Cloud Computing
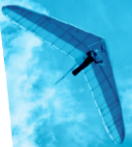
Un'opportunità per ridefinire i processi di produzione

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R&D Manager

Cloud Computing

NICE

Google "cloud computing"

Web ...oks   Images

12,000,000 20 seconds)

Everyone is talking about cloud computing…

… me too!

TECHSPOT   LOGIN f

TRENDING ▾   REVIEWS ▾   FEATURES ▾   PRODUCT FINDER ▾   FORUMS ▾   DOWNLOADS ▾

INDUSTRY NEWS

Majority of Americans believe bad weather affects cloud computing

By **Shawn Knight** on August 30, 2012, 3:00 PM

… but many believe "The Cloud" requires a rain coat!

Source: Citrix cloud survey conducted by Wakefield Research (August 2012)
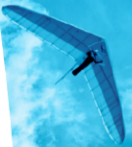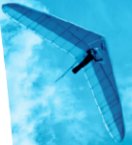
Cloud Computing

...but what is Cloud Computing?

> Cloud Computing is a model for enabling **convenient**, **on-demand** network access to a **shared pool** of **configurable** computing resources (e.g., networks, servers, storage, applications, and services) that can be **rapidly provisioned and released** with **minimal management effort** or service provider interaction.

Cloud Computing

...interesting… but how can I use it?

Social Networking

E-mail Management
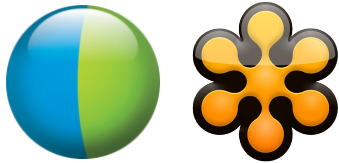
Web-conference Tools

Cloud Storage

Virtual Office

CRM

Backup Services

Extra Computing Power

Cloud Computing

...and more!

Cloud Computing and Smart&Green Factory

… wow… but what about the Smart&Green Factory?

Smart & Green Factory

- Maximizes production efficiency
- Reduces costs
- Saves energy
- Reduces waste
- Optimizes labor and human resources
- Uses latest technologies
- Enables data-driven decisions
- Utilizes mobile devices
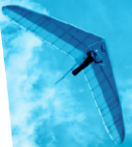
Cloud Computing and Smart&Green Factory

… tell me more… how can Cloud Computing help me to improve my production processes and be smarter?

Most of the classical "cloud services" are addressed to corporate sectors that are not directly connected to the "production" (such as Finance & Accounting, Marketing, Sales, Human Resource Management, Customer Service, etc.)

… but, recent technological advances have made the "cloud computing" also attractive for key areas of the company, such as the engineering or the design department

… please, welcome:

The Technical Cloud
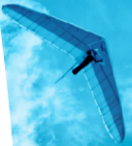
Technical Clouds

What is a Technical Cloud?

A technical cloud enables convenient, on-demand network access to a shared pool of computing resources that run:
- **engineering simulation tools** and other **HPC applications**
- **high-end 3D technical applications** (like visualization applications for scientific data, CAD applications, etc.)

… but how a Technical Cloud can help me?

