

Next-Generation VDI: The Right Solution for Remote Work Environments

Lawrence Miller

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IN THIS PAPER

GPU-accelerated virtualization solutions enable businesses to support geographically dispersed teams that rely on graphics-intensive platforms. This paper will help you discover how GPU-accelerated VDI can help you address security, privacy, and compliance challenges.

Highlights include:

- Increasing remote worker productivity and team collaboration on any device
- Delivering a superior user experience with superior application performance for complex use cases
- Simplifying remote IT support and manageability with GPU-accelerated VDI

The recent global pandemic has fundamentally redefined the nature of work, making remote working a necessity for entire organizations and student bodies. Application and desktop virtualization technology has been used in different industries for various telecommuting use cases for nearly 20 years. Now it's even more important because the remote workforce has exploded in a way that will reshape the business landscape.

Virtual desktop infrastructure (VDI) software, such as Citrix Virtual Apps and Desktops, VMware Horizon, and Windows Virtual Desktop, enables organizations to deliver a full application or desktop experience to end users across a broad array of devices and locations. But performance issues in the underlying hardware—server processors, memory configuration, and the lack of graphics cards in the configuration—have, until now, limited the use and widespread adoption of VDI.

With severe consequences for non-compliance or a data breach—including punitive fines, legal fees, recovery costs, reputation damage, and customer churn—companies must ensure continuous compliance, regardless of where their employees are working.

As applications become more graphically intensive, GPU hardware acceleration is increasingly required to deliver superior performance and return on investment (ROI) in VDI environments. By adding virtual GPU software to your VDI server infrastructure, the GPU can be virtualized and shared across multiple users, or multiple GPUs can be aggregated for a single user who needs a more powerful virtual machine (VM), as shown in **Figure 1**.

Before taking a closer look at VDI use cases, let's explore some of the modern challenges of remote working, and see how VDI solves them.

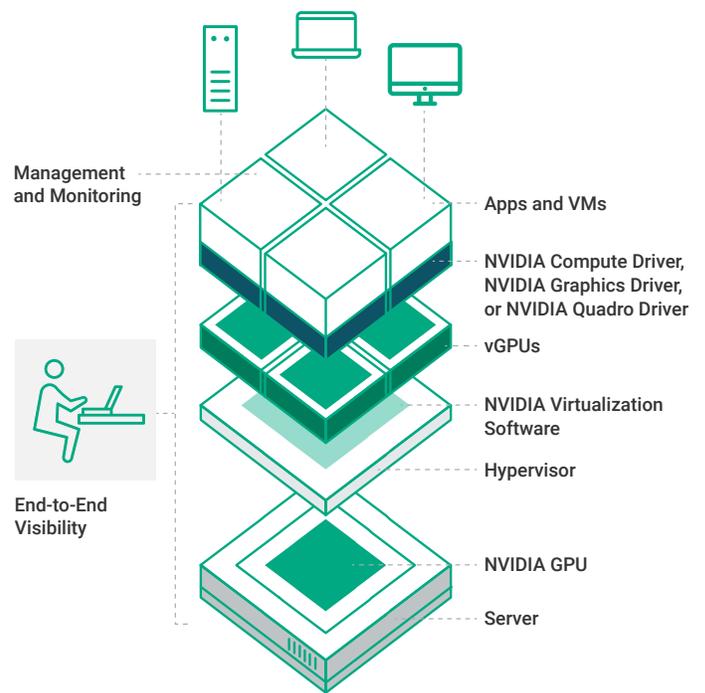


Figure 1: A high-level overview of a GPU-accelerated VDI architecture

Security

Long before the global pandemic, the notion of a security perimeter—the boundary between an organization's "trusted" network and the "untrusted" Internet—had all but disappeared. The rapid growth of cloud computing, particularly software-as-a-service (SaaS) applications, and the proliferation of mobile devices, created a "global perimeter" where businesses must balance the need for greater productivity and competitiveness against the need to protect sensitive and valuable information from increasingly sophisticated threats.

