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

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Disclaimer

- 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

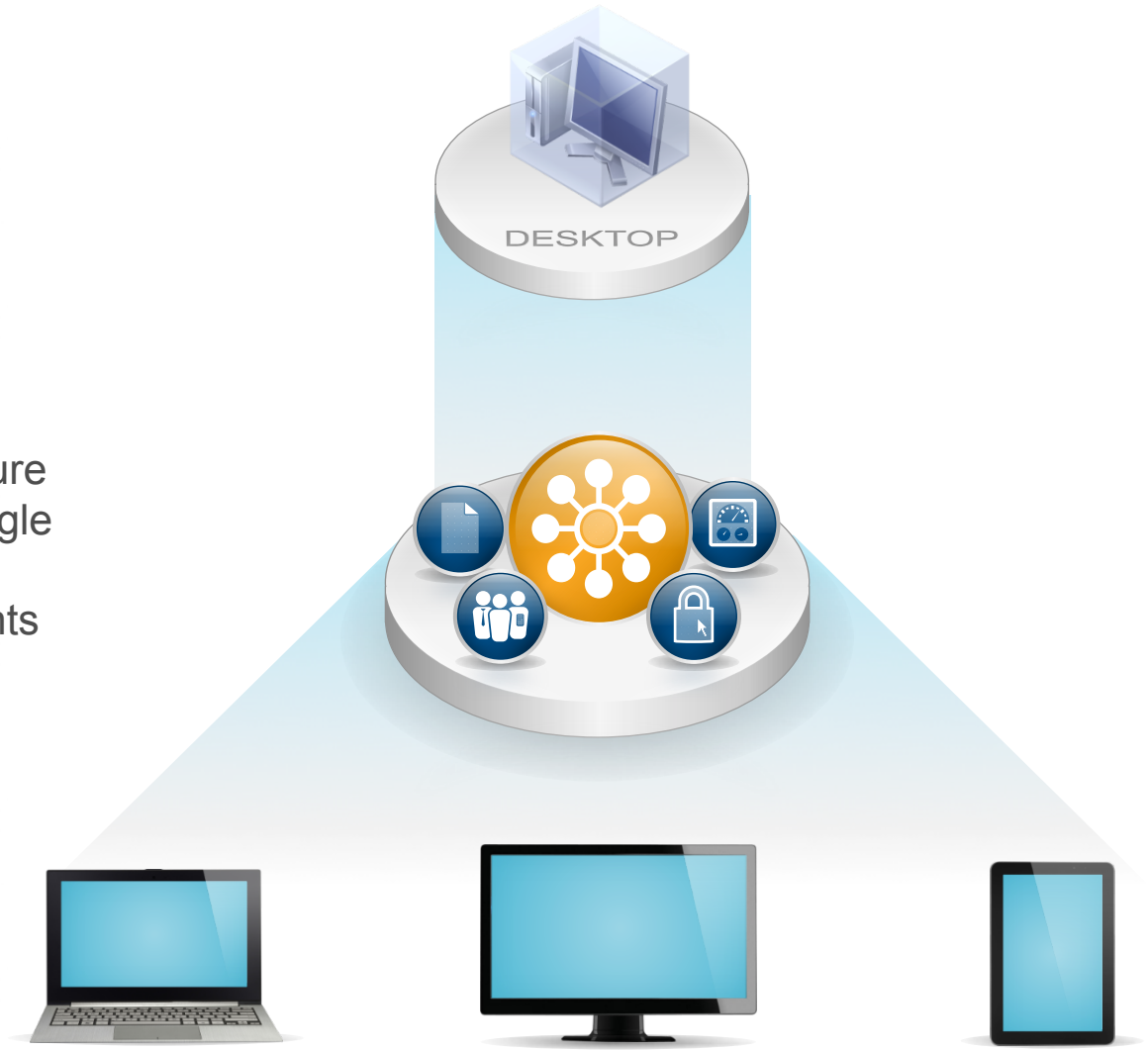
- Why Desktop Virtualization?
- Graphics Trends and User Segmentation
- VMware Graphics Overview & Use Cases
- Using NVIDIA Graphics with Horizon View
- Certification Program Overview
- Q&A

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)

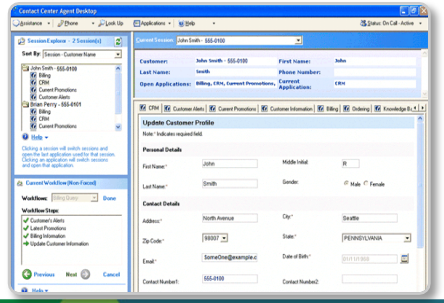
25M

POWER USER
(PLM, Medical, Showcase)

200M

KNOWLEDGE WORKER
(MS Office, Photoshop)

400M



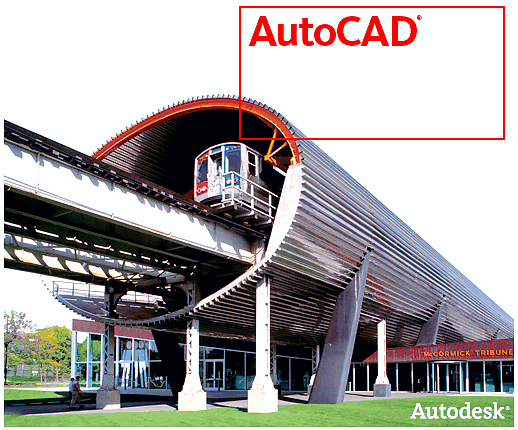
TASK WORKER
(Call Center Apps)

