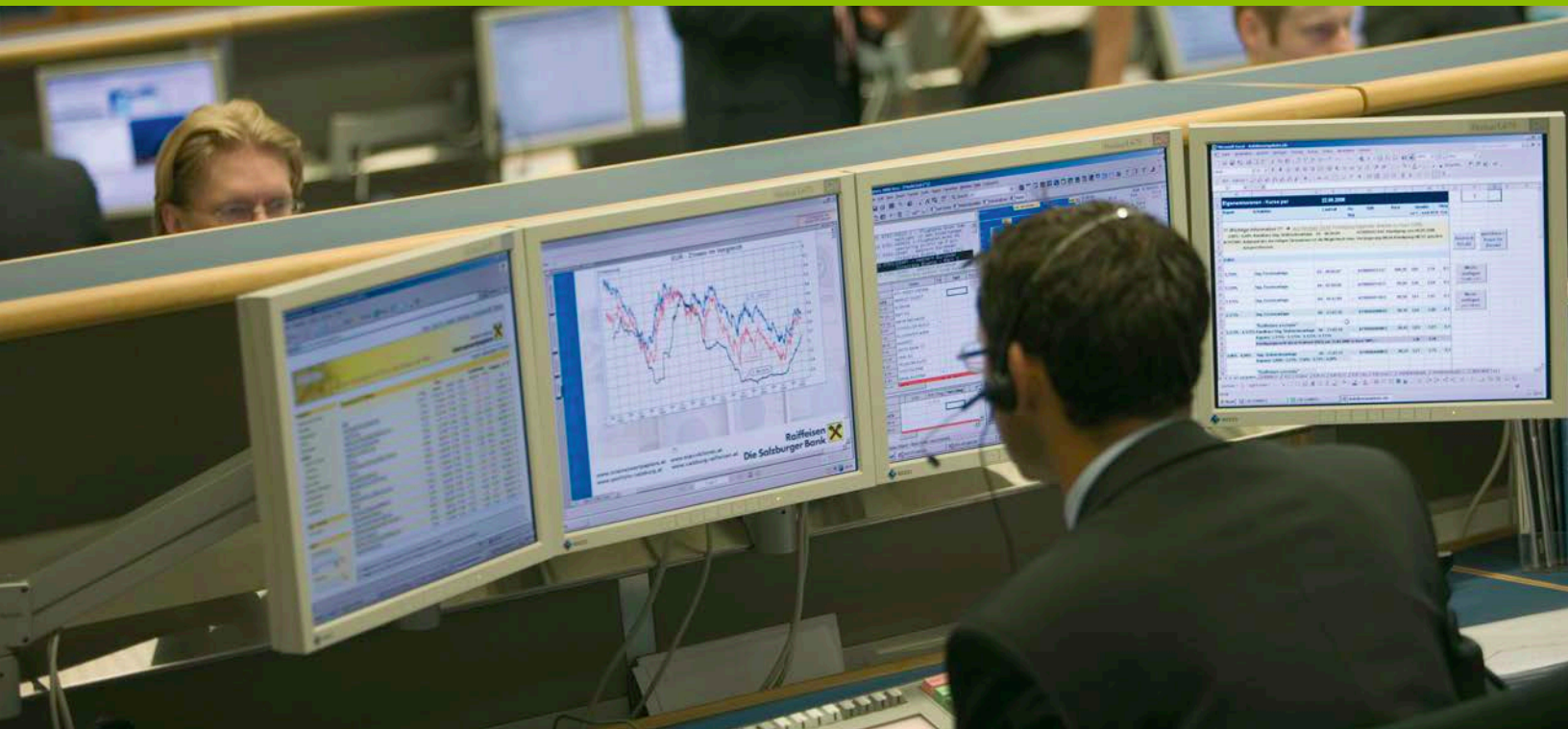# DIGITAL TRANSFORMATION IN THE FINANCIAL SERVICES INDUSTRY

Increase Mobility, Deliver Great User Experiences, and Reduce Downtime with NVIDIA Virtual GPU Solutions

The financial services industry is comprised of several sectors, ranging from investment banking and trading to retail and insurance. Today, all are facing challenges to improve scalability and mobility while also meeting stringent security and regulatory compliance requirements. To stay ahead of the market and competitors, professionals in the financial services industry need to access their workspace from anywhere, on any device, with a great experience. This becomes even more difficult with the advent of Windows 10, which impacts every sector in the financial industry. For example, financial analysts and advisors routinely scroll through countless screens of data. Without graphics acceleration, common operations in business applications like scrolling through a 300-page PDF, are plagued with significant lag time which reduces productivity.
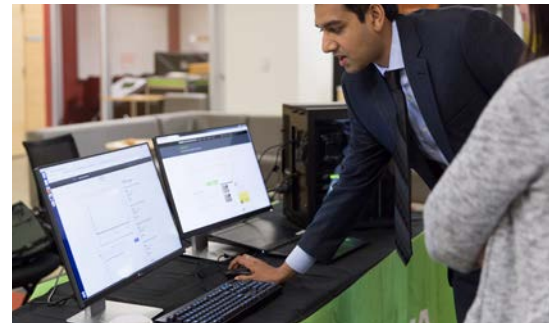
The trading floors, in particular, have unique challenges that can only be solved by virtualized solutions. Traders need mobility and are often moved around, along with their systems, to work closely with groups specializing in equity, commodities, or risk income. They also need to be up and running constantly, working on physically small desk areas. Multi-monitor support is the desired approach, as some professionals may have up to 15 applications open at a time. In addition to safeguarding data from information breaches and insider trading, data must also be preserved in the event of natural and man-made disasters to ensure the trading floor can be restored in no time.

