NVIDIA VIRTUAL PC AND VIRTUAL APPS
GPU-ACCELERATED PERFORMANCE FOR THE VIRTUAL ENTERPRISE

Desktop virtualization has been around for many years, but some organizations still struggle to deliver a user experience that stands up to what workers have enjoyed on physical PCs. Remote offices, virtual collaboration, and fast access to information, coupled with the rising use of modern, graphics-intensive applications, make GPUs more relevant than ever.

NVIDIA® Virtual PC (vPC) and Virtual Apps (vApps) improve virtual desktops and applications for every user, with proven performance built on NVIDIA GPUs for exceptional productivity, security, and IT manageability. The virtualization software divides NVIDIA GPU resources, so the GPU can be shared across multiple virtual machines running any application.

Here are three powerful reasons to deploy vPC and vApps in your data center.

Reason 1: Flexible Workers Require a Seamless Experience

As organizations form return to work plans, it is clear that remote work will be part of the long term solution. By allowing employees to seamlessly transition between the office and home, organizations are adopting the flexible office model. User experience has become more important than ever. Video collaboration, as well as simple productivity applications found in Microsoft Windows 10 (Win 10), Office 365, web browsers, and streaming video can benefit from GPU acceleration.

82% of organizations have the option of working remotely.

Traditional desktop and laptop PCs boost application performance with embedded or integrated GPUs.

However, when making the transition from physical to virtual, IT has traditionally left the computer graphics burden—such as from DirectX and OpenGL workloads and video streaming—to be handled by a server CPU. This has caused a performance bottleneck that limits scale and compromises the user experience. Now, IT departments can take advantage of GPU technology to deliver a virtual desktop experience that's as good as a physical device.

Reason 2: Modern Digital Employees Need Access to Multiple Devices

Information workers, designers, and engineers can realize up to a **42%** increase in productivity through the use of multiple displays.[1]

Knowledge workers have changed the way they work. In today's fast-paced, digital world, technology has altered information accessibility. Knowledge workers have multiple devices and expect access to the web conferencing and productivity tools applications they need, anytime, with seamless experience between those devices, while collaborating with remote teams. The modern digital workplace includes multiple devices, multiple 4K resolution monitors, and consistent performance. No longer used only by professionals in the financial services or healthcare industries, multi-monitor setups have quickly become an affordable and effective way to boost productivity.

At the same time, software developers and electronic design automation (EDA) engineers, and designers that require Linux-based development environments, can also increase productivity by utilizing the like-native experience that vPC provides.

Reason 3: There Are More Users to Support Than Ever Before

Today's virtual desktops and applications require graphics acceleration for a native-PC experience. With NVIDIA, you can deliver GPU-acceleration to every virtualized user and support up to 64 concurrent users on a GPU card.[2] 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 developed a benchmarking tool based on a methodology that measures key aspects of the user experience. The results of the testing showed that a GPU-enabled VDI environment delivered better user experience with improved end user latency and more remoted frames. **Even with 30%** more users than the CPU-only virtual desktop environment, the GPU-accelerated virtual desktop environment provided an incomparably better experience.[3]
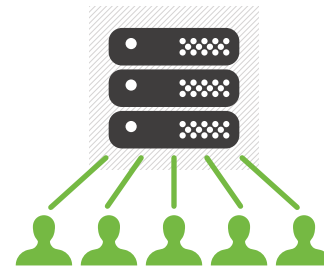
30% more users can be supported with a better Win10 VDI user experience with a GPU.[3]

NVIDIA enables organizations to extend the reach of their virtual desktop infrastructure (VDI) investment and give every user a native-PC experience that meets the needs of today's graphic-intensive applications.

Cost Effectively Scale VDI Across Your Enterprise With NVIDIA

Contact your NVIDIA sales specialist for details.

