# IDC
## Analyze the Future

## Business Value Highlights

Annual benefits per user
### $5,507

Reduction in total cost of computing
### 40%

Reduction in user's lost time
### 53%

Five-year ROI
### 398%

Payback period
### 11.8 months

# Assessing the Business Value of Cisco's Desktop and Application Virtualization Solution

## EXECUTIVE SUMMARY

IDC predicts that by 2018, there will be approximately 40 billion devices worldwide as well as 3.8 billion mobile users who are expected to produce approximately 6.75TB of data per person per day.

Today, we are already witnessing the onset of this rapid influx of smart devices, including tablets and phones, in the enterprise via bring-your-own-device (BYOD) and mobile workforce trends.

While these consumerization trends are adding significant data security and governance complexity to IT operations, the increased employee productivity, collaboration, and satisfaction that mobile technologies offer are not lost on business leaders. Business leaders are increasingly looking to IT organizations to enable employees with access to corporate data, applications, and communication resources on their devices of choice.

As a result, more and more IT organizations are seeking the benefits of desktop virtualization such as centralized desktop and application management, access to corporate data from any device, and the ability to protect the business' intellectual property in order to meet, or exceed, business users' growing demands on technology services.

By hosting desktops and applications in the corporate datacenter, IT staff is able to more effectively ensure proper hardware configurations, manage user access, and demonstrate compliance with industry and governmental regulations such as HIPAA, SOX, PCI, and FISMA.

While desktop and app virtualization stands to significantly transform how business users access corporate resources, it can also create new challenges related to IT's ability to effectively manage, secure, and scale the supporting infrastructure. In fact, many IT organizations that have implemented desktop virtualization to reduce desktop-related capex

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and opex are discovering that fragmented server architectures often simply shift cost from the client side to the datacenter.

Therefore, more and more IT organizations are seeking integrated infrastructure and/or desktop-as-a-service offerings to overcome common obstacles in implementing optimized and secure virtual desktop environments while enabling a more agile and mobile workforce.

## In This White Paper

This white paper presents IDC's analysis of the business value that 12 large organizations are achieving by deploying Cisco's Desktop Virtualization (DV) solutions. These customers have an average base of 10,750 employees and range in size from 1,000 employees to 40,000 employees. The organizations come from the banking, computer technology, financial services, government, insurance, IT services, real estate, retail, and telecom industries.

Table 1 provides an aggregate profile of the organizations interviewed for this white paper.

Fully one-half of these organizations rely on Cisco's DV solution as their primary computing environment, with three organizations indicating that 100% of their employees are using Cisco's DV solution and another two companies moving to 100% over the next three years.

**TABLE 1**

| Demographics | |
| --- | --- |
| Number of employees | 10,750 |
| Number of users | 9,948 |
| Number of IT staff | 1,238 |
| Percentage of mobile employees | 26 |
| Percentage of companies with BYOD | 50 |
| BYOD as a percentage of total devices | 19 |
| Percentage using DV now | 61 |
| Percentage using DV in three years | 82 |
| Industry | Banking, computer technology, financial services, government, insurance, IT services, real estate, retail, and telecom |

*Source: IDC, 2015*

# Situation Analysis

Desktop and app virtualization offers a unique value proposition in providing information security in mobile environments because as the data sits in a datacenter and streams to the endpoint, leaving no data on the actual device, the solution improves security and data loss prevention.

Likewise, desktop and app virtualization enables IT administrators to provide a more consistent and seamless experience to the rapidly expanding population of business users who seek to utilize multiple device types in order to conduct business transactions. For example, in most desktop virtualization implementations, business users can access the same desktop instance as well as securely access corporate data and applications anytime and anywhere, through one set of policies and log-ins, regardless of the device or operating system.

Conversely, while it has been several years since desktop virtualization solutions were first brought to market, many IT organizations have struggled to overcome infrastructure implementation roadblocks such as designing, scaling, and managing the necessary storage, networking, and compute required to run a high-availability virtualized desktop environment.

