

White Paper

Desktop Virtualization

Concept Becomes Reality with Quest

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Executive Summary

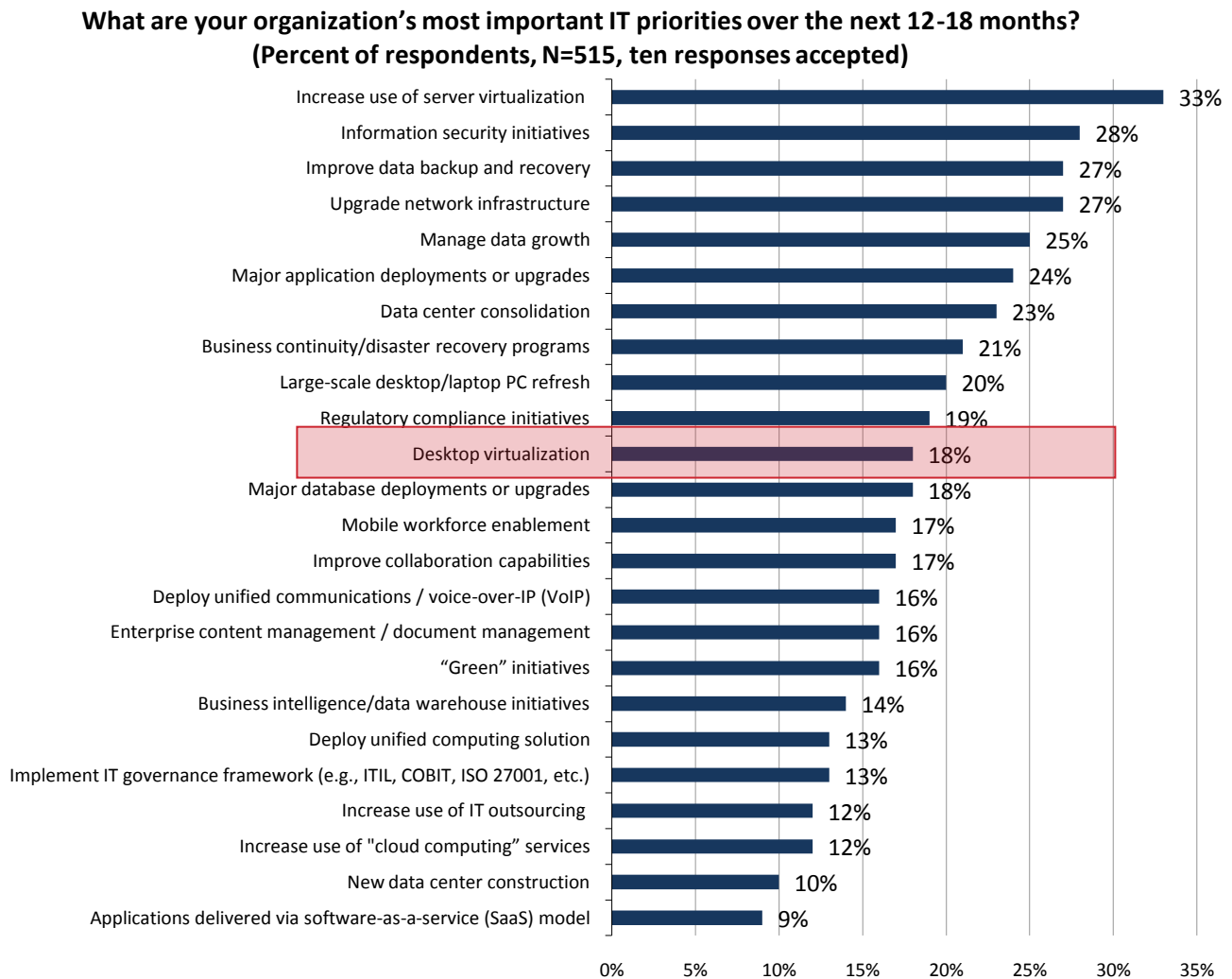
CIOs and senior IT management are tuning their focus to desktop virtualization as they look for new ways to enhance their desktop strategy with simultaneous benefits to the end-user and IT operations. VDI (virtual desktop infrastructure) has been the industry buzz word and may be the right fit for certain scenarios, but successful desktop virtualization implementations view VDI as one of many deployment models. The key is being able to optimally manage the environment independent of whether applications and desktops are deployed on terminal servers, VDI, blade PCs, physical PCs or with application virtualization. Fueled by Microsoft Windows 7 migration, improved security, and operational efficiency, desktop virtualization has the potential to offer a promising future if businesses can weed through its potential complexity and build long term goals based on flexible solutions.

