

## WHITE PAPER

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# Measuring the Business Value of VMware Horizon View

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## EXECUTIVE SUMMARY

An IDC analysis of organizations adopting a centralized virtual desktop (CVD) computing environment (also known as virtual desktop infrastructure [VDI]) with the use of VMware Horizon View shows that investment in the technology can result in significant business value with very high return on investment (ROI) of over 300%. Our analysis yielded the following observations:

- ☒ Organizations deploying VMware Horizon View realized annual savings of \$665 per supported end user; the savings came from lower device and IT staff support costs compared with organizations using unmanaged PCs. In addition, improved productivity (less downtime) delivered another \$381 savings per user. They recovered the cost of their investment after less than eight months of use.
- ☒ With companion technologies, VMware Horizon View effectively creates a platform that can address disconnected PCs and mobile and nonstandard devices. This platform can make it easier to embrace the BYOD trend and the consumerization of IT within the enterprise and promote organizational synergy.
- ☒ Organizations that maximized the value associated with the adoption of centralized virtual desktops paid attention to and managed the critical aspects of the platform, such as performance, mobile access, and datacenter capacity.

## METHODOLOGY

IDC's ROI model draws upon surveys of IT professionals who have deployed VMware Horizon View as their CVD platform. IDC's estimates ROI using the following three-step process:

- ☒ Measuring the savings from reduced operational costs (consolidation of hardware and software, avoided staff hired), increased operations efficiency, increased revenue, and improved user productivity
- ☒ Ascertaining the investment made in deploying the solution and the associated training and support costs
- ☒ Projecting the costs and savings over a five-year period and calculating the ROI and payback for the deployed solution

IDC uses the net present value (NPV) of the savings over five years in calculating the ROI and payback period for the deployment. IDC uses a 12% discount factor to account for opportunity cost. IDC uses the following assumptions in its calculations:

- ☒ To quantify savings from IT efficiency, IDC multiplies the reduced staff time values by burdened salary (salary plus 28% for benefits and overhead).
- ☒ Because the full benefits of the solution are not available during the deployment period, IDC prorates the benefits on a monthly basis and subtracts the appropriate amount for the deployment time from the first-year savings.

The ROI and payback period estimates presented within this white paper represent IDC's estimate of the general business value realized through the successful deployment of VMware Horizon View.

This white paper provides a quantitative measurement of the business value, defined as the expected ROI, associated with the use of VMware Horizon View as a platform for the targeted deployment of a CVD computing architecture.

## **SITUATION OVERVIEW**

To ensure that PCs continue to be operational in order to maximize the productivity of employees, IT must perform a range of tasks. Although the extent to which these tasks pose challenges to IT varies significantly depending on the number of desktops in the environment and the regulatory requirements that must be met, the requirements for maintaining a desktop environment are fairly consistent and are often viewed in the framework of a PC life cycle. The PC life cycle includes the following tasks:

- ☒ Acquisition
- ☒ Deployment
- ☒ Maintenance
- ☒ Retirement

To simplify the tasks required across the PC life cycle, technology vendors have developed a range of solutions that enterprises have adopted in significant number. These solutions include configuration management databases (CMDBs), electronic software distribution (ESD) tools, asset management tools, and virtualization enabled through the use of hypervisors, among many others.

The most recent push for client virtualization technologies came from organizations that had successfully implemented server virtualization. Their experience with virtualization's fast ROI period and immediate reduction of hardware capital expense prompted IT organizations to look at other pain points that virtualization might address. Existing hindrances to effective desktop management, combined with IT budgets reduced during the past recession, pushed organizations' IT leadership to turn to virtualization to reduce the end-user management complexities and the associated costs of client management.

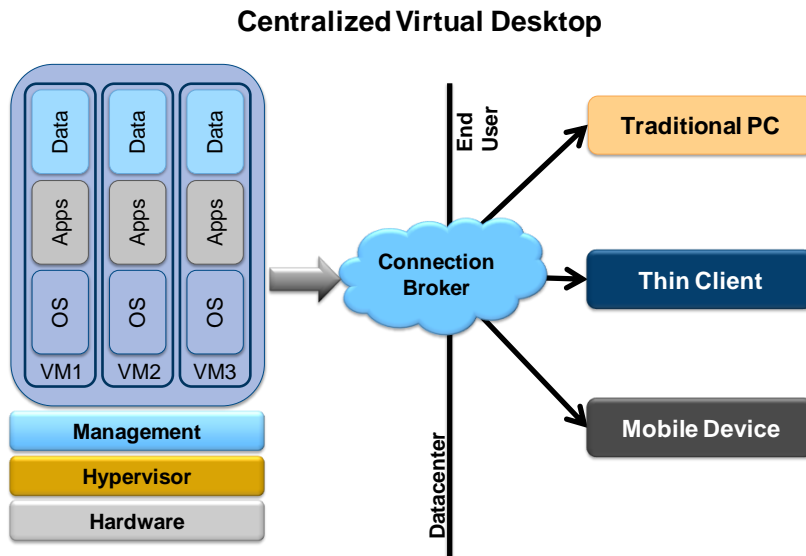
## Simplifying PC Management Through Virtualization

Of the desktop technologies currently available, client virtualization technologies represent the most recent addition to the set of tools used to efficiently manage PC environments. After the tremendous growth in server virtualization, which enabled hardware consolidation as well as other capabilities, virtualization technologies are now increasingly being applied to the desktop environment in various ways.

