Collaviz®

Remote and Collaborative Visualization with Collaviz

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A modern scientific issue

- Process increasingly **large volumes of data**
  - Visualize and manipulate data
  - Share data and **collaborate** with other partners
  - …with a generic, scalable and inexpensive solution, which helps rationalizing costs:
    - Investment costs
    - Time & travel costs

Collaviz definition

- **Collaviz is an innovative multi-domain remote collaborative platform for the simulation-based design applications.**

- Collaviz is not another post-processing engine. It is a middleware layer to expose reference/legacy tools as services.

Consortium

- International collaborative R&D project
- 28 Partners
  - 17 financed
  - 11 non-financed

Challenges

- **Interactive and participative collaboration**, not only “shared display” visualization
- **Full transparent access** to scalable resources
- **Mainstream technologies** for service access (network, hardware…)
- **Generic approach** applicable to the needs of diverse communities

Global approaches (1/2)

- A simple solution to break the bottlenecks of data volume production, processing, sharing and visualization:

modularity

  - Services approach
  - Integration of multiple pre & post processing engines (e.g. Ensight, Paraview, Cassandra)
  - Compression and watermarking
  - Collaboration

Global approaches (2/2)

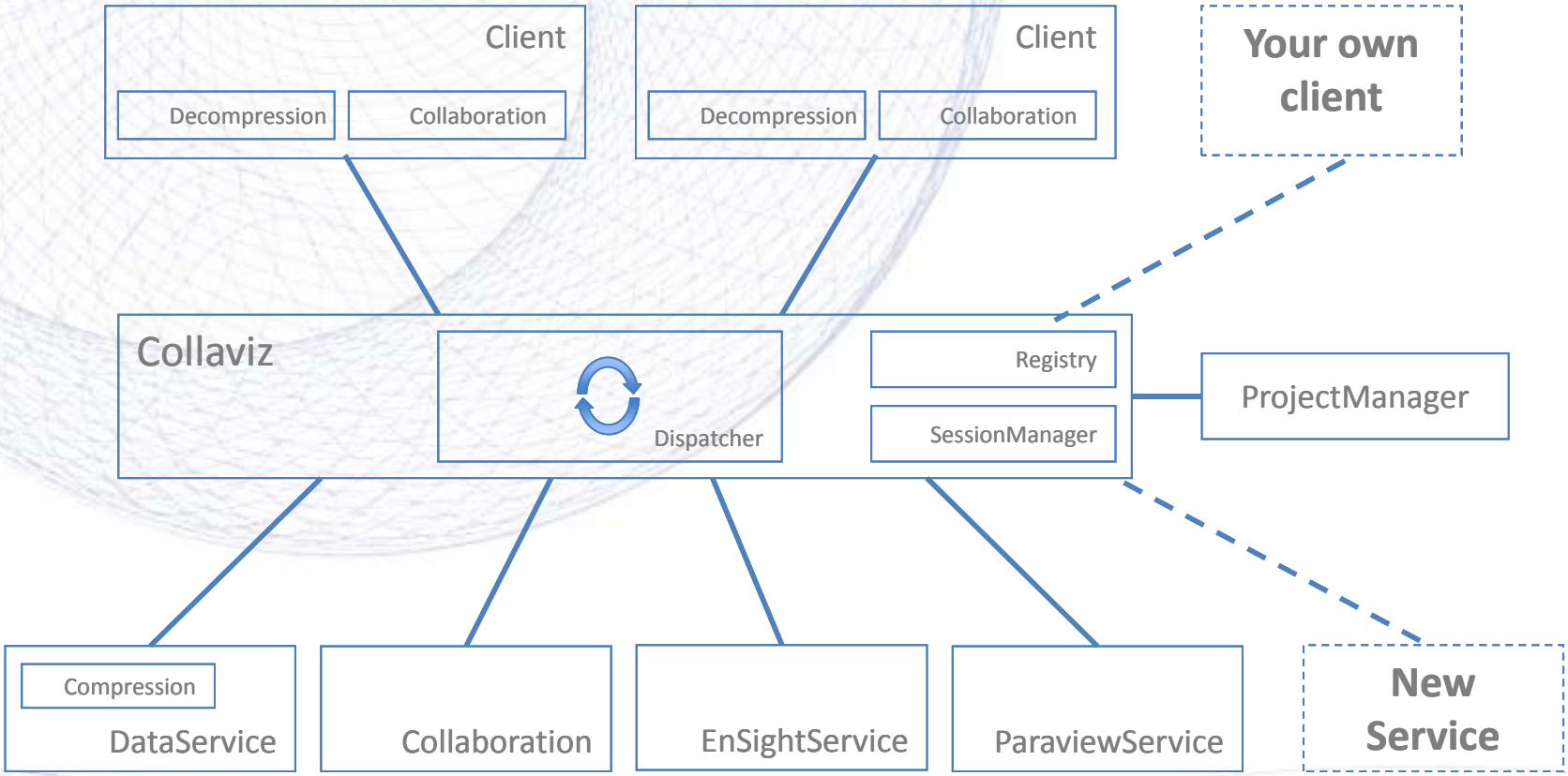
- A **web based approach** to bridge the gap of network and computation capabilities
  - Web architecture, thin client, HP back office
    - Scientific datasets are processed on remote servers
    - 3D processing outputs are exported as X3D scenes
    - The X3D is shared by all the clients

