



FlexPod for 3D Graphics Visualization

Enabling remote 3D visualization for graphic and compute-intensive applications

The Challenge

Graphically intensive workflows continue to evolve. Feeding data to decentralized visualization workstations is increasingly difficult, due to the rapid growth in dataset size, inability to upgrade bandwidth to the desktop, and the need to integrate diverse, multidisciplinary data types. Workflows span organizational boundaries and domains, driving a strong desire in most organizations to improve collaboration, but it's also necessary to make sure that sensitive data is not exposed.

Allowing a mobile workforce to visualize operational data, wherever they happen to be, is becoming an essential part of oil and gas processes. This visualization requires either a local copy of the dataset, which can be difficult and potentially risky to provide, or remote visualization. Up to now, remote visualization solutions have been complicated to deploy and manage and haven't provided the quality and responsiveness that users expect.

The Solution

Fully integrated desktop virtualization with advanced visualization

FlexPod for 3D Graphics Virtualization with NVIDIA Quadro Virtual Datacenter Workstation (Quadro vDWS) addresses the critical need for secure, remote access to advanced 3D geology and geophysics applications and data for geographically dispersed, cross-disciplinary teams to improve collaboration and accelerate decision making.

Key Benefits

- Extends 3D visualization to engineers, geoscientists, and other workers wherever they are — local, remote office, in the field
- Integrated solution that incorporates advanced technologies from NetApp, Cisco, and NVIDIA, coupled with industry-leading desktop virtualization and graphics transport providers
- Fast and easy to deploy, offering a single point of contact for support
- Lowers TCO by eliminating the need for desktop workstations that are decentralized, expensive, and difficult to maintain, enabling more effective, dynamic, and scalable resource sharing
- Keeps valuable assets — data and infrastructure — inside the data center, where they are protected and secure
- Improves the user experience by increasing performance and enabling multiuser collaboration

By combining validated technologies from industry leaders in data management, networking, desktop virtualization, and graphics, Quadro vDWS delivers a complete virtual desktop solution with the proven 3D visualization capabilities your organization needs today and the ability to scale rapidly to address future requirements. The solution supports the primary desktop virtualization technologies provided by VMware, Citrix, Microsoft, and Red Hat, and can use a variety of network protocols to deliver high-intensity graphics. In environments where multiple high-resolution monitors are needed at the desktop and low-bandwidth networks are in place, this combination provides top performance and an excellent end-user experience.

Quadro vDWS is a fully integrated solution designed to meet the demanding requirements of upstream oil and gas workflows:

- Eliminates the infrastructure challenges created by ever-growing datasets
- Improves collaboration within the organization
- Makes visualization available where and when it's needed, including on mobile devices—without local data copies
- Allows users to share the results of visualization across organizational boundaries while keeping valuable datasets secure
- Centralized management and allocation of resources improves business continuity and disaster recovery

Proven FlexPod technology

[FlexPod® from NetApp and Cisco](#) is a proven data center solution that offers a flexible, shared infrastructure that easily scales to support your growing workload demands without impacting performance. FlexPod provides reliable delivery of secure business applications with world-class speed. The solution offers 89% less planned downtime, 100+ record-breaking benchmarks, and 56% faster time to market for new applications.

NetApp® FAS and AFF hardware reduces overall storage costs while delivering the necessary I/O performance for virtual desktop infrastructure (VDI) in conjunction with demanding industry applications. FAS and AFF support both all-flash and hybrid storage configurations to create an optimal storage platform for users' visualization needs.

[Cisco UCS](#) unites computing, networking, storage connectivity, and virtualization in a single cohesive system that meets the unique demands of desktop virtualization. Cisco UCS rack and blade servers feature extended memory for faster rendering, bigger datasets, more desktops per server, and low 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 access to geological and geophysical applications.

NVIDIA Quadro Virtual Datacenter Workstation

Quadro vDWS technology delivers the rendering and processing power of a standalone workstation to the data center while adding the efficiency and flexibility of virtualization. This technology allows multiple users to share the graphics processing power of a single GPU, thereby broadening the accessibility of advanced subsurface visualization.

For users, Quadro vDWS provides a highly responsive experience for demanding 3D graphics applications on any device, even tablets. The NVIDIA Tesla family of GPUs used in the FlexPod for 3D Graphics Virtualization solution features the most powerful rendering and computation power available.

Fully tested

FlexPod for 3D Graphics Virtualization with NVIDIA Quadro vDWS has been tested with geology and geophysics applications and datasets from leading providers such as Schlumberger, Halliburton, IHS Markit, and Paradigm, so you can be confident that the solution will work seamlessly with the applications you rely on.

Achieve Deeper Insight in Less Time

Collaboration is the key to effective decision making. Removing data silos and being able to visualize diverse datasets independent of location helps close information gaps between domains to improve the safety, speed, and accuracy of operational decisions. Remote visualization can enable collaboration

between remotely located experts to expedite decisions. It can also reduce the personnel required at the field location, thereby reducing health, safety, and environmental risks; decreasing costs; and simplifying logistics.

