

# Graphics in the Cloud

**Will Wade, NVIDIA VGX Product Line Manager**

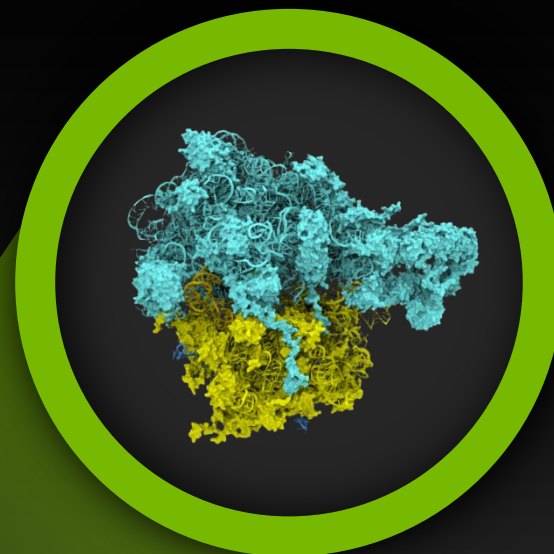
GTC | San Jose Convention Center | May 15, 2012

*A Brand New Idea...*

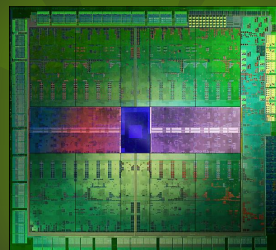




**Graphics**



**Computing**

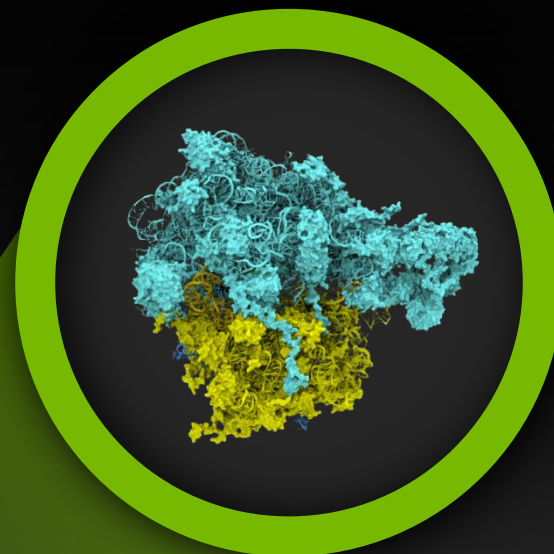




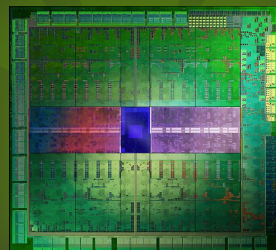
**Graphics**



**Cloud**



**Computing**



# “BYOD” Movement



Windows PCs



Tablets and  
Smartphones



Mac PCs

# Enterprise Computer Users



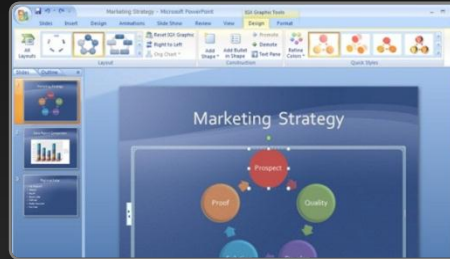
**DESIGNER**  
(CATIA, CS6, Inventor)

**25M**



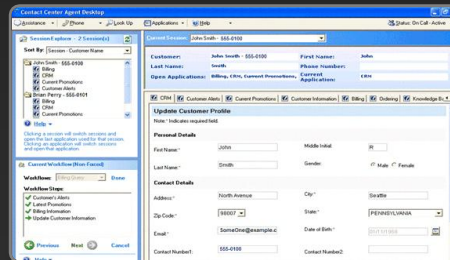
**POWER USER**  
(PLM, Med Img,  
Showcase)

**200M**



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

**400M**



**TASK WORKER**  
(Call Center Apps)

**100M**



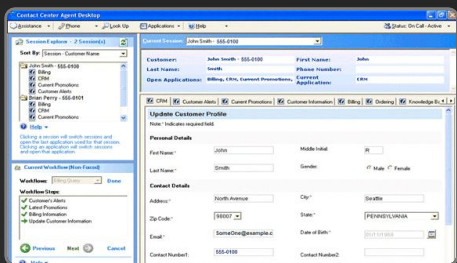
**DESIGNER**  
(CATIA, CS6, Inventor)



**POWER USER**  
(PLM, Med Img, Showcase)



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



**TASK WORKER**  
(Call Center Apps)



## DESIGNER

(CATIA, CS6, Inventor)



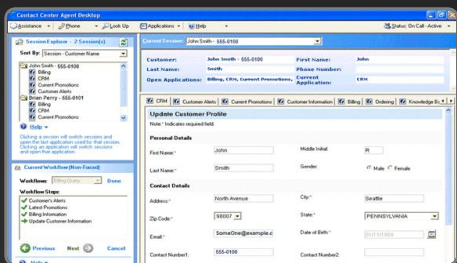
## POWER USER

(PLM, Med Img, Showcase)



## KNOWLEDGE WORKER

(MS Office, Photoshop)



## TASK WORKER

(Call Center Apps)

PC

GPU  
Pass-  
through

Software  
(CPU)  
Rendered  
Graphics

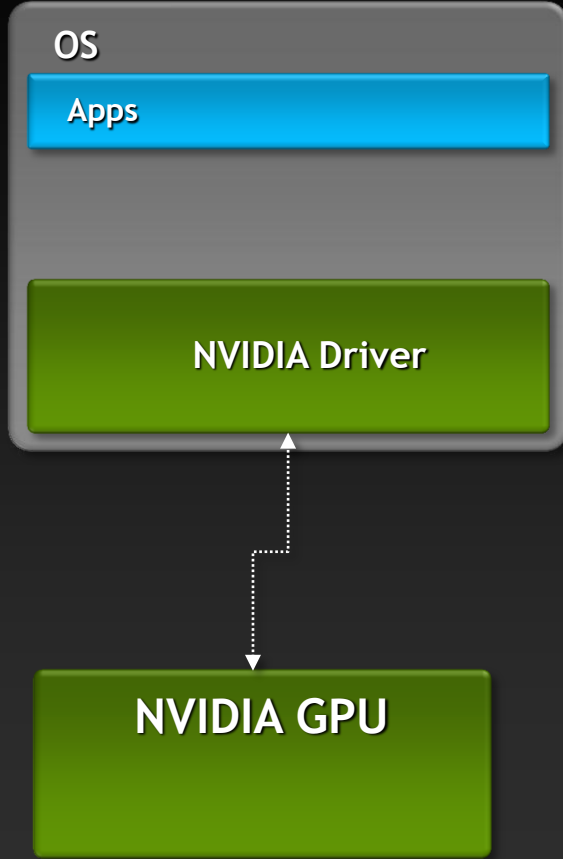
API  
Intercept  
(DX9)