A Typical Scenario in the CAE sector

1 – Upload input and submit

2 - Transfer output to visualize

HPC Center

3 - Collaboration needs data exchange
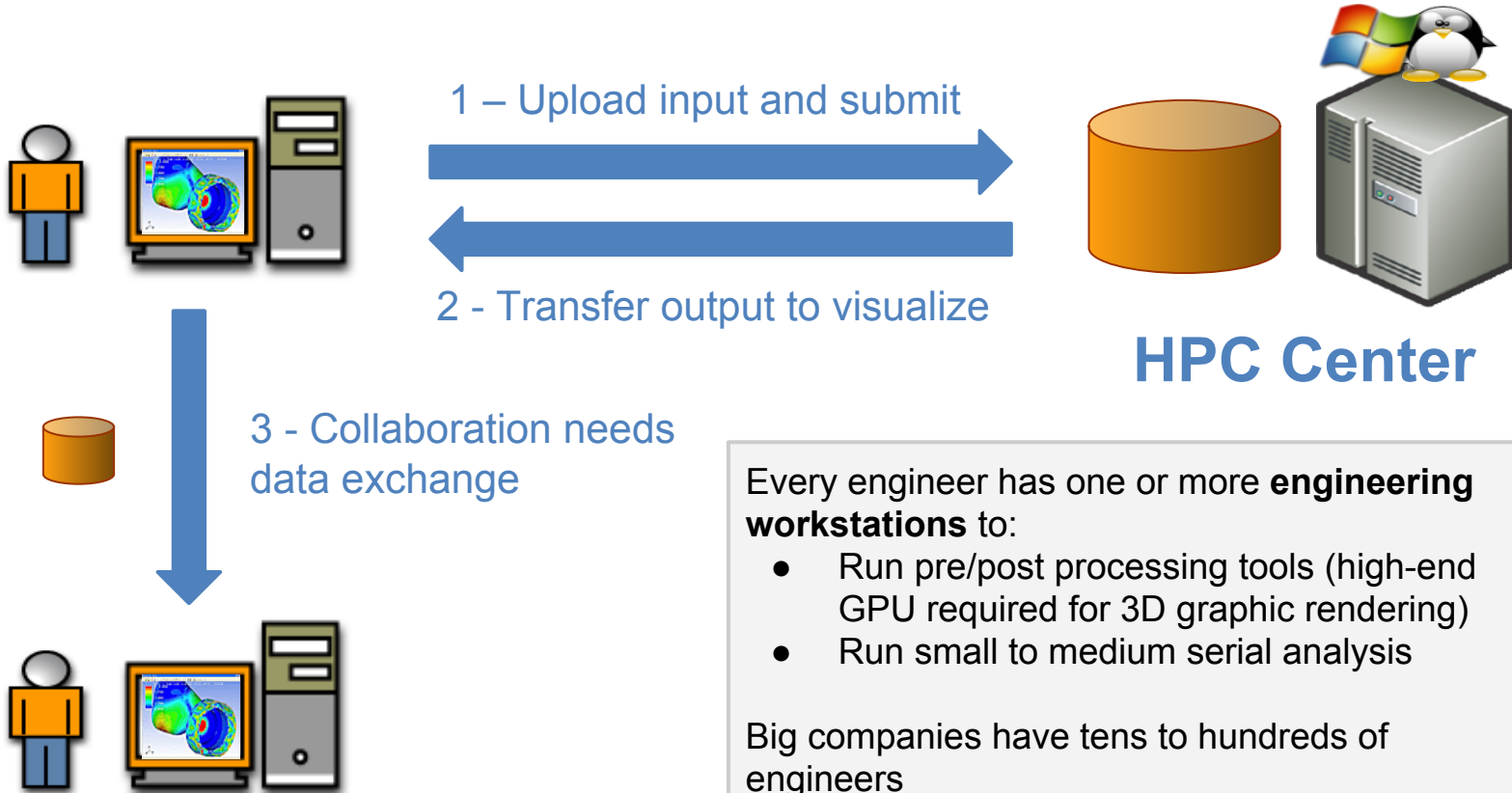
Every engineer has one or more **engineering workstations** to:
- Run pre/post processing tools (high-end GPU required for 3D graphic rendering)
- Run small to medium serial analysis

