

The Promise of Desktop Virtualization

Desktop virtualization can help rein in the costs of managing and maintaining PC infrastructures. By Megan Santosus

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Executive Summary

Much like server virtualization, virtualizing desktops involves separating the physical location of a client device from its logical interface. In practical terms, desktop virtualization allows end users to access all of their data and applications without being tied down to a specific hardware device. It also allows IT departments to reduce management and support costs, along with capital expenses for desktop hardware.

Yet while desktop virtualization has been around for some time, the incentive to adopt it has only grown compelling relatively recently, as the proliferation of desktop devices, applications, and data—along with the computing demands of a remote and often far-flung workforce—have driven IT departments to seek more effective ways of managing desktop computing resources.

This white paper will examine the state of the desktop virtualization market, discuss two desktop virtualization models, and explore the pros and cons of implementing each one.

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Introduction

When most people hear the word “virtualization,” servers are probably what come to mind first. Indeed, in a recent survey by IDG Research Services Group, more than 70 percent of respondents said they’re currently investing in server virtualization. Yet desktop virtualization is gaining traction too. Among respondents to the IDG survey, 41 percent said they are already spending money on desktop virtualization, and 22 percent said that desktop virtualization is a critical priority for their organizations in the next 12 months.

While respondents to the IDG survey are virtualizing only 6 percent of their desktops so far, desktop virtualization’s corporate footprint is set to increase considerably. Survey participants expect 24 percent of their desktops to be virtualized within the next 24 months, and 34 percent of their desktops to be virtualized by 2010. Hence the prediction by Framingham, Mass.-based research firm IDC that sales of desktop virtualization software will reach \$1.8 billion by 2011, up from \$500 million in 2008.

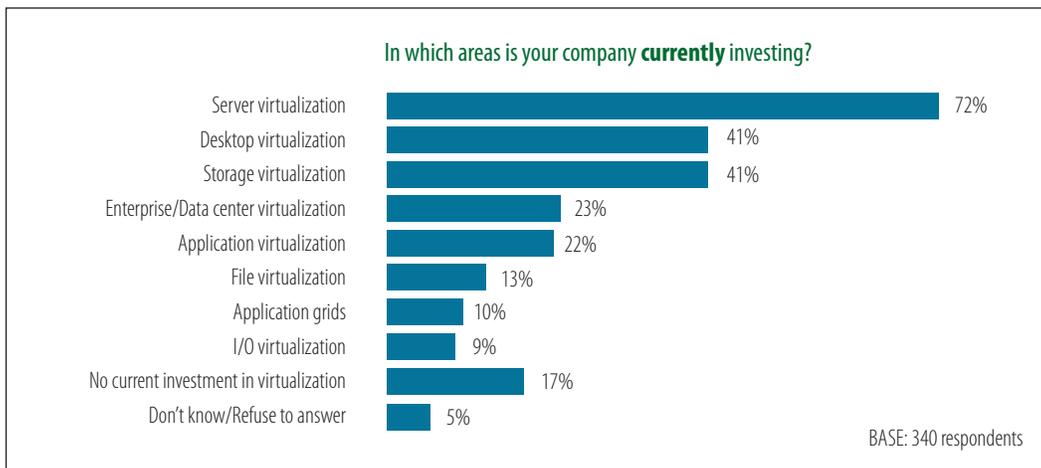
Types of Desktop Virtualization

There are two main variants of desktop virtualization:

Hosted desktop virtualization: This is when a server located in a data center hosts virtual machines. Users connect to the server via connection brokers and receive their user interface via standard protocols, such as Remote Desktop Protocol. VMware Inc. is among the leaders in this market. Other vendors include Citrix Systems Inc., Virtual Iron Software Inc., and Qumranet Inc.

Client virtualization: In this model, “hypervisor” software installed on the client device allows one desktop to run multiple operating systems. Top vendors in this market include VMware Inc., Microsoft Corp., Sentillion Inc., and Parallels Inc.

Current Virtualization Investment



Source: IDG Research Services Group

>> **Transferring much of the desktop processing workload from client devices to the data center enables IT departments to reduce wear and tear on client hardware and thereby extend its life span.**

The Benefits of Desktop Virtualization

Unlike server virtualization, which got its foothold in many organizations as a way to consolidate servers, desktop virtualization doesn't aim to reduce the number of PCs. By separating physical machines from their logical interfaces, desktop virtualization aims to reduce the headaches and complexity associated with deploying and maintaining client devices, which ultimately helps IT departments reduce desktop management costs.