Centralized virtual desktop (more commonly known as VDI) is a form of server-based computing that utilizes server-grade hypervisors to host multiple unique and isolated client operating systems aboard a single server or group of servers in the datacenter. The virtual desktops are delivered to end users' devices via the network (see Figure 1).

**FIGURE 1**

Centralized Virtual Desktop



Source: IDC, 2013

This use of hypervisor technology as an infrastructure for desktops enables a far more flexible client architecture than the traditional client environment. The elimination of the logical bond between physical PC hardware and the applications delivered by the PC can significantly simplify the many tasks necessary for the management of the PC. By using this architecture, IT organizations can more effectively and efficiently manage their desktop environments, particularly for end users who are largely outside the oversight of existing desktop management tools.

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## The Benefits of Centralized Virtual Desktops

Enterprises have quickly discovered that the use of virtualization to support desktop workloads creates significant benefits, including improved IT management efficiency, improved price efficiencies, and improved capabilities. IDC categorizes these benefits as follows:

- ☒ **Quantifiable.** Centralized virtual desktops can drive benefits that are directly measurable, as showcased in this white paper. Virtual machines (VMs) rely less on the horsepower of the endpoint devices themselves, thus creating an opportunity for IT to significantly drive down the cost of endpoint hardware either by extending the life span of existing PCs by repurposing them as CVD endpoints or by replacing PCs with a thin-client device. The simplified management model of CVD can further drive down the total IT costs by enabling IT to work more efficiently. Additionally, CVD can make users more productive by improving desktop reliability, lessening the need to contact support.
- ☒ **Functional.** Certain key functions of desktop management can be improved with CVD. The ability to move data from the edge of the IT environment into the datacenter inherently reduces the security risks to an IT organization. Data backup is improved because CVDs reside entirely within the datacenter. These security and backup improvements make it easier to ensure full compliance. Disaster recovery is significantly simplified because central IT staff can effortlessly revert virtual desktops back to their last known good states.
- ☒ **Organizational.** Traditional tension between IT and the rest of the organization can be lessened with CVDs. Because virtual desktops are easier to manage and secure than traditional desktops, IT can provide end users more freedom and promote goodwill. CVDs can also improve the user experience, especially when compared with aging physical PCs. Additionally, CVDs can allow users ubiquitous access to their virtual desktops on any devices, which can improve overall user satisfaction.

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## Challenges for Centralized Virtual Desktops

Understanding desktop virtualization and the cost of deployment as long-term investments can create the right mindset and expectations when exploring this technology. The effort to deploy and manage desktop virtualization technology involves both technical and organizational dimensions. Datacenter capacity constraints can significantly limit the extent to which an organization can support centralized virtual desktops internally. Inadequate storage, network, and server capacities can severely limit the effectiveness of a CVD implementation. At the same time, the requirement for desktop operations management to rely on server administrators within the datacenter can create a challenge for those looking to leverage CVD within their desktop environments. Additionally, organizations should bear in mind issues that wouldn't be apparent until a scaled deployment is under way, such as VM density, VM boot storm, network load, and storage I/O blending.

Long-term strategy can be another challenge for centralized virtual desktops. CVD is a tool to improve the overall desktop management paradigm. The inherent benefits are results of an improved long-term desktop management strategy. Organizations utilizing CVDs as a stopgap measure to plug various holes in their desktop environment will ultimately fail in their desktop virtualization endeavors.

## **Enabling Centralized Virtual Desktops with VMware Horizon Suite: Understanding the Value**

VMware Horizon Suite is a relatively new package that allows customers to manage virtual and physical desktops, SaaS applications, and mobile applications. However, VMware Horizon View, the tent pole of the suite, is a mature and scalable product that dates back to 2005, when it was known as VMware VDI.

VMware Horizon Suite includes:

- ☒ Horizon View
- ☒ Horizon Mirage
- ☒ Horizon Workspace

Customers can purchase these three packages individually or together. However, VMware has priced the entire package competitively to make buying the suite very attractive.

