La virtualisation des services HPC au service des utilisateurs

HPC Democratisation

Simplified access to simulation applications

Philippe Bricard

Business Development & HPC Alliances

Typical Technical Computing issues

Engineers
Researchers

Project manager
Team leader

Power Users
Application
Developers

IT Admins

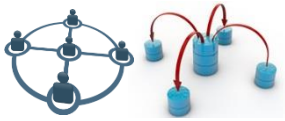
HPC complexity

100s of applications

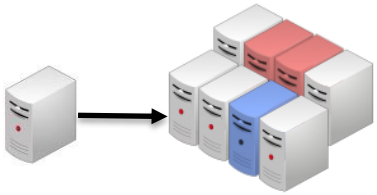
Increasing volumes of data

Complex usage
(CLI, schedulers)

Limited IT
and support staff



Increasing Multi-tenancy
Distributed users – Distributed Resources



Evolving HPC infrastructure

Resources

Visualisation Servers

Linux &
Windows
interactive 3D
applications

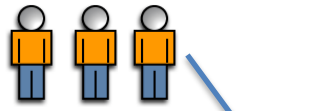
Application licenses

Shared storage

HPC batch
Applications

HPC Clusters

Adressing the Technical Computing challenge

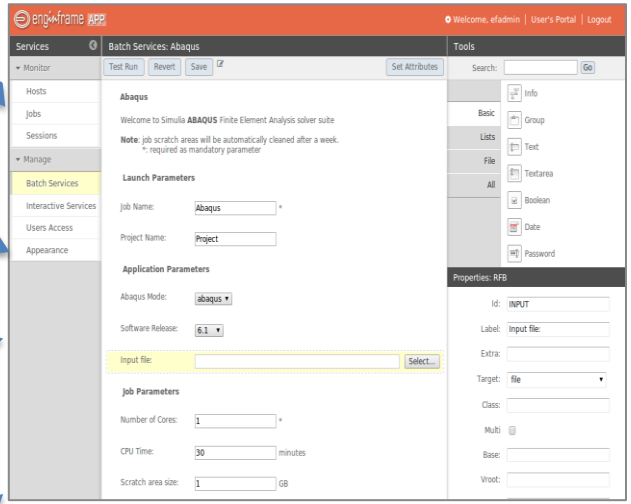


Engineers
Researchers

Project manager
Team leader

Power Users
Application
Developers

IT Admins



Removing complexity

Resources

Visualisation
Servers

Linux &
Windows
interactive 3D
applications

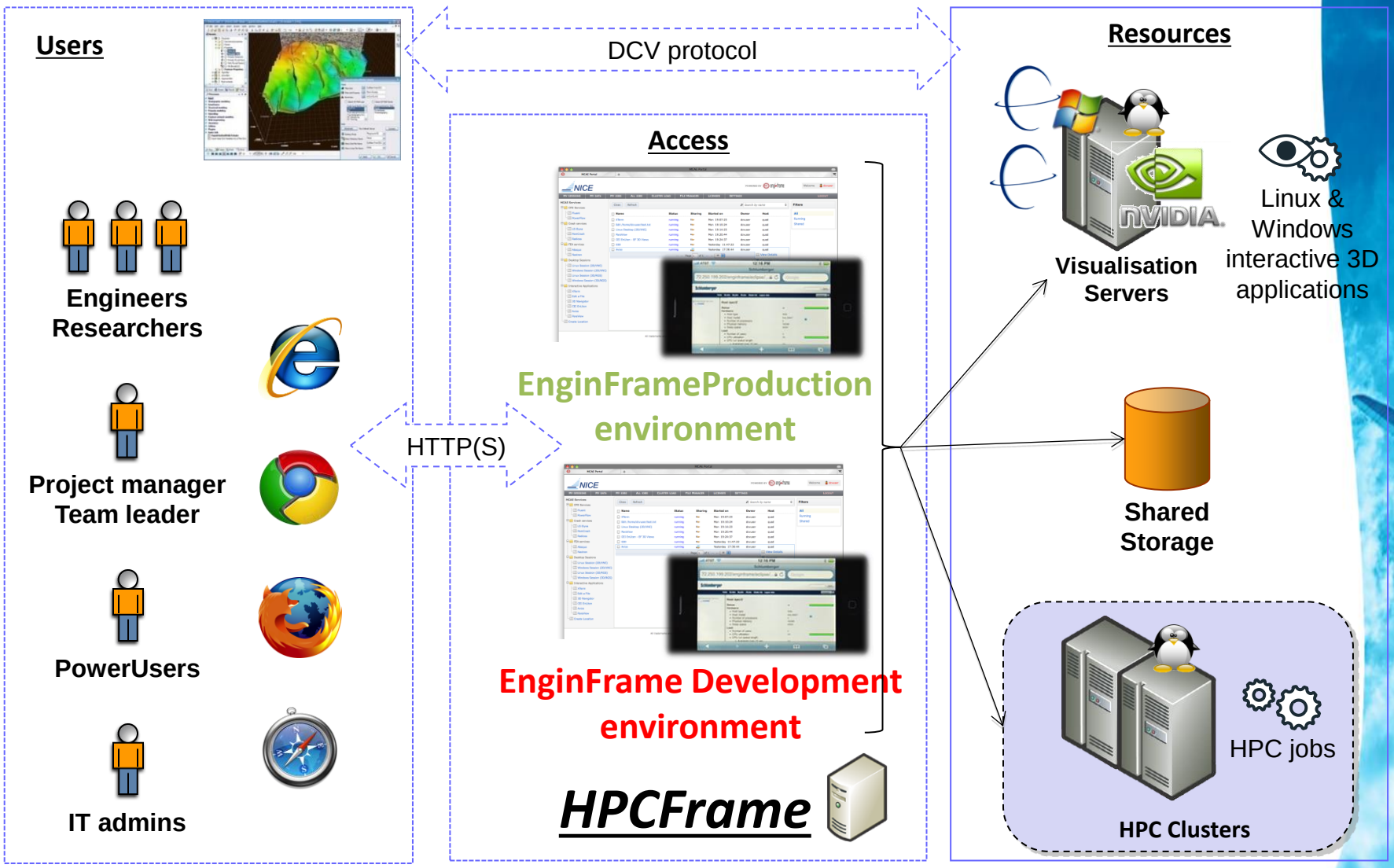
Application
licenses

Shared storage

