

SALOME version 9.7.0

Release Notes

June 2021

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❖ GENERAL INFORMATION

CEA/DEN, EDF R&D and OPEN CASCADE are pleased to announce [SALOME](#) version [9.7.0](#). It is a public minor release that contains the results of planned minor improvements and bug fixes against SALOME version 9.6.0 released in November 2020.

❖ PREREQUISITES

The table below lists pre-requisite products used with SALOME 9.7.0. The differences of 3rd-party product versions used for SALOME 9.6.0 and 9.7.0 are highlighted in bold.

Product	Linux		Windows	
	SALOME 9.6.0	SALOME 9.7.0	SALOME 9.6.0	SALOME 9.7.0
Alabaster	0.7.6	0.7.6	0.7.6	0.7.6
Babel	2.6.0	2.7.0	2.7.0	2.7.0
Boost	1.58.0	1.71.0	1.67.0	1.67.0
Certifi	2018.8.24	2018.8.24	2019.6.16	2019.6.16
Cgns	3.3.1	4.1.1	3.3.1	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
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	0.25.2	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	3.3.0	3.12.2	3.5.2	3.12.2
Expat	-	-	2.0.1	2.0.1
F2C	-	-	1.0.0	1.0.0
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	4.1.4	-	-
Graphviz	2.38.0	2.38.0	2.38.0	2.44.1
Hdf5	1.10.3	1.10.3	1.10.3	1.10.3
Homard	11.12	11.12	-	-
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	native	2019 U8	2019 U8	2019 U8
Ispc	1.9.2	1.15.0	1.10.0	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

Product	Linux		Windows	
	SALOME 9.6.0	SALOME 9.7.0	SALOME 9.6.0	SALOME 9.7.0
Libbatch	2.4.4	2.4.5	2.4.4	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	2.2.2	3.0.3	3.1.0	3.1.0
Med	4.1.0	4.1.0	4.1.0	4.1.0
Mesa	19.0.8	19.0.8	19.2.3	19.2.3
MeshGems suite ¹	2.10.4	2.12-1	2.10.4	2.12-1
Metis	5.1.0	5.1.0	5.1.0	5.1.0
Netgen ²	5.3.1	5.3.1	5.3.1	5.3.1
Nlopt	2.4.2	2.5.0	2.5.0	2.5.0
Numpy	1.15.1	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	7.4.0p2 ³	7.5.0p1⁴	7.4.0p2	7.5.0p1
Opencv	3.2.0	3.2.0	3.2.0	3.2.0
Openturns	-	1.16	-	1.16
OpenVKL	-	0.11.0	-	0.11.0
Ospray	1.8.4	2.4.0	1.8.4	2.4.0
Packaging	17.1	17.1	19.0	19.0
Paraview	5.8.0	5.9.0	5.8.0	5.9.0
Petsc	3.14.0	3.15.0	-	-
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
Pockets	0.6.2	-	0.7.2	-
Psutil	-	5.7.2	-	5.7.2
Pthreads	-	-	2.9.1	2.9.1

¹ Commercial product by 3DS Spatial; requires license.

² Patched for SALOME.

³ SHA1 identifier of this version is 85f78ac11072de6694d3a60343640bb7eef90526.

⁴ SHA1 identifier of this version is 0c61d93892d0c21283d1810da7ec3df2f6447e80.

Product	Linux		Windows	
	SALOME 9.6.0	SALOME 9.7.0	SALOME 9.6.0	SALOME 9.7.0
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	5.9	5.15.3	5.9	5.15.3
PyQtChart	5.9	-	5.9	-
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	2.4.2	2.8.0	2.8.0
Pytz	2015.7	2015.7	2019.1	2019.1
Qt	5.9.1	5.12.10	5.9.1	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
Root	-	6.22.02	-	6.24.0
Scipy	0.19.1	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	4.19.3	5.5.0	4.19.3	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-napoleon	0.6.1	-	0.7	-
Sphinxcontrib-websupport	1.1.0	1.1.0	1.1.2	1.1.2
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
Swig	3.0.12	3.0.12	3.0.12	3.0.12

Product	Linux		Windows	
	SALOME 9.6.0	SALOME 9.7.0	SALOME 9.6.0	SALOME 9.7.0
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-9.7.0-*SRC/BINARIES-*/Python/lib/python3.6/site-packages on Linux and SALOME-9.7.0\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.