However, recent advancements in processor technology and modern flash storage offerings being tightly integrated within hyperconverged infrastructure stand to enable higher virtual desktop density per server and enhanced desktop performance. Further, virtual graphic processing unit (vGPU) and shared GPU technology, via integrations with technologies such as NVIDIA GRID, are allowing applications previously considered too resource demanding to be good candidates for virtualization to not only run in a virtualized desktop environment but also, in many cases, perform as well as, if not better than, when installed natively. What's more, these graphically intensive applications, which have often required large and costly desktop PCs, can now be utilized across a wide range of device types via desktop virtualization, fostering new mobile workplace use cases.

Likewise, utilizing integrated infrastructure to host centralized virtual desktops can yield significant benefits, including the following:

» **Cost savings primarily due to reduced opex.** The underlying hardware pieces (server, storage, and network) are designed and optimized to work with each other, which can help reduce IT labor cost because of the built-in interoperability between each component.

» **Simplified management.** Most integrated infrastructure solutions can be managed by a single console to streamline hardware management and automate workloads, further reducing IT operations complexity and thus opex.

» **Improved availability.** In the integrated infrastructure model, high availability and automatic failover capabilities are improved because of the built-in interoperability on the hardware layer.

» **Increased flexibility/utilization.** Adding more capacity will be easier in the converged model than in the traditional model; higher utilization of hardware resources can also be achieved.

Cisco maintains several strategic technology and channel partnerships to provide customers with a wide range of integrated and converged infrastructure solutions based on UCS Integrated Infrastructure. Examples of these partnerships/ technologies include:
» FlexPod with NetApp
» VCE vBlock Systems
» Cisco solutions for VSPEX with EMC
» VersaStack solution with IBM
» Cisco solutions for UCP Select with Hitachi
» SmartStack solution with Nimble Storage

# The Cisco Solution

Cisco's Unified Computing System (UCS) unifies computing, networking, virtualization, storage access, and management capabilities into a single integrated architecture. Thus UCS provides IT departments with end-to-end visibility and control over their virtualized applications and desktops, thereby lowering the cost and complexity commonly associated with managing and appropriately scaling this environment.

Cisco's hardware and infrastructure software solutions are well tested and have proven themselves in demanding situations; Cisco's partnerships with Citrix and VMware — both of which are leaders in the virtual client computing market, according to IDC research — offer mature and reliable desktop virtualization broker technologies. As IT organizations increasingly shift their datacenters toward virtualized private, hybrid, and public cloud computing models, many will seek comprehensive reference architectures consisting of predesigned computing, networking, and storage building blocks to optimize the initial design cost, simplify management, and efficiently scale out their DV environment linearly.

By enabling IT organizations to more seamlessly move application workloads between servers, UCS allows infrastructure resources to be efficiently shared and expanded as needed while mitigating concerns regarding fluctuations in network latency. Likewise, UCS provides virtual interfaces that can be connected directly to virtual desktops through pass-through switching or hypervisor bypass technology. This stands to reduce the CPU overhead dedicated to networking, thereby providing more CPU cycles, which can be leveraged to run more virtual desktops on a single server.

To that end, Cisco UCS stands to deliver the following desktop and app virtualization benefits:

» Simplified physical and virtual networks, reducing cost while increasing manageability

» Improved scale with lower infrastructure cost per desktop

» Greater performance of virtualized environments through optimization of infrastructure resources

» Enhanced IT responsiveness to changing business conditions through increased workload flexibility

In addition to the benefits derived from the physical design, Cisco UCS Manager allows IT administrators from the server, network, and storage disciplines to discover, provision, and monitor all system components from within a unified management console. This capability helps reduce operational complexity, thus decreasing the risk of performance degradation as well as improving IT responsiveness. Furthermore, UCS is based on open standards, allowing it to interoperate with existing system management tools.

In addition to Cisco's UCS offering, Cisco's Desktop as a Service (DaaS) solution enables both customers and partners to deliver Cisco cloud-based virtual desktops and applications with optimal scalability, security, and performance in public and private clouds alike.