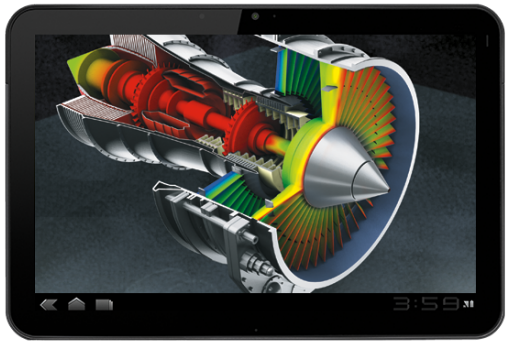
100M

VMware Graphics Overview & Use Cases

VMware Graphics Virtualization Goals

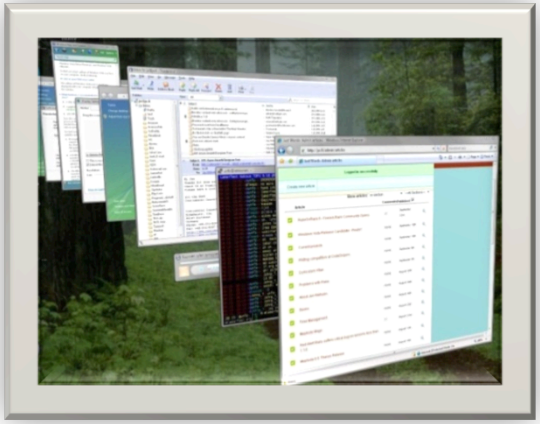
- Most flexible platform for all graphics needs
- Broadest coverage of all use cases
- Highest scalability across use cases
- Full application compatibility

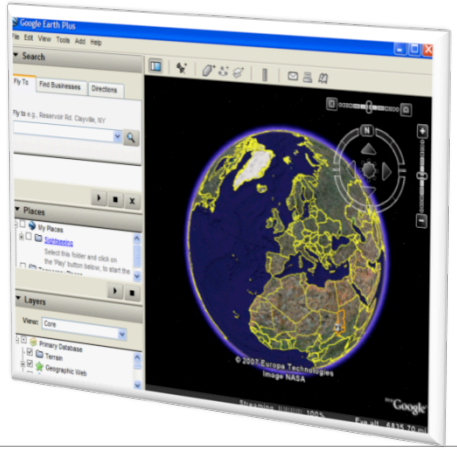




Soft 3D – Basic 3D without GPU

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

COMING SOON!

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**
- **Mulitple 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

