# 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.

- 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

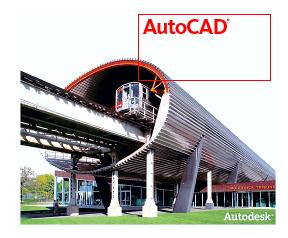
# **VMware Graphics Overview & Use Cases**



### **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









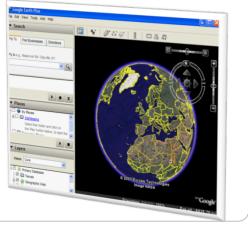
### Soft 3D – Basic 3D without GPU

### 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

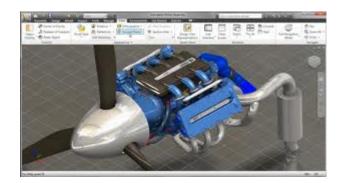


### **All Hardware Accelerated Graphics Core Features**

- 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





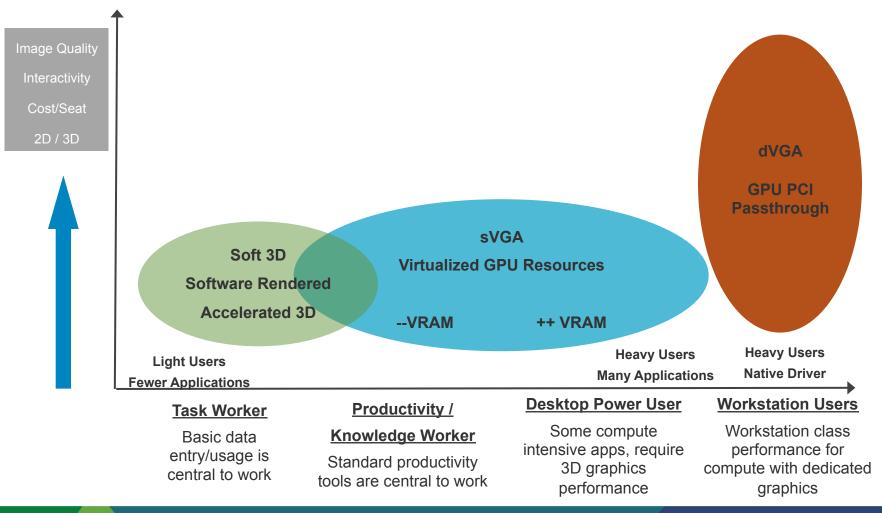




### **Access 3D Desktops from Wide Variety of Clients**



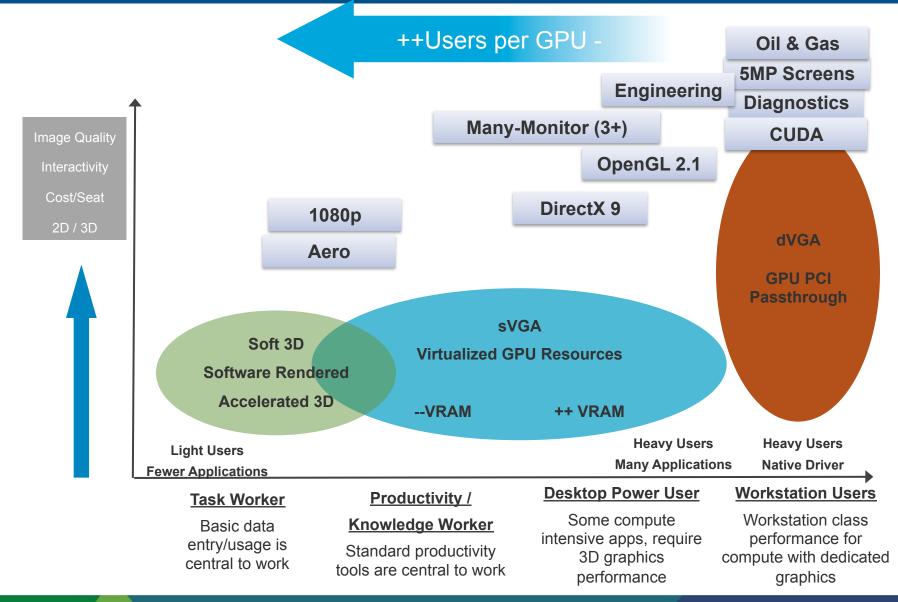




<sup>13</sup> The information on the roadmap is intended to outline our general product direction and it should not be relied on in making a purchasing decision. It is for informational purposes only and may not be incorporated into any contract.

