

FlexPod®

FlexPod Datacenter with Citrix XenDesktop and NVIDIA GRID

Delivering Professional 3D Graphics from the Cloud for Product Design and Manufacturing

The Challenge

Companies engaged in product design and manufacturing are increasingly dependent on a global workforce. However, having sensitive design data distributed on the workstations of designers and engineers around the world poses significant risks in terms of data protection and data security. And, with design files growing ever larger, the time needed to transfer files, even locally, is becoming a significant bottleneck that impedes progress and increases time to market.

An alternative is needed to meet the needs of an increasingly global workforce, enhance collaboration, and protect intellectual property.

The Solution

Advanced 3D Graphics in a fully integrated desktop virtualization solution

FlexPod® Datacenter with Citrix XenDesktop and NVIDIA GRID addresses the critical needs of engineers and designers in a wide range of industries, including automotive design, aerospace, industrial equipment, electronic design and engineering services running graphics-intensive applications for computer-aided design (CAD), computer-aided engineering (CAE), product lifecycle management (PLM), and other applications with interactive 3D graphics. It eliminates the need for local copies of design files, allowing important intellectual property to remain secure inside your data center.

By combining validated, best-in-class technologies from industry leaders in storage, networking, desktop virtualization, and graphics, FlexPod Datacenter with Citrix and NVIDIA delivers a complete virtual desktop solution with full GPU acceleration for graphics-intensive applications.

Key Benefits

- Enables you to take full advantage of a global workforce while keeping intellectual property secure in your data center
- Increases user productivity by eliminating the need for file copies and providing ubiquitous fast access to 3D graphics
- Allows full access to graphics applications on mobile devices
- Makes 3D graphics output available to a wider range of users on the manufacturing floor, in the field, on the go
- Lowers TCO by decreasing reliance on expensive, difficult-to-maintain desktop workstations and standalone software licenses
- Incorporates leading technologies from NetApp, Cisco, Citrix, and NVIDIA in an integrated solution that's fast and easy to deploy

CITRIX®

NVIDIA



A user's entire desktop environment runs inside the data center. All graphics processing is performed by the FlexPod solution, and only graphical output traverses the network to the end user.

FlexPod Datacenter with Citrix and NVIDIA is a fully integrated solution designed to meet the demanding requirements of manufacturing and design. This solution:

- Eliminates the need to copy design data outside the data center, so it remains secure
- Reduces or eliminates time-wasting file copying
- Improves collaboration by allowing people in different locations to view the same designs and facilitates design reviews
- Makes the output of graphical applications viewable wherever it's needed, including mobile devices:
 - Work productively from home without expensive graphics workstations
 - View and verify design details on the manufacturing floor or while on the go
- Allows you to share graphical output across organizational boundaries without putting intellectual property at risk

Proven FlexPod technology

FlexPod is a proven data center solution from NetApp and Cisco, offering a flexible, shared infrastructure that easily scales to support your growing workload demands without affecting performance. FlexPod is the number one integrated infrastructure solution, according to the IDC Worldwide Integrated Infrastructure and Platforms Tracker for Q3 2014.

NetApp® FAS storage hardware reduces your overall storage costs while delivering the necessary I/O

performance for a virtual desktop infrastructure (VDI) in conjunction with demanding design, simulation, and other graphics-intensive applications. FAS storage supports both all-flash and hybrid storage configurations, creating an optimal storage platform for the needs of power users.

Cisco UCS® unites computing, networking, storage connectivity, and virtualization in a single cohesive system that meets the unique demands of graphics-intensive applications. Cisco UCS C240 M3 rack servers feature extended memory for faster rendering, bigger datasets, more desktops per server, and the lowest latency.

Cisco UCS integrates computing resources with Cisco Nexus® switches and a unified I/O fabric, which identifies and handles different types of network traffic, including storage I/O, streamed desktop traffic, management, and application access.

