



# VELaSSCo overview

17<sup>th</sup> / 18<sup>th</sup> November 2016

Final Evaluation Event

# VELaSSCo project overview

*The vision of **VeLASSCo** is to provide new visual analysis methods for **large-scale simulations** serving the petabyte era and preparing the exabyte era by adopting Big Data tools/architectures for the **engineering and scientific community** leveraging new ways of **in-situ processing for data analytics** and hardware accelerated **interactive visualization**.*

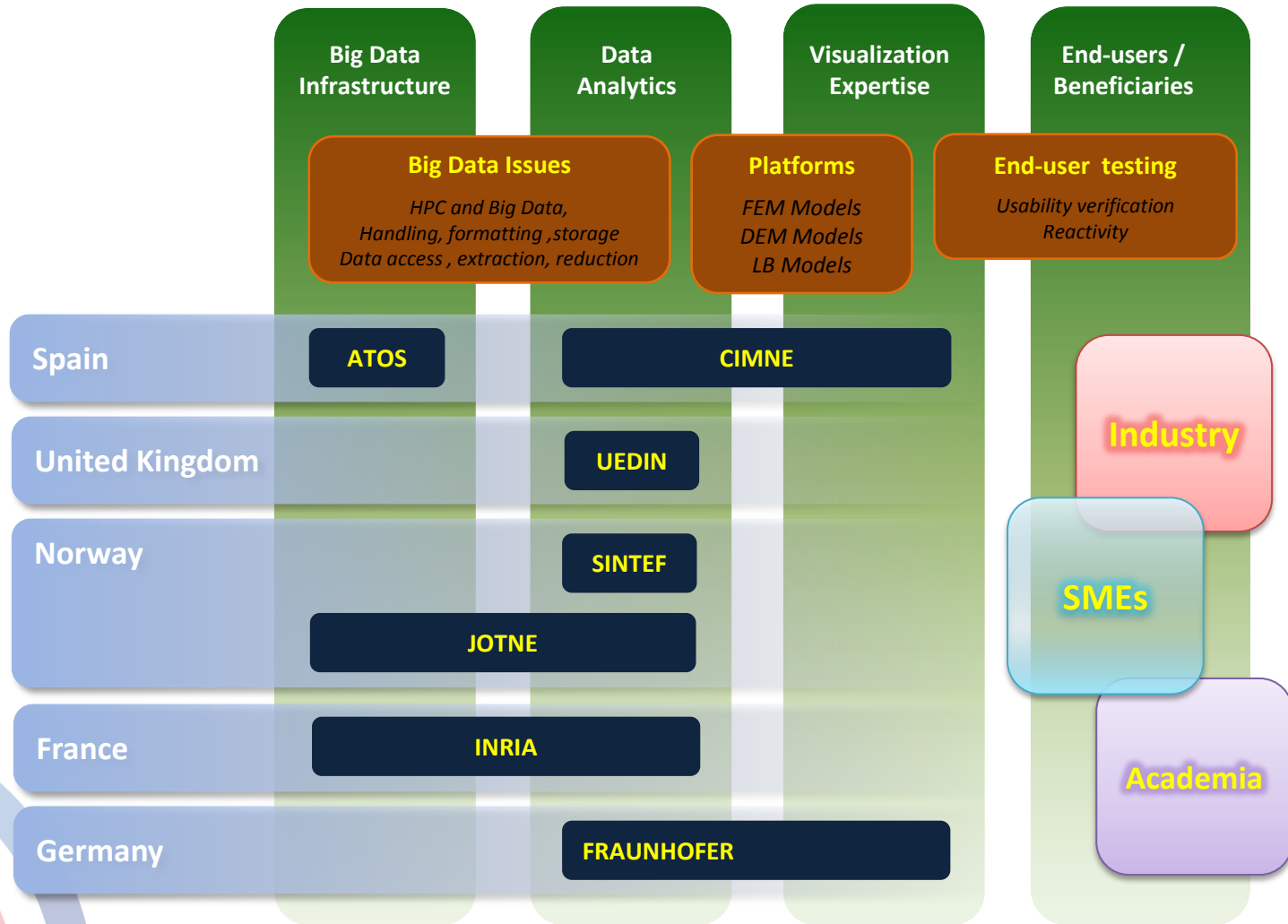
- FP7-EU funded project: 3.3M€ between 2014-2016.