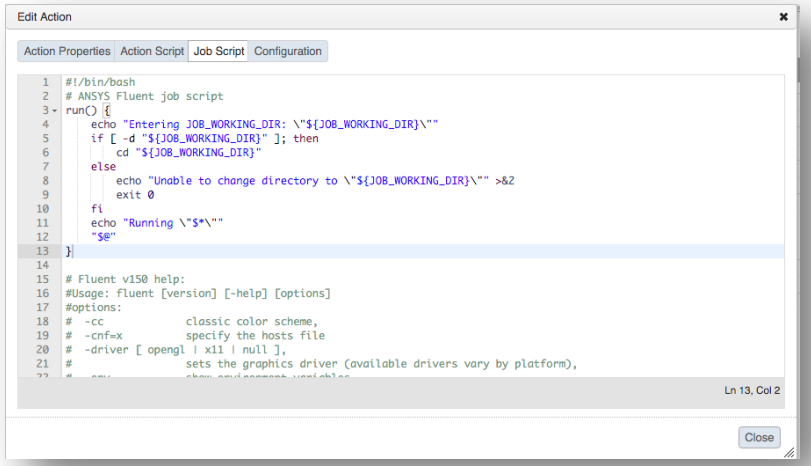
HPC batch
Applications

HPC Clusters

HPCFrame an EnginFrame solution

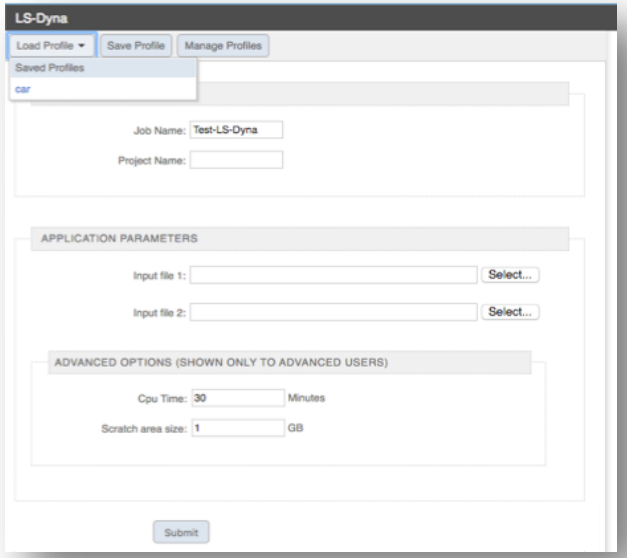


From Application to Services



Batch or interactive job script

+



Submission form

"HPC Service" built in "Drag & Drop" Editor

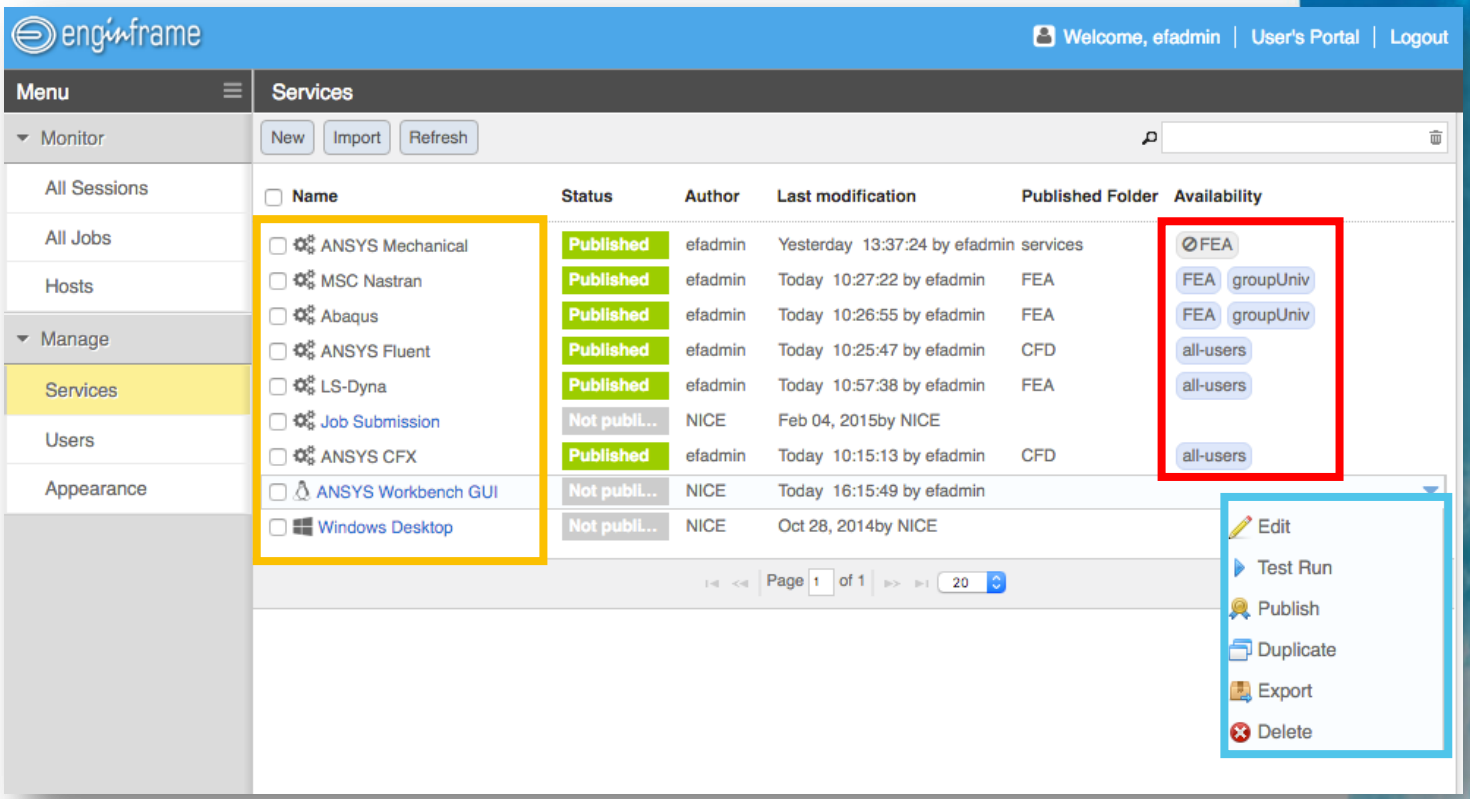
Published to Users & Groups

HPC Service catalog

Unified workspace for batch & interactive applications

