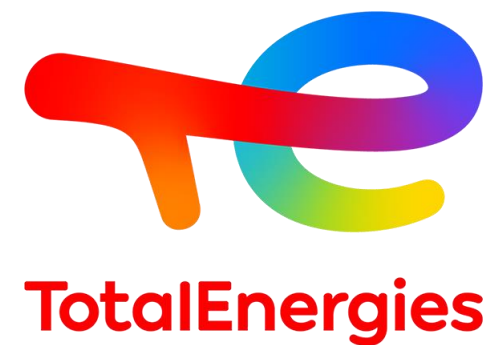
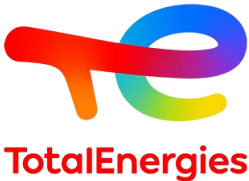




GEOS Python tools: Current status and Proposal for new organisation

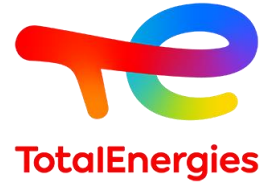
Martin Lemay, Margaux Ragueneil

Current status of TotalEnergies internal tools



	geostk	Geos-Preprocess	Geos-TRAME	Geos-Postprocess
Description	Visualisation of xml objects (wells, boxes, mesh)	Pre-processing tools of input mesh	Edition+Visualisation of GEOS inputs	Post-processing tools + Output Visualization
Python version	3.10	3.9	3.10	3.9
Documentation				
Unit Tests				
Packaged				
Dependencies	 pyVista		 vtk numpy/scipy/pandas pyVista Trame	
		ParaView		pyVista ParaView

TotalEnergies code sharing



Objectives:

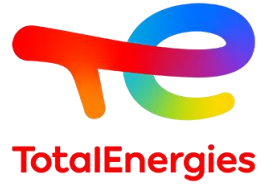
- Whole GEOS community will benefit from internal tools
- Avoid duplicated features
- Mutualize resources to keep developing these tools

Issues

- Duplicated fonctionnalités with current code from GeosPythonPackages (e.g., Makutu code sharing #47 and #52)
- Need the tools to be used either through Paraview or Applications (e.g., Mesh-doctor #16)

=> Need a reorganization of GeosPythonPackages project

Project new organisation – Example with mesh-doctor

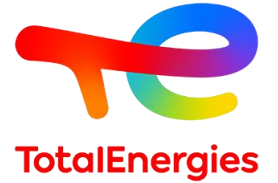


mesh-doctor is a set of python scripts to either check mesh geometry or process meshes

Issues:

- Users do not know where mesh-doctor is in the repository
- Need to integrate mesh-doctor in PV (PR #16)

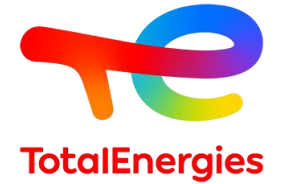
Project new organisation – Example with mesh-doctor



Solutions:

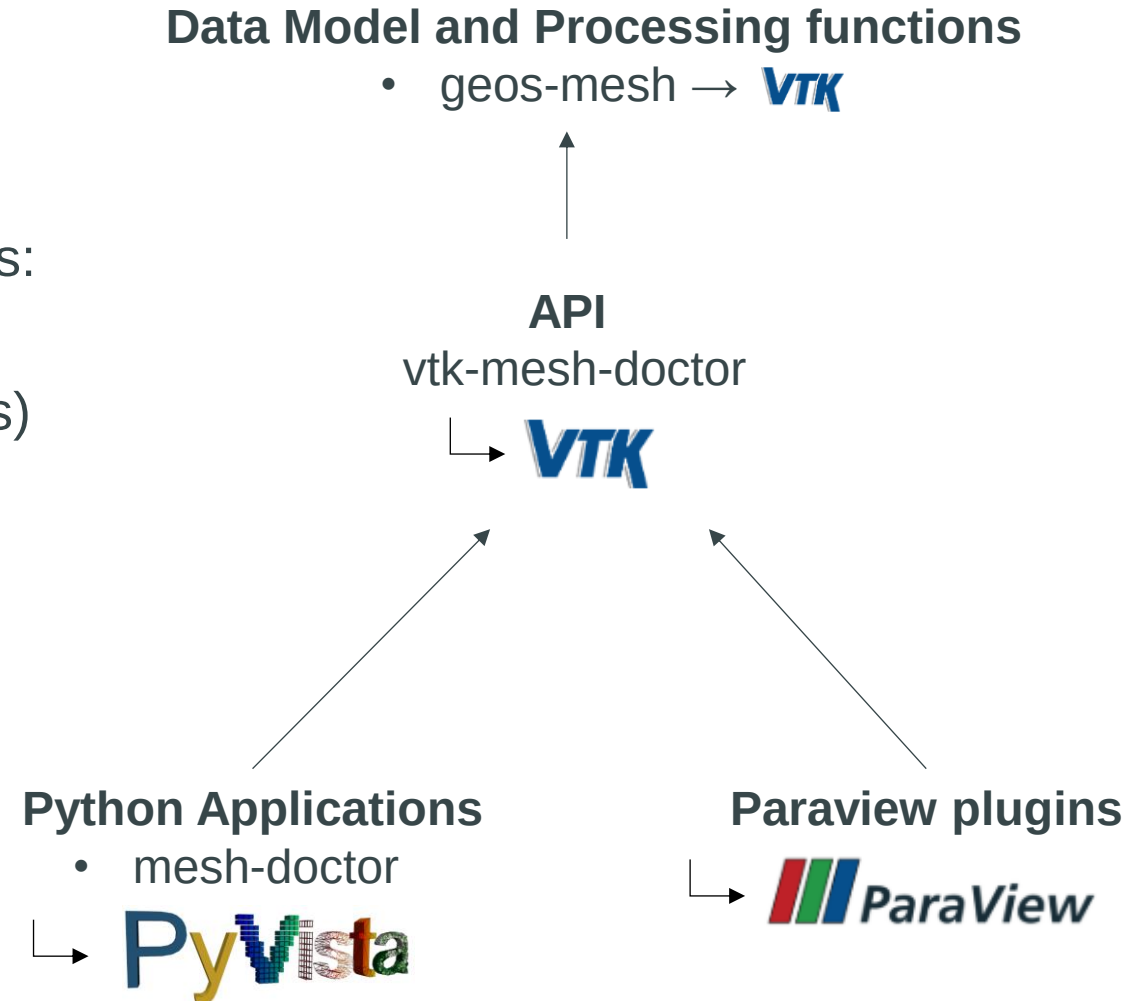
- Use mesh-doctor scripts in Paraview:
 - Complex call of mesh-doctor scripts through Paraview
 - Introduce dependency to pyVista (not recommended)
- Create Paraview plugins to do what mesh-doctor does:
 - Duplicate workflows