Big companies have tens to hundreds of engineers

A Typical Scenario in the CAD sector

1 – Checkout Model/Assembly

2 - Commit Model/Assembly

PDM Server
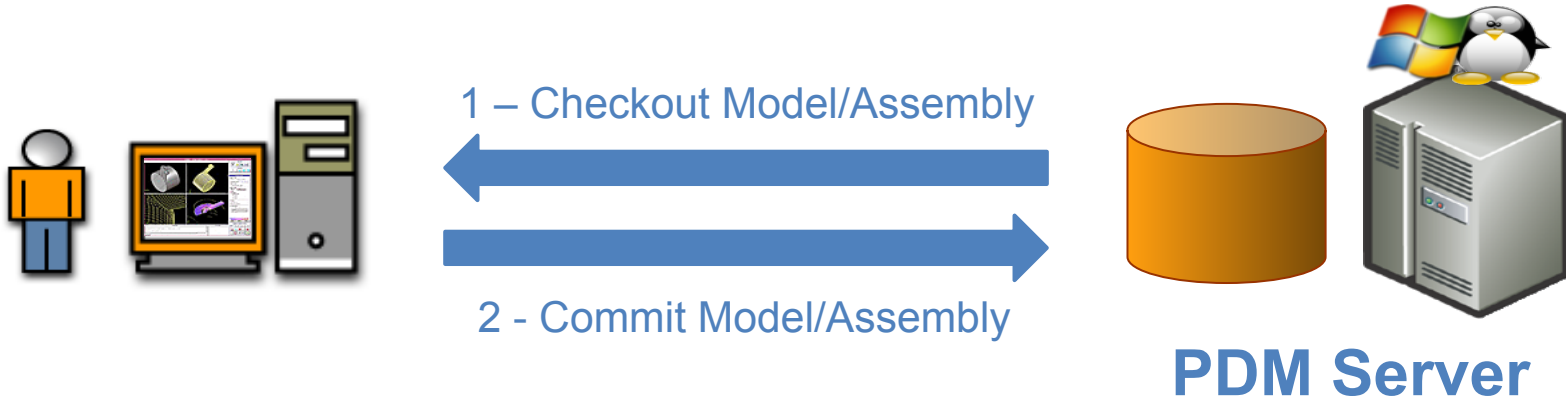
Every designer has its own **CAD workstations** to:
- Run CAD software (high-end GPU required for 3D graphic rendering)
- Run analysis tools (e.g. clash)

Big companies have tens to thousands of engineers

Issues with the "workstation model"

I love my workstation… what is wrong with it?

NETWORK
Network overload leading to poor performance and response times all round

COST
Expensive, dedicated workstations (GPU, memory, …) with short lifecycle

IT MANAGEMENT
Support, update and replace tens to tens of thousands of workstations

