

# Access 3D Apps Anywhere, On Any Device With VMware Horizon View & NVIDIA GRID

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# Disclaimer

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- This session may contain product features that are currently under development.
- This session/overview of the new technology represents no commitment from VMware to deliver these features in any generally available product.
- Features are subject to change, and must not be included in contracts, purchase orders, or sales agreements of any kind.
- Technical feasibility and market demand will affect final delivery.
- Pricing and packaging for any new technologies or features discussed or presented have not been determined.

# Agenda

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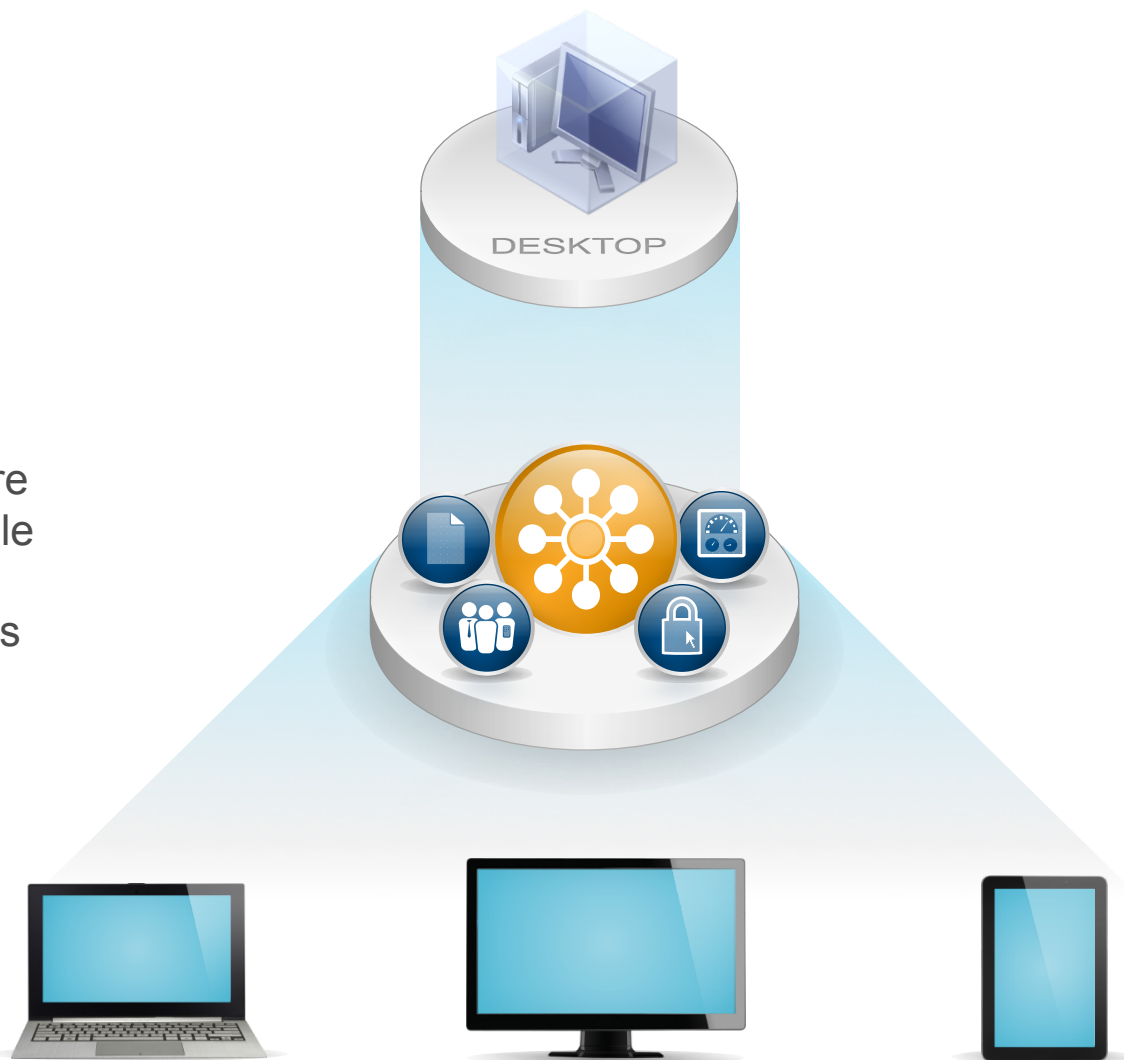
- Why Desktop Virtualization?
- Graphics Trends and User Segmentation
- VMware Graphics Overview & Use Cases
- Using NVIDIA Graphics with Horizon View
- Certification Program Overview
- Q&A

# Horizon View Virtualizes Desktops into a Central Service

**Transform:** Simplify desktops and apps into the datacenter with virtualization

**Broker:** Manage and secure virtual desktops from a single admin console while removing data off endpoints

**Deliver:** Empower your workforce with secure, roaming access to your same desktop across devices





# Market Trends and Why Cloud Graphics Matters



**DESIGNER**  
(CATIA, CS6, Inventor)

**25M**



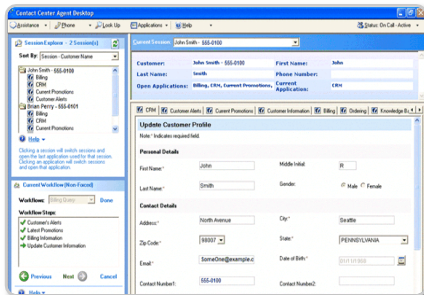
**POWER USER**  
(PLM, Medical, Showcase)