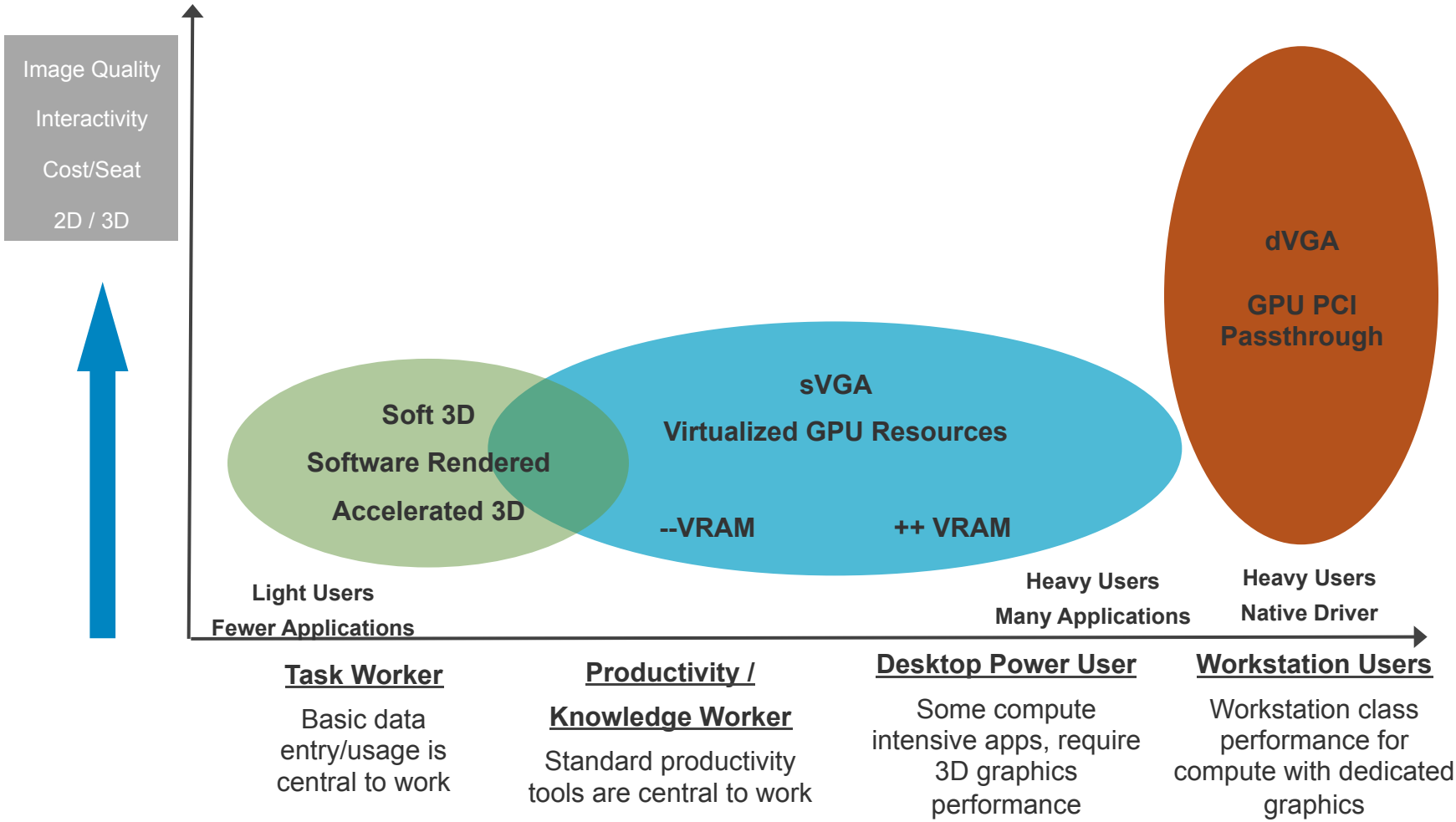
Tablets/Phones

Zero Clients

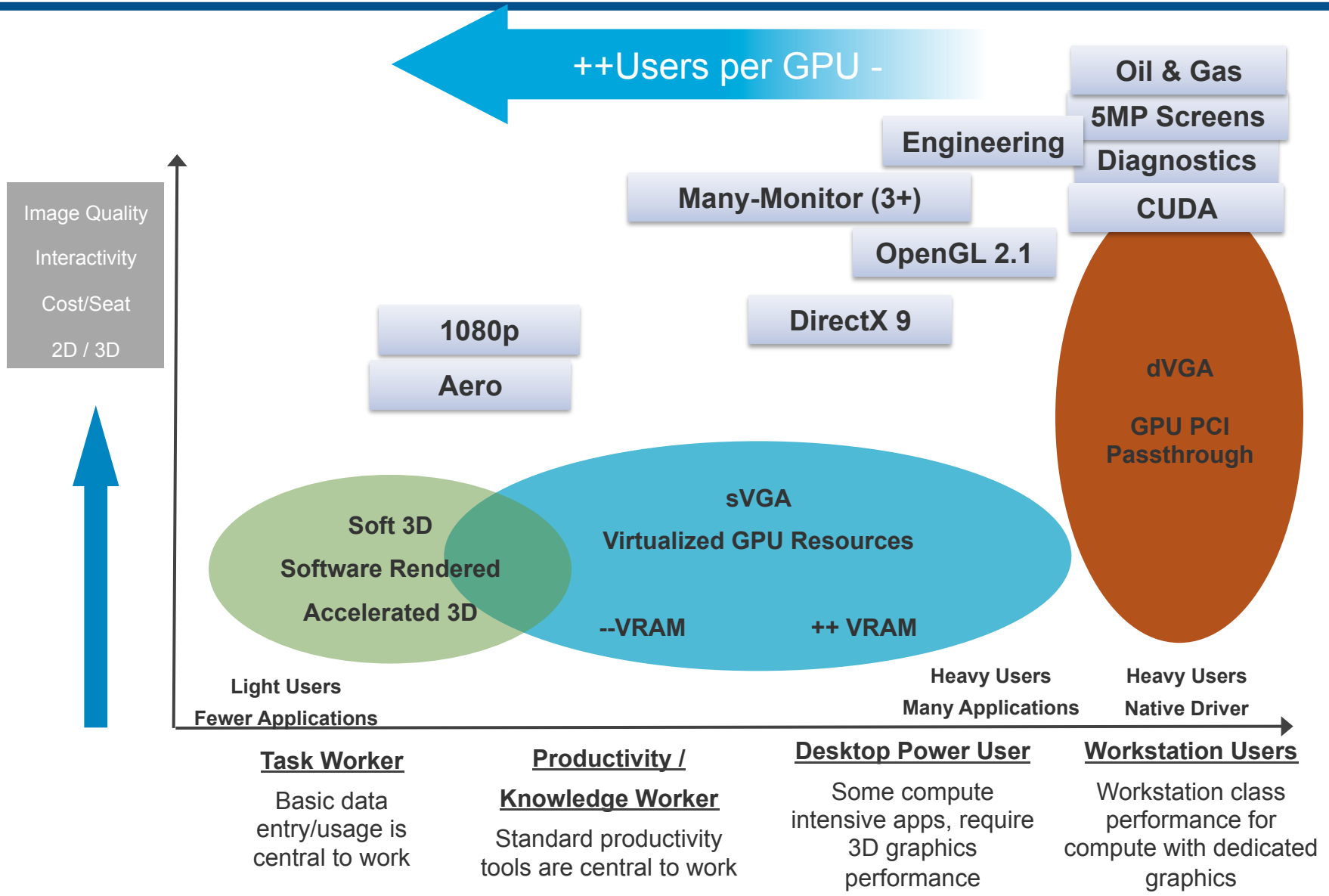
Desktops

Thin Clients

Virtual Desktop User Segmentation



Virtual Desktop User Segmentation



Graphics Use Cases – Office Apps and Power Users

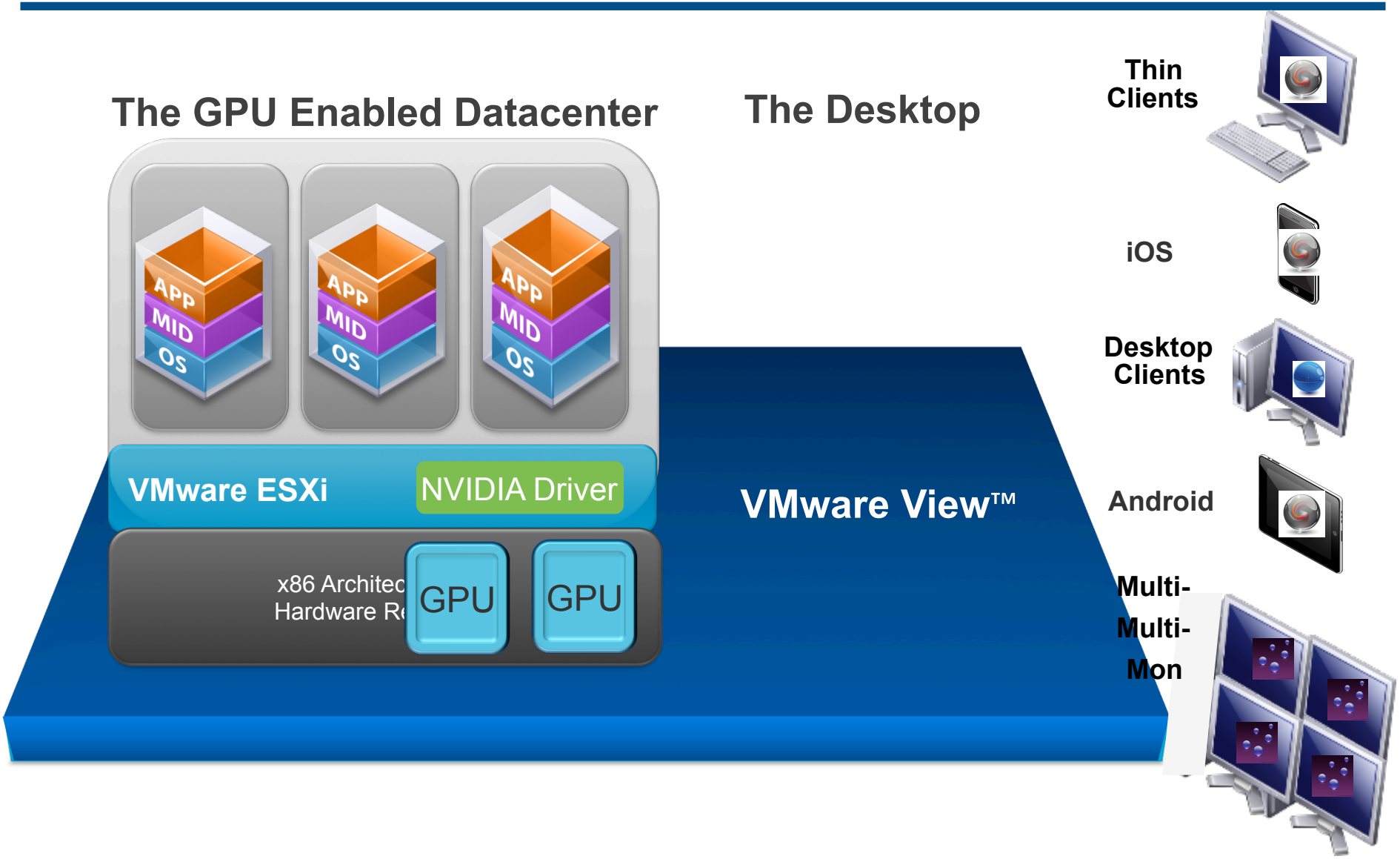
	Soft 3D	vGPU (Shared)	vGPU (Dedicated)
Windows Aero	X	X	X
Microsoft Office	X	X	X
Microsoft Visio	X	X	X
Google Earth	X	X	X
HTML 5/Web 3D	X	X	X
Adobe Photoshop		X	X
Epic	X	X	X
SolidWorks View		X	X
Team Center Vis		X	X
PTC Creo View		X	X
Siemens NX Viewer		X	X
Adobe Premiere			X