In the aforementioned IDG survey, the benefits of desktop virtualization most commonly cited by respondents were reduced costs (54 percent), more manageable desktop environments (54 percent), and the ability to provision PCs and other client devices centrally (52 percent).

Hosted Desktop Benefits

In the hosted desktop virtualization model, data and applications run on servers in the data center and are essentially streamed to clients. That leads to greater security, because data and applications reside on physically secure servers rather than on more easily compromised client devices. Also, transferring much of the desktop processing workload from client devices to the data center enables IT departments to reduce wear and tear on client hardware and thereby extend its life span.

In addition, hosted desktops enable IT departments to improve support. With traditional desktop computing, the IT department must dispatch a technician every time a client device won't start properly. With virtual hosted desktops, however, a technician can rebuild the entire operating system without ever setting foot outside the data center, and have the end user up and running in minutes. That means increased productivity for IT employees and end users alike.

Moreover, unlike "dumb" terminals that deliver the same plain vanilla computing experience to everyone, virtual hosted desktops support customization. Just like a regular PC, virtual machines reflect users' personal operating system and application settings. They can also store personalized screen savers and digital music collections.

Client Virtualization Benefits

The client virtualization model of desktop virtualization delivers equally compelling benefits. For instance, IT departments can use client virtualization to isolate confidential data and applications within discrete virtual machines. That helps protect the data from hackers if they compromise a client device's operating system. Similarly, IT administrators can assign different security restrictions to virtual machines based on the sensitivity of the data they contain. For example, they can configure some virtual machines to bar users from copying data onto thumb drives and other portable storage devices, while configuring other virtual machines more permissively.

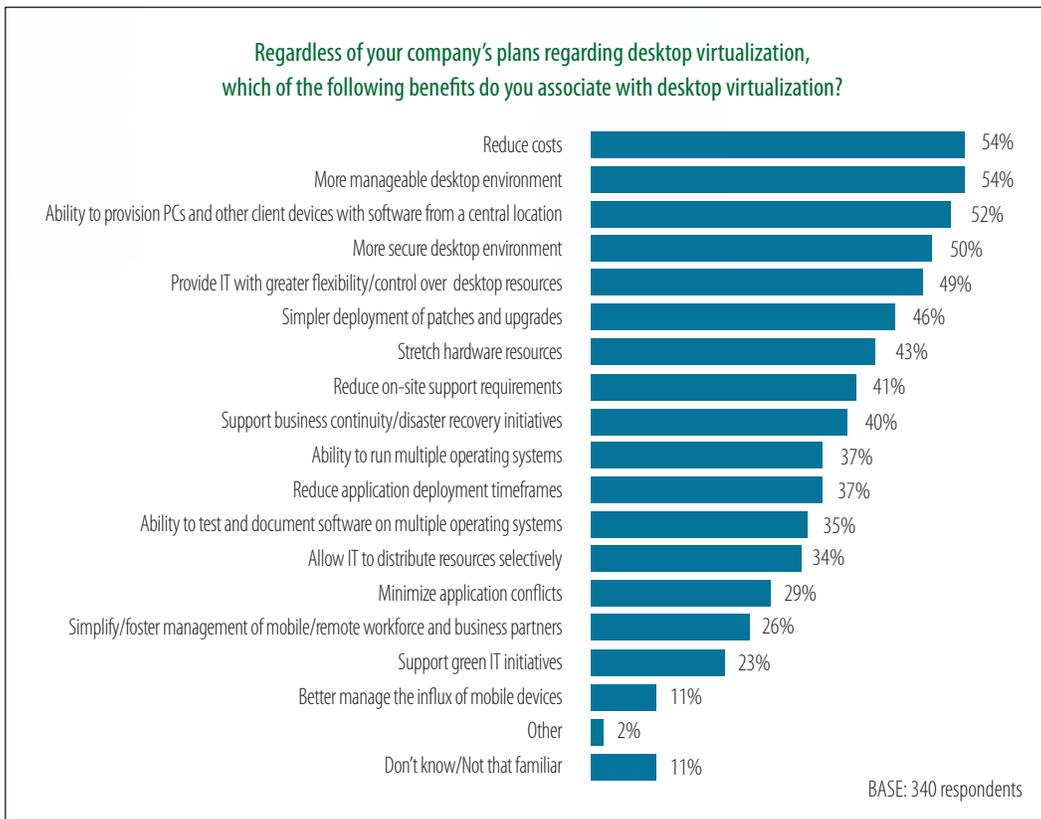
For end users, client virtualization means greater flexibility, since they can run multiple operating systems and thereby accommodate both legacy applications and newer systems. A company that uses a homegrown application incompatible with Windows Vista, for example, no longer has to rewrite the software before upgrading to Microsoft's latest operating system. Using client virtualization, the company can simply run the application on its Windows Vista PCs inside a Windows XP-based virtual machine.