Quest has focused its efforts in the right places. Its vWorkspace platform reduces capital and operating costs as well as management overhead; automates IT tasks; reduces the risks of both compliance failure and productivity-affecting downtime; improves operational efficiency; and provides to users a seamless, fully functional experience. vWorkspace can scale to deliver desktop virtualization benefits to a broad set of end-users while maintaining control and delivering user flexibility. Organizations that decide to start small can scale their implementations easily and effectively while keeping costs down. This gives organizations a choice of products and deployments today and in the future. Organizations can match their deployments with long-term desktop strategies while leveraging prior investments, and meet end-user requirements without compromising their experience.

Solving Desktop Management Challenges

The current costs and complexity related to desktop PC management are driving organizations to desktop virtualization. In ESG’s 2010 spending intentions survey, 18% of respondents listed desktop virtualization as a key priority over the next 12-18 months—a significant amount given that the top priority, server virtualization, was chosen by 33% (see Figure 1).¹ Interestingly, numerous initiatives mentioned by between 17% and 28% of respondents are objectives that desktop virtualization can impact: information security, improving data backup and recovery, managing data growth, application deployments/upgrades, data center consolidation, desktop/laptop PC refresh, regulatory compliance, and mobile workforce enablement. ESG suspects that as organizations look for ways to accomplish these goals, they will look more closely at desktop virtualization.

Figure 1. Most Important IT Priorities for 2010



Source: Enterprise Strategy Group, 2010.

Desktops generally include a user’s preferences, operating systems, applications, and data access; however, the continuing evolution of the way people work has prompted dramatic changes in the “desktop” environment. Employees need application and data access from remote locations, often from mobile devices, and expect constantly available, high-performance application, storage, and network services. IT departments, in turn, are expected to provide predictable, high-quality, secure computing environments while keeping costs down—and that can be a tall order.

¹ Source: ESG Research Report, [2010 IT Spending Intentions Survey](#), January 2010.

As a result, the IT employees charged with supporting personal computers face numerous challenges. Information security and compliance with corporate and regulatory mandates are proving more and more difficult to ensure. The mobility of laptops, netbooks, smart phones, and other devices exposes data to potential loss or theft as employees travel around the globe. In fact, since more than one-third of organizations do not encrypt any of their laptops or other mobile devices, mobile user data is easily accessible to anyone in possession of the device.² Managing information security across so many disparate devices is a strenuous task at best.

Most organizations also lack a consistent backup process for their client access devices, particularly laptops and other mobile devices. Data residing on these devices often has no formal, regularly scheduled backup, so if the user fries their motherboard or leaves their laptop in a hotel lobby, their data is sacrificed. In addition, maintaining client access devices is expensive—more than 50% of organizations spend between 6 and 18 hours annually maintaining each client device. That doesn't sound so bad—at first. Take a relatively small organization and the low end of the estimated hours: an organization with 500 employee desktops taking six hours to maintain each device annually would spend 3,000 hours on client device management. Divide that by eight-hour shifts and we're looking at 375 shifts—one IT employee spending from 9 am to 5 pm every day for a year, doing nothing else but maintaining endpoints would still leave 10 shifts uncovered. Is that the best use of IT resources?

The hefty task of deploying and upgrading applications for all these end-user devices must also be counted. About 50% of organizations support between 20-100 applications. With 500 desktops and 20-100 applications needing version updates, patches, configuration changes, and the like, desktop infrastructure support requirements are tremendous. Despite its ability to streamline IT operational costs and make all this much easier still, many organizations remain skittish about deploying desktop virtualization in production.

One Size Doesn't Fit All

All of these factors are driving the move to desktop virtualization. But contrary to popular belief, virtual desktop infrastructure (VDI) is not the only game in town. As described in a recent ESG brief, there are several virtualization techniques for desktop applications and a mix of approaches is often the most cost-effective way to deliver the right services to various types of users.³ VDI is often part of an overall desktop virtualization initiative and may be used in conjunction with strategies such as application virtualization, profile virtualization, streaming operating systems, blade PCs, and client-side hypervisors. But vendors and customers that focus solely on VDI will often fall short when it comes to the overall goals of desktop virtualization.

