THPDP050

Improving User Experience and Performance in Sardana and Taurus: A Status Report and Roadmap

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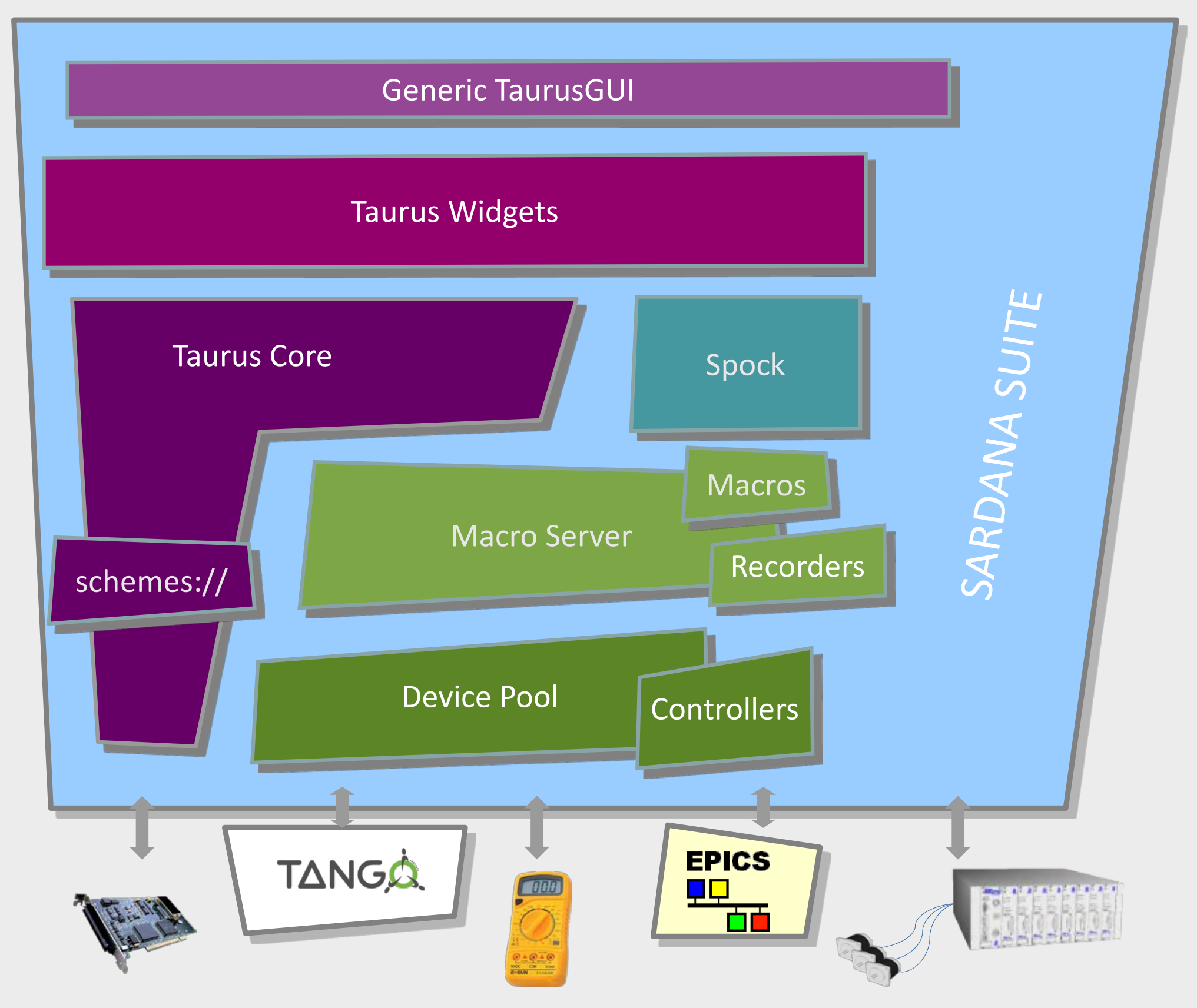
SARDANA – Scientific SCADA Suite