Create, edit, publish, import and export applications

Manage applications availability to groups of users



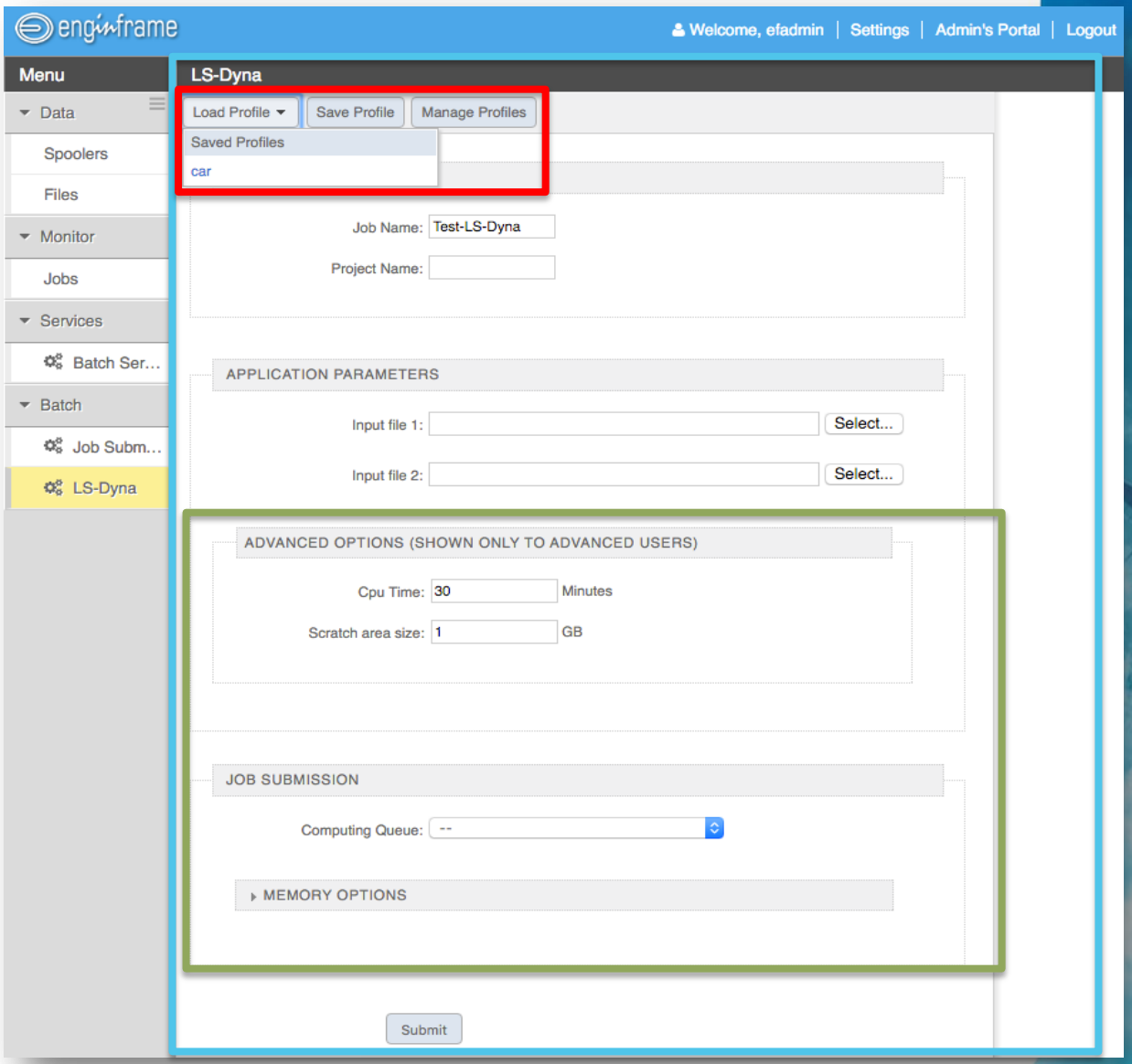
Service submission

Access user friendly, application-oriented job submission forms

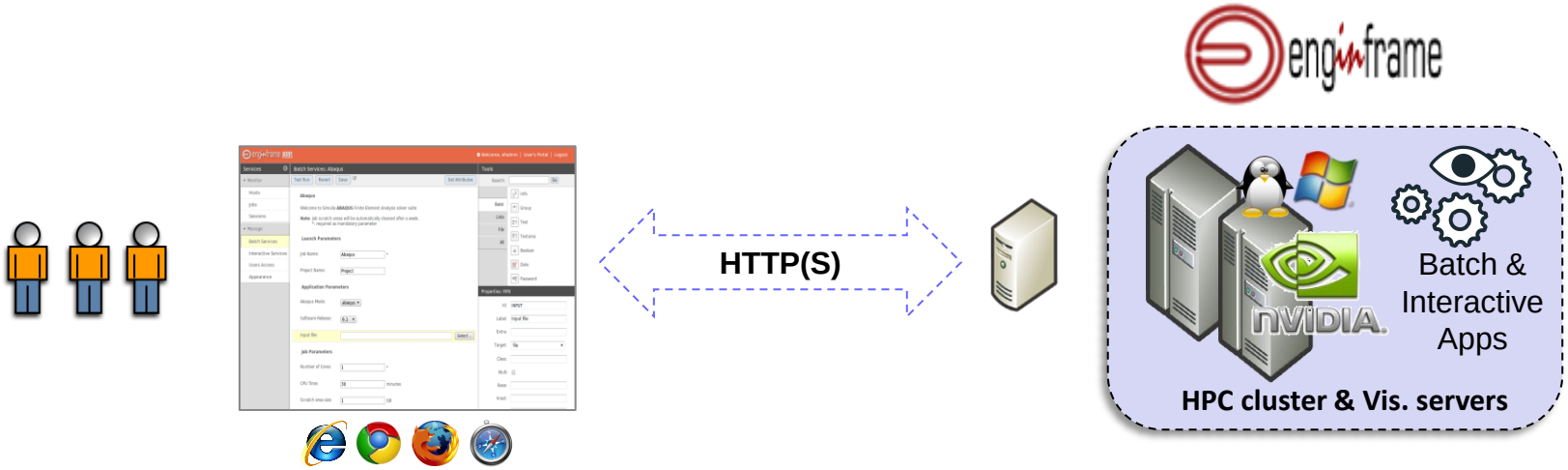
Complexity of underlying scheduler is hidden

Show different options depending on user's skills (ACL managed)