Contrary to popular belief, virtual desktop infrastructure (VDI) is not the only game in town.

While each method works a little differently, they are all designed to separate the user's needs from the underlying hardware, making profiles and applications portable and accessible from remote locations. Implementing them results in hardware savings, operational savings due to centralized management, and easier data protection and compliance management. Application virtualization, profile virtualization, and streaming operating systems all enable IT to centrally manage these resources and stream them over the network while retaining user personalization. Blade PCs provide individual nodes containing CPU, memory, and disk space in a blade footprint that sits in a rack enclosure in the data center. IT is responsible for serving up the computing resources users access via thin clients. These strategies enable organizations to buy less expensive desktop hardware (which can reduce energy costs significantly) or repurpose older desktops and laptops to stretch their investments.

Server-side hypervisors that offer the ability to run multiple virtual machines on one physical server represent a mature, well supported technology. Client-side hypervisors represent an emerging technology in this space, with very limited hardware support or established standards. Client-side hypervisors are capable of running multiple operating systems on the client, but that is just one example of the potential value of the technology. Client side hypervisors hold the promise of allowing user desktop images to be hardware agnostic and provide for a new

² Source: ESG Research Report, [Virtual Desktop Infrastructure Market Trends](#), February 2009.

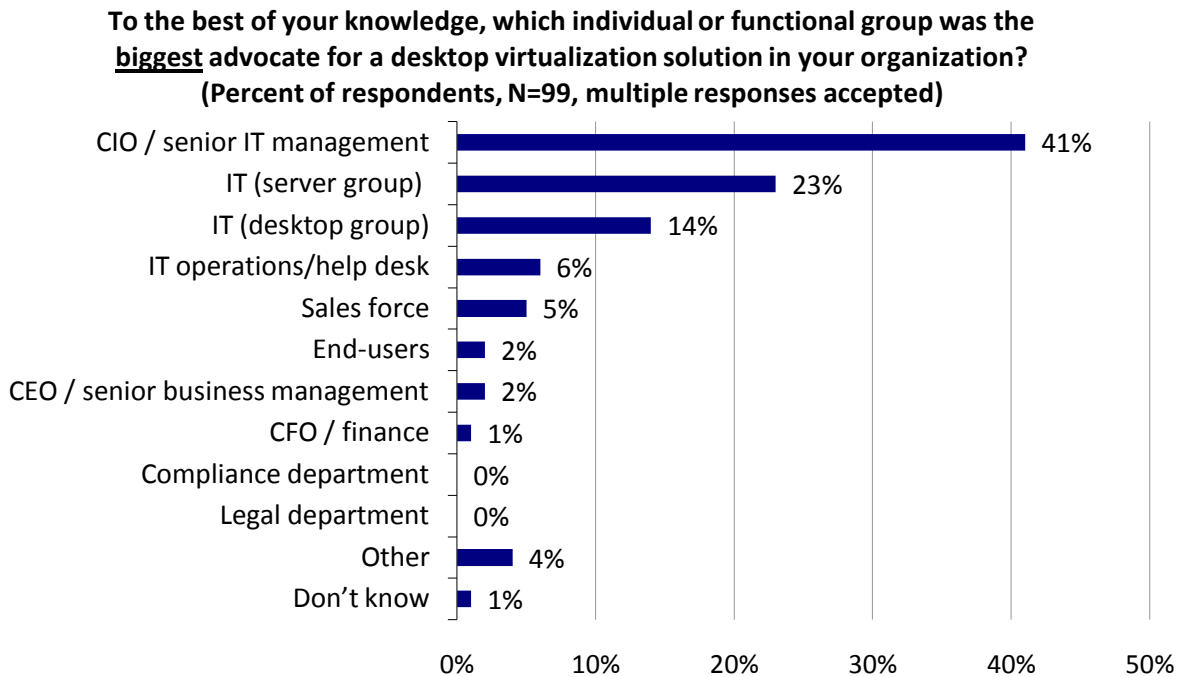
³ Source: ESG Brief, [2010 Desktop Virtualization Trends](#), February 2010.

approach to desktop image management. Organizations that match the right combination of solutions with the right types of employees stand to gain capital and operational savings as well as productivity and security improvements. Hypervisor technology is now mature with extremely high penetration into enterprises, mid-market and SME alike. A very significant number of organizations are using more than one hypervisor. Adoption of a single hypervisor is becoming an increasingly unlikely prospect for the enterprise, so developing a management strategy and technology set that will fully support disparate hypervisors across the network and storage layers is essential.