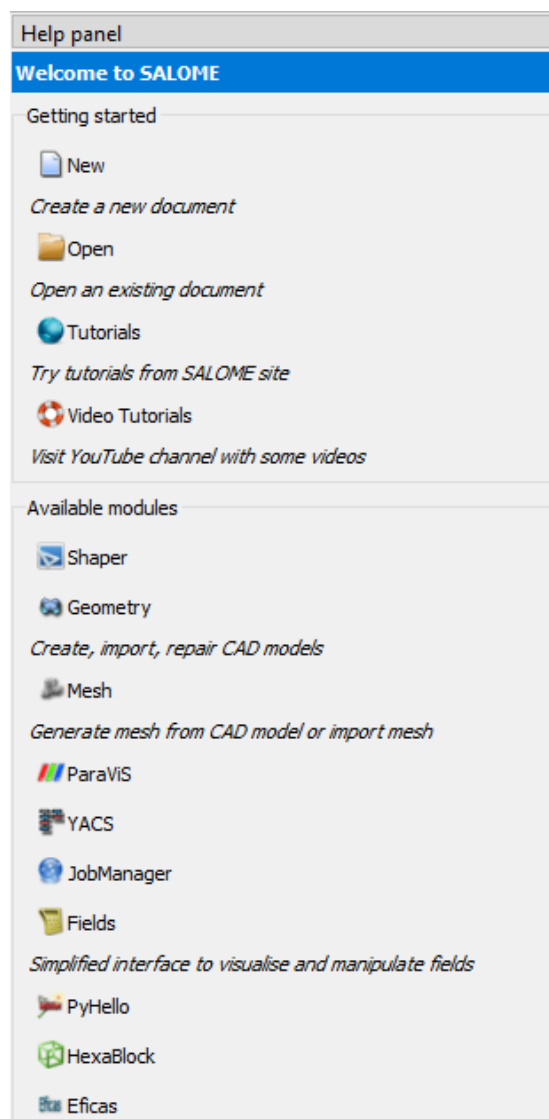
❖ NEW FEATURES AND IMPROVEMENTS

Kernel module

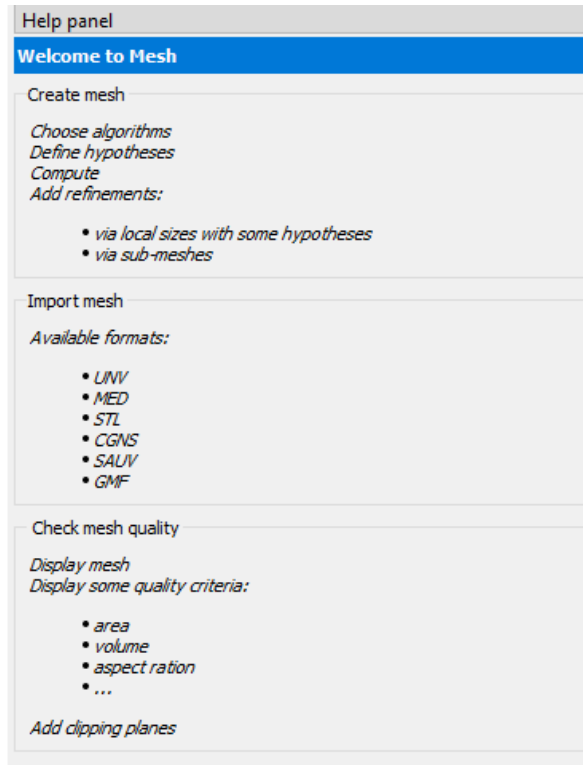
- Usage of psutil tool has been introduced into KERNEL module. The psutil Python module (<https://pypi.org/project/psutil>) is used to simplify management of SALOME processes and services, in particular to start / stop SALOME sessions.

GUI module

- SALOME help panel. This panel provides the following useful information:
 - Getting started on SALOME application and general information about each SALOME module, if there is not active module:



- More detailed information about active module and useful actions which may be applied:



Shaper module

- The following inspection features have been added:
 - Display of coordinates of a point or a vertex (Point coordinates).
 - Calculation of the volume, area or length of objects (Geometry calculation).
 - Calculation of the bounding box (Bounding box).
- Additional mode for the Interpolation feature has been implemented. This mode allows constructing a 3D curve using parametric representation ($x=f(t)$, $y=g(t)$, $z=h(t)$).
- Complete «Import STEP» feature with:
 - Name each object resulting from the assembly with its name contained in the STEP.
 - Assign the colour of each of the solid objects results in the 3D view with the corresponding colour in the STEP.
 - Possibility to create groups of objects of different colours.
 - Possibility to create groups of objects of different materials.
 - Possibility to disable the scale the model in meters.
- Implemented possibility to Show/Hide SHAPERSTUDY objects and to manage their presentation parameters.
- Measurement tool (Inspection → Measurement) provides additional information in Distance and Length modes (distance along X, Y, Z axes).
- New creation mode for sketcher's Rectangle feature - centered rectangle - create rectangle by clicking center point and one of its corners.
- The color of construction points is customizable using Preferences dialog.
- Hotkey Ctrl+Z to undo the selection in the "Hide faces" panel.
- Import STL files (ASCII and binary).