Quickly access frequently used parameters

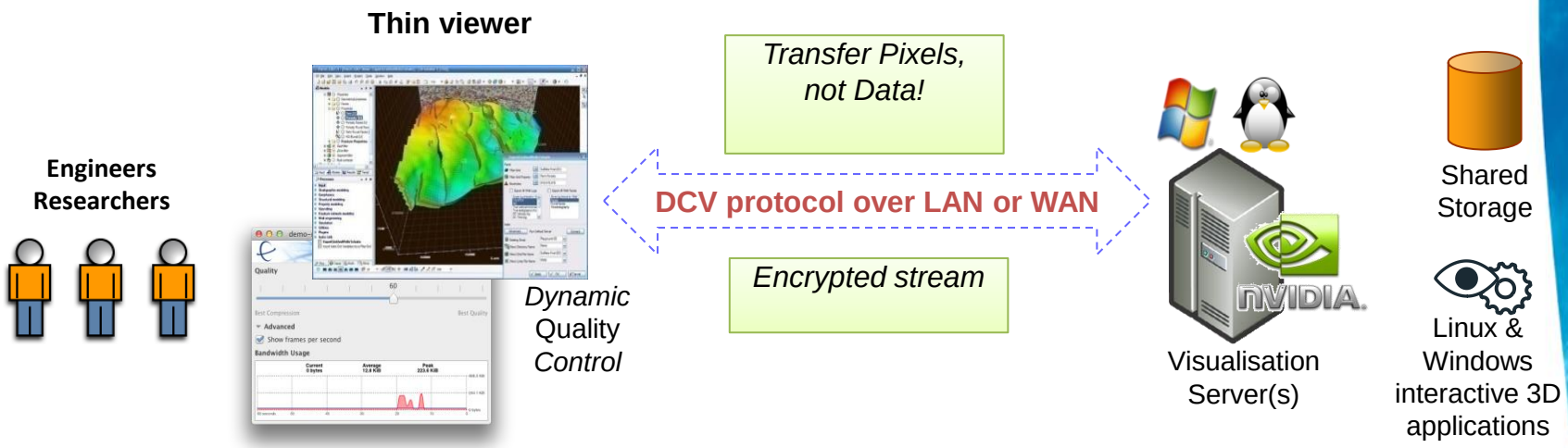


Technical Computing Portal



- Web based workspace for simulation users
  - Engineers, Researchers, Scientists, Designers...
- Easy integration of HPC and Visualisation applications
  - Reuse existing scripts
  - Web based editor to design submission forms
  - Clear separation between development & production
- Advanced Data management functions
  - Remote file browsing
  - Simulation results organization & pre-visualisation
- User roles and management
  - PowerUser role
  - Graphical user interface to manage user/groups application access
- Off-the-shelf connexion with HPC Clusters
  - Connects to one or multiple clusters
  - Through a single or different job schedulers
  - Support for LSF, PBS, Moab, GridEngine, Slurm, Openlava...
- Highly secured environment
  - Encrypted communications
  - Authentication through PAM – Support for TFA
  - Integration with existing directories (LDAP, AD…)
- Packaged solution deployment & management
  - Automated integration to HPC environment
  - Optional Remote Visualisation & High Availability support
  - Comprehensive management and support tools