FlexPod for 3D Graphics Visualization enables you to centralize important datasets in one or a few locations and make the results of visualization available wherever they're needed. Centralizing data simplifies data integration between systems and accelerates workflows across functions (geoscience and engineering). Geoscientists, engineers, and business decision makers can see important results in near real time, without the bottlenecks that result from transferring huge datasets over network connections.

Geoscientists and engineers can access their workspaces, data, and applications instantly and seamlessly without the need for heavy-duty workstations. Collaborators can view and manipulate the same images, eliminating potential points of confusion and miscommunication and saving valuable time.

FlexPod for 3D Graphics Visualization helps you to support and communicate with remote field operators and address the visualization and collaboration needs of geoscientists and engineers around the world. As a result, end users of all types have better access to information for deeper insight and faster decision making.

Improve Data Security and Quality

Dataset copies are not only time consuming; when data is copied and made available from multiple sources, data quality issues arise. Every copy is an opportunity for data to be corrupted, lost, or compromised by prying eyes. Centralizing data helps mitigate these issues, improves data quality, and reduces risks that can cost you millions of dollars annually.

With FlexPod for 3D Graphics Visualization, your valuable data and IP remains in your data center, protected and secure. When you have to ensure compliance with national data export restrictions and in-country content laws, remote visualization facilitates analysis and collaboration that would otherwise be difficult or impossible.

Because data is stored on NetApp AFF and FAS storage, the solution also provides the tools to help you effectively manage and protect your data 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. If you are exploring moving applications to the cloud, NetApp offers several options for storage in the cloud: NetApp® Cloud Volumes ONTAP® in AWS, Azure, and Google, and NetApp storage in IBM. NetApp can quickly and efficiently move data between cloud environments while preserving storage efficiencies like deduplication, compression, and compaction, thereby reducing overall costs for data movement.

Simplify Operations and Lower Costs

Graphics-intensive applications have traditionally required specialized workstation hardware for best performance. Workstations are typically procured to meet peak performance needs, representing an expensive nonsharable resource that has to be deployed and managed outside the data center.

As datasets grow in size and complexity, these workstations require more computing and visualization power, more local storage, and faster network connections to move data, which can mean frequent and expensive upgrades.

FlexPod for 3D Graphics Visualization 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 are. The solution delivers higher resource utilization for greater return on investment. Because almost everything resides in the data center, this solution is much more reliable than workstations in dispersed locations, where power loss and other events can interrupt work and cause data loss.

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 UCS servers.

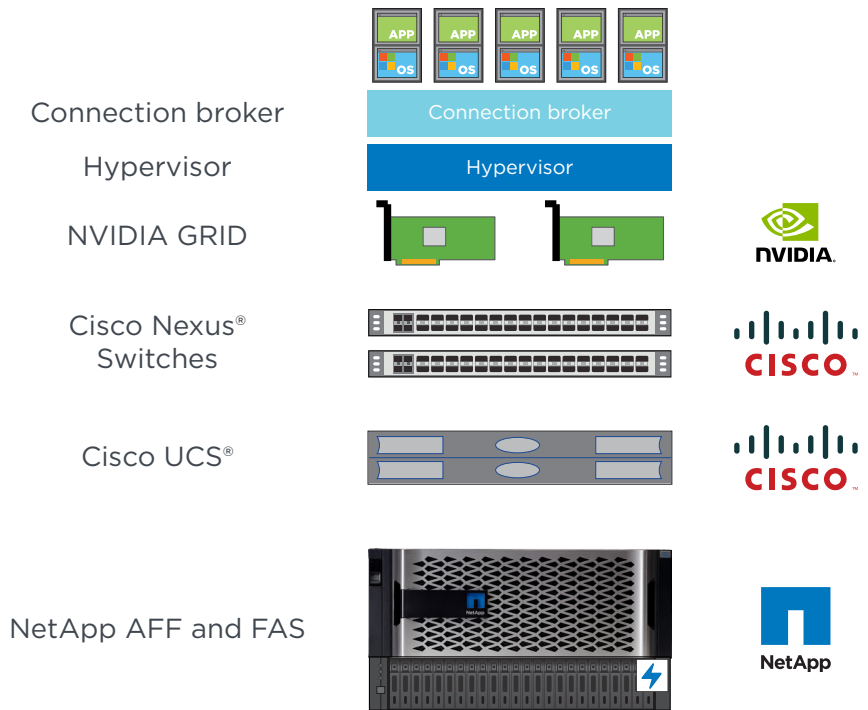


Figure 1) FlexPod for 3D Graphics Virtualization with NVIDIA Quadro vDWS.

Stand Up New Infrastructure in Less Time

No matter how carefully you plan, unforeseen needs can result in a requirement for more compute infrastructure in a hurry. Whether it's in an existing data center or a remote location, the integrated and tested design of FlexPod for 3D Graphics Visualization means that you can have a new infrastructure up and running in less time with less effort, providing a distinct competitive advantage when time is of the essence.

Open Delivery Ecosystem

Select from a broad network of solution delivery partners to implement FlexPod. These partners understand your business requirements and are certified and trained on FlexPod, as well as complementary technologies, to deliver a complete enterprise or private 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.