

SALOME : A unified computational framework

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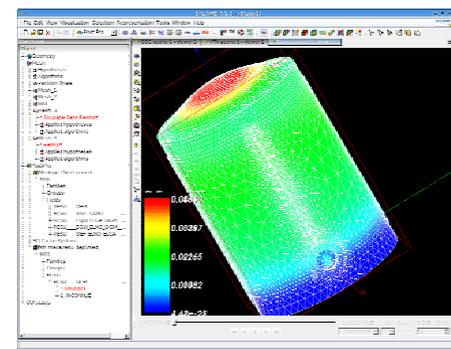
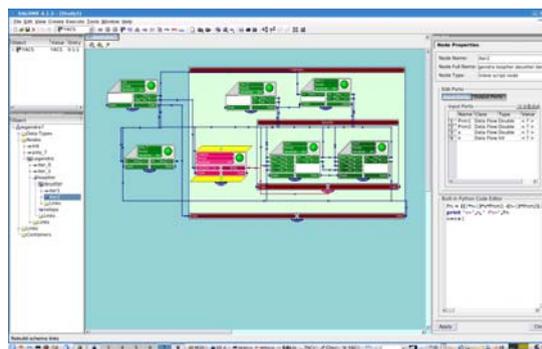
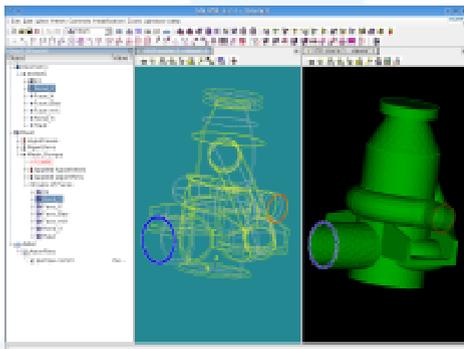
SALOME

General
presentation



What are the aims of SALOME ?

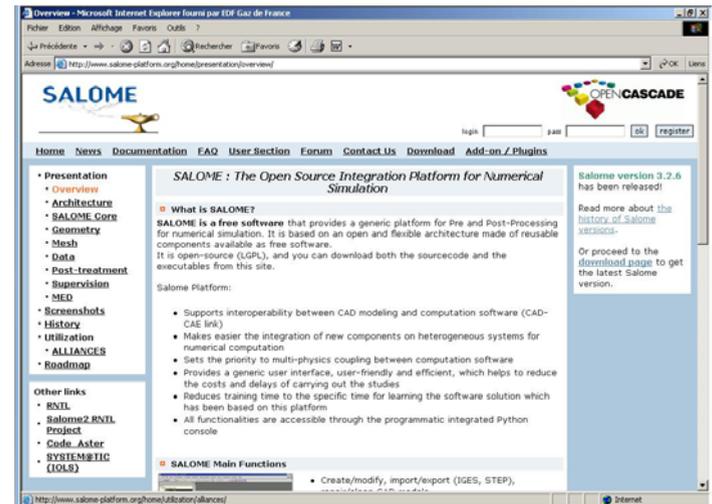
- SALOME is a generic platform for **pre and post processing and code coupling** for numerical simulation with the following aims
 - Facilitate **interoperation between CAD modelling and computing codes**
 - Facilitate **implementation of coupling between computing codes** in a distributed environment
 - Provide a **generic user interface**
 - **Pool production of developments** (pre and post processors, calculation distribution and supervision) in the field of numerical simulation





How SALOME is developed and distributed ?

- © SALOME has been developed by EDF together with CEA (French Atomic Energy Commission) and other industrial or academic partners since 2001
- © SALOME is distributed under the terms of the GNU LGPL license
- o Open Source platform able to define propriety or commercial solutions
- o Download : <http://www.salome-platform.org>
 - Last open source release available : SALOME 4.1.4 (december 2008)





What are the main features of SALOME ?

