

# **SALOME version 9.8.0**

## **Release Notes**

**December 2021**

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## ❖ GENERAL INFORMATION

CEA/DEN, EDF R&D and OPEN CASCADE are pleased to announce [SALOME](#) version [9.8.0](#). It is a public minor release that contains the results of planned minor improvements and bug fixes against SALOME version 9.7.0 released in June 2021.

## ❖ PREREQUISITES

The table below lists pre-requisite products used with SALOME 9.8.0. The differences of 3<sup>rd</sup>-party product versions used for SALOME 9.7.0 and 9.8.0 are highlighted in bold.

Product	Linux		Windows	
	SALOME 9.7.0	SALOME 9.8.0	SALOME 9.7.0	SALOME 9.8.0
Alabaster	0.7.6	0.7.6	0.7.6	0.7.6
Babel	2.7.0	2.7.0	2.7.0	2.7.0
Boost	1.71.0	1.71.0	1.67.0	1.67.0
Certifi	2018.8.24	2018.8.24	2019.6.16	2019.6.16
Cgns	4.1.1	4.1.1	4.1.1	4.1.1
Chardet	3.0.4	3.0.4	3.0.4	3.0.4
Click	6.7	6.7	7.0	7.0
Cmake	3.12.1	3.12.1	3.12.1	3.12.1
Cminpack	-	1.3.6	-	-
Colorama	-	-	0.4.1	0.4.1
Cppunit	1.13.2	1.13.2	1.13.2	1.13.2
Cycler	0.10.0	0.10.0	0.10.0	0.10.0
Cython	0.25.2	<b>0.29.12</b>	0.29.12	0.29.12
Docutils	0.12	0.12	0.14	0.14
Doxygen	1.8.14	1.8.14	1.8.3.1	1.8.3.1
Eigen	3.3.4	3.3.4	3.3.4	3.3.4
Embree	3.12.2	3.12.2	3.12.2	3.12.2
Expat	-	-	2.0.1	2.0.1
F2C	-	-	1.0.0	1.0.0
FMILibrary	-	<b>2.0.3</b>	-	-
Freeimage	3.16.0	3.16.0	3.18.0	3.18.0
Freetype	2.9.0	2.9.0	2.9.1	2.9.1
Gmsh	4.1.4	<b>4.8.4</b>	-	<b>4.8.4</b>
Graphviz	2.38.0	2.38.0	2.44.1	2.44.1
Hdf5	1.10.3	1.10.3	1.10.3	1.10.3
Homard	11.12	built-in <sup>1</sup>	-	-
Idna	2.7	2.7	2.8	2.8
Imagesize	1.0.0	1.0.0	1.1.0	1.1.0
Intel® Threading Building Blocks	2019 U8	2019 U8	2019 U8	2019 U8

<sup>1</sup> Since version 9.8 of SALOME homard tool is a part of HOMARD module.

Product	Linux		Windows	
	SALOME 9.7.0	SALOME 9.8.0	SALOME 9.7.0	SALOME 9.8.0
Ispc	1.15.0	1.15.0	1.15.0	1.15.0
Jinja2	2.7.3	2.7.3	2.10.1	2.10.1
Kiwisolver	1.0.1	1.0.1	1.1.0	1.1.0
Lapack	3.8.0	3.8.0	3.8.0	3.8.0
Libbatch	2.4.5	2.4.5	2.4.5	2.4.5
Libjpeg	-	-	9c	9c
Libpng	-	-	1.5.10	1.5.10
Libxml2	2.9.1	2.9.1	2.9.1	2.9.1
Llvm	8.0.1	8.0.1	8.0.1	8.0.1
Markupsafe	0.23	0.23	1.1.1	1.1.1
Matplotlib	3.0.3	3.0.3	3.1.0	3.1.0
Med	4.1.0	<b>4.1.1</b>	4.1.0	<b>4.1.1</b>
Mesa	19.0.8	19.0.8	19.2.3	19.2.3
MeshGems suite <sup>2</sup>	2.12-1	<b>2.13-1</b>	2.12-1	<b>2.13-1</b>
Metis	5.1.0	5.1.0	5.1.0	5.1.0
Netgen <sup>3</sup>	5.3.1	<b>6.2.2101</b>	5.3.1	<b>6.2.2101</b>
Nlopt	2.5.0	2.5.0	2.5.0	2.5.0
Numpy	1.16.4	1.16.4	1.16.4	1.16.4
Omniorb	4.2.2	4.2.2	4.2.3	4.2.3
Omniorbpy	4.2.2	4.2.2	4.2.3	4.2.3
Open CASCADE Technology	7.5.0p1 <sup>4</sup>	<b>7.5.3p1<sup>5</sup></b>	7.5.0p1	<b>7.5.3p1</b>
Opencv	3.2.0	3.2.0	3.2.0	3.2.0
Openturns	1.16	<b>1.17</b>	1.16	<b>1.17</b>
OpenVKL	0.11.0	0.11.0	0.11.0	0.11.0
Ospray	2.4.0	2.4.0	2.4.0	2.4.0
Packaging	17.1	17.1	19.0	19.0
Pandas	-	<b>0.25.2</b>	-	-
Patsy	-	<b>0.5.2</b>	-	-
Paraview	5.9.0	5.9.0	5.9.0	5.9.0
Petsc	3.15.0	<b>3.16.0</b>	-	-

<sup>2</sup> Commercial product by Dassault Systemes SE; requires license.

<sup>3</sup> Patched for SALOME.

<sup>4</sup> SHA1 identifier of this version is 0c61d93892d0c21283d1810da7ec3df2f6447e80.

<sup>5</sup> SHA1 identifier of this version is b08cd044f97635a40cceb86769b2399527090001.

