THE STATE OF VIRTUALIZATION

Trends in Desktop Virtualization:

Simplifying Client Management

by Andrew Mazer

Desktop virtualization is becoming one of the hottest IT trends as IT administrators turn to this technology to simplify management, improve ROI, accelerate provisioning, and achieve better security and compliance. As a bonus, users get a reliable, conflict-free computing experience.

Desktop virtualization is gaining traction among enterprises as they seek to centralize desktop management and lower infrastructure costs, according to a new TechWeb survey of 490 IT decision makers, most of whom have implemented, are piloting, or are planning to roll out desktop virtualization. To date, 23 percent of those surveyed have deployed desktop virtualization in at least one department, and an additional 19 percent are planning to roll out the technology by 2011.

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METHODOLOGY

In April 2010, TechWeb surveyed our database of technology decision makers about their current state of desktop virtualization. The survey was conducted online, and respondents were recruited via an e-mail invitation containing an embedded link to the survey. Survey results reflect data from just over 490 respondents who have already implemented, are piloting, or planning to roll out desktop virtualization in the coming year. Several data points in this report are based on the total 490 respondents, while others focus on only those people who have already implemented or are piloting desktop virtualization.

numbers of client devices running smoothly, enhancing the security of corporate data and improving availability.

"We're starting to explore desktop virtualization, because we need to simplify desktop management," says Anthony DiSalvo, IS manager at KTVU in Oakland. "Right now, we are spending way too much time updating individual machines. By putting all the applications and data on our centralized servers, our goal is to be able to better manage and achieve more security."

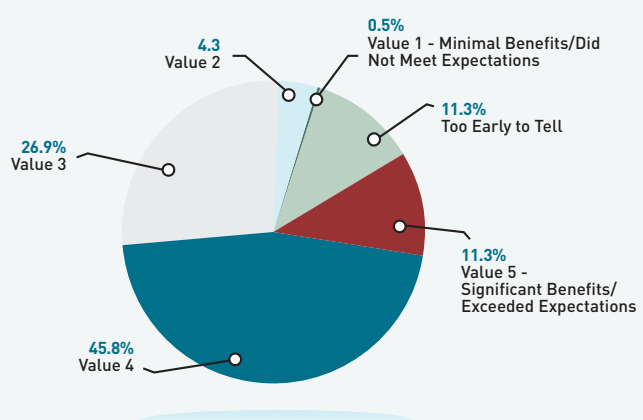
Desktop virtualization can refer to a variety of technologies, including terminal services (introduced more than a decade ago), application and OS streaming, virtual desktop infrastructure (VDI) and the newly launched virtual containers. But all desktop virtualization solutions have one thing in common: They enable users to access applications and data from a desktop, laptop or thin client on the corporate network. By consolidating assets at the data center, desktop virtualization makes it easier for IT groups to provision, support and maintain desktops.

Our survey shows that desktop virtualization is delivering the goods — 84 percent of IT experts whose organizations have deployed desktop virtualization responded that the technology met or exceeded their expectations overall (see values 3, 4, and 5 in the chart on this page).

What Is Desktop Virtualization?

Desktop virtualization, also known as client virtualization, stores images of each user's desktop centrally in the data center. These images are composed of four components, each with its own management policies: the operating system, application stack, user profile (containing customized settings for applications and displays) and data.

Overall Experience with Desktop Virtualization



Base: 200 respondents who have already implemented desktop virtualization.
Data: TechWeb survey of 490 IT decision makers.

Depending on the type of virtualization solution, users can access applications and data from a standardized interface with limited flexibility on a thin client or experience a fully customized, capable and versatile computing experience as if they were using a perfectly functioning PC. Because each application comes packaged with the necessary OS components and settings it requires, users can concurrently work with programs that might normally conflict with each other.

When Glendale Community College in Arizona virtualized 500 workstations in labs and classrooms three years ago, its goal was to eliminate the conflicts and configuration hassles caused by serving more than 280 applications to its students.

