, many companies (such as Google) are offering their web-based applications for free—which to both individuals and large organizations is much more attractive than the high costs charged by Microsoft and similar desktop software suppliers.

Instant Software Updates

Another software-related advantage to cloud computing is that users are no longer faced with the choice between obsolete software and high upgrade costs. When the app is web-based, updates happen automatically and are available the next time the user logs in to the cloud. Whenever you access a web-based application, you're getting the latest version—without needing to pay for or download an upgrade.

Increased Computing Power

This is an obvious one. When you're tied into a cloud computing system, you have the power of the entire cloud at your disposal. You're no longer limited to what a single desktop PC can do, but can now perform supercomputing-like tasks utilizing the power of thousands of computers and servers. In other words, you can attempt greater tasks in the cloud than you can on your desktop.

Unlimited Storage Capacity

Similarly, the cloud offers virtually limitless storage capacity. Consider that when your desktop or laptop PC is running out of storage space. Your computer's 200GB hard drive is peanuts compared to the hundreds of petabytes (a million gigabytes) available in the cloud. Whatever you need to store, you can.

Increased Data Safety

And all that data you store in the cloud? It stays in the cloud—somewhere. Unlike desktop computing, where a hard disk crash can destroy all your valuable data, a computer crashing in the cloud doesn't affect the storage of your data. That's because data in the cloud is automatically duplicated, so nothing is ever lost. That also means if your personal computer crashes, all your data is still out there in the cloud, still accessible. In a world where few individual desktop PC users back up their data on a regular basis, cloud computing can keep data safe.

Improved Compatibility Between Operating Systems

Ever try to get a Windows-based computer to talk to a Mac? Or a Linux machine to share data with a Windows PC? It can be frustrating.

Not so with cloud computing. In the cloud, operating systems simply don't matter. You can connect your Windows computer to the cloud and share documents with computers running Apple's Mac OS, Linux, or UNIX. In the cloud, the data matters, not the operating system.

Improved Document Format Compatibility

You also don't have to worry about the documents you create on your machine being compatible with other users' applications or operating systems. In a world where Word 2007 documents can't be opened on a computer

running Word 2003, all documents created by web-based applications can be read by any other user accessing that application. There are no format incompatibilities when everyone is sharing docs and apps in the cloud.

Easier Group Collaboration

Sharing documents leads directly to collaborating on documents. To many users, this is one of the most important advantages of cloud computing—the ability for multiple users to easily collaborate on documents and projects.

Imagine that you, a colleague in your West Coast office, and a consultant in Europe all need to work together on an important project. Before cloud computing, you had to email or snail mail the relevant documents from one user to another, and work on them sequentially. Not so with cloud computing. Now each of you can access the project's documents simultaneously; the edits one user makes are automatically reflected in what the other users see onscreen. It's all possible, of course, because the documents are hosted in the cloud, not on any of your individual computers. All you need is a computer with an Internet connection, and you're collaborating.

Of course, easier group collaboration means faster completion of most group projects, with full participation from all involved. It also enables group projects across different geographic locations. No longer does the group have to reside in a single office for best effect. With cloud computing, anyone anywhere can collaborate in real time. It's an enabling technology.

Universal Access to Documents

Ever get home from work and realize you left an important document at the office? Or forget to take a file with you on the road? Or get to a conference and discover you forgot to bring along your presentation?

Not a problem—not anymore, anyway. With cloud computing, you don't take your documents with you. Instead, they stay in the cloud, where you can access them from anywhere you have a computer and an Internet connection. All your documents are instantly available from wherever you are. There's simply no need to take your documents with you—as long as you have an Internet connection, that is.

Latest Version Availability

And here's another document-related advantage of cloud computing. When you edit a document at home, that edited version is what you see when you

access the document at work. The cloud always hosts the latest version of your documents; you're never in danger of having an outdated version on the computer you're working on.

Removes the Tether to Specific Devices

Finally, here's the ultimate cloud computing advantage—you're no longer tethered to a single computer or network. Change computers, and your existing applications and documents follow you through the cloud. Move to a portable device, and your apps and docs are still available. There's no need to buy a special version of a program for a particular device, or save your document in a device-specific format. Your documents and the programs that created them are the same no matter what computer you're using.

Cloud Computing: Disadvantages

That's not to say, of course, that cloud computing is without its disadvantages. There are a number of reasons why you might not want to adopt cloud computing for your particular needs. Let's examine a few of the risks related to cloud computing.

