WHITE PAPER

Optimizing Virtualized Desktop Environments with VCE Converged Infrastructure

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IDC OPINION

The rapid influx of smart devices, including tablets and phones, has greatly accelerated the bring-your-own-device (BYOD) and mobile workforce trends, which in turn is creating an ever-mounting management challenge to today’s IT environment. The entry of diverse untrusted devices, multiple operating systems (OSs), and consumer-oriented applications into what used to be a controlled IT environment creates an onslaught of potential security holes and governance nightmares.

While consumerization trends are adding significant complexity to IT operations, the increase in employee productivity, collaboration, and satisfaction that mobile technologies offer is 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. But seizing this opportunity while maintaining proper governance and control over proprietary corporate data is complex and overwhelming for many IT teams. As a result, today it makes more sense than ever for IT leaders to consider virtual client computing (VCC) solutions.

The benefits of VCC include centralized desktop and application management, "any device" access to corporate IT resources, and an increased ability to protect corporate intellectual property. What's more, capabilities for provisioning desktop images allow IT staff to more effectively ensure proper hardware configurations and software currency/licensing, manage user access, and demonstrate compliance with industry and governmental regulations such as HIPAA, SOX, PCI, and FISMA.

SITUATION OVERVIEW

Historically, IT had great control over the choice of OSs and software installed on corporate-owned devices and thus supported relatively homogeneous environments. However, with consumer-grade cloud systems and service, more and more IT organizations are caught between a rock and a hard place, as they realize that failure to keep up with the speed of the business often fosters unnecessary inefficiencies, costs, and rogue IT movements such as "shadow IT." To that end, managing desktop PCs has been a long-standing uphill battle for IT departments, with many IT administrators relying on manual processes and disparate endpoint management solutions for provisioning, configuring, securing, and maintaining client devices. Furthermore, traditional desktop management tools and processes often require business users to hand over their devices to IT for undetermined and often extended periods of time.
With an increasingly mobile and global workforce, IT organizations must look toward innovative solutions that allow them to streamline, centralize, and automate the ongoing management of their back-end infrastructure to increase productivity and at the same time reduce operational costs.

**VIRTUAL CLIENT COMPUTING INFRASTRUCTURE**

One way for IT organizations to strike a balance between providing user empowerment and proper IT governance and control is to virtualize the client computing environment, whether the entire desktop or line-of-business applications, or a combination of the two.

With centralized virtual desktop (CVD), more commonly known as virtual desktop infrastructure (VDI), CVD is a form of server-based computing; IT organizations can utilize server 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.

A key benefit of CVD is its centralized desktop management capabilities for provisioning desktop images, which allow IT staff to more effectively ensure proper hardware configurations and software currency/licensing, manage user access, and demonstrate compliance with industry and governmental regulations such as HIPAA, SOX PCI, and FISMA. Centralized desktop management also simplifies operating system migration because it can reduce the number of golden images (master copies that contain the prepped operating system and applications for a given group) needed and completely abstracts any potential hardware issues. And because the data sits in a datacenter and streams to the endpoint, leaving no data on the actual device, CVD improves security and data loss prevention.

What's more, client virtualization enables IT administrators to provide a more consistent and seamless desktop experience to the rapidly expanding population of business users who seek to utilize multiple device types to conduct business transactions. For example, in most CVD 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 hardware or operating system.

Many businesses are looking to client virtualization solutions for relief because they provide:

- Centralized management
- "Any device" access
- Reduced operational costs
- Ability to protect corporate intellectual property

While there are many benefits, these solutions can be complex to deploy and difficult to scale without proper knowledge and experience. Client virtualization can also have large up-front capital costs. It will require new servers, storage, and networking to be able to scale properly and efficiently. In addition, the environment will need to be implemented and managed by people with experience and knowledge in this area.
For instance, one of the major issues with on-premises client virtualization deployments is what is commonly known as "VDI stall." A proof of concept to 50-100 users can run seamlessly, causing overconfidence in the IT administrator's mind as to what can realistically be deployed within the datacenter. As deployments scale to 200 users, then 500 users, and then maybe even 1,000 users, the networking and storage requirements start to become overwhelming and ultimately drag down user experience. When this happens, typically the deployments stop because IT staff members have to figure out the root cause of issues and whether it makes sense from an economics standpoint to increase investments to make the deployments successful. Even worse, once users are burned by the experience, they may be much less likely to accept the technology in the long term, even if the issues ultimately are worked out.