"Installing so many applications was mangling the registries on our Windows workstations and creating a maintenance nightmare," says IT Director KC Hundere, a survey respondent. "Desktop virtualization enables us to create a recipe for configuring each app that we

add to the environment. That recipe is sent with the app every time it streams out to a workstation, so we no longer have to worry how one app integrates with others — each app sits in its own self-contained environment and runs just fine for the student."

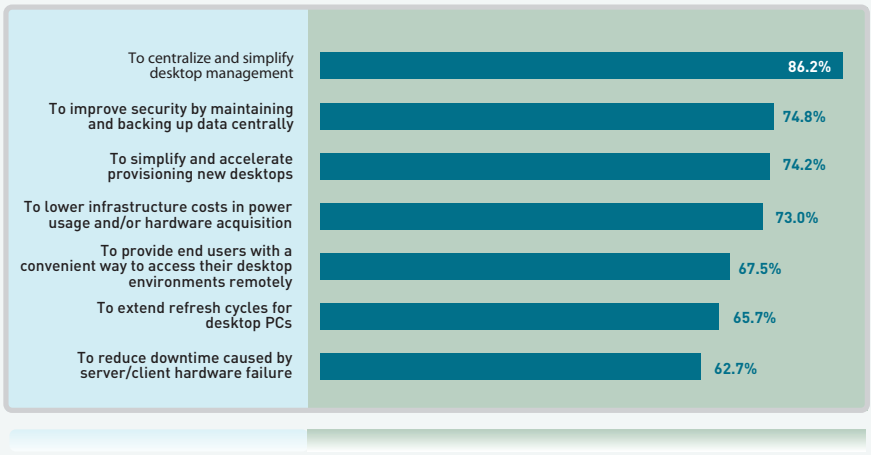
Desktop virtualization allows IT administrators to focus on managing digital identities — the client images — rather than desktops or devices. Building and maintaining virtual desktop images requires a knowledgeable, well-trained IT group.

"In a virtual desktop environment, IT groups no longer need the traditional desktop support technician who makes on-site calls to fix OS and application issues on PCs," says Jake McTigue, IT manager at Carwild Corp. "Instead, IT needs a master engineer who can administer the environment and provision desktops that accommodate a range of applications."

Because operating systems, applications and data can be stored centrally, IT managers have greater control over these assets, and the risk of lost or stolen data from mobile PCs is eliminated.

Drivers for Desktop Virtualization
(Organizations rating benefits of desktop virtualization "quite or very important")

Percentages based on a 4 or 5 rating on a scale of 1 to 5, where 5 is "very important."



Base: 300 respondents who have implemented, are piloting, or planning to roll out desktop virtualization in the next year.

Data: TechWeb survey of 490 IT decision makers.

In fact, concern for data security was high among those surveyed. Three-quarters of survey respondents cited improved security as an important benefit of desktop virtualization (trailing only centralizing and simplifying desktop management, which was cited by 86 percent of respondents).

Almost as important was the desire to accelerate provisioning new desktops, lower infrastructure costs and provide users with convenient remote access to their desktops. Nearly two-thirds of respondents also cited the benefits of extending refresh cycles for desktops and reducing downtime caused by hardware failure.

Delivering the Virtualized Desktop

Users can access and interact with virtual desktops in a variety of ways. The most common delivery mechanism (used by 59 percent of respondents) is the virtual desktop infrastructure, which is designed to replicate the functionality of a traditional desktop.

VDI uses virtualized desktops that run as virtual machines within the data center. These virtual machines are handed off to users as if they were real desktop machines, as they contain all the functionality and unique user settings of a real desktop. Within the data center, VDI virtual machines can be moved among physical servers to accommodate maintenance and load balancing and to enhance overall availability. In this way, they contribute efficiency benefits similar to server virtualization.

