

SALOME version 9.16.0

Release Notes

June 2026

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- **GENERAL INFORMATION**

CEA, EDF and OPEN CASCADE are pleased to announce [SALOME](#) version [9.16.0](#). It is a public minor release that contains the results of planned minor improvements and bug fixes against SALOME version 9.15.0 released in July 2025.

● PREREQUISITES

The table below lists pre-requisite products used with SALOME 9.16.0. The differences of 3rd-party product versions used for SALOME 9.15.0 and 9.16.0 are highlighted in bold.

Product	Linux		Windows	
	SALOME 9.15.0	SALOME 9.16.0	SALOME 9.15.0	SALOME 9.16.0
Alabaster	0.7.6	0.7.6	0.7.16	0.7.16
attrs			24.2.0	24.2.0
Babel	2.14.0	2.14.0	2.7.0	2.7.0
BasicIterativeStatistics	v0.1.0	v0.1.0	v0.1.0	v0.1.0
bcrypt		5.0.0		5.0.0
beniget		0.4.0		0.4.0
Boost	1.71.0	1.71.0	1.67.0	1.79.0
C3po	v2.3	v2.3		
catalyst	2.0	2.0		
Certifi	2018.8.24	2018.8.24	2019.6.16	2019.6.16
cffi		2.0.0		2.0.0
cftime	1.6.3	1.6.3	1.6.3	1.6.3
cgal	v5.6.1	v5.6.1	v5.6.1-x86_64-<dist>	v5.6.1-x86_64-<dist>
Cgns	4.2.0	4.2.0	4.2.0	4.2.0
Chardet	3.0.4	3.0.4	3.0.4	3.0.4
charset_normalizer	3.3.2	3.3.2		
Click	6.7	6.7	7.0	7.0
Cmake	3.31.6	3.31.6	3.24.2	3.24.2
Cminpack	1.3.10	1.3.10	1.3.10	1.3.10
Colorama			0.4.1	0.4.1
contourpy	1.2.0	1.2.0		
cork	5987de5	5987de5	5987de5-x86_64-<dist>	5987de5-x86_64-<dist>
Cppunit	1.13.2	1.13.2	1.13.2	1.13.2
cryptography		46.0.3		46.0.3
Cycler	0.10.0	0.10.0	0.10.0	0.10.0
Cython	0.29.37	0.29.37	0.29.37	0.29.37
decorator		5.1.0		5.1.0
Dill		0.3.4	0.3.4	0.3.4
distro			1.9.0	1.9.0
Docutils	0.20.1	0.20.1	0.14	0.14

Product	Linux		Windows	
	SALOME 9.15.0	SALOME 9.16.0	SALOME 9.15.0	SALOME 9.16.0
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	3.13.1	3.12.2	4.4.0
exceptiongroup			1.2.2	1.2.2
Expat			2.0.1	2.0.1
F2C			1.0.0	1.0.0
Fftw	3.3.10	3.3.10	3.3.9	3.3.9
FMILibrary	2.0.3	2.0.3	2.0.3	2.0.3
fonttools	4.48.1	4.48.1		
Freeimage	3.16.0	3.16.0	3.18.0	3.18.0
Freetype	2.9.1	2.9.1	2.13.3	2.13.3
gast		0.5.0		0.5.0
gcc	8.5.0	8.5.0		
gdal	2.4.0	3.7.1		
gmsh	4.10.3_with_CAS_7.8	4.14.1	4.10.3_with_CAS_7.8	4.14.1
Graphviz	2.38.0	2.38.0	2.44.1	2.44.1
gssapi		1.8.3		1.8.3
h5py	3.9.0	3.9.0	3.11.0	3.11.0
hdf5	1.10.3	1.14.6	1.10.3	1.14.6
Idna	2.7	2.7	2.8	2.8
Imagesize	1.4.1	1.4.1	1.1.0	1.1.0
importlib_metadata	7.0.1	7.0.1		
importlib_resources	6.1.1	6.1.1		
Iniconfig			2.0.0	2.0.0
Intel® Threading Building Blocks	2019_U8	2021.9.0	2019_U8_win	2021.12.0
invoke		2.2.1		2.2.1
ispc	1.15.0	1.16.1	1.15.0	1.21.1
Jinja2	3.1.3	3.1.3	2.10.1	2.10.1
joblib		1.2.0		
jom				1.1.4
Jsoncpp	1.9.6	1.9.6		
Kiwisolver	1.3.1	1.3.1	1.4.5	1.4.5
Lapack	3.8.0		3.8.0	
Libbatch	V2_6_1	V2_6_1	V2_6_1	V2_6_1