### ***VMware Horizon View***

VMware Horizon View includes more than just the CVD software; it also includes the components necessary to deploy and manage virtual desktops and virtual applications. The components are as follows:

- ☒ **VMware View Composer.** View Composer is an image management technology that works to drastically simplify the software updates and changes made to virtual desktops that are necessary for their continued productivity, such as OS and application patches, application upgrades, and other tasks. Additionally, the View Composer architecture significantly reduces storage requirements by using VMware's linked clone technology to consolidate multiple unique images for each virtual machine down to one shared image.
- ☒ **VMware ThinApp.** ThinApp application virtualization enhances the simplification and scalability provided by View Composer by isolating and separating applications from the OS in the base virtual desktop image. The virtualized application can then be stored on a file server so that it can be streamed into a virtual or physical desktop, enabling the sharing of a single application package by multiple users and simpler management of the application.
- ☒ **VMware vSphere for Desktop.** The hypervisor and its embedded services enable multiple unique virtual desktops to be executed by a single piece of hardware.
- ☒ **VMware vCenter Server.** The platform allows for the monitoring and management of a virtual environment. vCenter gives administrators control over capabilities such as vMotion, Distributed Resource Scheduler, Fault Tolerance, and High Availability.
- ☒ **VMware View Manager.** This product provides a second level of administrative control specifically as it relates to virtual desktops within the environment. It provides necessary capabilities for the management of a virtual desktop environment such as session management, group policies, and authentication.

- ☒ **VMware vShield Endpoint.** A part of the VMware vShield family of products, vShield Endpoint offloads antimalware capabilities to a dedicated virtual machine. This enables a one-to-many security model, which requires far fewer computing resources than the traditional solutions that are built into the individual desktop VMs.
- ☒ **VMware Local Mode.** Local Mode utilizes VMware Player technology (type 2 hypervisor) to enable end users to "check out" personalized virtual desktops running on the CVD environment to a notebook computer for use offline and then "check back in" to the same desktop running in their CVD environment.

### ***VMware Horizon Mirage***

VMware Horizon Mirage is a layered image management solution that categorizes the PC into logical layers. A complete copy of the image is stored in the datacenter, allowing IT staff to update the IT managed layer while protecting the integrity of the user data. The Mirage client allows the PC to continuously synchronize with the datacenter image in order to receive any updates and changes that have been made to the IT-managed layers.

### ***VMware Horizon Workspace***

VMware Horizon Workspace is a single workspace for end users to securely access corporate assets on nearly any device. IT departments can allocate data, applications, or desktops based on the needs of users or groups as opposed to strictly targeting devices. As a result, business users have the ability to self-provision corporate applications and services, reducing the IT staff's workload. Horizon Workspace also enables IT organizations to easily add new devices, users, or applications without having to reconfigure the devices or endpoints. In addition, Horizon Workspace's centralized management simplifies the enforcement of user policies, enabling enhance security and compliance across device platforms. It enables the following:

- ☒ File access and sharing for employees, as well as on-premise management and control, so that IT can restrict what data and apps are available to which users as well as set policies and add apps to the user catalog
- ☒ Integration with third-party cloud file access and sharing applications such as Dropbox and ShareFile
- ☒ Ability to rapidly make changes to workspaces by adding, deleting, and updating user accounts; manage storage quotas; and determine mobile policies as well as the ability to control external sharing and other policies that can help implement the security and control that IT requires

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## **Enabling Centralized Virtual Desktops with VMware Horizon View: Quantifying the Value**

The use of centralized virtual desktops is optimized in certain use cases where high densities of end users need to uniformly access business applications. In all scenarios, CVD architecture delivers two primary business values:

- ☒ **Improved operational efficiency.** The deployment and maintenance of PCs throughout their life cycle involve a series of steps as outlined at the beginning of this document. The use of centralized virtual desktops can significantly improve the efficiency with which many of the tasks are performed.

- ☒ **Improved control over data and users.** By centralizing the client's storage and execution, IT can better manage its access, thereby eliminating potential security risks and in some cases more easily complying with government regulations. Centralization of the desktop, and in particular the deployment of thin clients, can also substantially simplify support for geographically distributed end users and contract workers. As one distributed banking firm manager pointed out, "It's actually cheaper now for us to provide a remote user with a virtual desktop and a thin client than to give them a normal client."

To quantify the value associated with the benefits experienced with the particular application of CVD technology using VMware Horizon View, IDC interviewed customers, nominated by VMware, to articulate their experiences using the platform. These companies represent the typical virtual desktop user across a range of business sectors and sizes. IDC quantified the value that these organizations have received through the use of VMware Horizon View and compared it with the costs of migrating from the traditional desktop model to the centralized virtual environment. The following sections discuss the findings from IDC's research.

