PSA PEUGEOT CITROËN

NVIDIA GRID™ at PSA Peugeot Citroën :

The Year in Review

March 17, 2015 | San Jose

Alain Gonzalez

GPU TECHNOLOGY CONFERENCE

DSIN
Direction des Systèmes d'INformation

PSA PEUGEOT CITROËN

Agenda

1. **PSA Peugeot Citroën & IT Department**
2. In 2013….
3. In 2014 till Today
4. How, Who, Where, How to manage, why
5. Conclusion

GPU TECHNOLOGY CONFERENCE

DSIN
Direction des Systèmes d'INformation

1

PSA Peugeot Citroën Group

2014

- **$62 Billions** in revenue
- **2,94 Millions** Cars produced
- **2nd Largest** car manufacturer in **Europe**
- **194 682 Employees** in **160** countries

- **Three brands** with strong identities and differentiated

PEUGEOT

CITROËN

PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

PSA Peugeot Citroën IT Department

1

Missions

- **To Ensure** Information Systems adequacy to the Group's ambitions (Business priorities);
- **To Guarantee** functional and technical architectures consistency of Information Systems;
- **To Ensure** daily software performance, availability and delivery to workstations;
- **To Provide** new technologies to the Group to optimize the performance / cost ratio;
- **To Be force of proposals, advice, arbitration and achievement**, IT Department aligns its strategy on the group's, adopting the same economic constraints.
- **2 256** employees in 26 countries

PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

PSA Peugeot Citroën IT Department

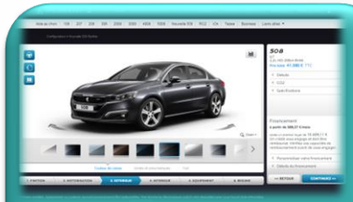
1

Missions

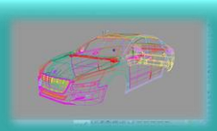
Explore System | Design System | Define Architecture & Solutions | Design product & process | Verify, validate, adjust product & process | Pilot serial life


Styling

Perceived quality

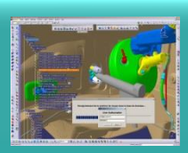


Marketing Images

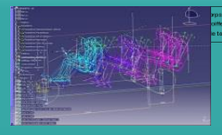
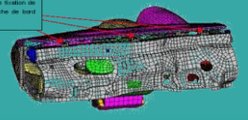
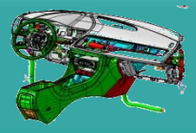
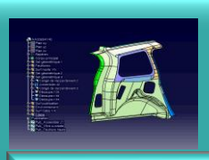



Class A Modeling

After Sales




Digital Factory

Computing Design

PSA PEUGEOT CITROËN

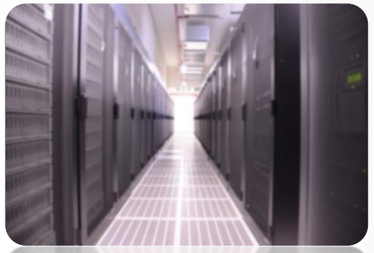
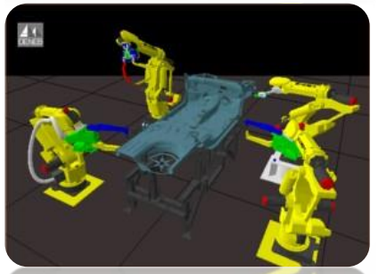
GPU TECHNOLOGY CONFERENCE

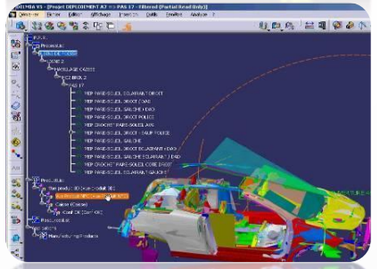
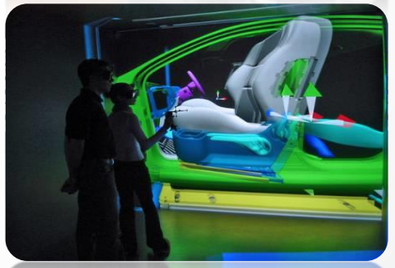
DSIN