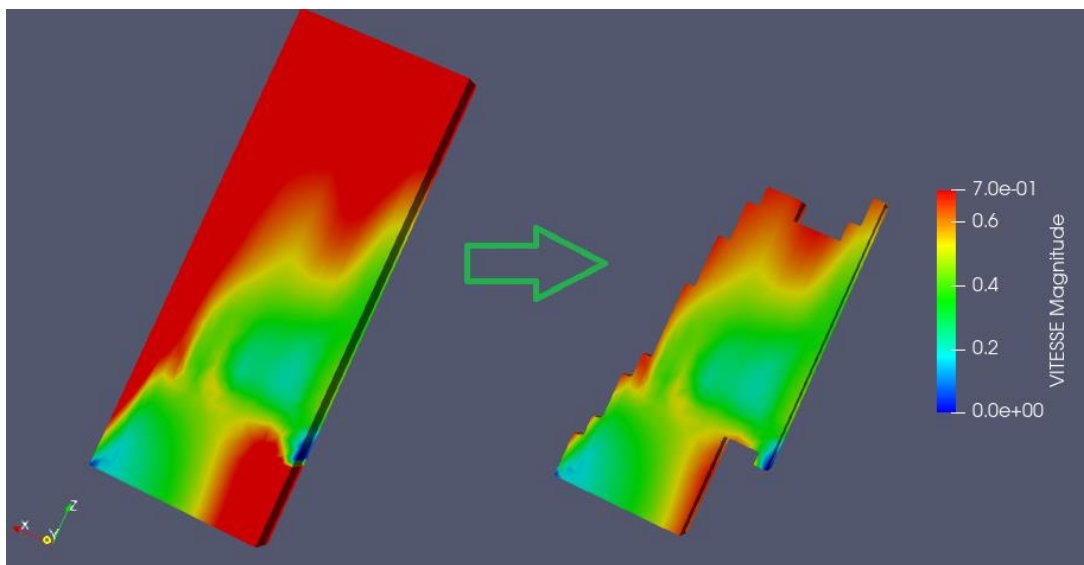
- Load image files and apply basic transformations (scaling, translation, rotation)
- Selection of shapes by lasso in the viewer filters the elements which lead to invalid result of a feature (applicable for features from the Build plugin).

Mesh module

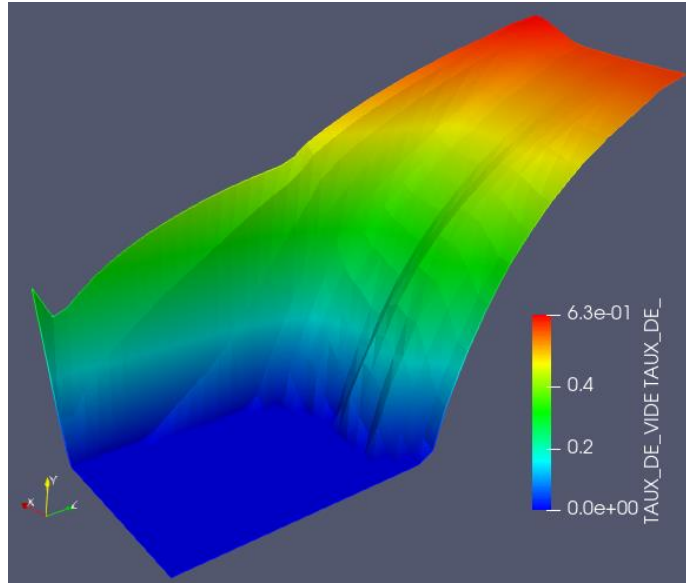
- MG-Adapt plugin, intended for a mesh refinement, has been integrated into SALOME Mesh module.
- Improvement of *blocFissure* plugin taking into account geometry coming from Shaper and usage of groups to specify path of crack (instead of GEOM reference ID).

Fields module

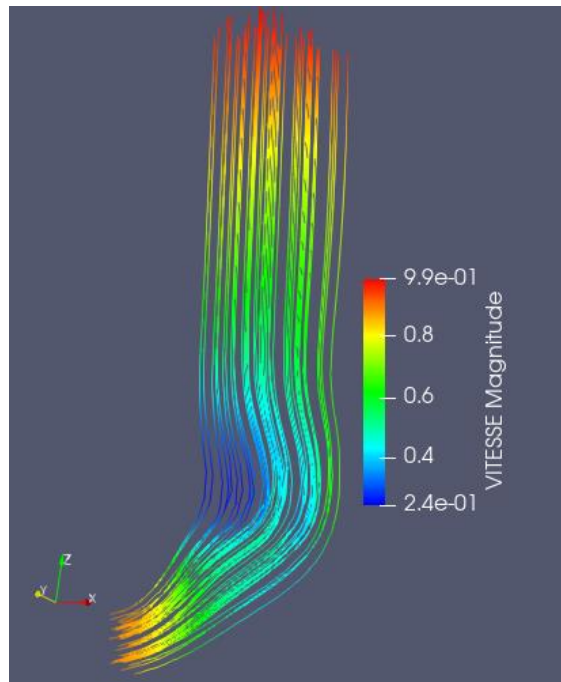
- Possibility to Show/Hide Scalar Bar for any coloured FIELDS presentation has been added.
- Possibility to set a custom (imposed) range for Scalar Bar has been added.
- The possibility to Show/Hide cells with values outside of the imposed range has been added:



