



nVISION 08
THE WORLD OF VISUAL COMPUTING

Remoting Your 3D

Ian Williams - Manager, PSG Applied Engineering

Agenda

- Motivations
- Current Remoting Solutions
- Partner Presentation - Citrix
- Summary

Why is Remoting 3D Interesting?

i.e. Why are you here?

Reasons for Remoting 3D

- Data security
- Centralization
- Accessibility
- Management
- Cost savings
- Deliver Capability
 - application+data
-

Remoting Solutions

- SW Remote Desktop
 - VNC, Remote Desktop - 2D
- HW Remote Desktop
 - Teradici PC-over-IP
- Application Virtualization
 - Citrix - Virtual Design Studio

HW Remote Desktop

Teradici PC-Over-IP[®]

True 3D Graphics. Network Delivered



Datacenter
Compute Resource



All Applications
All USB
All Graphics

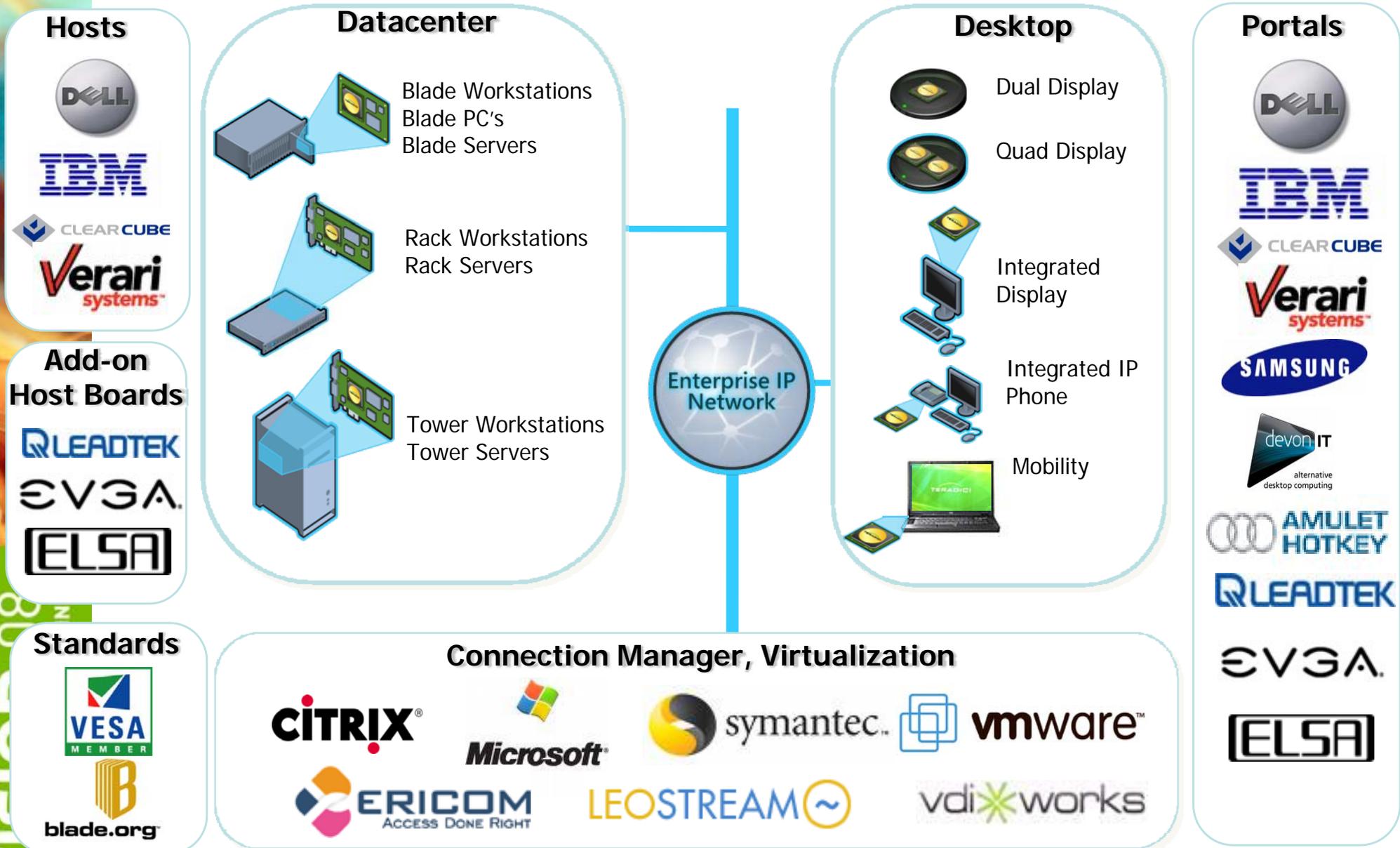
Fully Hardware
Accelerated Delivery
of the Host GPU