### ***Delivering Lower Platform Costs***

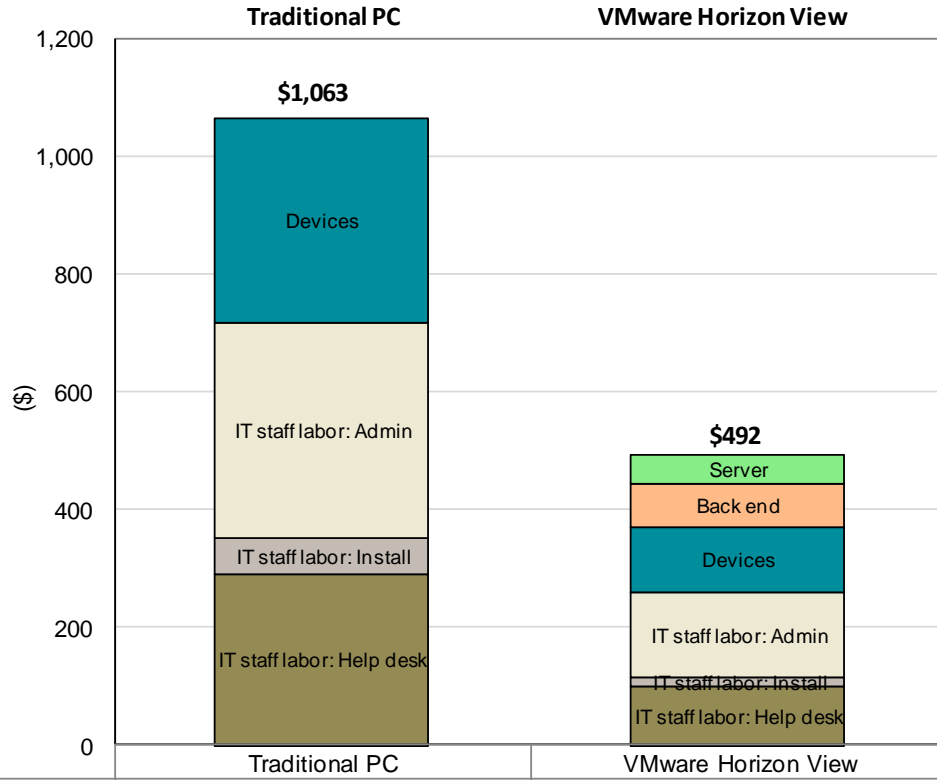
The costs for building and maintaining a desktop environment tend to more directly impact IT budgets than the costs for any other IT operation. These costs include not only the entirety of the physical infrastructure but also the payroll costs associated with the human IT resources necessary to maintain and support a desktop environment.

Figure 2 represents a comparison between the annual platform costs for traditional PCs and centralized virtual desktops deployed through the use of VMware Horizon View over a five-year period. Note that the consumption of available and existing resources (such as network bandwidth) is not included in this analysis. IDC has categorized IT labor into three buckets:

- ☒ **Administration.** These tasks usually consume the bulk of desktop IT's time and resources. The administration labor tasks measured in this white paper are security management of data or access, application testing and provisioning, desktop imaging and management, and hardware configuration. VMware Horizon View enabled the number of PCs per PC administrator to be extended from 207 to 400.
- ☒ **Installation.** This bucket refers to tasks involving packaging and deploying applications, OS/application patching, and upgrading and supporting applications. In this bucket, time is the most wasted resource. These IT labor costs associated were reduced by 74%.
- ☒ **Help desk.** End-user support has traditionally been the biggest headache for IT, which is why this bucket is significant to the overall cost of desktop IT operations. IDC categorized providing help desk support for users, user administration, and desk-side service for users as the most wasteful to desktop IT labor in this bucket. Reducing help desk calls and enabling more resolution centrally lowered the IT labor costs related to help desk support by 66%.

**FIGURE 2**

Differences in Annual PC Infrastructure/Support Costs per User:  
Traditional PC Versus VMware Horizon View



	Traditional PC	VMware Horizon View
Server	\$-	\$50
Back end	\$-	\$72
Devices	\$347	\$112
IT staff labor: Admin	\$365	\$143
IT staff labor: Install	\$61	\$16
IT staff labor: Help desk	\$290	\$99

Notes:

- Costs represent annual costs per user averaged over a five-year period.
- Server costs refer to the costs of hardware devoted to the CVD.
- Back end refers to the storage and the internal network and virtualization software — the back-end infrastructure (excluding servers) — required to operate the CVD.
- IDC assumes that customers are Microsoft Software Assurance (SA) for Volume Licensing customers. Non-SA customers must add a \$100 VDA license per desktop virtualized.

