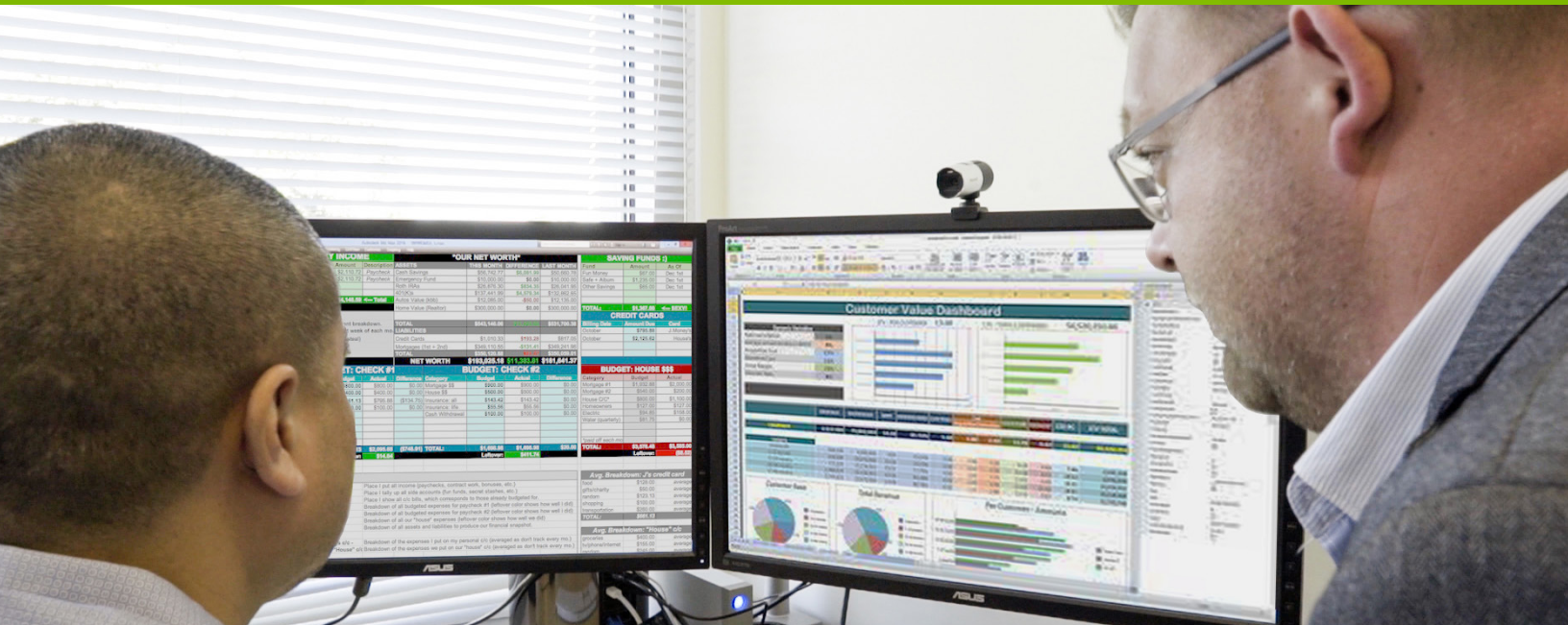


CUSTOMER SUCCESS STORY | FSI

TRANSFORMING FINANCIAL SERVICES IT WITH NVIDIA VIRTUAL GPU SOLUTIONS

THREE STORIES DEMONSTRATE
REAL-WORLD RESULTS



NVIDIA.



INTRODUCTION

The financial services industry is growing more dynamic as technology advances and the world becomes more interconnected. Erratic market conditions and new pricing pressures are prompting banks, trading firms, and insurance companies everywhere to look for a competitive edge. In this environment, many organizations are reexamining their IT infrastructure, looking for solutions that can improve user productivity, security and mobility, as well as consolidate IT infrastructure and reduce IT costs.

