PEUGEOT

MOTION & EMOTION

CITROËN

3D Workstation Virtualization

GTC 2013

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Summary

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SOMMAIRE

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- 3D Virtualization project
  - Introduction
  - Today status & goal
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  - Steps, architecture & implementation
  - Remote 3D tests
- Conclusion

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IT department presentation

Challenge in the design world

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Guiding the product plan of the Group

- Reducing the time of the design cycle and unit costs (MCP)
  - Rapid delivery of vehicle innovations,
  - Reactivity to market demand,
  - Supporting the increase in the vehicle product plan,
  - Guaranteeing our competitiveness.
- Guaranteeing quality : design to deliver “good”
  - Requirement with regard to the competition and to the growth in volumes,
  - Having processes that guarantee quality and being able to measure it.
- **Working in the Extended Enterprise**
  - **Access for suppliers to our systems from outside,**
  - **The same for our partners – Toyota, BMW, GM, ….**

The Technico-Industrial Upstream assists the Group’s product plan with high-performance tools, such as digital factory and virtual reality.

Challenge in the design world

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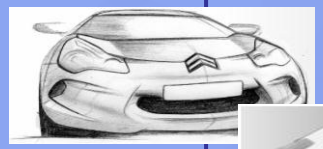
Pilot Study	Project implementation	Architecture and sizing	Detailed design	Product and process development	Marketing



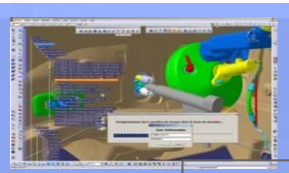
Styling

Perceived quality

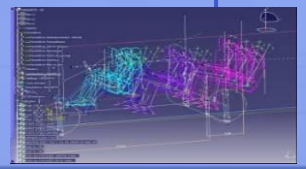
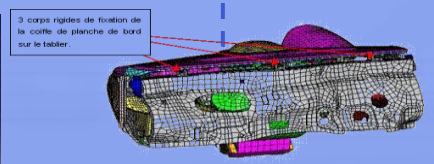
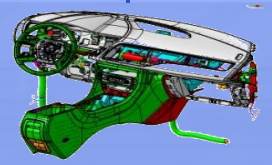
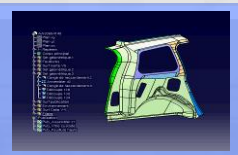
Marketing Images

CLASS-A Modeling

After sales



Digital factory

Computing design

IT Department in figures

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Servers

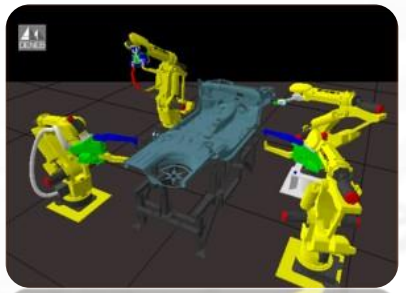
- 10 000 Operating Systems Instances
  - **Windows, Mainframe, Unix, Linux**
  - **60% of Virtual servers**

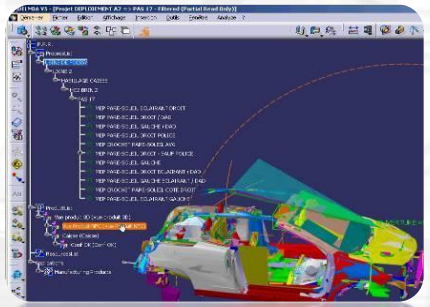
Storage

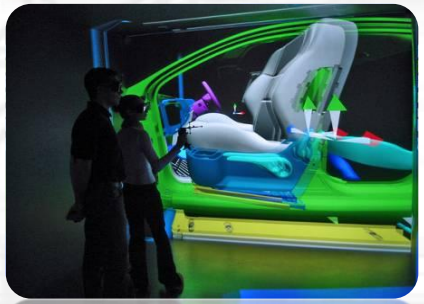
- 14 000 Tbytes
  - **Shared open systems**
  - **Mainframe**
  - **CAD**
  - **Dedicated Open systems storage**

Workstations

- **70 000 Office**
- **10 000 CAD/CAM**
- **7000 Industrial Terminals**







DSIN
DIRECTION DES SYSTÈMES D'INFORMATION

SIPP
SYSTÈMES D'INFORMATION PRODUIT PROCESS

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3D Virtualization project

Introduction

- CAD/CAM workstation as it is perceived today will change significantly in coming years.
- Evolution of the deployment model of 3D applications.
- Open infrastructure CAD/CAM designers.
- Data Security.
- Global environnent.
- Trivialization of the client.
- Evolution of the workspace

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3D Virtualization project
Today Status & Goal

