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

Pat LeeDirector of Product Management, VMware End User ComputingAaron BlasiusSenior Product Manager, VMware vSphere



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.

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

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

DESKTOF

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) **25**M





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POWER USER

(PLM, Medical, Showcase)

200M

KNOWLEDGE WORKER

(MS Office, Photoshop)



TASK WORKER (Call Center Apps)

100M

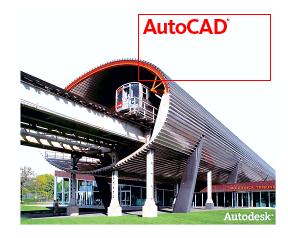
VMware Graphics Overview & Use Cases



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









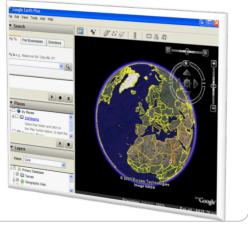
Soft 3D – Basic 3D without GPU

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 <u>shared</u> access to <u>physical</u> 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).



Full workstation class user experience



Overview

- Enables <u>dedicated</u> access to <u>physical</u> 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





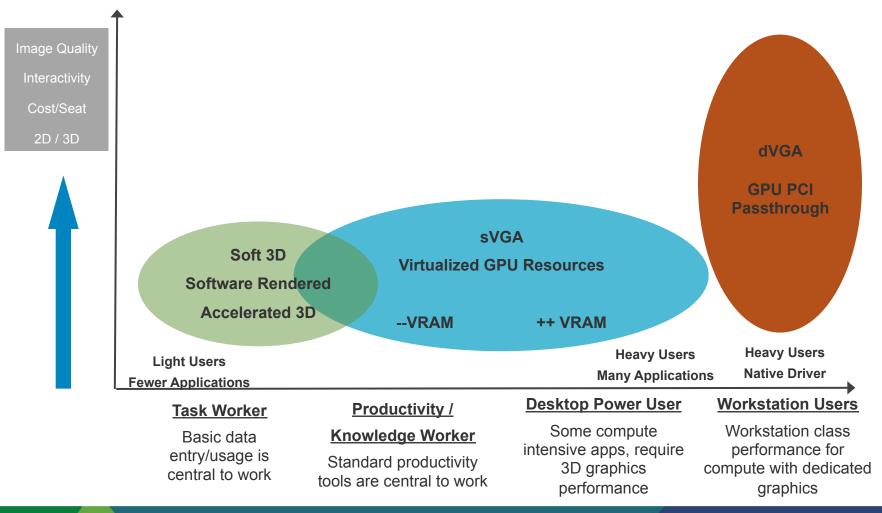




Access 3D Desktops from Wide Variety of Clients



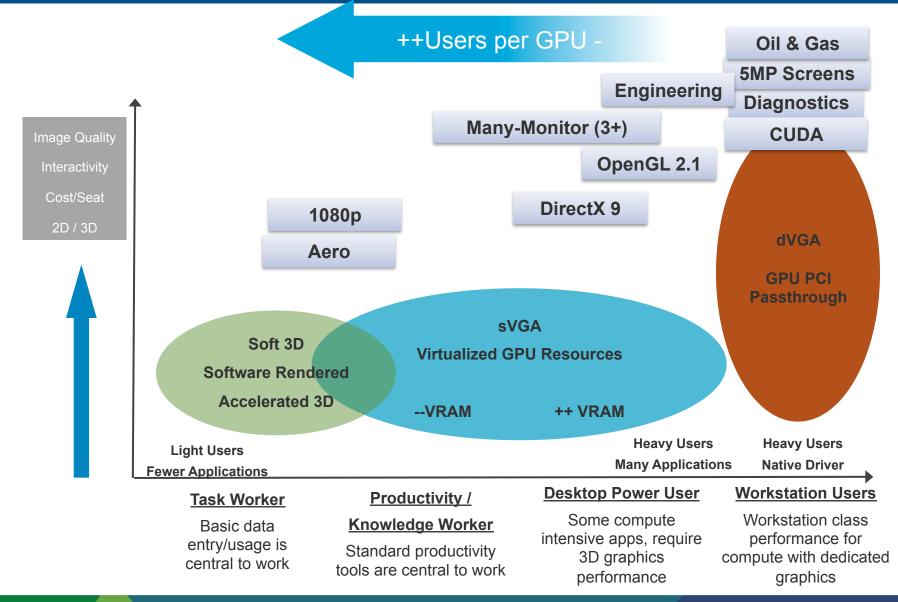




¹³ The information on the roadmap is intended to outline our general product direction and it should not be relied on in making a purchasing decision. It is for informational purposes only and may not be incorporated into any contract.