- Team of experts with complementary background:
  - Big Data handling.
  - Advanced visualisations.
  - Engineering simulations.



# VELaSSCo consortium

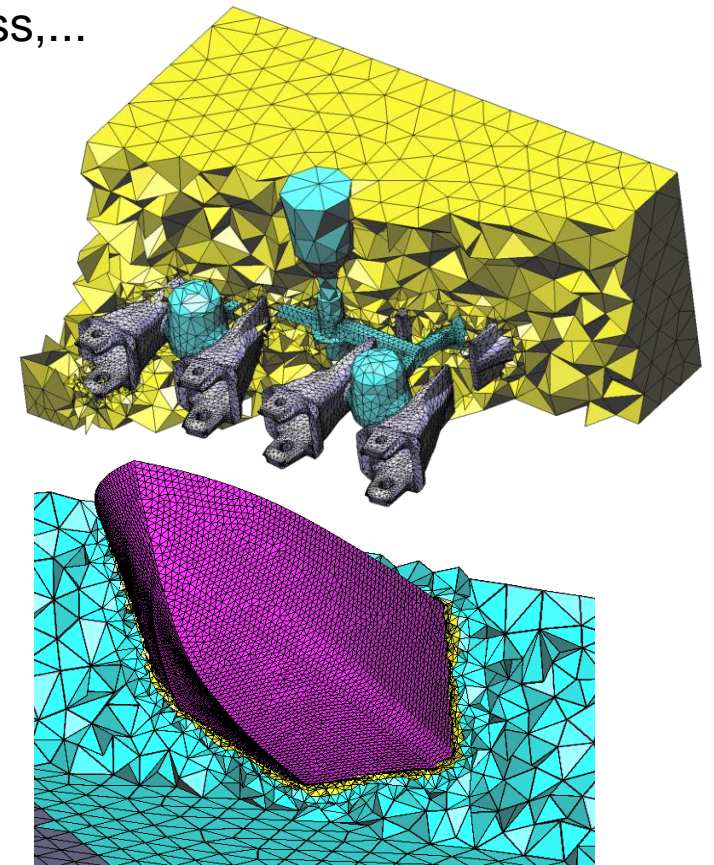
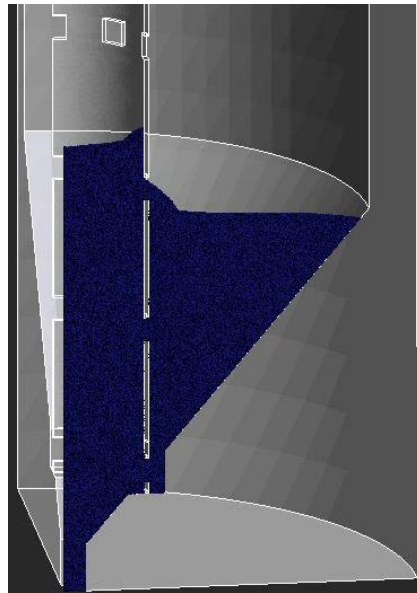
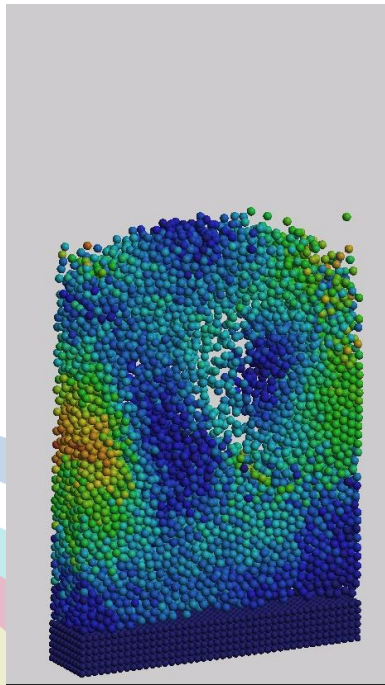


# Simulation data

- Discrete Element Method (DEM)
- Particles and contacts.
- Finite Element Method (FEM, CFD)
- Meshes: nodes and elements.