Cisco DaaS is based on Cisco's UCS, Cisco's Virtualized Multiservice Data Center (VMDC) architecture, and client virtualization technologies from Cisco's ecosystem partners Citrix and VMware.

Further, the Cisco DaaS solution architecture and the Cisco Validated Design for DaaS provide the foundation for the security, scalability, and flexibility needed for provisioning multitenant desktop as a service via a cloud-based delivery infrastructure. Key features include the following:

» Cisco's UCS Virtual Machine Fabric Extender (VM-FEX) guarantees minimum committed bandwidth to critical services, which facilitates great user experiences and the ability to meet service-level agreements (SLAs) associated with the virtual desktops and applications.

» Network containers configured for multitenancy provide per-tenant segmentation of traffic on physical and virtual infrastructure and the ability to provide value-added application services on a per-tenant basis.

» Cisco's UCS Central unifies management of multiple UCS domains and tens of thousands of services and simplifies global operations with centralized inventory, faults, logs, and server consoles with remote management capabilities, even to on-premises infrastructure.

# Business Value/Financial Benefits Analysis

Cisco DV customers have been using Cisco's solutions for one-and-a-half to five years, with a few of them using other DV solutions for a couple of years prior to deploying Cisco UCS. IDC calculates that on average, the organizations interviewed for this white paper will capture annual benefits worth $34.4 million, or $5,507 per user, over five years. The benefits can be assessed according to four primary metrics (see Figure 1):

» **Business productivity.** Organizations were enabled to implement a more agile and mobile business model. Average annual benefits totaled $2,230 per user.

» **User productivity.** The users experienced a faster and more reliable computing experience. Average annual benefits totaled $1,744 per user.

» **IT staff productivity.** By centralizing and automating desktop operations and management, IT staff resources are freed up to be invested in new business initiatives. Average annual benefits totaled $1,302 per user.

» **IT infrastructure.** The centralized DV platform is a more efficient model than the traditional device-oriented PC model with hardware and software cost advantages. Average annual benefits totaled $231 per user.