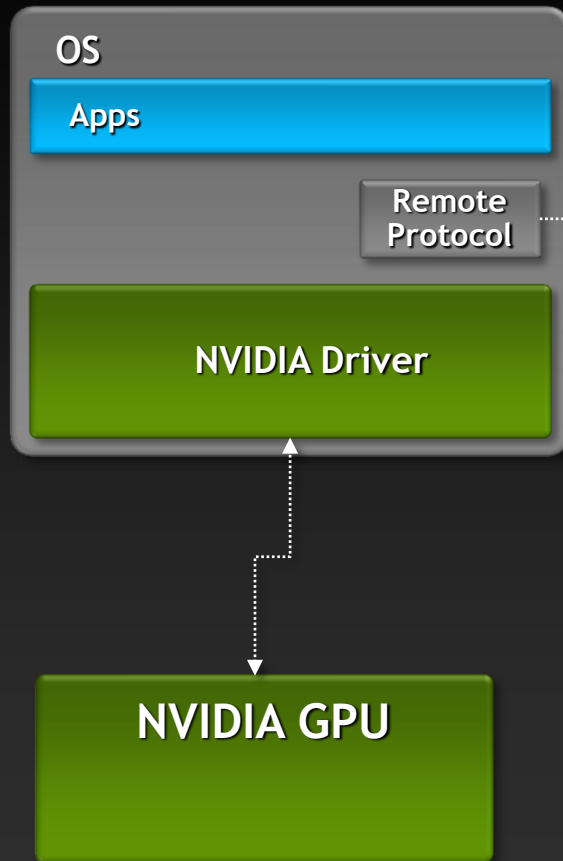
NVIDIA  
VGX



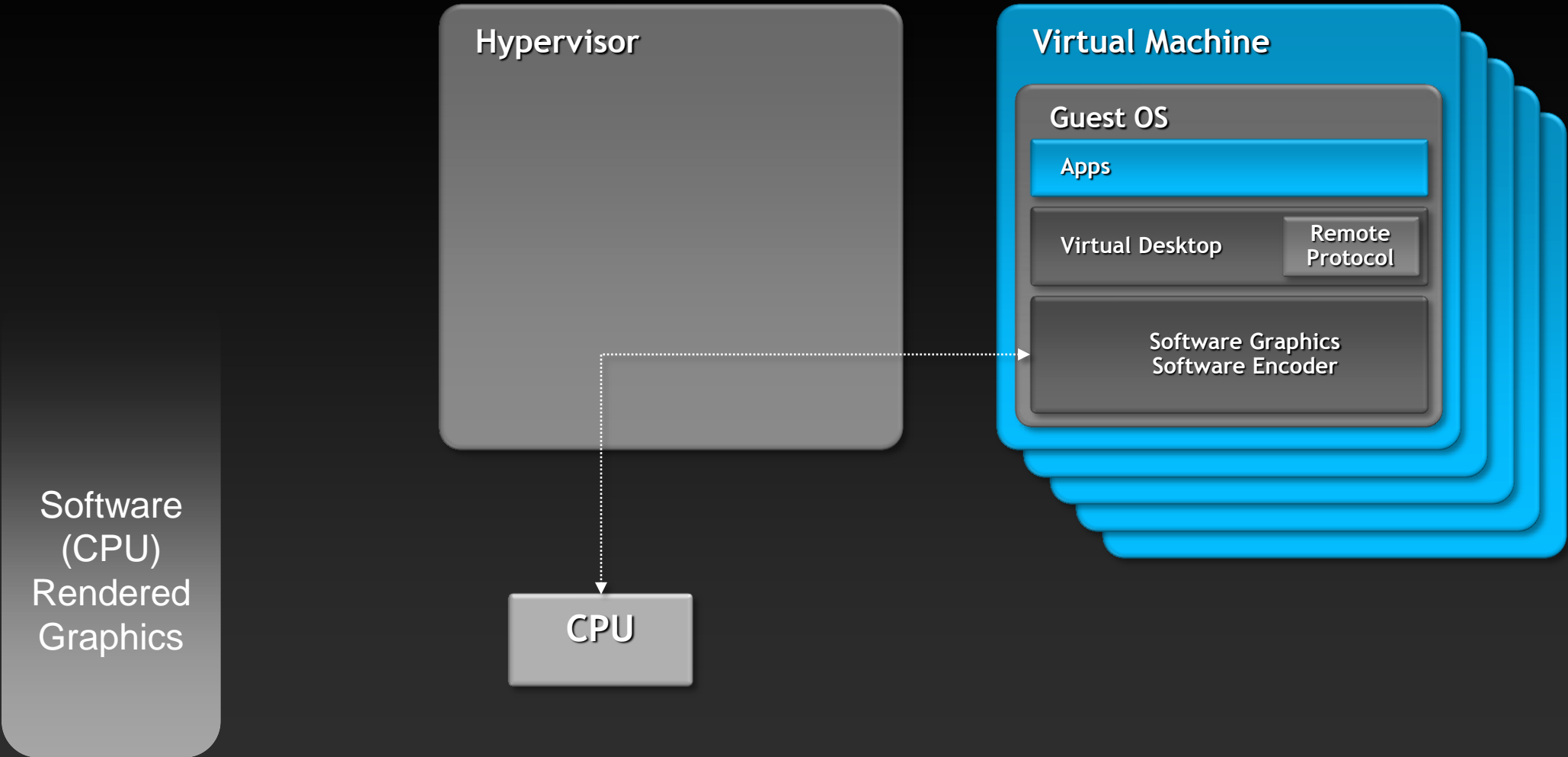


PC



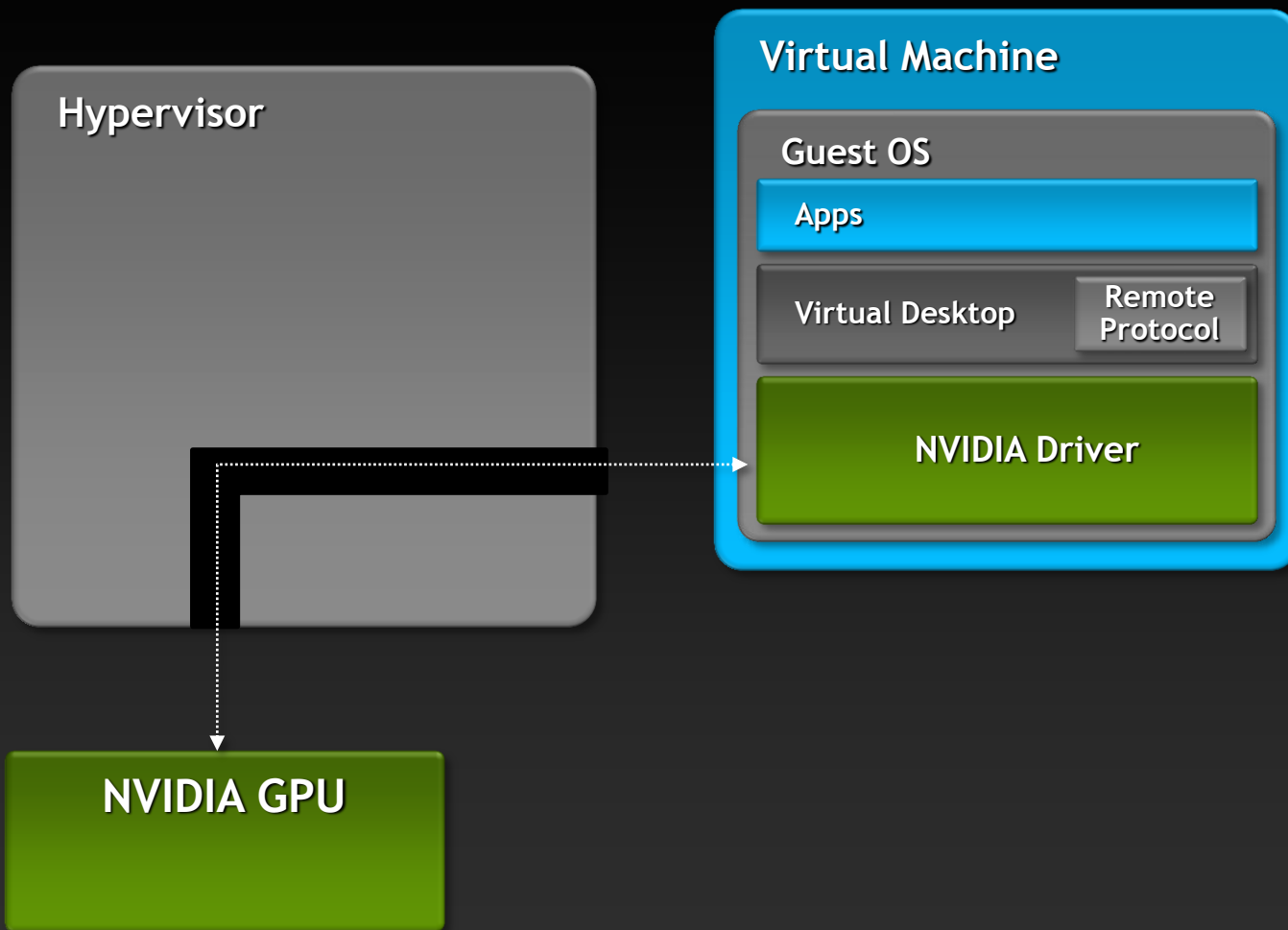


- Citrix HDX 3D Pro
- HP RGS
- NICE
- Schlumberger LiveQuest
- TeamViewer
- ....
- Consumer Applications
  - Splashtop
  - GoToMyPC