Results related to particles, contacts and nodes:

- Velocity, mass, volume, force, pressure, stress,...





# Motivation for VELAaSSCo

- The **huge amount of data** provided by the solvers in HPC **cannot be stored** in one single machine, so it is mandatory:
  - **Distributed post-processing**
  - **Distributed visualization**
- Problems if a calculation node fails in HPC. Need a **redundancy** for the data.

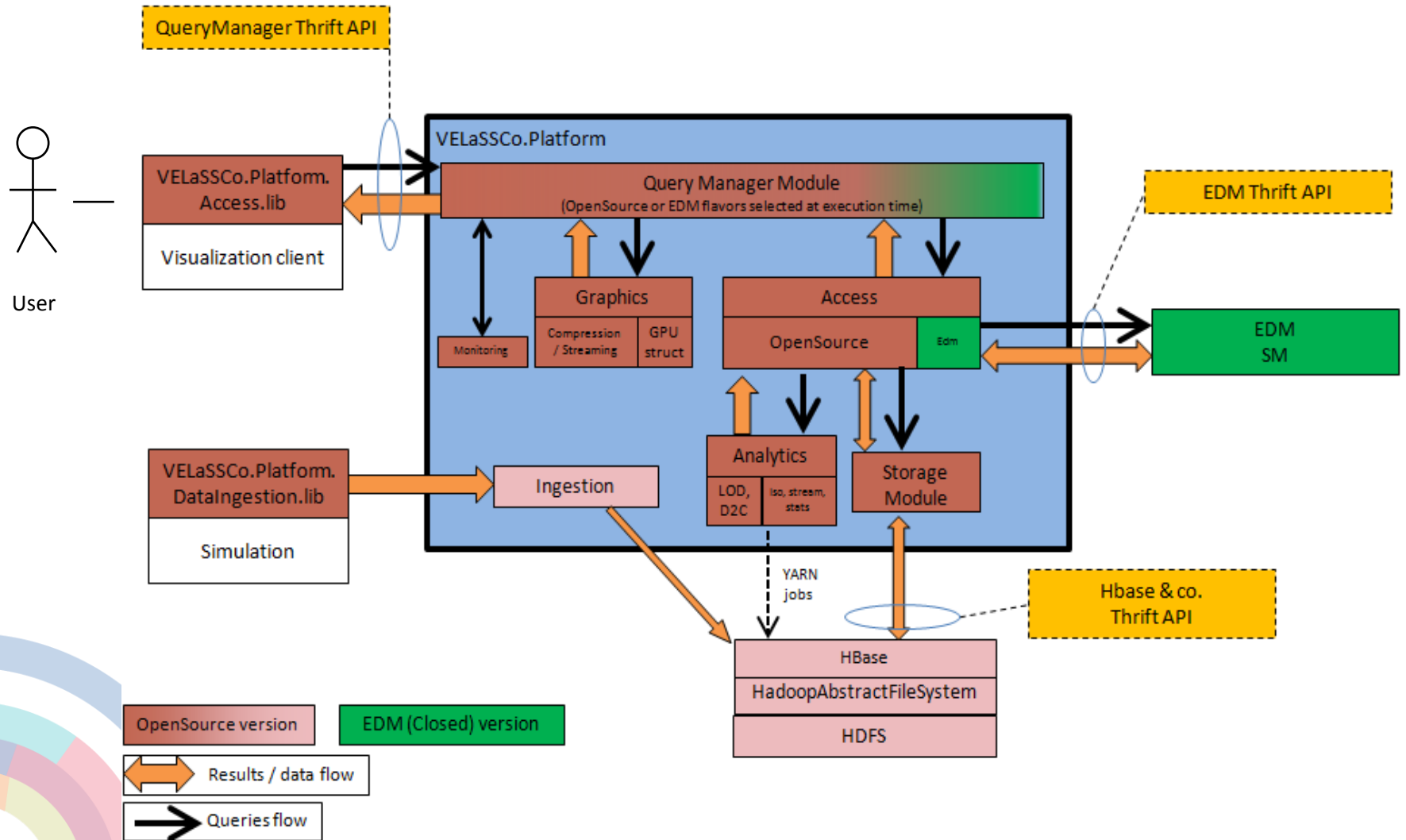


Big Data

# Objective of VELaSSCo

- The main **objective of VELaSSCo** project is to build the VELaSSCo Platform, a system that performs distributed **post-processing operations and visualization of very large simulations.**
- To address this objective, VELaSSCo brings together **Simulation and Big Data.**