Requires a Constant Internet Connection

Cloud computing is, quite simply, impossible if you can't connect to the Internet. Because you use the Internet to connect to both your applications and documents, if you don't have an Internet connection, you can't access anything, even your own documents. A dead Internet connection means no work, period—and in areas where Internet connections are few or inherently unreliable, this could be a deal breaker. When you're offline, cloud computing just doesn't work.

This might be a more significant disadvantage than you might think. Sure, you're used to a relatively consistent Internet connection both at home and at work, but where else do you like to use your computer? If you're used to working on documents on your deck, or while you're at a restaurant for lunch, or in your car, you won't be able to access your cloud-based documents and applications—unless you have a strong Internet connection at all those locations, of course. A lot of what's nice about portable computing becomes problematic when you're depending on web-based applications.

note Some web-based applications are now being designed to work on your desktop when you're not connected to the Internet. Witness Google Gears, a technology that turns Google's web-based applications into locally run applications.

Doesn't Work Well with Low-Speed Connections

Similarly, a low-speed Internet connection, such as that found with dial-up services, makes cloud computing painful at best and often impossible. Web-based apps often require a lot of bandwidth to download, as do large documents. If you're laboring with a low-speed dial-up connection, it might take seemingly forever just to change from page to page in a document, let alone launch a feature-rich cloud service.

In other words, cloud computing isn't for the slow or broadband-impaired.

Can Be Slow

Even on a fast connection, web-based applications can sometimes be slower than accessing a similar software program on your desktop PC. That's because everything about the program, from the interface to the document you're working on, has to be sent back and forth from your computer to the computers in the cloud. If the cloud servers happen to be backed up at that moment, or if the Internet is having a slow day, you won't get the instantaneous access you're used to with desktop apps.

Features Might Be Limited

This particular disadvantage is bound to change, but today many web-based applications simply aren't as full-featured as their desktop-based brethren. Compare, for example, the feature set of Google Presentations with that of Microsoft PowerPoint; there's just a lot more you can do with PowerPoint than you can with Google's web-based offering. The basics are similar, but the cloud application lacks many of PowerPoint's advanced features.

So if you're an advanced user, you might not want to leap into the cloud computing waters just yet. That said, many web-based apps add more advanced features over time. This has certainly been the case with Google Docs and Spreadsheets, both of which started out somewhat crippled but later added many of the more niche functions found on Microsoft Word and Excel. Still, you need to look at the features before you make the move. Make sure that the cloud-based application can do everything you need it to do before you give up on your traditional software.

Stored Data Might Not Be Secure

With cloud computing, all your data is stored on the cloud. That's all well and good, but how secure is the cloud? Can other, unauthorized users gain access to your confidential data?

These are all important questions, and well worth further examination. To that end, read ahead to the "The Security Conscious" section later in this chapter, where we examine just how safe your data is in the cloud.

If the Cloud Loses Your Data, You're Screwed

I can't put it any more delicately. Theoretically, data stored in the cloud is unusually safe, replicated across multiple machines. But on the off chance that your data does go missing, you have no physical or local backup. (Unless you methodically download all your cloud documents to your own desktop, of course—which few users do.) Put simply, relying the cloud puts you at risk if the cloud lets you down.

Who Benefits from Cloud Computing?

Let's face it, cloud computing isn't for everyone. What types of users, then, are best suited for cloud computing—and which aren't?

Collaborators

If you often collaborate with others on group projects, you're an ideal candidate for cloud computing. The ability to share and edit documents in real time between multiple users is one of the primary benefits of web-based applications; it makes collaborating easy and even fun.

Suppose, for example, that you're in charge of an upcoming presentation to the senior management of your company. You need to work with the heads of your company's various departments, which happen to be based in a half-dozen locations. Given everyone's busy schedules, it's tough enough to schedule a group conference call. How in the world can all of you get together to create a cohesive presentation?

The solution, in this instance, is to use a web-based presentation program, such as Google Presentations. You and the department heads can access the main presentation document at your leisure. The changes one person makes are automatically visible when the other collaborators access the document. In fact, more than one of you can edit the document at the same time, with each of your changes happening in real time. Collaborating with a web-based application is both more convenient and faster than trying to assemble everyone's pieces into a single document managed by one member of the team.

This type of collaboration isn't limited to the corporate world. I like the way families and communities use web-based scheduling programs, such as Google Calendar, to manage their busy schedules. On a personal note, my wife and I share a single Google calendar; when she adds an item to the calendar, it automatically shows up on the version that I see. It makes it easy for the two of us to keep our schedules in sync.