Source: IDC's Business Value Research, 2013

Although hosting a traditional desktop environment requires no direct server, datacenter storage, and software cost, it should be noted that these technologies do incur indirect costs in these areas. For example, the delivery of applications and the recording of asset inventory and desktop configurations require the use of storage devices, server hardware,



and other software. We are assuming that there are limited existing desktop management tools beyond those inherent within Microsoft Windows client and server platforms. Depending on the assumptions made, deploying a centralized virtual desktop architecture with its network-based storage, server infrastructure, and licensing costs clearly incurs incremental costs for these components.

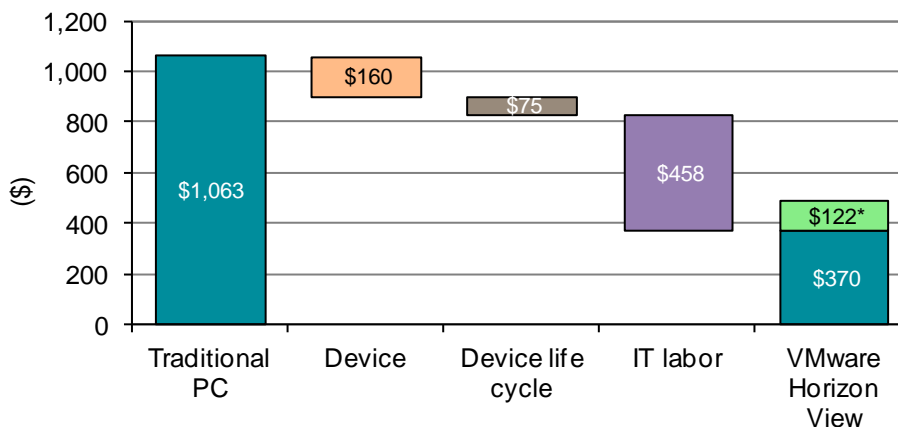
Our research finds that savings in IT staff labor and hardware devices are the most important component of ROI, and maximization of these savings is absolutely essential to the cost-effective deployment of centralized virtual desktops. When these savings are not realized, which can occur when the technology is deployed for the wrong purposes or is designed inefficiently, the operational cost savings can be significantly reduced and result in lower, if not negative, ROI.

Another way of looking at the advantages of the CVD environment is depicted in Figure 3, which shows the major cost savings relative to the annual costs for a traditional PC and the VMware Horizon View CVD:

- ☒ **Device.** The CVD device costs 46% less than traditional PCs, **saving \$160 per year.**
- ☒ **Device life cycle.** On average, the life cycle of a CVD device is 5.5 years versus 3.3 years for traditional PCs, which translates to a 22% savings — **\$75 annually.**
- ☒ **IT labor.** Optimized labor for CVD device installation, annual hardware and software support, and user support (help desk) is 58% less than that for traditional PCs, **saving \$458 annually.**

**FIGURE 3**

Key Cost Savings for VMware Horizon View (Average Annual Costs per Device)



\*\$122 of the \$492 is for server and other back-end infrastructure.

Source: IDC's Business Value Research, 2013

Reducing the IT staff labor costs normally required to manage desktops accounts for 41% of the cost savings delivered by the CVD environment. Centralizing the desktops in a secure and integrated environment reduces the hours IT staff spend in traditional desktop management by 58%. Table 1 presents a more detailed view of the specific desktop initialization, deployment, configuration management, support, and retirement tasks that respondents indicated are directly affected by the centralized desktop approach. It presents how much less time the IT staff needs to spend on each desktop management task category after implementing the centralized desktop solution.

**TABLE 1**

**VMware Horizon View's Effect on Desktop Management and Support Labor Tasks**

Desktop Management and Support Task Category	% Reduction in Labor — VMware Horizon View Versus Traditional PC	Reason for Improvement (Examples Cited by Survey Participants)
Providing desk-side service for users	68	Fewer images, as well as centralized patching and application deployment, mean that there are very few reasons to visit desktops.
Desktop imaging/reimaging	67	There are fewer images, and all images can be pushed out without having to visit the desktop.
Hardware configuration	67	Not only are there fewer machines, but companies tend to extend the life of the machines and run fewer applications. So the hardware becomes easier to maintain.
Providing help desk support for users	66	Although software issues do not change, hardware issues that used to result in a reinstall now take minutes instead of hours.
Deploying applications	58	Applications are given an MSI and then copied to a remote site server. The command file will copy the MSI to all of the desktops.
Security management of data or access	48	IT is able to access all desktops at any time to push patches without having to wait for individual machines to be online or offline.
Patching, upgrading, and supporting applications	40	IT no longer has to visit individual desktops.
Managing and supporting the desktop images	34	IT is able to reduce the number of images and the time required to tweak each image.
Application testing and provisioning	25	Applications can be tested and provisioned centrally without having to test each machine.
Managing applications	14	Applications are managed centrally.