CAD/CAM workstation infrastructure today

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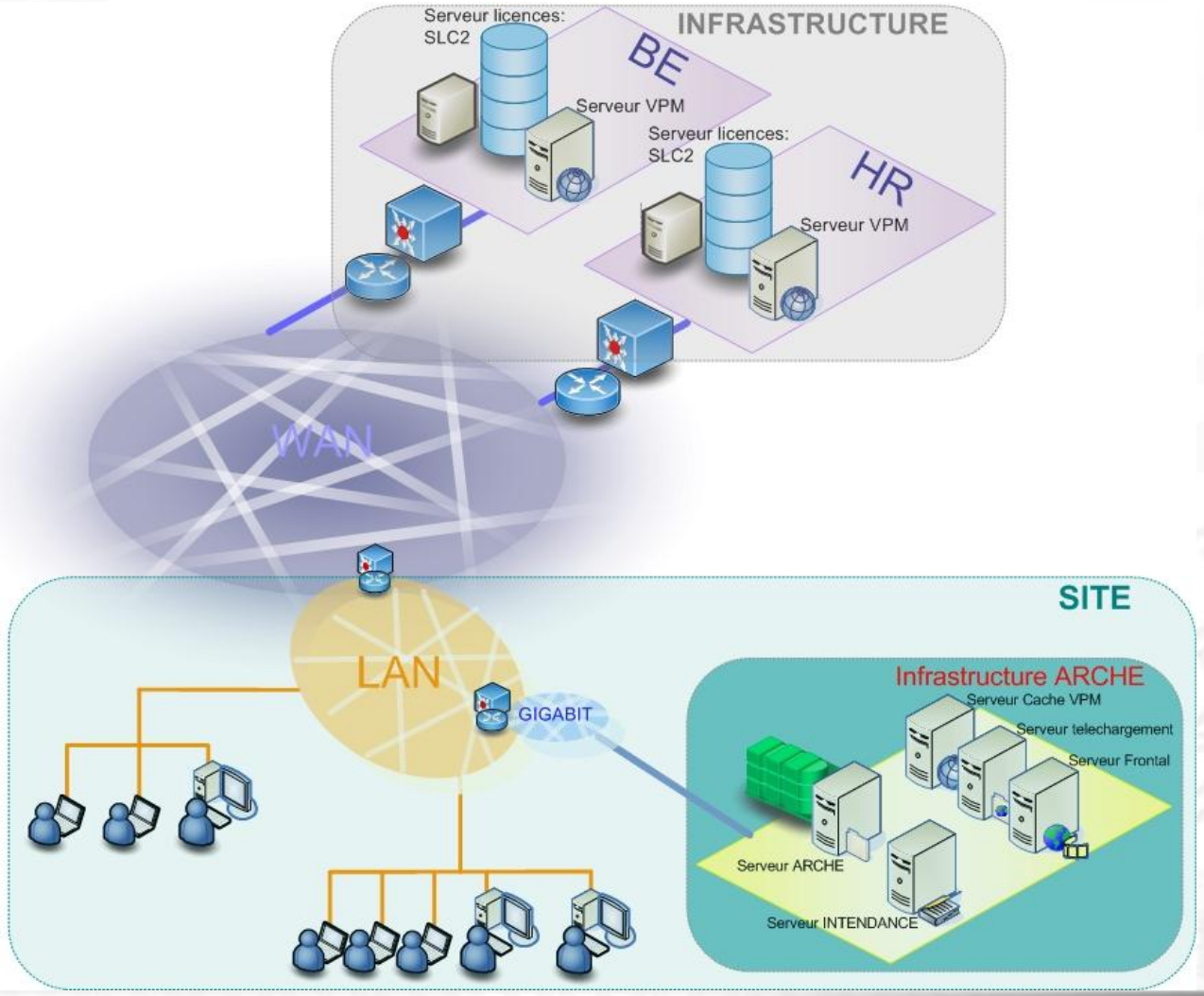
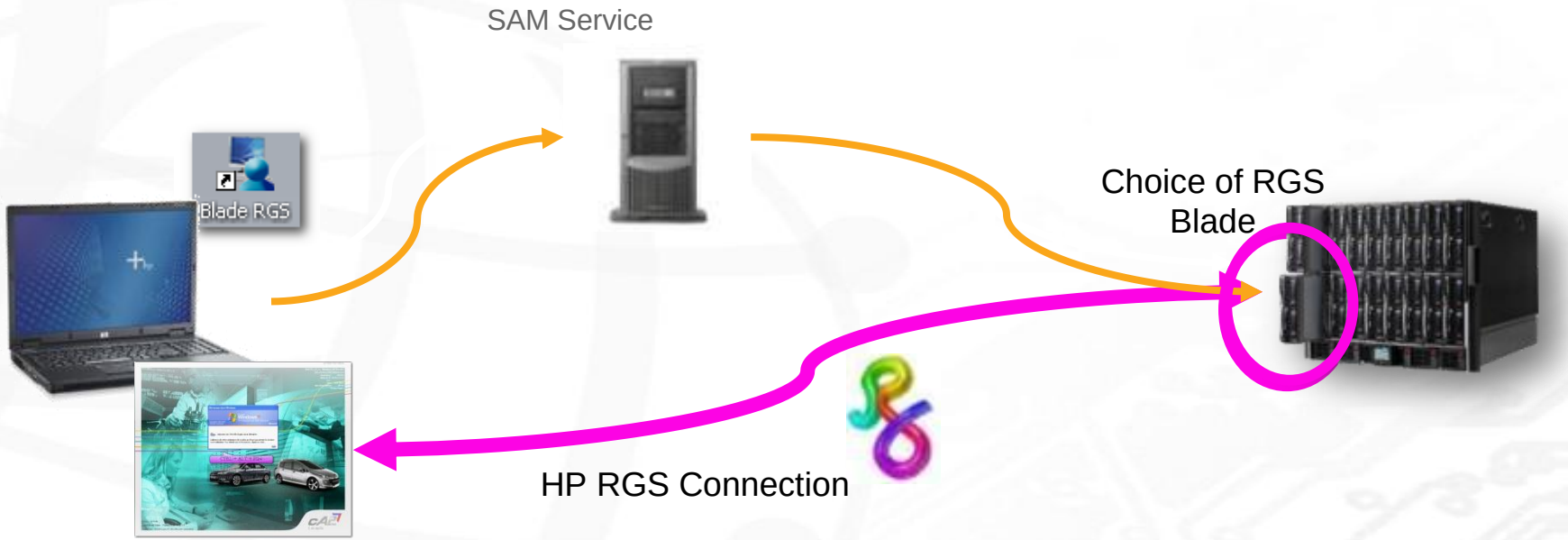