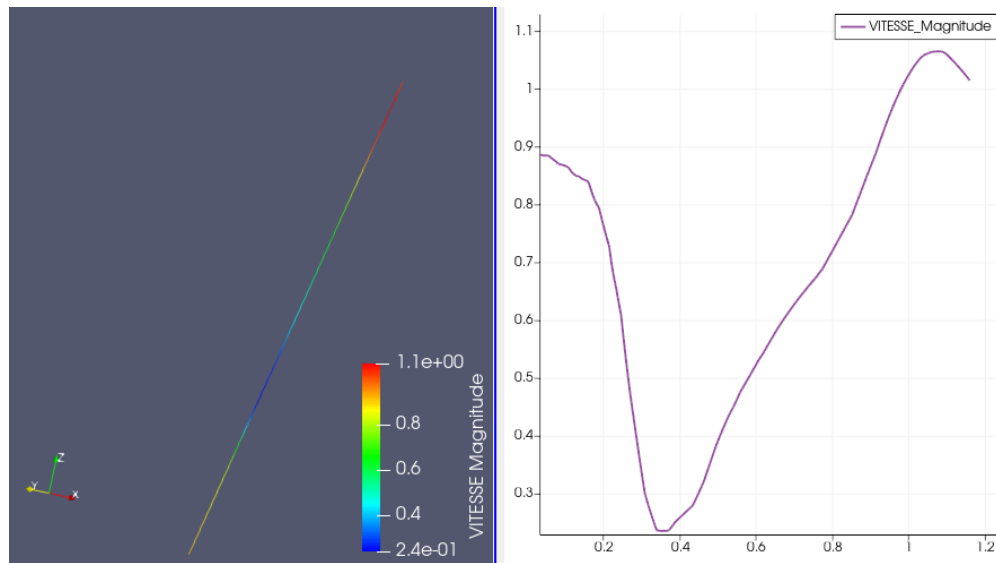
- Vectors presentation has been extended with the scale factor parameter.
- Possibility to build the Contour presentation for the components or magnitude of a multidimensional field has been implemented.
- The following new presentations have been added into FIELDS module:
 - **Plot 3D** presentation is a presentation of scalar values of meshes lying on a cutting plane. The relief and colouring of the resulting presentation both correspond to the values applied to the cells of a mesh.



- **Stream lines** presentation is a type of presentation transforming the cells with vectors having most similar direction into lines. A streamline can be thought of as the path that a massless particle takes in a vector field. Streamlines are used to convey the structure of a vector field.



- **Cut segment** presentation is a type of presentation which displays coloured cells with applied scalar values on the mesh where cut segment is placed.



- Description of existing presentations has been added to the User's Guide of the FIELDS module.

MEDCoupling module

- Export of cell/cell intersection using GEOM modeller from architectural work on server-less mode (`geom2medcoupling.py`).
- Matrix comparisons (`MEDCouplingRemapper.ToCSRMatrix`).
- `dataArray` conversion from `int32` to `int64` and reversely to ease INT64 switch to C++ client codes (`convertToInt32Arr` and `convertToInt64Arr`).
- Reactivation of Python API python of ParaMEDMEM with integration of non-regression tests.
- Tool for geometrical check (`MEDCouplingUMesh.checkGeomConsistency`).
- Peak memory optimisation on partial load of coordinates (`MEDFileUMesh.loadPart`).
- Adaptation of code for C++17.
- Suppression of default reverse nodal connectivity in `MEDFileUMesh`.
- Reader/writer from/to MeshGems format.

ParaVis module

- MED export of `int64` fields.
- Integration of 29 new PARAVIEW plugins to ease ParaView usage.

YACS module

- Generate an error when no resource can run a task with the workload manager.

ADAO module

- Identification in the graphical interface of optimization algorithms or with reduction.
- Improvements of iterative assimilation algorithms and their outputs.
- Internal improvements in parallelism, estimation bounds management, performance for large states.
- User documentation improvements and corrections.

Int64 configuration

- 64-bits configuration mode has been introduced, which allows dealing with meshes including more elements than maximal value of 32-bits integer.

SALOME Session Less mode

SALOME version 9.7 allows launching python script invoking services from GEOM, SHAPER and SMESH modules without launching any other servers like before. This mode is called SSL (Salome Session Less).

To use it, simply invoke `salome.standalone()` before calling `salome.salome_init()`. All implied the treatments will be performed in the Python interpreter.

This new feature allows easily parallelizing GEOM/SHAPER/SMESH treatments using YACS or multiprocessing.

