

Citrix Ready Bundle Solution Guide: Citrix, Nutanix, and NVIDIA



As technology continues to advance, businesses are increasingly viewing the traditional, physical workspace as a restrictive and unproductive environment. The traditional workspace cannot match the advantages of the modern digital workspace, which delivers the benefits of **productivity, security, flexibility and cost effectiveness**.

The digital workspace is also a key driver in a global shift of business strategy. Monica Basso, a Gartner Research Vice President, said, “We believe that the digital workspace is an unavoidable step for any business that wants to succeed in digital transformation.”¹ The Gartner glossary definition is also quick to point out the benefits: “[it] enables new, more effective ways of working; [it] raises employee engagement and agility and exploits consumer-oriented styles and technologies.”² Creating this environment is critical to move into the new age of technology and set up your business for success.

By combining Citrix, Nutanix and NVIDIA virtual GPU (vGPU) technologies, we’ve created a simple blueprint to bring the digital workspace to you. This technology enables the delivery of graphics-accelerated virtual applications and desktops to provide the best possible user experience. Simultaneously, this solution simplifies infrastructure requirements, reduces administrative overhead and slashes hypervisor costs.

This solution guide outlines how Citrix, Nutanix, and NVIDIA offer the best combination of **simplicity, scalability, performance and cost savings** in the delivery of graphics-accelerated, secure digital workspaces.

Business Challenges

Organizations seeking to maximize the potential of the modern digital workspace face a number of challenges in meeting the user experience provided by physical desktops. These include:

- **Providing Anywhere, Anytime, Any Device Access:** The traditional, physical, nine-to-five workspace is rapidly morphing into the relic of a bygone era. Co-workers who once would have been separated only by a few cubicles are now just as likely to be separated by multiple time zones. The high-performance digital workspace that provides anywhere, anytime, any device access to apps and data makes that possible. It’s what the modern worker needs and expects.
- **Evolving Away from Legacy IT Infrastructure:** Many organizations seeking to enter the digital workspace face challenges in escaping their past. Their legacy IT infrastructures — many of them little changed over decades — entrap them in a web of dependence and, for some, a zone of comfort. Breaking away from a long-entrenched legacy system can be both technologically and culturally jarring.

Yet the necessity, even urgency, of evolving away from legacy IT infrastructures is evident. Gartner, in fact, ranks the need to modernize legacy systems as one of the top five challenges currently facing business leadership.³ Typically composed of separate silos of compute, storage, networking and virtualization resources, legacy systems create IT complexity, increase operational costs, reduce business speed and elevate risk.

- **Meeting Modern Graphics Requirements:** Graphics requirements for business users are rising. Today, creative and technical professionals using applications for workflows such as computer aided design (CAD) need graphics-accelerated workspaces more than ever. But even knowledge workers using common office productivity applications now require advanced graphics capabilities to enable the best Windows 10 user experience. In fact, according to research from Lakeside Software, Windows 10 requires 32 percent more computer graphics (measured by calls to DirectX and OpenGL) than Windows 7, and updated versions of the basic office productivity apps such as Chrome, Skype, and Office demand a much higher level of computer graphics than ever before.
- **Meeting the “As-Good-As-Physical-Desktop” Expectations:** Most users are aware of the capabilities of modern technology, and accordingly have high expectations for their workspaces. Many, in fact, routinely enjoy the latest and greatest in technology in their personal lives, but they must endure a significant step-down when they come to work. Keeping workers fully engaged requires a digital workspace that offers as-good-as-physical-desktop performance capabilities for both virtual desktops and applications.

Technology Overview

This Citrix Ready Bundle combines technologies from Citrix, Nutanix, and NVIDIA into a validated solution stack to deliver a modern, graphics-accelerated, secure digital workspace.

Citrix XenApp, XenDesktop and XenServer: Citrix XenApp and XenDesktop are the leading application and desktop delivery platforms, delivering Windows, Linux, web and SaaS applications or full virtual desktops from any cloud.

XenApp and XenDesktop offer:

- Persistent Windows or Linux virtual desktops that can be fully customised to meet the needs of the most demanding users, anytime, anywhere and from any device
- Cost-effective, locked-down server virtual desktops that are shared across many users, providing the benefits of desktop virtualization while maximizing IT control and simplifying management
- FIPS 140-2 compliance and Common Criteria certification

- A real-time user experience that equals or exceeds the user experience delivered by a local, physical desktop and app
- The ability to deliver immediate access to core business applications on Windows 10 devices, and the enablement of the centralized management of Windows 10 virtual desktops
- Up to 90 percent reduction in the cost and complexity of application upgrades, migrations and updates

Citrix XenServer hypervisor, offered as an entitlement in all editions of Citrix XenApp and XenDesktop, helps slash hypervisors costs significantly for on-premise software deployments.