PCoIP[®] Delivered Desktop

Teradici PC-Over-IP[®]

A Flexible Architecture for Both Host and Portal

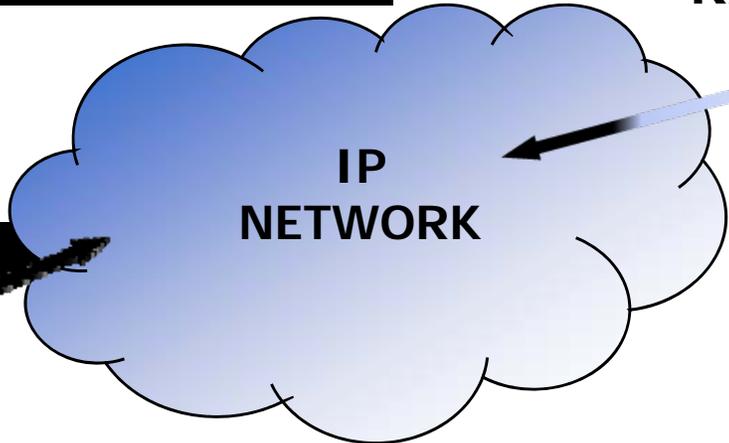
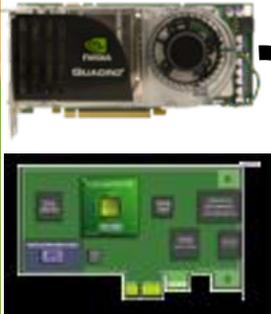


Dell Precision™ R5400 and FX100 Remote Access Device™

Data Center

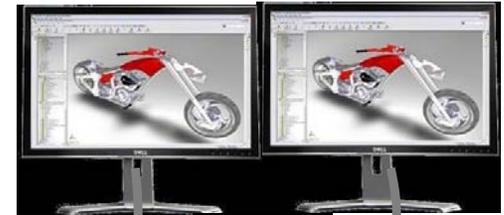


Graphics Card



Campus

Remote User



FX100
RAD



- USB
- keyboard
- mouse
- audio
- video

Remote Access PC-over-IP® Card delivers dedicated hardware compression and encryption for better performance and reduced latency



Quadro Plex Family

Quadro Plex Deskside (D2 / D4)

- Deskside, 3U Rackable
- Up to 8, Synched DVI
- Enabling power desktops and turnkey powerwalls



Quadro Plex 1U System (S4)

- Data Center Design
- Graphics via network
- Enabling remote & distributed visualization



Quadro Plex Remoting Roadmap



Maximum GPU
Performance &
Density

Quadro Plex 2100 S4

4 G80 GPUs
1.5GB/GPU
Readback to Host
PCI-E Gen1
2 HICs

Quadro Plex 2200 S4

4 G100 GPUs
4GB/GPU
Readback to Host
PCI-E Gen2
2 HICs

2007

2008

Application Virtualization

Nvision 2008

Amitabh Sinha
Vice President, Engineering
Citrix Systems

Agenda

Company background

What is application virtualization?

Why graphics remoting?

What is Citrix Virtual Design Studio?

Optimizing Graphics Remoting Performance

Company Overview

- 2007 Revenue: \$1.39 Billion
- 4,200+ employees in 35 countries
- 7,000 partners in over 100 countries
- 200,000 customers
 - 94% customer loyalty
 - 75% of all Internet users
 - 70M corporate users
 - 1,000,000 servers running Citrix infrastructure
 - 100M online virtualization sessions