Product	Linux		Windows	
	SALOME 9.15.0	SALOME 9.16.0	SALOME 9.15.0	SALOME 9.16.0
Libigl	v2.5.0	v2.5.0	v2.5.0-x86_64-<dist>	v2.5.0-x86_64-<dist>
Libjpeg			9c	9c
Libpng			1.5.10	1.5.10
Libxml2	2.9.12	2.9.12	2.9.1	2.9.1
Llvm	8.0.1	8.0.1	8.0.1	8.0.1
Markdown_it_py	3.0.0	3.0.0	3.0.0	3.0.0
Markupsafe	2.1.5	2.1.5	1.1.1	1.1.1
Matplotlib	3.8.2	3.8.2	3.3.4	3.3.4
mcut	b5b0ec6	b5b0ec6		
Mdurl	0.1.2	0.1.2	0.1.2	0.1.2
Med	4.2.0	6.0.1	4.2.0	6.0.1
Mesa	19.0.8	19.0.8	19.2.3	19.2.3
Meshbooleanplugin	V1.0.0		V1.0.0	
MeshGems suite ¹	2.15-1	2.15-1	2.15-1	2.15-1
meshio	5.3.5	5.3.5	5.3.5	5.3.5
meson		1.9.1		1.9.1
meson_python		0.14.0		0.14.0
Metis	5.1.0	5.1.0	5.1.0	5.1.0
mmg	5.6.0	5.6.0	5.6.0	5.6.0
mmgplugin	v1.0.0		v1.0.0	
Mpi4py	3.1.0	3.1.0		
mpir			855491e	855491e
msvc			2017	2017
NetCDF4	1.6.5	1.6.5	1.6.5	1.6.5
Netcdf	4.6.2	4.9.2	4.6.2	4.9.2
Netgen	5.3.1_with_CA S_7.8	5.3.1_with_CAS_7. 8	5.3.1_with_CA S_7.8	5.3.1_with_CAS_7_8 _win
networkx		2.5		2.5
ninja		1.12.1		
Nlopt	2.7.0	2.7.0	2.7.1	2.7.1
Nose	1.3.7	1.3.7		
Numpy	1.21.1	1.22.2	1.21.6	1.22.2
Numpydoc	1.6.0	1.6.0		

¹ Commercial product by Dassault Systemes SE; requires license.