Remote solution Today



Solution in production since 2007

- 500 users
  - Partners
  - Subcontractors
  - International sites

Virtualization Goal

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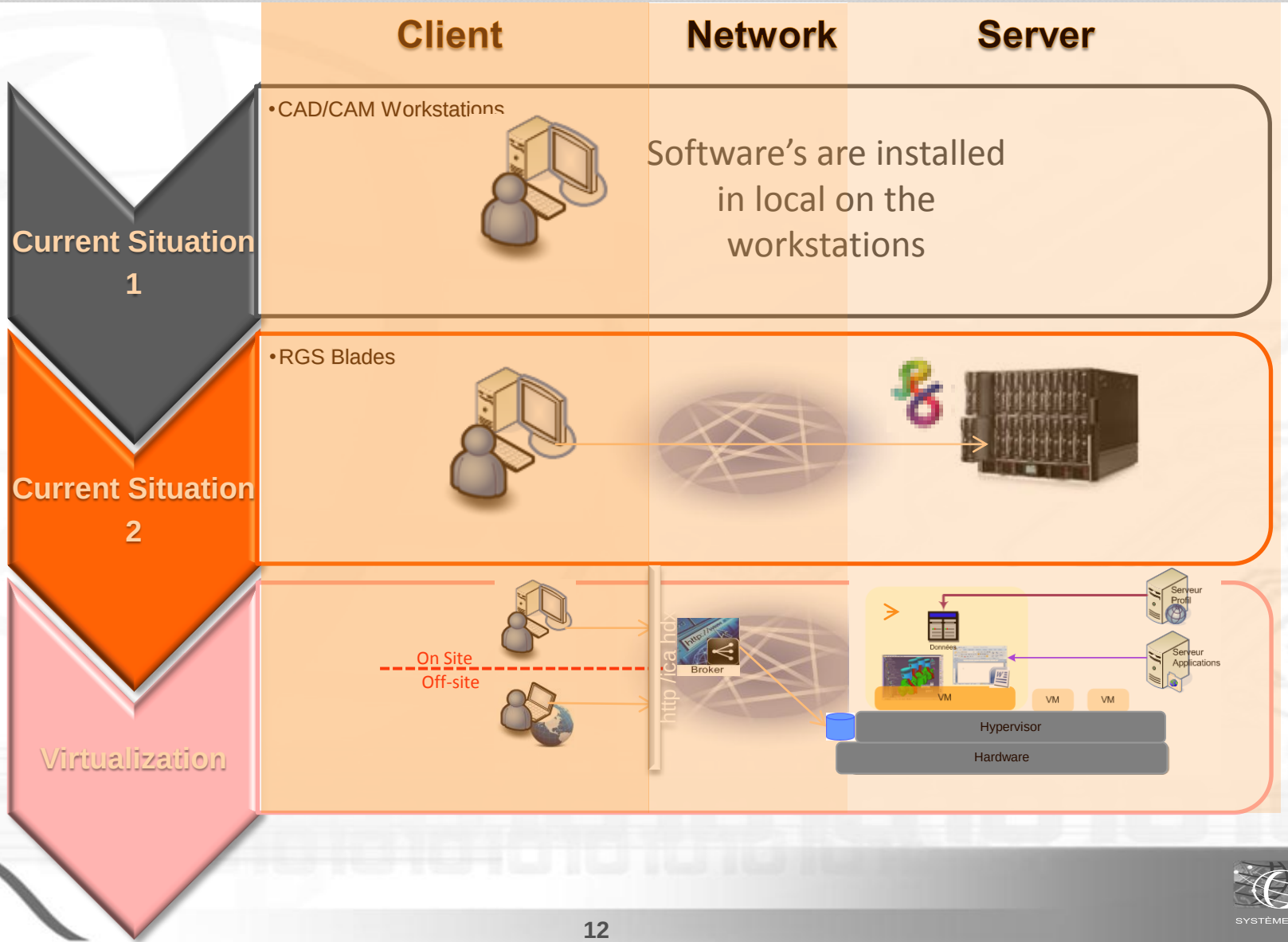

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3D Virtualization project
User classification & action field