To compete successfully in a global economy, businesses must leverage the diverse talent of a global workforce and enable secure access to applications and data anywhere and on any device, all the time.

Ensuring the security and privacy of corporate applications and data was challenging enough with "bring your own device" (BYOD) policies becoming the norm in many organizations over the past decade. However, the risk of a data breach was relatively limited, primarily to corporate email on smartphones, compared to the risks inherent

in a fully remote working environment where employees access corporate applications and data from a laptop or desktop PC in their home office.

In today's environment, though, it's much more common for employees to use their own devices to supplement their company-issued ones. As a result, organizations have recognized the need to allow their employees to access corporate applications and data on their personal home computers.

VDI enables mobile users to work securely on any device while delivering a consistent desktop and application experience for greater productivity and better collaboration across teams.

The regulatory environment has also become more complex, with stringent security and privacy requirements being enacted around the world, such as:

- Australia Privacy Principles
- Brazil General Data Privacy Law
- California Consumer Privacy Act (CCPA)
- China Personal Information Security Specification
- European Union General Data Protection Regulation (GDPR)
- India Personal Data Protection Bill
- South Africa Protection of Personal Information (POPI) Act
- U.S. Health Insurance Portability and Accountability Act (HIPAA)

With severe consequences for non-compliance or a data breach—including punitive fines, legal fees, recovery costs, reputation damage, and customer churn—companies must ensure continuous compliance, regardless of where their employees are working.

VDI helps organizations address remote working security challenges by:

- Delivering a consistent, secure, and updated virtual desktop environment—including operating system and applications—to every employee, every time they log in
- Limiting the risk of malware infection from a personal home computer—access between the virtual desktop and the personal computer can be blocked and the virtual desktop image can be refreshed after every user session
- Ensuring continuous governance and regulatory compliance by keeping corporate applications and data on corporate systems (rather than letting employees save large or complex files on their local computers to work on them)

Mobility

Mobile computing has become a way of life—our smartphones are always either in our hands or within easy reach. As smartphones have become, well, smarter, the variety and functionality of business apps have increased to a level that makes it possible for people to do much of their work on a smartphone or tablet. As more 5G networks become operational, mobile computing, whether it's on a phone, tablet, or laptop, will become even more ubiquitous. 5G technologies will also enable new high-speed, real-time, bandwidth-intensive mobile use cases.

But, despite these advances in mobile devices and mobile connectivity, there are still many important applications—such as computer-aided design (CAD), 3D rendering, advanced data analytics, data modeling, and more—that can't yet run natively on a smartphone, tablet, or even a laptop computer.

At the same time, accessing these applications and uploading and downloading large files to a mobile device can take hours. The result is not only lost productivity, but also potential version control and security issues. With GPU-accelerated VDI, engineers, architects, and other professionals—as well as knowledge workers—can get started working in their applications and files in minutes rather than hours. This powerful capability extends

mobile working to all kinds of use cases for work that has traditionally been performed in an office.

VDI has the potential to address many of these mobile opportunities by delivering the full capabilities of a GPU-accelerated server in a virtual desktop. VDI enables mobile users to work securely on any device while delivering a consistent desktop and application experience for greater productivity and better collaboration across teams.

User Experience and Performance

Today, IT organizations must support a broad and diverse workforce that includes distributed offices and remote, mobile workers with a variety of roles and requirements. VDI with virtual GPU acceleration delivers the user experience and performance demanded by employees in this challenging environment, including:

- **Up to 33% better application performance**, resulting in an exceptional user experience in a VDI environment that supports multiple 4K monitors, streaming video, and WebGL
- **The ability to run any 3D professional application** virtually and provide a native experience from anywhere
- **Greater productivity** while creating amazing content with hardware-accelerated ray tracing, deep learning, and advanced shading capabilities
- **Up to 7x faster performance** with multiple GPUs dedicated to a single VM, resulting in dramatically faster production workflows
- **The power to run artificial intelligence (AI) and data science applications** in a virtualized environment by aggregating multiple GPUs
- **Elimination of idle time** waiting for large file uploads and downloads, and processing complex application data on a local desktop computer

Manageability

IT departments face increased complexity in their environments, particularly with more employees than ever working remotely, and as with most things, IT support costs continue to rise. Remote IT support capabilities have

long been recognized as an effective way to lower such costs. Ironically, remote IT support today isn't just an efficient way to support your workforce, it's essential in the current environment.