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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

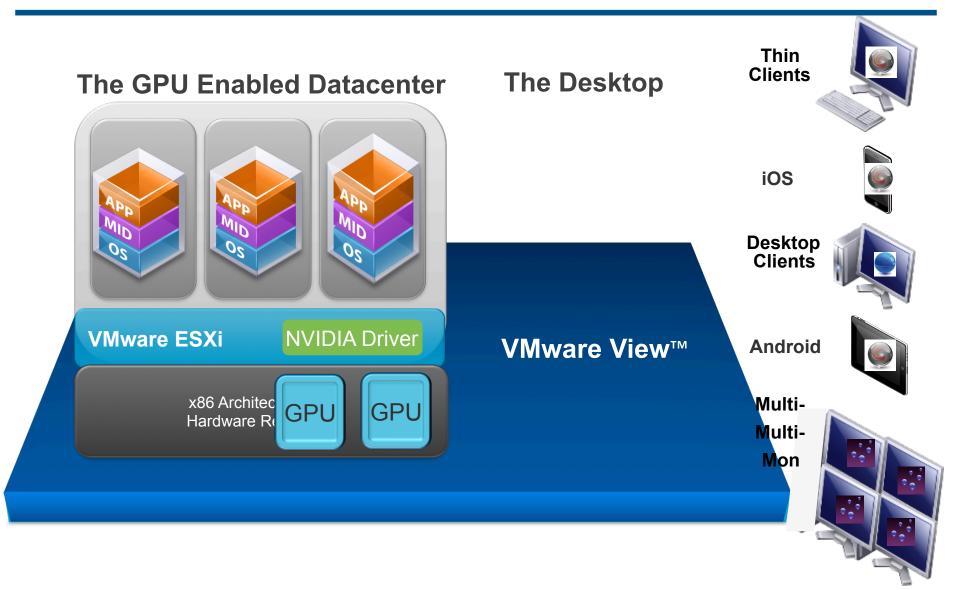
### **Graphics Use Cases – 3D Design and Engineering Apps**

	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**



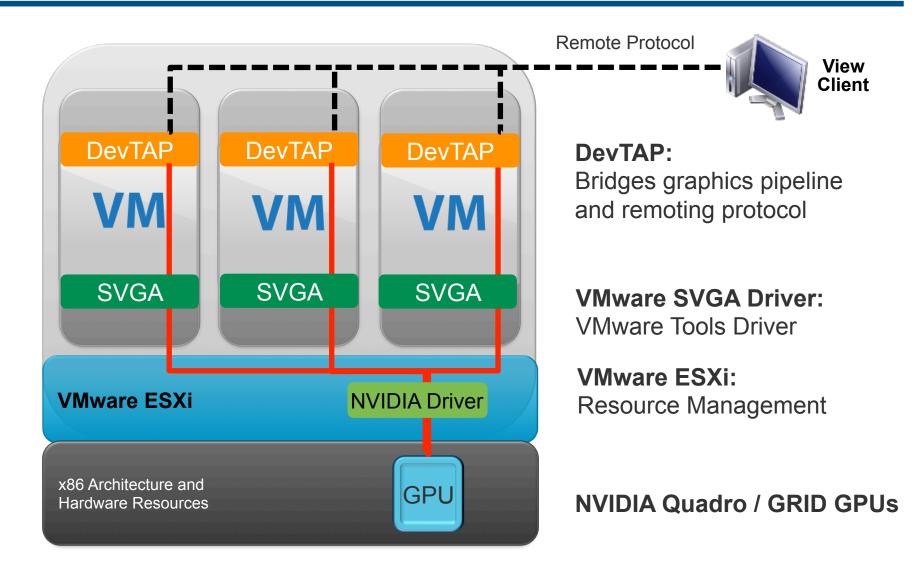
### **Virtualization of Desktop 3D Workloads**