Product	Linux		Windows	
	SALOME 9.15.0	SALOME 9.16.0	SALOME 9.15.0	SALOME 9.16.0
Omniorb	4.2.5	4.2.5	4.2.6	4.2.6
Omniorbpy	4.2.5	4.2.5	4.2.6	4.2.6
ONNX		1.22.0		1.22.0
Open CASCADE Technology	SALOME_9_15_V7_9_0a1	SALOME_9_16_V7_9_0b2	SALOME_9_15_V7_9_0a1	SALOME_9_16_V7_9_0b2
Openblas		0.3.29	0.3.23	0.3.29
Opencv	3.2.0	3.2.0	3.2.0	3.2.0
Openmpi	4.0.3	4.0.3		
Openssl			1.1.1n	1.1.1n
Openturns	1.24	1.25.1	1.24	1.25.1
OpenVKL	0.11.0	1.0.1	0.11.0	1.3.2
Ospray	2.4.0	2.7.1	2.4.0	2.12.0
Packaging	23.2	24.2	19.0	19.0
Pandas	1.1.5	1.1.5	1.5.3	1.5.3
paramiko		4.0.0		4.0.0
ParaView	5.13.2918b94391	6.0.0.c61dcc8ee0	5.13.2918b94391	6.0.0.c61dcc8ee0
Patsy	0.5.4	0.5.4	0.5.2	0.5.2
perl			5.28.1.1	5.28.1.1
Persalys	v18.0	v19.0	v18.0	v19.0
Petsc	3.20.5	3.20.5		
Pillow	8.4.0	8.4.0	10.2.0	10.2.0
Planegcs	0.18-3cb6890	0.18-3cb6890	0.18-3cb6890	0.18-3cb6890
pluggy			1.5.0	1.5.0
ply		3.8		3.8
poetry	1.8.3	1.8.3		
poetry_core	1.9.0	1.9.0	1.9.0	1.9.0
proj		9.2.1		
Psutil	5.9.8	5.9.8	5.9.8	5.9.8
Pthreads			2.9.1	2.9.1
pyasn1		0.6.1		0.6.1
pybatch		65f6e083		65f6e083
pybind11		2.11.0		2.11.0
pycparser		2.23		2.23
PyFMI	2.6	2.6	2.6	2.6
Pygments	2.17.2	2.17.2	2.13.0	2.13.0

Product	Linux		Windows	
	SALOME 9.15.0	SALOME 9.16.0	SALOME 9.15.0	SALOME 9.16.0
pynacl		1.6.2		1.6.2
pyarsing	3.1.1	3.1.1	2.4.0	2.4.0
pyproject_metadata		0.8.0		0.8.0
Pyqt	5.15.3	5.15.3	5.15.3	5.15.3
pyqwt	0.12.1	0.12.1	0.12.1	0.12.1
Pyreadline	2.0	2.0	3.4.1	3.4.1
pyside		v5.15.17		v5.15.17
pytest	8.1.1	8.1.1	8.3.2	8.3.2
Python-dateutil	2.7.3	2.7.3	2.8.2	2.8.2
Python	3.9.14	3.9.14	3.9.14	3.9.14
pythonfmu		0.6.3		
pythran		0.14.0		0.14.0
Pytz	2017.2	2017.2	2020.1	2020.1
Pyyaml	6.0	6.0	6.0	6.0
Qt	5.15.15	5.15.15	5.15.15	5.15.17
qtpy	2.4.1	2.4.1	2.4.1	2.4.1
Qwt	6.1.6	6.1.6	6.1.6	6.1.6
Rapidjson	1.1.0	1.1.0	1.1.0	1.1.0
Requests	2.31.0	2.31.0	2.22.0	2.22.0
Rich	13.7.1	13.7.1	13.7.1	13.7.1
RkCommon	1.5.1	1.7.0	1.5.1	1.11.0
Root	6.28.10	6.28.10		
Ruby			2.5.5-1	2.5.5-1
scikit_learn		1.2.2		
Scipy	1.6.2	1.11.4	1.6.2	1.11.4
Scotch	6.1.2	6.1.2		
scp		0.15.0		0.15.0
Setuptools	69.0.3	69.0.3	69.0.3	69.0.3
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	2.2.0	2.2.0	2.2.0	2.2.0
Sphinx-intl	2.1.0	2.1.0	2.0.0	2.0.0
Sphinx-rtd-theme	2.0.0	2.0.0	0.4.3	0.4.3
Sphinx	7.2.6	7.2.6	3.5.4	3.5.4
Sphinxcontrib-applehelp	1.0.8	1.0.8	1.0.1	1.0.1