Product	Linux		Windows	
	SALOME 9.7.0	SALOME 9.8.0	SALOME 9.7.0	SALOME 9.8.0
Pip	19.1.1	19.1.1	19.1.1	19.1.1
Pillow	7.1.1	7.1.1	7.1.1	7.1.1
Planegcs	0.18	0.18	0.18	0.18
Psutil	5.7.2	5.7.2	5.7.2	5.7.2
PyFMI	-	2.5		
Pthreads	-	-	2.9.1	2.9.1
Pygments	2.0.2	2.0.2	2.4.2	2.4.2
Pyparsing	2.0.3	2.0.3	2.4.0	2.4.0
Pyqt	5.15.3	5.15.3	5.15.3	5.15.3
Pyreadline	2.0	2.0	2.1	2.1
Python	3.6.5	3.6.5	3.6.5	3.6.5
Python-dateutil	2.4.2	2.6.1	2.8.0	2.8.0
Pytz	2015.7	2017.2	2019.1	2019.1
Qt	5.12.10	5.12.10	5.12.10	5.12.10
Qwt	6.1.2	6.1.2	6.1.2	6.1.2
Requests	2.19.1	2.19.1	2.22.0	2.22.0
RkCommon	1.5.1	1.5.1	1.5.1	1.5.1
Root	6.22.02	6.22.02	6.24.0	6.24.0
Scipy	1.4.1	1.4.1	1.4.1	1.4.1
Scotch	6.0.4	6.0.4	-	-
Setuptools	38.4.0	38.4.0	41.0.1	41.0.1
Sip	5.5.0	5.5.0	5.5.0	5.5.0
Six	1.10.0	1.10.0	1.12.0	1.12.0
Snowballstemmer	1.2.1	1.2.1	1.9.0	1.9.0
Sphinx	1.7.6	1.7.6	2.1.2	2.1.2
Sphinxcontrib-applehelp	-	-	1.0.1	1.0.1
Sphinxcontrib-devhelp	-	-	1.0.1	1.0.1
Sphinxcontrib-htmlhelp	-	-	1.0.2	1.0.2
Sphinxcontrib-jsmath	-	-	1.0.1	1.0.1
Sphinxcontrib-qthelp	-	-	1.0.2	1.0.2
Sphinxcontrib-serializinghtml	-	-	1.1.3	1.1.3
Sphinxcontrib-	1.1.0	1.1.0	1.1.2	1.1.2

Product	Linux		Windows	
	SALOME 9.7.0	SALOME 9.8.0	SALOME 9.7.0	SALOME 9.8.0
websupport				
Sphinx-intl	0.9.10	0.9.10	2.0.0	2.0.0
Sphinx-rtd-theme	0.4.3	0.4.3	0.4.3	0.4.3
Statsmodels	-	0.8.0	-	-
Swig	3.0.12	3.0.12	3.0.12	3.0.12
Tcl	8.6.0	8.6.0	8.6.9	8.6.9
Tclx	8.4.1	8.4.1	8.6.9	8.6.9
Tk	8.6.0	8.6.0	8.6.9	8.6.9
Toml	-	-	0.10.2	0.10.2
Urllib3	1.23	1.23	1.25.3	1.25.3
URANIE	4.5.0	4.5.0	-	-
Zlib	-	-	1.2.5	1.2.5

Note: the table above lists only most important pre-requisite products; some optional products are not shown. For additional information about pre-requisite products and SALOME modules dependencies refer to the paragraph **“Supported distributions and pre-requisites”** below.

Note: listed versions of pre-requisites are considered as “base” ones; there can be minor differences in particular SALOME packages.

Note: several prerequisites given in the above table are installed with **PIP** package manager. The installation folder for these PIP packages is SALOME-9.8.0-\***-SRC/BINARIES-\*/Python/lib/python3.6/site-packages** on Linux and SALOME-9.8.0\W64\Python\lib\site-packages on Windows.

**LICENSE RESTRICTIONS**

Hereby we explicitly declare that PyQt and PyQtChart (by Riverbank Computing Ltd) are distributed under the terms of GNU GPL license; for more details, please refer to the PyQt site:

<https://riverbankcomputing.com/commercial/license-faq>

If you plan using SALOME for commercial purposes, please consider obtaining a commercial license for PyQt from Riverbank Computing Ltd.



## ❖ NEW FEATURES AND IMPROVEMENTS

### KERNEL MODULE

- Several services to obtain calculation node's load have been added to the `Engines::Container` IDL interface, including the following functions:
  1. `getNumberOfCPUCores()`: get number of CPU cores in a calculation node.
  2. `loadOfCPUCores()`: get a load of each CPU core.
  3. `setPyScriptForCPUload(script)`: set custom script (instead of default) to calculate a load of each CPU core.
  4. `resetScriptForCPUload()`: nullify a custom script to calculate each CPU core's load.
  5. `getTotalPhysicalMemory()`: get total physical memory of calculation node in megabytes.
  6. `getTotalPhysicalMemoryInUse()`: get used physical memory of calculation node in megabytes.
  7. `getTotalPhysicalMemoryInUseByMe()`: obtain physical memory, used by the current process in megabytes.

### GUI MODULE

- Automatic detection and choosing of more powerful GPU (in case of dual GPUs) under Windows OS has been added.

### SHAPER MODULE

- New feature to create and display a face normal has been added.
- The following new filters for groups have been added:
  - Edge size
  - Face size
  - Volume size
  - Featured edges
  - Continuous faces
- Auto-color for groups: "Auto color" item has been added to the result's contextual menu. When this feature is enabled, a color is automatically generated and assigned to each new group being added. "Disable auto color" menu can be used to disable this feature.
- Treatment of parameters has been improved:
  1. A parameter can be modified with double-click on its name in the Object Browser.
  2. Python command `addParameter` now returns an error message in case if parameter already exists or its value could not be evaluated, etc.
  3. Set of parameters can be imported from a file:
    - New button "Import file" has been added to the Parameters dialog.
    - New Python command `importParameters` has been implemented in the Python API of Shaper module.
    - The structure of input file must be the following:

parameter value # (optional) comment

**Example:**

```
Longueur 36. # Longueur de la pièce
Largeur 24 # Largeur de la pièce
Hauteur Longueur * Largeur
```

- "Plane" feature has been extended by adding a possibility to create several planes at once. The new attribute "Nb. copies" has been added in case of building copies of a selected planar shape, either parallel to that shape or rotated around given axis. This value allows specifying the number of copies to be created with the given step. The default value of this attribute is set to 1 in order to provide the same behaviour as in previous versions. The corresponding Python command `addPlane` has been extended as well.
- Python command `setColor` has been improved to allow assigning a random color to the specified result. The usual case is the assigning a color by its components (RGB):

```
result.setColor(red, green, blue)
```

The new option provides the following interface:

```
result.setColor(random=True)
```

- A new macro has command has been added; with this macro a pipe network described by point coordinates in a file is transformed into the cylinders. The whole is connected, possibly with bending radii at some junction points.