NVIDIA vGPU-ENABLED VIRTUAL DESKTOPS FOR THE FINANCIAL SECTOR

Many financial services companies rely on desktop virtualization to centralize data and safeguard against cyber threats. However, most virtual desktop infrastructure (VDI) environments weren't architected to support the increased graphics usage now common in most productivity applications. With GPU acceleration, VDI can support the performance—as well as the streamlined manageability and enhanced security—that financial institutions require.

Discover the benefits of NVIDIA virtual GPU (vGPU) technology:

- > **Enhanced productivity and user experience.** With graphics acceleration, financial services professionals enjoy superior performance on virtual desktops when using office productivity apps and high-performance apps, such as Bloomberg, Thomson Reuters Eikon, and electronic trading platforms.
- > **Optimal infrastructure utilization.** IT can easily configure virtual machines, allocating memory to users whether they're on two 4K or four HD or 2K screens or they need larger frame buffers for data visualization and pattern recognition.
- > **Better server density.** NVIDIA vGPUs improve the density of existing VDI environments resulting in IT cost savings while significantly upgrading the user experience.
- > **Increased scaling and manageability.** Financial services organizations often have hundreds and thousands of users to support. With NVIDIA vGPUs, IT can set up desktops for users in geographically dispersed locations in minutes. Plus, management tools such as live migration are available, ensuring IT can proactively monitor large-scale VDI deployments and prevent downtime.

NVIDIA vGPUs are transforming IT across the financial services industry. The following real-world examples highlight what's possible.



A MAJOR RETAIL AND INVESTMENT BANK MODERNIZES ITS VIRTUALIZED ENVIRONMENT

CUSTOMER PROFILE

- > **Organization:** Large retail and investment bank
- > **Headquarters:** Minneapolis, Minnesota
- > **Employees:** 235,000

SOLUTION - RETAIL BANK

SOFTWARE

- > **Hypervisor:** VMware Horizon on vSphere
- > **Graphics Acceleration:**
 - Knowledge Workers: NVIDIA GRID vPC with 1B profile and NVIDIA GRID vApps with 8A profile
 - Creative and Marketing Team: NVIDIA GRID vPC with 2B profile

HARDWARE

- > **GPU:** NVIDIA M10 GPUs

SOLUTION - TRADING FLOOR

SOFTWARE

- > **Hypervisor:** VMware Horizon on vSphere
- > **Graphics Acceleration:** NVIDIA Quadro vDWS software with 2Q or 4Q profiles

HARDWARE

- > **GPU:** NVIDIA P4 GPUs

OVERVIEW

One of the world's largest banks manages assets worth \$45 billion. Its 230,000 retail banking employees serve more than 55 million customers around the world, and its investment side has more than 4,000 traders working in multiple countries. Renewing VDI for its retail employees approximately every three years, the company's goal was to introduce technology that would help control IT costs while improving productivity. It also wanted to deploy reliable, high-performance VDI for traders. During this project, NVIDIA vGPUs were deployed in two phases: first to retail banking and then to the investment side.

PHASE 1: RETAIL BANK CHALLENGES

Refreshing its virtual desktops every three years for a sizable global workforce requires a significant investment of time and money. Every new patch and upgrade on multiple builds means the project is never done. As the company's IT team looked ahead at another upgrade cycle, it wanted to roll out a single build. It also wanted to solve the issue of a declining user experience. As core desktop applications like Microsoft Excel and PowerPoint have grown more graphics-intensive, system performance has consistently decreased year over year. The issue was made worse by users working on anywhere from two to four monitors.

Increased graphics usage by the Windows 10 operating system and the constant release of new builds by Microsoft meant that the IT team needed to strategize how to improve performance before the next upgrade. Otherwise, additional servers would be needed to handle the increased workload. The company wanted to avoid buying new hardware and, if possible, reduce the number of servers and their associated cooling and power costs.