FlexPod Datacenter with Citrix and NVIDIA integrates Citrix XenDesktop with HDX 3D Pro and NVIDIA GRID with the proven FlexPod architecture to provide a complete VDI solution tailored to the needs of product design and manufacturing.

Citrix XenDesktop with HDX 3D Pro

Citrix XenDesktop delivers applications and desktops as secure mobile services to improve mobility and provide greater security for intellectual property with centralized control. XenDesktop with HDX 3D Pro delivers a native, touch-enabled experience that is optimized for the type of device, as well as the network.

HDX 3D Pro technologies are specifically designed to enhance visual performance for high-performance, graphics-intensive applications with multiple WAN

optimization technologies, deep compression and quality of service (QoS) controls, hardware-level GPU acceleration, and full support for OpenGL applications.

By complementing XenDesktop with integrated GRID software and NVIDIA GPUs, FlexPod VDI empowers users with full graphics capabilities regardless of location or device.

NVIDIA GRID

NVIDIA GRID technology offloads graphics processing from the CPU to the GPU in virtualized environments. As the first virtualized GPU hardware solution, NVIDIA GRID vGPU allows multiple users to access the graphics-processing power of a single GPU. As a result, you can efficiently share GPU resources and make graphics acceleration available to a wider range of users, not just designers and engineers.

NVIDIA GRID provides a highly responsive experience for demanding 3D graphics applications on any device, even tablets. The NVIDIA GRID K2 boards used in the FlexPod Datacenter solution feature two high-end Kepler-based GPUs with a total of 3,072 CUDA cores. NVIDIA GRID GPUs and NVIDIA drivers are fully tested and supported by industry-leading CAD software vendors.

Take Full Advantage of a Global Workforce While Keeping Intellectual Property Secure

There are talented designers and engineers all over the world. Integrating them into your development teams has the potential to make your operation more productive, with people able to work on important design projects around the clock.

However, many organizations hesitate to exploit global talent because of concerns about the security of intellectual property. How can you be certain that proprietary design data is protected when copies of it may exist on workstations scattered around the globe?

Those organizations that do engage a global workforce face another challenge. Team members often find that the first thing they do in the morning is initiate file transfers to obtain up-to-date files. These file transfers often take several hours to complete, wasting productivity.

The FlexPod with Citrix and NVIDIA solution solves these problems. Critical design data remains centralized in your data center, so there's no security risk. And designers and engineers no longer waste valuable time waiting for large files to transfer.

Team members in different locations can easily collaborate on important projects by viewing the same imagery. This ability to view the same session in multiple locations also facilitates design reviews by globally dispersed teams, and your team can also easily view and discuss designs with sub-contractors and other third parties without sharing sensitive design files.

Better-than-Local Performance

Users report that the FlexPod Datacenter with Citrix and NVIDIA solution delivers better-than-local performance for network round trip latencies up to 150ms. (Today it's possible to achieve average latencies at that level between locations as distant as San Francisco and London.)

Even at latencies over 150ms, it's possible to carry out many common and productive functions. Technical

Citrix
XenDesktop
with HDX 3D Pro



CITRIX

NVIDIA GRID
with K2 GPUs



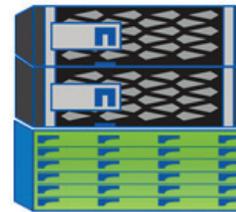
NVIDIA

Cisco UCS
C-Series Rack
Servers and Cisco
Nexus Switches



CISCO

NetApp® All-Flash
FAS System with
10GigE and FCoE



NetApp

Figure 1) FlexPod Datacenter with Citrix XenDesktop HDX 3D Pro and NVIDIA GRID combines the proven capabilities of FlexPod with leading visualization technologies to seamlessly deliver remote access to 3D data and applications, accelerating innovation and time to market.

writers can access drawings to create documentation and courseware, remote team members can check designs, and minor updates can be made. Users find the slight delay caused by latency is far preferable to a lengthy data transfer.

