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As midsized organizations begin to look beyond server virtualization to virtual desktops, the questions start to flow: What does desktop virtualization really cost? Which technology approach should I choose? Will desktop virtualization help me extend the life of my Windows XP-compatible applications? What are the drawbacks?

To answer these questions, we spoke with Ty Schwab, CEO and founder of Blackhawk Technology Consulting LLC in Eugene, Ore. Schwab has worked on close to 200 server, storage and desktop, and application virtualization projects, and has seen quite a lot since founding his firm two years ago. He can tell you that virtualization licensing fees are tacked on top of traditional software application fees, for example, but there can be cost savings elsewhere.

With so many options -- application virtualization, application or OS streaming, virtual desktop infrastructure (VDI) and desktop virtualization -- companies are also still getting a handle on the terminology. Despite all the options and monikers, the technologies share the same basic end result: Virtual desktops are created when components of a desktop such as the CPU, a hard disk, memory and the operating system are isolated in a bubble and do not interact with anything else on the desktop or server, such as another OS. With application virtualization, the application and the files and settings that the application needs to run are also isolated and remain separate from the underlying OS.

Here is more to help with [demystifying virtualization](#):

Why are CIOs looking beyond the server to possibly virtualize desktops and applications as well?

Schwab: They've realized ROIs on server virtualization: power and cooling efficiencies, a return from server consolidation and being able to keep older

servers in production. Now they're wondering if they can get similar benefits, if not more, on the desktop side.

Many organizations have invested in applications that are designed for Windows 2000 and Windows XP that won't work with Vista. By putting applications or the OS in a virtual environment, users can work in XP or on Vista on the same physical desktop, or the OS and applications can be streamed to them from the data center without compatibility problems.

Many businesses are also coming up on hardware refresh cycles and they don't want to spend an arm and a leg to optimize new IBM or Dell hardware for XP. Rolling a new desktop from Vista back to XP requires a lot of customization, so a typical new \$500 desktop with Vista will now add up to \$600 to \$700 to make it work with XP, so they're turning to virtualization to make new desktops work with older operating systems and applications.

At the same time, they can extend the life of older PCs to continue using XP and you can run Vista in a hosted environment on that older PC as well. Of course, there's a lot of efficiencies to be gained by centralizing desktop images ... so less patching and physical visits to the desktop, along with a more secure environment.

What are some of the limitations of desktop and application virtualization technologies?

Schwab: Every application can't be virtualized, and that's often due to its development or the way it was written. We spent almost two months trying to virtualize a sales force application for a dental insurance firm. It was written in three or four programming languages and it needed to talk to the server. It would have taken way too much customization to make it work [in a virtualized environment].

Applications that rely on the server, ones that are database-driven, or ones like antivirus that need to scan outside of a virtual environment also don't work well. The vendors are working on new protocols for graphics-intensive applications [experts claim the [remote display protocols](#) currently used by some VDI vendors don't cut it], so graphics-laden applications remain a problem in the virtual world.

There's a lot of focus on the benefits of virtualization technologies for IT, but how do these translate into benefits for the overall business?

Schwab: In the past it would take days or weeks to customize applications for each user on a traditional desktop. For this county government customer, we had to spend 12 to 13 hours a day for two weeks, with additional staff, to get 300 applications out to 12 departments. They had 2,500 desktop images taking up 12 to 18 terabytes of SAN space. So when it came time to re-image the desktops again, the CIO wanted to try desktop virtualization.

We installed two virtual machines to house 30 desktop images, instead of 2,500, that users could connect to. That knocked the SAN space down to 3 GB. If a user's application crashed, it became a two- to three-minute, right-click fix on the virtual server to fix the problem. By centralizing and cutting out desk-side visits for crashes, or even flights to branch locations, help desk costs were cut by 65%. That's a lot of savings for a business.

What about end-user benefits?

Schwab: An accountant, for example, can have QuickBooks with all their personal client information in a virtualized desktop that is protected from another OS, or corporate image on the same physical machine. If that user surfs the Web and gets a virus, it won't impact the information in QuickBooks that they need to do their job every day.

Or if the user's personal settings and application are running on a virtual machine on the server or VDI model, the user can report a problem to the staff and then walk over and start using another virtual machine and regain access to their personal setting and applications in a clean environment. That really boosts productivity because that takes minutes instead of hours or days to resolve now.

What costs are companies not factoring in?

Schwab: I see smaller companies virtualizing the [physical] desktop instead of going with VDI because they don't have the server space or infrastructure for application streaming, or the bandwidth needed to have people connected to a centralized server, or they can't justify the cost of buying thin clients to replace laptops or desktops.

There are misconceptions around licensing. Desktop virtualization vendors don't typically charge for the server portion of their offerings, but they do charge for the client, anywhere from \$150 to \$250 per user or desktop to be virtualized. On the application virtualization side, there's usually a one-time fee of \$2,000 to \$5,000 for the application virtualization studio or administration console that you need to design, repackage and virtualize applications. On top of that there is an application virtualization licensing cost of \$39 to \$150 per application that is virtualized.

Then what you also have to factor in is the traditional licensing fee that you are already paying the software vendor for the application you now want to virtualize. Not all software vendors have a plan for how they're going to charge for their applications in a virtual environment.

So what is a good plan of attack to get started?

Schwab: Well, first you have to test the application or desktop to make sure it can be virtualized. Then you need to call the software vendors you work with to come

up with a plan for how they're going to charge you for licensing.

What about getting the business ready for virtual desktops?

Schwab: A solid and reliable desktop design begins with an in-depth understanding and review of your business challenges, drivers and the technical and nontechnical issues that your IT teams are dealing with. The direction of the business, including planned growth and expansion, acquisition or other major changes, must be factored in when [developing] a desktop strategy.

Technical requirements also extend beyond normal design and integration efforts. Businesses will need to evaluate their own internal technical capabilities and skill sets when they're going down the path of a new desktop strategy. Often, the skill sets which are required to design, implement, maintain and support a new virtualized desktop environment can extend past what a traditional desktop support and engineering team is trained and prepared for. They may not have the server virtualization skills, for example, for a VDI scenario.

With this understanding of the existing environment, the technology and required skill sets, a proper design can be built around the businesses' specific requirements and one that is focused on a specific vendor or technology.