IMPLEMENTATION

They were already running VMware Horizon on vSphere ESXi. NVIDIA worked in partnership with the IT team to install NVIDIA® M10 GPUs in its data center. Then, NVIDIA GRID® Virtual PC (GRID vPC) software at the virtualization layer was configured to meet the needs of two user groups:

- > **Knowledge workers and office staff** were allocated a 1B profile on NVIDIA GRID. This profile ensures smooth delivery of general-purpose VDI on Windows 10 using productivity apps on multiple monitors (These users typically had up to two HD displays or one 2K resolution display). Some administrators were also provided NVIDIA GRID Virtual Apps (GRID vApps) sessions, which were spun up as needed with an 8A profile.
- > **Creative and marketing teams** working on promotional materials, like brochures, were assigned a 2B profile on NVIDIA GRID. This profile meets the high-performance requirements of more graphics-intensive apps, such as Adobe® Photoshop®, and homegrown apps with higher-resolution, multi-monitor support (These users typically had up to two 4K or four HD or 2K resolution displays).

Key NVIDIA Benefits

- > **Improved server density.** Adding NVIDIA GRID vPC and M10 GPUs to the data center increased the company's server density by 30 percent. As a result, the company reduced its total number of servers and anticipates significant cost savings.
- > **Native-PC experience.** As the IT team rolls out Windows 10, users aren't logging any issues with performance, despite the increased graphics requirements.
- > **Multiple Display Work Environments.** Support for multiple 4K and HD displays provides opportunities for employees to expand their workspace and increase their productivity.
- > **Efficient collaboration.** Creative department users working on graphics-intensive apps, like Adobe Photoshop, can collaborate in real time on collateral like brochures and proposals while information is securely stored in the data center, ensuring no leaks prior to a planned public release.

PHASE 2: TRADING FLOOR CHALLENGES

The retail bank's success with NVIDIA virtual GPUs inspired other parts of the firm to consider deploying NVIDIA virtual desktops. Deploying VDI on the company's trading floor could solve many IT hassles. By providing thin clients with a single sign-on, adds, moves, and changes would no longer require the typical labor-intensive and costly process of moving physical PCs around the trading floor. Plus, security, remote access, and disaster recovery would be built into the environment. Backend IT support would be simplified with technicians doing updates, patches, and repairs remotely.

However, with technical problems leading to potentially millions in lost revenue per minute, the company needed proof that VDI could deliver reliable performance without latency problems. Traders were accustomed to snappy application performance on physical workstations equipped with GPUs to handle two to four 4K resolution monitors each. The new thin clients needed to deliver performance that was at least as good as PCs, whether traders were working on Bloomberg, Thomson Reuters Eikon, electronic trading platforms, or homegrown apps in Windows 10.

IMPLEMENTATION

Before replacing PCs with thin clients, the company's IT team requested a proof of concept (POC), and NVIDIA demonstrated the performance and reliability of vGPUs on thin clients running multiple 4K monitors. The IT team purchased additional NVIDIA P4 GPUs for the data center and licenses of NVIDIA Quadro® Virtual Data Center Workstation (Quadro vDWS) software for every trader. Each user was assigned a 2Q or 4Q profile for high-performance VDI on Windows 10. This solution ensured graphics-intensive financial apps and homegrown apps were highly responsive on up to four 4K resolution monitors with 10 to 20 windows open at a time.

Key NVIDIA Benefits

- > **Zero downtime.** NVIDIA's support of live migration of GPU-accelerated virtual machines ensures high system availability. The company's IT team can perform workload leveling, infrastructure resilience, and server software upgrades 24/7 without end-user disruption or data loss.
- > **Multiple monitor support.** Every trader now works on a thin client that displays on multiple 4K resolution monitors seamlessly.
- > **Exceptional user experience.** Graphics acceleration ensures that traders never experience the high latency and poor user experience of typical VDI deployments. With NVIDIA, they can instantly view data exactly when and where they need it.
- > **Simplified management.** With NVIDIA software, the IT team can remotely monitor system usage and allocate additional memory to individual traders when they need it, ensuring optimal infrastructure usage and a streamlined user experience.