**FIGURE 1**

## Average Annual Benefits per User
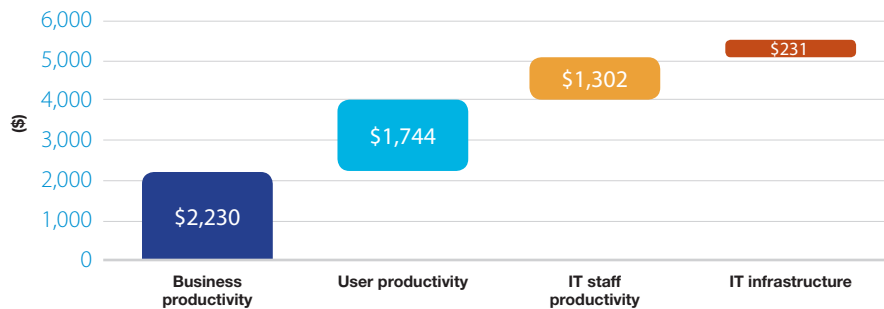


*Source: IDC, 2015*

## Delivering a More Efficient Computing Platform

Although the scale and scope of desktop and app virtualization deployments have been greatly enlarged over the past 10 years, the initial driver remains the same — to replace the traditional one–to-one device model with a more efficient centralized services platform to reduce capex and opex. Other advantages that the organizations have experienced using Cisco's UCS include reduced complexity; elasticity and scalability; use of fewer IT staff resources; centralized management; and agility. From a TCO vantage point, these advantages can be described as ease of management and minimization of capex.
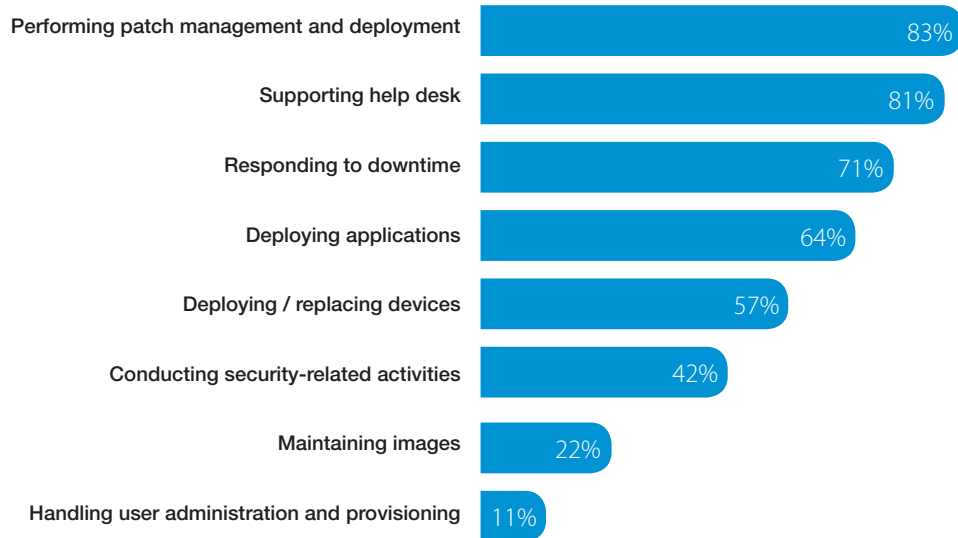
» **Ease of management.** Several companies presented reducing their operational costs as the primary driver for migrating to Cisco DV. As one insurance provider explained, "Operational efficiencies were definitely the biggest reason to move to DV. It's challenging to keep up to date and troubleshoot all of the independent systems … so we like having the centralized golden image. Update one system, and you impact everyone … and troubleshoot only one system rather than hundreds."

» **Security.** Half of the companies in the study expressed that security was one of the primary drivers for adopting Cisco DV. One organization that admitted to having had serious security issues before stated, "Security — the only way to get it is to go through DV." Another company, a telecom services provider, chose desktop virtualization primarily because of security. Some companies pointed to the advantages of centralized management and being able to go into the server to update definition files to ensure that all clients received security updates. Reducing data loss was a key benefit. The companies reduced data loss by an average of 95%, with four companies eliminating data loss altogether. One banker related, "It's partly because of VDI and partly because of Cisco. For Cisco, there are certain built-in security protocols that reduce data loss. I'm sure the other vendors have that too. But based on our relationship, Cisco seems to have a much better success rate."

The centralized DV model requires 61% fewer IT staff resources to fully support devices and users. Figure 2 shows the specific areas of time savings for IT staff. On average, each organization in the study had migrated 6,000 PC users to Cisco DV and optimized its IT staff resources and reduced its operations cost to support devices and users by over $7 million annually.

By reducing the time IT has to spend supporting desktops and desktop users, IT has more time to spend on analysis of business needs and supporting business initiatives. The DV centralized management architecture reduces the time spent keeping the lights on by 14%.

> The companies reduced data loss by an average of 95%, with four companies eliminating data loss altogether.

**FIGURE 2**

## IT Staff Time Savings

| Activity | Savings |
|---|---|
| Performing patch management and deployment | 83% |
| Supporting help desk | 81% |
| Responding to downtime | 71% |
| Deploying applications | 64% |
| Deploying / replacing devices | 57% |
| Conducting security-related activities | 42% |
| Maintaining images | 22% |
| Handling user administration and provisioning | 11% |

*Source: IDC, 2015*

## Minimizing IT Infrastructure Cost

All the participants chose desktop virtualization to reduce infrastructure costs. Because virtual machines rely less on the performance of the endpoint devices, DV has a major capex advantage related to the costs of the devices. The companies in the study had paid on average $1,078 per PC and only $640 per client device that replaced the PC. This 41% cost advantage is based on using the full cost for a new client device despite the fact that 2 of the 12 participants used repurposed PCs as DV endpoints. This cost advantage was further leveraged because of DV's 54% longer productive life span. Extending the life span from an average of 3.4 years to 5.3 years adds another 21% cost advantage. On an annual basis, migrating to DV reduces device cost by 61%, saving $193. In addition to device savings, DV provided a 15% reduction in software license costs and a 7% reduction in bandwidth costs. Cisco DV users noted that they experienced another 15% reduction in software costs.