PSA Peugeot Citroën IT Department

IT Department in Figures

- **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**
  - **75 000 Office**
  - **13 000 CAD/CAM including 3D Virtual machines**
  - **7000 Industrial Terminals**

PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

Agenda

1. PSA Peugeot Citroën IT Department
2. **In 2013….**
3. In 2014 till Today
4. How, Who, Where, How to manage, why
5. Conclusion

GPU TECHNOLOGY CONFERENCE

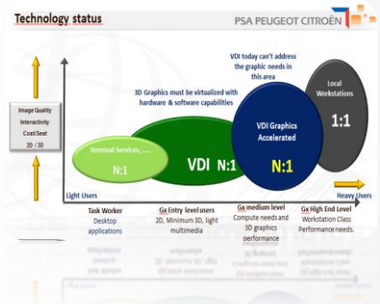
DSIN
Direction des Systèmes d'INformation

In 2013 …..

2

From early phase to operationnal prototype

- The software & Hardware stack was almost ready to use
  - Software : OS, Hypervisor, GPU Passtrough, Remote access, Broker….
  - Hardware : Blade and GPU extensions, Server with full length graphics cards
- Our Prototype was operational
- User acceptance was good
- Advanced testing (50 users)
- Near Shore partners can be addressed



PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

Agenda

1. PSA Peugeot Citroën IT Department
2. In 2013….
3. **In 2014 till Today**
4. How, Who, Where, How to manage, why
5. Conclusion

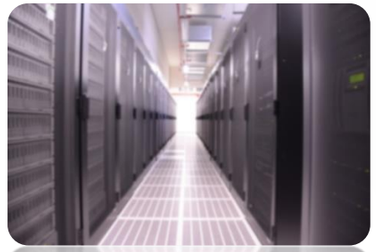
GPU TECHNOLOGY CONFERENCE

DSIN
Direction des Systèmes d'INformation

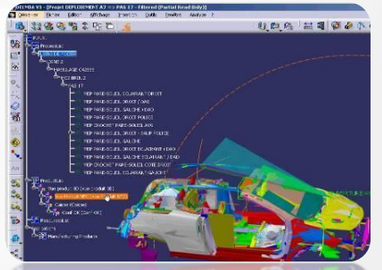
In 2014 till Today

Breaktrough

- **1250 Users** working everyday with a 3D Virtual Machine
  - Internal employees
  - Work at home
  - Subcontractors
  - Partners



- In **9 Countries** (Europe and Near Shore)
- **30 different** Partners & Subcontractors
- **Breaktrough** in IT, **Transparent** for Users



PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

PSA PEUGEOT CITROËN

Agenda

1. PSA Peugeot Citroën IT Department
2. In 2013….
3. In 2014 till Today
4. **How, Who, Where, Manage, why**
5. Conclusion

GPU TECHNOLOGY CONFERENCE

DSIN
Direction des Systèmes d'INformation

How…

4

Close partners

- **Close Partnership** with :
  - Nvidia
  - HP
  - Citrix

- **Every Partner involved** in this project since **2011** :
  - Detailed use cases and constraints
  - Involved in the R&D process
  - Early phase : Beta testing with end users

PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

How…

Architecture in Production

Client	Remote display	Broker	Hypervisor	Hardware	Virtual Machine Storage *Intranet & Work at home* NAS NFS
  	 HDX 3D PRO CITRIX VDA Version 7.1	 XenDesktop CITRIX Version 5.6	 Xen Server CITRIX Version 6.2	 6 GPUs 	