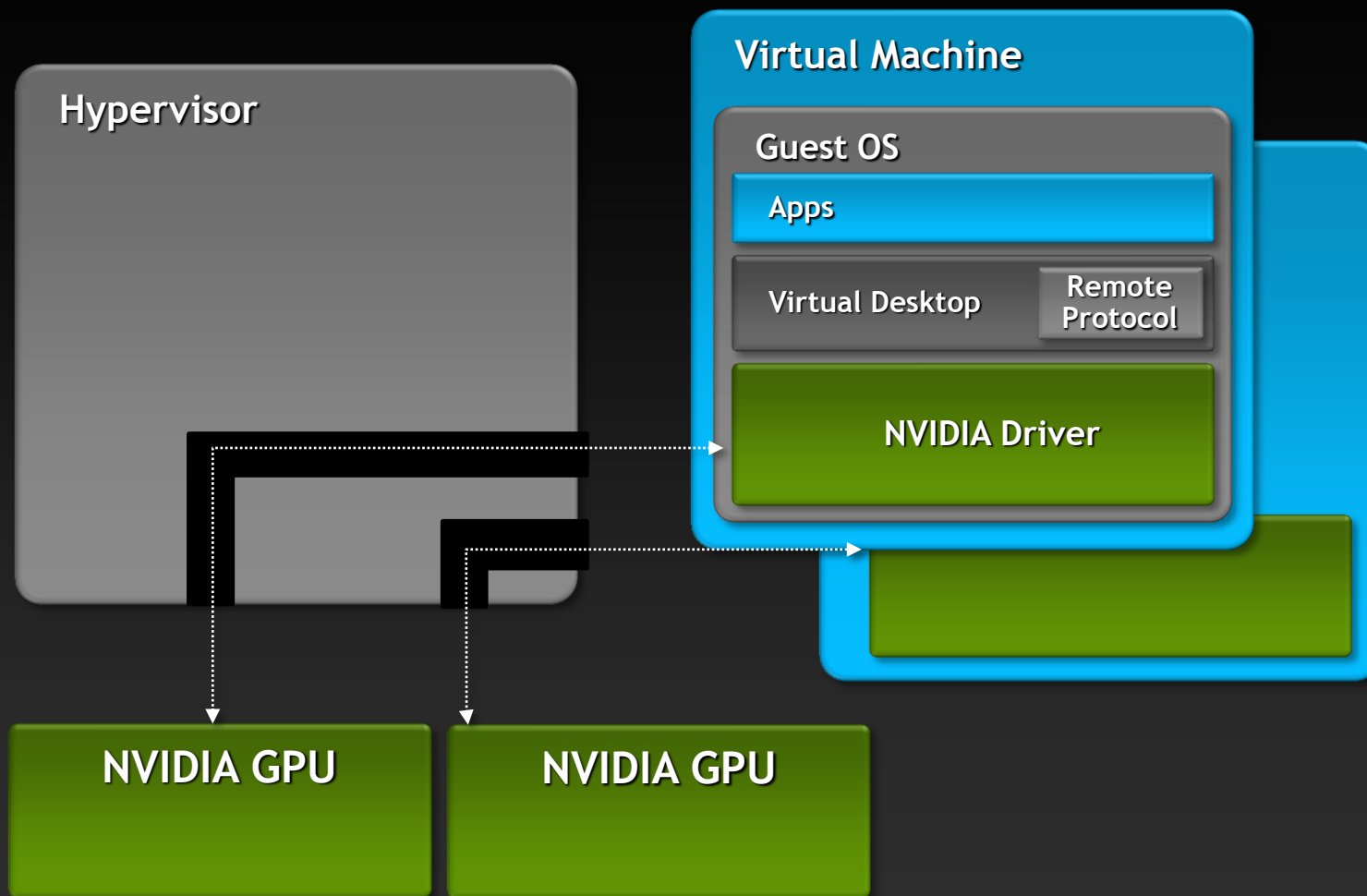




GPU  
Pass-  
through



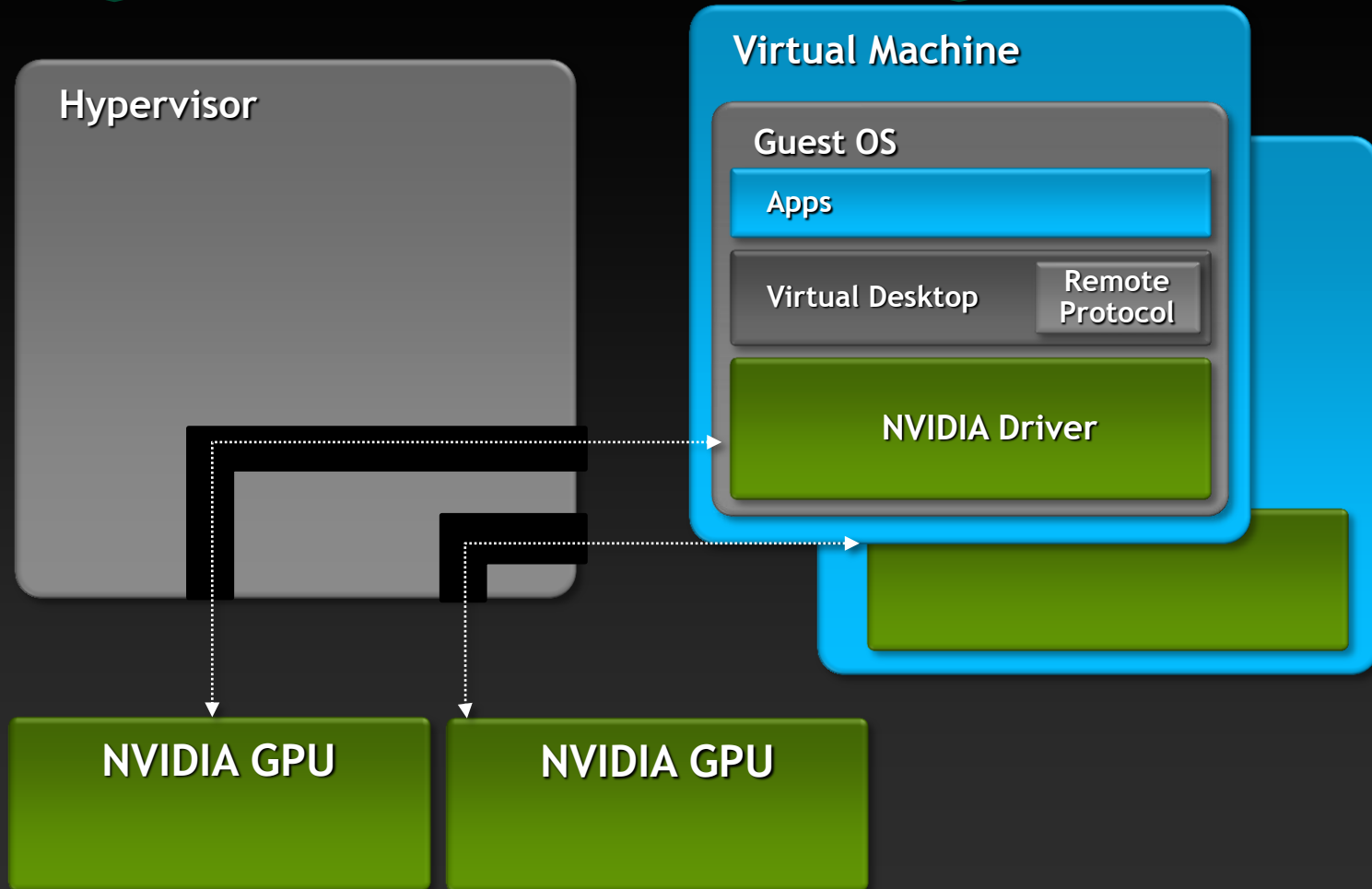
# GPU Pass-through