Microsoft “Global ISV of the Year” 2003, 2005

Leader in Application Delivery Infrastructure



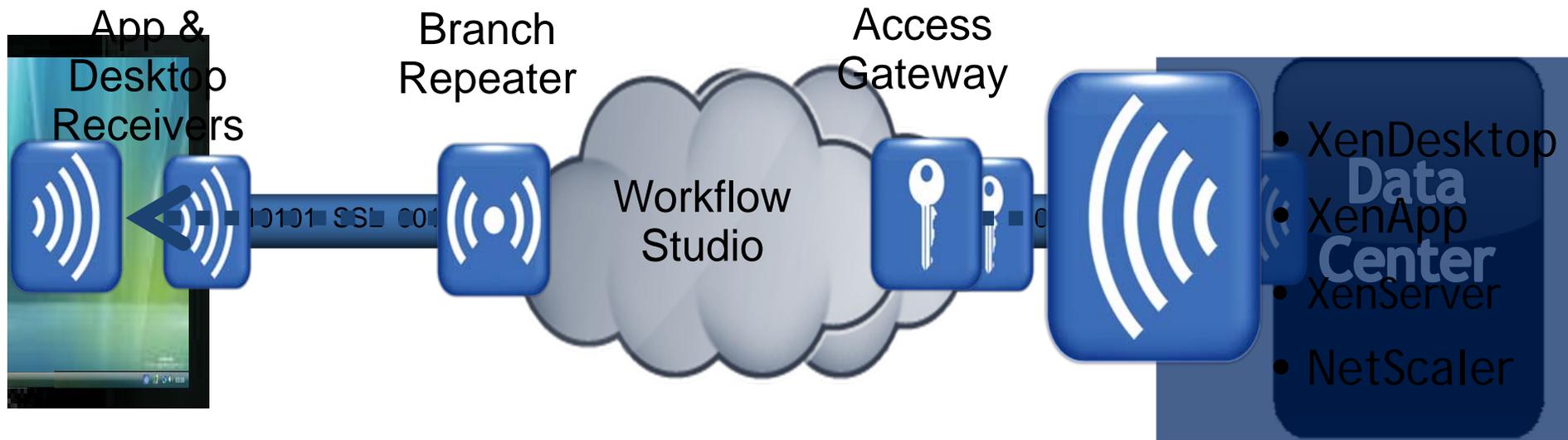
Our Vision for Business



A world where **anyone** can work and play from **anywhere**

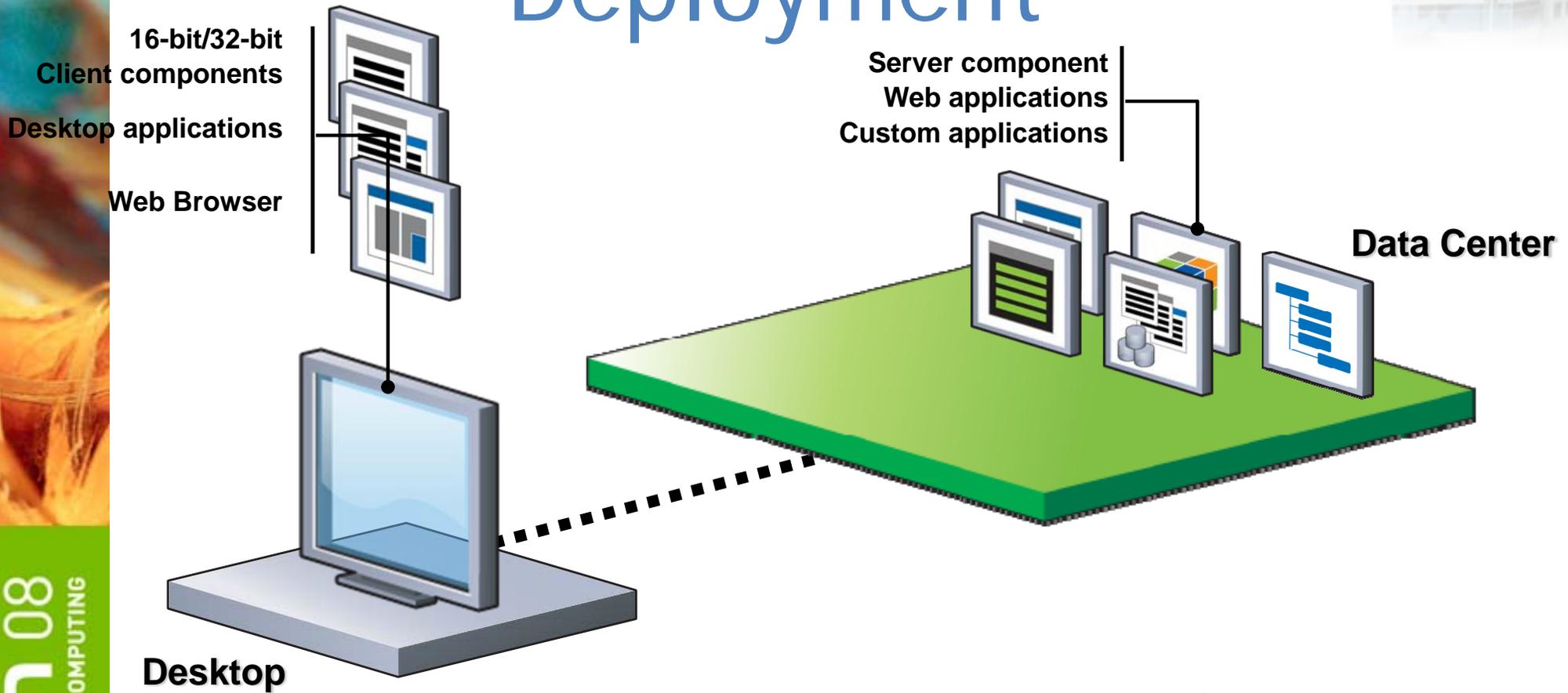


Citrix Delivery Center



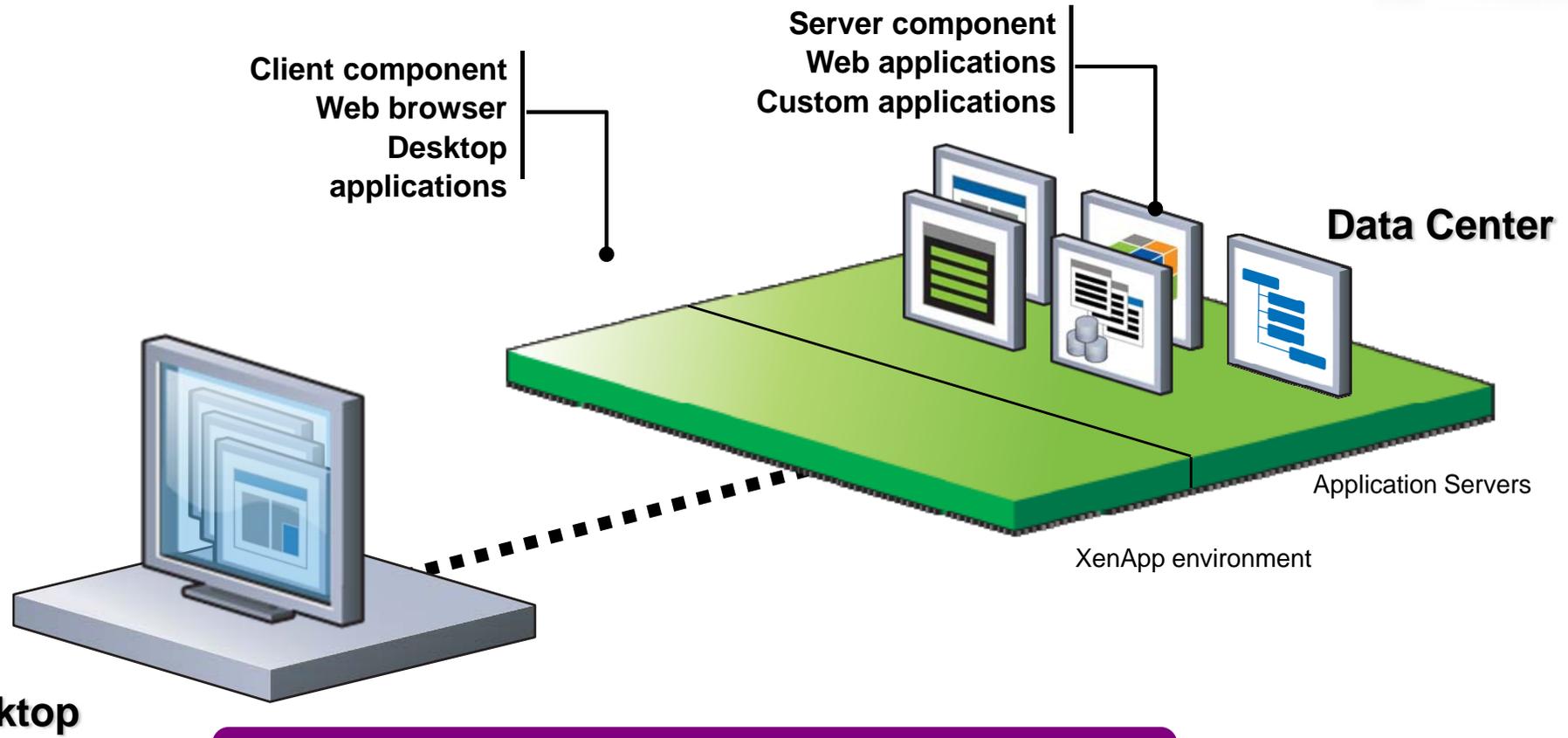


Traditional Windows Deployment



Costly to manage and support
 Difficult to secure and monitor