SALOME is a toolbox with the following features :

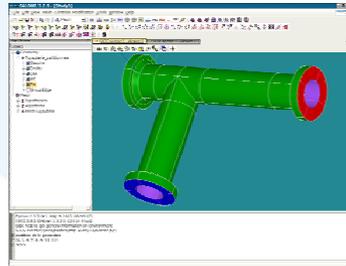
- 1 Importing/exporting, repairing/cleaning and creating/modifying of geometries
- 2 Meshing of the geometric elements, controlling quality, importing/exporting

Handling physical or numerical properties of geometrical elements

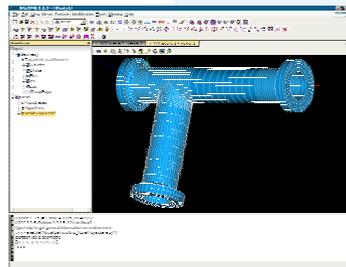
- 3 Performing a computing step using a solver : data input, solver configuration, result field output

Implementing chaining and coupling between solvers

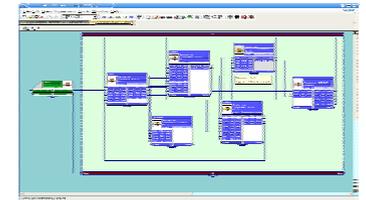
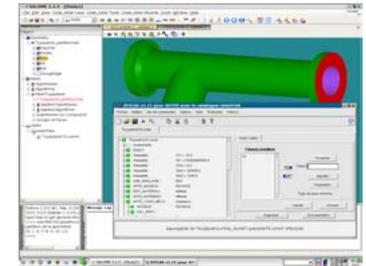
- 4 Post-processing the results fields



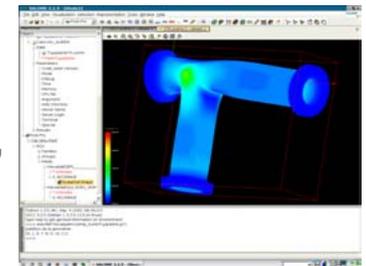
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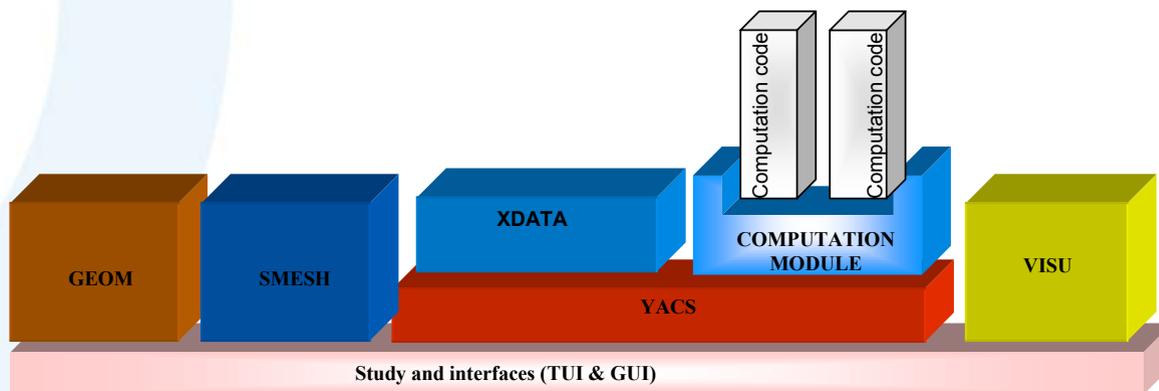


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What are the main features of SALOME ?