Project new organisation – Example with mesh-doctor

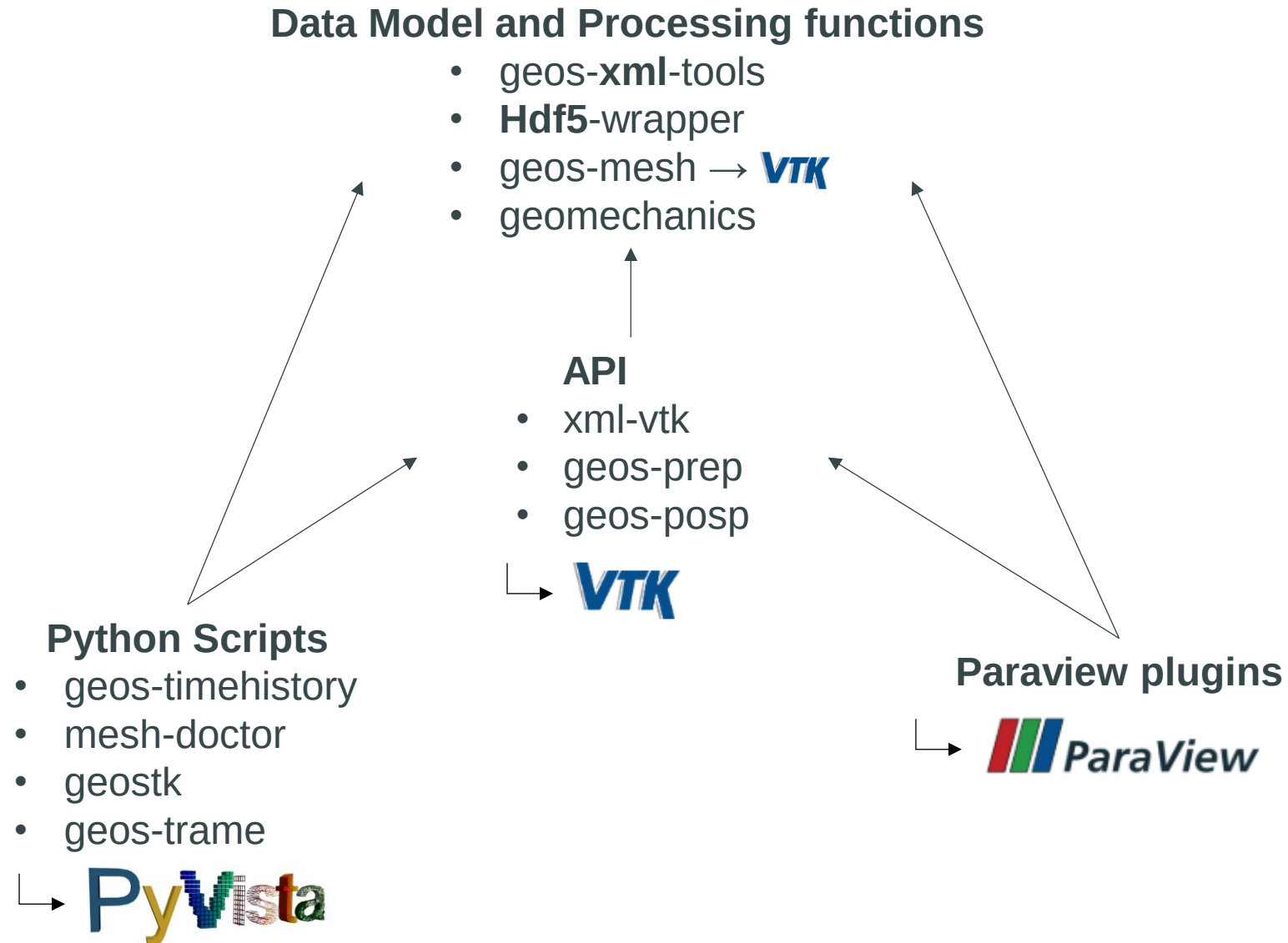


Solutions:

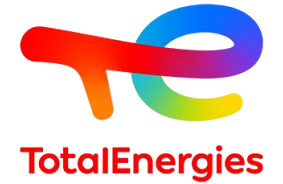
- Use mesh-doctor scripts in Paraview:
 - Complex call of mesh-doctor scripts through Paraview
 - Introduce dependency to pyVista (not recommended)
- Create Paraview plugins to do what mesh-doctor does:
 - Duplicate workflows
- Create an API for each mesh-doctor feature (vtk filters)
 - No code duplication
 - Better package dependency management



Project new organisation – Generalisation



Proposed organization in Python Packages repo



CusiniM feat: Add script to process IntegratedTests failures to geos_at. (#53) cf02eb4 · last week 81 Commits

- .github
- docs
- geos-ats
- geos-mesh
- geos-xml-tools
- hdf5-wrapper
- pygeos-tools
- geos-posp
- geos-prep
- xml-vtk
- geos-xml-viewer
- geos-trame
- geos-timehistory
- mesh-doctor
- geos-pv
- .gitignore
- .readthedocs.yml

tools

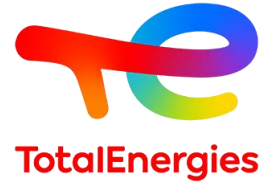
Vtk filters

Applications

ParaView plugins

Hierarchisation of the project?

Proposed organization in Python Packages repo

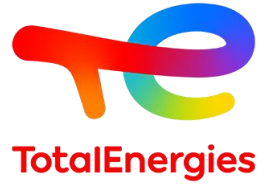


CusiniM feat: Add script to process IntegratedTests failures to geos_at. (#53) cf02eb4 · last week 81 Commits

- .github
- docs
- geos-ats
- pygeos-tools
- geos-toolkit
 - geos-xml-tools
 - hdf5-wrapper
 - geos-mesh
 - geomechanics
- vtk-filters
 - geos-posp
 - geos-prep
 - xml-vtk

- applications
 - geos-xml-viewer
 - geos-trame
 - mesh-doctor
 - geos-timehistory
- geos-pv
 - .gitignore
 - .readthedocs.yml

Work to do and timeline



Feb 2025

- Create packages with current TotalEnergies code

Dec 2025

- Integrate new projects into geosPythonPackage ci/cd
- Refactoring of TotalEnergies code with project packages

- Refactoring of current codes to vtk filters + PV plugins / python applications
 - geos-mesh + mesh-doctor + geos-pv
 - I/O
 - Stats => no mesh modification
 - Process => output mesh different from input mesh (Geometry / Attributes)
 - Geos-xml-tools + xml-vtk + geos-xml-viewer + geos-pv
 - From xml to mesh: visualization of xml elements (ex: boxes, wells)
 - From mesh to xml: write pieces of Geos xml from mesh operations (ex: box / well + perforation coordinates)