### *Cisco DV Cost Advantages*

Cisco's integrated infrastructure offerings — combined with client virtualization technologies from Cisco's partners Citrix and VMware and centrally managed — provide optimal scalability, security, and performance.

The capex advantages of Cisco's converged model over the traditional DV model are the result of higher utilization of hardware resources. We estimated savings of $127 per user annually, which included the following:

» **Server:** One-third less costly, saving $65 per user annually

» **Software:** 25% less costly, saving $33 per user annually

» **Networking hardware — cabling and switching:** 39% less costly, saving $26 per user annually

» **Facilities and power:** 33% less costly, saving $3 per user annually

Cisco's tightly integrated and managed solution delivered opex advantages of 28%, saving $29 per user annually from more efficient server administration.

Compared with PC costs, Cisco DV reduces annual IT desktop support costs by $1,175 per user and endpoint device costs by $215 per user (see Figure 3).

**FIGURE 3**

## Annual Costs per User
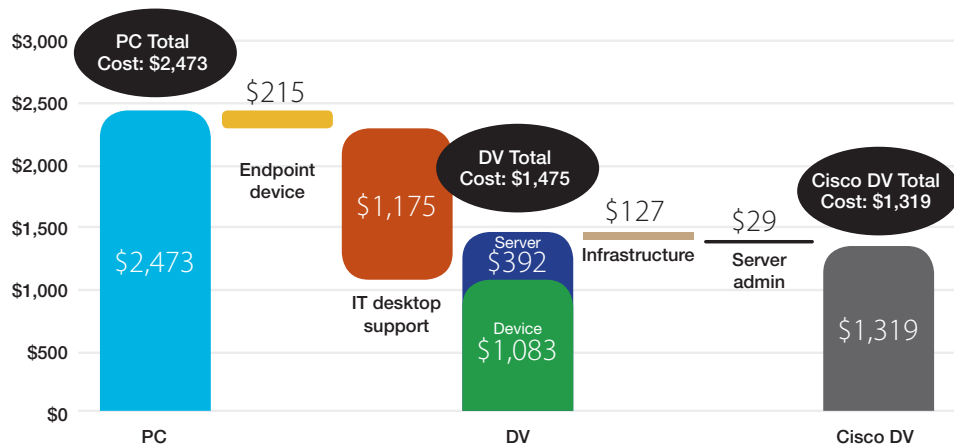


*Source: IDC, 2015*

## User Productivity — Enhancing Performance and Reliability

Companies may choose to migrate to DV for the quantifiable cost advantages, but all organizations also realize the productivity benefits from the user experience. DV's centralized application delivery and management model dramatically improves users' day-to-day computing experience by enhancing desktop operations performance and reliability. The DV model offers much higher risk mitigation than traditional desktop models. In the integrated infrastructure model, high availability and automatic failover capabilities reduce unplanned downtime. Users in the study experienced 75% less downtime and enjoyed nearly zero problems with data loss. A government organization was

able to cut its device failure rate in half even though it used repurposed old PC devices after migrating to Cisco DV.

In addition, by centralizing management and control, IT staff can reduce time previously wasted by users having to run virus scans (30 minutes per week), install software (5 minutes per week), and troubleshoot their devices (40 minutes per week). Finally, device log-in and single sign-on enabled users to save as much as 1 hour per day (1.3 hours per week on average).

IDC calculates that in total, users in the organizations interviewed for this white paper are achieving average productivity gains of 130 hours per year (see Table 2).