Because every second of downtime translates to lost revenue, the financial services industry is very conservative and requires stable systems. It's not uncommon that some organizations are still on Windows XP because they haven't had time to upgrade their systems and cannot afford downtime.

> Brokers can lose $4 million in revenue per millisecond if their electronic trading platform is 5ms behind the competition.[1]

> The financial services industry is the one most-breached sector, with an average total cost of data breach of $18.37 million.[2]

> The financial services sector, including banking and insurance, is the largest contributor to the desktop virtualization revenue forecast through 2020 - security being one of the major driving factors.[3]

[1] Quantifying the Impact of Virtual GPUs, August 2019.

[2] Cost of Cybercrime, 2019

[3] BusinessWire. Research and Markets: Desktop Virtualization Market - Forecast and Trends (2015 - 2020).

NVIDIA VIRTUALIZATION TECHNOLOGY DELIVERS A MOBILE DIGITAL WORKPLACE THAT REDUCES DOWNTIME AND BOOSTS SECURITY

Financial services organizations are embracing virtualization solutions to increase mobility, ensuring anytime access to data while also enabling improved security. In addition, they need to increase the quality of performance and user experiences in modern office applications that are substantially more graphics intensive. By adding NVIDIA virtual GPU solutions to their VDI environments, organizations are centralizing apps and data, delivering cost-effective VDI performance that scales. Plus, they can provide virtual workspaces for knowledge workers, power users, and mobile professionals that offer improved management, security, and productivity. The benefits of virtual GPU are significant:

> **Enhance Productivity and User Experience.** Financial services professionals can now access their workspace from anywhere, on any device with a native PC-like experience. With graphics acceleration, financial services organizations can take full advantage of Windows 10 and modern business apps—including key apps such as Bloomberg and homegrown, customized apps—with significantly lower latency. In addition, NVIDIA virtualization solutions can satisfy unique financial services productivity requirements such as multi-monitor support for brokerage systems and larger frame buffers for better data visualization and pattern recognition.

> **Increase Manageability and Scalability.** In all sectors, financial services organizations often have to support hundreds and thousands of users with requirements ranging, from rolling out systems to quickly resolving issues. Moreover, on trading floors, every second of downtime equates to thousands of dollars in lost revenue. Now, financial services organizations can centralize data and applications in the data center, delivering virtual workspaces with improved manageability, security, and performance while reducing downtime and support costs. IT can also easily manage large-scale virtualization deployments with end-to-end visibility of the organization's infrastructure and proactive monitoring.

> **Bolster Security and Regulatory Compliance.** As a heavily regulated industry, financial services organizations must safeguard data against information breaches and insider trading or face serious consequences. By securely hosting sensitive financial information within the data center, organizations can improve their overall security while simultaneously protecting data in the event of disaster. Not only does virtualization allow more users to securely access more applications, it also enables secure work-from-anywhere workstyles.

WHAT IS GPU VIRTUALIZATION?

GPU virtualization enables every virtual machine to leverage the same GPU benefits as a physical desktop. Because work that is typically done by the CPU has been offloaded to the GPU, users enjoy a much better experience and more users can be supported.

NVIDIA VIRTUAL GPU SOLUTIONS

NVIDIA Virtual PC and Virtual Apps

The **NVIDIA Virtual PC/Virtual Apps** (vPC/vApps) is designed for general-purpose VDI across all sectors of the financial services industry.

BENEFITS

Support for the increasing graphical requirements of Windows 10 and modern productivity applications

Support up to two 4K or four HD resolution monitors for increased productivity

Cost-effective solution to scale VDI across your organization for as little as $2 per user per month[4]

Lower IT management costs

Security enforced in the data center

Increased employee mobility

Central management of business continuity and disaster recovery

COMMON APPLICATIONS

Windows 10, Microsoft Office 365, modern browsers, advisory and
analysis software, proprietary and custom applications

NVIDIA RTX Virtual Workstation

The **NVIDIA RTX Virtual Workstation** (vWS) is designed for high-frequency, super traders.

