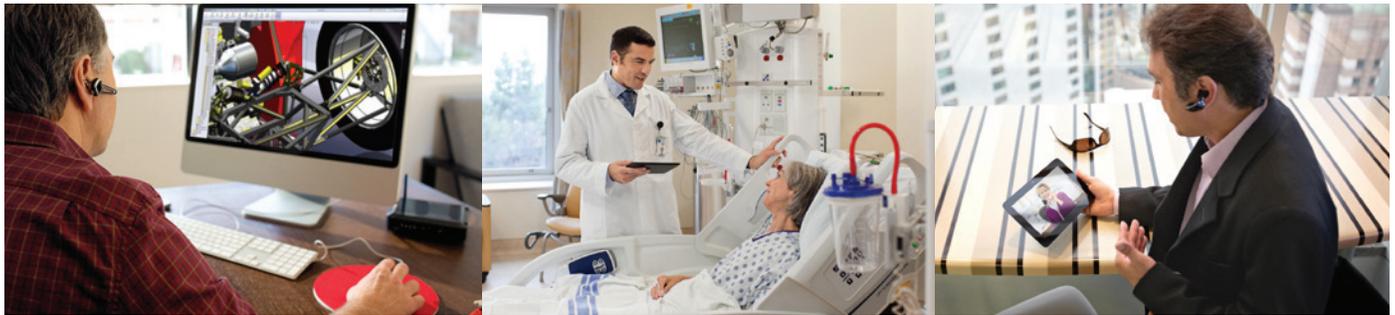


# Cisco, NVIDIA, and VMware Deliver High-Performance Virtual Desktops with Uncompromised 3D Graphics Experiences

Solution Brief  
November 2013



In collaboration with:



## Highlights

- Built on the industry's fastest-growing server solution and the most widely adopted virtualization platform
- Offers improved productivity for an expanded user base, including graphics-intensive workstations demanding high-quality three-dimensional (3D) rendering
- Includes support for both virtual shared graphics acceleration (vSGA) and virtual dedicated graphics acceleration (vDGA) with NVIDIA GRID™ graphics processing units (GPUs)
- Delivers an uncompromised experience that scales easily
- Can be delivered within the Cisco Unified Computing System™ (Cisco UCS®) managed environment, expanding Cisco UCS differentiation to graphics-intensive use cases
- Provides exceptional price-to-performance ratio that enables organizations to expand their deployments to match business demands

## Cisco® Desktop Virtualization Solutions with VMware® Horizon View™ and NVIDIA GRID™ deliver a true graphics workstation experience on any device for users interacting with graphics-intensive applications.

Virtual desktops have been deployed successfully for task workers and many knowledge workers. Until recently, virtual desktop graphics have been rendered using the general-purpose CPUs in data center servers. This additional CPU burden can slow all desktop workloads running on a server. Although CPUs are excellent for many types of processing, graphics processors, with parallel-processing capabilities, are best for graphical rendering. With Cisco Unified Computing System™ (Cisco UCS®), VMware Horizon View, and NVIDIA GRID graphics processors, desktop managers can gain the control and security of centralized desktop applications while delivering a true graphics workstation experience to users anywhere and on any device. This approach greatly simplifies desktop maintenance and management and increases worker productivity and motivation.

### Evolution of the High-End Graphics Workstation

The approach to delivery of high-end graphics workstation-like performance is evolving. Organizations are increasingly using geographically dispersed workforces. Businesses are seeking ways to resiliently secure sensitive corporate information. In today's workplace, users need to be able to work untethered from physical workstations to be most productive.

Traditional approaches to desktop virtualization have not delivered the application responsiveness and user experience demanded by high-end graphics workstation environments. This failure has limited the use of applications such as Autodesk Inventor and 3ds Max, Dassault CATIA, Adobe Premiere Pro and Illustrator, and advanced magnetic resonance imaging (MRI) and computed tomography (CT). As a result, transitioning users who use advanced applications to virtual desktops has been difficult. Additionally, the lack of shared graphics processing unit (GPU) solutions has negatively affected the economics of virtual desktop deployment for high-end users.