With the FlexPod with Citrix and NVIDIA solution, your designers and engineers can work on any modern laptop or desktop. High-resolution configurations with up to four monitors are supported, as are 3D mouse technology and other specialized graphics input devices.

Work Productively from Any Location

FlexPod Datacenter with Citrix and NVIDIA enables users to work more productively from any location. Local users in your facilities can work from their desks, just as if they were

using a typical high-end graphics machine, but they can also access their full desktop environment from wherever they happen to be with no loss of productivity. Users can leave the office and pick up at home where they left off. This flexible work environment is also more adaptable to personal and family needs, so your designers and engineers can be more productive.

Because mobile devices such as tablets are fully supported, this solution extends the availability of 3D graphics beyond traditional use cases. A supervisor on the manufacturing floor can use a tablet to review a design. Technicians in the field can access technical documentation with detailed 3D views that weren't previously possible. Users on the go can access the data they need to make important decisions without delay.

Speed Time to Market While Improving Efficiency and Reducing Costs

By increasing user productivity, reducing or eliminating the need to copy files, and enhancing security, the FlexPod Datacenter with Citrix and NVIDIA solution makes your operations more productive and decreases time to market.

In addition, this solution can be significantly less expensive than traditional design and engineering environments. Specialized graphical workstation hardware represents an expensive resource that has to be deployed and managed outside the data center. Software licenses for each workstation add to the overall expense.

As design files grow in size and complexity, workstations require more computing and graphics power, more local storage, and faster network connections to move data, which translates to frequent and expensive upgrades.

FlexPod Datacenter with NVIDIA and Citrix eliminates the expense and complexity of dedicated workstations, replacing them with a much more efficient and scalable shared resource capable of supporting workers wherever they happen to be and making graphical output accessible to a broader range of employees.

The solution delivers higher resource utilization for greater return on investment and can reduce the total number of expensive software licenses required. Because almost everything resides in the data center,

WhiteWater West: Driving Innovation and Opportunity

Backed by the power and flexibility of its NetApp FAS8020 system, the company recently took on a major initiative to create an NVIDIA GRID–supported SolidWorks CAD environment. Running on the company’s Citrix XenDesktop platform, engineers are now able to access centralized 3D CAD vaults from any location at any time, and 75% more quickly than in the previous environment. This efficiency helps support a global design team and design process, which ultimately speeds time to market and revenue.

this solution is much more reliable than workstations in dispersed locations, where power loss and other events can interrupt work and cause data loss.

With all design files stored on NetApp FAS storage, the solution provides the tools to help you effectively manage and protect your designs while increasing storage efficiency with deduplication, compression, and cloning technologies. Disaster recovery and business continuance options let you easily address specific data protection and data availability objectives.

The FlexPod architecture is designed to scale easily as your needs change and grow. Need more storage? You can easily scale FlexPod storage capacity and performance. Need more compute horsepower? Simply add more Cisco UCS servers.

Stand Up New Infrastructure in Less Time

No matter how carefully you plan, unforeseen needs and opportunities can result in a requirement for more graphics infrastructure in a hurry.

Whether it’s in an existing data center or a new location, the integrated and tested design of FlexPod Datacenter with NVIDIA and Citrix means that you can have new infrastructure up and running in less time with less effort, providing a distinct competitive advantage in situations where time is of the essence.

Open Delivery Ecosystem

You can choose from a broad network of world-class solution delivery partners to implement FlexPod. These partners understand your business requirements and are all certified and trained on NetApp, Cisco®, NVIDIA GRID, and Citrix, as well as complementary technologies, to deliver a complete enterprise or cloud solution that fits your business needs.

Getting Started

To learn how FlexPod enables you to build a flexible and efficient shared infrastructure today as your foundation for future-ready IT, contact your local data center partner.