**200M**



**KNOWLEDGE WORKER**  
(MS Office, Photoshop)

**400M**



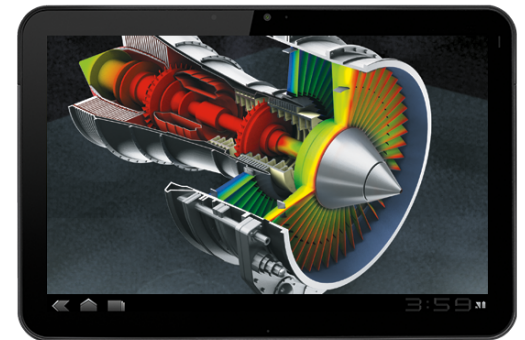
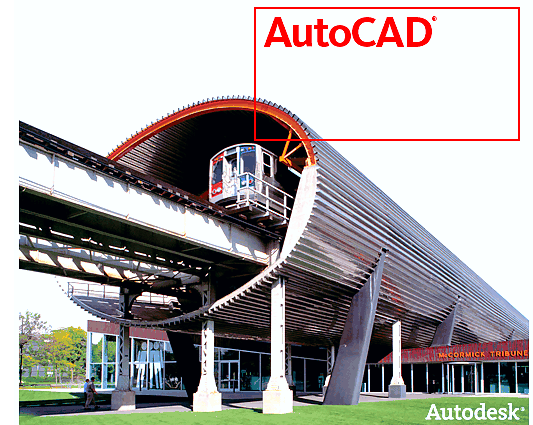
**TASK WORKER**  
(Call Center Apps)

**100M**

# VMware Graphics Overview & Use Cases

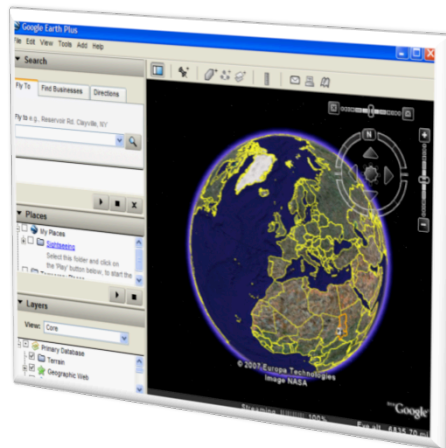
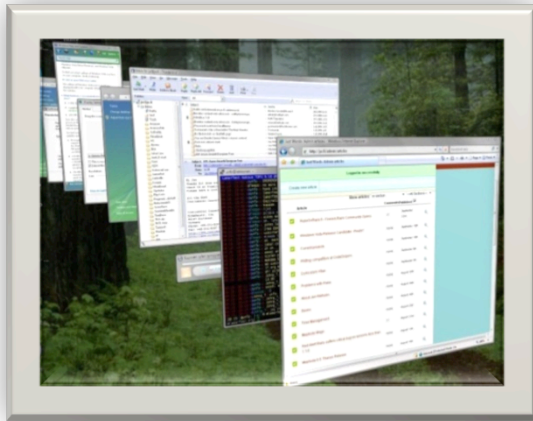
# VMware Graphics Virtualization Goals

- Most flexible platform for all graphics needs
- Broadest coverage of all use cases
- Highest scalability across use cases
- Full application compatibility



# Soft 3D – Basic 3D without GPU

*Software renderer provides 3D to productivity apps*



## Overview

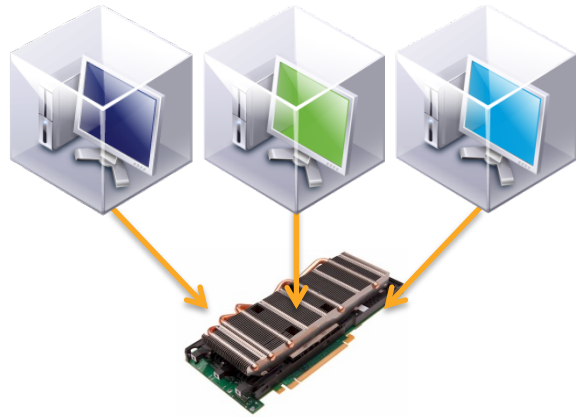
- Basic 3D graphics capabilities for productivity workers
- Targeted at Task and Knowledge Workers who need AERO or applications that require 3D graphics

## Benefits

- Enables DirectX 9 and OpenGL 2.1 apps
- No physical GPU required
- Lower initial VDI CAPEX
- No Windows client side dependencies

# sVGA - Shared GPU Among Multiple Virtual Machines

*Run rich 3D applications with higher consolidation*



## Overview

- Enables shared access to physical GPU hardware for 3D and high performance graphical workloads.
- Desktops still see abstracted VMware SVGA device for maximum virtual machine compatibility & portability.
- Cost effective with multiple VMs sharing single GPU resource

## Benefits

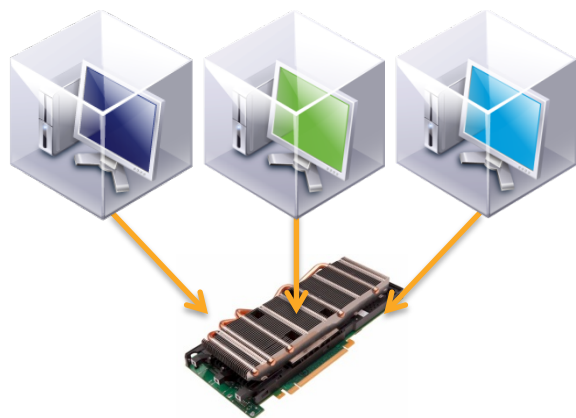
- Enables truly high performance graphics
- Cost effective with multiple VMs sharing single GPU resource
- Full compatibility with hosts lacking physical GPUs (for vMotion, DRS, etc).