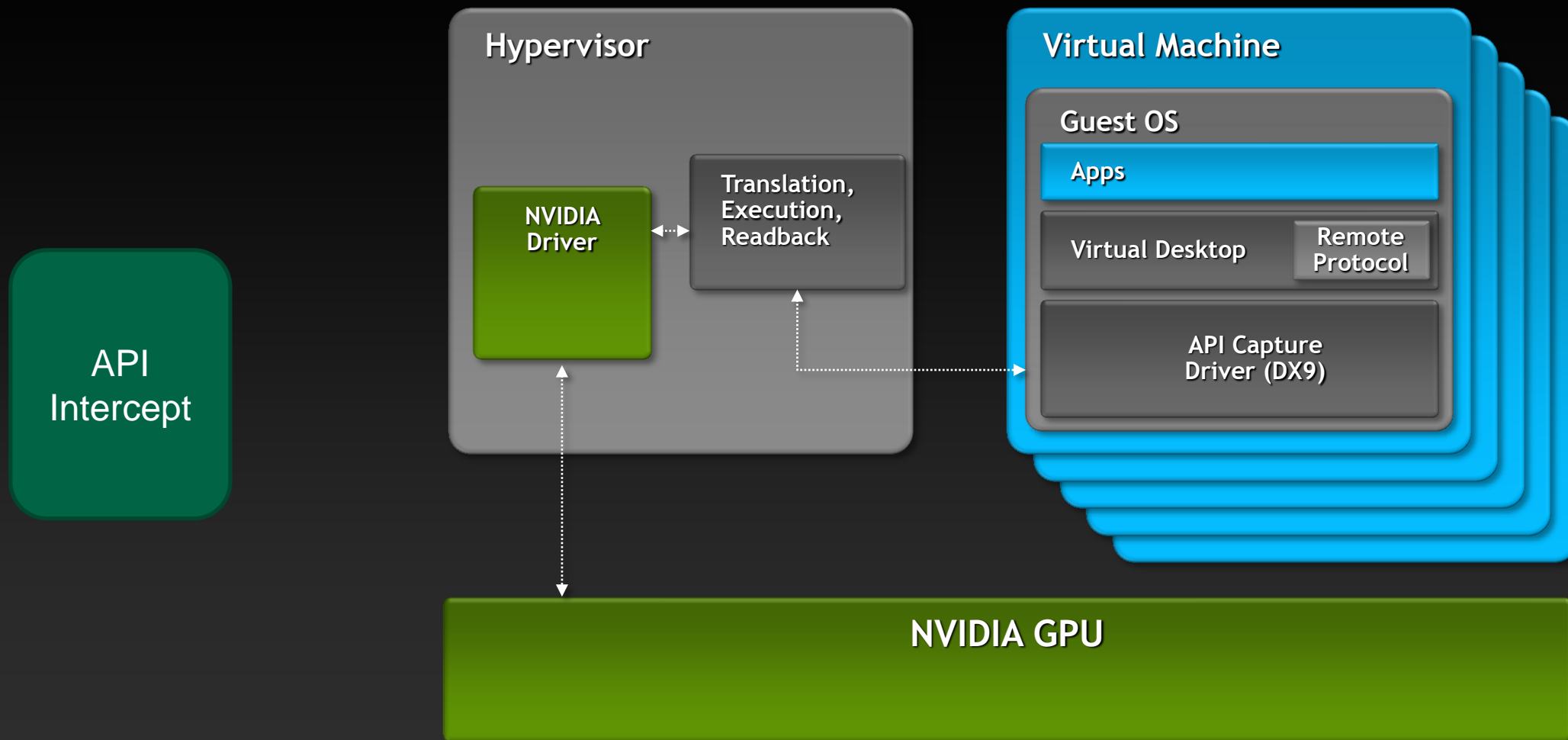


GPU  
Pass-  
through

- Citrix XenServer 6
- VMware ESX - Coming Soon
- Parallels Workstation 6 Extreme