### Benefits for End Users

With Cisco UCS, VMware Horizon View, and NVIDIA GRID, workers are now free to access their graphics-intensive applications and files remotely in a virtualized desktop environment—with the same level of interactivity that they’ve come to expect at their high-end graphics workstations. With this solution, NVIDIA GRID graphics cards installed in Cisco UCS C-Series Rack Servers perform all the graphics processing. This approach enables end users to access their applications and files using VMware Horizon View clients on any device that they choose and to experience highly responsive graphics rendering. Depending on the graphics-processing requirements of the application, organizations can assign each worker a virtual dedicated

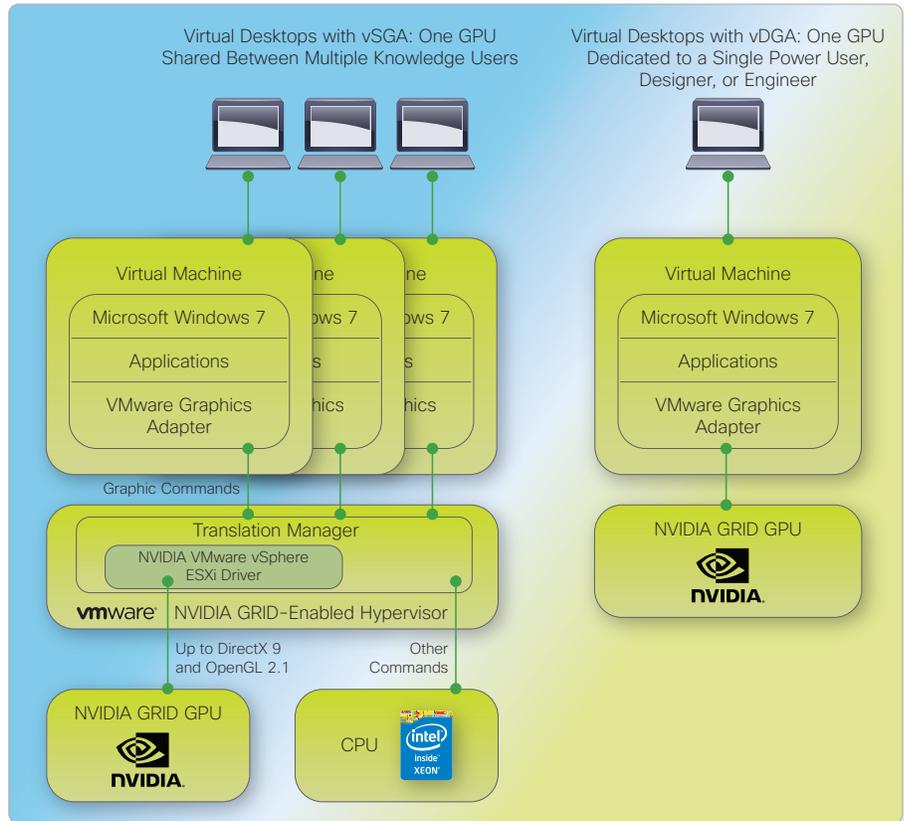


Figure 1. Administrators Can Allow Several Virtual Desktops to Share One GPU (vSGA) or Assign One GPU per Virtual Desktop (vDGA) Depending on the User’s Graphics Needs

graphics acceleration (vDGA) graphics processor or a virtual shared graphics acceleration (vSGA) graphics processor across multiple virtual desktops (Figure 1). With a vDGA, the virtual machine has dedicated access to the GPU and provides full API support of OpenGL 4.3, Microsoft DirectX9, 10, 11, or NVIDIA CUDA® 5.0. With the vSGA, users share a GPU across virtual machines with API support of up to DirectX9 or OpenGL 2.1. This solution

extends all the benefits of current Cisco Desktop Virtualization solutions to users with graphics-intensive workloads.

### Benefits for IT Departments

IT administrators benefit from the easy management, business continuity, and added security that virtualized desktops bring. In fact, the Cisco UCS C-Series Rack Servers can be managed within a Cisco UCS or Cisco



UCS Central Software management domain, which greatly reduces the total cost of ownership (TCO). Furthermore, virtualizing graphics-intensive desktops gives businesses the flexibility to outsource these desktops or send them offshore in a secure, centralized environment. This flexibility is especially useful when outsourcing product development or engineering to third parties who have the expertise necessary to complete a project but may be located in a different geographic area. In a healthcare setting, clinicians can access detailed MRI and CT scans at patient bedsides, at home, or on the go while using the device of their choice, optimizing workflow and improving patient outcomes.