Source: IDC's Business Value Research, 2013

All of the data presented in this white paper is representative of the deployment of CVD technology by advanced IT managers. Most of the individuals surveyed have consolidated desktop images and adopted an efficient management model for virtual desktops. As a result, Table 1 shows significant IT labor savings in the area of desk-side service (68%) and desktop imaging (67%). Less dramatic reductions are found in areas such as data management and application testing, which are less affected by the move to a virtual and centralized environment.

### **Delivering Desktop Uptime**

IT organizations' cost analyses of PCs often do not take into consideration employee hours lost as a result of either the maintenance or the failure of employee PCs. They miss these costs because of their indirect nature and because the costs do not show up on any balance sheet. However, they certainly impact the business. VMware customers in our study were able to reduce lost user productivity by reducing the time to onboard new users by 73%, reducing security issues by 100% (no security issues since deploying VMware), reducing help desk issues by 45%, and lowering unplanned downtime by 96% (see Table 2).

**TABLE 2**

**User Productivity Key Performance Indicators**

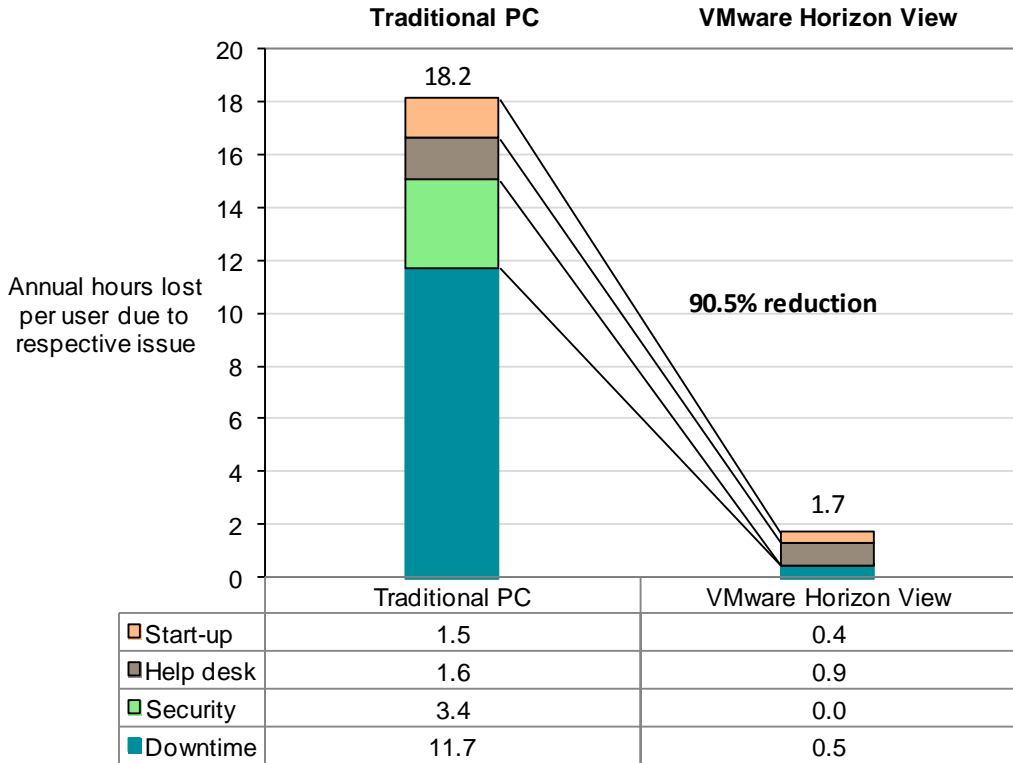
	Traditional PC	VMware	Difference	% Reduction
<b>Start-up</b>				
Time to onboard new users (hours)	6.3	1.7	4.6	73
Percent of users affected	24	24		
Time lost per user per year (hours)	1.5	0.4	1.1	73
<b>Help desk</b>				
Support desk calls per week	619	341	277	45
Time lost per call (to include resolution) in minutes	35.0	21.7	13.3	38
Time lost per user per year (hours)	1.6	0.9	0.7	45
<b>Security</b>				
Security incidents per year	24	4	20	84
Time lost per incident (hours)	4.0	0.1	3.9	98
Percent of users affected	3	1	2	65
Time lost per user per year (hours)	3.350	0.004	3.346	100
<b>Downtime</b>				
Downtime incidents per year	167	27	140	84
Hours per incident	5.0	1.7	3.3	66
Percent of users affected	1.4	1.0		
Time lost per user per year (hours)	11.7	0.5	11.3	96
<b>Total hours per user</b>	<b>18.1</b>	<b>1.7</b>	<b>16.4</b>	<b>91</b>

Source: IDC's Business Value Research, 2013

Figure 4 presents our findings of the relative loss in employee hours and the respective value in dollars of lost productivity. The analysis presents the employee time and dollars lost as a result of issues related to PC *downtime* (software and hardware and configuration issues), *help desk* (time to resolve issues), and *security* (virus removal and the like) and then the time involved in restoring the client to full operation. The numbers thus represent time consumed, on an annual basis, for the average desktop user because of issues with or maintenance of the user's PC.