User Classification

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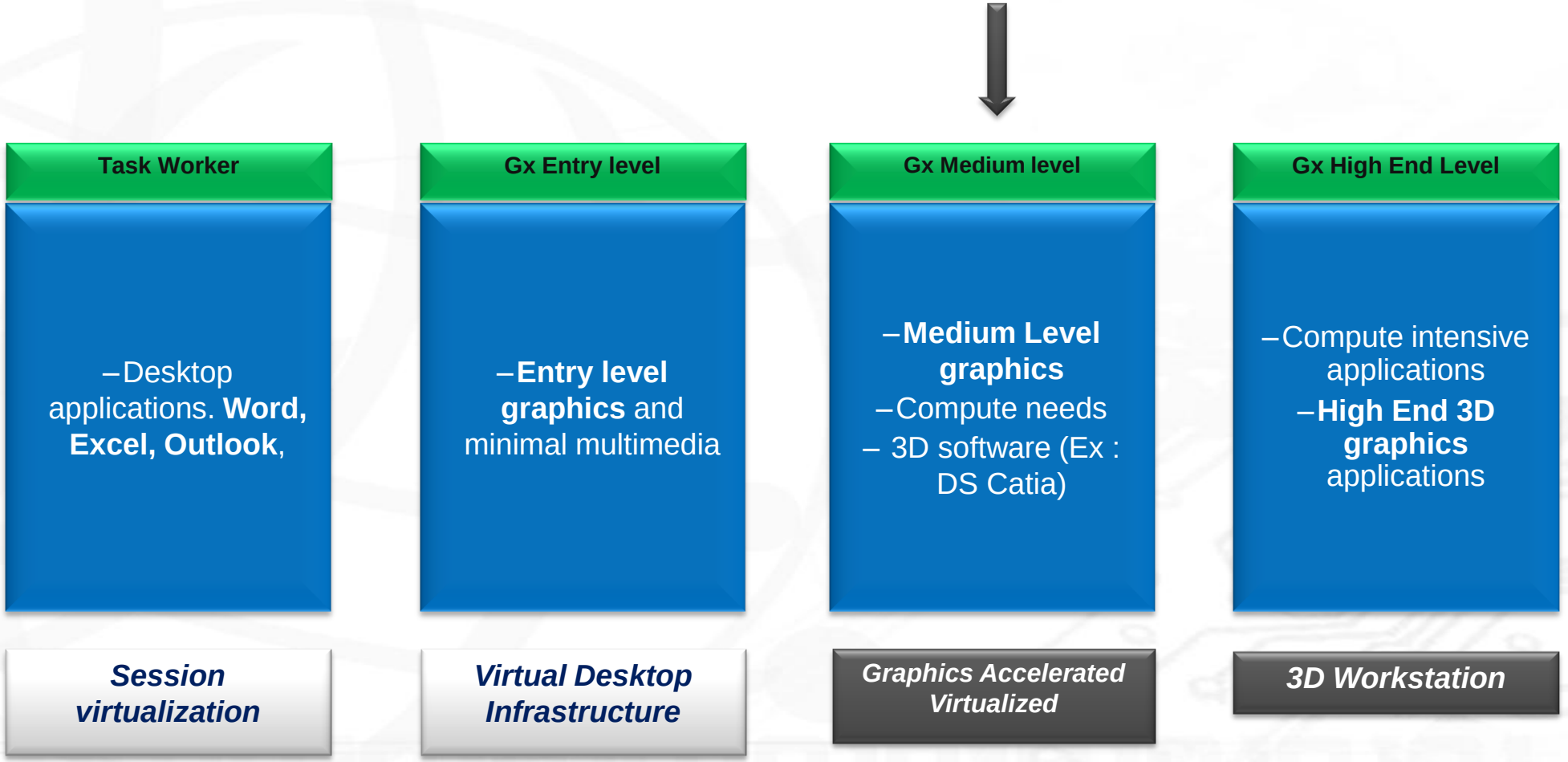
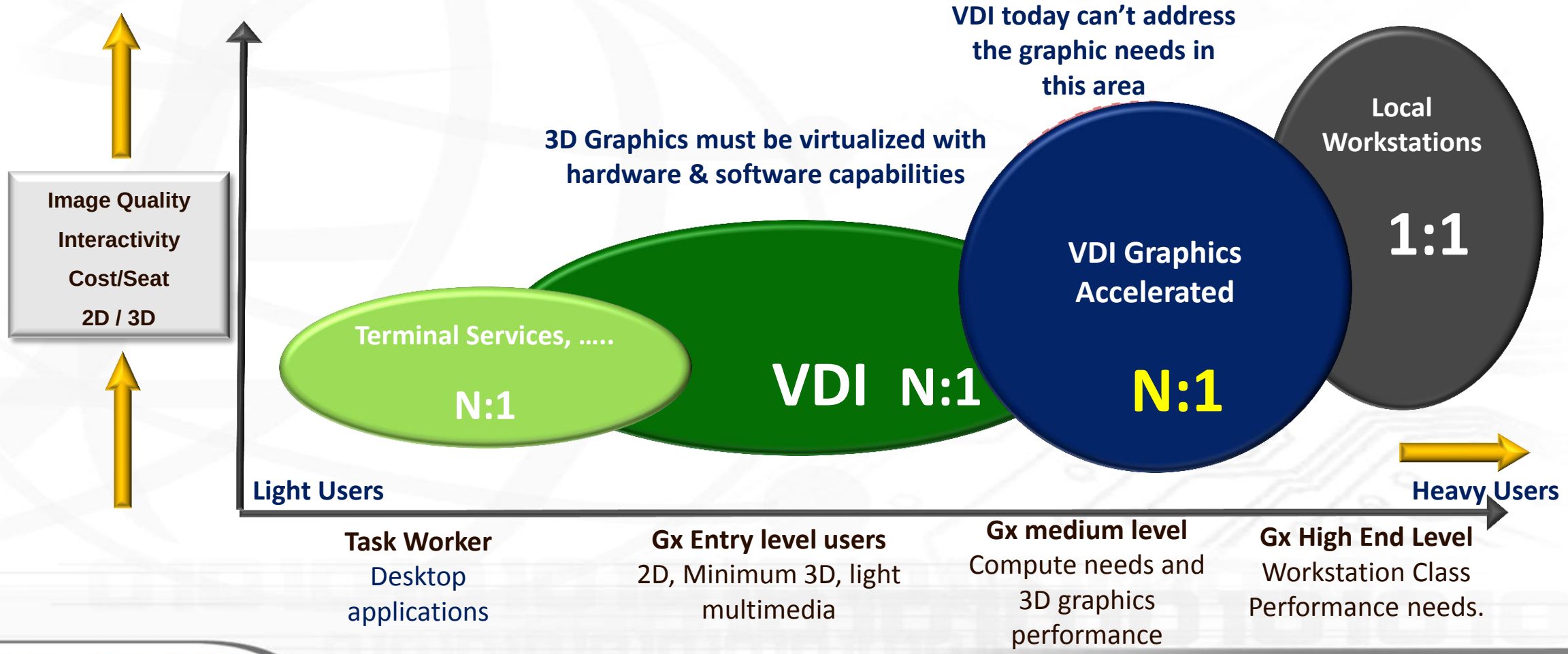