Client virtualization is also an ideal model for organizations that allow employees to use their laptops for both work and personal use. IT departments can create different corporate and personal images on separate virtual machines, and impose stringent security controls only on the corporate image. That enables companies to remain in compliance with government data privacy regulations while still giving employees the freedom to use their computers for personal tasks as they wish.

Challenges of Desktop Virtualization

As with any technology, desktop virtualization doesn't come without trade-offs. For organizations considering hosted desktops, client virtualization, or a combination of the two, it's necessary to first understand desktop virtualization's limitations.

Benefits of Desktop Virtualization



Source: IDG Research Services Group

>> **To overcome ... challenges, organizations should carefully assess where implementing client virtualization makes sense**

Hosted Desktop Virtualization Challenges

- Most networks aren't powerful enough to deliver rich graphics, such as those offered by the Aero interface in Windows Vista, to a virtual hosted desktop.
- Virtual hosted desktops are server-based and delivered to end users over the network. If the network goes down, therefore, users will be unable to access their desktops.
- Virtual hosted desktops require significant bandwidth, and the ratio of users to servers is not as high as in other client computing models. As a result, some organizations may need to make costly upgrades to their servers, storage, and network infrastructure before rolling out desktop virtualization.
- End users may experience latency when operating their virtual desktops. Remote workers in particular may experience poor performance if their virtual hosted desktops are delivered across a wide area network.

The best way to address these challenges is to deploy hosted desktops only to appropriate users. Traditional target users for virtual hosted desktops are workers who use their computers for very specific tasks that are not knowledge-intensive, such as employees in call centers and administrative workers. Remote and mobile workers can be good fits for hosted desktop virtualization too, provided they have access to high-speed network connections.

Client Virtualization Challenges

Client virtualization has its challenges as well. For one, running multiple virtual machines simultaneously requires more powerful client hardware, particularly in terms of processing and memory. As a result, organizations must often make up-front investments to get their desktops "virtual machine ready." Additionally, end users sometimes experience degraded performance when running applications not native to their client device's base operating system. For example, some Apple Mac-based systems may not operate as speedily on a Microsoft Windows-based PC, even when they're run in a Mac-based virtual machine.

To overcome these challenges, organizations should carefully assess where implementing client virtualization makes sense. Traditional use cases for this model include technical end users, such as software testers. Client virtualization enables them to have multiple virtual test machines with multiple different operating systems running on one physical desktop. Employees who need to work with applications on incompatible platforms can also benefit from client virtualization, as can contract workers who need to access a customer's network through their own PCs. IT departments can simply create virtual desktops for them with all the applications and data they require. Accessing that hosted desktop through a virtual machine allows contractors to keep the customer's applications and data separate from their own.

Cultural and Organizational Challenges

With either desktop virtualization model, the biggest barriers to adoption are often

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cultural and organizational rather than technical. For example, in traditional IT shops, data center personnel and desktop support personnel rarely collaborate. Under desktop virtualization, however, both groups must learn to work together closely. IT management must also clearly delineate responsibilities across both groups for resolving desktop support issues that stem from host server problems.

In addition, end users accustomed to their traditional desktop experience may balk at moving to client virtualization. IT departments must take the time to carefully explain the rationale behind desktop virtualization and the benefits that will affect users personally, such as faster support.

Conclusion

Desktop virtualization in both its iterations is still in the early adoption phase. But CIOs who are faced with rising desktop support costs, stretched support resources, and waning end-user satisfaction need to begin speaking with their technology partners about desktop virtualization and start conducting their own investigations now. The benefits of virtualizing desktops—whether at the server level or on the client side—are too compelling to ignore.

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