**MESH MODULE**

- New MeshGems<sup>6</sup> license checking procedure: all MeshGems-based plugins for SALOME Mesh module have been adapted to the new MeshGems license system. Please contact Dassault Systemes SE to get license for MeshGems products. You will also need to contact the SALOME Team for its integration in SALOME (use the "Contact us" page on our web site).
- The `ExportMEDCoupling` method has been added to `smeshBuilder`; this method allows exporting in Python a mesh and/or a field from the SMESH module in a MEDCoupling memory structure (`MEDFileData`) without writing to disk.

**NETGEN PLUGIN MODULE**

- SALOME NETGEN meshing plugin has been migrated to series 6x of Netgen finite element software; compatibility with Netgen 5 has been preserved.

**GMSH PLUGIN MODULE**

- SALOME GMSH meshing plugin has been migrated to Gmsh version 4.8.4.
- GMSHPLUGIN is now compiled with OpenMP support, allowing parallel meshing via Gmsh 4.8.4. By default maximum available number of threads will be used while performing meshing; and environment variable `OMP_NUM_THREADS` can be specified to control the number of threads if needed.
- GMSHPLUGIN enables unstructured 2D/3D meshing:
  - with triangles and/or quadrangles (when recombination options are used) in 2D;
  - with tetrahedra, hexahedra, or tetrahedra and pyramids (when the boundary mesh contains quadrangles) in 3D.
- The following algorithms from Gmsh 4.8.4 are available for 3D meshing:

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<sup>6</sup> MeshGems is a commercial trademark of Dassault Systemes SE.

- Delaunay
  - Frontal Delaunay
  - MMG3D
  - R-tree
  - Parallel Delaunay (HXT)
- The following algorithms from Gmsh 4.8.4 are available for 2D meshing :
- Automatic
  - Mesh adapt
  - Delaunay
  - Frontal
  - Delaunay for quads
  - Packing of parallelograms

For detailed information on the use of different algorithms offered by GMSHPLUGIN please refer the Gmsh 4.8.4 documentation. Alternatively, the following table can be consulted for obtaining a specific mesh :

GMSHPLUGIN “ <i>hypothesis construction</i> ” options		2D Meshing				3D Meshing			
		Tria.	Quad. + Tria.	Quad.	Quad. (Tria. split)	Tetra.	Tetra. + Pyramids	Hexa.	Hexa. (Tetra. split)
2D algorithm	- Automatic	✓	✓	✓	✓	✓	✓	✓	✓
	- Mesh Adapt	✓	✓	✓	✓	✓	✓	✓	✓
	- Delaunay	✓	✓	✓	✓	✓	✓	✓	✓
	- Frontal	✓	✓	✓	✓	✓	✓	✓	✓
	- Delaunay for quads	✓	✓	✓	✓	✓	✓	✓	✓
	- Packing of parallelograms	✓	✓	✓	✓	✓	✓	✓	✓
3D algorithm	- Delaunay	✗	✗	✗	✗	✓	✓	✓	✓
	- Frontal Delaunay	✗	✗	✗	✗	✓	✗	✗	✓
	- MMG3D	✗	✗	✗	✗	✓	✗	✗	✓
	- R-tree	✗	✗	✗	✗	✓	✗	✗	✓
	- Parallel Delaunay (HXT)	✗	✗	✗	✗	✓	✗	✗	✓
Recombine all triangular meshes	✗	✓	✓	✗	✗	✓	✓	✗	
Subdivision algorithm	- None	✓	✓	✗	✗	✓	✓	✗	✗
	- All Quads	✗	✗	✓	✓	✗	✗	✗	✗
	- All Hexas	✗	✗	✗	✗	✗	✗	✓	✓

In the table “Tria.”, “Quad.”, “Tetra.”, and “Hexa.” refer to triangular, quadrangular, tetrahedral, hexahedral meshes respectively. “Quad. (Tria. split)” refers to quadrangular mesh that is obtained by performing splitting of each triangle within a triangular mesh into three quadrangles. Similarly, “Hexa. (Tetra. split)” refers to hexahedral mesh that is obtained by performing splitting of each tetrahedron within a tetrahedral mesh into four hexahedra.

### SALOME SESSION-LESS MODE

- The `sessionless` option has been added to the `salome` command, allowing to launch the SALOME GUI without a CORBA servers:

```
$ salome sessionless
```

This mode of launching the GUI is more robust but still contains some known malfunctions (especially for some meshers).

- The YACS engine has been ported to serverless mode. It is therefore possible to create, modify and launch a YACS graph without having a session running.

## ❖ CHANGE LOG

This chapter does not provide the complete set of changes included into this version of SALOME; only the most important changes are listed.