Citrix XenApp and XenDesktop optimize virtualization of rich graphics apps using HDX 3D Pro graphics acceleration technologies for both the delivery scenarios: hosted-shared delivery and VDI delivery.

Available under Citrix Cloud services, XenApp and XenDesktop Service offers the quickest way to deploy a fully featured app and desktop virtualization solution, extending existing on-premises software deployments and creating hybrid workspace services.

Nutanix Enterprise Cloud: Nutanix enables IT teams to build and operate powerful multi-cloud architectures. The Nutanix Enterprise Cloud OS software melds private, public and distributed cloud operating environments, and provides a single point of control for managing IT infrastructures and applications at any scale. Nutanix hyper-converged infrastructure technology integrates compute, virtualization, storage, networking and security to power any application, at any scale of deployment.

The Nutanix Enterprise Cloud provides a range of benefits crucial to enabling the modern digital workspace, including:

- A complete IT infrastructure (full cloud stack) that integrates all compute, storage and virtualization resources for running nearly all applications
- On-demand scalability that allows businesses to scale linearly without limits or performance impact
- Consumer-grade and app centric management that supports automation and one-click simplicity, streamlining IT lifecycle management and eliminating the need for specialized IT teams
- The ability to deploy applications in minutes instead of weeks or months
- Automation of common IT tasks, empowering application owners and developers with on-demand IT services

- Lower total cost of ownership, with IT costs slashed by up to sixty percent (average investment payback is just seven months)
- Support of hybrid cloud deployments, with combined public and private cloud operations, and the unified management of IT infrastructure and applications

NVIDIA Virtual GPU Technology: NVIDIA virtual GPU is the industry's most advanced technology for sharing GPUs across multiple virtual desktop and applications instances, delivering a superior graphics experience to any device, anywhere. With the advent of the modern digital workspace, GPU capability has become an essential for every user. Nearly all current business management software applications demand heavy graphics support that can frequently overwhelm CPU resources.

NVIDIA Virtual GPU technology fully supports the graphics need of digital workspace environments. Key benefits delivered by virtual GPU include:

- **Productivity-boosting collaboration.** Virtual GPU enables seamless, real-time collaboration among users, from any location and from any device. Workflows can be transformed to unshackle users from the restrictions of physical PCs, workstations and locations.
- **Simplified IT management.** Provides IT with the ability to centralize data and applications in the data center. Supports the delivery of graphics-accelerated virtual workspaces with improved IT manageability and security – and with graphics performance that consistently exceeds user expectations.
- **Secures mission-critical applications and data.** Intellectual property and proprietary data are protected by centralizing them in the data center. Supports safe collaboration with business partners while simultaneously enabling the mobile, work-from-anywhere benefits of digital workspaces.
- **Fully enables the potential of VDI technology.** Supports applications and use cases that in the past were not viable in VDI.

The NVIDIA virtual GPU solution brings graphics acceleration to the data center. It requires both hardware and software licensing components:

- **NVIDIA GRID Software for knowledge workers using office productivity applications and Windows 10.** There are two NVIDIA GRID software offerings:
 - GRID Virtual PC (GRID vPC) for virtual desktops delivering standard PC applications
 - GRID Virtual Apps (GRID vApps) for use with Citrix XenApps or other RDSH solutions

- NVIDIA Quadro virtual Data Center Workstation (Quadro vDWS) Software for creative and technical workers using professional graphics applications.** Quadro vDWS software includes an NVIDIA Quadro driver to deliver the power of a physical Quadro workstation virtually.
- NVIDIA Tesla Data Center GPUs.** NVIDIA Pascal and Maxwell-based GPU Accelerators in certified server platforms run the NVIDIA virtualization software. The NVIDIA Tesla M10 is optimized for density and recommended for knowledge worker and Windows 10 deployments. NVIDIA Tesla M60 and P40 are optimized for performance and commonly used for acceleration of professional graphics applications.