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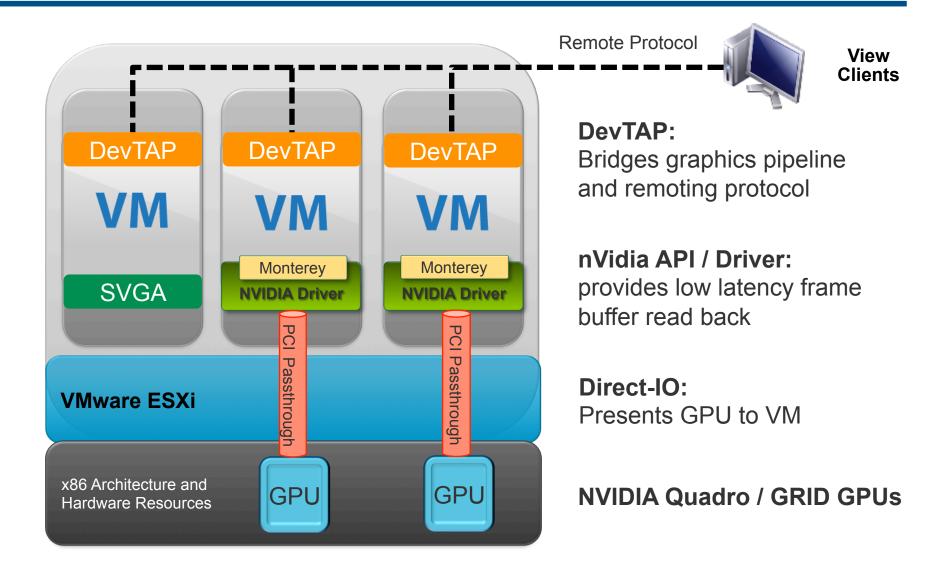
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### vSGA with NVIDIA Technical Overview



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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



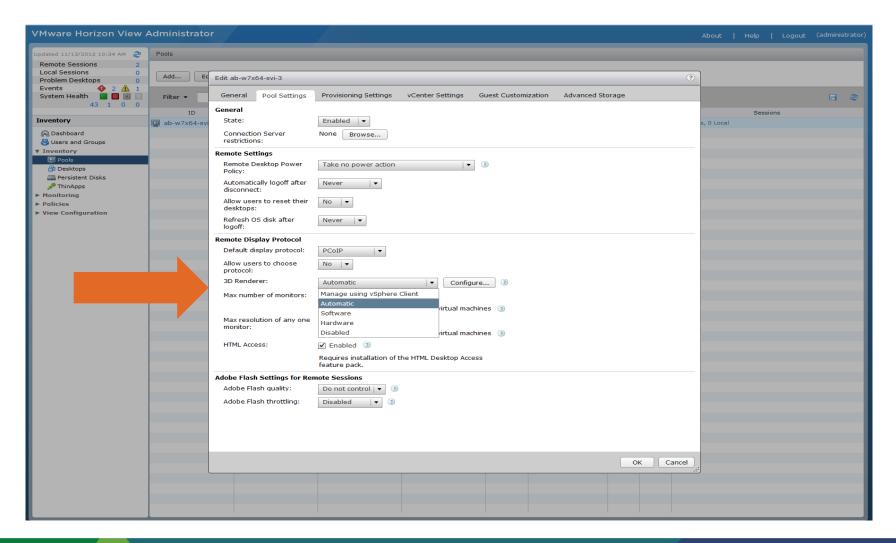
# vSGA / vDGA NVIDIA GPUs Moving Towards Certification

### 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
	Adobe Flash quality:	o not control   🔻 🔞
	Adobe Flash throttling:	Disabled
		< Back Next > Cancel

### vSphere - Checking a Virtual Machines Configuration

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### vSphere – Editing a Virtual Machines Configuration

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## **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?