Remote visualisation with DCV

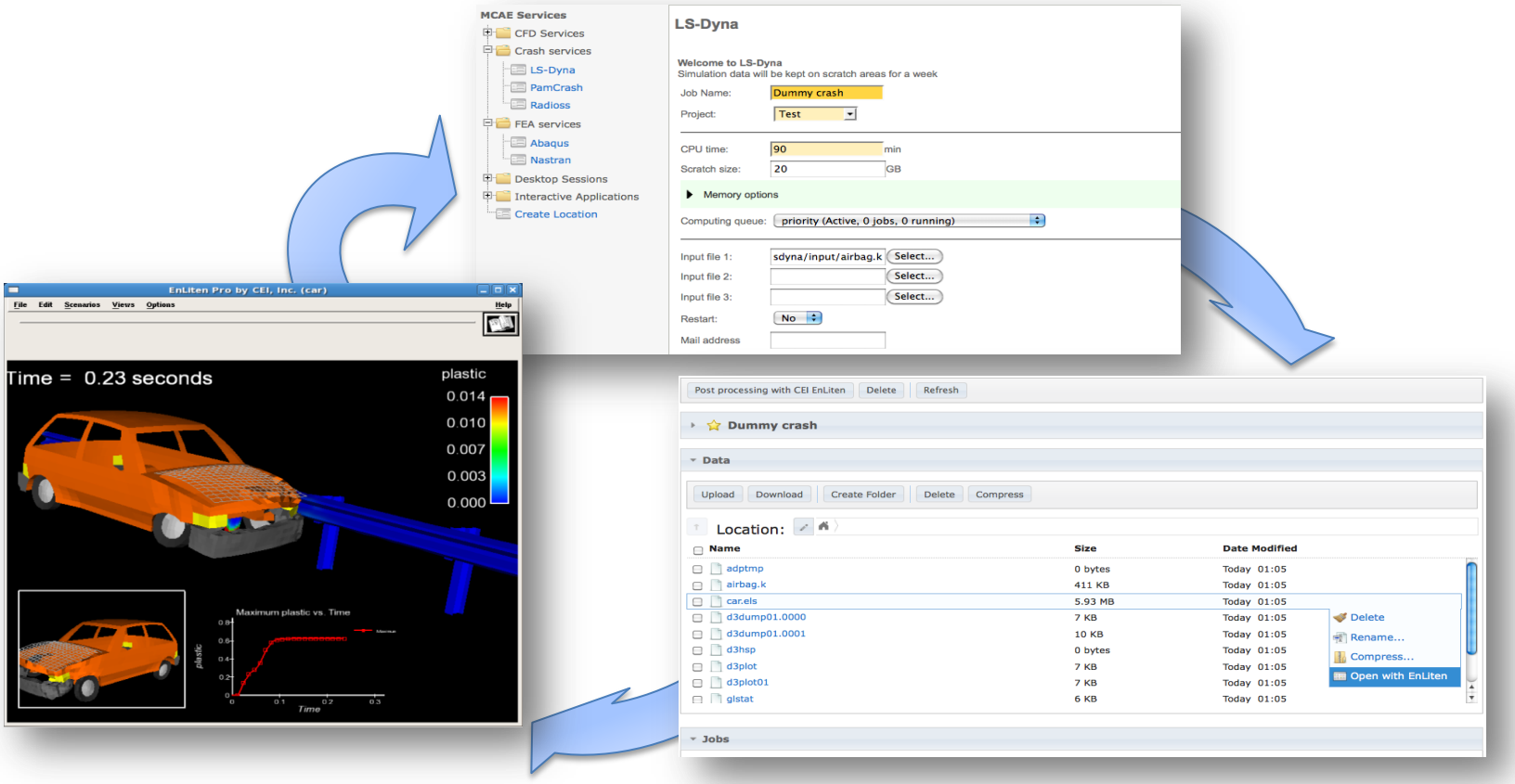


- **Thin viewer**, with low-end requirements
- **OpenGL** and **DirectX** applications
- **Collaboration**
- **Bandwidth and latency adaptable** on a per-client basis

- **Windows** and **Linux** servers support
- **Windows**, **Linux**, **OSX**, **iOS***, **Android*** clients support
- Share GPUs among multiple Users
- Leverage high-end NVIDIA GPU
  - GRID API 2.0
  - H264 Encoder Chip

* Dowload RealVNC from the Apple/Android appstore

Combining Self-service HPC + Visualization



Value proposition

For Data Center Managers

- Increase quality of HPC services
- Shorten response time to clients' requests
- Democratize HPC

For Users

- Access service anywhere at anytime
- Harness the full power of HPC
- Get quick access to new simulation services

For IT Admins

- Provide secure access to the datacenter
- Reduce support requirements
- Easy integration with the existing HPC infrastructure

Technical Computing in the Cloud Era
www.nice-software.com

Applications Mobile
HPC Secure Access
Efficient Cloud
Remote Visualization
3D Flexible
Cross Platform Big Data
Analytics