Desktop Virtualization Objectives

According to IT executives, three criteria are crucial for desktop virtualization to deliver maximum value: better management, better end-user experience, and a combination of choice and flexibility. As shown in Figure 2, the top advocates for desktop virtualization are CIOs and senior IT management who envision the benefits that will accrue over the long term.² These individuals can quickly identify immediate opportunities in their organizations for success using desktop virtualization, particularly as proof-of-concept installations give way to full-fledged, scalable deployments.

Figure 2. Internal Desktop Virtualization Advocates



Source: Enterprise Strategy Group.

ESG believes that these individuals will be the ones driving desktop virtualization efforts and will be most likely to recognize best practice solutions.

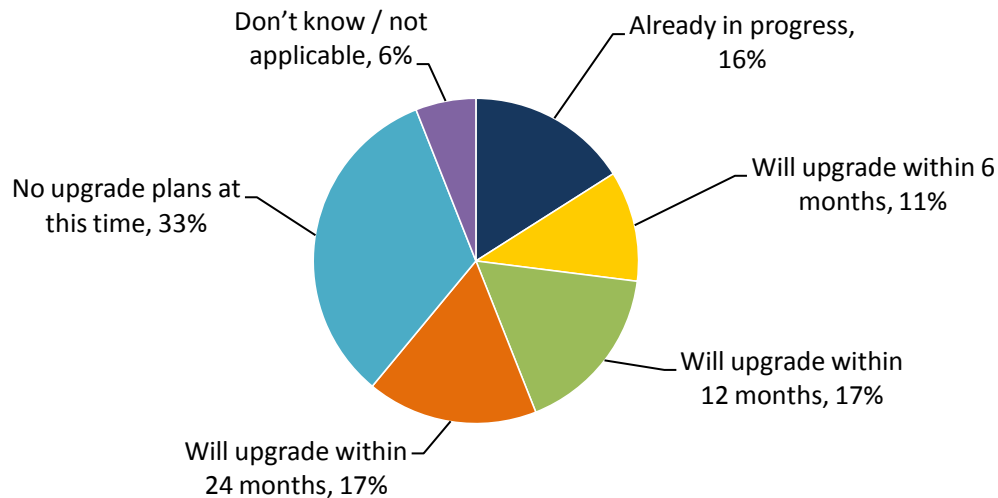
Desktop virtualization deployments should offer:

- Cost savings – capital and operational TCO
- Management improvement – consolidation, maintenance, upgrades
- Enhanced security and compliance – by limiting data exposure and letting IT manage endpoint compliance
- User experience that renders the underlying deployment transparent
- Flexibility for investment protection

Because desktop virtualization simplifies application and operating system upgrades and deployments, it can also make migrating to Windows 7 much easier. This is a task that many organizations will undertake this year, since the venerable Windows XP operating system is rapidly aging and many chose to skip Vista altogether. In fact, 44% of respondents to ESG's 2010 spending intentions survey indicated that they will either complete or initiate a Windows 7 upgrade within the next year, and more than 60% said they will do so within the next two years.⁴ Any organization considering an upgrade to Windows 7 is an ideal candidate for desktop virtualization as the two projects can be combined to minimize the interruption to business productivity.⁵

Figure 3. Windows 7 Upgrade Plans

To the best of your knowledge, does your organization have any plans to conduct a significant upgrade of its Windows-based desktops/laptops to Windows 7? (Percent of respondents, N=515)



Source: Enterprise Strategy Group, 2010.

The ability to improve compliance levels—and simplify compliance management—is yet another reason to deploy desktop virtualization. Trying to manage compliance across hundreds of endpoints, stationary and mobile, is an administrative nightmare. Just keeping track of what is compliant and what isn't is difficult enough before you even begin to implement compliance requirements. Centralized desktop management leaves organizations with much less to track and makes both data protection and implementing compliance changes easier.