BENEFITS

Support for up to two 8K resolution monitors and large frame buffer sizes for increased productivity

Security enforced in the data center

Lower IT management costs

Increased trader mobility

Central management of business continuity and disaster recovery

Guaranteed zero downtime, even during maintenance with Live Migration

Support latest RTX-enabled applications for real time ray tracing

COMMON APPLICATIONS

Bloomberg, Eikon, Reuters, other electronic trading platforms

CUSTOMER EXAMPLES

Unleashing Productivity

Cornerstone Home Lending, Inc. based in Houston, Texas, USA, realized that even its core desktop applications were becoming more graphics-intensive and its previous virtualization solution left employees with poor user experiences. With NVIDIA vPC, Cornerstone was able to deliver a low-latency, high-quality user experience — especially for modern business applications like streaming video and social media, which are key to Cornerstone's marketing campaigns.

Mobility That Knows No Limits

A multinational financial services corporation based in the Northeast, USA, was experiencing performance issues and a lack of mobility on their trading floor, with 300 traders using thin clients with multi-monitor support. With NVIDIA vGPU, productivity improved as a result of lower latency and fast access to the latest data and market trends. IT was also able to meet their internal cost model with improved density and lower infrastructure costs.

Continuous Uptime for All

An American hedge fund based in New York, USA, needed to incorporate remote access for traders. After the experience of "Superstorm Sandy," they wanted to ensure high availability in the event of other natural or man-made disasters. Before GPUs, they were unable to implement VDI properly and get the right level of performance or monitor resolution they needed. They migrated from NVIDIA GRID K1 to NVIDIA GPUs with RTX vWS and saw significant improvements in performance and manageability for more than 50 traders.
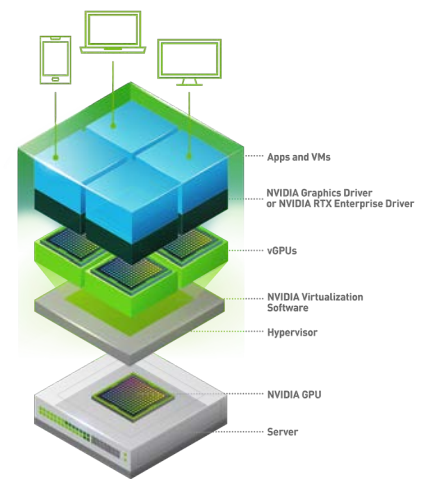
[4] Assumes cost of subscription, NVIDIA GRID vGPU software, and hardware, with three-year amortization of hardware of two M10 cards supporting 87 vApps users.

KEY FINANCIAL SERVICES USER GROUPS

	POWER TRADERS AND FINANCIAL ANALYSTS	RETAIL BANKERS, INVESTMENT MANAGERS, FINANCIAL ADVISORS, AND INSURANCE AGENTS
USE CASES	For running network-heavy apps (Bloomberg, Reuters, Eikon) on multi-monitors, with security, redundancy, and continuity	For simultaneously running productivity and financial apps, and general-purpose VDI with multi-monitor support on Windows 10
RECOMMEND	vWS on A40 (supports up to two 8K displays)	vPC/vApps on A16 (supports up to four HD or two 4K or one 5K displays)

HOW NVIDIA VIRTUAL GPU WORKS

In a VDI environment powered by NVIDIA virtual GPUs, the NVIDIA virtual GPU software is installed at the virtualization layer along with the hypervisor. This software creates virtual GPUs that let every virtual machine (VM) share the physical GPU installed on the server. The NVIDIA virtualization software includes a graphics driver for every VM. vWS includes, for example, the powerful Quadro driver. Because work that is typically done by the CPU is offloaded to the GPU, demanding engineering and creative applications are supported in a virtualized and cloud environment, delivering a much better user experience.

Apps and VMs
NVIDIA Graphics Driver or NVIDIA RTX Enterprise Driver
vGPUs
NVIDIA Virtualization Software
Hypervisor
NVIDIA GPU
Server

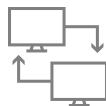## WHAT MAKES NVIDIA VIRTUAL GPU POWERFUL

EXCEPTIONAL USER EXPERIENCE

The ability to support both compute and graphics workloads for every vGPU

BEST USER DENSITY

The industry's highest user density solution with 2x the user density with A16 compared to the previous generation M10, reducing the amount of hardware resources needed and lowering your TCO

CONTINUOUS INNOVATION

Regular cadence of new software releases that ensures you stay on top of the latest features and enhancements

PREDICTABLE PERFORMANCE

Consistent performance with guaranteed quality of service, whether on-premises or in the cloud

OPTIMAL MANAGEMENT AND MONITORING

End-to-end management and monitoring to deliver real-time insight into GPU performance, plus broad partner integrations so you can use the tools you know and love

BROADEST ECOSYSTEM SUPPORT

Support for all major hypervisors and the most extensive portfolio of professional apps certifications with Quadro drivers

For more information, visit **www.nvidia.com/virtualgpu**