Product	Linux		Windows	
	SALOME 9.15.0	SALOME 9.16.0	SALOME 9.15.0	SALOME 9.16.0
Sphinxcontrib-devhelp	1.0.6	1.0.6	1.0.1	1.0.1
Sphinxcontrib-htmlhelp	2.0.5	2.0.5	1.0.2	1.0.2
Sphinxcontrib-jquery	4.1	4.1		
Sphinxcontrib-jsmath	1.0.1	1.0.1	1.0.1	1.0.1
Sphinxcontrib-qthelp	1.0.7	1.0.7	1.0.2	1.0.2
Sphinxcontrib-serializinghtml	1.1.10	1.1.10	1.1.3	1.1.3
Sphinxcontrib-websupport	1.2.7	1.2.7	1.1.2	1.1.2
sqlite		3.26.0		
Statsmodels	0.14.1	0.14.1	0.12.2	0.12.2
Swig	4.0.2	4.0.2	4.0.2	4.0.2
Tabulate	0.9.0	0.9.0		
Tcl/Tk			8.6.9	8.6.17
threadpoolctl		3.5.0		
Toml	0.10.2	0.10.2	0.10.2	0.10.2
Tomli	2.0.1	2.0.1	2.0.1	2.0.1
tqdm		4.66.5		
TTK	f8dafde2d7	1.3.0		
typing_extensions		4.13.2		4.13.2
URANIE	4.8.0	4.8.0		
Urllib3	1.23	1.23	1.25.3	1.25.3
Wheel		0.36.2	0.44.0	0.44.0
Zeromq	4.3.1	4.3.1		
Zipp	3.17.0	3.17.0		
Zlib			1.3.1	1.3.1

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-9.16.0-*/SRC/BINARIES-*/Python/lib/pythonX.Y/site-packages on Linux (where pythonX.Y corresponds to the version of Python being used - for example, python3.9) and SALOME-9.16.0\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:

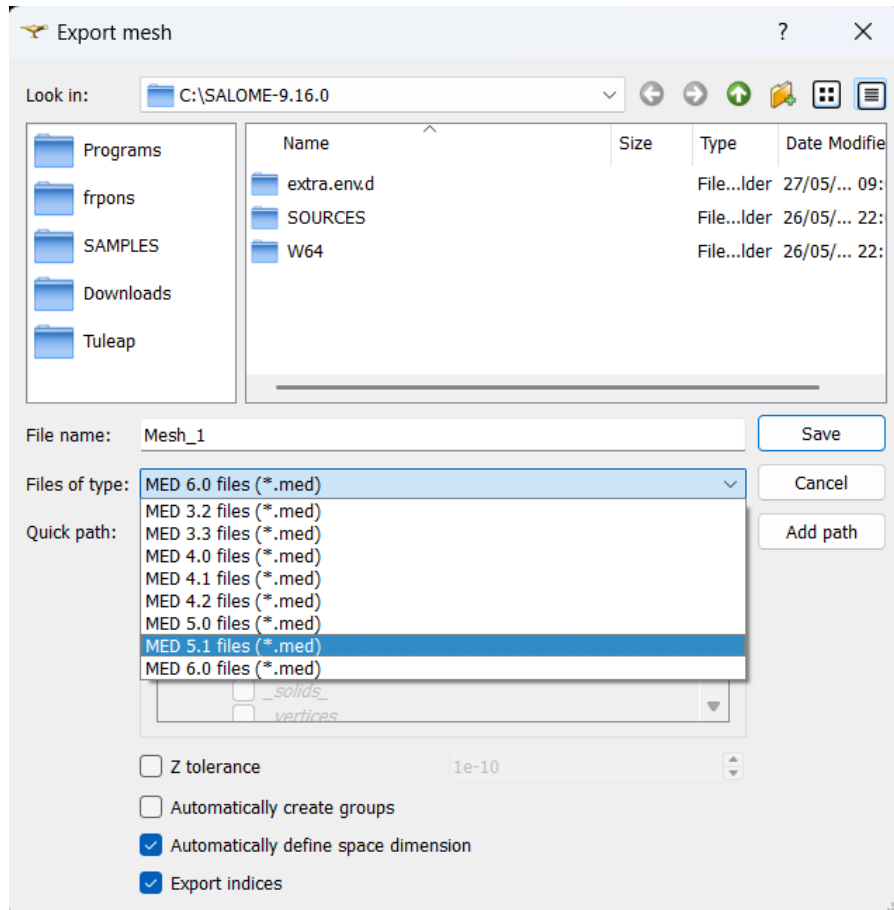
<https://riverbankcomputing.com/commercial/license-faq>

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

• NEW FEATURES AND IMPROVEMENTS

MED

- Version of MED was upgraded to v6.0.1.
- Please note that, by default, exported MED files with version 9.16 cannot be imported with previous versions of branch 9. If you need to import a MED file for a previous version, it is important to select the wanted format.