WORKSTATION SIZING
Workstations have to be sized for the largest expected models

SECURITY
Moving sensitive data around (in/out organization) is always risky

WORKFORCE
Current models do not support a diverse mobile workforce

NICE

Let's Think Different

NICE

Collaboration

3D Remote Visualization

HPC

Job Submission

Data I/O

Data I/O

Let's Think Different

Collaboration

3D Remote Visualization

HPC
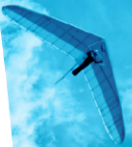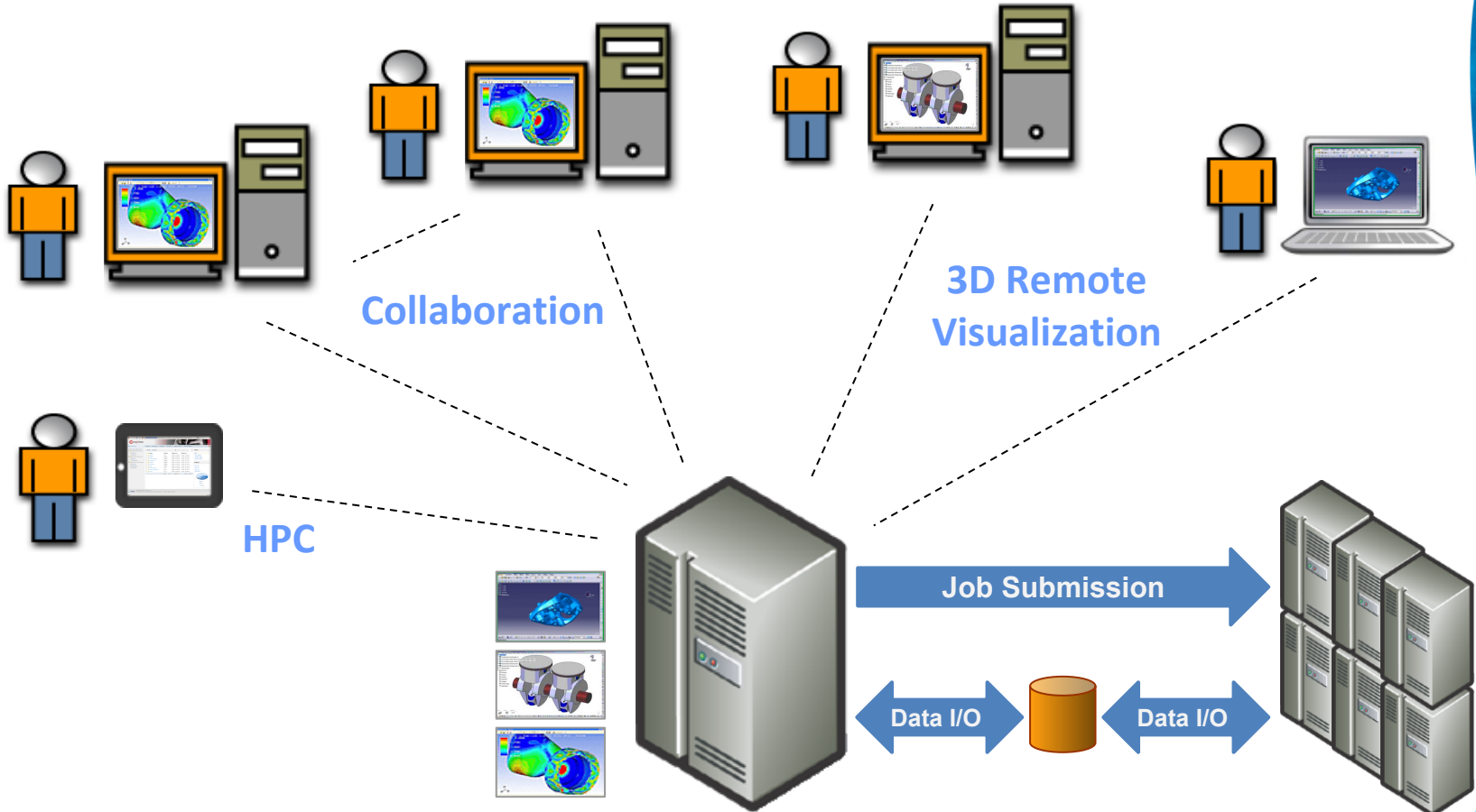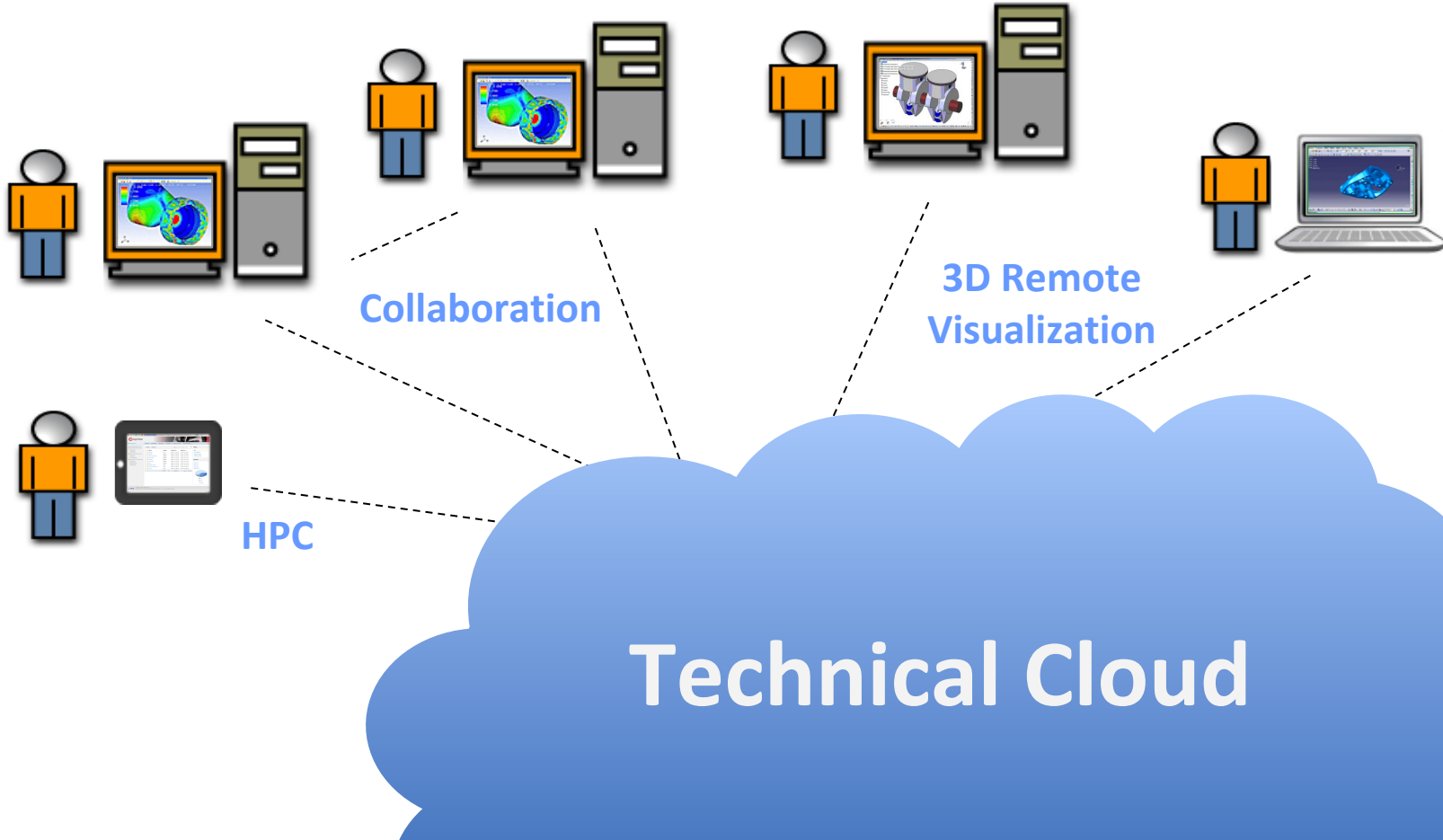
Technical Cloud