 Updates difficult and slow

Application Virtualization - Server-Side



Centralize and host in data center
Easier to install, manage and support
Applications and data are protected

Why remote graphics?



Manufacturing Drivers

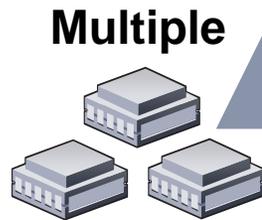
- Globalization
- M&A
- Natural & man-made disasters
- Differentiation via innovation
- Accelerated time to market
- Cost reduction



Global Manufacturers: Business Needs



- Source talent globally
- Outsource or offshore engineering and design
- Around the clock business continuity
- Distributed or Global Product Development
- Enable mobile and occasional productivity
- IT "Do More with Less"



Single



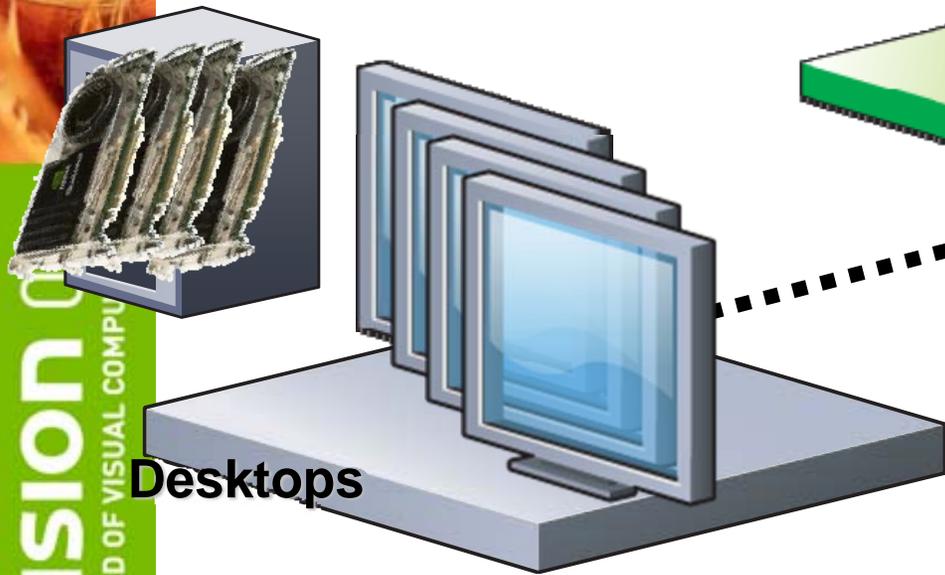
Number of engineering & design teams and sites

Low
(10's)

Product complexity
(number of parts)

High
(10000's)