But without a VDI solution for remote working, IT support teams could increasingly find themselves troubleshooting work-related issues on an employee's personal computer, and that kind of model is fraught with hazards, including unfamiliar hardware, operating systems, and software; unknown or non-standard configurations; security and privacy issues (as discussed earlier); and potential legal liability issues ("you broke my computer"). It's unsustainable.

VDI with virtual GPU acceleration delivers the user experience and performance demanded by employees in this challenging environment.

Managing a centralized VDI environment allows organizations to create standard desktop images for their various user groups which greatly simplifies troubleshooting and support. Additionally, new employees can be onboarded with a new VM in a matter of minutes, rather than waiting potentially weeks for desktop or laptop computers with standard images to be shipped to new employees.

Addressing the challenges in today's VDI environments requires visibility into all phases of the VDI lifecycle, from design and assessment to operations and support. Each phase has its own unique challenges:

- **Design and assessment:** IT architects need to be able to right-size their VDI environment for the best end-user experience and ROI
- **Operations:** IT administrators need to efficiently deploy VDI with the requisite performance and minimal downtime, and to proactively manage and monitor their environment
- **Support:** IT help desks and admins need to provide timely VDI user support and issue resolution

To understand the needs of users, optimize use of resources, and monitor and support the environment with responsiveness and agility, IT needs a comprehensive GPU strategy that provides end-to-end visibility for the virtual environment, from host characteristics to individual virtual-GPU-enabled VMs, to a holistic view of all the VMs on a host. The benefits of manageability in a GPU-accelerated VDI environment include the ability to:

- **Increase uptime and minimize user disruptions** while also improving the efficiency of IT support teams
- **Maximize data center utilization** by enabling mixed workloads, such as running VDI as well as AI and high-performance computing (HPC) from a common hardware infrastructure
- **Right-size the VDI environment and proactively manage it** with virtual GPU management and monitoring

VDI Across Industries

VDI has long been deployed for knowledge workers across a variety of industries, including healthcare, financial services, state and local education, and government. For these workers, common desktop applications such as Word, Excel, PowerPoint, and Adobe Reader were generally all that was required. Performance issues could often be addressed with more servers, processors, memory, storage, and/or bandwidth.

However, as applications and the types of data they produce and consume become more complex, graphics-intensive, and voluminous, these traditional performance fixes quickly reach their limits. For example, high-resolution monitors, multi-monitor support for greater productivity, streaming video applications (such as YouTube and others), and WebGL are putting more stress on these environments.

Similarly, VDI use cases for professionals and creative workers in these industries, as well as in manufacturing, media and entertainment, oil and gas, architecture, engineering, and construction that traditionally could not be supported without GPU acceleration have emerged as essential in our modern world of remote and mobile work. VDI accelerated with virtual GPUs enables these use cases and more across industries.

Addressing the challenges in today's VDI environments requires visibility into all phases of the VDI lifecycle, from design and assessment to operations and support.

Accelerated Performance with HPE and NVIDIA

Virtual desktop solutions from HPE and NVIDIA help organizations overcome the challenges of mobility, collaboration, and security in a remote working environment. With the accelerated performance of NVIDIA virtual GPUs, customers enjoy a consistently superior user experience. Remote business workers, creative designers, and technical engineers can work from anywhere on any device and get the performance, security, and manageability they need to succeed in a virtual environment.

Learn more about HPE VDI solutions with NVIDIA by visiting <https://www.hpe.com/us/en/solutions/desktop-virtualization-vdi.html>.