# vDGA – Direct Passthrough to a Specific Virtual Machine



*Full workstation class user experience*



## Overview

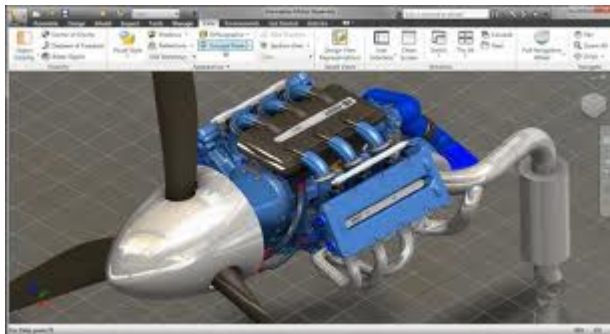
- Enables dedicated access to physical GPU hardware for 3D and high performance graphical workloads.
- Uses native nVidia drivers
- CUDA available to virtual machine
- Best for super high performance needs like manufacturing, oil & gas

## Benefits

- Full capabilities of physical GPUs
- True workstation replacement option

# All Hardware Accelerated Graphics Core Features

- Lossy and Lossless Image Compression
- Multiple Monitor support
- 3D and Relative Mouse support
- Increased vRAM support
  - Up to 512MB for (Soft3D – vSGA )
  - Up to Max GPU vRAM for vDGA
- Support for LAN or WAN



