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WHITE PAPER

Agentless Application Virtualization: Enabling the Evolution of the Desktop

Sponsored by: VMware

Michael Rose Frederick W. Broussard

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EXECUTIVE SUMMARY

An increasing number of IT managers are finding themselves challenged with scaling out and supporting desktop environments that are becoming increasingly complex, and at the same time, business units are demanding increased flexibility and agility from their IT resources. In an attempt to address this challenge, IT managers have been adopting a collection of virtualization technologies that can improve their existing environments, creating a computing model referred to by IDC as virtualized client computing (VCC).

One of the technologies that enables this VCC model, application virtualization, is finding its way into an increasing number of organizations because of the benefits that it can offer in terms of application mobility, simplified change and configuration management, application testing, and quicker time to market for applications.

The adoption of a VCC environment does not occur without challenges, however, and leveraging application virtualization technology specifically can introduce complexity. This is especially the case when virtualized applications are deployed into environments with existing management infrastructures, as well as when organizations deploy a mix of virtualized and native (nonvirtualized) applications.

Any application virtualization platform that can leverage existing desktop and application management infrastructures can alleviate much of the potential for increased complexity. By leveraging existing infrastructures for the purposes of discovery, inventory, and licensing compliance of virtual applications, IT managers can experience quicker paybacks on their application virtualization investments and maximize return on investment (ROI).

In appreciation of these challenges, VMware has developed VMware ThinApp (formerly Thinstall), an agentless platform that is designed specifically to simplify the adoption of virtualized applications within managed desktop environments. This paper considers application virtualization, and VMware ThinApp specifically, within the construct of virtualized client computing. It considers how IT organizations can leverage the technology to address many of the challenges that they face with their desktop computing environments.

Global Headquarters: 5 Speen Street Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 www.idc.com

SITUATION OVERVIEW

Desktop Challenges: Creating Opportunity

Providing IT resources to users in a way that satisfies the often divergent needs and wants of IT managers and end users has been a challenge since the advent of the computer terminal. Specifically, most distributed desktop environments suffer from the following limitations:

- **Data security.** Sensitive information is being stored within the IT environment at an exponential rate. In a distributed desktop environment, this sensitive data often must be stored locally, thus producing a significant security concern.

- **Fault tolerance.** Traditionally distributed PCs are susceptible to hardware and software issues, including device failures, viruses, and application conflicts. These vulnerabilities cause countless hours of computer downtime, lost productivity, and therefore significant financial cost.

- **Software manageability.** PCs (including desktops and notebooks) can be difficult to manage because of their distributed nature. They require a steady diet of patches, updates, and other necessary software maintenance that can be difficult to perform on devices not permanently connected to the network from which they are typically delivered. Furthermore, although moves/adds/changes can be managed with existing desktop management platforms, the platforms can suffer from the need for interoperability and complexity.

- **Physical support/management.** The physical distribution of IT assets makes it increasingly difficult for break/fix operations as the environment scales out.

- **Scalability.** With the changing pace of business, organizations are increasingly being challenged to quickly scale out their desktop environments, particularly in response to mergers, acquisitions, and other business activities. This can be increasingly difficult for organizations that must distribute and manage physical computing assets.

- **Power consumption.** Organizations are becoming increasingly aware of the cost associated with powering their IT assets, particularly when utilization rates of those devices are similarly compared.

- **Data loss.** Because of the distributed nature of data within a traditional desktop environment, recovering data lost because of local device failures can be very challenging.

Organizations have largely accepted these limitations because of the lack of viable alternatives. However, a new group of technologies that make up virtualized client computing represent a way of providing IT resources to end users in a way that addresses many of these challenges.

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Addressing Desktop Challenges Through Virtualized Client Computing

IDC defines virtualized client computing as a collection of virtualization software and delivery technologies that improve upon the limitations associated with a distributed desktop environment.

Enabling VCC via Virtualization Software

A wide range of virtualization software technologies enable VCC. These products can be broken down into three major categories:

- **Application virtualization software** encapsulates and isolates an application from its underlying host operating system, as well as from other local applications running within a client environment. The representative VMware product in this category is VMware ThinApp.