Graphics Use Cases – 3D Design and Engineering Apps

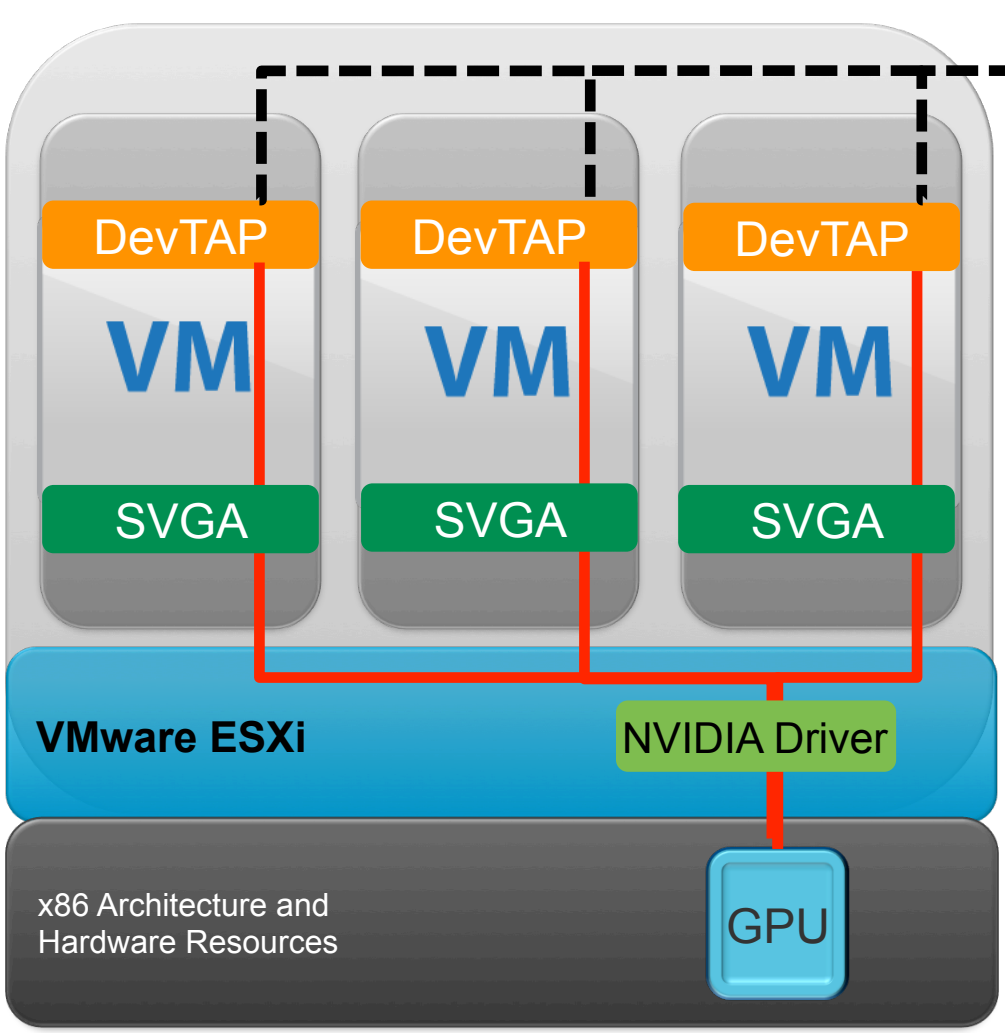
	Soft 3D	vGPU (Shared)	vGPU (Dedicated)
AutoDesk AutoCAD		X*	X
AutoDesk Inventor		X*	X
AutoDesk 3DS Max		X*	X
AutoDesk Maya		X*	X
CATIA		X*	X
Solidworks		X*	X
Enovia		X*	X
Siemen NX		X*	X
Schumberger			X
Petrel			X
CUDA Apps			X
Custom 3D Apps			X

Using NVIDIA GRID with Horizon View

Virtualization of Desktop 3D Workloads



vSGA with NVIDIA Technical Overview



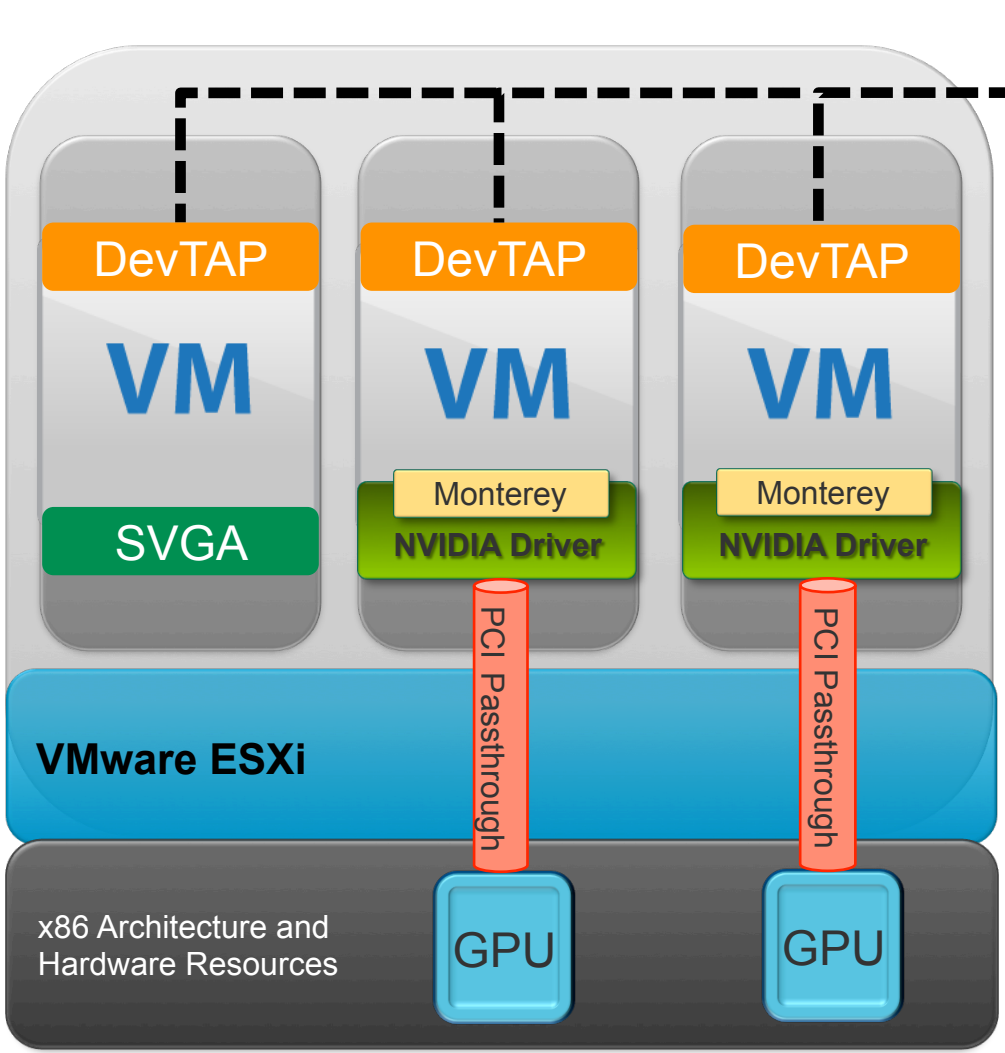
DevTAP:
Bridges graphics pipeline and remoting protocol