SHAPER

- Parametric update of filters
 - Enhanced the behavior of Groups defined by filters based on Parameters. Now, updating the Parameter will automatically update the filter and the content of the Group.
 - Implemented the dump and loading of filters in Python scripts. This ensures that the content of selections within filters is preserved, eliminating the issue of empty selections.
 - Groups defined by filters are now read-only. To modify the list of elements, users must first delete the filter.
 - Added a "Remove filters" button in the Group feature to remove filters while retaining the selected objects within Groups. This allows selection of new elements, or removal of some elements of the Group.
 - Compatibility with existing scripts that may have empty selections in filter arguments. Filters with empty selections are now automatically removed, and a warning is displayed in the Salome Python console to notify users of this action.

MESH

- Export to UNV of pyramids. According to available documentation, linear pyramids can be stored as dataset 119 or 312. As VisIt-LLNL, the only other open-source code that reads pyramids from UNV, reads them as dataset 312, we chose to export them as dataset 312. In import, SALOME can read them as dataset 119 and 312.
- Boolean mesh plugin has been improved:
 - icon to call it from the icon toolbar
 - cancel button to be able to cancel an algorithm that takes too much time
 - python API to be able to call the algorithms from a python script.
 - python dump management. The boolean mesh python API lines are added to python script when calling Dump Study, as for the other features.
- New import file formats (via MEDCoupling): INP (Abaqus), CDB (ANSYS), ASC (SYSTUS), GEOFF (zset).
- Import/export of other formats: file formats managed by GMSH are exported via GMSH instead of meshio (because GMSH that better deals with groups than meshio's current version).
 - export/import via GMSH: Gmsh 4.1 (*.msh), Gmsh 2.2 (*.msh), MAIL (*.mail), Abaqus (*.inp), Nastran (*.bdf), OBJ (*.obj), OFF (*.off), PLY (*.ply), STL (*.stl), SU2 (*.su2), Tecplot (*.tec), VTK (*.vtk)
 - export/import via MeshIO: ANSYS msh (*.msh), AVS-UCD (*.avs), DOLFIN XML (*.xml), Exodus (*.e), Exodus (*.exo), FLAC3D (*.f3grid), H5M (*.h5m), Kratos/MDPA (*.mdpa), Nastran (*.fem), Nastran (*.nas), Netgen (*.vol), Netgen (*.vol.gz), PERMAS (*.post), PERMAS (*.dato), SVG, 2D output only (*.svg), TetGen (*.node), TetGen (*.ele), UGRID (*.ugrid), VTU (*.vtu), WKT, TIN (*.wkt), XDMF (*.xdmf), XDMF (*.xmf)

MEDCOUPLING

- **Parallel P1P1**
 - MEDCoupling 9.16.0 introduces a new parallel interpolation engine based on the MPI paradigm, implemented through the CFEMDEC class. CFEMDEC enables interpolation within a set of $n + p$ MPI processes, from a source nodal field distributed across n processes to a target nodal field distributed across p processes, and vice versa.
 - Unlike the existing node-to-node interpolation method based on the dual mesh, the method underlying CFEMDEC relies on locating the target node within the source element that either contains it or intersects its projection. From this localization step and the associated shape functions, a vector of weighting factors is computed for the nodes of the target cell, following the algorithm described in [Code Aster](#). Detailed references can be found in the source file MEDCouplingFieldDiscretizationOnNodeFE.cxx.
 - CFEMDEC also supports reverse interpolation (target $\rightarrow$ source) as well as ghost cells.
 - The CFEMDEC implementation delivered in version 9.16.0 is not optimized in terms of memory usage and CPU performance. The aggregated source meshes are stored on each target processor, which may lead to prohibitive memory peaks for large-scale cases. A memory and CPU optimization addressing this issue has already been integrated into the master branch.
- Support for Systus, ANSYS, ABAQUS, ASTER, ZSET, and TETGEN formats. A module named `MEDConverter.py` has been developed to load mesh files in Systus, ANSYS, ABAQUS, ASTER, ZSET, and TETGEN formats into memory as a MEDFileUMesh instance. These meshes can then be written to the MED format or manipulated directly in memory.