# Access 3D Desktops from Wide Variety of Clients



Laptops



Modern Browsers



Tablets/Phones



Zero Clients



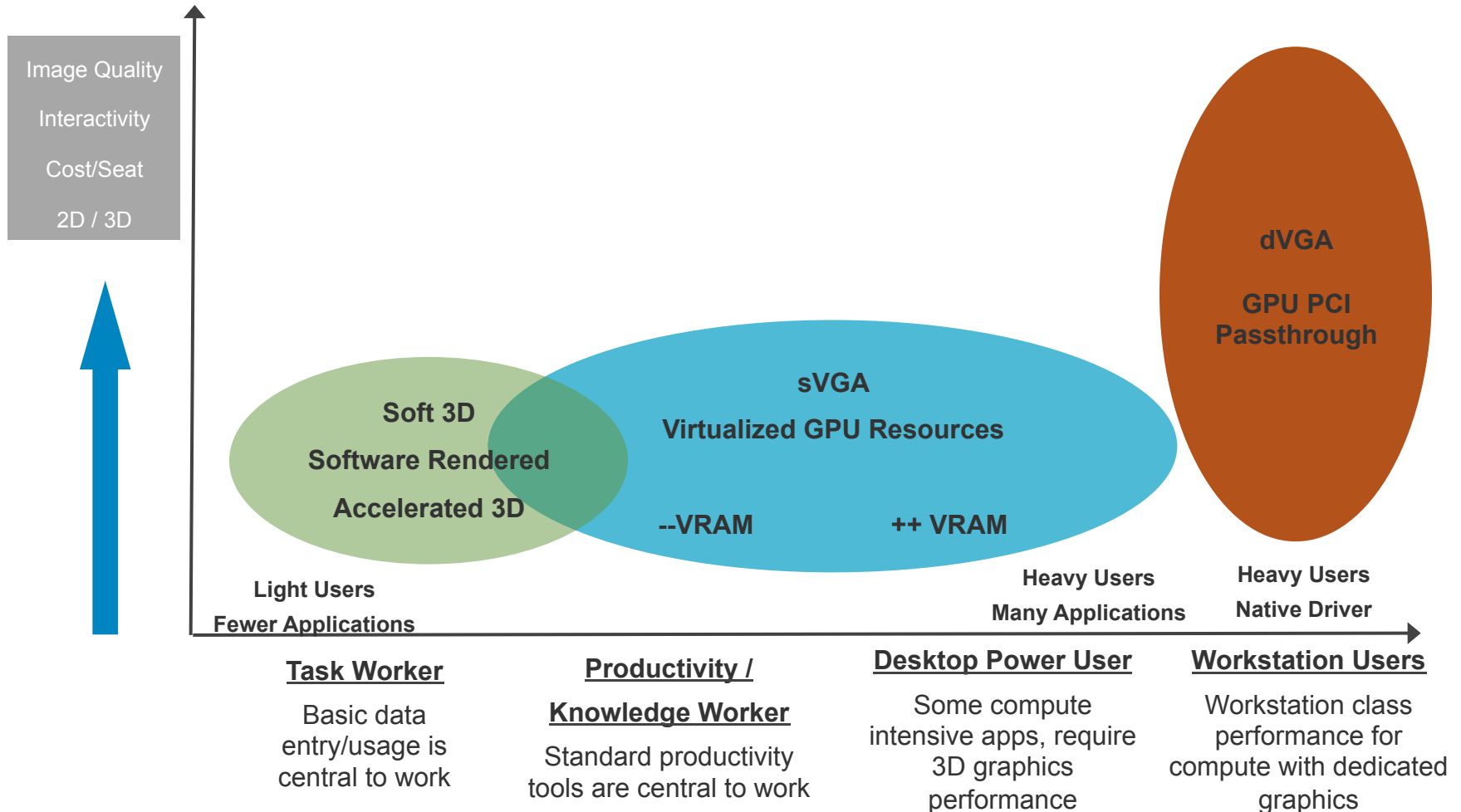
Desktops



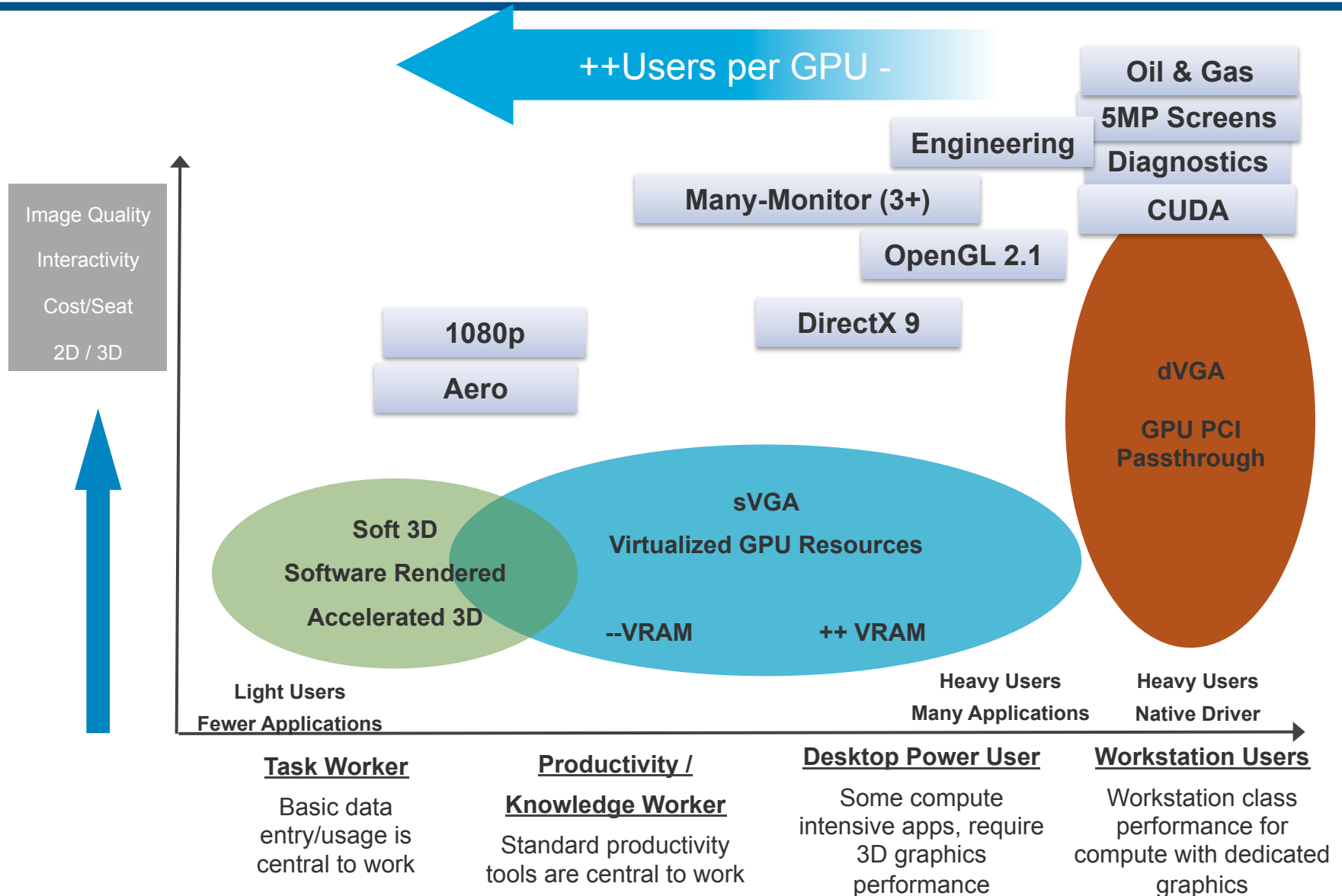
Thin Clients



# Virtual Desktop User Segmentation



# Virtual Desktop User Segmentation



# Graphics Use Cases – Office Apps and Power Users

	Soft 3D	vGPU (Shared)	vGPU (Dedicated)
Windows Aero	X	X	X
Microsoft Office	X	X	X
Microsoft Visio	X	X	X
Google Earth	X	X	X
HTML 5/Web 3D	X	X	X
Adobe Photoshop		X	X
Epic	X	X	X
SolidWorks View		X	X
Team Center Vis		X	X
PTC Creo View		X	X
Siemens NX Viewer		X	X
Adobe Premiere			X

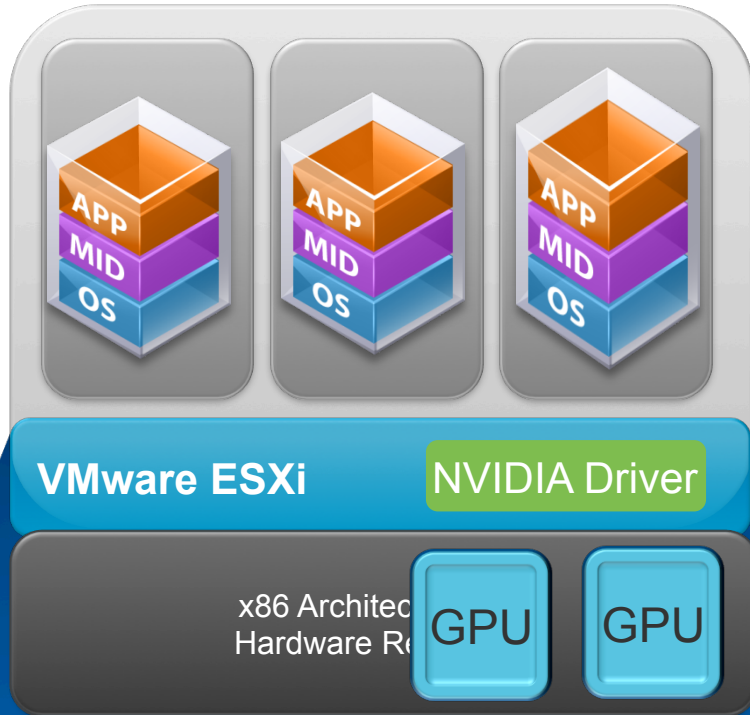
# Graphics Use Cases – 3D Design and Engineering Apps