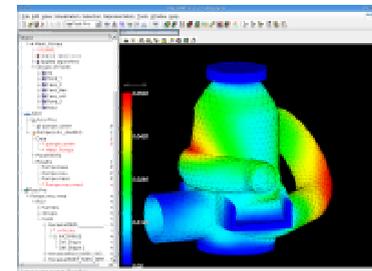
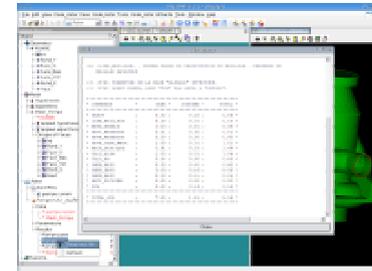
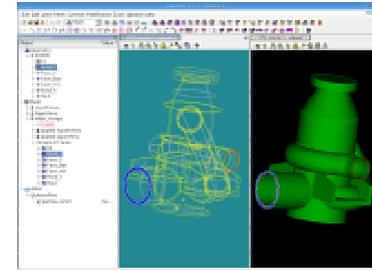
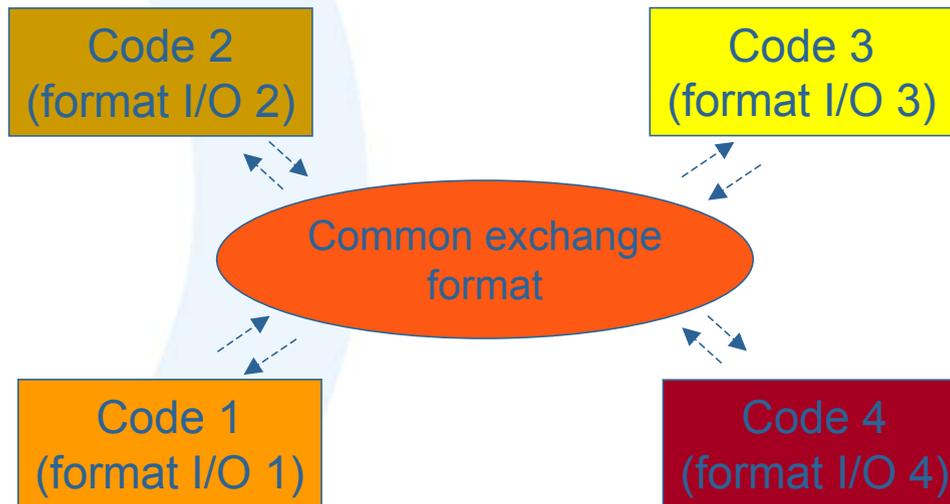
- ◎ SALOME is a software with a **modular architecture** where are integrated
 - Pre-processing modules (GEOM : geometry, SMESH : meshing)
 - A Post-processing module (VISU)
 - A Data setting module (XDATA)
 - A Coupling and Supervision module (YACS)
- ◎ In order to build a scientific application, **computation modules** (scientific computation codes) **can be integrated in SALOME**





What are the main features of SALOME ?

- © SALOME provides a **common data exchange model** (MED) to facilitate exchanges between integrated modules (SMESH, VISU, computations modules)
 - This model is based on field of result and mesh concepts





What are the technical choices of SALOME ?

- Adhesion to open source standards
 - Operating system : Linux
 - Programming language : C++
 - Script language : Python
 - Software middleware : CORBA (omniORB)
 - Graphical User Interface : Qt
 - File format : HDF5 (MED file)
 - CAD library : Open Cascade





How to use SALOME ?

SALOME modules can be executed in SALOME environment by using

- Graphical User Interface
- Textual User Interface : python script
- Supervision and coupling module (YACS) : computation scheme

The screenshot displays the SALOME 4.1.3 environment. On the left, there is an 'Object Browser' showing a tree structure with 'YACS' and 'GeomGraph' as main categories. Below it, a 'Python interpreter' window is open, showing the prompt '>>>'. The main workspace contains a 'Computation scheme' diagram with several interconnected nodes, including a 'MakeCopy_1' service node. The top of the window features a standard menu bar (File, Edit, View, Create, Execute, Tools, Window, Help) and a toolbar with various icons. Labels with arrows point to these elements: 'Modules available' points to the top toolbar, 'Object Browser' points to the left sidebar, 'Computation scheme' points to the central diagram, and 'Python interpreter' points to the bottom window.





What are the future prospects of SALOME ?

- ◎ EDF starts a new common project with CEA (2009-2013) with the following main objectives
 - Improve the productivity of R&D and industrial studies
 - Continue the extension to parallel computation
 - Parallel mesh generation
 - Coupling of parallel codes
 - Parallel visualization (integration of ParaView)
 - Facilitate the integration of computation codes