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Virtual Desktop User Segmentation



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Graphics Use Cases – Office Apps and Power Users

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

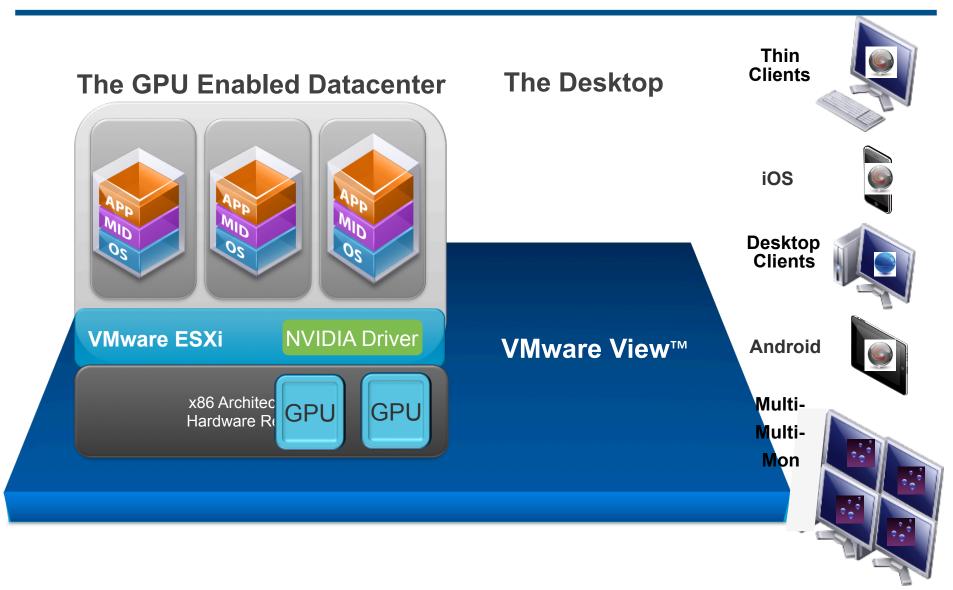
Graphics Use Cases – 3D Design and Engineering Apps

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

Using NVIDIA GRID with Horizon View



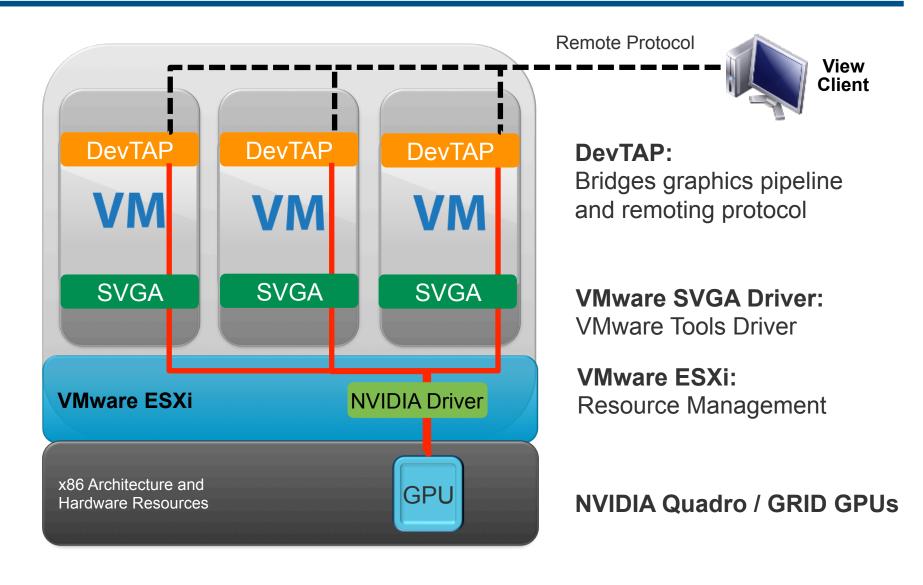
Virtualization of Desktop 3D Workloads



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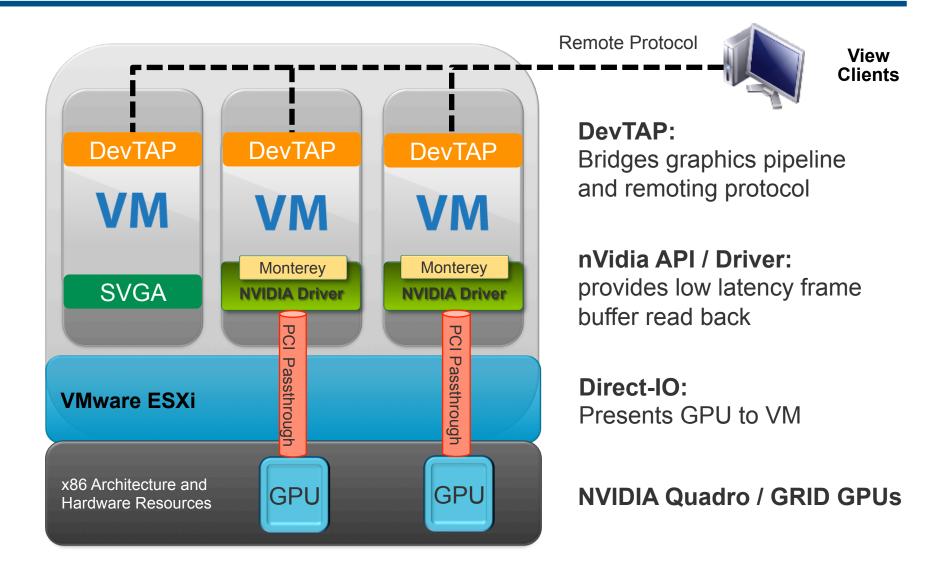
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vSGA with NVIDIA Technical Overview



