

# DIGITAL TRANSFORMATION IN THE FINANCIAL SERVICES INDUSTRY

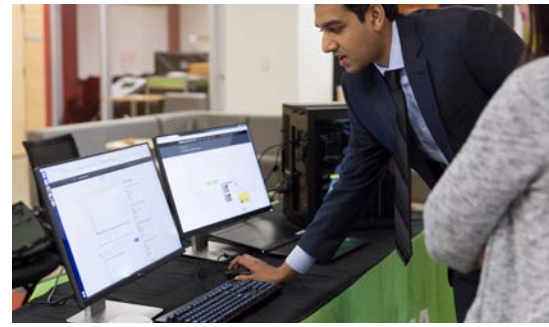
Increase Mobility, Deliver Great User Experiences, and  
Reduce Downtime with NVIDIA Virtual GPU Solutions



**NVIDIA**

NVIDIA VIRTUAL GPU | BROCHURE | JUL20

The financial services industry is comprised of several sectors, from investment banking and trading to retail and insurance. Today, they're all facing challenges in improving scalability and mobility while 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 any device, anywhere, with a great experience. This becomes even more challenging with the advent of Windows 10, which impacts every sector in the financial industry. For example, financial analysts and advisors routinely scroll through screens upon screens of data. Without graphics acceleration, functionality in common business applications, such as being able to scroll through a 300-page PDF, is plagued with significant lag time and results in reduced productivity.



The trading floors, in particular, have unique challenges that are generating the need for virtualized solutions. Traders need mobility and are often moved around, along with their systems, to work closely with different groups like equity, commodities, or risk income. They also need to be constantly up and running, and have physically small desk areas. Multi-monitor support is the desired approach, as some may have as many as 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 that the trading floor can be up and running 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.

- > Brokerage firms and stock exchanges stand to lose millions of dollars if transactions or trading were interrupted for just minutes during normal business hours.<sup>1</sup>
- > The financial services industry is the most-breached sector, experiencing 35% of all data breaches, with an average total cost of data breach of \$10.1 million.<sup>2,3</sup>
- > 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.<sup>4</sup>

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<sup>1</sup> [ITIC Blog](#) (2013, July 24). One hour of downtime costs > \$100K for 95% of enterprises.

<sup>2</sup> [Forbes Insights](#). What Financial Services Executives Need To Know About Data Security. January 15, 2019.

<sup>3</sup> [Identity Theft Resource Center and Generali Global Assistance](#). The Impact of Cybersecurity Incidents on Financial Institutions. February 2018.

<sup>4</sup> [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 looking to 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, these organizations can centralize 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 needs 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 hundreds and thousands of users to support, from rolling out systems to quickly resolving issues. Moreover, on trading floors, every second of downtime equates to thousands of dollars lost. 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 get the same GPU benefits as a physical desktop. Because work that was typically done by the CPU has been offloaded to the GPU, the user has a much better experience and more users can be supported.

# NVIDIA VIRTUAL GPU SOLUTIONS

<h2>Virtualization with NVIDIA GRID® and NVIDIA® GPUs</h2> <p>The <b>NVIDIA GRID Virtual PC/Virtual Apps</b> (GRID vPC/vApps) is positioned for general-purpose VDI across all sectors of the financial services industry.</p>	<h2>Virtualization with NVIDIA Quadro® vDWS and NVIDIA® GPUs</h2> <p>The <b>NVIDIA Quadro® Virtual Data Center Workstation</b> (Quadro vDWS) is positioned for high-frequency, super traders.</p>	<h2>NVIDIA Virtual Compute Server</h2> <p>The <b>NVIDIA Virtual Compute Server (vCS)</b> is ideal for running compute intensive workloads including AI, data science, and high-performance computing (HPC).</p>
<h3>BENEFITS</h3> <ul style="list-style-type: none"> <li>Support for the increasing graphical requirements of Windows 10 and modern productivity applications</li> <li>Support up to two 4K or four HD resolution monitors for increased productivity</li> <li>Cost-effective solution to scale VDI across your organization for as little as \$2 per user per month<sup>4</sup></li> <li>Lower IT management costs</li> <li>Security enforced in the data center</li> <li>Increased employee mobility</li> <li>Central management of business continuity and disaster recovery</li> </ul>	<h3>BENEFITS</h3> <ul style="list-style-type: none"> <li>Support for up to two 8K resolution monitors and large frame buffer sizes for increased productivity</li> <li>Security enforced in the data center</li> <li>Lower IT management costs</li> <li>Increased trader mobility</li> <li>Central management of business continuity and disaster recovery</li> <li>Guaranteed zero downtime, even during maintenance with Live Migration</li> <li>Support latest RTX-enabled applications for real time ray tracing.</li> </ul>	<h3>BENEFITS</h3> <ul style="list-style-type: none"> <li>Run applications in virtual machines and containers for improved manageability and security.</li> <li>Harness the power of multiple GPUs in a single VM to scale application performance or share a GPU across multiple VMs for improved efficiency.</li> <li>Eliminate data center silos and leverage the same hypervisor management tools for both compute and graphics workloads</li> <li>Maximize infrastructure utilization by running compute-intensive workflows during the night when utilization of VDI is lower</li> </ul>
<h3>COMMON APPLICATIONS</h3> <p>Windows 10, Microsoft Office 365, modern browsers, advisory and analysis software, proprietary and custom applications</p>	<h3>COMMON APPLICATIONS</h3> <p>Bloomberg, Eikon, Reuters, other electronic trading platforms</p>	<h3>COMMON APPLICATIONS</h3> <p>FRAMEWORKSRAPIDS, TensorFlow, MXNet</p>