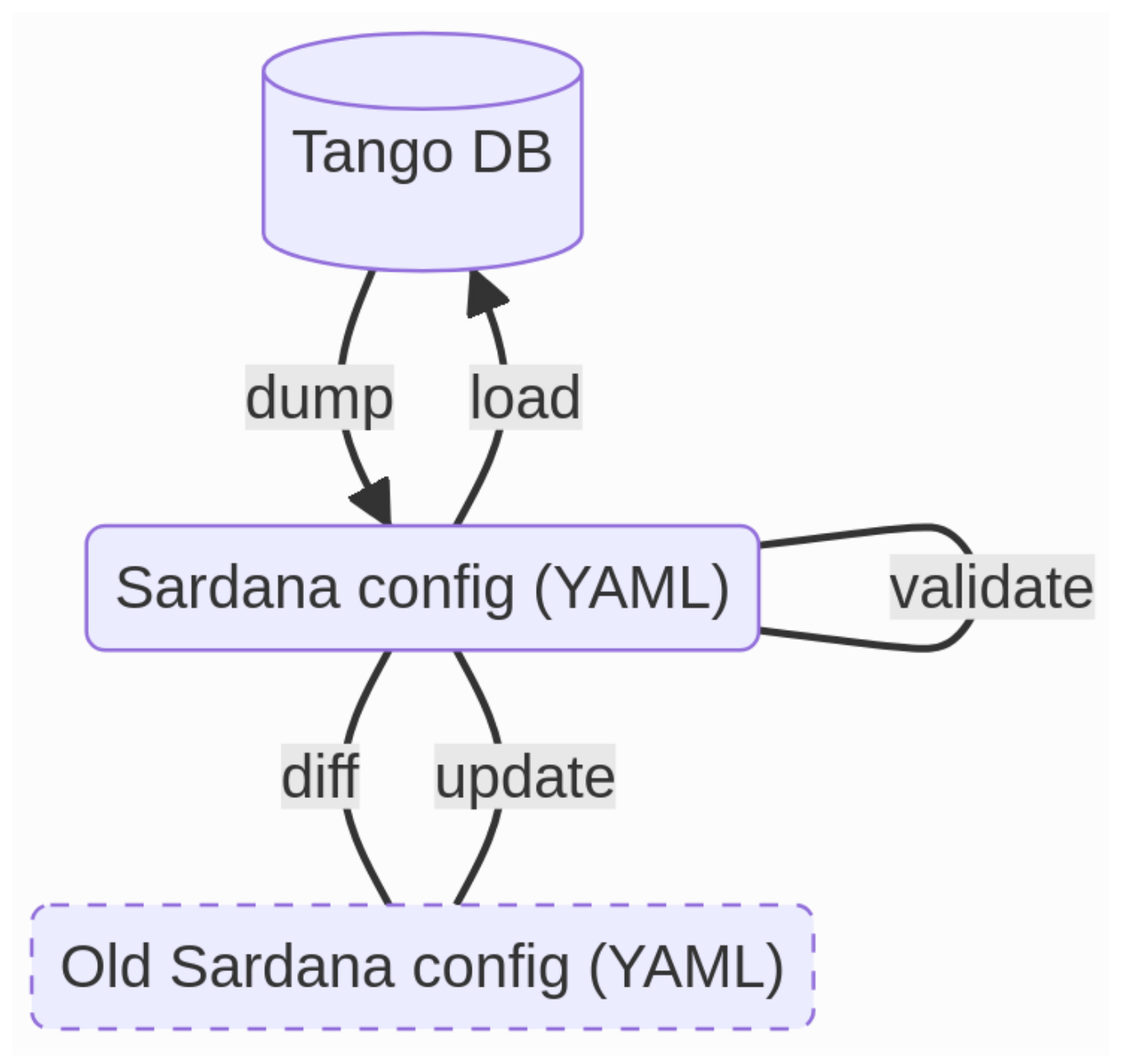


- Community-driven
- Widely used
- Production-ready
- Well supported
- Actively developed
- Free/Open Source
- Modular
- Multi-platform
- Easy to install
- Based on Python
- Built on top of TANGO

DEVELOPER EXPERIENCE

Configuration

- New YAML based format describes the whole Sardana system.
- CLI tools for load, dump, etc.
- Deleting Sardana elements at runtime now checks the existence of dependent elements.