A PROPRIETARY TRADING FIRM IMPROVES PRODUCTIVITY AND MOBILITY TO EXPAND BUSINESS

CUSTOMER PROFILE

- > **Organization:** Proprietary trading firm
- > **Headquarters:** Chicago, Illinois
- > **Employees:** 200

SOLUTION

SOFTWARE

- > **Hypervisor:** Citrix Virtual Desktop on Citrix Hypervisor
- > **Graphics Acceleration:**
 - Knowledge Workers: NVIDIA GRID vPC with 1B profile
 - Traders: NVIDIA Quadro vDWS with 2Q or 4Q profiles

HARDWARE

- > **GPU:** NVIDIA M10 GPUs

OVERVIEW

A small proprietary trading firm leveraged its innovative technology to exponentially grow its assets over a few years. Its once 50-member workforce grew to several hundred traders and administrative staff, and managing IT for staff working on physical PCs was becoming cost-prohibitive. Looking ahead, the firm wanted to expand its team to multiple locations and improve business mobility to attract independent traders. Deploying reliable, high-performance virtual desktops was a key business objective for cost-effectively scaling the firm.

CHALLENGES

Updating IT infrastructure across the entire firm required a large financial investment. The IT team wanted to control costs on its new virtual desktop deployment by replacing the hardware in its data center while repurposing its aging PCs as thin clients. A primary concern was maximizing performance on these PCs while minimizing new server costs. Ideally, the firm wanted to get the highest user density per server to control infrastructure costs in the long term. It also wanted to upgrade to Windows 10 and avoid any performance issues.

Another goal was improving staff productivity. PC performance had been slowing down, with analysts experiencing significant lag time while performing simple tasks in common business applications, such as scrolling through a 300-page PDF. Additionally, staff needed additional monitors for better multi-tasking. The new VDI environment needed to provide quick access to financial and productivity applications on multiple monitors without slowing anyone down.

IMPLEMENTATION

NVIDIA partnered with the firm to deploy a VDI solution using Citrix Virtual Desktop running on Citrix Hypervisor that included graphics acceleration. NVIDIA M10 GPUs were installed in a new hyperconverged infrastructure in its data center. Licenses of NVIDIA GRID vPC and NVIDIA Quadro vDWS software were purchased to meet the needs of two user groups:

- > **Knowledge workers and office staff** were allocated a 1B profile on NVIDIA GRID vPC. This profile delivers general-purpose VDI on Windows 10 for users working on productivity apps with multiple monitors (typically up to two HD displays or one 2K display).
- > **Financial analysts, advisors, and traders** were assigned a 2Q or 4Q profile on NVIDIA Quadro vDWS for meeting the requirements of graphics-intensive financial apps, such as Bloomberg and Thomson Reuters Eikon, and homegrown apps with multi-monitor support (up to four 4K displays).

Key NVIDIA Benefits

- > **Lower latency.** Graphics acceleration ensures that the new VDI deployment doesn't impact staff productivity. Today, traders don't experience any issues with latency when accessing the latest market trends or using high-performance financial apps.
- > **Multiple monitor support.** Every user now works on a thin client that displays on multiple HD or 4K monitors seamlessly.
- > **Improved server density.** IT is able to meet their internal cost model with improved density and reduced infrastructure costs.
- > **Increased mobility.** Business mobility ensures the firm can hire the best industry talent. New independent traders can quickly access all the firm's IT resources anytime, from any device.