	Soft 3D	vGPU (Shared)	vGPU (Dedicated)
AutoDesk AutoCAD		X*	X
AutoDesk Inventor		X*	X
AutoDesk 3DS Max		X*	X
AutoDesk Maya		X*	X
CATIA		X*	X
Solidworks		X*	X
Enovia		X*	X
Siemen NX		X*	X
Schumberger			X
Petrel			X
CUDA Apps			X
Custom 3D Apps			X

# Using NVIDIA GRID with Horizon View

# Virtualization of Desktop 3D Workloads

## The GPU Enabled Datacenter



## The Desktop

Thin Clients



iOS



Desktop Clients



Android

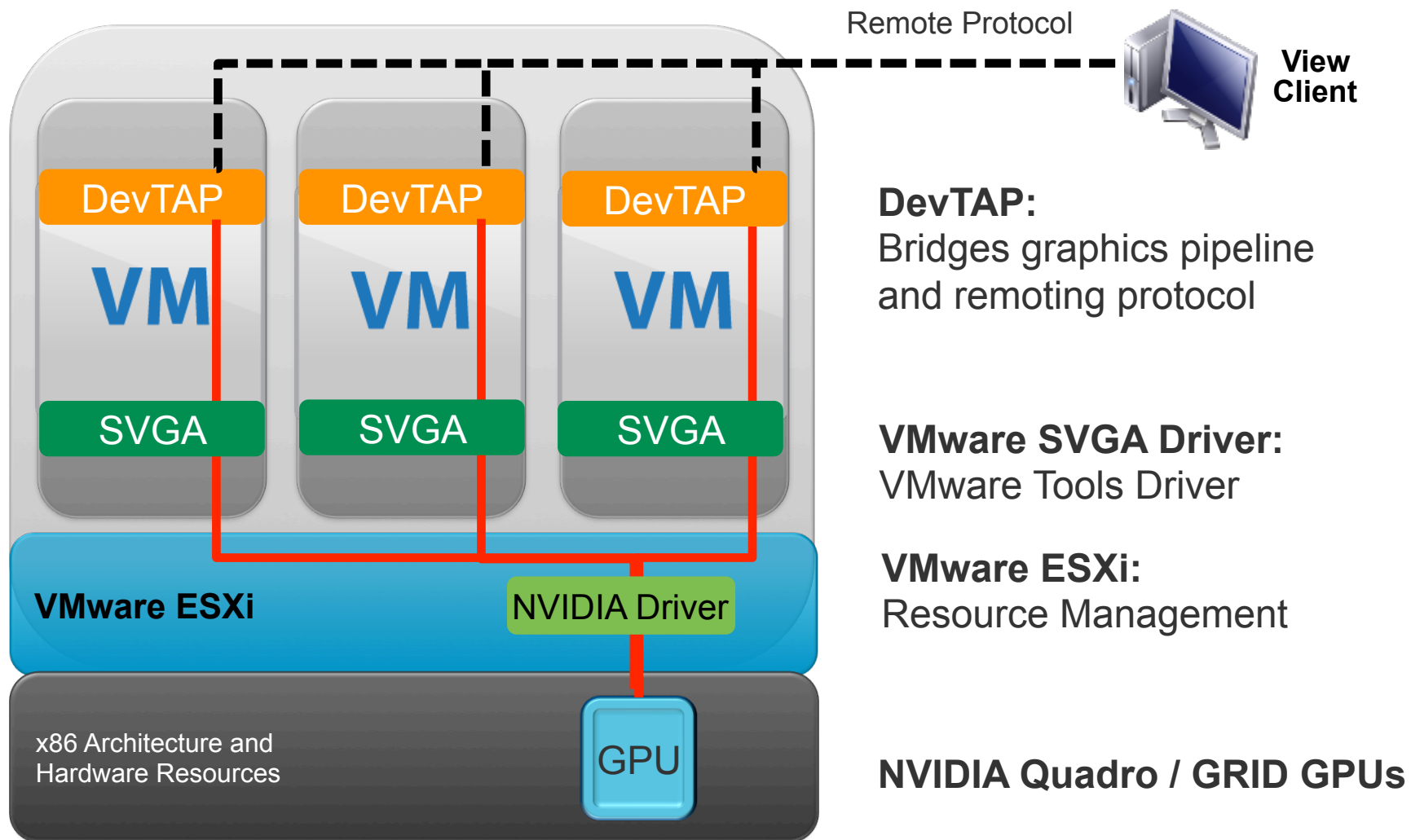


Multi-Multi-Mon

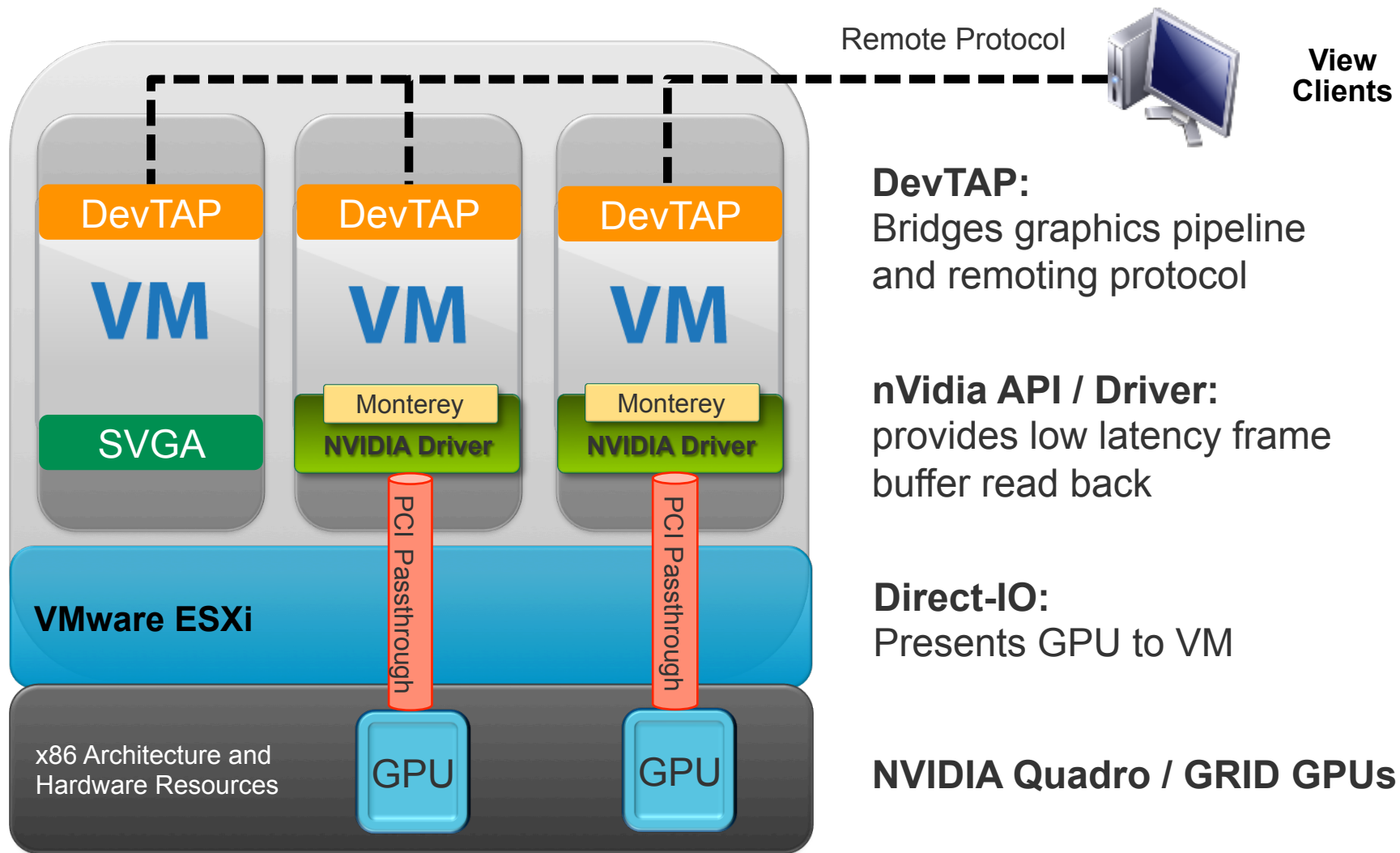


VMware View™

# vSGA with NVIDIA Technical Overview



# vDGA with NVIDIA Technical Overview





# vSGA / vDGA Benefits and Comparison

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## vSGA