### GUI MODULE

24393	<p><i>Summary:</i> [EDF]: SALOME GUI module can't be compiled if all viewers are disabled</p> <p>Compilation of the GUI module without viewers has been corrected: missed include file has been added.</p>
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### SHAPER MODULE

19893	<p><i>Summary:</i> [CEA] SHAPER results in error when launched in batch mode or in GUI with the module loaded</p> <p>UnifySameDomain algorithm failure has been fixed in OCCT 7.5.3p1.</p>
20438	<p><i>Summary:</i> [CEA] SIGSEGV in SHAPER and GEOM in Pipe binormal</p> <p>SIGSEGV in Bi-normal Pipe has been fixed with OCCT 7.5.2.</p>
20513	<p><i>Summary:</i> [EDF 22586] Filling problem</p> <p>Restore current feature after update of a sketch from Python API.</p> <p>Improve Filling feature to update correctly the orientation of closed wires.</p> <p>Improve the parametrization of a wire used is an object of Filling feature.</p>
24033	<p><i>Summary:</i> [EDF 23082] Problem to fuse</p> <p>UnifySameDomain algorithm has been improved in OCCT 7.5.2.</p>
24175	<p><i>Summary:</i> [EDF 22805] Wrong split</p> <p>Partition algorithm has been improved in OCCT 7.5.3.</p>
24260	<p><i>Summary:</i> [CEA] Fatal error <code>gp_Dir()</code> input vector has zero norm when loading Python dump</p> <p>The Sketch stays invalid while the sketch plane is re-selected.</p>
24389	<p><i>Summary:</i> [CEA 24384] SHAPER default browser</p> <p>Default browser specified in SALOME preferences is used instead of OS default browser.</p>
24412	<p><i>Summary:</i> [CEA] SHAPER TestImportImage_1.py TestImportImage_2.py failing</p> <p>Mentioned tests cases have been updated to be correctly executed with <code>salome test</code> command.</p>
24500	<p><i>Summary:</i> [EDF 23798] Problem of export</p>

	A problem with corrupting a toroidal surface while writing STEP file has been fixed in OCCT 7.5.3p1.
24727	<i>Summary:</i> [CEA] Selection mechanism is not working on a re-opened study Enabled selection by naming in a re-opened study.
24728	<i>Summary:</i> [CEA] Call geometric dump only when explicitly asked by the user Provide option flag "Dump by coordinates" in the Dump feature. Disable geometric dump by default.
24758	<i>Summary:</i> [EDF 24017] Problems with <code>ExtrusionCut</code> Boolean Cut and Fuse shaper algorithms were improved for the case of multi-level compound arguments.
26505	<i>Summary:</i> [EDF 24182] Picking ellipse from sketch Fixed a problem with elliptic edges selection in Extrusion/Revolution operations.
26514	<i>Summary:</i> [CEA 24622] Failing SHAPER tests <code>UnifySameDomain</code> algorithm has been improved in OCCT 7.5.3p1. Test case <code>SHAPER_TestDefeaturing_OnCompsolid3.py</code> was updated with new values.
26531	<i>Summary:</i> [CEA] Shaper tests fail with <code>SEGFAULT</code> <code>Method DumpAssistant.collectFeatures()</code> has been improved. Now a copy of <code>sys.modules</code> is used there to avoid exception "dictionary changed size during iteration". Improved parsing of Python exception message in <code>Config_ModuleReader::loadPlugin()</code> to prevent crash on Python 3.8.
26534	<i>Summary:</i> [EDF 24265] Problem of recover in TUI Enable in TUI referencing features without results. Now a feature without results can be correctly processed as an operation argument.
26611	<i>Summary:</i> [EDF] <code>cloison_07</code> fails Duplicated parameters have been removed from the script <code>cloison07.py</code> .

**GEOMETRY MODULE**

16182	<i>Summary:</i> [EDF 13477] Problem with Fuse <code>UnionEdges</code> and <code>UnionFaces</code> Geometry algorithms have been replaced with <code>UnifySameDomain</code> OCCT algorithm. Several related regressions have been fixed in OCCT 7.5.3p1.
20438	<i>Summary:</i> [CEA] <code>SIGSEGV</code> in SHAPER and GEOM in Pipe binormal <code>SIGSEGV</code> in Bi-normal Pipe has been fixed with OCCT 7.5.2.

	Suppressed forcing C1 approximation in Pipe shell builder.
24378	<i>Summary:</i> [EDF 23686] Too much importing time Degradation of shape triangulation performance on small toroidal surfaces has been fixed in OCCT 7.5.3p1. Shape displaying time was significantly decreased on such cases.
24528	<i>Summary:</i> [EDF 23831] Bring to front Error in "Bring to front" operation on a reopened study has been fixed.
26341	<i>Summary:</i> [EDF 9557] Test fails UnifySameDomain algorithm has been improved in OCCT 7.5.3p1.

**MESH MODULE**

20643	<i>Summary:</i> [EDF 22805] Problem with Viscous Layer Failure of viscous layers construction on periodic surface has been fixed.
24052	<i>Summary:</i> [CEA 24050] Body Fitting with shared faces Missing volumes and overlapping faces resulted from Body Fitting algorithm have been fixed.
24357	<i>Summary:</i> [CEA] Export mesh with field on vertices Fix MED export of 0D field so that supporting type to be POINT1.
24368	<i>Summary:</i> [EDF 23667] Duplicates nodes Fix orientation of 2D joint elements created by "Duplicate nodes on group boundaries" operation.
24400	<i>Summary:</i> [CEA] Option in SALOME for not storing in med files the indices (number of nodes) Enable switching off saving numbers of nodes and cells when exporting mesh to MED file, in order to reduce file size.
24761	<i>Summary:</i> [EDF 24020] Difference of behaviour between sub-mesh and group from geometry Enable creating a mesh group on a geometry group sharing items with another group being the shape to mesh.
26429	<i>Summary:</i> [CEA] Can't load meshes from HDF if its size is too big Failure at opening a large HDF file (> MAX_INT) has been fixed.
26515	<i>Summary:</i> [CEA 24622] Failing SMESH tests Failure of blocFissure tests due to changed number of mesh entities generated by NETGEN has been fixed.

26523	<i>Summary:</i> [EDF 24234] Viscous Layer Viscous layers construction failure at some configurations has been fixed.
26609	<i>Summary:</i> [CEA][Windows] Patching Windows Tests Several tests have been adapted to Windows OS.
26615	<i>Summary:</i> [CEA][Windows] MGAdaptTests_without_session failing Disable test for the features which aren't supported on Windows.
26616	<i>Summary:</i> [CEA][Windows] Type long MEDCOUPLING failing test Use long long (which is true 64-bit type on Windows) to transfer pointer as a function parameter.
26630	<i>Summary:</i> [EDF 6032] Problem of projection Failure of Projection 2D algorithm has been fixed.
26655	<i>Summary:</i> [EDF 24384] Problem of Display Problem with deleting Groups and Sub-Meshes presentations in VTK viewer during mesh deletion has been fixed.