Similarly, community groups and sports teams can use web-based calendars to alert their members of upcoming activities. If authorized, group or team members can add their own items to the calendar, helping the entire group plan around individual conflicts.

note I like the story of how one bride used Google Spreadsheets to manage her upcoming wedding. She initially gave access to both her mother and mother-in-law so that they could add or edit elements on her wedding to-do list. It worked fine until her future mother-in-law did a little too much editing to the items the bride had added. The bride ultimately responded by rescinding her mother-in-law's access to the shared spreadsheet!

Road Warriors

Another prime candidate for cloud computing is the road warrior. When you work at one office today, at home the next day, and in another city the next, it's tough to keep track of all your documents and applications. You may end up with one version of a document on your work PC, another on your laptop, and a third on your home PC—and that's if you remember to copy that document and take it with you from one location to the next.

Far better, therefore, if you can access a single version of your document from any location. When you're in the office, you log in to your web-based app and access your stored document. Go home and use your web browser to access the very same app and document via the Internet. Travel to another city and the same application and document are still available to you.

With cloud computing, you don't have to remember which document is where, or to bring a copy of a document with you. You don't even have to worry about whether a particular application is installed on all your PCs. Because the apps and docs you use are stored on the web and accessible wherever you have an Internet connection, versioning and compatibility simply aren't issues. It's the same application and the same document wherever you go.

Could life get any easier?

Cost-Conscious Users

Another group of users who should gravitate to cloud computing are those who are cost conscious. With cloud computing you can save money on both your hardware and software.

Hardware-wise, there's no need to invest in large hard disks or super-fast CPUs. Because everything is stored and run from the web, you can cut costs by buying a less fully featured PC—without sacrificing anything in the way of performance.

You can save just as much—if not more—when it comes to software. Instead of laying out big bucks for the latest version of Microsoft Office, you can use Google's versions of these apps (Google Docs, Spreadsheets, and Presentations) for zero expenditure. That's right, these web-based applications—and many more from other companies—are completely free to use. When your budget is tight, free is a lot better than the hundreds or thousands of dollars you might spend otherwise.

This is why many universities are abandoning Microsoft and turning instead to Google's suite of online applications. Money is always tight on college campuses, and a few hundred dollars savings per student adds up quickly. As long as the web-based application does everything you need that a traditional software program does, why not use the free solution?

Cost-Conscious IT Departments

Many corporate IT departments are also becoming enamored of the cloud computing model. Although they might appreciate the software savings we just discussed, for them bigger savings result from having to buy fewer central servers.

You see, on a corporate network much of the computing takes place on the servers centrally located on the organization's network. When users need more computing power, more servers need to be purchased.

This need for more computing power becomes less of an issue when the organization embraces cloud computing. Instead of purchasing a new server, the IT staff just redirects the computing request out to the cloud. The servers that comprise the cloud have plenty of capacity to handle the organization's increased needs, without the IT staff having to spend a single dime on new hardware.

Users with Increasing Needs

Hardware-based cost savings also apply to individual computer users. Need more hard disk space to store all your digital photos and MP3 files? You could purchase a new external hard drive, or you could utilize lower-cost (or free) cloud storage instead. Having trouble running the latest version of your favorite software program because it's power hungry? Abandon that power-sapping program and use a less-demanding web-based app instead. Need more computing power to tackle a particularly vexing problem? Use the power of the cloud, where thousands of computers are at your disposal.

In the old days, the only solution to increased needs was to purchase more powerful hardware. With cloud computing, the solution is in the cloud—which saves you money.

Who Shouldn't Be Using Cloud Computing?

Now let's look at the flip side of the coin. If cloud computing isn't for everyone, who isn't it for?

The Internet-Impaired

Because cloud computing is based on the Internet cloud and depends on Internet access, if you don't have Internet access, you're out of luck. Without Internet access, you can't run web-based applications or open documents stored on the web. Users without readily available Internet access simply shouldn't be considering a switch to cloud-based computing—until they get Internet access, that is.

The same goes if you have slow Internet access, like that found with dial-up Internet connections. A slow connection isn't much better than none at all when accessing big apps and docs on the web. It takes a long time to download these apps and docs, and that waiting time becomes intolerable on anything less than a broadband connection.

Offline Workers

Along the same lines, anyone who consistently works offline in a non-Internet-enabled environment probably isn't the ideal candidate for cloud computing. That means anyone who works out of their vehicle, anyone who works in an office without Internet access, anyone who works at home without Internet access, and anyone who travels from office to office without guarantee of an Internet connection. No Internet, no cloud computing—it's that simple.