- **Desktop virtualization software** uses virtual machine software (VMS) to decouple a client environment (including operating system, application, and data) from its host hardware while isolating it from other software running aboard a device. These newly created virtual desktops can be hosted upon either clients or servers. The representative VMware products in this category are Assured Computing Environment (ACE) and Virtual Desktop Infrastructure (VDI).

- **Virtual user session software** runs on servers and creates multiple user sessions within an individual operating system, which can be interacted with by multiple users simultaneously. Interaction with these virtual user sessions is performed through the use of a remote interaction delivery model. The most widely represented product in this category is Microsoft's Terminal Services.

Delivery Models That Enable or Extend the Value of VCC

Adoption of virtualized client computing via virtualization software often requires, or the value may be extended by, the use of specific delivery models. These models leverage a collection of protocols and software and can be broken down into two major categories:

- **Remote streaming** involves the delivery of executable blocks of data from a server to a distributed device via a collection of specific (and sometimes proprietary) protocols and/or software.

- **Remote interaction** involves the delivery of I/O operations between a client device and a server via a collection of specific (and sometimes proprietary) protocols and software. Remote interaction is used as a delivery model in both server-hosted virtual desktop and virtual user session environments.

Considering the Adoption of Virtualized Client Computing Within the Enterprise

There is no perfect solution for the pain points experienced with a distributed desktop computing environment, and each virtualized client computing technology is unique in terms of its capabilities and limitations. When adopting virtualized client computing, organizations should deploy each individual solution based upon two important criteria:

- **The percentage of an organization's user base to which a given VCC technology can be deployed.** Some VCC technologies can be deployed to practically all users, whereas mobility and performance limitations dictate that some VCC technologies can be deployed to only a certain percentage of an overall user environment.

- **The extent to which each VCC technology can improve upon the limitations of a distributed desktop environment.** Each VCC technology addresses specific challenges with a distributed desktop environment, and no one solution can address all of them.

Applicability of a VCC Technology

Based upon the differentiating capabilities of virtualized client computing platforms, it is essential to consider the following three user requirements when determining to whom VCC technologies should be deployed within the environment:

- **Mobility.** For many users, the ability to work offline (without network connectivity) is essential. However, for some users, mobility is not at all a requirement because IT resources are always accessed from the same location.

- **Multimedia/graphical performance.** Multimedia/graphical performance should be considered, including some less obvious use cases such as Internet streaming media and Web pages that utilize Flash.

- **Customization of client environment.** Some users need, or would like to access, an interactive client environment that is fully customizable. Meanwhile, others need access only to applications without the requirement of a fully customizable Windows experience.

When segmenting users based on these three requirements, IT managers can determine the extent to which they can leverage each type of VCC technology within their environment. Figure 1 shows the extent to which each individual VCC technology can be leveraged within a broad user base, based on the preceding criteria.

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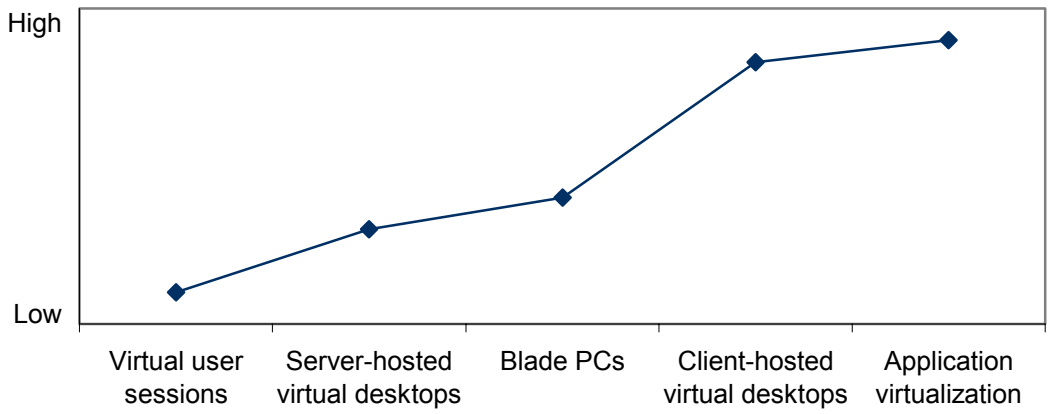
FIGURE 1