One of the key advantages of VDI is that IT administrators can flexibly manage the virtual machines, assigning resources and privileges to virtualized desktops based on whatever criteria they desire. IT administrators commonly create pools of virtual desktops on the back-end infrastructure, configuring the pools with applications and user profiles. These pools are intended to support a specific department or purpose.

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However, VDI does have limitations. At this point in its development, VDI lacks full audio and video streaming capabilities, communications collaboration (voicemail and phone, for example), and mobile solutions. Also, because VDI cannot presently allocate graphics processor unit (GPU) resources, graphic design, drafting and 3D modeling applications are not well suited for desktop virtualization.

If a user somehow corrupts a desktop, it is a simple matter for the IT administrator to re-provision a new desktop from the base image. These desktop pools not only reduce storage requirements, but also can share application stacks and connectivity to a network infrastructure.

Nearly 70 percent of survey respondents cited the ability to centrally provision PCs as VDI's chief advantage. Others cited providing more manageable desktop environments (69 percent) and reduced IT administration costs and easier patching and upgrading (67 percent). Other important benefits mentioned were improved data and application security (65 percent) and lower IT support costs (63 percent).

After VDI, the next most-common way to virtualize desktops is terminal services, which is used by 46 percent of the organizations surveyed. With terminal services, multiple users share a desktop session on a server (or cluster of server machines), but do not get their own custom desktop.

Although it costs less than other desktop virtualization models and provides the most control to IT, terminal services requires some trade-offs. If a user starts doing a labor-intensive task that demands a lot of resources, a performance hit can affect everyone in the session. Because all users are sharing a single machine with a single logical installation of the OS, it's difficult for IT groups to make sure all users have access to the resources they need.

Similarly, terminal services are more prone to interruptions than VDI. For example, if a print spooler crashes during a terminal server session, all users lose that spooler. If a user with administrative privileges deletes software, it uninstalls for everyone.

Terminal services are commonly used by workgroups that require only one or two applications, such as call centers or billing departments. They are a good solution for regulated environments that disallow the use of memory stacks or USB devices and require users to send print jobs to network printers.

For those using terminal services, the biggest benefit was easier deployment of patches and upgrades (65 percent), followed by better data and application security (61 percent) and more manageable desktop environments (58 percent).

On-Demand Application Streaming

The third most common way organizations deploy desktop virtualization was on-demand application streaming, used by 25 percent of those surveyed. "Application streaming is

the easiest way for most IT groups to get started with desktop virtualization. It works on existing networks and with existing client images, but provides increased access control and security for critical applications. Plus, investments made today in streaming will continue to apply as IT organizations evolve their own virtual client architectures," says Dell virtualization expert Juan Vega.

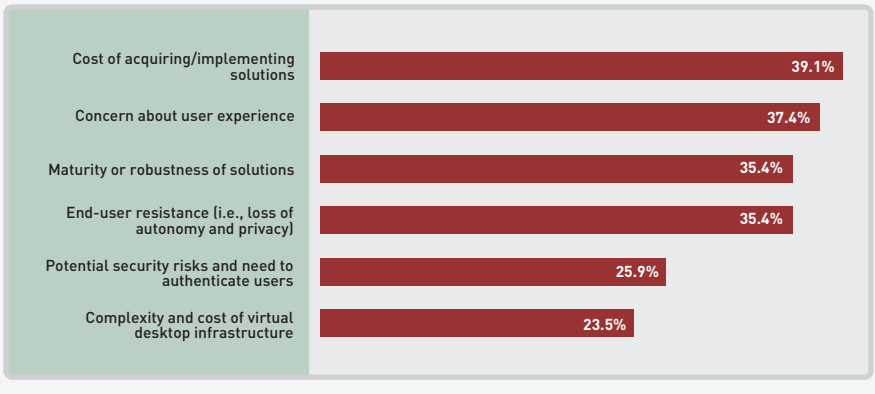
The streamed application is stored at the data center and packaged with the key components (i.e., registry calls, dependent applications and DLLs) that it needs to run in a "post-install" manner. Because the application and its data are not permanently installed on the workstation (unless the IT administrator enables them to be), on-demand application streaming provides very high security and control over these assets. Application streaming is an excellent solution for critical business applications that you don't want leaving your controlled corporate environment.