Benefits of the Technical Cloud

… I'm impressed… why this approach is better?

NETWORK
Network is no more a bottleneck and data loads faster

COST
Centralized & Shared servers are less expensive to buy & manage

IT MANAGEMENT
Support, update and replacement are more efficient & do not affect users

WORKSTATION SIZING
Resources are dynamically sized based on users needs

SECURITY
Sensitive data remain within protected data center with full access control

WORKFORCE
Users can virtually connect & collaborate from anywhere with any client
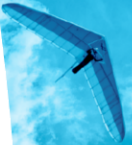
NICE Proposal for Technical Clouds
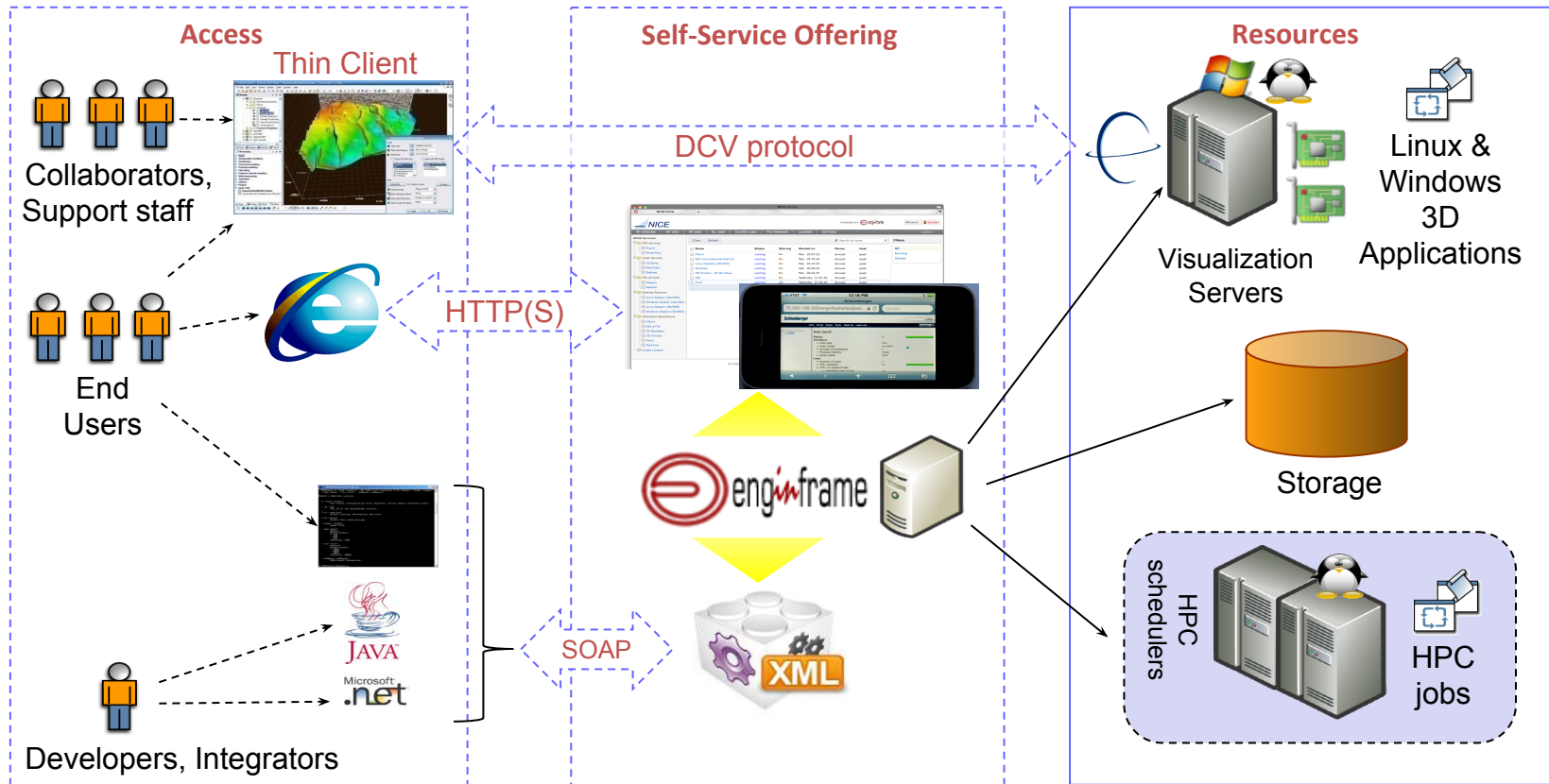
Solutions for Different Workloads

o **Remote 3D "Virtual Workstations"**
*with **NICE DCV (Desktop Cloud Visualization)** &
EnginFrame Views*

- ▪ This model is ideal for 3D visualization and connecting remote users to 3D applications that run in a data center.
- ▪ Users access full desktop sessions through a web browser
- ▪ The 3D performance is significantly better than a traditional VDI

o **Full Featured HPC Portal**
*with **NICE EnginFrame** for HPC*

- ▪ This model is ideal for computational-intensive and/or parallel job submission, control, and monitoring
- ▪ Users access applications and data through a web browser