## VMware Horizon View

VMware Horizon View is an industry-leading end-to-end solution that simplifies IT management and increases security and control of end user data while decreasing costs by centrally delivering desktop services from a private cloud. VMware Horizon View enables highly available, scalable, secure, and reliable desktop services unmatched by physical PCs, greatly

reducing TCO. Delivering a high-fidelity performance and user experience across locations, VMware Horizon View uses the PC over IP (PCoIP) protocol to provide users with a robust, personalized desktop with fast access to data, applications, unified communications, and three-dimensional (3D) graphics.

### Cisco Unified Computing System

Cisco UCS is the foundation of Cisco Desktop Virtualization Solutions. Cisco UCS provides an open, end-to-end, service- and application-optimized infrastructure for next-generation virtual workspaces, delivered jointly with VMware and NVIDIA to:

- **Simplify:** Accelerate time to productivity by simplifying data center infrastructure and deployment processes.
- **Secure:** Improve protection of data center infrastructure and assets with consistent security settings that travel with the virtual desktop.
- **Scale:** Support more desktops per server with predictable performance.
- **Save:** Achieve accelerated return on investment (ROI), improved

deployment speed, greatly reduced operating costs, and investment protection.

Cisco UCS is a single converged system with configuration automated through integrated, model-based management to simplify and accelerate deployment of enterprise-class applications and services running in bare-metal, virtualized, and cloud-computing environments. With all components managed as a single system (Figure 2), integration with VMware vCenter simplifies the deployment and ongoing management of the entire virtual desktop infrastructure to reduce operating costs and call-center incidents. Whereas Cisco UCS Manager handles a single Cisco UCS management domain, Cisco UCS Central Software extends the unified management domain for virtual desktop administrators, spanning thousands of servers across the data center and around the world.

## NVIDIA GRID

NVIDIA GRID technology offers the capability to offload graphics processing from the CPU to the GPU in virtualized environments. This capability

Cisco, NVIDIA, and VMware Deliver High-Performance Virtual Desktops with Uncompromised 3D Graphics Experiences

gives desktop managers the freedom to deliver true PC graphics-intensive experiences to more virtual users for the first time. IT departments and data center managers can now use industry-leading virtualization solutions such as VMware vSphere together with high-performance Cisco UCS with NVIDIA GRID to offer a better experience for their most graphics-intensive users, including highly responsive multimedia, and professional applications, from anywhere and on any device.

**Expand Your Virtual Desktop Coverage**

Now businesses can manage even more of their desktops consistently and securely while providing increased flexibility and a high-performance graphics experience to users. Cisco Desktop Virtualization with VMware Horizon View and NVIDIA GRID gives you choice in deploying high-performance graphics-enabled virtual desktops to meet user needs:

- **Designer and Engineer Virtual Workstation:** This virtual workstation, with vDGA, is for designers and engineers who need uncompromised graphics-rendering capabilities to create and work with complicated data sets using graphics-intensive applications (3D design, medical diagnostics, etc.). Users benefit from the enhanced experience of a GPU-powered desktop for everyday tasks and improved user density, with lower costs. This workstation can be