VTK display speed improvements

Displaying meshes is now faster about 10x factor for tetrahedra and 3x for hexahedra, thanks to multithreading (Paraview 5.9 is now built with OpenMP support and some computations are delegated to VTK class `vtkGeometryFilter::UnstructuredGridExecute`).

However, this breaks elements selection in "Create Group" and other mesh edition dialogs (for instance removing elements, mesh information, etc.). If you need these features, you can switch off the speed improvement by setting to 0 the environment variable in bash:

```
$ export SALOME_ACTOR_DELEGATE_TO_VTK=0
```

or in salome launcher:

```
context.setVariable(r"SALOME_ACTOR_DELEGATE_TO_VTK", r"0", overwrite=True)
```

❖ 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.

KERNEL MODULE

19007	<i>Summary:</i> [CEA][Windows] SALOME non regression tests on Windows SALOME KERNEL tests have been adapted to Windows platform.
20365	<i>Summary:</i> [CEA] [Windows] Problem with <code>killSalomeWithPort.py --spy</code> Problem with <code>killSalomeWithPort.py --spy</code> on Windows has been corrected.
24218	<i>Summary:</i> [CEA 24189] Cannot launch SALOME - <code>/tmp/logs</code> wrong permissions When creating log and control files for SALOME session, the directories are created with proper permissions, allowing other users to write there as well - since these directories are re-used for all users, who runs SALOME sessions on the same workstation.

GUI MODULE

20558	<i>Summary:</i> [CEA 20539][Forum] Universal SALOME distribution and <code>libnss3.so</code> Firefox browser issue Issue with Universal SALOME distribution and Firefox web browser has been corrected.
20588	<i>Summary:</i> EDF 22731 - python command of load script Change a way to execute a Python script in the embedded Python console, in order to properly specify context of execution (filename).
24088	<i>Summary:</i> EDF 23089 - problem with studies Reinitialize study services properly when SHAPERSTUDY requests them.
24211	<i>Summary:</i> EDF 23398 - problem of transparency in SHAPER Problem with transparency through background in OCC Viewer (Shaper and Geometry modules) has been fixed. A patch for Open CASCADE Technology has been produced to solve this problem.

SHAPER MODULE

19241	<i>Summary:</i> [CEA 19240] SHAPER HDFS tests on error HDF testing procedure has been reworked.
19827	<i>Summary:</i> EDF 21817 - Wrong Fuse Pipe functionality in SHAPER has been improved. Result is now checked against self-

	intersections.
20101	<p><i>Summary:</i> EDF 22038 - SIGSEGV after validating extrusion</p> <p>The bug appears because of selection error in previous version of application. This problem is solved with the corresponding fix for Open CASCADE Technology.</p>
20274	<p><i>Summary:</i> [CEA] No intersection point from python dump</p> <p>Dumping of sketch features Linear Copy, Angular Copy and Mirror has been improved to keep the order of sketch edges unchanged after loading the script.</p>
20456	<p><i>Summary:</i> EDF 22534 - Another dump study fails</p> <p>Check user-defined name of result basing on the name of the result it conceals.</p>
20469	<p><i>Summary:</i> EDF 22546 - crash when creating wire</p> <p>Correct the approach of closing a wire when the whole sketch is selected.</p>
20564	<p><i>Summary:</i> EDF 22692 - Extrusion not possible</p> <p>Allowed Prism creation on non-planar faces in Shaper.</p>
20603	<p><i>Summary:</i> EDF 22744 - Visualization problems</p> <p>The Auto-Highlight mode is switched off for Result presentation, because it produces different behaviour of selection for simple shape and compound. For example when selection mode is Vertex the shape is selected by vertex, but compound is selected by whole shape.</p>
20661	<p><i>Summary:</i> EDF 22847 - Move to the end</p> <p>Fixed the <code>RemoveSubShape</code> feature's naming structure: sub-bodies of the main result should be stored as "modification", not "primitives".</p>
23885	<p><i>Summary:</i> [CEA] OCCT 7.5 related regressions</p> <p>The problem of cut on intersected compounds is fixed: now intersected parts of compounds are not processed in the <code>Ciseaux.py</code> script case.</p>
24015	<p><i>Summary:</i> [CEA 24013] Align major ellipse axis</p> <p>Fix crash when calculating intersection point for two identical lines.</p>
24043	<p><i>Summary:</i> EDF 23094 - problem with dump</p> <p>Fixed a dump study problem in Shaper. There was wrongly named entities after selection with filters on Compounds/Compsolids.</p>
24048	<p><i>Summary:</i> EDF 23096 - Warning too long</p> <p>Improved warning dialog which is shown on attempt to delete some parameters/features from Shaper. Now the lists of dependent features are shown in the "Details" area that can be shown/hidden and scrolled. This prevents the dialog from expanding beyond the screen</p>

	boundaries.
24055	<i>Summary:</i> [CEA 24054] Editing <code>ExtrusionCut</code> object updates other Fixed a problem in Shaper with wrong initialization of some property panels in edition mode.
24164	<i>Summary:</i> [CEA] Failing SHAPER tests Regressions in unit tests were fixed.