**MG-CADSURF PLUGIN MODULE**

16292	<i>Summary:</i> [CEA 6719] MGCADSurf: option SetEnforced1D mesh Now it is possible to enforce 1D mesh into MG-CADSurf mesh.
24731	<i>Summary:</i> [CEA] Changing 3D algorithm leads to inconsistent dumped python script. Invalid dump of empty list of enforced meshes has been fixed.

**MG-TETRA PARALLEL PLUGIN MODULE**

26435	<i>Summary:</i> [EDF] MG-Tetra_HPC failed Problem with mesh construction with MG-Tetra_HPC mesher has been corrected.
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**HEXOTIC PLUGIN MODULE**

26436	<i>Summary:</i> [CEA] Copy Mesh and MG-Hexa Failure of MG-Hexa on 2D shell without geometry has been fixed.
26666	<i>Summary:</i> [CEA] Size map ignored by MG-Hexa



	Bug that the size-map is incorrectly passed to MG-Hexa has been fixed.
--	------------------------------------------------------------------------

**GMSH PLUGIN MODULE**

24165	<i>Summary:</i> [CEA 24105] Extra edges with GMSH algorithm in Mesh Migrate on GMSH v4.8.4.
26550	<i>Summary:</i> [EDF] Some GMSH plugin tests fail Several problems with GMSH plugin under Scibian 9 have been corrected.

**MEDCOUPLING MODULE**

26638	<i>Summary:</i> [CEA] buildInnerBoundaryAlongM1Group Fix a problem with inner boundaries construction in mesh. Split <code>findNodesToDuplicate()</code> into two parts. Properly identify singular points in some particular cases. Properly handle cells around the M1 group which form non-convex patterns.
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**YACS MODULE**

24591	<i>Summary:</i> [CEA 18828] YACS use external PMML tool repository Possibility to build YACS with external PMML tool has been introduced.
26594	<i>Summary:</i> [CEA] Failed KERNEL test Adapt YACS for Swig v4.

**PARAVISMODULE**

24531	<i>Summary:</i> [CEA] failing <code>VoroGauss</code> test Paravis test case <code>test_VoroGauss.py</code> was improved in order to correctly find required data files.
24597	<i>Summary:</i> [CEA] [Windows] PARAVISADDONS compilation issue PARAVISADDONS plugins have been ported to Windows OS.

**FIELDS MODULE**

24636	<i>Summary:</i> [CEA] Two items in FIELDS trigger an exception Exception on "Expand Time Series" and "Use in Workspace" GUI commands has been eliminated.
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**OTHER ISSUES**

<p>243 63</p>	<p><i>Summary:</i> [CEA 24049] SalomeFindHDF5 does not return HDF5_CXX_LIBRARY Implement a workaround which fixes problem with incorrect treating of COMPONENTS keyword by SALOME_FIND_PACKAGE_AND_DETECT_CONFLICTS() macro.</p>
<p>244 74</p>	<p><i>Summary:</i> [CEA 24313] -DSALOME_CREATE_SYMLINKS=ON - relative symbolic links Added CMake option that allows creating relative symbolic links instead of absolute ones. Relative symbolic links to documentation can be created with the following set of options: -DSALOME_INSTALL_MODULES_DOC=ON -DSALOME_CREATE_SYMLINKS=ON -DSALOME_RELATIVE_SYMLINKS=ON.</p>
<p>263 61</p>	<p><i>Summary:</i> [CEA 17813] TASK 112.2 duplicate file in SAMPLES Clean-up data files repository: remove files which are duplicated in other modules.</p>
<p>264 32</p>	<p><i>Summary:</i> [CEA 26431] Import/export SAUV removal Support of SAUV format has been suppressed in Mesh and Paravis modules.</p>
<p>264 58</p>	<p><i>Summary:</i> [EDF] OTHER: versioning of sources via git commit id (sha1) Add a possibility to better identify SALOME build via embedding git SHA1 commit id into the version data.</p>
<p>265 09</p>	<p><i>Summary:</i> [CEA] OCCT creates \$HOME/.cmake/packages/OpenCASCADE SAT: Use -DCMAKE_EXPORT_NO_PACKAGE_REGISTRY=ON CMake option to avoid exporting registry record for Open CASCADE Technology.</p>

## ❖ OCCT 7.5.3 BUG CORRECTIONS

This chapter lists bug corrections and improvements made for SALOME project in Open CASCADE Technology. Below listed bug corrections and improvements are included into OCCT version 7.5.3 patch #1 used by SALOME 9.8.0; complete list of bugs and improvements made in OCCT can be seen at <https://dev.opencascade.org/forums/occt-releases>.

31890	Modeling Algorithms - Invalid result of common fuse BOP. Intersection has failed.
32196	Modeling Algorithms - Invalid section curve
32332	Modeling Algorithms - Incorrect result of <code>ShapeUpgrade_UnifySameDomain</code>
32424	[Regression] Mesh - Slow triangulation of a simple shape.
32470	Modeling Algorithms - BOP wrong result on sphere and box
32556	Data Exchange - A toroidal part of solid is corrupted while writing or reading STEP file
32561	Modelling Algorithms - <code>UnifySameDomain</code> does nothing while it is expected to union two pairs of faces
32581	Modelling Algorithms - <code>UnifySameDomain</code> produces invalid result
32619	[Regression] Modelling Algorithms - <code>UnifySameDomain</code> ignores shared face
32623	[Regression] Modelling Algorithms - <code>UnifySameDomain</code> invalid result only in release mode

## ❖ SUPPORTED DISTRIBUTIONS AND PRE-REQUISITES

SALOME is a cross-platform solution that supports Linux and Windows. It is distributed as open-source software under the terms of the GNU LGPL license.