Sardana CLI configuration tools

Programming interface

- Trigger/Gate Controller now supports multiplexor mode and gets synchronization description in *dial position units*.
- New Taurus multi-model API simplifies development of model *container* and model *composer* widgets.

```
class MyTriGaCtrl(TriggerGateController):

    [...]

    def SetAxisPar(self, axis, par, value):
        # set axis parameter: active_input
        [...]

    def SynchOne(self, axis, description):
        # description in dial position units

    [...]
```

Skeleton of the trigger/gate controller

Testing

- PyTest fixtures can be used for Sardana core and plugins testing without the need to worry about setup and teardown.

```
import pytest
from sardana import State

ctrl_mark = pytest.mark.kwargs({
    "motctrl01": {
        "klass": "MyMotorController",
        "library": "MyMotorCtrl.py"
     }
})

pytestmark = [ctrl_mark]

def test_get_state(mot01):
    assert mot01.state == State.On
```

Test of controllers StateOne() method

Continuous Integration

- Docker images are now based on micromamba: support multiple python versions, are more modular, occupy less space and are easier to extend.
- CI now uses GitLab services.

Packaging

- PyPI and conda packages were split in several sub-packages.
- Now users can install only those dependencies which are needed.

Maintenance

- Both Sardana and Taurus code have been migrated to Python3.
- Taurus plotting widgets have been migrated from PyQwt5 to pyqtgraph.