Technology status



Why Virtualize the 3D

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- Reduce costs vs 3D remote 1:1 solution
- Answer to power on demand
- Data security improvement
- Data consolidation
- Maintenance improvement
- Power consumption
- Improve mobility
- …..

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3D Virtualization project Steps, Architecture & Implementation

Project Steps

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Hardware Prototype configurations in virtualized mode "GPU Passthrough“ evaluation

- Partners Nvidia, HP
- Prototype implementation
- Blade system with multiple GPUs

Software prototype in virtualized mode "GPU Passthrough“ evaluations

- Operating systems, Hypervisors, Remote solutions, protocols, …
  - Citrix Xenserver
  - Windows Server 2008 R2
  - Parallels Desktop
  - VMWare server
  - Xendesktop
  - Remote FX
  - HP Remote Graphics (RGS)
  - Citrix HDX 3D pro
  - VmWare Views
  - Nvidia Monterey
  - PCoIP
  - …..

Project Steps

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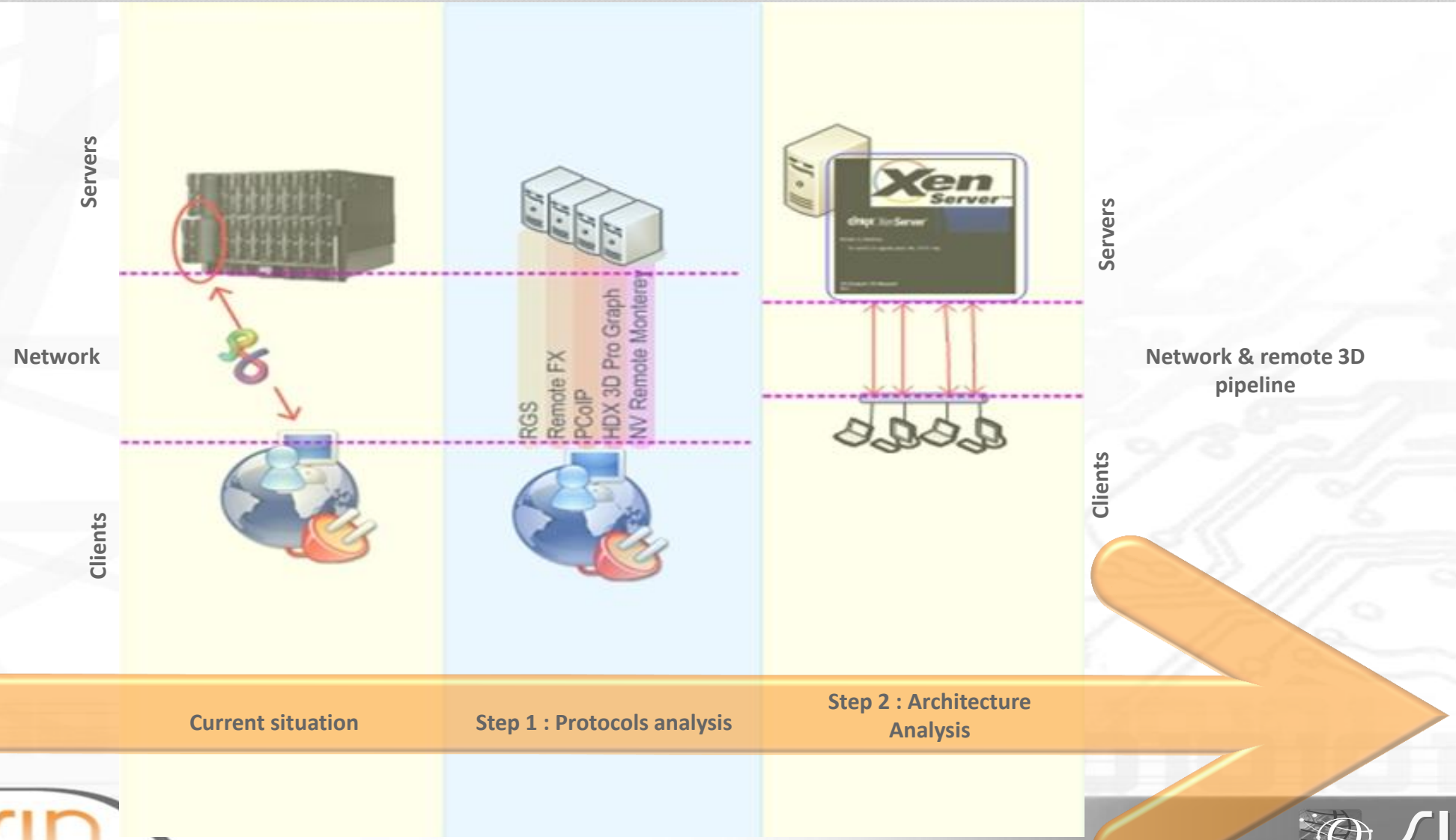
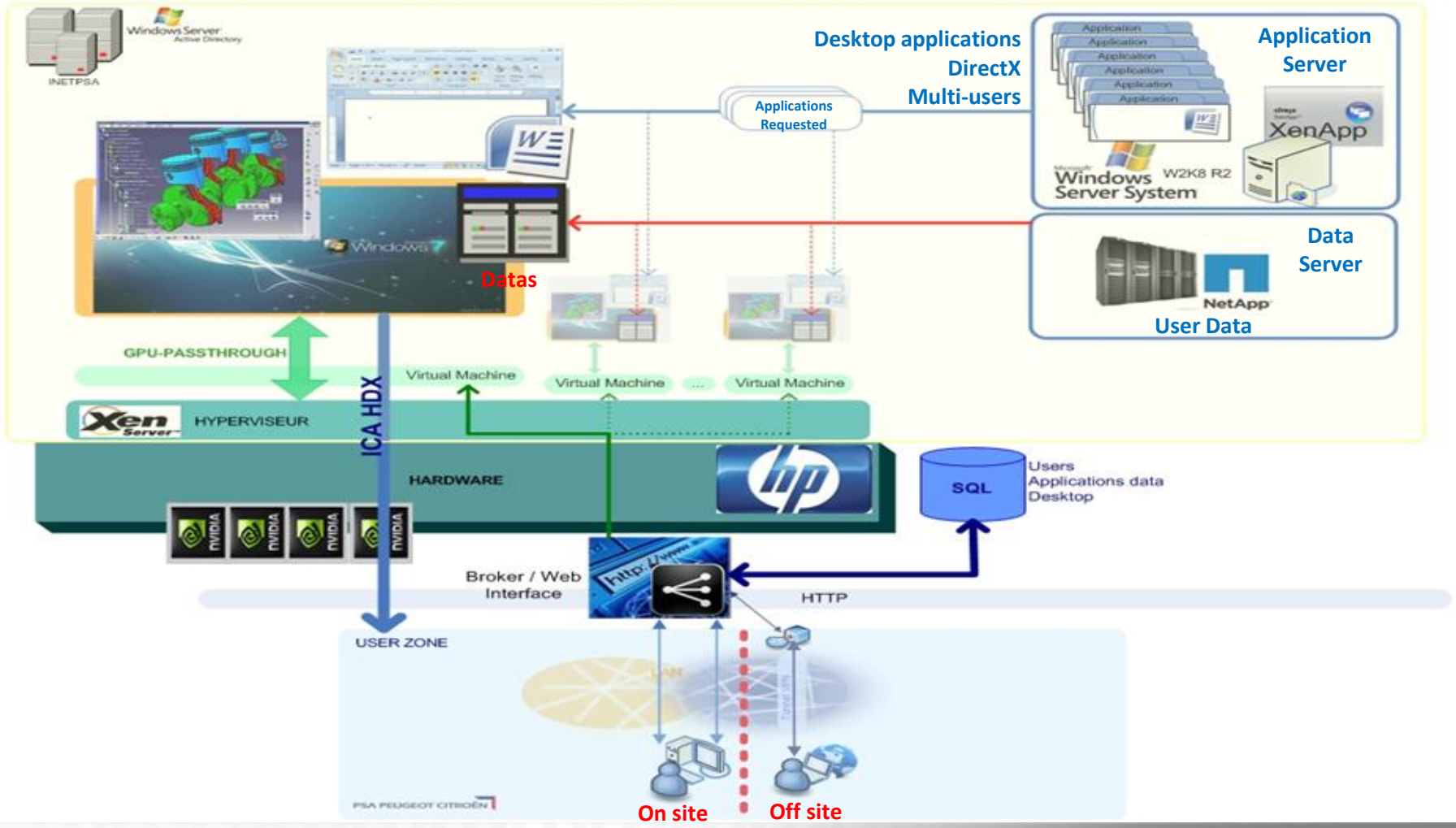
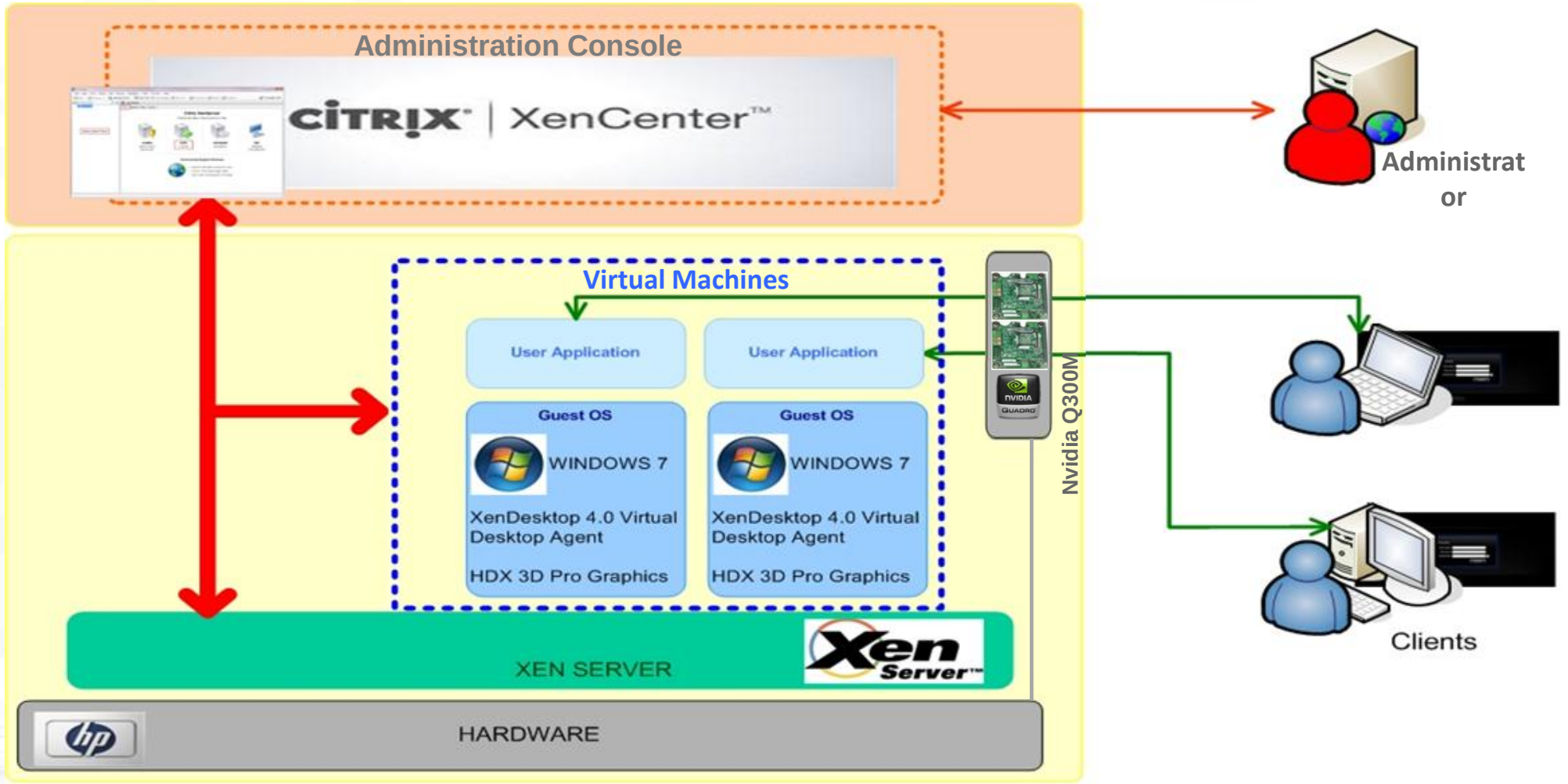


