CLOUD DYNAMICS: SUPERCHARGING GRAPHICS AND RENDERING WORKLOADS WITH NVIDIA QUADRO VIRTUAL WORKSTATIONS

Manvender Rawat, Product Manager, NVIDIA
AGENDA

• What is Quadro?
• Quadro in the Datacenter
• Quadro in the Cloud
• Ways to access Virtual Workstations in the Cloud
• Use cases for Virtual Workstations in the Cloud
WHAT IS QUADRO ?
# QUADRO VALUE PROPOSITION

<table>
<thead>
<tr>
<th>KEY VALUE</th>
<th>CUSTOMER BENEFIT</th>
<th>QUADRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workflow Acceleration</td>
<td>Best professional application performance</td>
<td>Highly tuned drivers for professional applications such as Dassault Systèmes CATIA and SOLIDWORKS, Autodesk MAYA, and many more</td>
</tr>
<tr>
<td></td>
<td>Advanced professional features</td>
<td>Large memory w/ECC, GPUDirect for Video, multi-GPU support, quad buffered stereo, MOSAIC multi-display, Quadro Sync, and many more</td>
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<tr>
<td></td>
<td>Scalable performance</td>
<td>Larger memory configurations Qualified multi-GPU configurations for extreme performance</td>
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<tr>
<td>Enterprise-Grade Reliability</td>
<td>Mission critical drivers</td>
<td>Long life, stable drivers Enterprise-grade system level verification by OEMs Enterprise-grade release management</td>
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<td></td>
<td>ISV certifications</td>
<td>Certified by major ISVs for over 100 professional applications</td>
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<tr>
<td></td>
<td>Certified with OEM workstations</td>
<td>Extensive joint qualification with major workstation OEMs for enterprise deployment</td>
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<tr>
<td>Efficient IT Management</td>
<td>Device management tools</td>
<td>Configuration, monitoring and diagnostic tools with local and remote access</td>
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<td></td>
<td>Global support</td>
<td>Access to industry solutions experts Enterprise level technical support Built and Warrantied by NVIDIA</td>
</tr>
<tr>
<td></td>
<td>Extended product availability</td>
<td>Bulk availability Full product lifecycle management</td>
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</table>
QUADRO USE CASES
Quadro accelerates & streamlines professional workflows

Manufacturing
Architecture
Medical Imaging
Energy
Video Editing
Photorealism
Mapping & Analytics
Simulated Training
PROVEN QUADRO EXPERIENCE, ANYWHERE

Accelerating Design and Engineering Applications

Quadro in Physical Workstations
Quadro in traditional desktop and mobile workstations

Quadro in the Data Center
Quadro workspaces virtualized from the data center with Quadro vDWS
QUADRO IN THE DATACENTER
QUADRO vDWS
NVIDIA delivers Quadro vDWS features anywhere, on any device

Security
Designs and IP secured in the datacenter

Data Proximity
Interact with models as if data were in close proximity

Higher Consolidation & Resource Utilization
Ensure right-size allocation of resources

Management & Monitoring
End-to-end visibility into your infrastructure

Application Certification
Support for major ISV applications

Enterprise Class Reliability
Support for mission critical drivers and certified for OEM Servers
PROVEN QUADRO EXPERIENCE, ANYWHERE
Accelerating Design and Engineering Applications

Quadro in Physical Workstations
Quadro in traditional desktop and mobile workstations

Quadro in the Data Center
Quadro workspaces virtualized from the data center with Quadro vDWS

Quadro in the Cloud
Quadro delivered from the cloud with Quadro Virtual Workstation (Quadro vWS)
QUADRO IN THE CLOUD
QUADRO IN THE CLOUD

Scale up or down to the cloud
Supplement on-premises deployments with the cloud based virtual workstations

Enable burst workloads
Easily support seasonal demand and cyclical project needs

Adopt/evaluate newer GPU architecture
Test the latest technology like RTX risk free

Location based deployments
Ideal for remote offices, dispersed workforce, and contractors
ACCESSING NVIDIA QUADRO VIRTUAL WORKSTATION
WAYS TO ACCESS NVIDIA GPUS IN THE CLOUD
Simplify customer experience & simplify cloud

Enterprise BYOL
CSP Marketplace
Daas & DaaS Managed Services
Quadro Certified ISV

Servers with NVIDIA GPUs
ENTERPRISE BYOL
Extend enterprise deployment to the Cloud

NVIDIA Quadro Workstation Performance
NVIDIA Tesla GPUs in the cloud power high-performance simulation, rendering, and design.