**TABLE 2**

| User Productivity Savings (Hours per Year per User) | | |
|---|---|---|
| | **Pre-DV** | **Post-Cisco DV** |
| Downtime | 7.36 | 1.87 |
| Device log-in | 120.16 | 58.41 |
| Antivirus | 44.29 | 17.71 |
| Installing software on own device | 5.37 | 1.42 |
| Troubleshooting email problems | 66.62 | 34.20 |
| Additional hours added per year | – | 130.18 |

*Source: IDC, 2015*

## Business Productivity Benefits from a Mobile Environment

The advantages of client virtualization go far beyond reducing the cost of desktop computing. Today, organizations are looking at desktop and app virtualization as a strategy for deploying 3rd Platform technologies by leveraging the increasing capabilities to transform legacy desktop applications to work well on mobile devices. This leads to enhanced mobility and improved customer experience, which drive business productivity.

### *Enhanced Mobility*

Fully 100% of the participants in this study explained that to support workforce mobility in their organizations, they deployed Cisco DV to deliver desktops and applications to corporate-owned mobile devices. One of the primary benefits to the business was Cisco DV creating

a more mobile-friendly environment and helping these customers more than double their adoption of the mobile 3rd Platform. As one customer explained, "DV has definitely contributed to the increase of mobile people. It was very low before. That was probably one of the main reasons that we moved forward with DV."

Cisco DV customers also reported leveraging improved capabilities for mobile computing to generate improved business outcomes:

» An IT services company that was able to increase its percentage of mobile users to 50% and deliver 10% faster customer response claimed that because of Cisco DV, "it's easier for people to be mobile."

» A telecommunications services provider that had deployed Cisco DV to automate key business processes like auditing added, "Desktop virtualization has definitely helped us become more mobile. Before, I think it was only like 10% out there. Now it's more like 20%. Overall, they estimated a companywide increase in productivity of 8%."

» As a financial institution that had migrated all nontrading functions to Cisco DV commented, "Even though not everyone has DV, they are still impacted by the increase in mobility. Resolutions to issues are faster. It's not necessarily the amount of time spent; it's the time spent more productively."

Organizations in the study estimated that as a result of enhanced mobility, they had raised their productivity by 7%.

## *Improved Customer Experience*

Several of the organizations in the study reported improved customer experience as a result of migrating to Cisco DV. Desktop virtualization enables companies to transition from a distributed model to a centralized model for deploying applications and accelerates their time to deploy applications by 71% so that their customers, both internal and external, enjoy a quicker time to market for new business applications. When companies can reduce the costs and time to deploy applications, it enables them to increase the number of applications that directly support new business initiatives. Companies using Cisco DV found they were able to increase their application output by 64% compared with their pre-DV environment. But customer experience was more about the improved performance and reliability of the applications:

» A government organization felt that it gained 5% productivity because of better performance of its applications.

&raquo; A financial institution that deployed DV to improve response to its clients' needs said, "People can get access to files quicker … images, checks, different documentation. They can get access quicker from a central location." The institution estimated it had improved its operations by 4% as a result of the deployment of Cisco DV.

&raquo; Another government organization explained that by migrating to Cisco DV and reducing its downtime by 97%, it has improved organizational productivity by 10%.

&raquo; A retail operation estimated that it has increased revenue by 20% as a result of Cisco DV's better security ensuring its customer information is not at risk.

Organizations in this study estimated that Cisco DV had raised their productivity by 10% from increased performance of their applications and 13% from increased reliability.

In addition to improving productivity, half of the organizations recognized additional revenue from more reliable operations. All organizations recognized an average of $858,000 annually in additional revenue (see Table 3).

**TABLE 3**

## Business Productivity Benefits

| Improved business productivity | Annual benefit |
|---|---|
| Productivity increase from mobility | 7% |
| Productivity increase from higher performance | 10% |
| Productivity from increased reliability | 13% |
| Value of improved productivity per user | $2,048 |
| **Revenue enhancements** | |
| Additional revenue from improved operations | $858,001 |
| Additional revenue per user | $248 |
| Operating margin | 10% |
| Annual operating margin increase per user | $24.78 |
| **Total business productivity and revenue gains per user** | **$2,072** |

*Source: IDC, 2015*

# ROI Analysis

IDC uses a discounted cash-flow methodology to calculate the return on investment (ROI) and payback period for the organizations' investment in and use of Cisco's Desktop Virtualization solution. ROI is the ratio of the net present value (NPV) and discounted investment. Payback period is the time in months required to pay back the initial investment using the net benefits generated by Cisco DV.