The table below lists the versions of the pre-requisite products used by SALOME platform. Other versions of the products can also work but this is not guaranteed.

Product	Version	KERNEL	GUI	GEOM	SHAPER	SMESH	FIELDS	YACS	PARAVIS	HOMARD	HEXABLOCK	JOBMANAGER	NETGENPLUGIN	GHS3DPLUGIN	GHS3DPRPLPLUGIN	BLSURFPLUGIN	HexoticPLUGIN	HEXABLOCKPLUGIN	HYBRIDPLUGIN	GMSHPPLUGIN	ADAO	EFICAS
Gcc*	4.8***	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GNU make*	3.81***	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Microsoft Visual Studio**	2017	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cmake	3.12.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Python	3.6.5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Qt	5.12.10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sip	5.5.0		X																			
Pyqt	5.15.3	X	X			X	X		X												X	X
Boost	1.71.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Swig	3.0.12	X	X	X	X	X	X	X		X	X											
OCCT	7.5.3p1		X	X	X	X				X	X		X	X	X	X	X	X	X	X		
Qwt	6.1.2		X			X																
OmniORB	4.2.2	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OmniORBpy	4.2.2	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hdf5	1.10.3	X	X			X																
Med	4.1.1					X	X		X	X												
Vtk	8****		X	X		X	X		X		X		X	X	X	X	X	X	X	X		
Numpy	1.16.4		X			X	X		X	X												X
Scipy	1.4.1																					X
Graphviz	2.38.0	X	X	X	X	X	X	X					X	X	X	X	X		X	X		
Doxygen	1.8.14	X	X	X	X	X	X	X					X	X	X	X	X	X	X	X		
Netgen	6.2.2101												X									
Metis	5.1.0						X															
Scotch	6.0.4						X															
Libxml2	2.9.1	X	X		X		X	X														
MeshGems	2.13-1													X	X	X	X		X			
Sphinx	1.7.6	X	X		X	X	X	X	X	X	X	X									X	X
Libbatch	2.4.5	X																				
Cgns	4.1.1					X																
Paraview	5.9.0		X				X		X													
Psutil	5.7.2	X																				
Gmsh	4.8.4																				X	
Planegcs	0.18				X																	
Pillow	7.1.1						X															
Nlopt	2.5.0																					X
Eficas (tool)	9.8.0																				X	X

\*) Linux only  
 \*\*) Windows only  
 \*\*\*) Minimal required version, some features require newer version of gcc  
 \*\*\*\*) Version included into ParaView is used

The following products are not mandatory for SALOME directly; these products are either optional for SALOME or only required to build other pre-requisite products.

Product	Required by	Comment
Alabaster	Sphinx	Not used directly.
Babel	Sphinx	Not used directly.
Certifi	Sphinx	Not used directly.
Chardet	Sphinx	Not used directly.
Click	Sphinx	Not used directly.
Colorama	SAT	Not used directly. Windows only.
Cppunit	KERNEL, FIELDS, GEOM, YACS, HEXABLOCK	Optional, for unitary tests.
Cycler	Matplotlib	Not used directly.
Cython	Mpi4py, Scipy	Not used directly.
Docutils	Sphinx	Not used directly.
Eigen	Planegcs	Not used directly.
Embree	ParaView	Optional. Not used directly.
Expat	Graphviz	Windows only.
F2c	SMESH	Compile FORTRAN code (converted to C).
Freeimage	OCCT	Optional. Not used directly.
Freetype	OCCT, ParaView	Optional. Not used directly.
Idna	Sphinx	Not used directly.
Imagesize	Sphinx	Not used directly.
Intel TBB	OCCT, Ospray, SMESH	Optional.
Ispc	Ospray	Optional. Not used directly.
Jinja2	Sphinx	Not used directly.
Kiwisolver	Sphinx	Not used directly.
Lapack	Numpy	Not used directly.
Libjpeg	Graphviz	Not used directly. Windows only.
Libpng	Graphviz	Not used directly. Windows only.
Llvm	Ospray	Optional. Not used directly.
Markupsafe	Shinx	Not used directly.
Matplotlib	ParaView	Optional. Not used directly.
Mesa	Visualization subsystem.	Optional. Not used directly.
Opencv	GEOM	Optional.
Openmpi	ParaView, Hdf5, Med, KERNEL, FIELDS	Optional.
Openturns		Not used directly.
OpenVkl	Ospray	Not used directly.
Ospray	ParaView	Optional. Not used directly.
Packaging	Sphinx	Not used directly.
Petsc	Solverlab	Not used directly.
Pip	Python extra packages	Optional. Not used directly.
Pthreads	OmniORB, and other	Not used directly.
Pygments	Sphinx	Not used directly.
Pyparsing	Matplotlib	Not used directly.
Pyreadline	SAT	Not used directly. Windows only.
Python-dateutil	Matplotlib	Not used directly.
Pytz	Matplotlib, Sphinx	Not used directly.
Requests	Sphinx	Not used directly.

<b>RkCommon</b>	Ospray	Not used directly.
<b>Root</b>		Not used directly.
<b>Setuptools</b>	Sphinx, Matplotlib, Numpy, Scipy, ...	Not used directly.
<b>Six</b>	Matplotlib	Not used directly.
<b>Snowballstemmer</b>	Sphinx	Not used directly.
<b>Sphinx-intl</b>	GUI, GEOM, SMESH, MEDCOUPLING	Optional.
<b>Sphinxcontrib-applehelp</b>	Sphinx	Not used directly. Windows only.
<b>Sphinxcontrib-devhelp</b>	Sphinx	Not used directly. Windows only.
<b>Sphinxcontrib-htmlhelp</b>	Sphinx	Not used directly. Windows only.
<b>Sphinxcontrib-jsmath</b>	Sphinx	Not used directly. Windows only.
<b>Sphinxcontrib-qthelp</b>	Sphinx	Not used directly. Windows only.
<b>Sphinxcontrib-serializing</b>	Sphinx	Not used directly. Windows only.
<b>Sphinxcontrib-websupport</b>	Sphinx	Not used directly.
<b>Sphinx-rtd-theme</b>	Sphinx	Not used directly.
<b>Tcl</b>	OCCT, Python	Optional. Not used directly.
<b>Tk</b>	OCCT, Python	Optional. Not used directly.
<b>Toml</b>	Sip	Not used directly.
<b>Tclx</b>	OCCT, Python	Optional. Not used directly.
<b>Urllib3</b>	Sphinx	Not used directly.
<b>Zlib</b>	Hdf5	Not used directly.
<b>FMIlibrary</b>	OpenTums	Optional.
<b>Pandas</b>	OpenTums	Optional.
<b>Patsy</b>	OpenTums	Optional.
<b>PyFMI</b>	OpenTums	Optional.
<b>Statsmodels</b>	OpenTums	Optional.