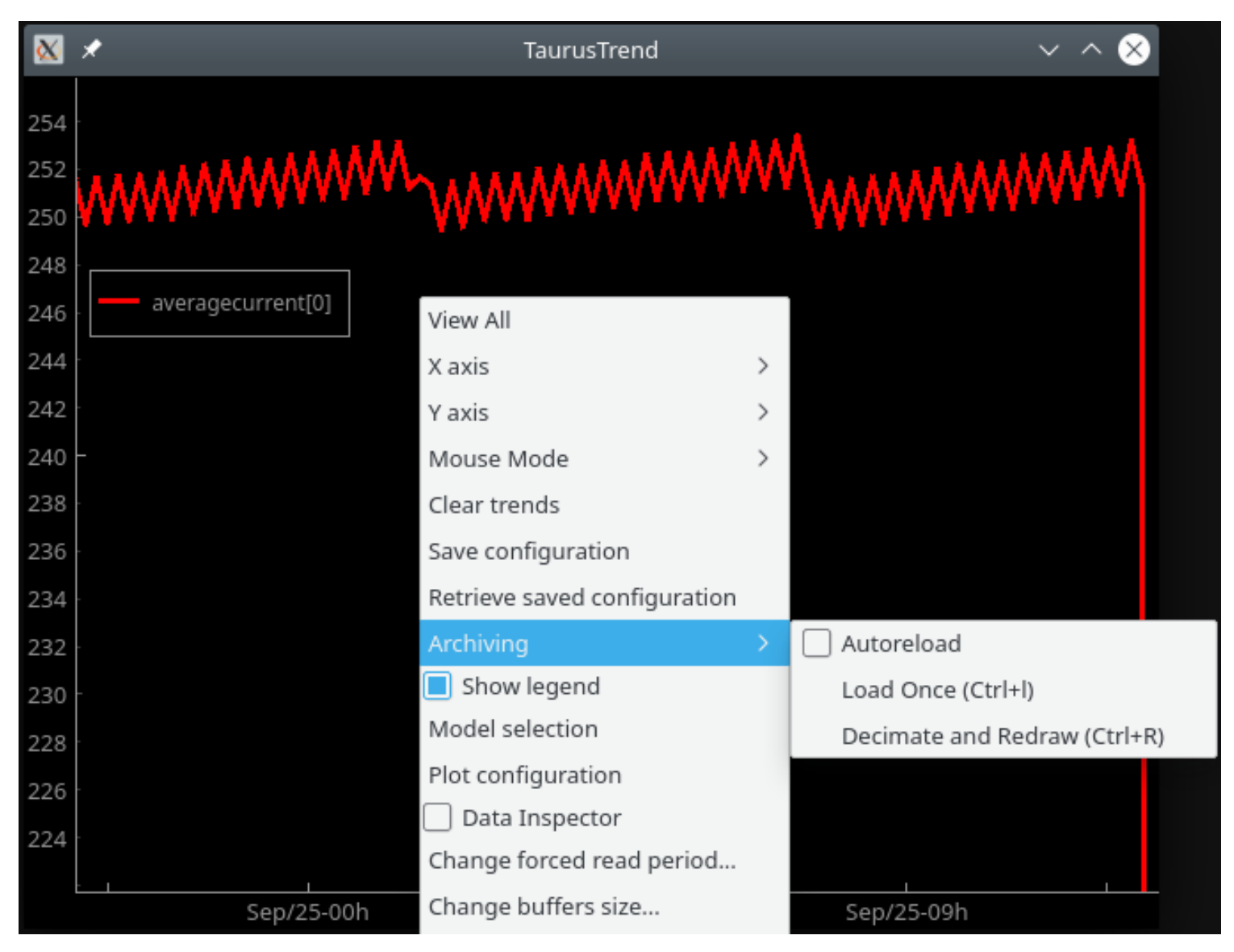
Type annotations

- Sardana automatically converted type information from docstrings into Python type hints.

USER EXPERIENCE

Trends with Live and Archived Data

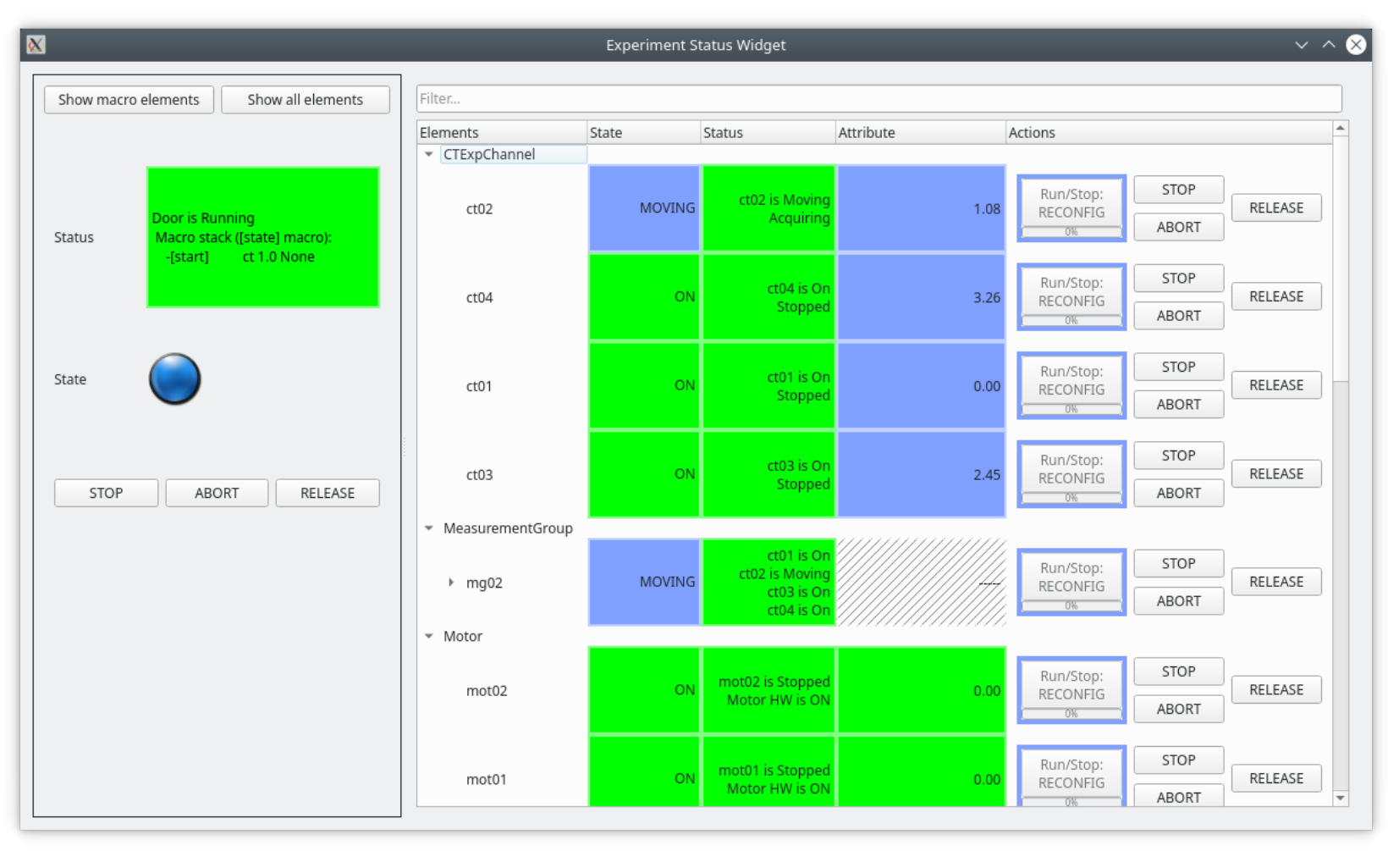
- Historical data is more accessible and insightful for users.
- At the same time the trend is continuously updated with new data being added.