Quest vWorkspace: A Best Practice Deployment

[Quest Software](#), with its vWorkspace platform, addresses key desktop virtualization challenges while supporting multiple deployment options. By centralizing and automating virtual desktop management, vWorkspace lets IT manage and back up desktops to protect data and remain compliant; secure user and administrator access is provided with multiple levels of configurable security, including support for two-factor authentication and delegation. Simpler, centralized, single-image management (leveraging cloning technologies) keeps costs down, as does the ability to perform OS and application maintenance and upgrades on a central image instead of on hundreds of individual endpoints. Quest has also dramatically increased user acceptance among WAN and VPN users with technologies that help mitigate the effects of latency on those links. Deep integration with the Microsoft virtualization solution stack is the result of coordinated development and is designed to make it easier for organizations standardizing on built-in Windows Server components to take advantage of desktop virtualization. Automation and advanced management functions in vWorkspace make it easier and faster to deploy desktop virtualization on the Microsoft platform while reducing total cost of ownership (TCO). In addition, vWorkspace has

⁴ Source: ESG Research Report, [2010 IT Spending Intentions Survey](#), January 2010.

⁵ Source: ESG Research Brief, [Windows 7 Takes Off](#), January 2010.

deep integration with the VMware vSphere platform for desktops hosted on vSphere, providing choice of hypervisors and the ability to blend virtualization investments from a single console.

Quest's understanding of what IT is up against both strategically and tactically has helped make vWorkspace a best practice solution for many companies. For example, as desktop virtualization expands through an organization, the savings from centralized management of mundane tasks and consolidated problem resolution should be exponential. Routing routine tasks such as virtual desktop provisioning should be a simple matter, or even automated. Many VDI solutions do not address the fundamental requirement to allow an administrator to provision thousands of machines with a few mouse clicks. Quest vWorkspace also supports cost and time saving "thin" provisioning such as support for linked clones (vSphere), and differencing disks (Hyper-V). Differencing disks and linked clones allow the administrator to maintain a single "master" OS image, or a few, while the child, or cloned image, uses a fraction of the disk space, and requires no image maintenance.

Quest vWorkspace's connection broker has the capability to provide load balancing functions across all platforms and uses advanced load evaluators on Hyper-V hosts to further optimize server utilization. In addition, it includes advanced integration with Microsoft Remote Desktop Session Host (RDSH), Microsoft's primary desktop and application virtualization platform that provides session virtualization (formerly known as "Terminal Server"). Session Host extends virtual desktop and application deployments, helps secure applications and data, and simplifies remote worker connectivity. When used with the Microsoft VDI stack, vWorkspace provides automated setup of Windows Server 2008 R2 as a connection broker with support for remote desktop gateway for secure internet access. Microsoft App-V is also supported with the same management interface with vWorkspace and should be considered in any comprehensive desktop virtualization solution

The quality of the end-user experience is extremely important in desktop virtualization. In particular, performance is critical. Users accustomed to having their own PCs loaded with applications and data will resist virtualized deployments that result in slow graphic rendering, poor multimedia quality, or limited application access. Their performance experience must be as good as, if not better than, the traditional method. The cost and management benefits of desktop virtualization for IT are clear, but end-users must experience faster application response, quicker logon times, and access (with consistent look and feel) from any endpoint device regardless of location for the implementation to be successful.

While centralizing applications and desktops in the data center, Quest vWorkspace drives out the complexity that increases costs.

Quest was careful to build these features into vWorkspace, developing a set of extensions for Microsoft's Remote Desktop Protocol collectively known as the Experience Optimized Protocol (EOP). EOP is designed to accelerate images and multimedia content, deliver high-quality bidirectional audio, ease printing, and increase compatibility with USB devices. One EOP feature, EOP Xstream, delivers accelerated WAN performance over the Internet and VPN

connections, improving the user experience and enhancing performance when RDP is the underlying protocol by reducing the effects of network latency; screens update faster and WAN or Internet/VPN connections interact more smoothly. EOP Xstream works with all supported hypervisors, including Terminal Server/Session Host, and the performance improvement makes the "Desktop as a Service" deployment model a viable option. vWorkspace's enhancements for USB devices and printers overcome problems with the lack of peripheral support on virtual desktops, which has historically caused problems with user acceptance, but Quest delivers a more seamless experience.

The Quest platform works with multiple hypervisors and supports different deployment options. It is important that customers be able to choose the hypervisor that fits all their criteria—and know that they can keep the vWorkspace platform even if they change or add hypervisors in the future. This flexibility offers investment protection and keeps TCO down as a single solution can operate in multiple deployments. Quest vWorkspace supports not only Microsoft Hyper-V and VMware ESX, but also Microsoft Session Host/Terminal Server, Microsoft Application Virtualization (App-V), and Parallels Virtuozzo. Quest is also a Microsoft RemoteFX partner; RemoteFX provides enhancements that give full-motion video, animation, 3-D applications, etc. local-like quality and

performance for remote users. Quest has clearly acquired Microsoft's confidence that the vWorkspace platform can provide that level of quality.