Flexibility in the Cloud
Scale up and down as your business needs change and pay for only what you need based on hourly usage.

IT Speed and Agility
Set-up a GPU-accelerated virtual workstation in minutes, without having to manage endpoints or back-end infrastructure.

Enterprise-Deployment in the cloud
Deploy IT managed and secured VMs for multiple clouds and locations
Inserting video: Insert/Video/Video from File.
Insert video by browsing your directory and selecting OK.
File types that work best in PowerPoint are mp4 or wmv.
NVIDIA QUADRO VIRTUAL WORKSTATION IN CSP MARKETPLACE
Same Quadro experience from the cloud to any device, anywhere

NVIDIA Quadro Workstation Performance
NVIDIA Tesla GPUs in the cloud power high-performance simulation, rendering, and design.

Flexibility in the Cloud
Scale up and down as your business needs change and pay for only what you need based on hourly usage.

ISV Certifications
Get proven NVIDIA Quadro® benefits from the cloud and leverage Quadro ISV certifications.

Always-Up-to-Date
Your NVIDIA Quadro Virtual Workstation image is always optimized with the latest patches and upgrades.

IT Speed and Agility
Set-up a GPU-accelerated virtual workstation in minutes, without having to manage endpoints or back-end infrastructure.

Enterprise-Grade Security
Enjoy Quadro performance with the confidence of secure access from anywhere, with high availability.
How to launch an NVIDIA Quadro Virtual Workstation instance from the Microsoft Azure marketplace
ALIBABA CLOUD AND NVIDIA OFFERINGS
The first vGPU enabled instance from the cloud

Available as a Technology Beta

<table>
<thead>
<tr>
<th>Alibaba Offering</th>
<th>Use Case</th>
<th>GPU</th>
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<tbody>
<tr>
<td>VGN5i</td>
<td>CAD, real-time simulation, rendering, photo-realistic imaging, and product design</td>
<td>Tesla P4</td>
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Coming Soon!

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<td>VGN6i</td>
<td>ML Inference, Training, Remote Visualization Workstations, Video Transcoding</td>
<td>NVIDIA T4</td>
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</tbody>
</table>
ALIBABA VGPU PRIVATE PREVIEW

The first vGPU enabled instance from the cloud - vgn5i
# CLOUD ECOSYSTEM

## CLIENTS
- IGEL
- 10Zig
- LG
- teradici
- VMware Horizon with Blast
- Citrix Virtual Desktop with HDX Protocol
- Microsoft
- NICE

## CLIENTS AND/OR PROTOCOLS
- Windows Virtual Desktop
- VMware Horizon with Blast
- Citrix Virtual Desktop with HDX Protocol
- Microsoft
- NICE

## DaaS
- amazon WorkSpaces
- Windows Virtual Desktop

## DaaS MANAGEMENT SERVICES
- Workspot
- FRAME
- CITRIX Cloud
- VMware

## INFRASTRUCTURE PROVIDERS
- Microsoft Azure
- Google Cloud Platform
- AWS
- Alibaba Cloud
- IBM Cloud
- Tencent Cloud
- HUAWEI
- NUTANIX
- ORACLE Cloud
- DiDi
- Baidu Cloud
WHAT’S NEW WITH GPU CLOUD COMPUTING?