Overhall Test Architecture



Detailed Architecture



Blade implementation example

HP Blade

Extension PCIE Blade

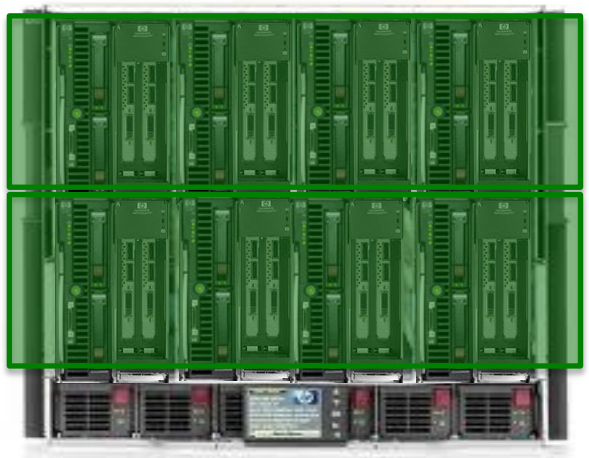
Nvidia Quadro Q3000M

Blade Gx

Xenserver 6

Xendesktop 4

HDX 3D Pro



Chassis Blade Classe C

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3D Virtualization project
Remote 3D tests

Introduction

- Remote is the key feature of the whole project.
- Overall feeling for users must be « just like local » and responsive.
- Bandwidth consumption and latency effects must be reduced.
- Image quality and framerate must be improved.
- In 2011 Nvidia Monterey Toolset improve compression, network protocol and client decoder.
- All the remote 3D tools are implementing the toolset (HDX 3D, RGS, Views, …)