**FIGURE 4**

Differences in Annual Employee Productivity Loss Due to PC Issues:  
Traditional PC Versus VMware Horizon View



Source: IDC's Business Value Research, 2013

As would be expected, user downtime and time spent dealing with the help desk were reduced by 96% and 45%, respectively. This reduction is largely due to the benefit associated with having desktop software executed on a virtual environment, with its inherent high availability and, in most cases, the provisioning of a highly fault-tolerant and practically stateless thin-client device with the user. Thin-client devices significantly reduce hardware maintenance issues that spawn help desk calls and user downtime, and centralized virtual desktops are highly available and in the event of a malfunction can be reverted back to working states very speedily and efficiently.

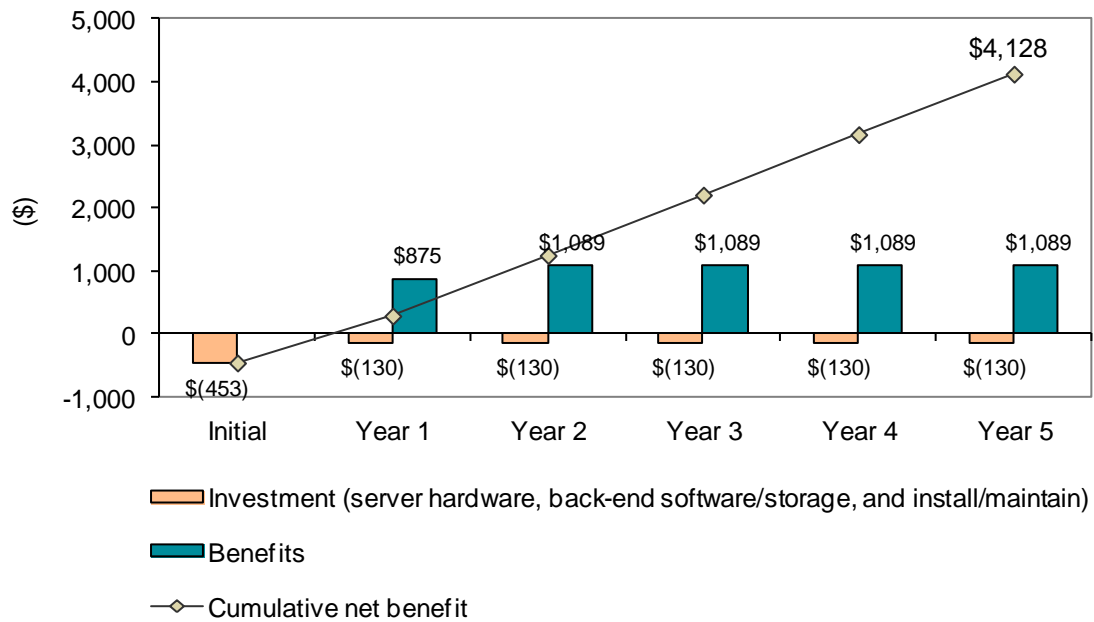
As shown, by provisioning centralized virtual desktops with, in many cases, thin-client devices at the edge, organizations can accrue significant soft-dollar savings.

## Quantifying the ROI of VMware Horizon View

IDC assessed the cost, benefits, and value of VMware Horizon View over a five-year period (see Figure 5). Initial installation of VMware Horizon View cost \$453 per user. Based on that investment, the organizations realized average annual benefits of \$1,089 per user (the first year is prorated to allow for deployment). Over five years, these companies will realize a cumulative net gain of \$4,128 per user.

**FIGURE 5**

VMware Horizon View Costs and Benefits per User Pro Forma: Five-Year View



Source: IDC's Business Value Research, 2013

Table 3 represents the estimated ROI per desktop associated with migrating a traditional PC environment to centralized virtual desktops deployed through the use of VMware Horizon View for five years. The analysis takes into consideration the cost increases and cost savings associated with the investment as outlined in the preceding figures and discounts those cost savings, or cost increases, by a rate of return that represents the return on capital that could reasonably be anticipated with an alternative investment (opportunity cost).

**TABLE 3**

**Five-Year ROI Analysis of VMware Horizon View per Desktop**

Total benefits	\$5,231
Total investment	\$1,103
Discounted benefits	\$3,734
Discounted investment	\$922
NPV	\$2,813
ROI	305%
Payback period	7.3 months
Discount rate	12%
Deployment time	3–12 months

Note: Deployment time refers to the time to deploy once a firm has decided to move ahead with CVD; it does not include time for "proof of concept" or prototyping phases that occur before production deployment.