GENERAL

SALOME now supports both PyQt5/SIP and PySide2/Shiboken2.

To build SALOME with PySide2/Shiboken2, edit the SALOME-9.16.0-native.pyconf or SALOME-9.16.0-windows.pyconf files and set "use_pyside" to "yes."

For the SALOME-9 series, PyQt5/Sip remains the baseline for SALOME GUI interfaces. The implementation of PySide2/Shiboken2 is currently a work in progress to prepare for SALOME 10, which will rely entirely on PySide6/Shiboken6. For detailed instructions on building SALOME 9.16 with PySide2/Shiboken2 support, refer to the recipe on the official SALOME Tool SAT wiki:

- <https://github.com/SalomePlatform/.github/wiki/SAT>

Please report any issues or suggested improvements at github.com/SalomePlatform.

● CHANGELOG

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

SHAPER

45226	<i>Summary:</i> [CEA 43947] Import step in centimeters failed Improved import of STEP files. Allowed more units. Case-insensitive units check implemented.
45819	<i>Summary:</i> [CEA][SHAPER] Fuse selection and remove intersection edges error
46029	<i>Summary:</i> Selection of a vertex (in a python script) returns a group = bug ?
47816	<i>Summary:</i> [CEA][Windows] SHAPER - Support Visual C++ 2019+
49142	<i>Summary:</i> Middle Point fail
49234	<i>Summary:</i> [EDF 34504] SHAPER : sigsegv
49351	<i>Summary:</i> EDF 34504 - saving problem
49354	<i>Summary:</i> [CEA] SHAPER: Fix SIGSEGV in ExportXAOMem (Debian 13)
52804	<i>Summary:</i> [CEA] Fatal error when cancelling a plane's sketch change

GEOM

41125	<i>Summary:</i> EDF 29603 - Create group : don't find all subshapes
47746	<i>Summary:</i> [CEA] GEOM notebook - adding a variable

48470	<i>Summary:</i> [GITHUB][GEOM #17] issue with MakeWrappedFace #17
48511	<i>Summary:</i> Improve GEOM MakeWrappedFace to get entire region with less points

SMESH

43484	<i>Summary:</i> [CEA 42969] Unexpected group modifications after calling "split volume" Fixed a problem with unexpected group modification after calling SplitVolumes.
44523	<i>Summary:</i> EDF 10054 - problem with GetIDs
47494	<i>Summary:</i> [CEA 46919][SMESH] Error SIGSEGV when using node selecting features
47750	<i>Summary:</i> [CEA] Notebook error when Update study
47807	<i>Summary:</i> [COTECH] Clean meshio temp files
48314	<i>Summary:</i> [GITHUB][SMESH: #34] not being able of opening submesh dialog after error
52130	<i>Summary:</i> [CEA 52095][SMESH] Error when adding a single Viscous Layer
52259	<i>Summary:</i> [CEA] SMESH/TopIIVolMesh: Fix missing imports.
48419	<i>Summary:</i> BLSURFPLUGIN tests not checking result of Mesh.Compute()
46393	<i>Summary:</i> [CEA] Error: OCC exception. Standard_NullObject: TCollection_AsciiString::Operator += parameter other