- Citrix XenDesktop 5.6
- VMware View - Coming Soon







API  
Intercept

### Hypervisor

- Microsoft Server 2008 HyperV
- VMware ESX - Coming Soon

### Virtual Desktop

- Microsoft RemoteFX
- VMware View - Coming Soon

NVIDIA GPU

**NEW!**

NVIDIA  
VGX

**NEW!**

NVIDIA  
VGX

GPU  
MMU

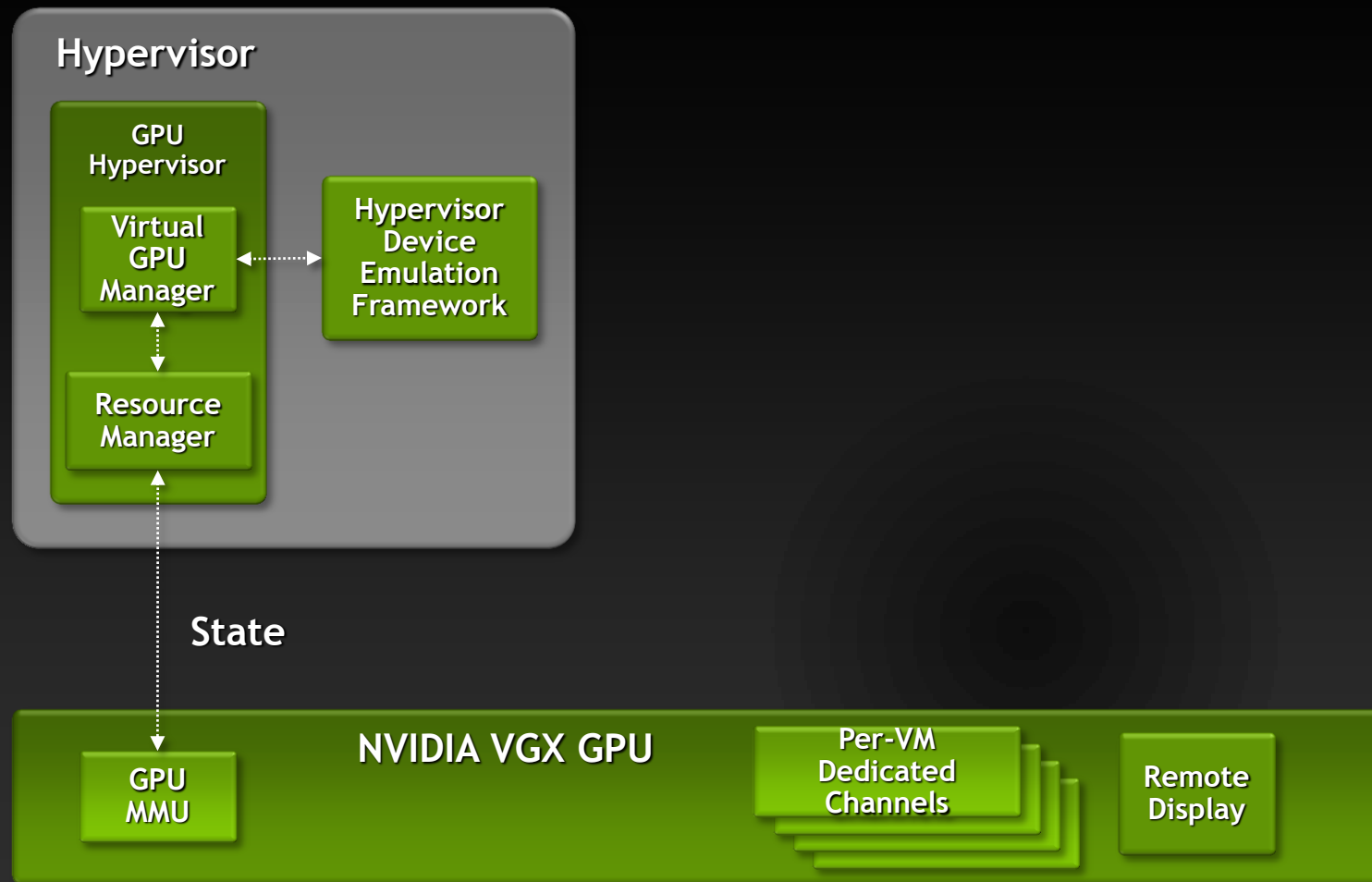
NVIDIA VGX GPU

Per-VM  
Dedicated  
Channels

Remote  
Display