• NVIDIA Quadro Virtual Workstation launch in the Azure Marketplace - Live
  • Support for Tesla P40, V100, P100 GPUs
  • Support for Ubuntu Server 18.04, Windows Server 2016
• NVIDIA Quadro Virtual Workstations In Ali Cloud Marketplace - Preview
  • VGN5i KVM-based virtual GPU computing instance on Tesla P4
  • VGN6i on NVIDIA T4 in the future
• NVIDIA T4 on GCP available today and Quadro vWS beta for marketplace
• NVIDIA T4 on AWS on EC2
DAAS MANAGEMENT SERVICES

No hassle, simple deployment

- Management layer to control on-premises and public cloud deployments
- Supports a hybrid cloud, multi-cloud, strategy
- For seamlessly migrating and extending on-premises to the cloud
- CSP services that DaaS management service provider partners with can be leveraged
- NVIDIA Quadro vWS can be accessed via BYOL or CSP Marketplace offerings*
CLIENTS AND PROTOCOLS

• Thin clients like IGEL are compatible with Citrix Virtual Desktops with full integration of Citrix features

• Choose the right protocol for your specific needs like PCoIP for advanced display compression in M&E, Blast for VMware Horizon users, HDX for Citrix Virtual Desktop users

Teradici Cloud Access Software with NVIDIA Quadro vWS on Azure can be quickly deployed to visualize applications remotely with the exceptional performance of the PCoIP protocol — on any device, including ultra-secure PCoIP Zero Clients.

— David Smith, CEO of Teradici
USE CASES FOR NVIDIA QUADRO VIRTUAL WORKSTATION
NEVER MISS A MOMENT OF EXCITEMENT

“When spikes in production demand occur, particularly around major broadcast events like the Olympics or the World Cup, time and budget to set up new temporary editors are a big problem. With Quadro Virtual Workstation on NVIDIA T4 GPUs in the GCP marketplace, I have access to the same Quadro experience on-demand and from anywhere. I can use critical applications like Adobe Premiere Pro, apply GPU-accelerated effects, reposition, scale and rotate clips with a native, workstation-like experience.”

Alvaro Calandra, Consultant and Adobe Certified Master Instructor, ELCanal.com
A BREAKTHROUGH IN REAL-TIME SIMULATION EXPERIENCE

“With Quadro vWS from the Azure marketplace, design engineers can quickly and easily interact with simulations in real time and iterate design alternatives remotely, on any device, resulting in significant cost and time reductions in the development phase.”

Justin Hendrickson, director of product management at ANSYS
GeForce NOW CLOUD SERVICE RUNS ON GRID

Play your favorite PC games on nearly any device anywhere you go like LAYERUNKNOWN'S BATTLEGROUNDS, Fortnite, and more from Steam, Uplay and other popular digital stores. Games load faster and are always up-to-date with the latest patches.
Cure for Alzheimer’s and Parkinson’s draws closer with neuron simulation boosted by cloud-based NVIDIA GPUs

Neurological disorders such as Alzheimer’s and Parkinson’s diseases afflict millions of people worldwide, yet no known cure is in sight. Biotech startup NeuroInitiative is working to change that by harnessing NVIDIA graphics processing units (GPUs) in Microsoft Azure to run neuron pathway simulations faster. With its high-performance computing simulation tool, NeuroInitiative is hopeful that it can cut today’s 12-to-20-year drug development period in half.
GPU CLOUD COMPUTING DEMOS

• Google
  • Visual Studio on T4: Accelerate content creation on the cloud

• Microsoft
  • Windows Virtual Desktop and Workspot running CAD/CAM applications
  • Quadro Virtual Workstation running Ansys Discovery Live
Virtual GPU Test Drive
https://www.nvidia.com/tryvgpu

NVIDIA Virtual GPU Website
www.nvidia.com/virtualgpu

NVIDIA Virtual GPU YouTube Channel
http://tinyurl.com/gridvideos

Questions? Ask on our Forums
https://gridforums.nvidia.com

NVIDIA Virtual GPU on LinkedIn
http://linkd.in/QG4A6u

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