Virtual Machine provisionning
Extended Enterprise
DAS

CITRIX PVS
Version 6.1

PSA PEUGEOT CITROËN

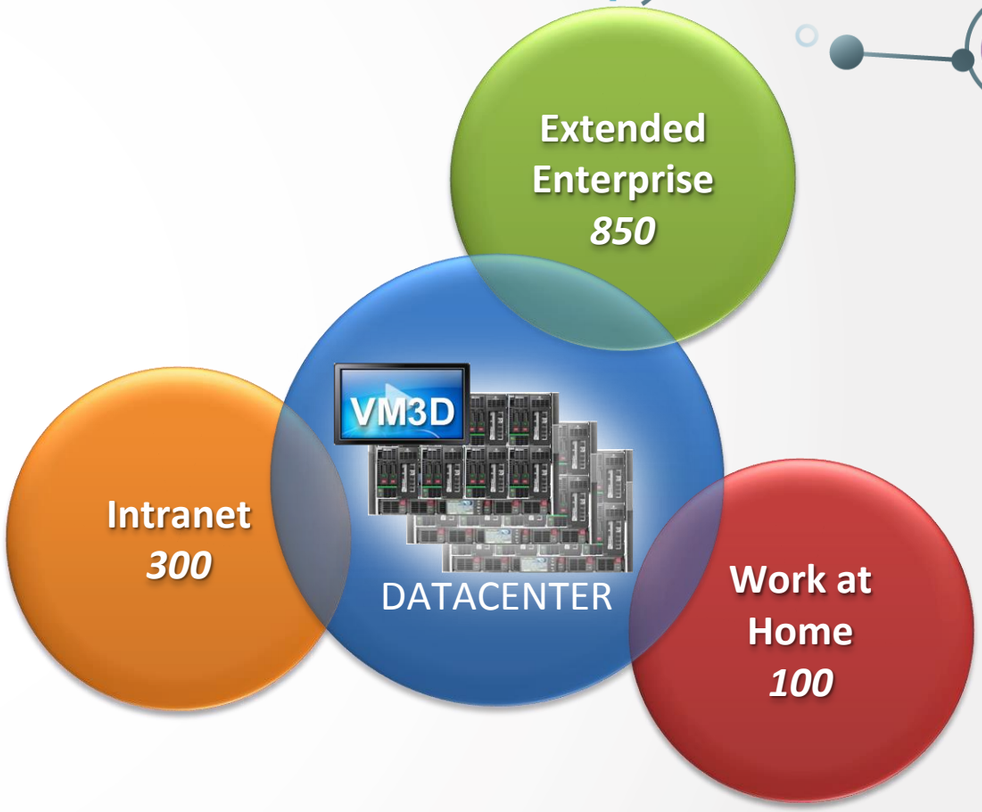
GPU TECHNOLOGY CONFERENCE

DSIN

Who …

Internal, Partners, subcontractors…

- Extended Enterprise
  - Partners
  - Subcontractors
- Intranet / Internal Employees :
  - New CAD/CAM workstation assignment policy
  - Office device + Screen assigment for end users
- Work at Home
  - 3D virtualization is the answer to work at home requests in CAD/CAM environment (Users data close to the VM).
- Users Profiles :
  - Plant Design : AutoCad
  - 3D Computing : Crash, NVH, structural
  - Design : 3DCom, Catia V5
  - Compute : ANSA, V.Lab, Metapost



Where….

Europe and Near Shore

1250 VM 3D Users

9 Countries

- 6 Europe
- 3 Near Shore

30 Partners & Subcontactors

Max distance range :

- 1200 Km for Europe (750 mi)
- 1900 km for Near Shore (1200 mi)

PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

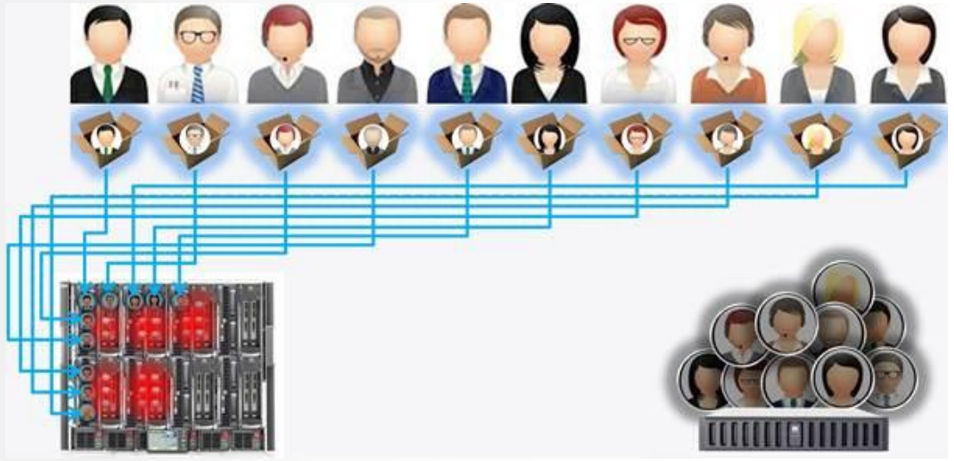
How to manage…

Pool & assigned : Two philosophies

4

«Assigned» Mode:

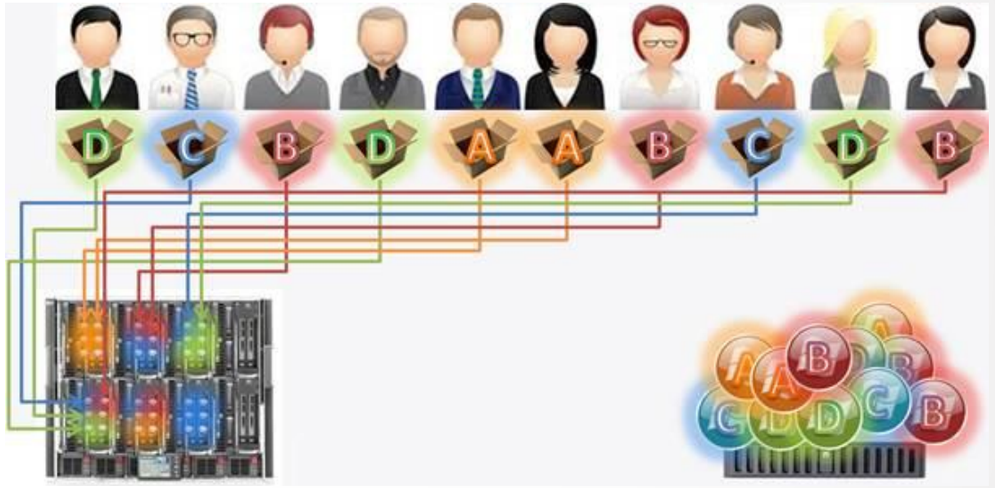
Users have their own virtual machine



- **Virtual machine Customization**
- **Installation/Software updates managed by users**
- **Better user acceptance**
  (User keep it's ow virtual machine)

«Pool» Mode:

Users are connected to a virtual machine according to their software profile



- **Virtual machines trivialization**
- **Lack of customization**
  Define and manage profiles
- **Paradigm shift (service concept)**
  Better surbooking versus « assigned mode»

PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

Why….

Business Challenges

- **Breaktrough** versus 1:1 remote workstation solution
- **Cost effective** : 60% less than a 1:1 remote workstation
- **Flexibility** in logistics, **Easier** hardware upgrade (Hardware in Datacenter)
- **Improve power on demand**, horizontal scalability (in number) and vertical (configuration)
- **Overbooking** possibilities, **better utilization** of expensive hardware
- Reduce the diversity of CAD hardware
- Maintenance, exploitability : **Client trivialization**, Automatic software updates, OS migration facilitated,…
- **Mobility** : Nomadism, Work at home
- Introducing an idea of **CAD service "on demand"**, payment to the real use of hardware

PSA PEUGEOT CITROËN

Agenda

1. PSA Peugeot Citroën IT Department
2. In 2013….
3. In 2014 till Today
4. How, Who, Where, Manage, why
5. **Conclusion**

GPU TECHNOLOGY CONFERENCE

DSIN
Direction des Systèmes d'INformation

Conclusion

5

The Road to xYOD

- **Plan for virtualized workstations :**
  - 10% in early 2015 (done)
  - 20% end of 2015 (on the way)
  - 50% in 2018
- **Improvements requests:**
  - Collaborative mode
  - Remote encoding/decoding
  - Reduce latency perception
  - Dynamic allocation of all resources
- **Technology :**
  - Nvidia :
    - GRID 2.0
    - M40, M60, GRID MXM
  - Citrix :
    - Xenserver 6.5,
    - Xendesktop 7.6,
    - HDX 3D pro 7.6
  - Hardware :
    - Blades
    - Full Length servers