- GPUs shared between users
- High consolidation ratio
- DirectX 9.0 SM3 / OpenGL 2.x
- vMotion / HA / DRS compatible
- Automatically fall back to software renderer

## vDGA

- GPU dedicated to user
- Workstation level compatibility
- Latest DirectX and OpenGL
- CUDA and OpenCL
- Maximum Performance

# vSGA / vDGA NVIDIA GPUs Moving Towards Certification

## vSGA

- Quadro 4000
- Quadro 5000
- Quadro 6000
- Tesla M2070Q
- GRID K1
- GRID K2

## vDGA

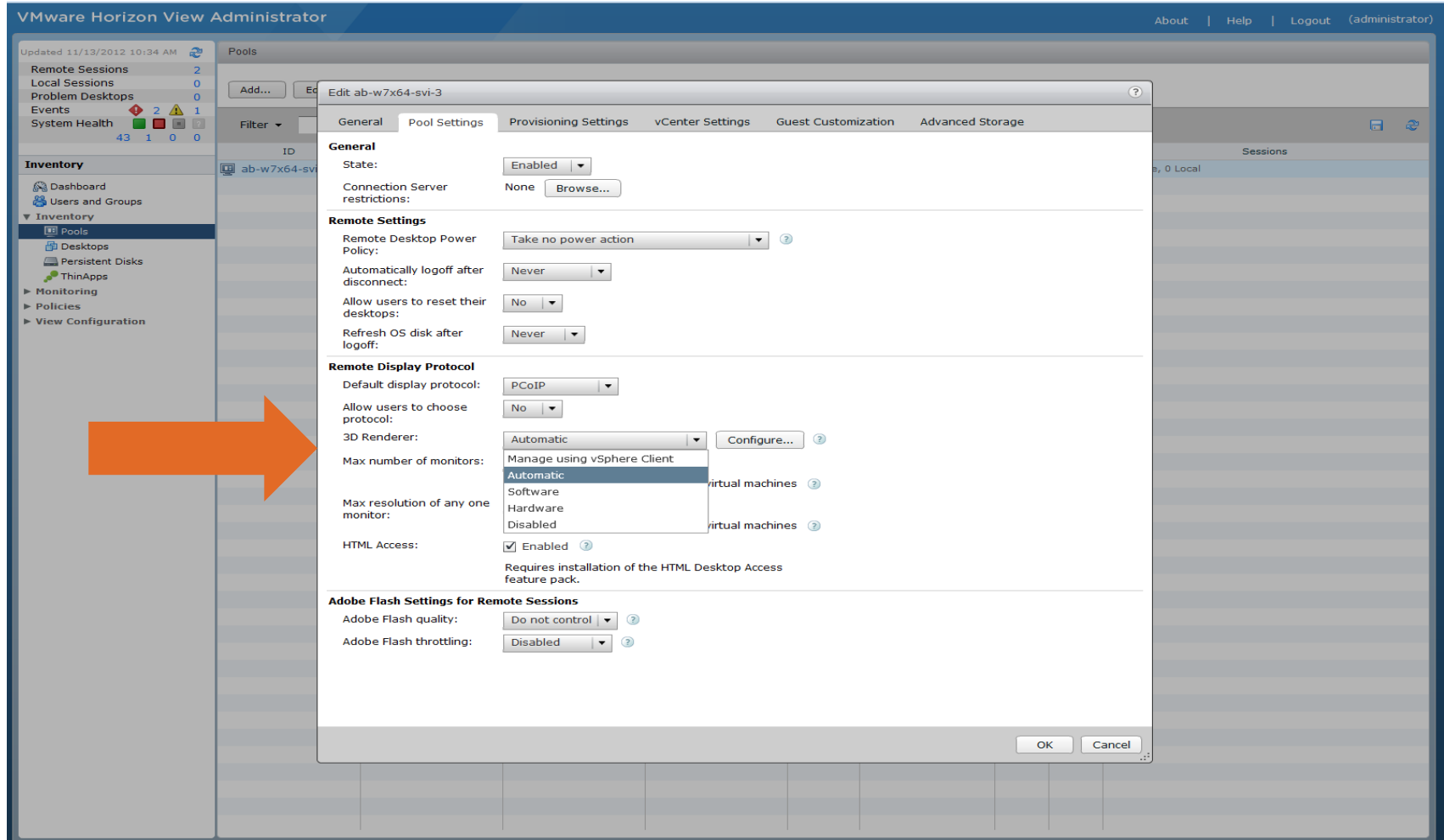
- Quadro 2000
- Quadro 4000
- Quadro 5000
- Quadro 6000
- Tesla M2070Q
- Quadro 1000M
- Quadro 3000M