# Architecture of VElLaSSCo platform



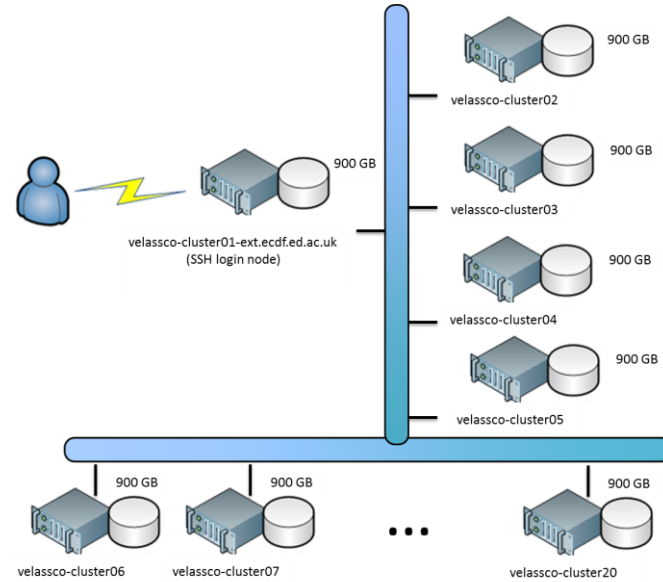


# Status of VELaSSCo platform

- **Final Release:**
  - **Simple queries:**
    - Visualization of particles and meshes with results
    - Get result values for specific particles/nodes and
    - Temporal evolution of results.
  - **Complex queries:**
    - Projection of discrete results into continuum field
    - Get simplified Mesh and its companion get simplified Mesh with results
    - and Do Streamlines with results

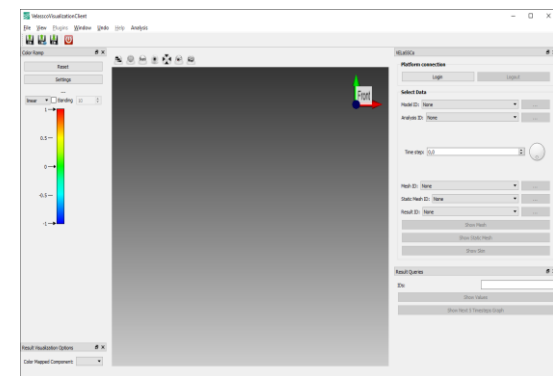
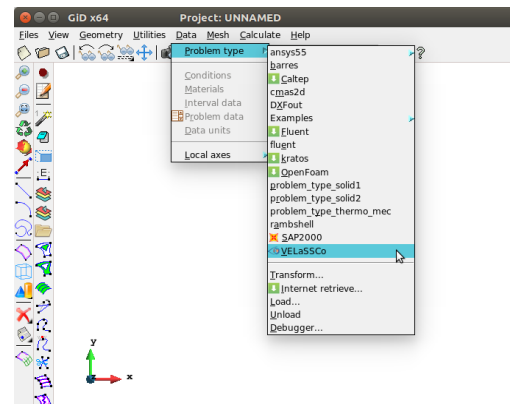
# Status of VELaSSCo platform (II)

- **Deployed in Eddie 3:**
  - 38 nodes:
    - CPU: @ 2.4 GHz ( 16 cores)
    - RAM: 64 GB RDIMM.
  - Local storage: 96,88 TB.
  - Network storage: 383 TB.



- **Visualization Clients:**

- GiD
- IFX





# Thank you for your attention

<http://www.velassco.eu/>

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