KERNEL

47747	<i>Summary:</i> [CEA] python warnings due to malformed strings or regular expressions
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54420	<i>Summary:</i> [EDF] Using appli_gen.py with json config file, name of config copy is wrong
54629	<i>Summary:</i> [EDF][appli] parent_application limited to a single parent
55007	<i>Summary:</i> Integrate the commit "[EDF33823] : Add forgotten /SalomeLauncher entry in attached mode" to V9_16_BR branch

GUI

48630	<i>Summary:</i> [CEA] Bug when starting new document
53243	<i>Summary:</i> [FORUM #3412] Python tab completion
54426	<i>Summary:</i> [EDF] On DB13 SALOME V9_16_BR, loading GEOM or SMESH failed with GUI
54445	<i>Summary:</i> [CEA 52328] Cannot run Tools/Plugins features
54541	<i>Summary:</i> [CEA] Windows Path UnicodeEscape SyntaxError in Python Console

PARAVIS

47138	<i>Summary:</i> PARAVIS Save hdf is empty
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OTHER

54534	<i>Summary:</i> [EDF 35335] UNSTABLE_YACS_PyNodeWithCache_swig : pylauncher not defined
55061	<i>Summary:</i> integrate a commit into branch V9_16_BR of yacsgen

• OCCT 7.9.0 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 7.9.0 used by SALOME 9.16.0 (tag `SALOME_9_16_V7_9_0b2`); complete list of bugs and improvements made in OCCT can be seen at <https://dev.opencascade.org/forums/occt-releases>.

SALOME 45819	Problem with selection of a mirrored cylinder in the viewer
SALOME 33439	ShapeUpgrade_UnifySameDomain gives wrong result on mirrored shape
OCCT 512 SALOME 45226	STEP import fails if cascade unit it set to M
SALOME 30432	Fix intersection with edges treatment: use parameters on polygon and on triangle's edge
SALOME 45822	Pipe feature errors

• 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.

CMake and Python are required for all modules.

GCC and GNU make are required only on Linux.

Microsoft Visual Studio is required only on Windows.

The version of VTK is included in ParaView.

Product	KERNEL	GUI	GEOM	SHAPER	SMESH	FIELDS	YACS	PARAVIS	HOMARD	HEXABLOCK	JOBMANAGER	NETGENPLUGIN	GHS3DPPLUGIN	BLSURFPPLUGIN	HexoticPLUGIN	HEXABLOCKPLUGIN	HYBRIDPLUGIN	GMSHPLUGIN	ADAO	EFICAS
Qt		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sip		X																		
Pyqt	X	X			X	X		X											X	X
Boost	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Swig	X	X	X	X	X	X	X		X	X										
OCCT		X	X	X	X				X	X		X	X	X	X	X	X	X		
Qwt		X			X															
Omniorb	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Omniorbpy	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hdf5	X	X			X															
Med					X	X		X	X											
Vtk ³		X	X		X	X		X		X		X	X	X	X	X	X	X		
Numpy		X			X	X		X	X										X	
Scipy																			X	
Graphviz	X	X	X	X	X	X	X					X	X	X	X		X	X		
Doxygen	X	X	X	X	X	X	X					X	X	X	X	X	X	X		
Netgen												X								
Metis						X														
Scotch						X														
Libxml2	X	X		X		X	X													
MeshGems													X	X	X		X			
Sphinx	X	X		X	X	X	X	X	X	X	X								X	X
Libbatch	X																			
Cgns					X															
Paraview		X				X		X												
Psutil	X																			
Gmsh																		X		
Planegcs				X																
Pillow						X														
Nlopt																			X	
Eficas (tool)																			X	X

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.
C3po		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.
Gdal	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	Sphinx	Not used directly.
Matplotlib	ParaView	Optional. Not used directly.
Mesa	Visualization subsystem.	Optional. Not used directly.
Mpi4py		Not used directly.
Netcdf	ParaView, Gdal	Optional. Not used directly.
Nose		Not used directly.
Numpydoc		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.
Persalys		Not used directly.
Petsc	Solverlab	Not used directly.
Pip	Python extra packages	Optional. Not used directly.
Pthreads	OmniORB, and other	Not used directly.