Solution Overview

This Citrix Ready Bundle enables the delivery of graphics-accelerated, secure digital workspaces. All three companies provide industry-leading solutions across infrastructure, virtualization and graphics. These integrated and complementary technologies provide organizations with simplicity, scalability, performance and cost savings in delivering high-performance virtual applications and desktops that provide the best possible user experience. This section reviews three main advantages of the Citrix Ready Bundle solution.

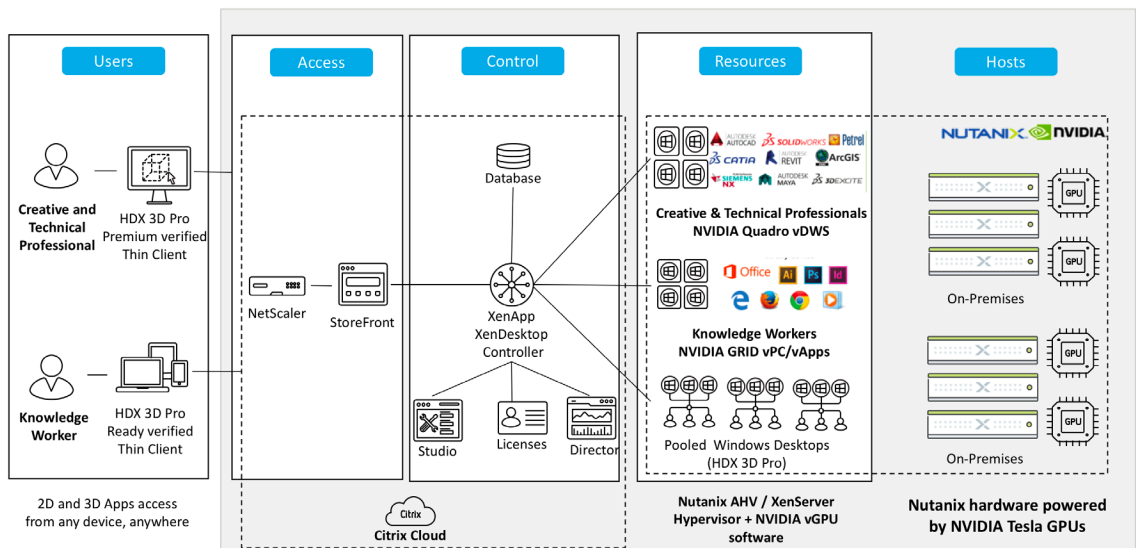


Figure 1. VDI Solution Architecture featuring Citrix Cloud, Nutanix Enterprise Cloud & NVIDIA virtual GPU technology

A cloud-ready solution

Nutanix Enterprise Cloud is Citrix Ready verified with XenServer, XenApp and XenDesktop. With the first-ever verified Citrix Workspace Appliance (CWA), Nutanix InstantOn for Citrix Cloud automates the integration with XenApp and XenDesktop Service in delivering a turnkey VDI and application virtualization solution that greatly reduces implementation complexities across the complete solution stack. Nutanix simplifies the solution stack, and Citrix Cloud XenApp and XenDesktop Service improves the app and desktop delivery platform. Accordingly, organizations can now implement hybrid cloud VDI within hours of racking the appliance, greatly accelerating the solution's time-to-value.

With subscription-based pricing available from XenApp and XenDesktop Service, and a scale-as-you-grow model from Nutanix, organizations can greatly reduce upfront capital costs. The simplicity of the solution also reduces ongoing maintenance costs and the need for specialized (expensive) IT resources.

Hypervisor of your choice

Nutanix AHV and Citrix XenServer both now support NVIDIA virtual GPU technology, including:

- GRID Virtual PC (GRID vPC) software
- GRID Virtual Applications (GRID vApps) software
- Quadro Virtual Data Center Workstation (Quadro vDWS) software
- Tesla M10, and M60, and P40 GPU accelerators

Nutanix AHV is the first commercial kernel-based virtual machine (KVM) to support vGPU. With vGPU support for Linux-KVM, NVIDIA virtual GPU software brings graphics acceleration to a new generation of cloud and data center VDI environments. Nutanix AHV is a comprehensive enterprise virtualization solution tightly integrated into Nutanix OS. It is provided at no additional license cost.

By giving organizations the flexibility to choose a hypervisor, they are able to select the one that best fits the organization's needs, while greatly reducing expensive hypervisor costs.

Easy delivery of high-end graphics

NVIDIA and Citrix were first-to-market with virtualized graphics capabilities. Citrix XenDesktop is the only desktop virtualization platform to support the latest H.265 codec with NVIDIA – a distinction that enables significantly improved user experience.