On occasion, IDC has seen complete deployments taken down because the initial architecture was not designed properly. As a result, many IT organizations seek converged infrastructure solutions to mitigate these types of VDI implementation pitfalls.

**BENEFITS OF CONVERGED INFRASTRUCTURE FOR VDI**

Although it has been several years since client virtualization solutions were first brought to market, many IT organizations have struggled to overcome some significant implementation roadblocks such as the complexity associated with designing, scaling, and managing the necessary storage, networking, and compute required to run a high-availability virtualized client environment.

However, converged infrastructure treats server, storage, and network infrastructure resources as pools to be assigned as needed to optimize the delivery of business services while simplifying IT operations. The following key benefits can be achieved with converged infrastructure:

- Integration of traditional hardware functionality such as combining servers and network equipment
- Tight integration of systems management and control software into hardware functionality

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

- **Cost savings due primarily to reduced operating expenses (opex).** Because the underlying hardware pieces (server, storage, and network) are designed and optimized to work with each other, IT labor can be reduced because of the built-in interoperability between each component.
- **Simplified management.** Most converged infrastructure solutions can be managed by a single console to streamline hardware management and automate workloads, further reducing IT operation complexity and, thus, opex.
- **Improved availability.** In the converged 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.
CVD can fully utilize the benefits offered on converged infrastructure. In fact, enterprises have quickly discovered that the use of virtualization to support desktop workloads on converged infrastructure creates significant benefits, including improved IT management efficiency, improved price efficiencies, and improved capabilities. IDC defines these benefits in one of the following three buckets:

- **Quantifiable benefits.** Virtual machines 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 by extending the life span of existing PCs, by repurposing PCs 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. In addition, CVD can make users more productive by improving desktop reliability, lessening the need to contact support.

- **Functional benefits.** 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 benefits.** Traditional tension between IT and the rest of the organization can be lessened with CVDs. Because virtual desktops are easier to manage and more secure than traditional desktops, IT can provide end users with more freedom and promote goodwill. CVDs can also improve the user experience, especially compared with an aging physical PC. In addition, CVDs can allow users ubiquitous access to their virtual desktops on any device, which can improve overall user satisfaction.

**VBLOCK SPECIALIZED SYSTEMS FOR EXTREME APPLICATIONS**

The VCE Company was formed by Cisco and EMC, with investments from Intel and VMware. VCE, through Vblock Systems, delivers fully integrated and virtualized cloud infrastructure systems. What's more, Vblock Systems are specially tuned systems that are specifically designed to run VDI in an optimized fashion.

According to the company, Vblock Systems combine best-in-class virtualization, networking, computing, storage, security, and management technologies with end-to-end vendor accountability. The integrated units of infrastructure enable rapid virtualization deployment, designed to allow customers to realize a quick return on investment (ROI). Vblock Systems offer storage capacities and processing/network performance and support such incremental capabilities as enhanced security and business continuity.
When speaking to VCE customers, IDC gathered noteworthy testimonials from organizations that have successfully deployed Vblock Systems to achieve the following benefits:

- **Rapid deployment.** Vblock Systems are factory-integrated components and validated solutions that, along with onsite installation, configuration, and performance tuning, speed time to value. IT no longer has to spend time integrating and testing products from multiple vendors to stand up new capabilities. Vblock Platforms are designed, tested, and validated as units of infrastructure. They are complemented by onsite installation, configuration, and performance-tuning services to ensure successful and rapid deployment. IT administrators can very quickly and easily deploy or migrate new business applications, operating systems, and technology updates, speeding time to value.