On-demand application streaming also enables organizations to cut licensing expenses. Since it is easy to track how many instances of an application are being used at any time, companies can determine the exact number of licenses they need to meet peak demand. The tracking abilities of on-demand streaming provide an audit trail to ensure compliance.

With workstations loaded with their own operating systems and processors to run the programs, end users enjoy the power and flexibility of using a regular PC. "We keep each student's profile on our network servers, and their settings are streamed to the workstation when they log in, so they have a totally customized desktop," says IT director Hundere at Glendale Community College. "We haven't noticed any performance degradation since we started on-demand streaming."

Although Glendale was able to get its on-demand streaming system up and running during summer break, the technology posed some technical challenges. Before an application can be streamed, the IT group needs to submit it to an analysis program that determines the correct registry settings for the application to run in the virtualized environment.

Greatest Obstacles to Desktop Virtualization



Data: TechWeb survey of 490 IT decision makers.

"It took us a little while to get up to speed with that, but we're pretty good at it now," says Hundere. "Also, some applications like AutoCAD just can't be virtualized, so we had to create a special environment to run it in. But the bottom line is that we know we can stream any application, with its unique settings and user profiles, to any of our workstations and it will run reliably."

Concerns and Obstacles

While IT execs whose companies have virtualized desktops report that overall the technology has met or exceeded their

expectations, many of their colleagues have reservations about how mature and robust it is. We asked IT experts who rated themselves "expert" or "competent" in desktop virtualization how ready they thought it was for prime-time.

Forty percent said that terminal services was ready to be rolled out today, but only 20 percent said the same of VDI, and 11 percent gave the nod to on-demand application streaming. However, these numbers rose 10 percent to 20 percent when we asked whether they thought these technologies would be market-ready with the support of some additional software tools.

What were the obstacles IT groups faced during the move to adopt desktop virtualization? The biggest one was the cost of acquiring and implementing the solution (39 percent). But our IT execs also encountered concerns about the user experience, the maturity/robustness of the solution, and end-user resistance (including loss of autonomy and privacy). Other noted impediments were potential security risks and the need to authenticate users, the complexity of VDI, and the challenge of determining ROI for desktop virtualization.

"We're replacing 25 percent of our desktops each year," says DiSalvo. "If I could take that budget and create a virtualized desktop environment, we could keep our physical desktops for who knows how long. That's what the promise is, and that's what keeps my eye on the prize."

Putting IT in the Driver's Seat

Desktop virtualization builds on the benefits of server virtualization by centralizing the management of desktop clients, applications and data. Problems with client devices that used to require a visit from a technician can usually be fixed from within the data center, saving time and money and improving productivity for both end users and IT staff.

With desktop virtualization, IT is in the driver's seat. With the ability to assign unique security restrictions to each virtual desktop (OS, application, user profile and data) based on the sensitivity of its data, IT administrators can lock down valuable corporate assets and enhance compliance.

Vega suggests that the real value of desktop virtualization lies in how the client image is built and deployed. "By isolating components, such as the OS and application stack, we're improving the way in which we virtualize the client image," says Vega. "IT groups can manage, protect and move virtualized user identity profiles among computing devices on the corporate network, achieving better manageability, control and security than ever."

Because desktop virtualization takes different forms — from complete client images stored in the data center to application streaming — enterprises have to carefully consider the model that's best for them. As with most things in life, costs will range depending on the sophistication of the solution and how much you need to build out your infrastructure. But the benefits — manageability, security, availability — are priceless.

ABOUT THE AUTHOR

Andrew Mazer has written extensively about the high-technology industry for more than 20 years, covering cloud computing, green IT, data center optimization, business intelligence and other topics that involve using IT as a strategic enabler for business initiatives.

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