A GLOBAL INSURANCE COMPANY UPGRADES USER EXPERIENCE WHILE LOWERING IT COSTS

CUSTOMER PROFILE

- > **Organization:** Global insurance company
- > **Headquarters:** United Kingdom
- > **Employees:** 125,000

SOLUTION

SOFTWARE

- > **Hypervisor:** Citrix Virtual Desktop on VMware vSphere
- > **Graphics Acceleration:**
 - Knowledge Workers: NVIDIA GRID® vPC with 1B profile
 - Terminal Services Users: NVIDIA GRID® vApps with 8A profile

HARDWARE

- > **GPU:** NVIDIA M10 GPUs

OVERVIEW

With 125,000 employees in Europe, Asia, and North America, one of the world's largest insurance companies needed to renew IT across its offices worldwide. Ideally, the company wanted a solution that didn't require the purchase of additional hardware and enabled the consolidation of 10–20 data centers around the globe. Additionally, the solution needed to deliver excellent user experiences on Windows 10 and modern productivity applications.

CHALLENGES

Several years ago, this global insurance company deployed CPU-based VDI to 100,000 of its employees. Since then, business and productivity requirements expanded beyond the capabilities of its VDI environment. Every employee workspace is on a dual-monitor configuration, and many users need to work on multiple 4K resolution monitors. Additionally, the firm's internal IT services provider wanted to upgrade to Windows 10, which requires increased graphics usage compared to prior versions of Windows. The company's virtual desktop environment wasn't designed to handle the increased graphics requirements of either scenario without negatively impacting user experience.

Various departments around the world were on a mix of Microsoft Windows Remote Desktop Services (Terminal Services) and Citrix Virtual Desktop on VMware vSphere Hypervisor. The IT team wanted to update infrastructure and consolidate data centers to streamline management and reduce costs. It was also important to enable a 24/7 production cycle to maintain server health.

IMPLEMENTATION

NVIDIA proved the power of its virtual GPU solutions during a POC with internal users using a side-by-side demonstration. In the demonstration, they were able to experience virtual desktops running on Windows 10 in the firm's current VDI environment and compare it to running the same virtual desktops and operating system in a GPU-accelerated environment. Virtual GPU acceleration delivered much better performance and significant price efficiency—the cost was lower than expected by a few dollars per month per user. The company installed NVIDIA M10 at its data centers worldwide and deployed two NVIDIA GRID software solutions for two groups:

- > **Virtual Desktop Users:** For users on general-purpose VDI running Windows 10 and office productivity apps on multiple monitors (up to two HD displays or one 2K display), the firm opted for NVIDIA GRID vPC software with a 1B profile.
- > **Terminal Services Users:** For users on VDI running Windows 10 and Citrix XenApp with Terminal Services, it chose NVIDIA GRID vApps software with an 8A profile.

Key NVIDIA Benefits

- > **Minimized downtime and delays.** NVIDIA virtual GPU software supports live migration with VMware vMotion. Live migration of GPU-accelerated virtual machines means high system availability—IT can perform workload migration, while users continue to have access to applications they need, ensuring high productivity.
- > **Improved user experience.** Users are no longer logging tickets with IT due to slow VDI performance. The VDI environment performs like a native-PC experience, even for users on multiple monitors on Windows 10.
- > **Reduced costs.** Server density improved by 25 percent, which also saved the company on rack space, climate control, and power costs.
- > **Increased manageability.** The IT team can set up customized vGPU-enabled desktops for users in geographically dispersed locations in minutes. Troubleshooting and upgrades are easily handled remotely.

To learn more about NVIDIA virtual GPU solutions visit:
www.nvidia.com/virtualgpu

www.nvidia.com



© 2019 NVIDIA Corporation. All rights reserved. NVIDIA, the NVIDIA logo, NVIDIA GRID, NVIDIA Quadro, and NVIDIA Tesla are trademarks and/or registered trademarks of NVIDIA Corporation. All company and product names are trademarks or registered trademarks of the respective owners with which they are associated. MAY19