**NEW!**

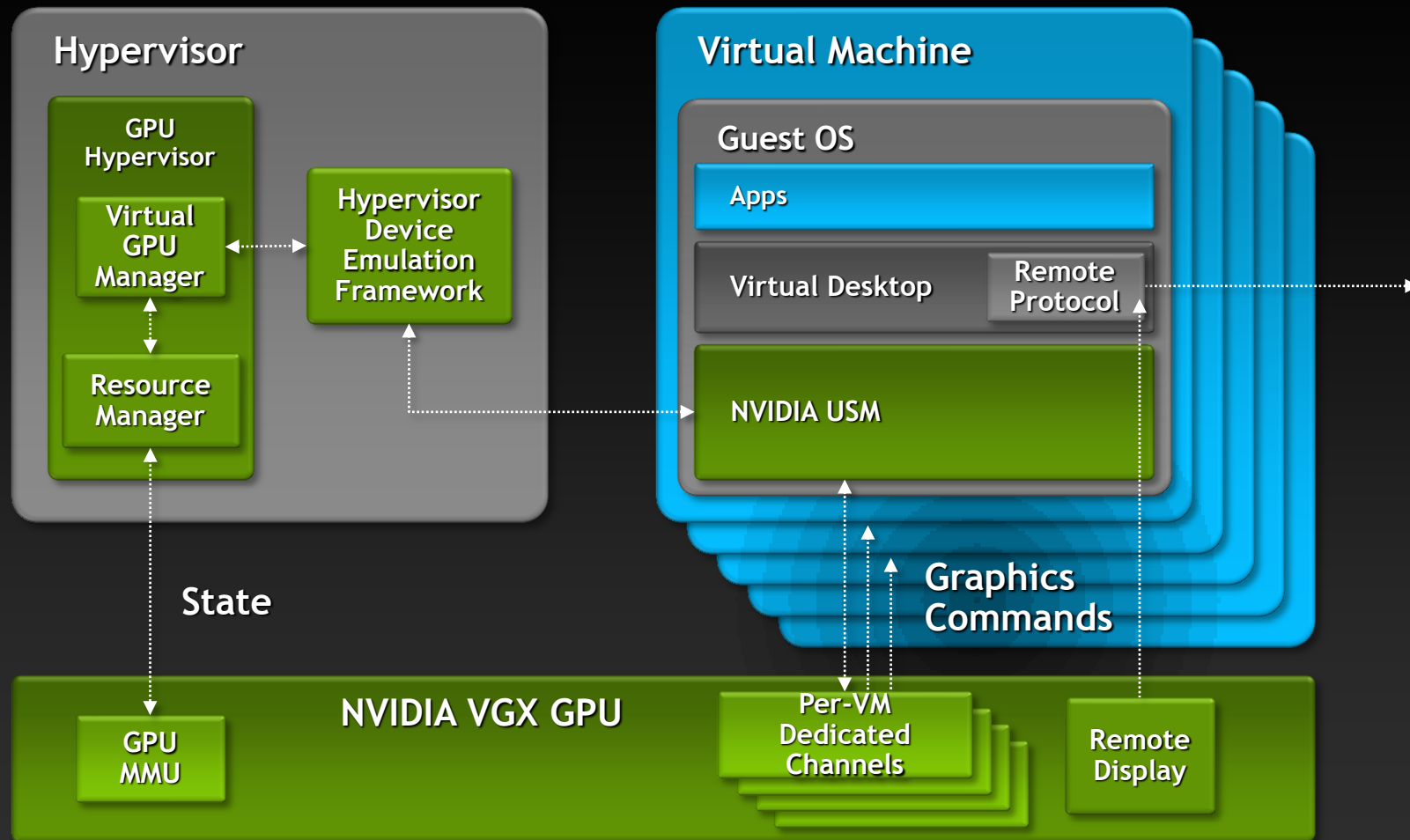
NVIDIA  
VGX





**NEW!**

NVIDIA  
VGX



# ***NVIDIA® VGX™ Platform***

**Frees Users to Run A True PC as a Service From Any Connected Device**

## ***VGX Board***

**World's First Virtualized GPU**

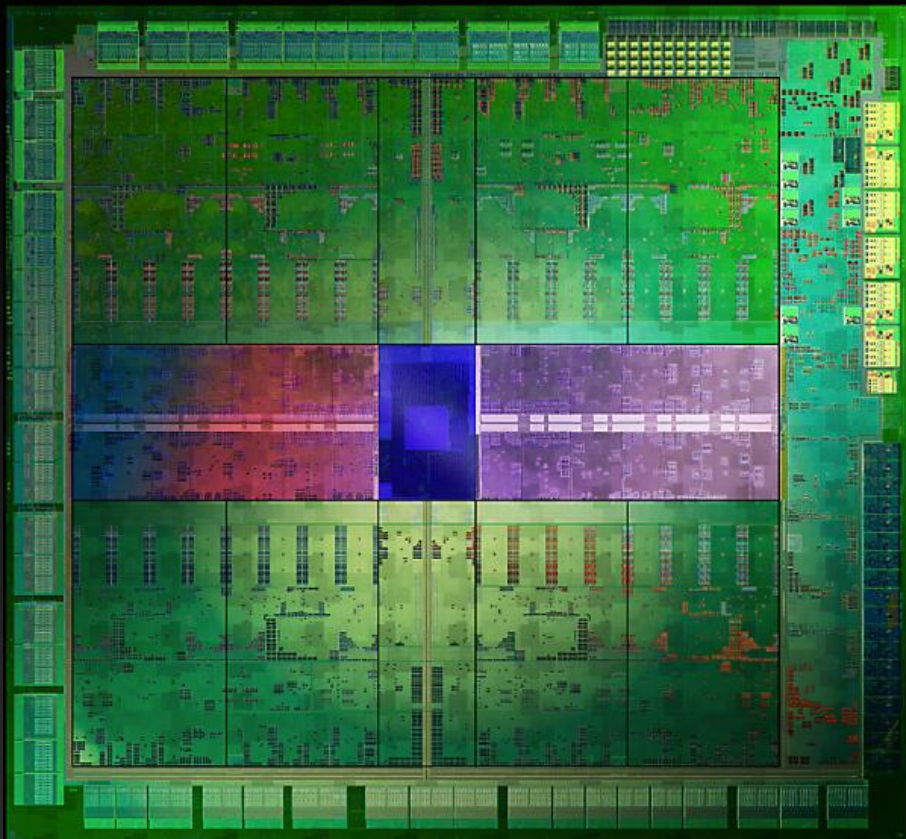
## ***VGX HyperVisor***

**True Virtual PC, Running Any App**

## ***User Selectable Machines***

**Enterprise Manageability**





# KEPLER

THE WORLD'S FIRST GPU for  