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[1] John Peddie Research. October 16, 2017. **Jon Peddie Research: Multiple Displays Can Increase Productivity By 42%.**
[2] This assumes the NVIDIA® A16 GPU with 1 GB frame buffer per user.
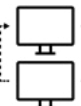[3] **NVIDIA vPC Sizing Guide.**

NVIDIA Delivers Productivity Without Boundaries

Native-PC Experience

Utilize NVIDIA software with GPUs to deliver responsive, virtual workspaces that perform like native PCs, for every user. Now, mobile professionals and knowledge workers can enjoy virtual desktops that are optimized for web conferencing and productivity applications.

Better Server Density

Bypass the challenges of modern applications and operating systems such as Windows 10 that are more graphics intensive and result in lower server density of VDI deployments. Increase user density and deliver a better user experience with NVIDIA virtual GPU solutions.[3]

Multiple Monitor

Support multiple HD displays and up to two 4K or one 5K-resolution displays to expand your workspace, enhance multi-tasking, and increase productivity.

Linux OS Applications

Deliver the benefits of like-native performance of VDI environments to software developers and EDA designers who rely on a Linux-based development environment.
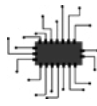
Video Performance

Optimize video performance and scalability through hardware encode/decode via NVIDIA NVENC. Support the latest video-compression standards, including HEVC/H.265 codec.

Investment Protection

Support increasing graphical requirements of Windows 10 and modern productivity applications, with continuous innovation delivered through every vGPU software release.

NVIDIA Feature List

Configuration and Deployment	vPC	vApps
Desktop Virtualization	✔	
Remote Desktop Session Host (RDSH) App Hosting	✔	✔
RDSH Desktop Hosting	✔	✔
Windows OS Support	✔	✔
Linux OS Support	✔[4]	
GPU Pass-Through Support[5]		✔
Bare Metal Support[6]		✔
NVIDIA Graphics Driver	✔	✔
Guaranteed Quality-of-Service Scheduling[7]	✔	✔

Display	vPC	vApps
Maximum Hardware Rendered Display	Four HD, Two 4K[4], One 5K[13]	One[8]
Maximum Resolution	5120 x 2880[13]	1280 x 1024

[4] Support starts with the NVIDIA virtual GPU software March 2018 release (version 6.0).
[5] GPU pass-through is only supported on 1:1 profiles.
[6] Only NVIDIA® M6 hardware is supported as a primary display device.
[7] Scheduling options include fixed share, equal share, and best effort/time slicing.
[8] NVIDIA vApps supports one 1280x1024 display from the GPU card. However, Citrix renders to an offscreen buffer, so it can support multiple software-rendered displays at higher resolutions.

Data Center Management	vPC	vApps
Host-, Guest-, and Application-Level Monitoring[9]	✓	✓
Live Migration[4]	✓	✓

Support	vPC	vApps
NVIDIA Direct Enterprise-Level Technical Support	✓	✓
Maintenance Releases, Defect Resolutions, and Security Patches for up to Three Years[10]	✓	✓

Advanced Professional Features	vPC	vApps
CUDA/OpenCL		✓[11]

Graphics Features and APIs	vPC	vApps
NVENC	✓	
OpenGL Extensions, Including WebGL	✓	✓
DirectX	✓	✓

Profiles[12]	vPC	vApps
Max Frame Buffer Supported	2 GB[4]	48 GB
Available Profiles	0B, 1B, 2B[4]	48A, 32A, 24A, 16A, 12A, 8A, 6A, 4A, 3A, 2A, 1A

NVIDIA Virtual GPU Hardware

GPUs	vPC	vApps
Best Density and Performance for the Knowledge Worker	A16[14], M10, T4	A16[14], M10, T4

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[9] Application-level monitoring is only available starting with the NVIDIA virtual GPU August 2017 release (version 5.0).

[10] Listed support is available with an active Support, Update, and Maintenance (SUMs) contract.

[11] CUDA/OpenCL is only supported for NVIDIA Maxwell™ 8A profile on NVIDIA vGPU 4.x and earlier releases.

[12] Profiles supported have dependency on GPU selected. For more information, read the **NVIDIA virtual GPU software user guide**.

[13] 5K resolution support starting with NVIDIA virtual GPU December 2019 (10.0) release.

[14] Available with a future vGPU Software release