The Security Conscious

Today, we think that cloud computing is safe—but we can't guarantee that. It's certainly possible that cloud systems can be hacked and cloud-based documents accessed by unauthorized users; it's also possible that your data could be snagged during transmission between your computer and the cloud. It may be unlikely, but it can happen.

caution Similarly, I wouldn't trust the cloud to be the sole repository for any of my documents. It may be a belt-and-suspenders approach, but if a document is truly essential, I download a copy of it to my computer's hard drive before I sign off from any web-based application. Better to be safe than sorry.

If your documents are confidential, you probably don't want to trust them with cloud computing just yet. Just as you wouldn't transmit confidential documents over a public Wi-Fi network, you shouldn't upload and store your documents on a cloud computing network with questionable security. When security matters, don't take chances.

Anyone Married to Existing Applications

Today, here's probably the most important reason not to sign up for a web-based application: You use Microsoft Office. That's right, many web-based applications are not completely compatible with Microsoft's file formats. This means it might be difficult if not impossible to open your Word or Excel docs with your web-based app—and vice versa.

If you or your organization is a dyed-in-the-wool Microsoft shop, the move to a web-based application will be a tough one. Make sure that your docs can convert, or that the web-based app can read and write in Microsoft's native formats. If not, it might be more trouble to migrate than it's worth.

There's a similar issue, of course, if you're sharing documents with others who use Microsoft software. If you use an online app, can you save your documents in a format that your Microsoft-equipped friends and colleagues can read? It's a real issue, and one that keeps Microsoft on top of the software pile.

Bottom line: Try before you switch. If your web-based docs aren't fully compatible with Microsoft programs, it might be best to remain a Microsoft shop.

DARK CLOUDS: BARRIERS TO USING WEB-BASED APPLICATIONS

As discussed earlier in this chapter, there are some disadvantages to cloud computing, as we know it today. These disadvantages present significant barriers to the widespread adoption of cloud computing technology—and could, if left unresolved, kill the concept completely.

What are these barriers to adopting web-based applications? They fall into several general groups:

- **Technical issues**. Establishing a cloud computing system is a technical challenge. Hundreds or thousands of individual computers or servers have to be purchased or otherwise commandeered, linked together, and managed. In addition, feature-rich web-based software has to be developed, and served to users with 24/7 uptime. All of this takes significant resources, which smaller companies might not possess.
- **Business model issues**. Given the expense inherent in building a cloud computing system and developing web-based applications, how do companies make money offering cloud computing services? Right now, Google is supplying its cloud services free of charge, which is a difficult way to generate revenue. Even if a company can charge for its cloud services and storage, how should those services be priced? Making money off of any new technology is a vexing issue, but particularly so with technology that literally exists within a cloud.
- **Internet issues**. Because cloud computing is viable only when users have constant access to high-speed Internet connections, the unfortunate fact that the United States is behind the curve in broadband access could be a major stumbling point. That's right, the United States falls well behind other Western nations in the deployment of high-speed Internet access. If enough Americans can't access web-based applications, the entire concept of cloud computing might be doomed.
- **Security issues**. Some feel as if this is a false issue, but I'm not so sure. How secure is cloud storage? If you save your web-based document in a cloud system, are you guaranteed that

your document will still be there when you need it—and that it won't be accessed by unauthorized users? Whereas cloud computing companies say their systems are safe and secure, other companies touting data security (such as major retailers and credit card companies) have been victims of data theft. What makes cloud storage more secure?

- **Compatibility issues**. Let's face it, if everyone in your company uses Microsoft Word, you're going to use Microsoft Word, too. Switching platforms is difficult at best, and if web-based applications aren't fully compatible with Microsoft's existing file formats, the move to cloud computing simply won't happen.
- **Social issues**. Finally, there's the big issue of whether the computing public is ready to put its trust in applications and documents that they don't physically "own." There's a security blanket effect to knowing that your apps and docs physically reside on your computer, right there, that you can reach out and touch with your own hands. Knowing that your docs are stored somewhere out in the "cloud" imparts a less fuzzy feeling. Many users might not trust something they can't see or touch. Ceding ownership and control of one's resources requires a major shift in the way we think about computing. It's as big a change as the shift from client/server to desktop computing in the 1980s.

Let's face it, cloud computing is a disruptive technology. Many users and organizations will be slow to change, and many existing software and hardware companies will be downright hostile to the concept. It's interesting that Microsoft has finally embraced cloud computing, in its Live Mesh initiative. After all, it has perhaps the most to lose in the computer industry from the shift from the desktop to the cloud. In a world where Microsoft owns the desktop, there's no guarantee that it'll own the cloud—which might be reason enough for Microsoft competitors to go full-bore with the new technology.

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