TaurusTrend Widget showing archiving and live data

Debugging and Recovery

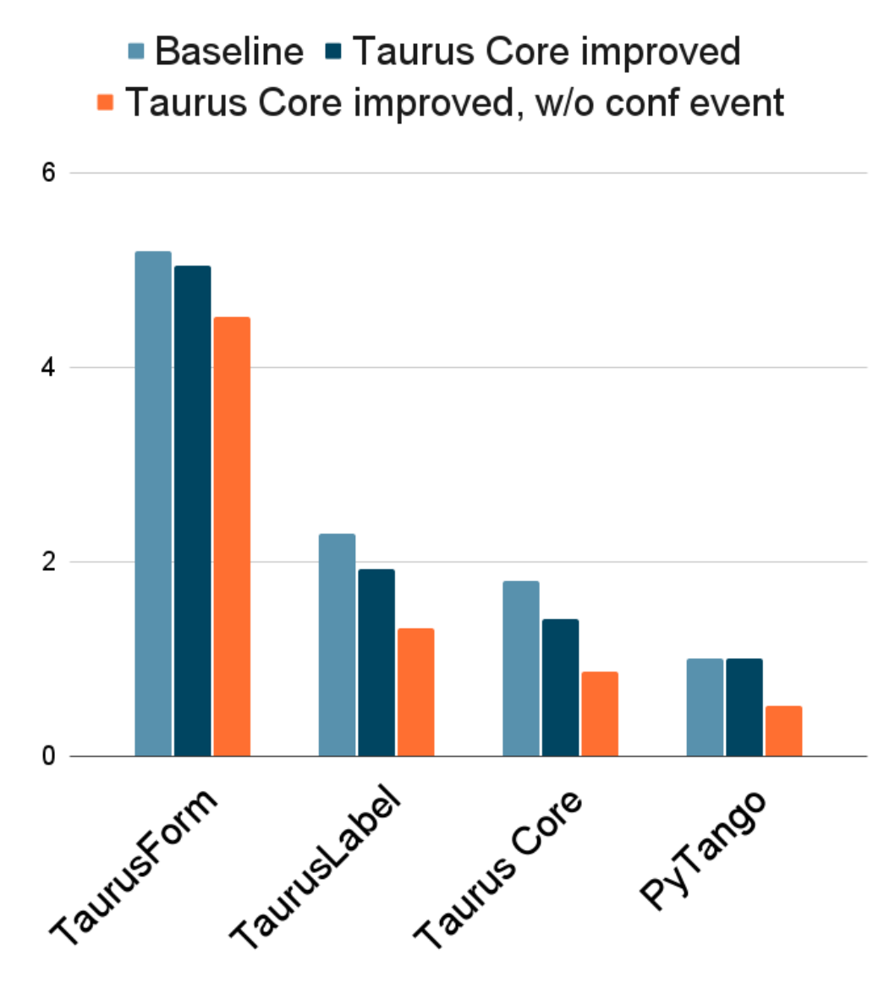
- GUI with real-time insights into the experiment status.
- Recovery of faulty elements with the *reconfig* functionality.