Measured Performances

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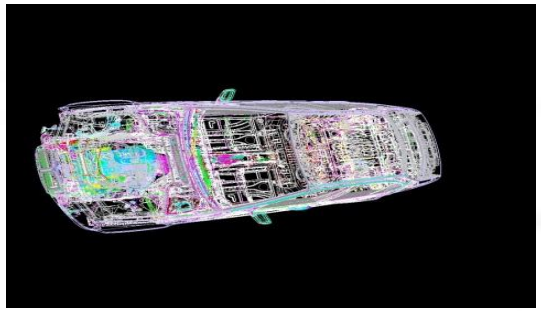
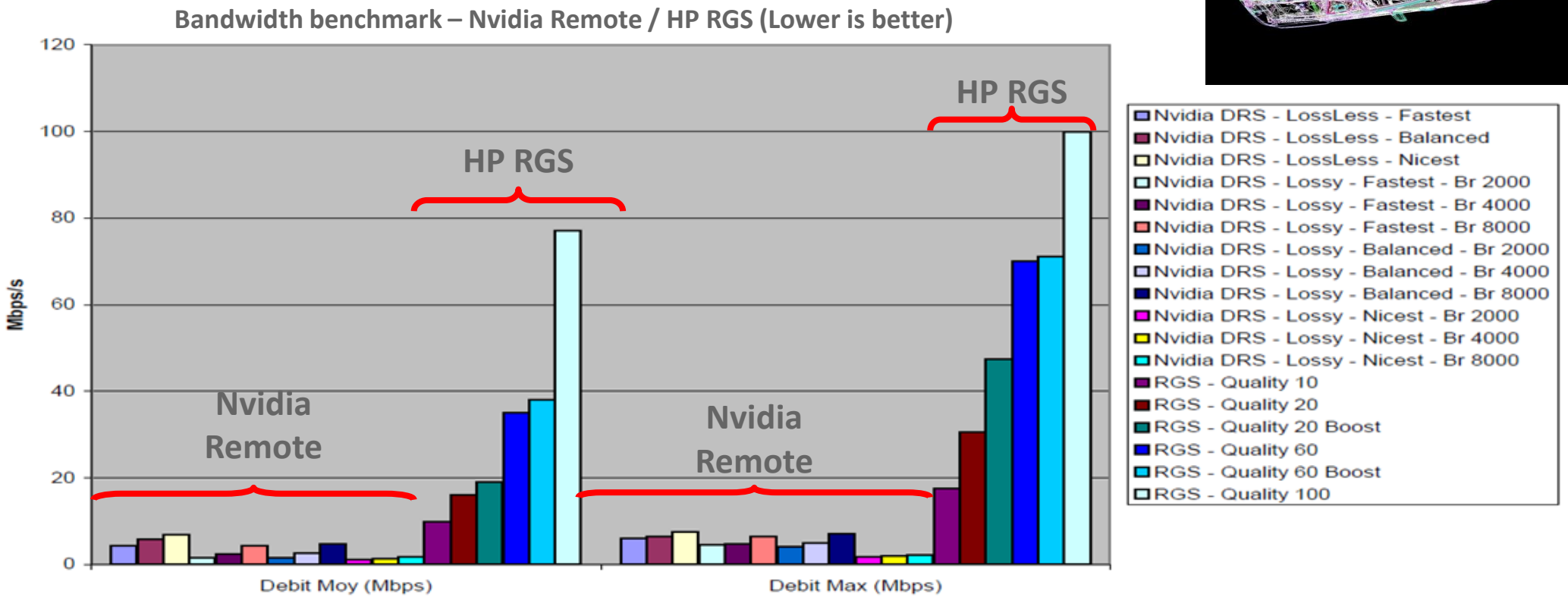
Intensive graphic test : Bench Viewperf Catia 1680x1050

The nvidia remote max bandwidth is lower than the HP GRS min bandwidth





SIPP
NFORMATION PRODUIT PROCESS

Mesuared Performances Synthesis

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- -275% bandwidth consumption versus HP RGS on similar compressions.
- -33% CPU Usage consumption.
- The sharpness of the image after degradation is almost instantaneous on progressive compression.
- Users feeling with Catia resolution 1680x1050 from Paris Data Center
  - « As in local » feeling in Paris facilities (30 Km Radius) → 15-30ms Latency
  - « As in local » Rest of France facilities (500 Km) → 30 ms Latency
  - « Good feeling » in Spain Facilities (1500 Km) → 60 ms Latency
  - « Usable » in China facilities (9000 Km) → 210 ms

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Conclusion

Conclusion

- **The software stack is now almost ready to use**
  - OS, Hypervisor, GPU Passtrough, Remote, Brooker….
- **The hardware stack is ready to use**
  - Blade and extension
  - Server with full lenght graphics cards
- **Prototype is operational**
- **User acceptance is good**
- **Overseas sites can be addressed**
- **Medium and long term vision :**
  - Full virtualization of graphics (many users per GPU)
  - Overall power of the virtualized workstation on demand
  - Open to Imagery computing

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Questions & Answers

Special Thanks

- PSA IT Infrastructure : Adolfo De La Torre
- Nvidia Europe & US
- HP Europe & US
- Citrix Europe & US
- GTC Team

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