User Requirements



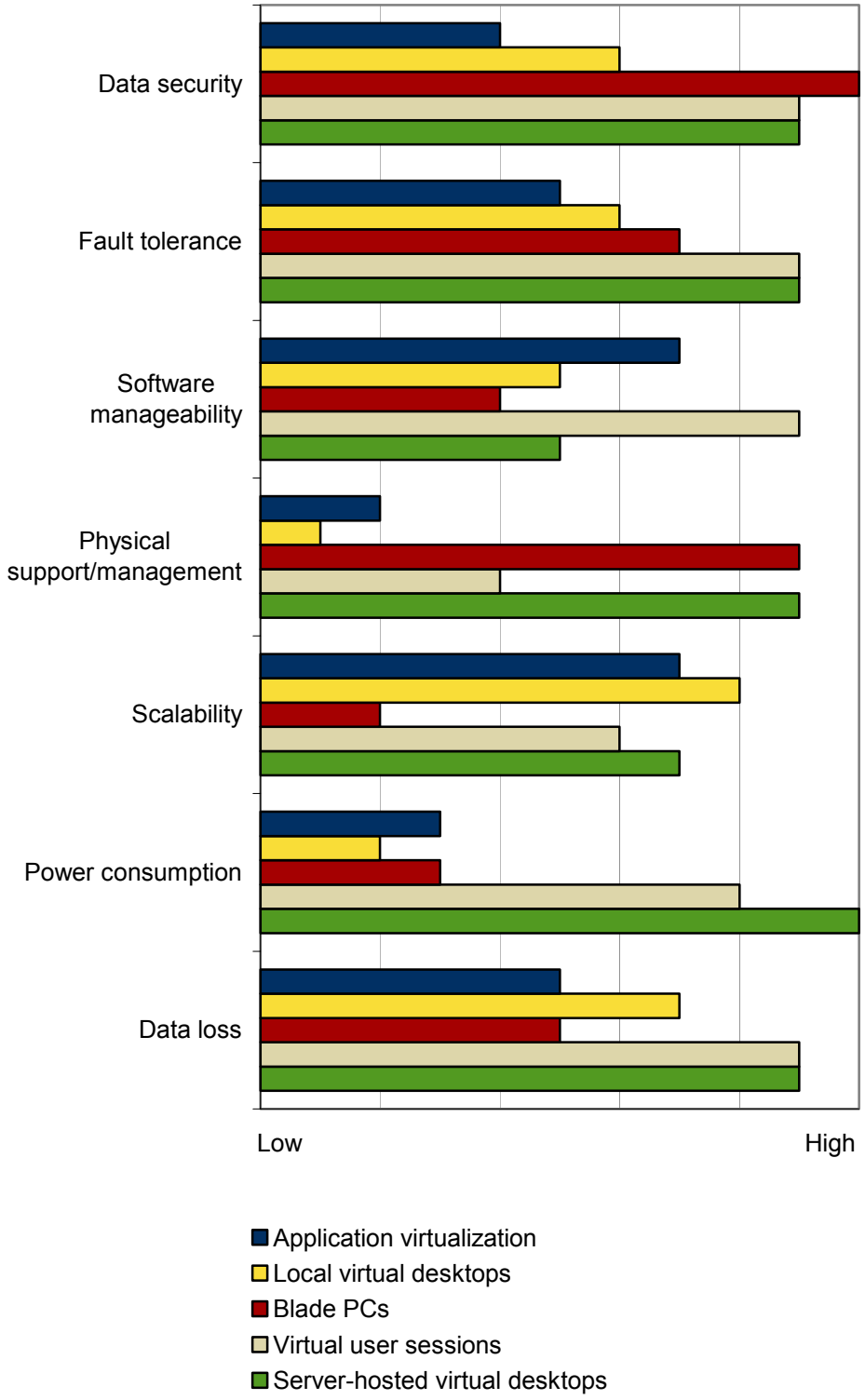
Source: IDC, March 2008

As can be seen in Figure 1, virtual user session software is relatively limited in the extent to which it can be deployed to a wide range of users because of limitations in terms of end-user performance, customization, and mobility. In stark contrast, application virtualization does not significantly impact these end-user requirements. As a result, the technology can be deployed to practically any user without impacting his or her computing experience.