NVIDIA Tesla P40 or M60 for high-end graphics, and Tesla M10 for high user density, combined with Nutanix AHV's high-density, scale-out architecture results in top-notch performance and reduced infrastructure footprints. Delivery of graphics-accelerated apps and desktops to all users with NVIDIA virtual GPU technology permits the elimination of expensive PC hardware and management software. The time-consuming PC management burden is also drastically reduced. The money and resources saved can be reinvested in other IT initiatives.

Nutanix includes NVIDIA virtual GPU management and monitoring capabilities in its Prism infrastructure management tool. This functionality provides IT departments with greater control and management of virtual GPU resources, which in turn simplifies the virtual GPU deployment, enables proactive management of virtual GPU resources, and isolates bottlenecks for faster support of VDI users. Additionally, Nutanix integrates management of Citrix Cloud XenApp and XenDesktop Service into Prism making Nutanix the ideal HCI platform for delivering on-premise graphics-accelerated apps and desktops with Citrix and NVIDIA.

Combining Citrix and Nutanix with NVIDIA virtual GPU technology accelerates the performance of digital workspaces, providing users with the best possible experience. Graphics-accelerated apps and desktops have been traditionally reserved for creative and technical professionals using graphics-intensive applications. But with the increasing demands of the modern workforce, today's knowledge workers will also benefit from a consistently great virtual desktop experience that supports all office productivity applications that require, or benefit from, graphics acceleration.

A Proven Solution That Fully Delivers on the Promise of the Digital Workspace

Today, many organizations are aware of the benefits of the digital workspace. But selecting and sourcing the right technologies to support the increasing demands of a mobile workforce can be challenging. Customers are looking to complementary partners like Citrix, Nutanix and NVIDIA to work together to deliver a validated solution that is simple to purchase, manage and support.

Accordingly, as more organizations are looking to efficiently support their global workforces through the digital workspace, the underlying architecture, the app and desktop delivery platform and the potential of graphics acceleration are all important factors to consider. Neither the infrastructure selection nor the VDI solution decision should be made independently – there must be a symbiotic relationship between the two in order to realize the maximum benefit.

With end users quickly on-boarded, productivity increases, costs decrease and profitability rises. This makes it possible for organizations to spend more time and resources focusing on their core business, and less on ensuring that end users are able to consistently and securely access their virtual desktops.

The Citrix Ready Bundle featuring NVIDIA virtual GPU and Nutanix AHV provides these benefits by ensuring a unified, secure and contextual user experience. This solution blueprint delivers graphics-accelerated virtual applications and desktops – the future of digital workspaces – to all organizational users.

This solution helps organizations save money on hypervisor costs, eliminate expensive PC hardware and management overhead, reduce infrastructure requirements, deliver a high-quality virtual desktop experience, and simplify app and desktop delivery infrastructures.

For more information about Citrix Ready solutions and partners, contact [Citrix](#).

For more information about NVIDIA, contact [NVIDIA](#).

For more information about Nutanix, contact [Nutanix](#).

Additional Links

To learn more about the Citrix partnership with NVIDIA, [click here](#).

To learn more about the Citrix partnership with Nutanix, [click here](#).

To learn more about how NVIDIA enhances Citrix product offerings, [click here](#).

To learn more about how Nutanix enhances Citrix product offerings, [click here](#).

¹<http://www.computerweekly.com/news/450426565/Why-businesses-should-tackle-the-digital-workplace>

²<https://www.gartner.com/it-glossary/digital-workplace>

³https://www.gartner.com/events-na/data-center/wp-content/uploads/sites/3/2017/07/LSC_top_challenges_facing_io_lea_324370.pdf

⁴Lakeside Software, Inc. “Elevating User Experience Through GPU Acceleration: A Windows 7 Analysis.” Lakeside Software White Paper. 2017

About Citrix Ready

Citrix Ready identifies recommended solutions that are trusted to enhance the Citrix Delivery Center infrastructure. All products featured in Citrix Ready have completed verification testing, thereby providing confidence in joint solution compatibility. Leveraging its industry-leading alliances and partner ecosystem, Citrix Ready showcases select trusted solutions designed to meet a variety of business needs. Through the online catalog and Citrix Ready branding program, you can easily find and build a trusted infrastructure. Citrix Ready not only demonstrates current mutual product compatibility, but through continued industry relationships also ensures future interoperability. Learn more at citrixready.citrix.com.