However you implement it, the purpose of desktop virtualization is to reduce TCO. The Quest platform does that by reducing management into a single consolidated console, providing automated and advanced functionalities that speed deployment, minimizing hardware and energy costs, reducing the amount of storage required, and providing the flexibility to support multiple virtualization products. Many organizations find that as they move out of proof-of-concept and into full scale deployments, their costs increase dramatically—the more users and applications that are included, the more IT staff they need. Costs simply move from the endpoint to the data center. A differentiator for Quest vWorkspace is that it creates not just consolidation, but a more efficient management environment that avoids these increases. While centralizing applications and desktops in the data center, vWorkspace drives out the complexity that increases costs. Finally, Quest offers both perpetual and term/subscription licensing options that include support and, as organizations pool applications, they can save money by purchasing only the number of licenses needed to support peak simultaneous use. This can result in significant savings.

The Bigger Truth

The primary reasons to deploy desktop virtualization are to reduce costs and improve efficiency and productivity. Desktop virtualization can help reduce capital expenses by enabling organizations to either purchase less expensive thin clients for users or to redeploy older laptops and desktops. This strategy also helps reduce operational expenses by consolidating desktop management, maintenance, upgrades, and the myriad tasks that must be performed to keep endpoints fully operational, compliant, and protected. Moving all of these tasks into the data center eliminates the operational burden of managing hundreds of individual machines and improves productivity by delivering more consistent access to applications and data. Desktop virtualization adopters also have to be aware that TCO savings are at risk and operational costs could be driven up if the management solution is not solid.

As mentioned previously, an improved user experience is extremely important, but not just to “grease the skids” for user adoption. As the way people work evolves, desktops become increasingly diverse, complex, and mobile—managing them can overwhelm an IT department charged with serving a large number of users. With a virtual desktop administered from the data center, employees can access their personalized desktops from a remote site in case of a disaster; they can carry only a minimally configured device on business travel and still access their preferences and applications; or they can simply plan to use remote endpoints at multiple locations as they travel. This makes the employees' physical presence in the office less important, opening up new opportunities for working remotely. It also enables IT to satisfy user requests more quickly and ensure that application requirements are met to keep access fully functional. It may even enable a new model of employee-owned PCs with corporate IT managing access, applications, and data—the ultimate in PC hardware savings for the business.

As the way people work evolves, desktops become increasingly diverse, complex, and mobile

Quest has concentrated its efforts on target with top business priorities. Its vWorkspace platform reduces capital costs, operating costs, and management overhead; automates IT tasks; reduces the risks of both compliance failure and productivity-affecting downtime; and improves operational efficiency. Users will have a seamless, fully functional experience. vWorkspace can scale to deliver desktop virtualization benefits to a broad set of end-users while maintaining control and delivering user flexibility; organizations that decide to start small can scale their implementations easily and effectively while keeping costs down. vWorkspace can scale not only in the number of users, but in numbers and types of deployments for added flexibility. This gives organizations a choice of products and deployments today and in the future; organizations can match their deployments with a long-term strategy for desktops while leveraging prior investments and can meet end-user requirements without compromising their experience. Ultimately, all parties may have a choice—IT can choose the virtual desktop deployment and users can choose work locations and endpoint devices. It may just be that rare solution that puts a smile on everyone's face.

About Enterprise Strategy Group

Enterprise Strategy Group (ESG) is an integrated, full-service IT analyst and business strategy firm, world-renowned for forward-looking market intelligence, analysis, and consulting services that deliver proven, measurable results. Recognized as one of the world's top 10 analyst firms by offering a unique blend of capabilities—including world-class market research, hands-on technical product testing, and expert consulting methodologies such as the ESG Strategy Lifecycle—ESG is relied upon by IT professionals, technology vendors, institutional investors, and the media for actionable IT and business intelligence.

About Mark Bowker

Mark Bowker joined ESG in 2006 and currently champions ESG's Data Center Transformation practice, focusing on all things virtualization and cloud computing. In his current role, Mark researches the various virtualization technologies available and the impact these solutions have on IT strategies and the broader marketplace. His other research areas include cloud computing, data center management, and application workload deployment in next generation data centers, as well as the external influences that drive the adoption of these technologies.



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