Source: IDC's Business Value Research, 2013

It should be noted that the preceding ROI analysis represents a collection of assumptions, outlined at the beginning of this white paper, that IDC believes are prudent and provide us with what we believe to be a reasonably accurate measure of a median ROI. The ROI reflects the aggregate ROI for these companies, which had extensive implementations and very good internal practices that tend to amplify the value.

## **FUTURE OUTLOOK**

The virtual client computing industry has been rapidly evolving over the past few years. The technology will become increasingly mature over the next 12–24 months. IDC believes the success stories and use cases from the early adopters, as well as the maturing technology, will facilitate wider adoption of client virtualization technologies and drive more scaled implementations in the next 12–24 months.

IDC also anticipates that the use of virtualization as an infrastructure used to manage desktop environments will continue to expand in tandem with the growth in the capabilities and maturity of virtual desktop platforms. The preceding ROI analysis of VMware Horizon View provides evidence that growth in management capabilities will drive adoption of hypervisors as a desktop management platform. Customers expect this advancement. As one executive put it, "The goal is to have all employees on virtual desktops ... but that's the dream. It will take time. We'll wait for technology to catch up with us."

IDC sees the growth in capabilities of virtual desktop platforms as a two-tier model, with growth coming through evolutionary improvements in CVD platforms such as VMware Horizon View and revolutionary improvements taking the form of type 1 hypervisors<sup>1</sup> becoming available for desktop PCs to host virtual desktops at the edge. IDC's understanding of the nature of these changes is noted in the following sections.

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## The Revolution of Virtual Desktops

Desktop virtualization has enabled several innovations that might fundamentally change the way enterprises approach IT:

- ☒ **Desktop as a service (DaaS).** For many organizations, resources and expertise aren't available to implement client-side virtualization. This is where virtual desktops hosted by managed service providers or cloud providers become a viable solution. DaaS can reduce the initial investment by requiring little, if any, onsite datacenter capacity. At the same time, DaaS can be deployed quickly, and end-user management can be outsourced to the hoster too. The user experience with DaaS, however, may not be as good as the user experience with onsite CVD solutions because of WAN bandwidth limitations. The actual Windows licensing for DaaS at this moment is also a bit hazy.
- ☒ **Consumerization of IT.** Personal and nonstandard devices have been making inroads to the enterprise lately. Managing nonstandard devices has been a pain point for IT, which spends much time on either keeping the devices out or supporting them. Desktop virtualization has created a platform where any device (mobile, personal, nonstandard) can access the same data and desktop environment while ensuring security. Considering that many enterprise leaders are now some of the most vocal advocates of nonstandard devices, IT will have a hard time supporting the influx of devices without virtualization.
- ☒ **Workspace management.** Virtual desktops have evolved beyond just the desktop to become the central control point for managing end users' total workspaces — domains beyond the desktop that now include file sharing services, access control, SaaS applications, and mobile devices and applications.

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<sup>1</sup> Type 1 (or native, bare-metal) hypervisors run directly on the host's hardware as a hardware control and monitor, which in turn allows "guest" operating system(s) to run on another level above them.

## CHALLENGES/OPPORTUNITIES

Organizations looking to virtualize their client environments should carefully analyze their own organizational needs, develop a specific client virtualization strategy, and then adopt the most appropriate types of client virtualization technologies that fit their needs. However, that's not to say that organizations are limited to one specific client virtualization technology; more often than not, better results can be realized through combining technologies, as depicted in this white paper.

Because the use of centralized virtual desktops is still maturing, IT organizations will find that testing and proofs of concept take longer and cost more for CVD technology than for many other technologies that they deploy. To maximize ROI on these projects, organizations must have a comprehensive testing phase so that there are no significant surprises when the technology is put into production. Furthermore, there are many potential "gotchas" associated with centralized virtual desktops that can be easy to miss unless the proofs of concept take into consideration all of the variables that exist in the production environment.

To address the complexities associated with the use of CVD architecture, IT organizations should take a conservative approach regarding the setting of expectations with their management teams. This will ensure that projects are not "oversold" and that the reputation of the technology is not hindered if certain objectives are not met.

Not every organization will have the capability to accomplish a desktop virtualization project internally. IDC encourages IT management to find service providers that have the right expertise and resources in planning and implementing a virtual desktop environment.

## CONCLUSION

IDC's study of organizations adopting a CVD computing environment with the VMware Horizon View platform shows that investment in the technology can result in significant business value and high ROI. IT organizations with high densities of users uniformly accessing business applications can benefit. To the extent that they undertake CVD deployment as a long-term investment in both technology and organizational processes, they can expect to obtain positive business value benefits and to be able to manage user and desktop use cases that had proved difficult to control before the advent of CVD.

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