VBLOCK® SYSTEMS FOR GEOSCIENCE AND PETROTECHNICAL APPLICATIONS

In response to the growing demand from Oil and Gas IT organizations for virtualization of upstream applications, enhanced end-user collaboration, and the sharing of analyses and data across geographies, VCE offers industry-leading Vblock Systems with the world’s most advanced converged infrastructure, configured specifically for GeoScience and PetroTechnical applications.

Oil and Gas enterprises are increasingly looking to converged infrastructure configurations and application virtualization to reduce implementation time, simplify application deployments, and reduce the total cost of ownership (TCO) associated with ongoing operations.

The deployment of converged infrastructure with virtualized applications and desktops will greatly decrease time to productivity, enable remote collaboration, increase data security and simplify the management of large data sets inside data centers and at remote exploration sites.

Solution Overview

VCE has pretested and validated several Exploration and Production (E&P) Geological and Geophysical (G&G) software applications on the Vblock System, leveraging various Virtual Desktop Infrastructure (VDI) solutions to present 2D and 3D virtualized desktops by means of NVIDIA accelerated graphics for LAN and WAN end users and for WAN collaboration.

The tested and validated VCE solution includes:

- World-class converged infrastructure of the Vblock® System
- VMware Horizon View or Citrix XenDesktop for desktop virtualization
- VCE technology extension for Cisco UCS compute
- NVIDIA GRID VGX platform for graphics virtualization
- Optional VCE technology extension for EMC Isilon for storing home directory and project data
- Optional Vblock® Data Protection with EMC Avamar/Data Domain backup and recovery solution

Figure 1 illustrates the components used in this solution.

Key benefits

- World’s most advanced converged infrastructure from VCE
- Best-of-breed compute, network, solid-state flash storage, and virtualization technologies in a tightly integrated system
- Pre-integration, testing, and validation allows systems to be put into production quickly to respond to unpredictable business requirements
- Factory-integrated data protection and mobility for mission-critical applications with a centralized project data repository for better security and data management
- Supports remote access and collaboration for high-end 3D visualization applications
- Factory-integrated VCE Data Protection product set from EMC for better data management, backup and recovery.
- Integration with EMC Isilon storage to support a cost-effective scale-out storage platform for rapid scalability
Vblock Systems

Vblock Systems from VCE represent the next evolution of IT—one that unleashes simplicity by delivering the extraordinary efficiency and business agility of virtualization and cloud computing. Seamlessly integrating best-in-class compute, network, and storage technologies from industry leaders Cisco, EMC, and VMware, Vblock Systems provide dynamic pools of resources that you can intelligently provision and manage to address changing demands and business opportunities.

Vblock Systems simplify and accelerate infrastructure deployment by pre-integrating and pre-validating compute and network resources from Cisco, storage resources from EMC, and virtualization technology from VMware.

Vblock technology extensions provide the capability to address the specific application needs of GeoScience and PetroTechnical compute environments through scale-out of Vblock configurations with Cisco UCS rack server and EMC Isilon storage extension technologies.

Cisco Unified Computing System

The Cisco Unified Computing System (UCS) is a next-generation data center platform that unites compute, network, storage access, and virtualization into a cohesive system designed to reduce TCO and increase business agility. The system integrates a low-latency lossless 10 Gigabit Ethernet unified network fabric with enterprise-class, x86-architecture servers. The system is an integrated, scalable, multichassis platform in which all resources participate in a unified management domain. With UCS, you can tune the environment to support the unique needs of each application while powering the server workloads on a centrally managed, highly scalable system.

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The VCE technology extension for Cisco UCS utilizes next-generation Cisco UCS technology for compute-intensive applications—from powering specialized graphics processing units to performing seismic modeling and reservoir simulation in the upstream exploration and production process.

New compute form factors and an incremental deployment model provide better choices without increased management overhead—for a superior TCO. In addition, seamless integration with the converged infrastructure of the Vblock System enables consistent provisioning, monitoring, and management of the technology extension resources.

**EMC XtremIO Storage**

The VCE solution for virtualized G&G applications relies on the EMC XtremIO, an all-flash scale-out enterprise storage array that provides substantial improvements to I/O performance and delivers new levels of real-world performance, administrative ease, and advanced data services for applications. XtremIO delivers performance in the millions of IOPS with sub-millisecond response times enabling virtual desktop users to boot the system and log in quickly from anywhere and to enjoy better access to the applications and information they need to get work done.

**NVIDIA Graphics Acceleration**

NVIDIA GRID solutions accelerate virtual desktops and applications, allowing the enterprise IT to deliver true graphics from the datacenter to any user on the network. The NVIDIA VGX platform utilizes the graphical processing unit (GPU) to deliver virtualized workstation performance and capabilities—including rich multimedia and 3D graphics—efficiently. The VGX K2 board, which includes two workstation-class GPUs, enables enterprises to increase user density without sacrificing performance or application compatibility.