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vDGA with NVIDIA Technical Overview





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



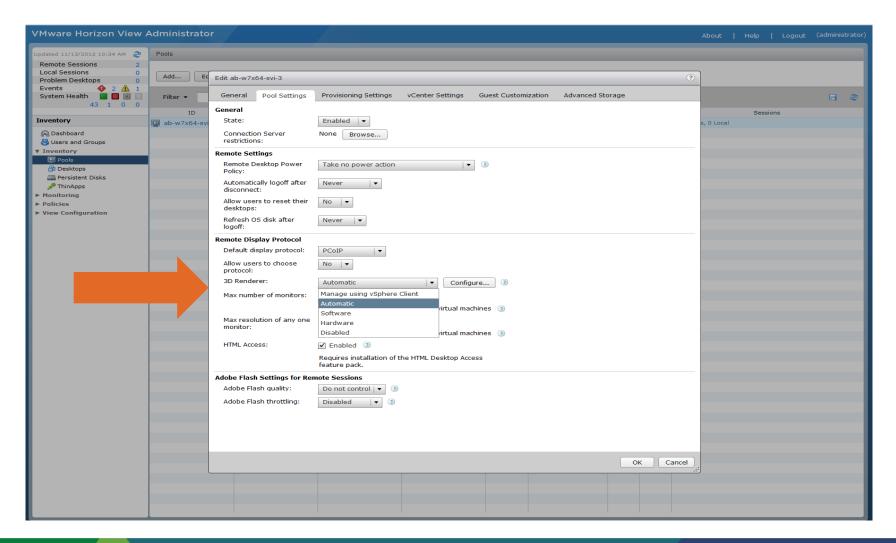
vSGA / vDGA NVIDIA GPUs Moving Towards Certification

vSGA **vDGA** Quadro 4000 Quadro 2000 Quadro 5000 Quadro 4000 Quadro 6000 Quadro 5000 Tesla M2070Q Quadro 6000 GRID K1 Tesla M2070Q **GRID K2** 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



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View Manager – Configuring vSGA Enabled View Pools

Set the desired VRAM

Add Pool - vSGA-Pool		(?)
Pool Definition Type User Assignment vCenter Server Setting	Policy:	ake no power action
Pool Identification Pool Settings	Allow users to reset their N desktops:	
Provisioning Settings	Remote Display Protocol	
vCenter Settings Advanced Storage Options	Configure VRAM for 3D guests	
Guest Customization Ready to Complete	More VRAM can improve 3D perfor a VRAM size.	mance, use the slider to select
	VRAM Size: 64 MB	512 MB MB OK Cancel .:
	HTML Access:	ay require power-cycle of related virtual machines ③ Enabled ③ equires SAML 2.0 Authenticator pairing and Horizon plication Manager installation on VMs.
	Adobe Flash Settings for Remot	e Sessions
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	Adobe Flash throttling:	Disabled
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vSphere - Checking a Virtual Machines Configuration

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vCenter 💌 🚛	Win7-3D-SHA1 Actio	ons 🔻				=		I
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vSphere – Editing a Virtual Machines Configuration

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vCenter 🔻	Win7-3D-SHA1 Actions			E.	T
III III III ✓ III IIII	Summary Monitor Manag	Bolated Objects	ttings	? ► CPU USAGE ▲	Recent Tasks
 Home ▶ 192.168.1.14 ▶ 192.168.1.20 ▶ 192.168.1.38 ▶ win7-3D-DHA1 ▶ Win7-3D-SHA2 ▶ Win7-3D-VGPU2 ₩ Win8 ▶ 192.168.1.9 	VM Hardware CPU CPU Memory Hard disk 1 Memory Metwork adapter 1 W So CD/DVD drive 1 C Floppy drive 1 C Video card	Virtual Hardware VM Option Image: CPU Image: CPU Image: C	SDRS Rules vApp Options 2 • 2048 • 40 • GB • LSI Logic SAS VM Network • Oatastore ISO File • Connected Datastore ISO File • Connected Specify custom settings 4 • 512.00 MB Video Memory Calculator • Enable 3D Support Hardware • Automatic	CPU USAGE 287 MHz MEMORY USAGE 368 MB STORAGE USAGE 40 GB	My Tasks More Tasks Work In Progress Win7-3D-SHA1 - E All (12) New (1 Ackno
	3D Renderer H Other A Compatibility E Advanced Configuratio EVC Mode N/A	Other Devices New device: Compatibility: ESXi 5.1 and la	Add	Cancel	 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
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



- 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 endto-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?