GEOMETRY MODULE

19936	<i>Summary:</i> [CEA] Wrong result in <code>MakeThickSolid</code> Fixed <code>MakeThickSolid</code> Geometry function for some particular cases.
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MESH MODULE

19939	<i>Summary:</i> [CEA 19938] Black screen after dumping view in the VTK Viewer Dump a content of VTK Viewer as an image has been corrected.
20282	<i>Summary:</i> EDF 22320 - general compute fails Fix the bug that 1D hypothesis assigned to a compound of solids as a prism vertical division is applied to divide edges of prism base faces (group of faces).
20553	<i>Summary:</i> EDF 22656 - Error after computation but mesh seems OK The bug that Quadrangle (Mapping) reports fake news, that inverted elements were generated, has been fixed.
20561	<i>Summary:</i> 22656 - Strange behaviour with sub-meshes The bug that Quadrangle (Mapping) reports fake news, that inverted elements were generated, has been fixed.
20584	<i>Summary:</i> EDF 22720 - degenerated edge / projection A new way of mesh projection to a face implemented. New nodes on a face are obtained by piercing the face by parallel lines starting at nodes on source face.
20640	<i>Summary:</i> EDF 22800 - Adding 3D Error of 3D mesh generation on a shell of quadrangles has been fixed.
20646	<i>Summary:</i> [CEA] Fix error in polyhedron per solid on pentahedron Error in Polyhedron per Solid algorithm on a pentahedral solid has been fixed.
20649	<i>Summary:</i> [CEA 19946] SMESH tests regression Regression of some tests using SHAPERSTUDY and launched via "salome test" has been

	fixed.
20650	<i>Summary:</i> EDF 22824 - UseExisting1DElements Error in Import 1D Elements from Another Mesh algorithm has been fixed.
20681	<i>Summary:</i> [CEA][Windows] SMESH: Missing OmniORB definitions Minor changes, connected with compilation problems.
23982	<i>Summary:</i> EDF 22984 - aspect ratio of hexa Aspect Ratio 3D computation method has been changed so that now Aspect Ratio of a cube is equal to 1.
24078	<i>Summary:</i> EDF 23136 - Problem with meshing Reinitialize study services properly when SHAPERSTUDY requests them.
24085	<i>Summary:</i> [CEA 24034][Windows] SplitVolumeIntoTetra crash Fixed crash on Windows when calling destructor of TSplitMethod two times and free memory twice.
24169	<i>Summary:</i> [CEA 24168] Error in AffectedElemGroupsInRegion SIGSEGV in Mesh AffectedElemGroupsInRegion() in the case where input faces to duplicate have no adjacent volumes at its both sides has been fixed.
24194	<i>Summary:</i> EDF - SplitHexahedraIntoPrisms Regression of SplitHexahedraIntoPrisms() has been fixed.
24257	<i>Summary:</i> [CEA] Fatal error when creating a sub-mesh if the mesh is on a sub-shape Fix fatal error when creating a sub-mesh if the mesh and a sub-mesh are on sub-shapes of the same level.

MG-CADSURF PLUGIN MODULE

20543	<i>Summary:</i> EDF 22638 - hyperpatch with CADSurf The issue of defining hyper-patches using SHAPERSTUDY objects has been fixed.
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NETGEN PLUGIN MODULE

18711	<i>Summary:</i> [CEA 18704] COTECH action 117.4: NETGEN 6 Integration in SALOME NETGEN plugin has been migrated to NETGEN series 6x. This possibility is still experimental, so it is switched OFF by default. To use NETGEN 6, it must be built and then NETGENPLUGIN must be recompiled.
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20597	<p><i>Summary:</i> EDF 22725 - Problem with NETGEN2D</p> <p>The bug that Use Edges to be Created Manually algorithm prevents NETGEN-1D2D successful work has been fixed.</p>
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HEXABLOCK MODULE

20455	<p><i>Summary:</i> [CEA20480] HEXABLOCK - Crash after New Study</p> <p>Fixed crash when re-activating HexaBlock in a new study after closing previous one.</p>
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FIELDS MODULE

23966	<p><i>Summary:</i> [CEA]: FIELDS: Wrong behaviour of "Displayed component" gui control</p> <p>The behaviour of "Displayed component" switcher has been corrected.</p>
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MEDCOUPLING MODULE

24092	<p><i>Summary:</i> EDF 23171 - Some information is missing in MEDCoupling documentation</p> <p>MEDCoupling User's Guide has been updated.</p>
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YACS MODULE