- Based on **open standards**:
  - API, service container layer (e.g. web services), communication layer (SOAP)
  - Data formats, for instance X3D

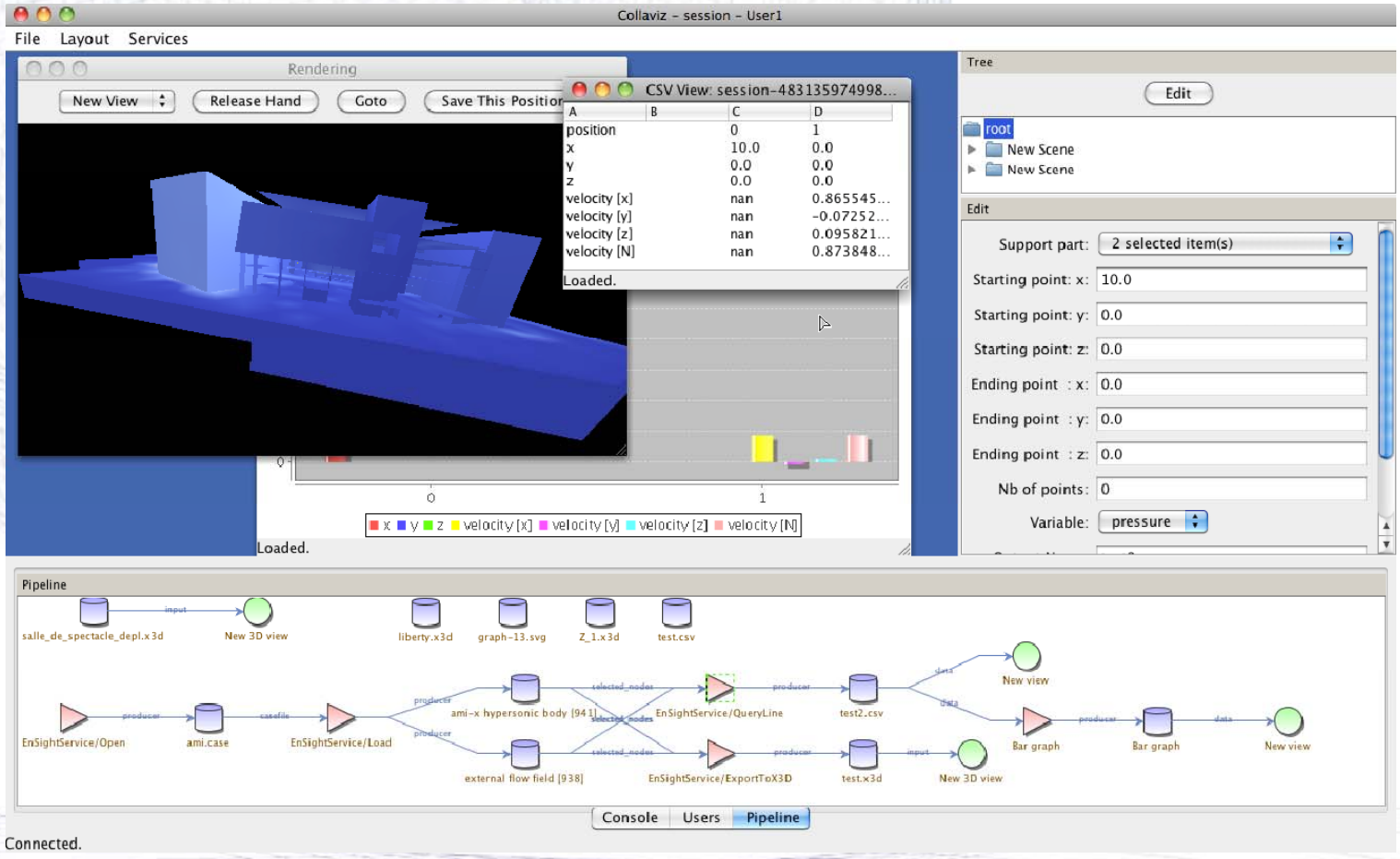
Advantages

- Collaviz improves on existing techniques:
  - Full open pipeline to enable 3rd party services
  - Uses http/https to simplify remote access
  - Cross-platform support
  - Using existing standards
  - Synchronous & asynchronous collaboration
  - …