VMware SVGA Driver:
VMware Tools Driver

VMware ESXi:
Resource Management

NVIDIA Quadro / GRID GPUs

vDGA with NVIDIA Technical Overview



DevTAP:
Bridges graphics pipeline and remoting protocol

nVidia API / Driver:
provides low latency frame buffer read back

Direct-IO:
Presents GPU to VM

NVIDIA Quadro / GRID GPUs

vSGA / vDGA Benefits and Comparison

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

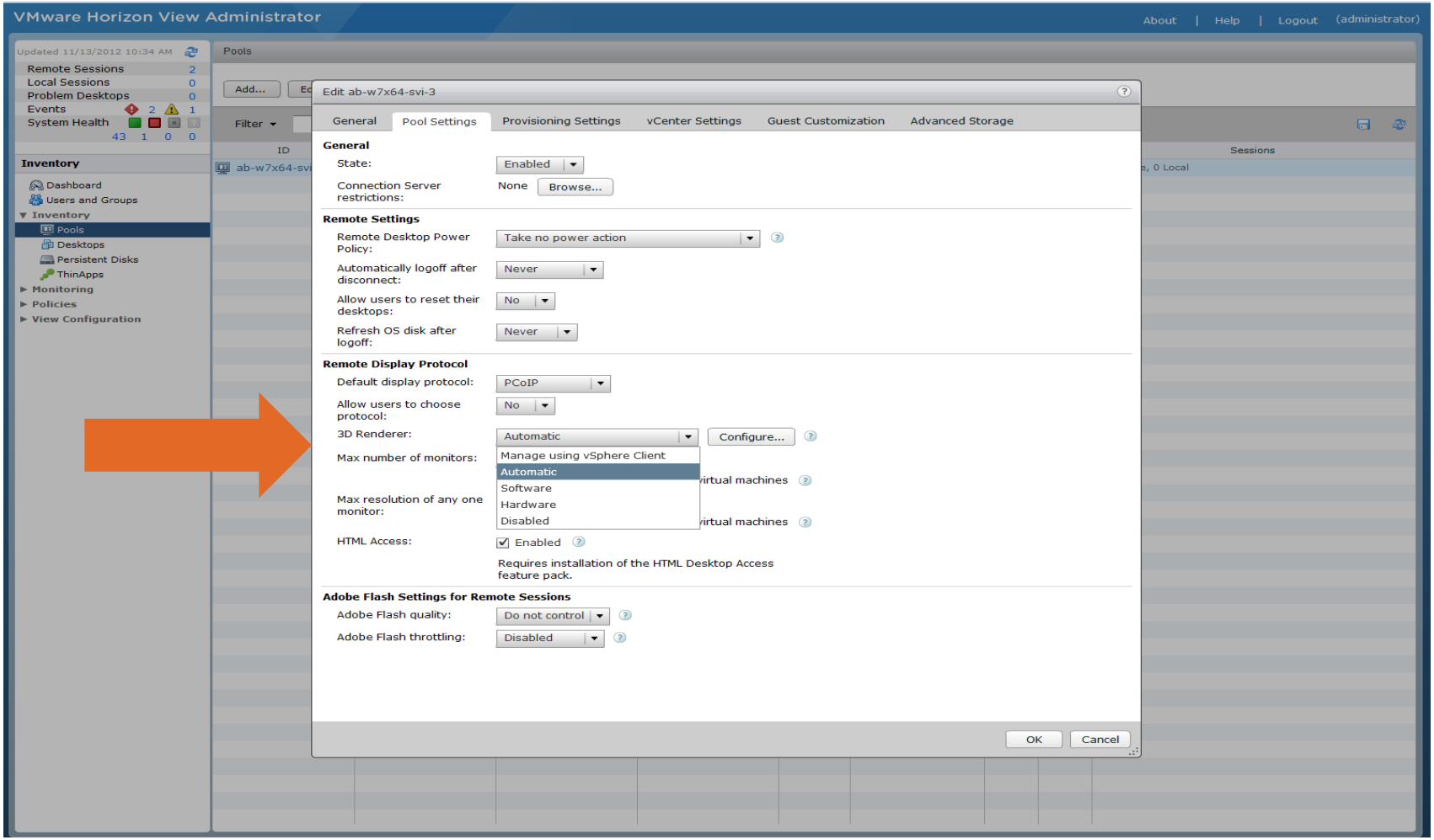
- Quadro 2000
- Quadro 4000
- Quadro 5000
- Quadro 6000
- Tesla M2070Q
- Quadro 1000M
- Quadro 3000M