IDC assessed the costs, benefits, and value associated with the use of Cisco DV by the 12 organizations interviewed for this white paper over a five-year period. IDC calculates that these organizations are initially investing an average of $16.8 million ($2,700 per user) in hardware, installation, consulting, and training. These organizations will achieve annual benefits worth an average of $34.3 million per organization ($5,507 per user) over five years (see Figure 4).

IDC's five-year ROI analysis shows that the organizations interviewed for this white paper will spend an average of $24.0 million ($3,846 per user) to implement and support Cisco DV (see Table 4). In return, the organizations will realize an average of $119.5 million per organization ($19,162 per user) in benefits. This results in a net present value of $95.5 million per organization ($15,316 per user). This means that interviewed organizations will break even on their investment in Cisco DV within the first year and will achieve an ROI of 398%.

**FIGURE 4**

## Cost-Benefit Analysis per User
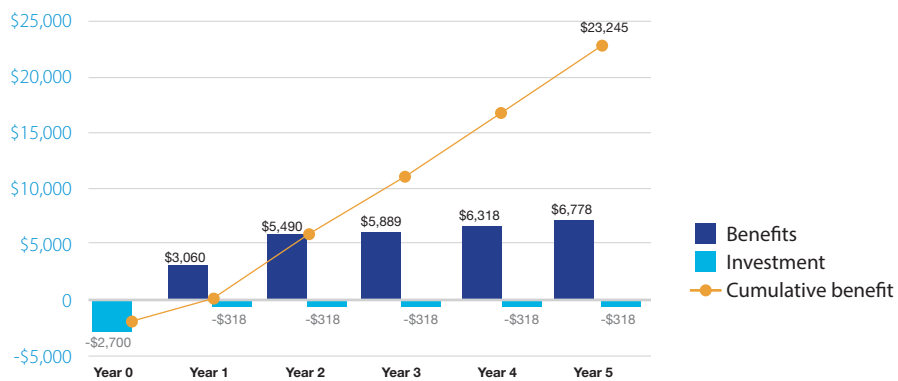


*Source: IDC, 2015*

**TABLE 4**

| Five-Year ROI Analysis per User | |
| --- | --- |
| Benefit (discounted) | $19,162 |
| Investment (discounted) | $3,846 |
| NPV | $15,316 |
| ROI | 398% |
| Payback period | 11.82 months |
| Discount factor | 12% |

*Source: IDC, 2015*

# Challenges/Opportunities

According to IDC research, many IT organizations believe that they face barriers to implementing a virtualized desktop environment due to lack of internal skills, costs of implementation, and difficulty of integration with existing infrastructure. In addition, many organizations fail to realize the need to leverage tools such as workload automation and streamlined management in order to further drive down opex.

Further, and as previously discussed, effectively delivering graphic-intensive applications (e.g., AutoCAD, SOLIDWORKS, and Adobe Creative Suite) in a desktop virtualization environment has been a long-standing obstacle for IT organizations, particularly in verticals such as manufacturing, healthcare, and, in some cases, higher education, because of performance and degradation concerns. Furthermore, as end-user experience increasingly becomes an essential element of most business software, many ISVs are bringing GPU-accelerated offerings to market. For example, newer releases of Microsoft Office products running on Windows 7 have been designed to take advantage of a GPU in order to deliver modern user interfaces and advanced multimedia capabilities.

As a result, delivering resource-demanding applications in virtualized desktop environments has been seen as either impractical from a technology standpoint or cost prohibitive. However, we are starting to see this issue become increasingly mitigated through the lower cost of network and compute resources coupled with technology advancements such as NVIDIA GRID entering the market.