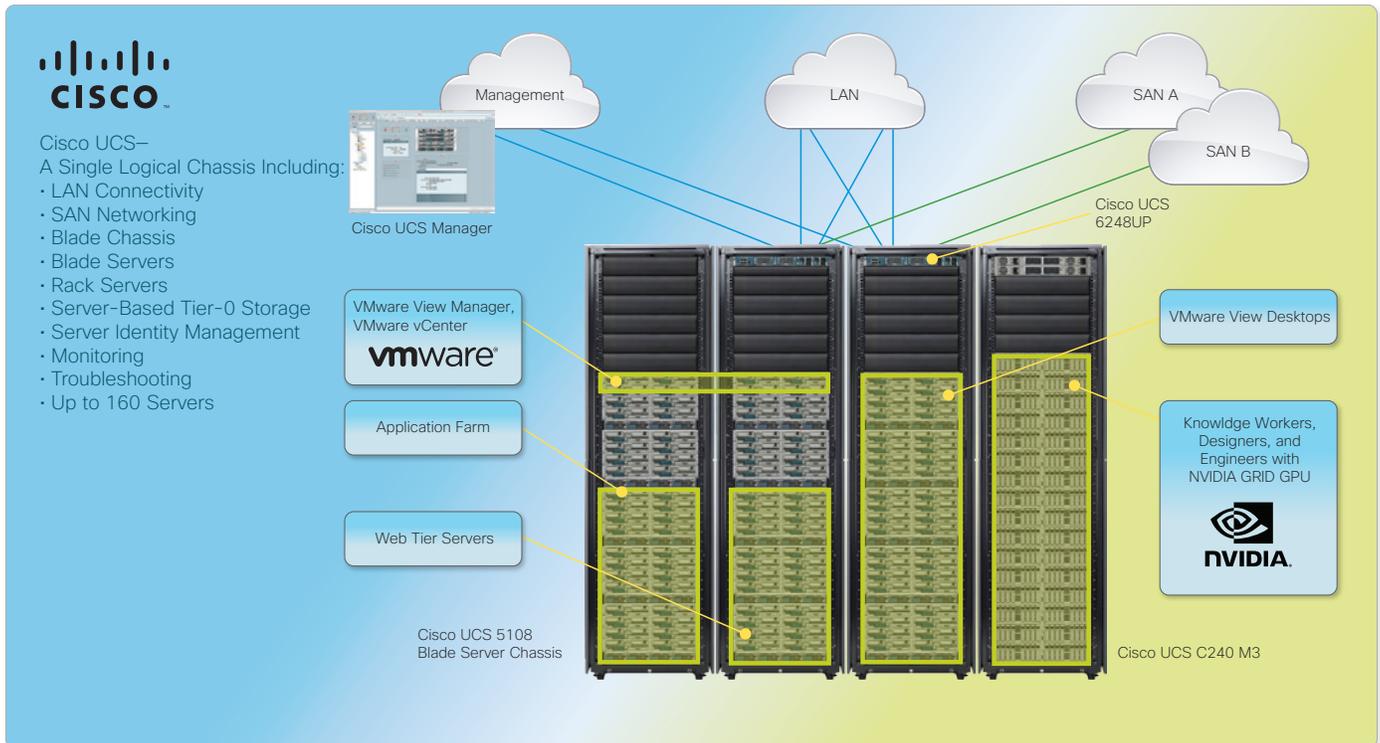


Figure 2. Up to 160 Cisco UCS Blade Servers and Rack Servers Can Be Managed as a Single Logical Chassis for VMware Horizon View Services

used for oil and gas, manufacturing, media and entertainment, medical imaging, and public-sector applications.

• **Power-User Virtual Workstation:**

This virtual workstation, with vDGA, is for users of visual data (3D images and 2D graphs and line charts). Often using a specialized application beyond the typical Microsoft Office Suite and web tools, these users may have tried virtual desktop infrastructure (VDI) without GPU acceleration and were not satisfied. This workstation can be used in healthcare (nurses' stations, doctors' offices, doctors' tablets, etc.), educational institutions (engineering and design schools, etc.), government (simulation and training, geospatial research, etc.), and manufacturing (product data management, product lifecycle management, manufacturing floor and job site workloads, support, etc.) applications.

• **Graphics-Enhanced Virtual Desktop:** This virtual desktop,

with vSGA, is for users who use office applications, email, video conferencing, and multimedia Internet applications, often called knowledge workers. This virtual desktop is excellent for financial services (retail, commercial and investment banking, insurance, etc.), manufacturing, life sciences, oil and gas, media and entertainment, telecommunications, government, and education applications.

### Excellent Solution for All Virtual Desktop Needs

Cisco Desktop Virtualization with VMware Horizon View, NVIDIA GRID, and Cisco UCS delivers truly scalable solutions for customers of all sizes, across a wide range of industries requiring high-quality 3D graphics. Workers, students, and clinicians are no longer tethered to physical workstations, but can gain the mobility and flexibility they need to be productive while accessing mission-critical, graphics-intensive applications anywhere, on any device.

This solution simplifies VDI management and reduces the time needed for desktop patching, provisioning, and updates from hours to minutes. End users benefit from an uncompromised experience that is consistent across devices and locations, delivered across a quality-of-service (QoS)-enabled infrastructure that is virtual machine and virtual desktop aware.

### For More Information

- Cisco Desktop Virtualization Solutions  
<http://www.cisco.com/go/vdivmware>  
<http://www.ciscovmwarevdi.com>
- VMware Horizon View  
<http://www.vmware.com/view>
- NVIDIA GRID  
<http://www.nvidia.com/vdi>
- Computer aided design image on page 1 courtesy of VMware



**Americas Headquarters**  
Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).