Accelerate Graphics Performance in VDI Environments with NetApp HCI

Chris (C-Rod) Rodriguez, Principal Solution Architect, NetApp
Nachiket Karmarkar, Product Manager, NVIDIA
NetApp’s Data Fabric accelerates data-driven digital transformation by simplifying and integrating data management.
NetApp HCI Differentiators

What makes NetApp HCI great

1. Scale Compute Nodes and Storage Independently
2. Mix Different Models of Compute or Storage nodes
3. Add nodes or remove nodes during production
4. Meet SLA’s/XLA’s with Guaranteed Performance
5. Any VMware ISO automatically deployed or Manual deploy Linux / Bare Metal

6. Not locked into one Hypervisor (e.g. VSAN)
7. Support for all three major Cloud Vendors
   - AWS
   - Azure
   - Google
8. Easy On-Premise and Public Cloud support with NetApp Kubernetes Service
9. Pre-Validated Solutions for easy Partner Offerings
10. Integrated Solution with all NetApp Data Fabric products
Traditional Graphics Workspace Challenges

• High performance and resolution workstations
• Limited collaboration features
• Data security
• Tied to the workplace
• Technology refreshes and patch management
• Expensive workstations and maintenance cost
NetApp VDI Solution
Move the Intensive Graphic applications into a centralized computer room on a VDI desktop

Mitigate business challenges:

- Network and power outages do not affect users’ working sessions.
- Users’ resources expand to fit their workflow and multiworkload needs.
- Data stays within the data center, regardless of where it is accessed.
- Very low bandwidth requirements mean users can connect from the most remote locations.
NetApp H615C: 1U HCI Compute Node

Delivering platform flexibility to HCI deployments

- 1U form-factor compute node
- Intel Cascade Lake CPU generation
  - Higher CPU core counts and clock speed
  - Increased RAM capacity options
    - 384GB – 1.5TB
- Three NVIDIA Tesla T4 GPUs
  - Mid-range to High-end graphics
    - CAD, medical imaging, seismic exploration
  - AI Edge Processing
  - AI Inferencing
Use Cases

- **Oil&Gas**: Follow the sun engineering and collaboration for P&E like Schlumberger Petrel; Geosystemic applications (H615C coming)

- **Manufacturing**: CAD/CAE, PLM like CATIA, SolidWorks, Siemens PLM NX

- **Healthcare**: MRI, PET and CT image analysis

- **Media**: Show customers animations, bring remote artistic expertise.

- **ISP’s**: 3D Desktop as a Service. Video rendering, manufacturing, telemedicine, collaboration,…
NetApp 3D HCI Solution Simplifies Graphics

3D HCI removes the expensive workstation from the desk

Mobility / Security  Performance  SLA  TCO
### User experience is the most important factor for VDI and DaaS

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Security</th>
<th>Cost</th>
<th>Pro 3D Apps</th>
<th>Modern Apps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 3 workers are remote or multilocation today</td>
<td>Loss of IP and data from cyberattacks, natural disaster, human error</td>
<td>Achieve highest user density while maintaining performance</td>
<td>Deliver a full Quadro experience from data center or cloud</td>
<td>82% of global IP traffic will be video by 2021</td>
</tr>
</tbody>
</table>

*Sources: Gartner, Lakeside, Cisco Visual Networking Forecast*
GPU VIRTUALIZATION FOR ANY WORKLOAD

NVIDIA delivers GPU virtualization for both graphics and compute workloads.
How It Works

NVIDIA virtual GPU products deliver a GPU experience to every virtual desktop

CPU-only VDI

With NVIDIA virtual graphics processing unit (vGPU)

Server

Hypervisor

Apps and VMs

NVIDIA Tesla GPU

NVIDIA virtualization software

NVIDIA graphics drivers

Apps and VMs

Home-grown Linux Apps

Server

Hypervisor

NVIDIA virtual GPU
# NVIDIA T4 Key Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPU Architecture</td>
<td>NVIDIA Turing</td>
</tr>
<tr>
<td>NVIDIA CUDA® Cores</td>
<td>2,560</td>
</tr>
<tr>
<td>NVIDIA Turing™ Tensor Cores</td>
<td>320</td>
</tr>
<tr>
<td>RT Cores</td>
<td>40</td>
</tr>
<tr>
<td>Giga Rays/second</td>
<td>5</td>
</tr>
<tr>
<td>Memory Size</td>
<td>16 GB GDDR6</td>
</tr>
<tr>
<td>Memory BW</td>
<td>Up to 320 GB/s</td>
</tr>
<tr>
<td>vGPU Profiles</td>
<td>1 GB, 2 GB, 4 GB, 8 GB, 16 GB</td>
</tr>
<tr>
<td>Form Factor</td>
<td>PCIe 3.0 single slot (half height &amp; length)</td>
</tr>
<tr>
<td>Power</td>
<td>70W</td>
</tr>
<tr>
<td>Thermal</td>
<td>Passive</td>
</tr>
</tbody>
</table>
RTX Performance in a Quadro Virtual workstation

Support for up to 5 Giga Rays/Sec

Real-time Rendering
Simulation, modeling, design
Rendering, design
Real-Time Inference Performance

Quadro Virtual Workstation for deep learning inferencing workloads

Support for NVIDIA GPU Cloud (NGC)

Ideal for deep learning labs and classrooms

Tested on a server with Intel Xeon Gold 6154 (18C, 3.0 GHz), Quadro vDWS with T4-16Q, VMware ESXi 6.7, host/guest driver 410.87/412.10, VM config, Ubuntu 16.04, 8 vCPU, 32GB memory. 25X performance improvement over CPU VM.
Powerful, Versatile Platform for VDI

Powerful **virtual workstation** for the engineer, professional designer, and data scientist

**Deep learning inferencing** for virtual labs and classrooms

High density **virtual desktops** for the best user experience for Windows 10
Questions?