SALOME depends on a number of products for run time execution, others are necessary only for compilation or generation of development documentation (like doxygen for example). Below there is a list of mandatory and optional products<sup>7</sup>.

**Software Requirements**

Product	Compilation and Development		Execution		Remarks
	Mandatory	Optional	Mandatory	Optional	
<b>Gcc</b>	X		X		C++17 support is needed to build Netgen 6 + plugin, Gmsh 4.8 + plugin
<b>GNU make</b>	X				
<b>Microsoft Visual C++</b>	X		X		For execution, runtime libraries are only required
<b>Boost</b>	X		X		
<b>Cgns</b>		X		X	For SMESH only Required only if used at compilation step
<b>Cmake</b>	X				
<b>Cppunit</b>		X			For testing only.
<b>MeshGems</b>	X	X	X	X	Compilation: depending on build optioned used, can be mandatory for BLSURFPLUGIN, GHS3DPLUGIN, GHS3DPRLPLUGIN, HexoticPLUGIN, HYBRIDPLUGIN. Runtime: mandatory for BLSURFPLUGIN, GHS3DPLUGIN, GHS3DPRLPLUGIN, HexoticPLUGIN, HYBRIDPLUGIN.
<b>Doxygen</b>		X			Needed only for documentation generation

<sup>7</sup> Some optional pre-requisite products are not listed.

<b>Eficas (tool)</b>	X		X		For ADAO, EFICAS
<b>Freetype</b>	X		X		
<b>Freeimage</b>		X		X	Required only if used when building OCCT
<b>Gmsh</b>	X		X		For GMSHPLUGIN only
<b>Graphviz</b>	X		X		In run-time required for YACS only
<b>Hdf5</b>	X		X		
<b>Homard</b>			X		For HOMARD module only
<b>Intel TBB</b>		X		X	Required if used when building OCCT and/or if used to build SMESH
<b>Libbatch</b>		X		X	Required only if used at compilation step for KERNEL
<b>Libxml2</b>	X		X		
<b>Matplotlib</b>				X	Required only if used when building ParaView. Used by ADAO.
<b>Med</b>	X		X		
<b>Metis</b>		X		X	Required only if used at compilation step for FIELDS
<b>Netgen</b>	X		X		For NETGENPLUGIN only
<b>Nlopt</b>				X	Required by ADAO.
<b>Numpy (+ Lapack)</b>	X		X		Required by FIELDS, ADAO
<b>OmniORB</b>	X		X		
<b>OmniORBpy</b>	X				
<b>OCCT</b>	X		X		
<b>Opencv</b>		X		X	Required only if used at compilation step for GEOM
<b>Openmpi</b>		X		X	Required only if used when building SALOME and/or pre-requisites
<b>ParaView</b>	X		X		Mandatory for PARAVIS module; optional for GUI module
<b>Pillow</b>				X	Optionally required by FIELDS.
<b>Planegcs</b>	X		X		Required by SHAPER
<b>Psutil</b>	X		X		Required by KERNEL to simplify management of SALOME processes and services.
<b>Pyqt</b>	X		X		
<b>Python</b>	X		X		
<b>Qt</b>	X		X		
<b>Qwt</b>	X		X		
<b>Scipy</b>			X		Required by ADAO
<b>Scotch</b>		X		X	Required only if used at compilation step for FIELDS
<b>Sip</b>	X				
<b>Sphinx</b>		X			Needed only for documentation generation
<b>Swig</b>	X				
<b>Vtk</b>	X		X		

*Note: additional pre-requisites may be required on some platforms. For example, to build SALOME on Linux CentOS 7, one may need to install devtoolset-8 package.*

## ❖ HOW TO GET THE VERSION AND PRE-REQUISITES

Sources of SALOME 9.8.0 can be retrieved from the Git repositories using V9\_8\_0 tag; the complete list of repositories can be found at <https://git.salome-platform.org/gitweb/>.

All pre-requisites can be obtained either from the Linux distribution (please be sure to use a compatible version) in form of native package or from the distributors of these pre-requisites.

*Note: SALOME version 9.8.0 patches some third-party pre-requisite products, such as ParaView, Netgen, Open CASCADE Technology and other. These patches solve different problems and introduce some specific features needed for SALOME project.*



## ❖ LICENSE

SALOME platform is distributed under terms of the GNU Lesser General Public License (LGPL) license version 2.1. All used pre-requisites use similar or compatible licenses (with minor exceptions). Detail information about licenses used by SALOME and its pre-requisites can be found on the following page: <http://www.salome-platform.org/downloads/license/>.

See also “*License restrictions*” paragraph above.