Case Study: ENI - Global Visualization Hubs

o **Problem**

- WW distributed operations
- Experts at HQ or travelling, many users at subsidiaries
- Very large models cannot be moved or synchronized
- Variable WAN latency
- Linux and Windows applications
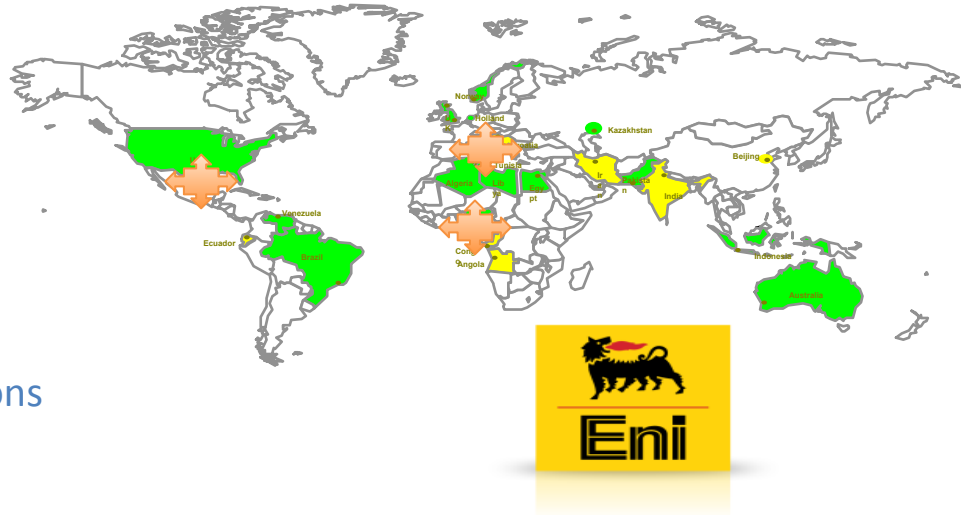
o **Solution**

- NICE DCV and HP RGS
- NICE EnginFrame 2013.0
- Multiple hubs with 3D and HPC resources

o **Benefits**

- Regional data/app consolidation
- Workstation-less services
- Full performance and mobility
- Regulatory compliance for data
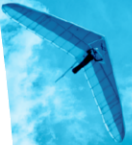
Case study: NORDAM - Ultimate Flexibility

o **Problem**

- ▪ As a Tier 1 OEM supplier, NORDAM needs to match customers' Catia revisions and SP's
- ▪ Difficult on a workstation
- ▪ Need to support remote workers
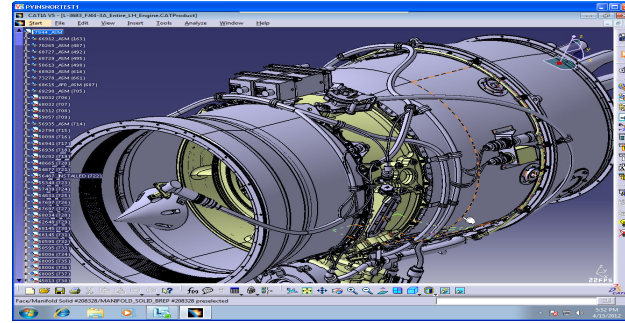
o **Solution**

- ▪ NICE DCV 2013.0 for Windows on NVIDIA vGPU
- ▪ NICE EnginFrame 2013.0
- ▪ XenServer 6.2 with NVIDIA GRID K2
- ▪ VM and data on NetApp Filer

o **Benefits**

- ▪ CATIA Service Packs can be easily upgraded and tested
- ▪ OS is not tied to physical hardware, allowing for greater flexibility
- ▪ Home working over VPN