CLOUD COMPUTING

Virtualized GPU

Low Latency Remote Display

Super energy-efficiency

# ***NVIDIA® VGX™ Board***

## ***Hardware Virtualization***

Four GPUs, 16GB of Frame Buffer

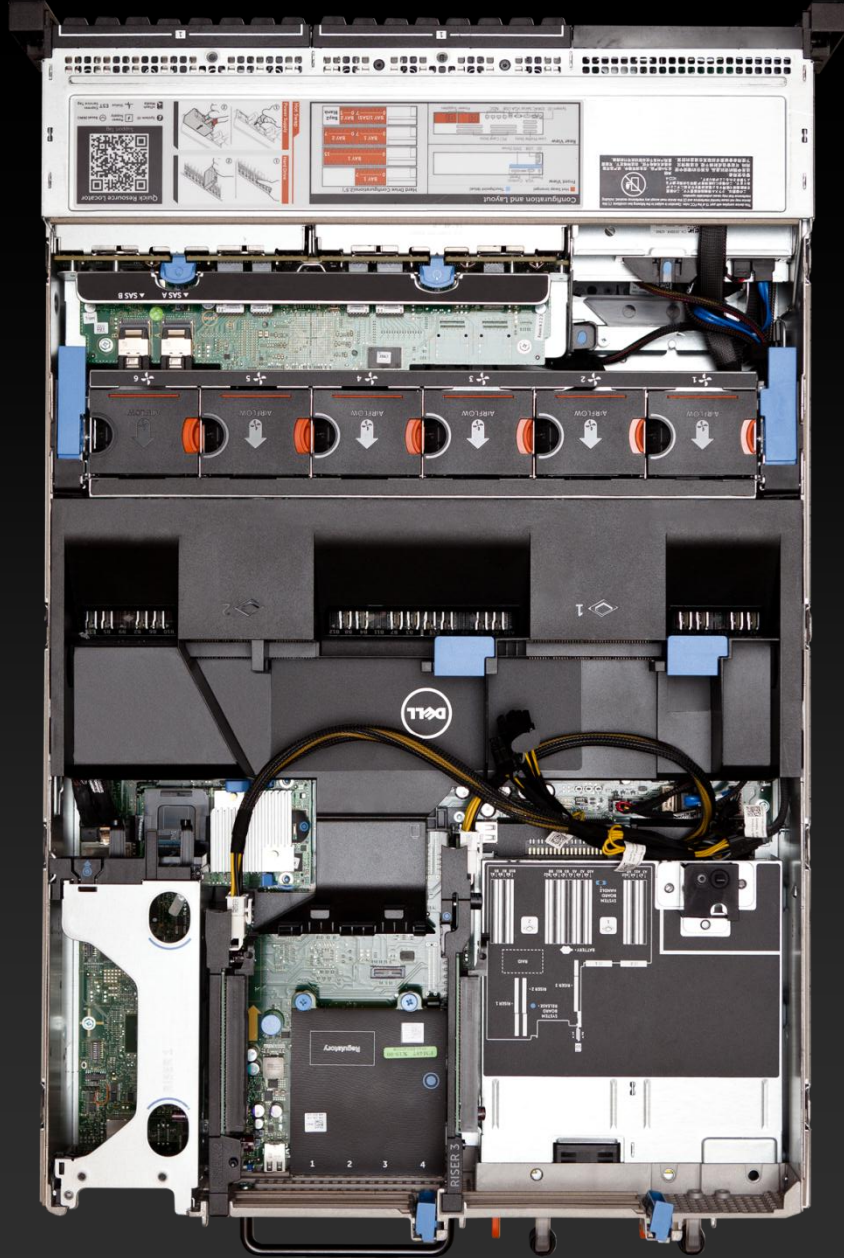
## ***Low Latency Remote Display***

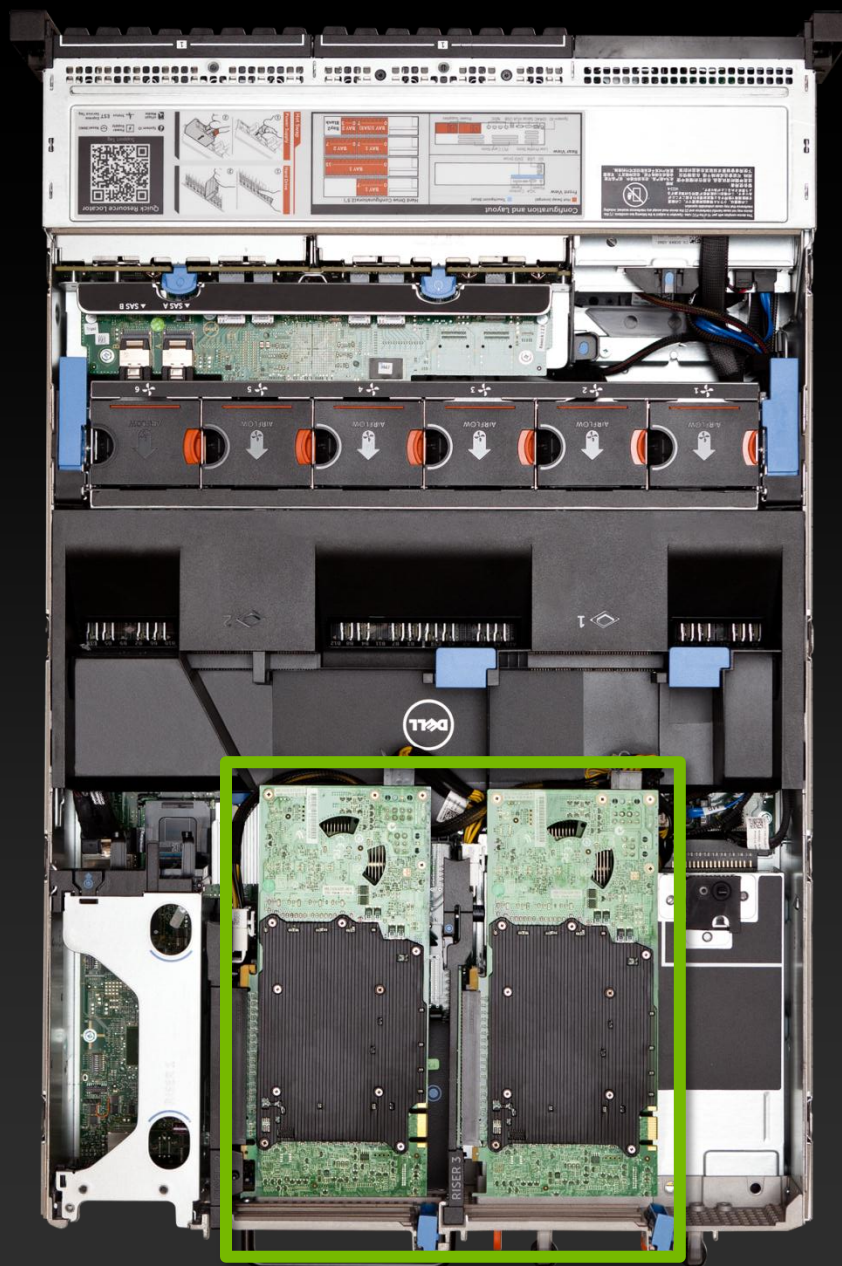
Dedicated h.264 Encoder

## ***Datacenter Efficiency***

New SMX Shader Design, Passively  
Cooled