Cisco's Desktop Virtualization solution is able to leverage the varying delivery models associated with the NVIDIA GRID technology, such as GPU pass-through, sharing, and virtual GPU or vGPU, enabling GPU access across multiple virtual desktop instances. As a result, IT

organizations are able to maximize the value of their NVIDIA GRID cards while meeting or exceeding the growing application performance demands of end users.

That said, there is still work to be done in regard to educating the market on the value proposition of this type of technology as well as establishing a price point that is attractive to both enterprise organizations and small and medium-sized businesses.

## Conclusion

In the era of mobility and BYOD, IT organizations increasingly need to shift from the PC-centric world of managing and protecting individual PC components, such as hard drives, to a datacenter model where corporate data is centrally stored, managed, and secured.

Likewise, a key benefit of properly implementing an enterprise-grade virtualized desktop and app environment (whether on-premises or hosted off-premises) is to gain an increased ability in unifying desktop, application, security, and BYOD management. As a result, organizations can more efficiently and effectively empower their employees via improved user experiences across disparate device types while improving IT operations and security.

As desktop and app virtualization software and support infrastructure solutions continue to mature, desktop virtualization is expected to become increasingly applicable to greater portions of organizations and a greater breadth of industry verticals beyond the typical healthcare, finance, government, and education segments that dominate the market today. Likewise, IDC believes that technologies such as NVIDIA GRID, which stand to allow designers, architects, and engineers to run advanced, graphics-rich applications in virtualized environments across a wide range of device types (to include mobile smartphones and tablets) will greatly contribute to growth of the virtual client computing market. As a result, IDC believes that the already $3.0 billion virtual client computing market will reach $4.4 billion by 2019.

Cisco's UCS is designed as an integrated, scalable, and manageable infrastructure platform aimed at mitigating the unique pain points commonly associated with virtualization implementations. In addition, the UCS Manager software delivers unified, embedded management that helps decrease TCO and improves business agility by enabling IT administrators to discover, provision, and monitor all the system components from within a single management tool.

To this end, by deploying a virtualized desktop and/or application computing environment on a converged infrastructure solution like Cisco's UCS, customers are able to streamline DV deployments, simplify scalability, and reduce long-term TCO. By integrating the compute,

storage, and networking, Cisco's UCS significantly reduces many bottlenecks, from both a technical perspective and a process perspective. In addition, the ability to quickly turn a proof of concept into a production deployment and then efficiently scale and manage the environment is a powerful value proposition for IT organizations seeking to optimize complex workloads like DV.

# Appendix

IDC's standard ROI methodology was utilized for this project. This methodology is based on gathering data from current users of the technology as the foundation for the model. Based on these interviews, IDC performs a three-step process to calculate the ROI and payback period:

» Measure the savings from reduced IT costs (staff, hardware, software, maintenance, and IT support), increased user productivity, and improved revenue over the term of the deployment.

» Ascertain the investment made in deploying the solution and the associated training and support costs.

» Project the costs and savings over a five-year period and calculate the ROI and payback for the deployed solution.

IDC bases the payback period and ROI calculations on a number of assumptions, which are summarized as follows:

» Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and productivity savings.

» Downtime values are a product of the number of hours of downtime multiplied by the number of users affected.

» The impact of unplanned downtime is quantified in terms of impaired end-user productivity and lost revenue.

» Lost productivity is a product of downtime multiplied by burdened salary.

» Lost revenue is a product of downtime multiplied by the average revenue generated per hour.

» The net present value of the five-year savings is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.

Because every hour of downtime does not equate to a lost hour of productivity or revenue generation, IDC attributes only a fraction of the result to savings. As part of our assessment, we asked each company what fraction of downtime hours to use in calculating productivity savings and the reduction in lost revenue. IDC then taxes the revenue at that rate.

Further, because IT solutions require a deployment period, the full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis and then subtracts the deployment time from the first-year savings.

*Note: All numbers in this document may not be exact due to rounding.*

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