- **Shared infrastructure.** Vblock Systems have standardized infrastructure for application mobility and IT simplicity and lower capex and opex. IT no longer has to manage complex application silos. Vblock Platforms can serve as a standardized infrastructure for a vast array of business-critical applications. Vblock Infrastructure Platforms deliver enterprise-level functionality to address the needs of business-critical applications. The ability to migrate applications and workloads enhances business continuity, and shared infrastructure simplifies IT staffing and training.

- **ITIL-based management.** VCE and partner management tools tuned for virtualization environments offer service catalogues, workload mobility, and trusted multitenancy to increase IT agility. Vblock Platforms enable a unified approach to infrastructure management. IT administrators can provision compute, network, and storage resources with just a few clicks. In addition, open APIs enable integration with management software platforms from ISVs.

- **End-to-end accountability.** Extensive collaboration throughout the channel ensures a seamless engagement, provides seamless support across the infrastructure, and lowers risk. VCE provides a single point of contact through support engineers who are experts in the entire infrastructure, utilize advanced collaboration capabilities, and have direct access into engineering resources at Cisco, EMC, and VMware. VCE implements a unique approach to release and configuration management to further simplify IT operations. The company makes available on formal release schedules validated and fully regressed software releases and firmware upgrades that cover the entire platform.

- **Security, compliance, and business continuity.** Solution performance is enhanced by industry-leading technologies (e.g., EMC FAST, Fast Cache and deduplication, VMware vShield) to provide needed security, compliance, and business continuity. Vblock solutions integrate compute, network, storage, virtualization, and management technology to improve application performance, security, dynamic scaling, and disaster recovery. Vblock solutions cover horizontal applications, vertical industry offerings, and application development environments, allowing customers to focus on business innovation instead of integrating, validating, and managing IT infrastructure. VCE provides open APIs on which major infrastructure management vendors build capability to support ITIL best practices. These capabilities enable IT to build service catalogues with tiered SLAs and to offer chargeback and metering in a multitenancy environment so that IT customers pay for only what they use.
VDI CASE STUDY USING VBLOCK SYSTEMS

Eastman Chemical Company is a Kingsport, Tennessee-based Fortune 500 global company engaged in the manufacture and sale of chemicals, fibers, and plastics. Founded in 1920, the company currently has more than 40 manufacturing sites worldwide and 14,000 employees.

Eastman's growth strategy and ability to remain a world leader in diverse markets require an IT organization that can efficiently deliver services across a highly disparate and dispersed computing environment.

As a result of recent acquisitions, Eastman has found itself dealing with a plethora of legacy systems in need of standardization and integration with Eastman's existing IT. What's more, the costs associated with provisioning and maintaining an outdated PC fleet spread across 30+ facilities and several geographic locations around the world were substantial. Because IT staff resources were limited or nonexistent at some locations, IT staff members from other facilities were often required to travel to perform even the most basic PC upgrades or repair tasks. As a result, a "high touch" approach to IT management was both unsustainable and inefficient in meeting objectives. According to Brandon Johnson, senior systems analyst, Server and Storage Architecture, "Our acquisition project required global hardware deployments to be completed within a schedule that could not be met with our internal company resources. A turnkey solution gave us greater agility and reduced the travel requirements for managing infrastructure at the newly added remote sites." Along with this challenge, Eastman was interested in implementing solutions that could accommodate the company's growing mobile workforce.

To meet these challenges, Eastman partnered with VCE to deploy a virtual desktop infrastructure solution running on Vblock Systems. The solution included 32 Vblock System 100 and VMware View VDI software.

Eastman credits the Vblock System's best-of-breed components for optimal VDI performance and VMware's VDI software for enabling outdated hardware to run the latest applications, and thus reducing the need to refresh Eastman's entire PC fleet. The resulting operational efficiency, combined with the Vblock System's ease of management, promised a more effective PC fleet.

While Eastman's tech-savvy IT team was capable of building and implementing a VDI environment of its own, it immediately recognized the value in leveraging the code-tested, standardized, preintegrated nature of the Vblock System. According to Dan Preston, supervisor, Server and Storage Architecture, "We love that the solution is lab tested and is fully supported. We take comfort in knowing that Vblock Systems are built and tested in a lab with code levels set correctly, which means no compatibility issues."