## ❖ KNOWN PROBLEMS AND LIMITATIONS

- SALOME 9.8.0 Windows is shipped with GMSH mesher which is available in SALOME in **experimental mode**.
- Application crash might occur on the data publication in the study if both data server and CPP container are running in the standalone mode.
- Sometimes regression test bases give unstable results; in this case the testing should be restarted.
- SALOME in general supports reading of documents from earlier versions but the documents created in the new version may not open in earlier ones. However, some studies may work incorrectly in SALOME 9x; mainly it concerns studies with Post-Pro data in which med v2.1 files have been imported. Due to removal of med v2.1 support and deprecation of Post-Pro module in SALOME series 9x, there can be problems with opening of such studies in SALOME.
- Compilation of OCCT by Makefiles on a station with NVIDIA video card can cause problems because the installation procedure of NVIDIA video driver removes library `libGL.so` included in package `libMesaGL` from directory `/usr/X11R6/lib` and places this library `libGL.so` in directory `/usr/lib`. However, `libtool` expects to find the library in directory `/usr/X11R6/lib`, which causes compilation failure (See `/usr/X11R6/lib/libGLU.la`). We suggest making symbolic links in that case using the following commands (*Note: you need root permission to do this*):

```
$ ln -s /usr/lib/libGL.so /usr/X11R6/lib/libGL.so
$ ln -s /usr/lib/libGL.la /usr/X11R6/lib/libGL.la
```

- MEFISTO algorithm sometimes produces different results on different platforms.
- In some cases the number of triangles generated by MEFISTO may be different at each attempt of building the mesh.
- When generating a 2D mesh with "Maximum Area" hypothesis used, MEFISTO algorithm can produce cells with maximum area larger than specified by the hypothesis.
- For the current moment, because of the ParaView application architecture limitations, PARAVIS module has the following known limitations:
  - PARAVIS module works unstably using a remote connection; when SALOME is running on a remote computer, activation of PARAVIS module can sometimes lead to the application hang-up.
  - Different visual artifacts may take place in ParaView or VTK viewer when using a remote connection; this is a limitation of indirect rendering: ParaView uses OpenGL 2.0 backend which some features are not supported by indirect rendering.
  - PARAVIS module compilation can fail on 64-bit platforms when building ParaMEDCorba plugin (due to crash of `kwProcessXML` tool during generation of the plugin documentation). In such case it is necessary to unset `VTK_AUTOLOAD_PATH` environment variable and restart the compilation, for example:

```
$ unset VTK_AUTOLOAD_PATH
```

- Loading big files in ParaVis might render SALOME instable. This problem is expected to be fixed in one of the next releases; it can be temporarily avoided in the current version by applying one of the two solutions below:
  - In ParaVis settings (ParaVis tab), disable the use of the external `pvserver`. This approach has the limitation that it is not possible to execute ParaVis' Python scripts outside the SALOME graphical interface (for instance, from an external terminal).
  - In ParaVis settings (ParaView tab → RenderView tab), increase the amount of memory under "Remote/Parallel rendering options" to something bigger than the default 20 MB (for example 200 MB).

- ParaVis module executes ParaView-related code in the standalone `pvserver` process that is launched with `--offscreen-rendering` option; this can cause problems with displaying data in ParaVis module if graphic card driver does not support off-screen rendering feature.
- ParaView application may crash during start-up on Linux because of graphics card driver's limitations. The following workaround may help solving this issue:

```
$ export VTK_DISABLE_VISRTX=1
$ export VTK_DISABLE_OSPRAY=1
```

- Med library (`medfichier`) can read only MED files of version 2.2 and newer.
- Users can experience OpenGL issues when running SALOME on virtual machines or with Intel graphic chipset. If such issue occurs, use `run_mesa_salome.bat` to launch SALOME.
- Sometimes a crash may be experienced on Windows when putting contents of the YACS graph to a *Bloc* node.
- For Windows 10 operating system, the Microsoft Visual C++ Redistributable for Visual Studio 2017 is required. It can be downloaded from the official Microsoft site:

<https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads>

For convenience, the distributable is included into the SALOME archive as well.

- Because of the known 8192 character command line limit, On Windows, the installation directory should be as short as possible, e.g. `C:\SALOME\SALOME-9.8.0`.
- On Linux and Windows, the installation folder should not contain spaces or special characters.
- There are known issues about behavior of the automatic link between Shaper and Mesh. The behavior will not be optimal if several iterations between the two modules are done by the user.
- When invoking context help from dialogs of SHAPER module, an error message can be observed in the case of using old versions of Firefox as the default browser:

```
PCOMGlueLoad error for file /usr/lib64/firefox/libxul.so:
/usr/lib64/firefox/libxul.so: undefined symbol: FT_Palette_Select
Couldn't load XPCOM.
```

This error message happens, for instance, with Firefox v75. The problem is caused by incompatibility of freetype library, shipped with SALOME, with old versions of Firefox.

The problem is not reproduced with newer versions of Firefox (e.g. v89). To solve mentioned problem, we suggest installing latest version of Firefox, or using other browser (e.g. Chrome) as the default one.

- Users can experience problem with launching SALOME because of absence of Python 3. For SALOME, Python 3 is a mandatory pre-requisite. It is available as a native package on most of Linux distributions, so if you experience this problem, just install the corresponding package. For example, on Debian or Ubuntu:

```
$ apt install python3
```

If you aren't able to install Linux packages (e.g. because of lack of permissions), you can use one of the following workarounds:

- a) Source environment file supplied with SALOME distribution:

```
$ . env_launch.sh
$ salome
```

- b) Generate bash script and use it as a launcher instead of default one:

```
$ ./install_bin.sh
$ sat launcher SALOME-9.8.0 --exe runSalome.py -n salome.sh
$ salome.sh
```

- There is a known problem with saving / loading big studies. The problem is caused by SALOME architecture and CORBA used as the transport between components. CORBA has 2 GB data transfer limit, so one may experience a problem with saving / loading big studies in default mode. This problem can be partially workarounded by using “multi-file” save-mode.
- SALOME version 9.7 introduced a “Session Less” mode allowed using SALOME API without launching CORBA servers. There is a known limitation that “session less” and “standard” modes cannot be mixed in the same session as this may cause various artifacts.
- On Fedora 32 and 34 platforms, users can experience issue displaying SALOME icons. The issue can be resolved as follows:

```
$ dnf install qt5ct
$ export QT_QPA_PLATFORMTHEME=qt5ct
$ qt5ct
$ ./salome
```