18360	<p><i>Summary:</i> [CEA] [Windows] YACS bloc crash</p> <p>Uninitialized pointer has been suppressed.</p>
20540	<p><i>Summary:</i> [CEA] YACS_WorkloadManager_swig regression</p> <p>Regression with YACS Workload Manager has been fixed.</p>
23871	<p><i>Summary:</i> [CEA 18962] Build YACS with clang in C++17 mode</p> <p>Now it is possible to build SALOME YACS module with clang C++17.</p>

HOMARD MODULE

19799	<p><i>Summary:</i> [CEA] HOMARD tutorial tests in Ubuntu archives</p> <p>HOMARD's tests have been adapted to Ubuntu platform.</p>
20382	<p><i>Summary:</i> Useless button in the zone selection</p> <p>Empty button has been removed from hypothesis creation dialog box.</p>

PARAVIS MODULE

20444	<p><i>Summary:</i> [CEA][int64] Reading big meshes in PARAVIS Problem with reading big meshes in PARAVIS module has been corrected.</p>
15946	<p><i>Summary:</i> [CEA 1512] Invisible file in the "Open file" Problem with invisible files in "Open file" dialog has been fixed with ParaView-5.9.0</p>

OTHER ISSUES

18963	<p><i>Summary:</i> [CEA 18962] Warnings in module compilations A lot of compilation warnings have been suppressed in most significant SALOME modules.</p>
20096	<p><i>Summary:</i> [CEA][Windows] Integration of graphviz-2.44.1 Graphviz-2.44.1 third-party tool is used now under Windows OS.</p>
23972	<p><i>Summary:</i> [CEA 19980] sphinxcontrib_napoleon and pockets removing Since napoleon extension (support of Google and NumPy coding styles) is included directly into Sphinx since version 1.3, installation of external Python module sphinxcontrib.napoleon is not needed anymore. Subsequently, its pre-requisite - pockets - is also removed from the list of pre-requisites.</p>

❖ **OCCT 7.5.0 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 7.5.0 plus patch #1 used by SALOME 9.7.0.

26071	[Regression to OCCT 6.5.5] <code>BRepOffsetAPI_MakePipeShell</code> produces rough result
26568	Modeling Algorithms - Crash when creating pipe
26876	Modeling Algorithms - Boolean algorithm fails or produce faulty shape
26882	Edge/Edge intersection algorithm produces incorrect result
29843	Modeling Algorithms - Boolean FUSE produces incorrect result
30185	Modeling Algorithms - Unify same domain algorithm corrupts the initial shape
30386	Modeling Algorithms - Unable to perform Cut operation
30597	Result of <code>BRepOffsetAPI_MakePipeShell</code> doesn't match the given profiles
31016	Projection of an ellipse is a B-spline in some cases
31153	Visualization - Non clear highlighting of selected trihedron elements
31187	Modeling Algorithms - Regression relatively 7.3.0. Unify same domain algorithm produces invalid shape.
31207	Regression in Boolean Operations: fuse gives wrong result
31242	Scaling with different coefficients along axes produces invalid shape
31294	Modeling Algorithms - Regression relatively 7.3.0. Crash in method <code>BRepPrimAPI_MakePrism::Generated(...)</code>
31404	Modelling Algorithms - BOP Fuse produces a self-interfering or a good shape depending on the order of arguments
31407	[Regression to 7.3.0] Extrema does not process parallel circles correctly
31415	Modelling Algorithms - Solid classifier works incorrectly on a cylinder
31440	Visualization - Impossible to make common behaviour for multi-selection in viewer

31441	UnifySameDomain corrupts the shape
31460	Modelling Algorithms - Regression: Revolution not done.
31462	Modelling Algorithms - BOP result depends on the arguments order
31464	BRepOffsetAPI_MakeFilling algorithm increases tolerances of vertices in input edges
31470	Modelling Algorithms - Regression: BOP common produces empty result (box and holed sphere)
31485	Data Exchange - Export STEP in non-manifold mode loses all faces except one
31558	BRepOffsetAPI_MakeFilling algorithm makes turned inside out face
31565	Visualization - SIGFPE, Arithmetic exception if SelectMgr_TriangularFrustumSet::Build() is called with single point
31604	Wrong result of Boolean Operation Cut
31617	Export STEP in non-manifold mode corrupts the shape
31655	Modelling Algorithms - Invalid result of General Fuse operation
31735	Modelling Algorithms - BRepOffset_MakeOffset works slowly and produces wrong result
31736	ShapeUpgrade_UnifySameDomain algorithm does not unify all possible faces
32136	Modelling Algorithms - Boolean fuse fails and corrupts the argument-shape
32140	Modelling Algorithms - unify same domain calls crossed for opposite vectors
32189	[REGRESSION] Modeling Algorithms - BOP Cut regression since 7.5.0
32199	[REGRESSION] Modelling Algorithms - BOP Cut produces invalid shape
32225	Modeling Data - Wrong result of extrema curve-surface