Coming Soon

- GRID K1
- GRID K2

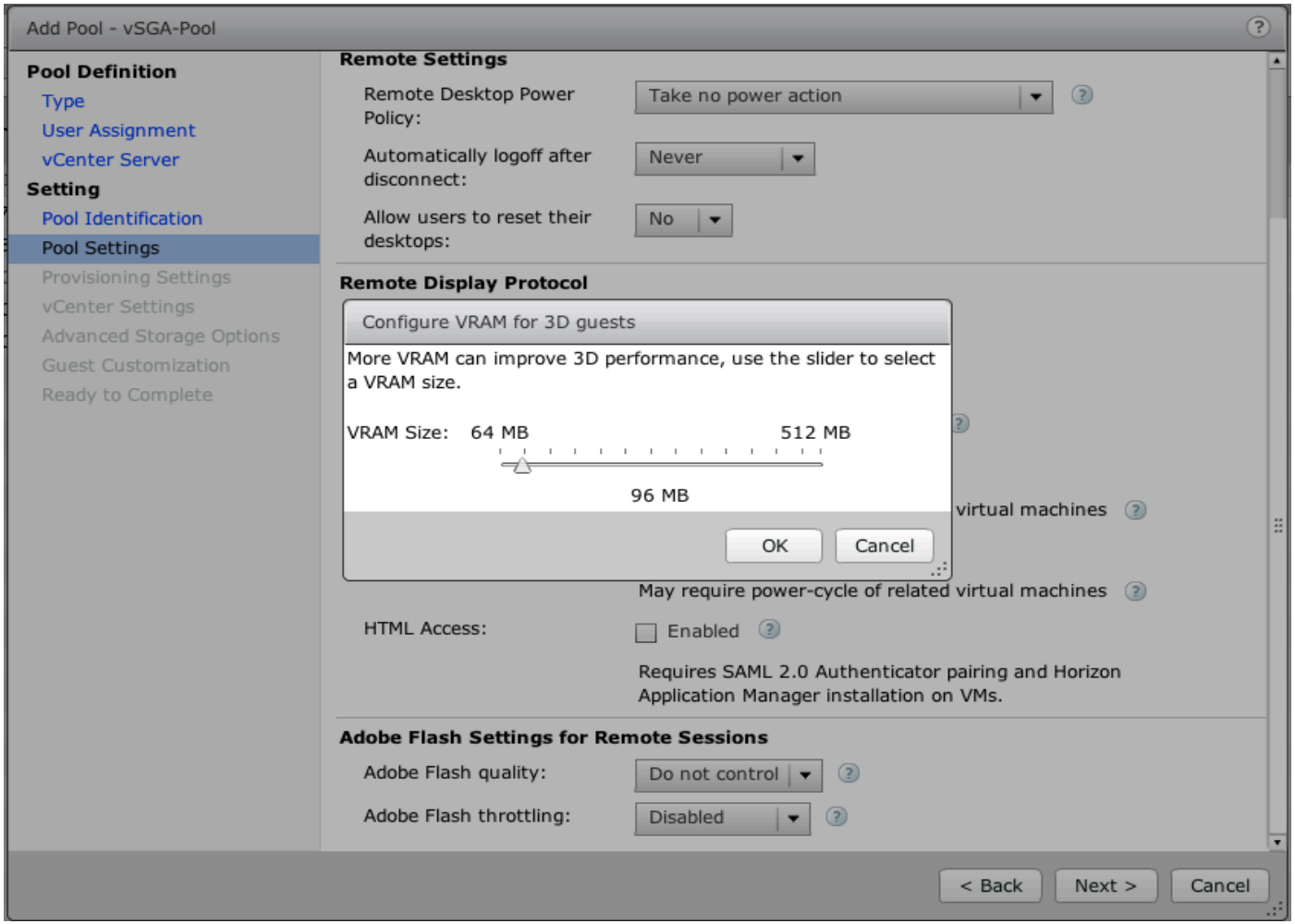
View Manager - Configuring vSGA Enabled View Pools