### Coming Soon

- GRID K1
- GRID K2

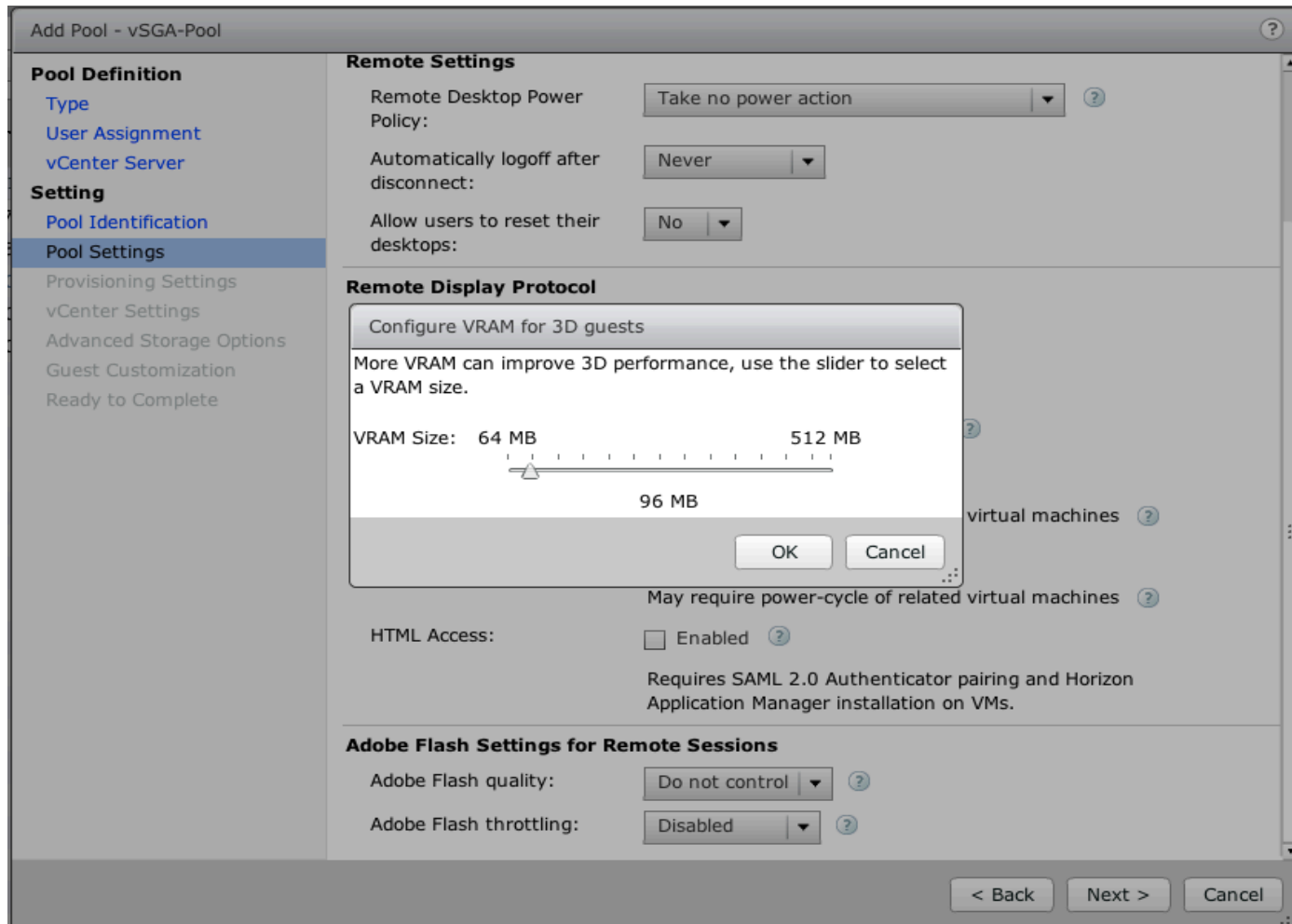
# View Manager - Configuring vSGA Enabled View Pools