Once an organization has determined the percentage of its user base to which the different virtualized client computing technologies can be deployed, IT must consider the extent to which each given VCC solution can help it address the specific challenges it faces within its environment. Figure 2 shows the extent to which each VCC technology can address the range of challenges outlined at the beginning of this document (see Figure 2).

FIGURE 2

Addressability of IT Requirements



Source: IDC, March 2008

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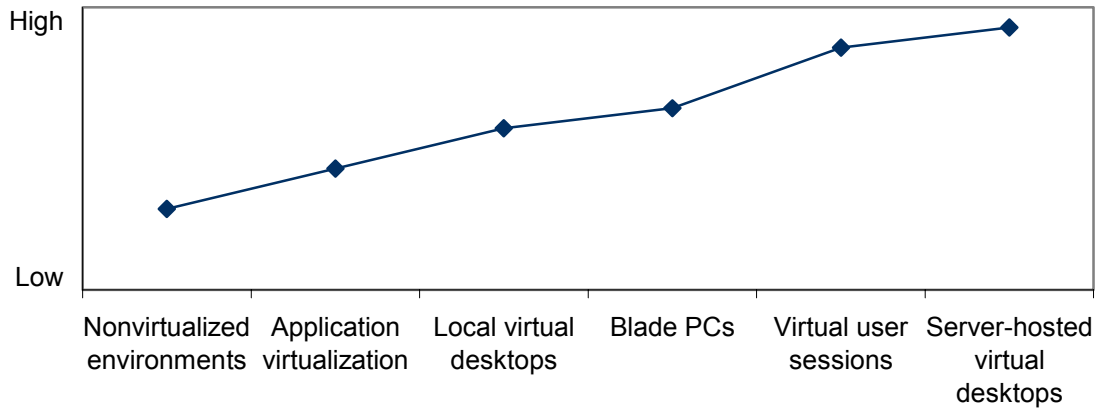
Figure 3 shows the relative extent to which a VCC technology can improve upon the wide range of limitations associated with traditional desktop computing environments.

FIGURE 3

Addressability of IT Requirements



Source: IDC, March 2008

As can be seen in Figure 3, VCC solutions that leverage a server-based computing model, such as server-hosted virtual desktops and virtual user sessions, tend to offer the most significant overall improvements to traditional distributed desktop environments as they are defined at the beginning of the white paper. In comparison, application virtualization technologies tend to offer more focused benefits, particularly around the challenges associated with managing deployed applications.

The Benefits of Application Virtualization

Application virtualization software is increasingly being leveraged by organizations to address challenges associated with the application life cycle, particularly those processes associated with application testing and deployment.

Fundamentally, application virtualization software aggregates operating system resources and isolates them within a virtualized container along with the application that accesses them (see Figure 4). Qualitative differences in the way in which this process occurs are dependent on the solution in use and vary based on packaging, agent integration, level of interaction required with the end user's system, and back-end system integration requirements.

The use cases and benefits associated with application virtualization are numerous and include the following:

- **Simplified application deployment/retirement.** Because applications are never installed into an individual operating system, the deployment phase of the application life cycle is greatly simplified. Furthermore, because applications do not install into the host operating system, IT managers can be confident in the complete removal of all application bits from a host PC during retirement.

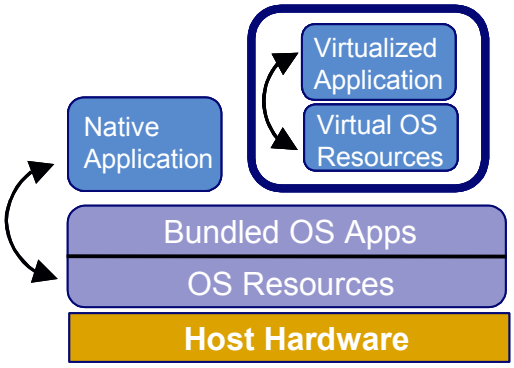
- **Simplified operating system image management.** Because applications in effect become completely separate components from the operating system, IT can simplify the way it manages operating system images and create a more dynamic desktop environment in which a desktop environment becomes an aggregation of separately managed components.