❖ 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	BLSURFPPLUGIN	HexoticPLUGIN	HEXABLOCKPLUGIN	HYBRIDPLUGIN	GMSHPLUGIN	ADAO	EFICAS
Gcc*	4.4***	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	7.5.0p1		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	4.1.0					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	0.19.1																					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	5.3.1												X									
Metis	5.1.0						X															
Scotch	6.0.4						X															
Libxml2	2.9.1	X	X		X		X	X														
MeshGems	2.12-1													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																				
Homard	11.12									X												
Gmsh	4.1.4																			X		
Planegcs	0.18				X																	
Pillow	7.1.1						X															
Nlopt	2.5.0																				X	
Eficas (tool)	9.7.0																				X	X

*) Linux only
 **) Windows only
 ***) Minimal required version
 ****) Version included into ParaViewis 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. Window s 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	Window s 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.
IntelTBB	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. Window s only.
Libpng	Graphviz	Not used directly. Window s 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. Window s only.
Python-dateutil	Matplotlib	Not used directly.
Pytz	Matplotlib, Sphinx	Not used directly.
Requests	Sphinx	Not used directly.

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

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 products⁵.

Software Requirements

Product	Compilation and Development		Execution		Remarks
	Mandatory	Optional	Mandatory	Optional	
Gcc	X		X		
GNU make	X				
Microsoft Visual C++	X		X		For execution, runtime libraries are only required
Boost	X		X		
Cgns		X		X	For SMESH only Required only if used at compilation step
Cmake	X				
Cppunit		X			For testing only.
MeshGems	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.
Doxygen		X			Needed only for documentation generation
Eficas (tool)	X		X		For ADAO, EFICAS
FreeType	X		X		
FreeImage		X		X	Required only if used when building OCCT
Gmsh	X		X		For GMSHPLUGIN only
Graphviz	X		X		In run-time required for YACS only
Hdf5	X		X		
Homard			X		For HOMARD module only

⁵ Some optional pre-requisite products are not listed.

Intel TBB		X		X	Required if used when building OCCT and/or if used to build SMESH
Libbatch		X		X	Required only if used at compilation step for KERNEL
Libxml2	X		X		
Matplotlib				X	Required only if used when building ParaView . Used by ADAO.
Med	X		X		
Metis		X		X	Required only if used at compilation step for FIELDS
Netgen	X		X		For NETGENPLUGIN only
Nlopt				X	Required by ADAO.
Numpy (+ Lapack)	X		X		Required by FIELDS, ADAO
Omniorb	X		X		
Omniorbpy	X				
OCCT	X		X		
Opencv		X		X	Required only if used at compilation step for GEOM
Openmpi		X		X	Required only if used when building SALOME and/or pre-requisites
ParaView	X		X		Mandatory for PARAVIS module; optional for GUI module
Pillow				X	Optionally required by FIELDS.
Planegcs	X		X		Required by SHAPER
Psutil	X		X		Required by KERNEL to simplify management of SALOME processes and services.
Pyqt	X		X		
Python	X		X		
Qt	X		X		
Qwt	X		X		
Scipy			X		Required by ADAO
Scotch		X		X	Required only if used at compilation step for FIELDS
Sip	X				
Sphinx		X			Needed only for documentation generation
Swig	X				
Vtk	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 9.7.0 can be retrieved from the Git repositories using V9_7_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 9.7.0 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

- The following modules are obsolete and not included into this SALOME release: FILTER, SUPERV, MULTIPR, VISU (Post-Pro). These modules are considered obsolete and not supported anymore.
- 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.
- If SALOME modules are not installed in a single folder, SALOME may not work in the CSH shell since the environment variables are too long by default. In this case, it is suggested to use SH or to install all modules in the same folder.
- 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 pserver. 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. As a workaround, SALOME Windows archive contains the `opengl32.dll` library, which can be used as follows:
 - In the extraction folder of SALOME, go to subfolder: `SALOME-9.7.0\W64\mesa\64`,
 - Select and copy `opengl32.dll`,
 - In the extraction folder of Salome, go to subfolder: `SALOME-9.7.0\W64\GUI\bin\salome`,
 - Paste `opengl32.dll`,
 - Eventually, edit file `run_salome.bat` SALOME launcher and add at line 11:

```
SET MESA_GL_VERSION_OVERRIDE=3.2
```

- 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.

- On Linux SALOME requires Python 3 package to be installed. If you don't have it, use the corresponding Linux package manager (`rpm`, `dpkg`, `apt-get`, `yum`, etc.) to install it. Alternative solution (which can also be applied on the platforms which do not provide native Python 3 package, like CentOS 6) to launch SALOME consists in using the environment script included into the SALOME archive, as follows:

```
$ cd SALOME-9.7.0-<OS>-SRC
$ . ./env_launch.sh
$ salome
```

Here, `<OS>` is an alias for the operating system being used, e.g. `CO7` for Linux CentOS 7.

- 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-9.7.0`.
- 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-9.7.0 --exe runSalome.py -n salome.sh
$ salome.sh
```