Enable 3D rendering for your desktop or pool

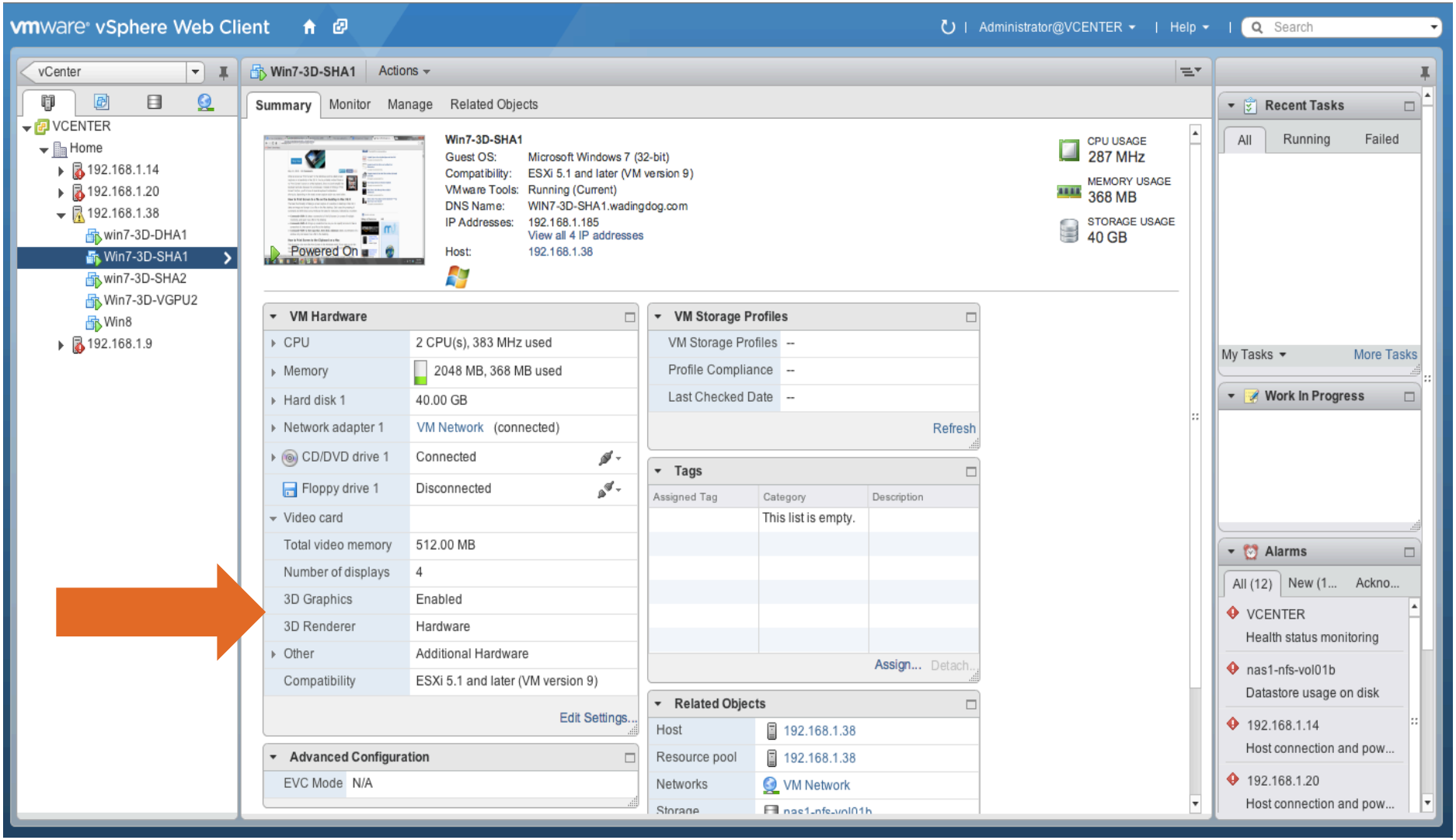


View Manager – Configuring vSGA Enabled View Pools

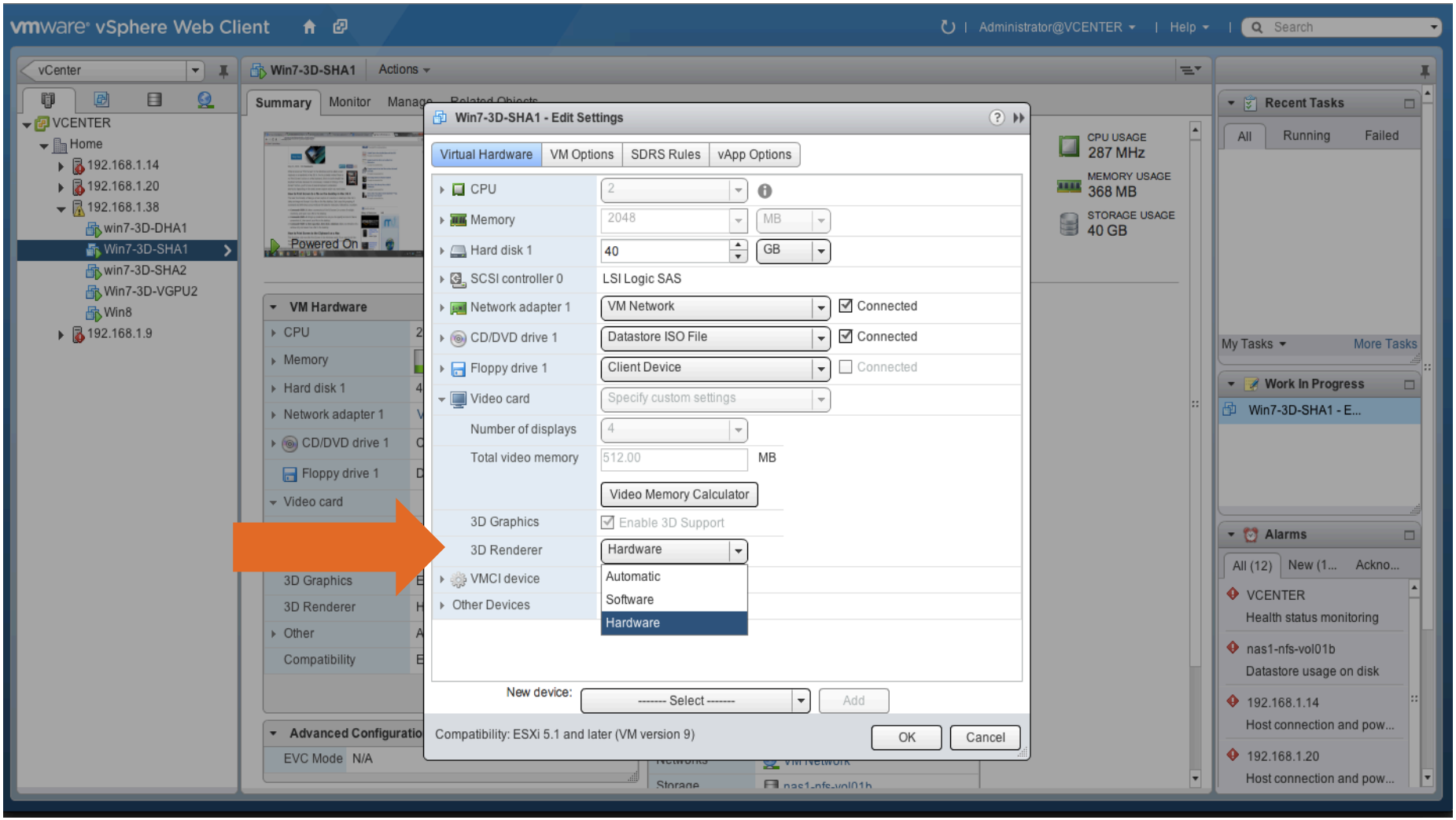
Set the desired VRAM



vSphere - Checking a Virtual Machines Configuration



vSphere – Editing a Virtual Machines Configuration



vSGA Tips and Tricks

ESXi Commands	Description
gpuvm	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!

- **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

- **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?
vmware