- **Elimination of resource conflicts.** Because each application is associated with its own virtual operating system resources, resource contention and application conflict issues can be eliminated.

- **Simplified application testing.** Because resource conflicts can be eliminated, application testing, in particular regression testing, can be significantly diminished.

FIGURE 4

Application Virtualization



Source: IDC, 2008

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The Dynamic Desktop: Using Desktop and Application Virtualization Together

The benefits associated with application virtualization technology are available not only to traditional desktop environments. On the contrary, best practices for the desktop environment of the future may likely include deploying virtual applications into virtual desktops to reap the benefits of both.

Using desktop and application virtualization together would enable a dynamic desktop environment in which operating system, application, and data tiers could be created dynamically, drastically improving storage efficiency and simplifying management.

Through its acquisition of Thinstall (rebranded as VMware ThinApp), VMware is now positioned to offer a product that can enable such a model for IT organizations that leverage VMware's VDI solution in conjunction with VMware ThinApp application virtualization. Although this is admittedly futuristic, IDC believes that the benefits associated with such a model could be significant.

VMware ThinApp Application Virtualization: Keeping It Simple

VMware ThinApp (formerly Thinstall) is an application virtualization technology acquired by VMware to extend its reach into the desktop environment. The VMware ThinApp platform has been in development since 1999, when Thinstall was founded as an independent company. According to VMware, ThinApp is currently leveraged on well over 1 million deployed endpoints and has been integrated with many of the leading packaging tools such as Acresso AdminStudio and PC configuration management solutions from vendors such as Microsoft, LANDesk, BMC, matrix42, and Symantec.

VMware has differentiated its ThinApp platform from other application virtualization solutions by designing it with the following characteristics:

- **Application compatibility.** VMware ThinApp is compatible with a vast majority of applications across a variety of operating systems. According to VMware, using ThinApp application virtualization technology enables running 32-bit applications on 64-bit systems or supporting legacy NT applications on XP or Vista machines to enable system consolidation and decommissioning of hardware, but not the applications associated with them.

- **Agentless applications.** The VMware ThinApp platform does not include any proprietary management agents. Instead the company supports packaging applications into .MSI/.EXE files that contain everything necessary for an application to run in user mode and that can be integrated with and managed by existing software management toolsets. VMware ThinApp can therefore increase endpoint flexibility while limiting the complexity associated with managing heterogeneous native and virtual applications.

- **Packaging simplicity.** Because ThinApp supports standard .MSI/.EXE packaging, it can follow preexisting packaging processes such as snapshot packaging. This further simplifies adoption of application virtualization by limiting the complexity associated with training administrators on a new platform or training them on yet another application packaging process. ThinApp also has out-of-the-box integrations with industry-leading packaging tools such as AdminStudio to enable packagers to leverage their existing toolsets.

  According to Ty Schwab, CEO of Blackhawk Technology Consulting, a virtualization services firm, "The snapshot capabilities of ThinApp greatly simplify the process of virtualizing applications."

"The snapshot capabilities of ThinApp greatly simplify the process of virtualizing applications."

- **Enablement of user mobility.** Because thinstalled applications are not agent based and are not permanently installed into an operating system, they are highly mobile, thus enabling IT organizations to deploy applications on numerous media types and devices regardless of user permission settings.

- **Ease of operating system migrations.** According to VMware, the platform can enable IT managers to migrate applications much more easily from one Windows platform to another, across a variety of systems and management tools.

Light Impact on Existing Infrastructures

Although application virtualization is a relatively new technology, application management infrastructures are not. These infrastructures are pervasive and tend to rely on integrated product suites that perform software and hardware asset discovery and inventory.

These infrastructures also include the capability to distribute applications and patches to multiple PCs and servers on the network, as well as integrate with problem resolution and event automation solutions. For application virtualization to become successful as a model, it will need to extend the capabilities of these platforms while not adding significantly more to existing management complexity.