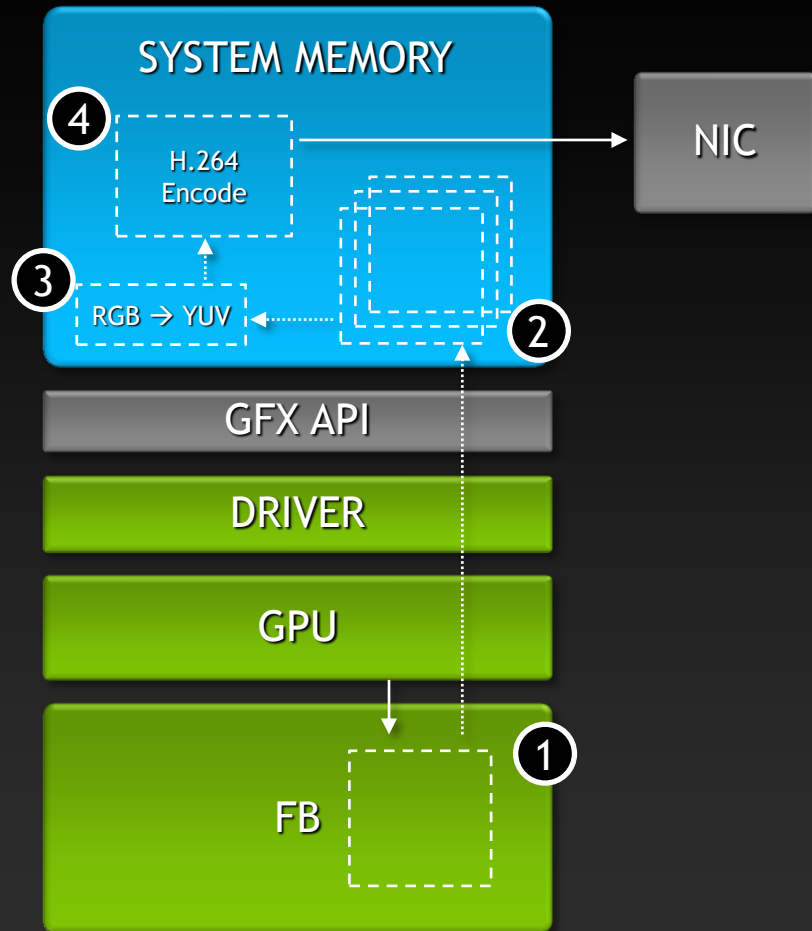




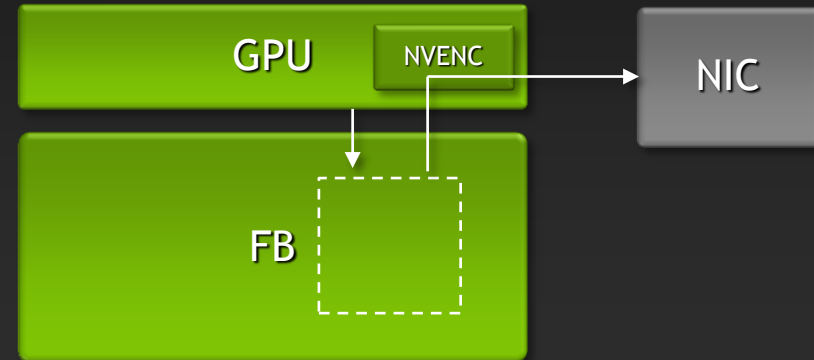
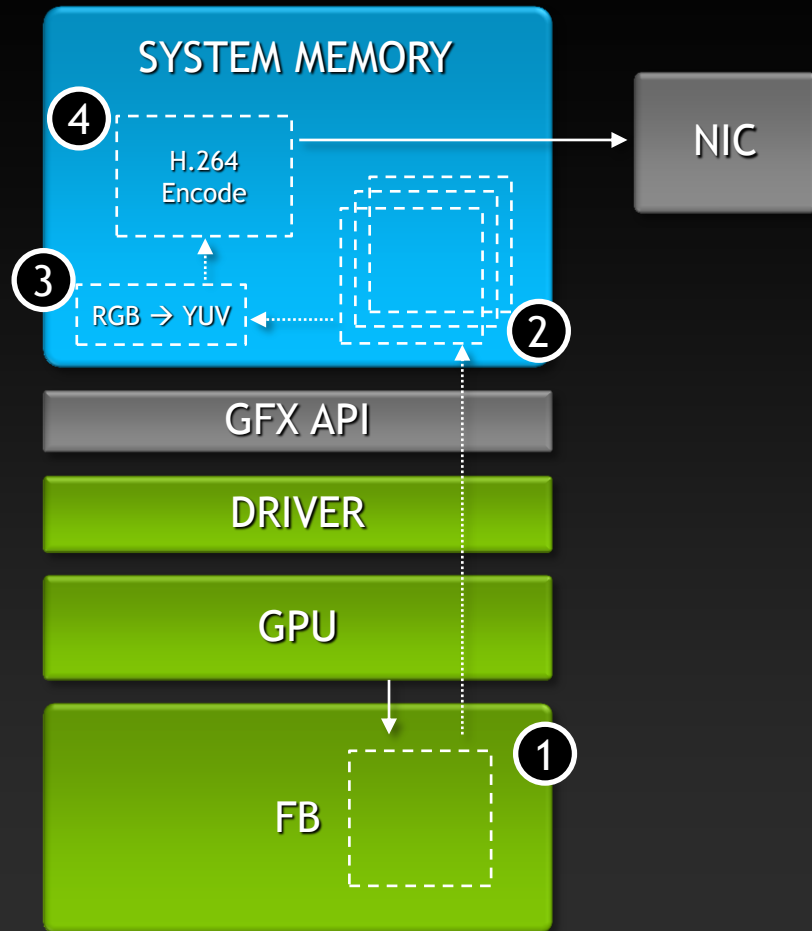




# NVIDIA VGX Remote Display



# NVIDIA VGX Remote Display







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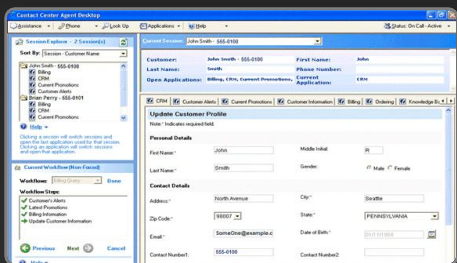
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(CPU)  
Rendered  
Graphics

API  
Intercept  
(DX9)

NVIDIA  
VGX

**Thank You**