Experiment Status Widget

Taurus Performance Optimization

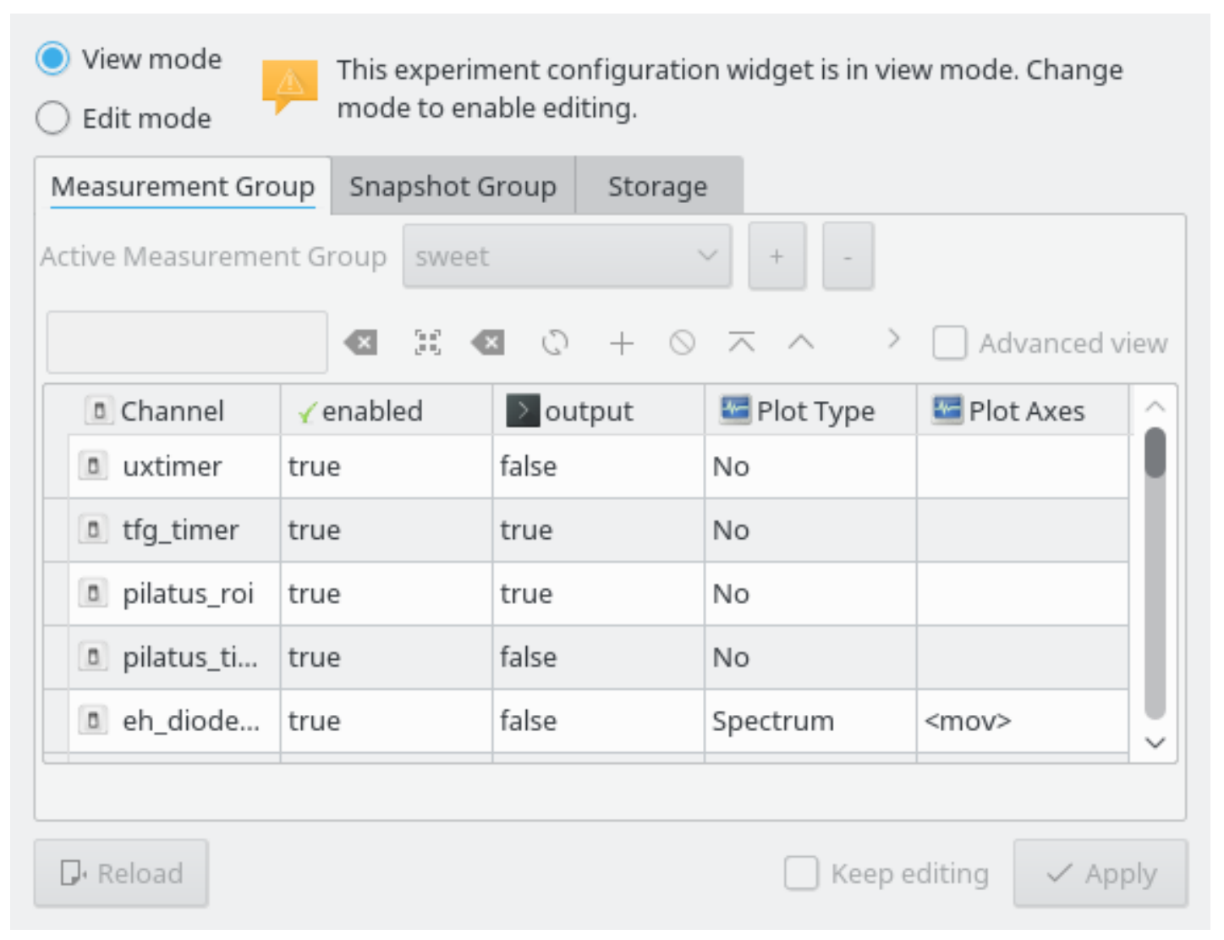
- Taurus Core's performance slows startup.
- Time profiling identified most critical issues.
- Optimization project is ongoing. Already reduced startup time up to ~50%.



Baseline measurement of relative startup times

Experiment Configuration

- Refined simple and advanced views.
- Introduced view and edit modes.
- New CLI version available.



This experiment configuration widget is in view mode. Change mode to enable editing.

Channel	enabled	output	Plot Type	Plot Axes
uxtimer	true	false	No	
tfg_timer	true	true	No	
pilatus_roi	true	true	No	
pilatus_ti...	true	false	No	
eh_diode...	true	false	Spectrum	<mov>

Experiment Configuration Widget

Documentation

- Added "What's new?" – CHANGELOG written in user friendly language.
- Started embedding video demos with short tutorials.

CLI

- Clearer and more accessible central point of access with single script with sub-commands.

ROADMAP

- Configuration: add support to environment and multiple files.
- Continuous scans:
  - Refactor Macro API for more flexible development of scans.
  - Add support for multiple synchronization descriptions.
  - Publication of data to an in-memory database.
- Reorganize documentation and provide tutorials for users.
- Further reliability and recovery improvements.
- Adapt Taurus to PyQt6.

MORE INFO

- `https://sardana-controls.org`
- `https://taurus-scada.org`

Acronyms and abbreviations
API – Application Programming Interface **GUI** – Graphical User Interface, **CLI** – Command Line Interface

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