With VMware ThinApp's agentless platform, in cases where an organization has a desktop management infrastructure in place, virtualized applications are tethered to the operating system and the existing management agent that resides on the PC (see Figure 5). This agent will always be aware of what virtualized applications are running and is then able to perform its existing functions such as inventory and license management.

Because of this simplified integration, Dirk Bracke, a desktop architectural consultant for HP Services, saw significant benefits by leveraging the ThinApp platform. When discussing his experience in using the product, he commented that "by deploying VMware ThinApp, we have seen significant improvements in the speed with which we can deploy applications. By virtualizing applications, we have been able to speed the time of deployment for an application from months to a matter of weeks."

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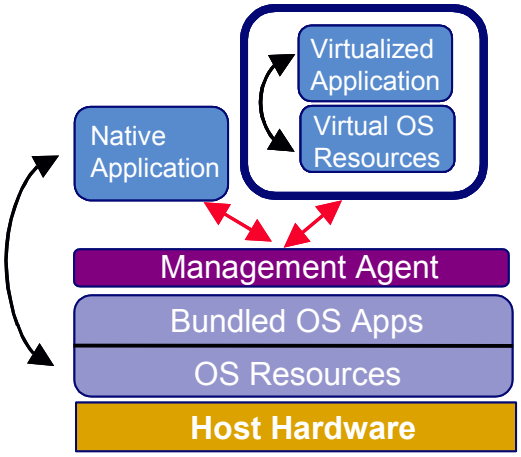
FIGURE 5

Agentless Application Virtualization



Source: IDC, 2008

The impact on the configuration management database (CMDB) of leveraging ThinApp applications from a configuration item standpoint will depend on who is interested in tracking the solutions in the CMDB. Frequently, this interest comes from two different groups:

- **Compliance and governance managers.** This group is interested in the fact that a license has been deployed that requires authorization to use, and an audit trail exists that documents use procedures are established and followed. In this case, there need not be a difference between the virtualized and native applications, as either configuration will allow tracking and management of the license through the same tools used today. ThinApp virtualized applications register with WMI (similar to natively installed applications) and can be tracked by the same mechanisms used to inventory and track natively installed applications. Because the virtual package is an .MSI or .EXE, it can also be registered with the Definitive Software Library and tracked through normal change and configuration management and asset management systems used today by natively installed applications.

- **Service desk managers/IT desktop administrators.** This group is likely to track the prepackaged virtualized application as a separate configuration item from a native application. In this case, the configurations may need to be tracked separately, as prepackaging itself creates different ways to package an virtualized application and, therefore, different ways to introduce changes and potential errors and conflicts.

CHALLENGES/OPPORTUNITIES

One of the most uniquely differentiating characteristics of the VMware ThinApp application virtualization platform is its agentless nature. It is largely this characteristic that enables the capabilities listed earlier, such as integration into existing management infrastructures for inventory, distribution, and compliance reporting. However, the lack of an agent on the endpoint device also means that thinstalled applications are dependent upon another systems management platform.

For many users, this reliance upon another management framework is a benefit given the large investments that their organizations have already made in these infrastructures. On the other hand, organizations that have less sophisticated IT environments, without significant software management infrastructures, may find this lack of infrastructure to be a limitation of the VMware ThinApp platform.

IDC believes that VMware ThinApp has the ability to capture a large segment of IT shops if it develops a management infrastructure around its application virtualization platform. This infrastructure could include delivery components such as application streaming, as well as licensing, life-cycle management, and inventory management.

Additionally, VMware has strong desktop virtualization products in the form of its ACE and VDI platforms, both of which could benefit greatly from an integrated management platform. The combination of these three products — ThinApp, ACE, and VDI — could provide a solution that could help small and medium-sized businesses, in particular, to address many of the challenges that they experience with their current desktop computing environments.

CONCLUSION

By providing a separation between application and operating system, IDC believes that application virtualization technology will be an integral part of the dynamic desktop environment of the future.

Further, compared with other VCC technologies, such as server-hosted virtual desktops, application virtualization represents a technology that can potentially offer short-term ROI benefits by limiting costs associated with the testing, deployment, and management of applications.

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