General architecture

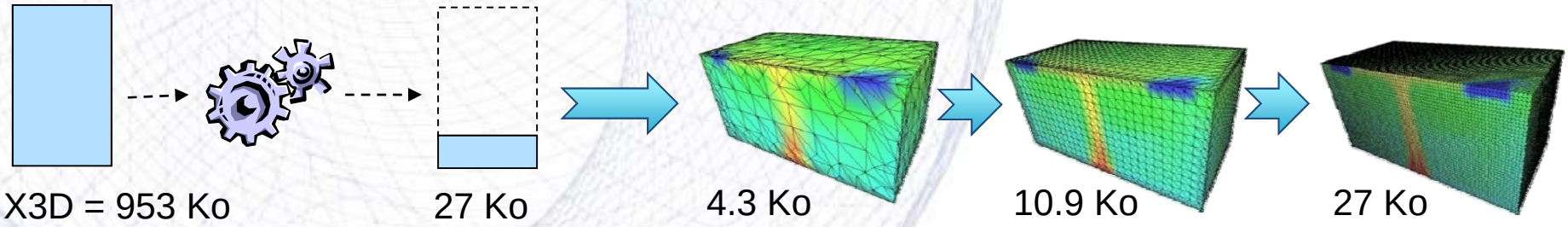


What it looks like…



Result example: Color Mesh Progressive compression

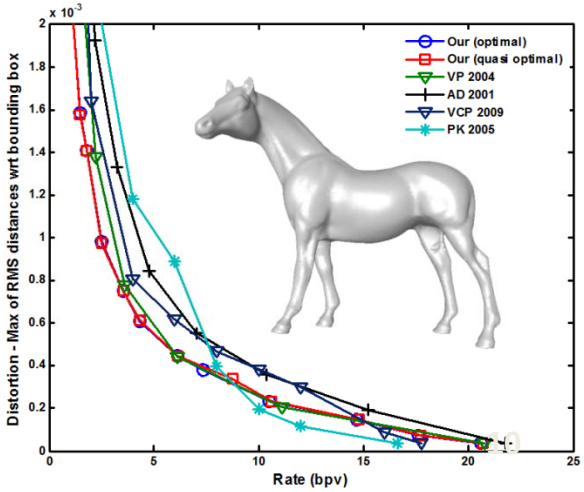
Color-driven progressive compression



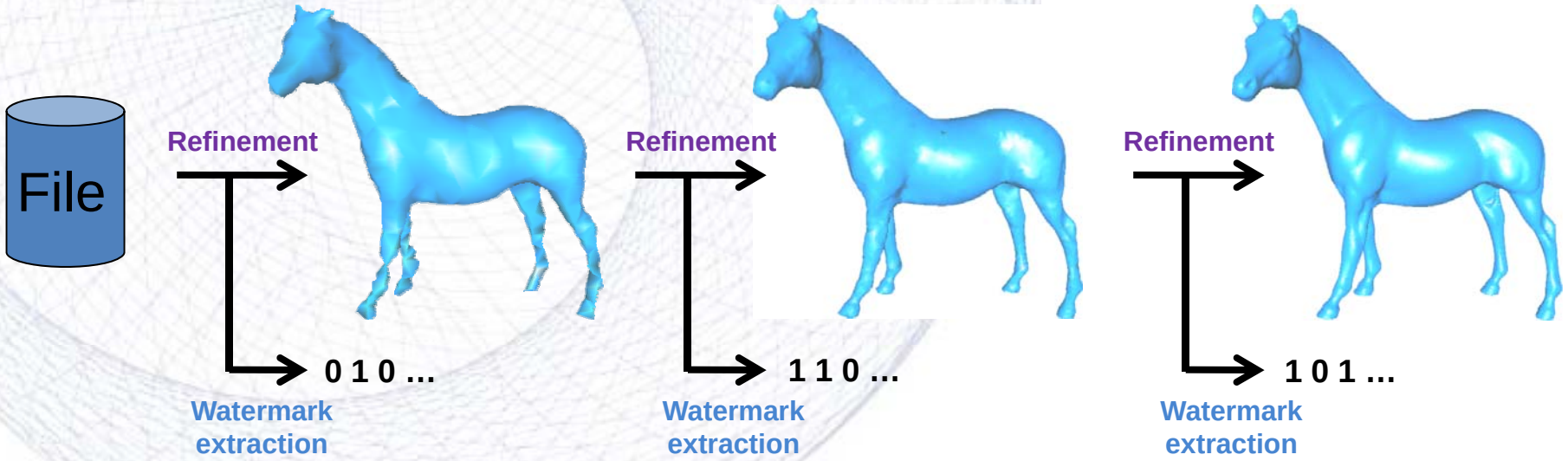
Optimization of the visual quality of intermediate Levels of Details

- Determination of the optimal quantization precision for geometry and color
- Introduction of a color metric to preserve important features

Article accepted with minor revision in Visual Computer



Result example: Joint Compression and Watermarking



Integration of copyright protection scheme into compression

Article accepted in CGI 2011 (Computer Graphics International, Vancouver) as one of 35 best papers / 220 submitted, published in Visual Computer.

To conclude…

- The Collaviz project started in January 2009 with a €4M funding (€2M from ANR).
- **The Collaviz framework will be Open Source released from June 2012** (packaging in progress)
- It includes **9 industrial and research use cases** (energy, chemistry, manufacturing, geosciences…)
- The extensibility of Collaviz will make it survive after the end of the project.

We are currently building
an OPEN Community…

So join us!

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