Case study: ANSYS - Regional Technical Clouds

o **Problem**
- Scattered HPC facilities
- Widely distributed users
- Large modes / mesh travelling over WAN
- Customer demand for centralization solutions

o **Solution**
- NICE DCV multi-platform
- NICE EnginFrame
- Single visualization & HPC cluster refresh
- Certification of DCV for ANSYS main products

o **Benefits**
- Regional data/app consolidation
- Minimize WAN data transfers
- Home working over VPN
- Standardized support for customer solutions
- Public Cloud foundation
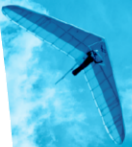
Case Study: Major EU Aerospace - Delmia mobility

o **Problem**
  - Maintenance and trainer building requires full aircraft assembly access
  - Traditional approach include in-hangar workstation + plotter and large paper printouts
  - Inefficient and expensive
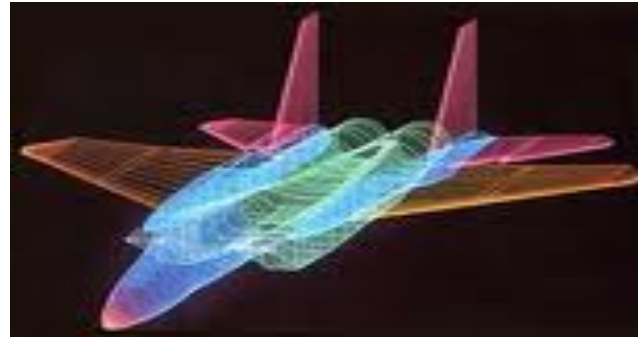
o **Solution**
  - NICE DCV on KVM
  - Windows tablets over WiFi

o **Benefits**
  - Full mobility, including tablets
  - Full assembly access at workstation class performance
  - Savings on HW and consumables
  - Better productivity and personnel efficiency

Research Project: Nuvola3D

Goal

o   Developing **enabling technologies for Technical Cloud** (with focus on high-end 3D applications):

   1.   **Remote visualization** technologies: providing secure remote network access to interactive 3D applications leveraging server-side graphic hardware acceleration

   2.   **GPU virtualization** technologies: for executing high-end 3D application in a virtualized environment with workstation-class performances, including GPU sharing among multiple VMs

   3.   **Remote sessions management** technologies: to allow end-users to easily launch and access remote interactive applications and to manage and load balance applications and desktop sessions among the available computational resources

Partners

Contacts

www.nuvola3d.org

NICE Customers and Market Segments

NICE

Energy & Chemical
Anadarko, BGP, British Gas, Cairn Energy, ConocoPhillips, Daqing Oil Field, Dow Chemical, Dupont, ENI/AGIP, EOG Resources, FMC, GEA Process Eng., GXT, Huabei Oil Field, Maersk Oil, Nova Chemical, Pentair, PetroChina, Tuha Oil Field, Tullow Oil, Xinjiang Oil Field

Life Sciences and Medical
Baxter, Eli Lilly, Howard Hughes Medical Institute, Institut Pasteur, Novartis, Ontario Cancer Institute, Shanghai Inst. for Biological Sciences

Research & Education
CINECA, DLTM, Insis, NCSA, South Dakota State University, TU Ilmenau, TU Ostrava, Uni Birmingham, Uni Buffalo, Uni LETI, Uni Liverpool, Uni Nagoya, Uni Padova

Aerospace & Defense
1st Aerospace Institute, Alenia Aermacchi, AVIC, BEMEI, Boeing, DLR German Aerospace, Procter&Gamble, P&W Canada, SelexGalileo, Gulfstream, MBDA, NORDAM, NGC, Parker Hannifin, Sikorsky

Automotive & Manufacturing
3M, ABB, Audi, BMW, Bosch, Continental, Daimler, Delphi, Emerson, Global Castings, Hyundai, JLR, Knowbe, Liebherr, Magneti Marelli, Mazda, McLaren, Panalpina, Rolls Royce, Scania, Toyota, Volkswagen

Others
Ansys, AWE, BlueCloud, CADFEM, CFX Berlin, Silicon Labs, Samsung, Tycoelectronics, Westinghouse

Key Partners

Thank You

Thank you for listening… any question?

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