Product	Required by	Comment
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.
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-inlt	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.
Zeromq		Not used directly.
Zlib	Hdf5	Not used directly.
FMIlibrary	OpenTurns	Optional.
Pandas	OpenTurns	Optional.
Patsy	OpenTurns	Optional.
PyFMI	OpenTurns	Optional.
Statsmodels	OpenTurns	Optional.

SALOME depends upon several products for runtime 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 products².

² Some optional pre-requisite products are not listed.

Software Requirements

Product	Compilation and Development		Execution		Remarks
	Mandatory	Optional	Mandatory	Optional	
Gcc	X		X		C++14 support is needed
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 options used, can be mandatory for BLSURFPLUGIN, GHS3DPLUGIN, HexoticPLUGIN, HYBRIDPLUGIN. Runtime: mandatory for BLSURFPLUGIN, GHS3DPLUGIN, 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
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		
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		
Rapidjson		X		X	Required by OCCT to export to glTF format
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 8, it is necessary to install devtoolset-11 package.

• HOW TO GET THE VERSION AND PRE-REQUISITES

Sources of SALOME 9.16.0 can be retrieved from the Git repositories using V9_16_0 tag; the complete list of repositories can be found at <https://github.com/SalomePlatform>.

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 9.16.0 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

- 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
```

- ParaVis and Mesh modules work unstably using a remote connection. You can use VirtualGL to benefit from the remote graphic card (launch `vglrun salome`), or use `mesa_salome` to bypass the graphic card (but it is slower). For ParaVis, you can also launch `pvserver` in the remote desktop and connect to it from your local computer. Finally, clusters often provide their own solution to access visualization nodes for remote post-processing. Ask the cluster's support for dedicated information.
- 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 unstable. 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 (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).
- 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` (Windows) or `mesa_salome` (Linux) to launch SALOME.
- For Windows 11 operating system, the Microsoft Visual C++ Redistributable for Visual Studio 2019 is required. It can be downloaded from the official Microsoft site:

<https://learn.microsoft.com/en-us/cpp/windows/latest-supported-vc-redist?view=msvc-160>

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

- Because of the known 8192 characters command line limit, On Windows, the installation directory should be as short as possible, e.g. `C:\SALOME-9.16.0`. On Linux and Windows, the installation folder should not contain space or special character.
- 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 this problem, we suggest installing latest version of Firefox, or using another browser (e.g. Chrome) as the default one.

- Users can experience problems 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 Linux distributions, so if you experience this problem, just install the corresponding package. For example, on Debian or Ubuntu:

```
$ apt install python-is-python3
```

If you cannot 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:

```
$ source ./env_launch.sh
$ salome
```

- b) Generate a bash script and use it to start SALOME:

```
$ ./install_bin.sh
$ sat launcher SALOME-9.16.0 --exe runSalome.py -n salome.sh
$ salome.sh
```

- There is a known issue with saving / loading large size studies. The issue is caused by SALOME architecture and CORBA used as the transport between components. CORBA has 2 GB data transfer limits, so one may experience this issue with saving / loading big studies in default mode. This size limit can be partially bypassed by using “multi-file” save-mode.
- SALOME version 9.7 introduced a “Session Less” mode allowing 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 some Linux flavors, users can experience issue displaying SALOME icons, due to a bad default Qt theme. The issue can be resolved as follows:

```
$ dnf install qt5ct
$ export QT_QPA_PLATFORMTHEME=qt5ct
$ qt5ct
```

Then, in qt5ct interface, choose "Fusion" instead of "Adwaita" or "Breeze" that are causing some issues.

To launch SALOME with the selected theme:

```
$ export QT_QPA_PLATFORMTHEME=qt5ct
$ salome
```

- Loading an HDF file containing a **SHAPER** geometry with groups generated using filters might introduce significant slowdowns if the number of elements in the group is important. This bug has been resolved, and the solution will be available in the next version of SALOME.