With VCE's Vblock solution, Eastman's IT team is now able to more rapidly provision VDI instances to stay ahead of acquisition-related demands while continuing to meet the organization's SLAs for top performance, availability, and scalability. In fact, the employees on VDI instances are now up and running in approximately one hour, which represents a reduction of several hours or even days compared with the prior implementation. Furthermore, for most use cases, the performance of old computers running VDI on Vblock Systems was equivalent to that of new PCs. Vblock Systems have enabled Eastman's IT department to replace approximately 1 out of 10 of the company's workstations (PC and laptops) with virtual desktops.
With Vblock Systems, Eastman has gained the benefit of centralized administration of the company’s infrastructure. Now, entire batches of devices can receive software and system upgrades remotely with limited IT support required. As a result, the Vblock Systems have significantly reduced the costs and effort associated with ongoing management of desktop infrastructure. What’s more, the entire environment can be managed from a single point of contact. Eastman’s system administrators can log in to the system from any remote location and quickly configure every facet of the VDI solution. This capability mitigates the need for IT administrators to travel and manually fix or upgrade remote machines. Now enabled with remote access capabilities, IT staff can administer user desktops from anywhere, driving major operational savings.

Eastman highly values its partnership with VCE. The single-call support combined with sophisticated management and provisioning software has simplified day-to-day management and significantly reduced time to resolution of any issues. “We consult our VCE account team whenever we have a question or concern, and it saves a lot of time lost on working with finger-pointing vendors,” said Johnson.

Through the VCE deployment, Eastman has experienced valuable productivity gains for its IT staff, enabling it to reduce the service backlog. As the number of Eastman employees and their associated devices continues to grow, the company will see continued return on the VCE investment as a result of the improved efficiency of running VDI on the Vblock Platform.

FUTURE OUTLOOK

The rise of mobility and the need to govern a true heterogeneous environment filled with multiple operating systems and a near infinite number of devices will continue to be a major challenge for IT organizations of all sizes. Likewise, delivering Windows applications to these devices will be a major driver for client virtualization.

The client virtualization market continues to be driven by the rise in mobility, and IDC expects that trend to only increase throughout 2018. In fact, IDC forecasts the VCC market will grow from $3.1 billion in 2014 to $4.7 billion in 2018, representing a five-year CAGR of 10.7%.

While major economic concerns continue to limit the potential growth of CVD (because of the large up-front costs), hosted solutions, appliances, and converged systems are rapidly helping clear this hurdle. Likewise, given the declining costs and complexity coupled with the increasing capabilities to transform legacy desktop applications to work well on mobile devices, the future for the client virtualization market is very bright.

CHALLENGES/OPPORTUNITIES

According to IDC research, many IT organizations believe that they face barriers to implementing a converged infrastructure for their CVD environment because of 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 to further drive down opex. VCE, as well as other vendors, must overcome these inhibitors.
To that end, vendors in the VDI space must deliver the message that desktop virtualization is fundamentally different from server virtualization, and organizations should not expect an immediate ROI. While short-term, tactical adoption of client virtualization could prove useful in gaining management buy-in, a successful desktop virtualization implementation is a journey of continuous optimization and process improvements. Any expectation of quick-and-dirty cost reduction through desktop virtualization is likely unrealistic.

**CONCLUSION**

IDC expects that desktop virtualization will experience continuous growth through 2018. Total customer count is expected to continue to rise well into the second half of the decade. As the solution matures, it will 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.

The expected growth of desktop virtualization will create a golden opportunity for ecosystem partners, especially for vendors that can deliver a converged infrastructure platform that allows customers to maximize their investments and opex savings. At the same time, converged infrastructure can also address the needs of managed service providers, where the emergence of hosted client virtualization, what IDC refers to as workspace as a service (WaaS), will force service providers to look into more efficient, cost-effective datacenter platforms.

IDC believes that VCE’s existing portfolio of solutions is a good fit to address current market needs. VCE has to provide Vblock solutions to support customers of different sizes, continue to reduce the time and cost of deployment, and deliver the right message to customers of varying sizes to ensure its continued success.
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