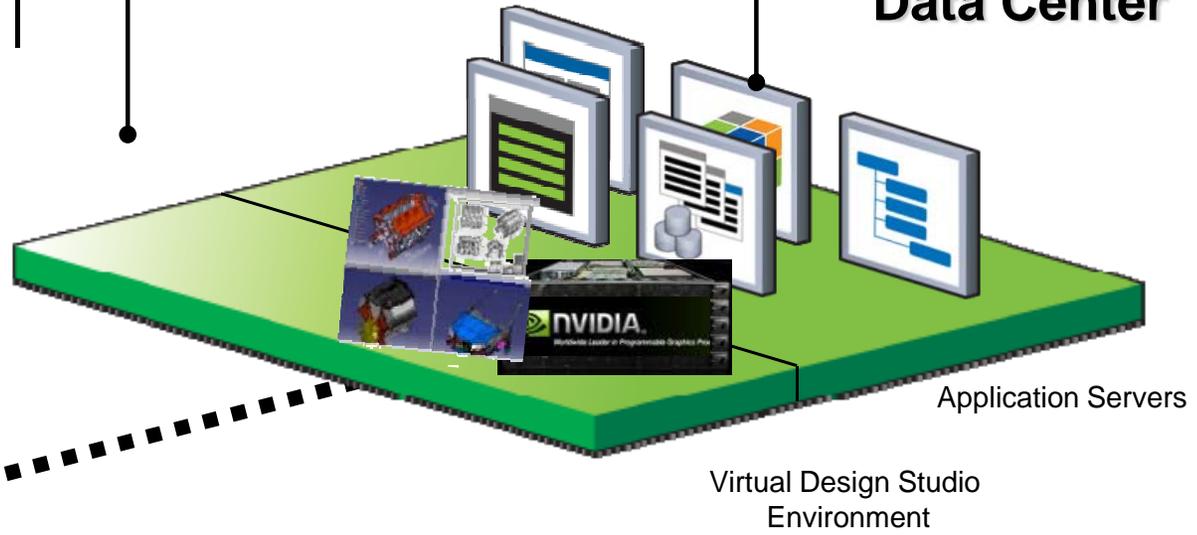
Graphical Application Virtualization - with Citrix Virtual Design Studio



Application processing on server with GPU in the datacenter

Server component
Web applications
Custom applications

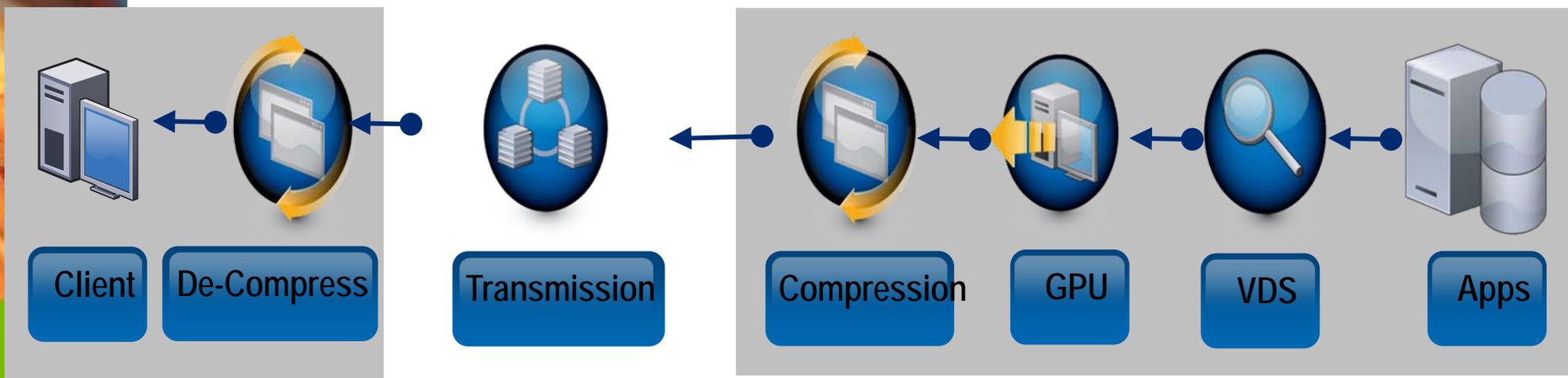
Data Center



- Multiple GPU in data center
- Multiple Users per GPU
- Applications and data are protected



Optimizing Graphics Remoting Performance in VDS



Graphics Remoting Considerations



- Bandwidth requirements

- Raw frame size is 2.5MBytes
- A medium complex model can generate 12 frames per second
- Bandwidth requirement without compression is 30 Mbytes/second or 240 Mbps!
- Target: Run with acceptable performance in 2Mbps network with 150ms latency

- Responsiveness

- Can the model be responsive when you are 75ms away on a low bandwidth network?
- Lag (time between mouse click and response) ≤ 1 second
- Overshoot (time between last mouse click and response) ≤ 1 second





Questions & Answers?

Summary

- Interest in remoting 3D graphics is driven by strong economic factors:
 - Centralization
 - Management
 -
- Remoting 3D Graphics is in its infancy
- Solutions and Technologies are developing quickly
- Partners are critical to 3D remoting Solutions

Thank you!

- Questions?