Using SMX, a revolutionary streaming multiprocessor, NVIDIA VGX provides unsurpassed performance per watt for enterprise data centers. This technology enables geophysicist and petro-engineers the ability to work on virtually any device remotely and still have access to the computing and graphics performance of a GPU-powered workstation.

**VCE Technology Extension for EMC Isilon**

Our customers tell us that their primary challenges are in managing the storage required for rapidly increasing amounts of E&P data and making it accessible to geoscientists and engineers when they need it. The VCE technology extension for storage integrates EMC Isilon scale-out NAS storage with a Vblock System meets the oil and gas sector’s most critical storage needs.

EMC Isilon storage integrated with a Vblock System provides a powerful scale-out platform to cost-effectively consolidate and manage enterprise data and applications. As a result, customers can now expand and extend their Vblock Systems to incorporate large-scale user data for VDI, highly efficient enterprise data lakes for big data analytics, as well as scale-out NAS.

Whether you require primary storage for demanding E&P applications such as interpretation and modeling, or a secondary tier to keep less active data online and ready as needed, EMC Isilon offers resiliency, scalability, and performance optimization, automated load balancing and tiering—all in a single file system, simplifying ongoing operations.

**Vblock® Data Protection**

VCE integrates EMC products and VMware virtualization to satisfy customer’s data protection requirements for their most important asset—their data. All VCE data protection solutions are an extension of the Vblock System, pre-designed and pre-configured in the VCE factory, and fully supported by VCE™ Support.

Equipped with integrated variable-length deduplication technology, EMC Avamar facilitates fast, daily full backups for virtual environments, remote offices, enterprise applications, network-attached storage (NAS), desktops, and laptops.

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Avamar backups integrate with EMC Data Domain Deduplication Storage Systems to provide highly reliable protection storage for critical data. Consolidating backup and archive data on a Data Domain system significantly reduces storage requirements, making disk cost-effective for onsite retention and highly efficient for network-based replication to disaster recovery sites.

**Virtual Desktop Infrastructure**

Vblock Systems provide an enterprise-class IT infrastructure for VDI rollouts, ensuring the response times, security, availability, and agility IT requires. Factory-integrated systems accelerate deployment and provide performance at scale for the most demanding applications.

Virtual desktops provide centralized automated management of these components for increased control, reduced cost, and business agility, while providing a flexible high performance desktop experience. In most cases, these virtualized desktops provide suitable performance to replace dedicated high-end 3D graphics workstations. More important than cost savings is the increase in data security, availability and protection resulting from the application and proprietary E&P data being physically located, controlled, and managed in the data center.

Table 1 describes three possible VDI scenarios for the Vblock System for GeoScience and PetroTechnical applications.

**Table 1: VDI Scenarios**

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<th>Scenario</th>
<th>Hypervisor</th>
<th>VDI Software</th>
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<td>VMware and Citrix</td>
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<td>Citrix</td>
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Figure 2 illustrates the high-level VDI and NVIDIA’s accelerated remote graphics architecture.

**VMware Horizon View**

VCE is leveraging a strategic partnership initiated in 2011 between VMware and NVIDIA to advance virtual 3D graphics technology and enable the remote delivery of high-end, workstation-class virtual desktops for geophysical analysis and upstream collaboration activities.

VMware Horizon View delivers rich, personalized virtual desktops from a virtualization platform built to deliver the entire desktop, including the operating system, applications and data. Horizon View virtualizes the operating system, applications, and user data and delivers modern desktops to end users.

VCE tested and validated VMware Horizon View 5.0, which delivers protocol enhancements that provide as much as 75 percent bandwidth improvement over LAN and WAN connections, advanced support of 3D graphics, and scalable unified communications integration for voice and video media services. By virtualizing NVIDIA GPU, you can dedicate or share physical GPU resources across multiple users, providing a rich 3D experience from the data center. Using a combination of software and hardware-accelerated graphics, VMware Horizon View provides the flexibility for delivering 3D graphics for virtual desktops and workstation use cases.

**Citrix XenDesktop**

Citrix XenDesktop delivers Windows applications and desktops as secure mobile services. With XenDesktop, IT can mobilize the business, while reducing costs by centralizing control and security for intellectual property. Incorporating the full power of XenApp, XenDesktop can deliver full desktops or just the applications to any device. HDX technologies enable XenDesktop to deliver a native touch-enabled look-and-feel optimized for the type of device, as well as the network to provide a comprehensive virtual desktop delivery for any use case. Combined with Vblock Systems, Citrix HDX technology provides a high-definition, desktop-quality user experience over a wide range of devices and network topologies.
For more information

To learn more about this and other solutions, contact a VCE representative or visit www.vce.com.

ABOUT VCE

VCE, formed by Cisco and EMC with investments from VMware and Intel, accelerates the adoption of converged infrastructure and cloud-based computing models that dramatically reduce the cost of IT while improving time to market for our customers. VCE, through the Vblock Systems, delivers the industry's only fully integrated and fully virtualized cloud infrastructure system. VCE solutions are available through an extensive partner network, and 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.

For more information, go to vce.com.

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