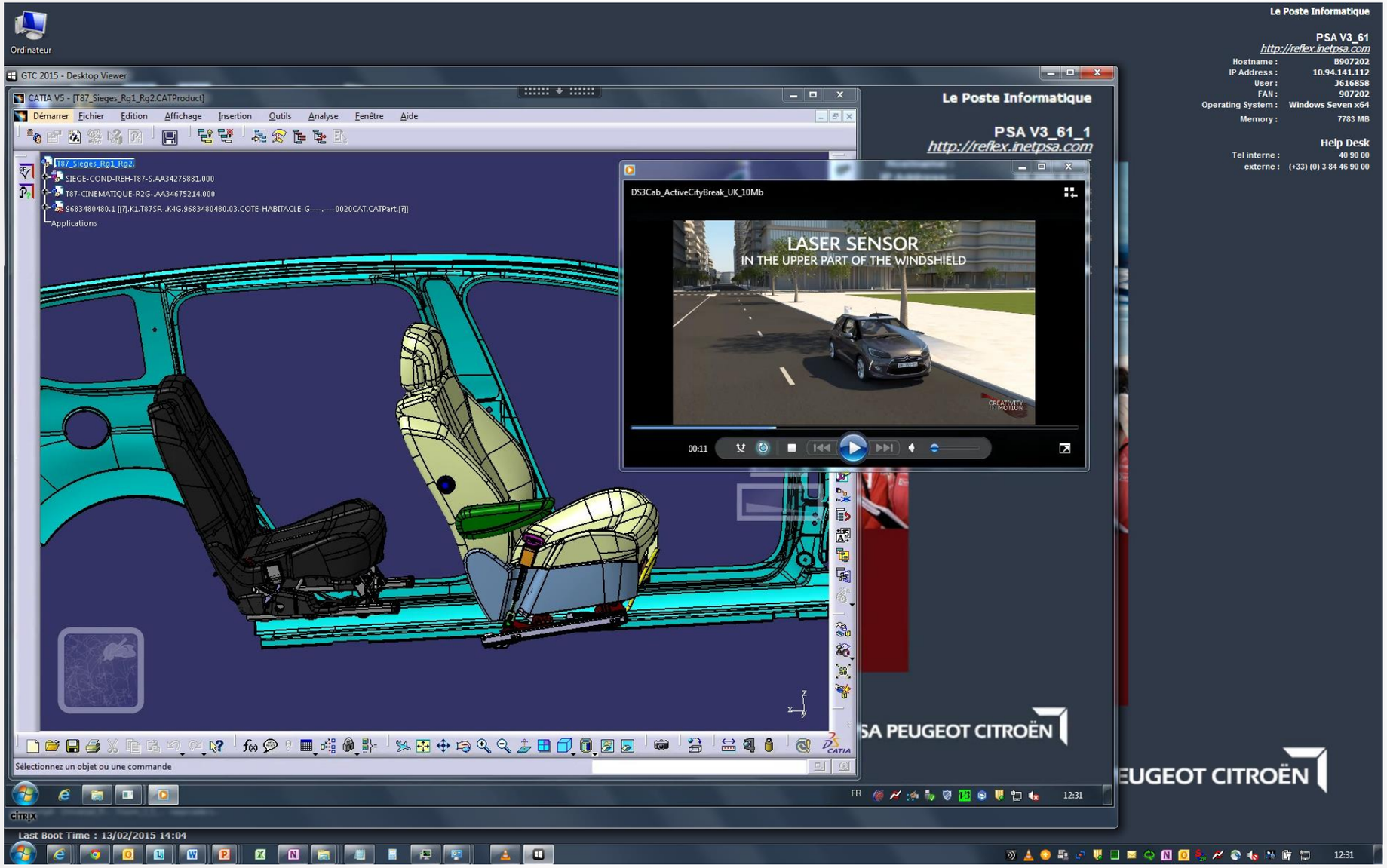
PSA PEUGEOT CITROËN

GPU TECHNOLOGY CONFERENCE

DSIN

Demonstration

6



DSIN

Thanks and Contact

Thierry Regis : PSA Peugeot Citroën IT Back Office

Romain Bouchez : PSA Peugeot Citroën IT Front Office

Nvidia Europe

Nvidia US

GTC Team

Details :

Alain Gonzalez

Expert Workstations, Graphics Technologies & 3D Imagery

Smart Devices Strategy

Contact e-mail : alain.gonzalez@mpsa.com