## CUSTOMER EXAMPLES

 <h3>Unleashing Productivity</h3>	 <h3>Mobility That Knows No Limits</h3>	 <h3>Continuous Uptime for All</h3>
<p>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 GRID, 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. Most people don’t know it is virtualization, but they know they have access to the applications they need anywhere.</p>	<p>A multinational financial services corporation based in the Northeast, USA, was experiencing performance issues and lack of mobility on their trading floor, with 300 traders using thin clients with multi-monitor support. With NVIDIA GRID, productivity improved as a result of lower latency and fast access to the latest data and market trends. IT was able to meet their internal cost model with improved density and lower infrastructure costs.</p>	<p>An American hedge fund based in New York, USA, needed to ensure 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 not able to implement VDI properly and get the right level of performance and monitor resolution they needed. They migrated from NVIDIA GRID K1 to NVIDIA Tesla GPUs with Quadro vDWS and saw significant improvements in performance and manageability for more than 50 traders.</p>

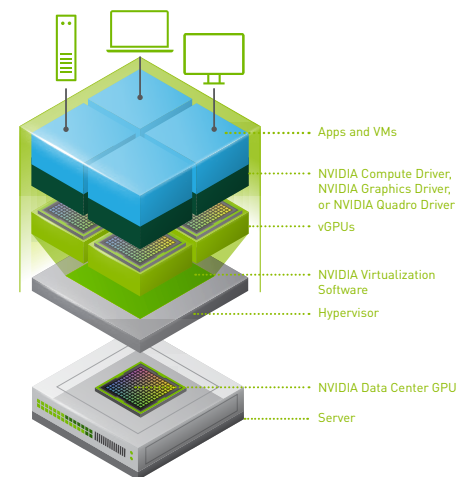
<sup>4</sup> Assumes cost of subscription, NVIDIA GRID software, and hardware, with three-year amortization of hardware of two Tesla M10 cards supporting 87 vApps users.

# KEY FINANCIAL SERVICES USER GROUPS

	POWER TRADERS AND FINANCIAL ANALYSTS	RETAIL BANKERS, INVESTMENT MANAGERS, FINANCIAL ADVISORS, AND INSURANCE AGENTS	IT MANAGERS, RESEARCHERS, DATA SCIENTISTS
<b>USE CASES</b>	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	For compute intensive workloads including AI, deep learning, and high performance computing (HPC) in a fully virtualized environment
<b>RECOMMEND</b>	Quadro vDWS on T4, RTX 6000/8000, V100S, or P6 (supports up to two 8K displays)	GRID vPC/vApps on T4, M10, or P6 (supports up to four HD or two 4K or one 5K displays)	GRID vCS on T4 or V100S or RTX 6000/8000

## 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. Quadro vDWS includes, for example, the powerful Quadro driver. Because work that was typically done by the CPU is offloaded to the GPU, the user has a much better experience, and demanding engineering and creative applications can now be supported in a virtualized and cloud environment.



## WHAT MAKES NVIDIA VIRTUAL GPU POWERFUL

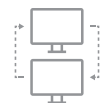
### EXCEPTIONAL USER EXPERIENCE

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



### BEST USER DENSITY

Support for up to 24 virtual desktops per physical GPU, or lower TCO with up to 8 vGPU profiles for the most flexibility to provision resources to match users' needs



### 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



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For more information, visit [www.nvidia.com/virtualgpu](http://www.nvidia.com/virtualgpu)

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