Enable 3D rendering for your desktop or pool



# View Manager – Configuring vSGA Enabled View Pools

Set the desired VRAM



# vSphere - Checking a Virtual Machines Configuration

vmware® vSphere Web Client

Administrator@VCENTER | Help | Search

vCenter

Win7-3D-SHA1

Summary Monitor Manage Related Objects

Win7-3D-SHA1

Guest OS: Microsoft Windows 7 (32-bit)  
Compatibility: ESXi 5.1 and later (VM version 9)  
VMware Tools: Running (Current)  
DNS Name: WIN7-3D-SHA1.wadingdog.com  
IP Addresses: 192.168.1.185  
View all 4 IP addresses  
Host: 192.168.1.38

Powered On

CPU USAGE  
287 MHz

MEMORY USAGE  
368 MB

STORAGE USAGE  
40 GB

VM Hardware

CPU	2 CPU(s), 383 MHz used
Memory	2048 MB, 368 MB used
Hard disk 1	40.00 GB
Network adapter 1	VM Network (connected)
CD/DVD drive 1	Connected
Floppy drive 1	Disconnected
Video card	
Total video memory	512.00 MB
Number of displays	4
3D Graphics	Enabled
3D Renderer	Hardware
Other	Additional Hardware
Compatibility	ESXi 5.1 and later (VM version 9)

VM Storage Profiles

VM Storage Profiles	--
Profile Compliance	--
Last Checked Date	--

Refresh

Tags

Assigned Tag	Category	Description
This list is empty.		

Assign... Detach...

Related Objects

Host	192.168.1.38
Resource pool	192.168.1.38
Networks	VM Network
Storage	nas1-nfs-vol01b

Advanced Configuration

EVC Mode	N/A
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Recent Tasks

All Running Failed

My Tasks More Tasks

Work In Progress

Alarms

All (12) New (1... Ackno...

VCENTER  
Health status monitoring

nas1-nfs-vol01b  
Datastore usage on disk

192.168.1.14  
Host connection and pow...

192.168.1.20  
Host connection and pow...

# vSphere – Editing a Virtual Machines Configuration

vmware® vSphere Web Client

Administrator@VCENTER | Help | Search

Win7-3D-SHA1

Summary Monitor Manage Related Objects

VCENTER

- Home
  - 192.168.1.14
  - 192.168.1.20
  - 192.168.1.38
    - win7-3D-DHA1
    - Win7-3D-SHA1
    - win7-3D-SHA2
    - Win7-3D-VGPU2
    - Win8
  - 192.168.1.9

Powered On

VM Hardware

- CPU
- Memory
- Hard disk 1
- Network adapter 1
- CD/DVD drive 1
- Floppy drive 1
- Video card

3D Graphics

3D Renderer

Other

Compatibility

Advanced Configuration

EVC Mode: N/A

Win7-3D-SHA1 - Edit Settings

Virtual Hardware VM Options SDRS Rules vApp Options

CPU: 2

Memory: 2048 MB

Hard disk 1: 40 GB

SCSI controller 0: LSI Logic SAS

Network adapter 1: VM Network ☒ Connected

CD/DVD drive 1: Datastore ISO File ☒ Connected

Floppy drive 1: Client Device ☐ Connected

Video card: Specify custom settings

Number of displays: 4

Total video memory: 512.00 MB

Video Memory Calculator

3D Graphics: ☒ Enable 3D Support

3D Renderer: Hardware

VMCI device: Automatic

Other Devices: Hardware

New device: Select Add

Compatibility: ESXi 5.1 and later (VM version 9)

OK Cancel

CPU USAGE: 287 MHz

MEMORY USAGE: 368 MB

STORAGE USAGE: 40 GB

Recent Tasks

All Running Failed

My Tasks More Tasks

Work In Progress

Win7-3D-SHA1 - E...

Alarms

All (12) New (1... Ackno...

- VCENTER
  - Health status monitoring
- nas1-nfs-vol01b
  - Datastore usage on disk
- 192.168.1.14
  - Host connection and pow...
- 192.168.1.20
  - Host connection and pow...

# vSGA Tips and Tricks

ESXi Commands	Description
gpuvvm	Show what VMs are using gpu(s)
Esxcli software vib install -v /path-to-vib/name-of-vib.vib	Loads the NVIDIA VIB
esxcli software vib list   grep NVIDIA	Verify NVIDIA vib is installed
Esxcli system module load -module nvidia	Verify NVIDIA module loads
Esxcli hardware pci list -c 0x300 -m 0xff	Verify devices are present
nvidia-smi	General status of the GPU / driver version

# Certification and Validation Programs Coming Soon!

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- **vSGA certification for GPU Partners**
  - Time and cost effective program for GPU vendors to self-certify
  - Certified GPU's and associated drivers listed on vSGA HCL
  - Supported servers used in certification and included as part of the listing
- **vDGA certification for Server Partners**
  - Partners test and validated end-to-end configurations
  - GPU devices, supported servers, and Guest OS certified for fixed passthrough
  - GPU device listed on server HCL, as part of vDGA solution certification
- **ISV validation**
  - Joint validation, testing and support between VMware, NVIDIA and ISV



# Key Takeaways

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- **Cloud graphics expands the virtual desktop use case from task and knowledge workers to the highest end workstation users**
- **VMware and NVIDIA have partnered to deliver comprehensive end-to-end cloud graphics solutions for the VDI market**
- **VMware Horizon View, vSphere and NVIDIA GPUs enable cloud based desktop and workstation delivery combining best of breed technology**
- **Visit VMware on the show floor to see demo today!**

# Thank You! Questions?



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