ALBA-MXCuBE status

MXCuBE and EDNA integration @ XALOC

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MXCuBE meeting, 27-30th June 2016, Hamburg (DESY)

Integration of MXCuBE 2 @ ALBA

Xaloc Beamline (BL-13)

- Fully operative beamline: **SARDANA** + **TAURUS** Control System.
- Beamline responsible: Mr. Roeland Boer.

- ***NEW Microfocus Beamline for Protein Crystallography (XAIRA).***
- Beamline responsible: Mr. Jordi Juanhuix.
- Phase III beamline: Project already started, operation in 2020.

Integration of MXCuBE 2 @ ALBA

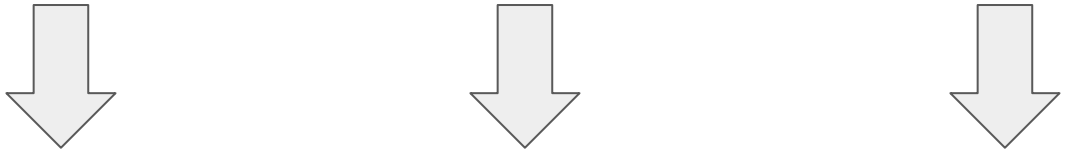
Current status

- Under development for XALOC Beamline (BL13) @ ALBA.
- Basic operations available (centering, autofocus, etc…)
- Early stage on the Qt4 implementation (*Qt3->Qt4 overhead*).
- *Limited access* for development due to beamline in fully operation.

we were:

Developing on branch 2.1	Qt3 Graphical Interface	EDNA @ workstation

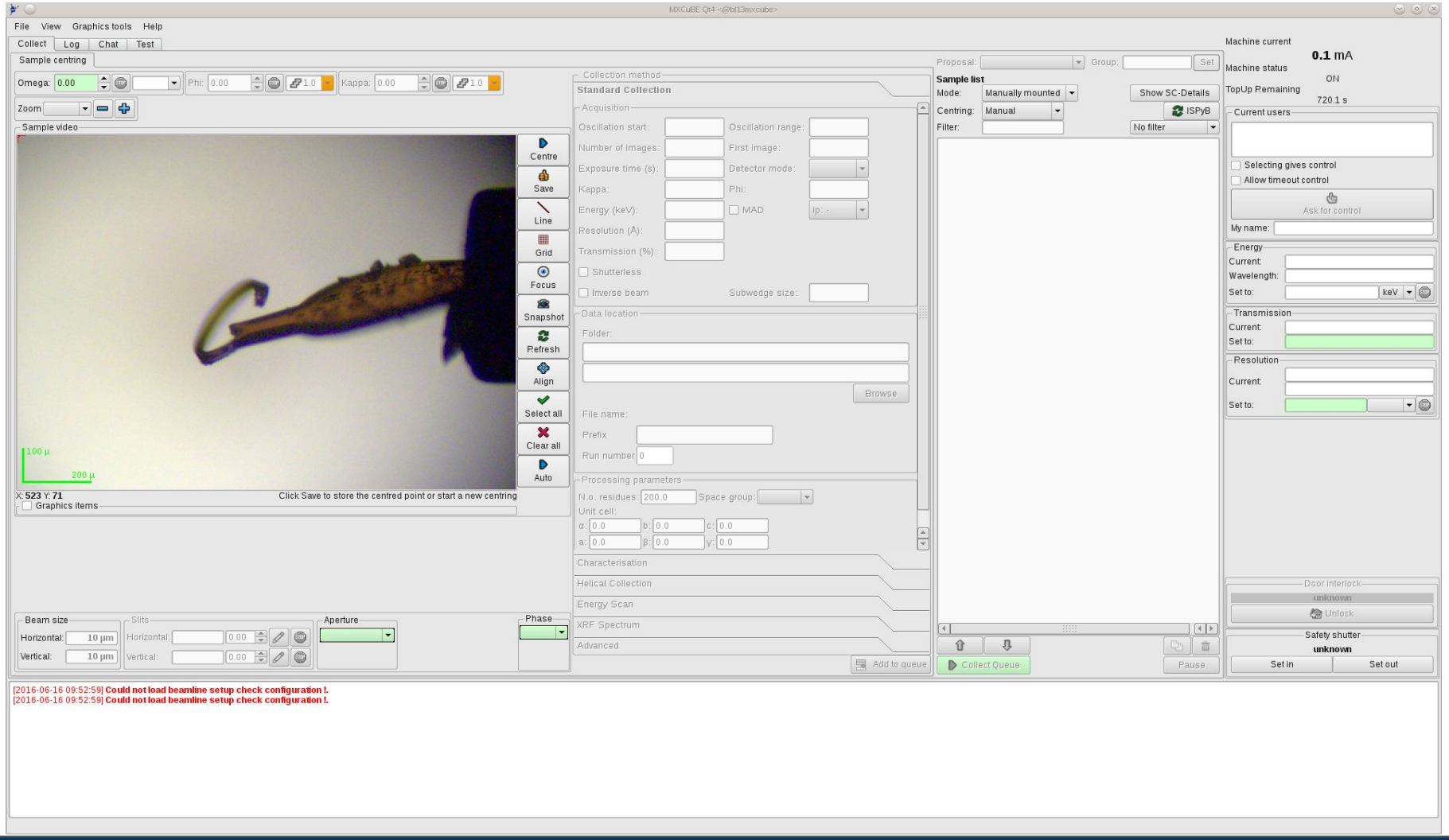
we are:



Developing on branch 2.2 (stable)	Qt4 Graphical Interface	EDNA @ cluster

Integration of MXCuBE 2 @ ALBA

XALOC: Current status



Qt4 Graphical Interface

General: Camera in Qt4 (PR # 74 to branch 2.2)

- Modifications to the **Qt4_LimaVideo.py** HwObj to provide support for Basler cameras *via* **LImA** library.
- Supported pixel types:
  - *YUV 422 packed* (Color)
  - *Y8* (Black and White)
- The implementation is **QUB** independent.
- Depends on **OpenCV** library python interface.
- Easily extensible to other pixel formats.

configuration:

```
<device class="Qt4_LimaVideo">
   <type>basler</type>
   <address>84.89.227.72</address>
   <encoding>yuv422p</encoding>
   <gain>0.3</gain>
   <exposure>0.01</exposure>
   <interval>30</interval>
</device>
```

Qt4 Graphical Interface

ALBA Specific: Xaloc Hardware Objects (PR # 73 to branch 2.2)

- The parent class of (ALBA specific) **XalocMinidiff** HwObj has been changed from **MiniDiff** to **GenericDiffractometer** class.
- Hutch menu brick works fine: Centering routines, focus (sardana macro), snapshot, etc...
- ...**BUT** we still using the old centering routines module.

- Overhead: We had the need to adapt some HardwareObjects which were already running for Qt3 version: MachineInfo, SafetyShutter, Beamstop, etc...

EDNA plugins

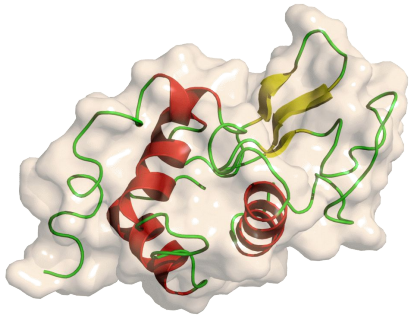
Strategy & Fast autoproc plugins

- **EDNA Strategy: EDPluginControlInterfaceToMXCuBEv1_3**
  - Already in production (Tango EDNA server).
  - Running on workstation (8 cores) Intel(R) Xeon(R) CPU E31275 @ 3.40 GHz.

- **EDNA Fast Autoproc plugin: EDPluginControlAutoprocv1_0**
  - Testing @ Cluster (direct batch queue).
  - Running on a HPC node (16 cores)Intel(R) Xeon(R) CPU E5-2650 v2 @ 2.60GHz

EDNA performance

Strategy & Fast autoproc plugins

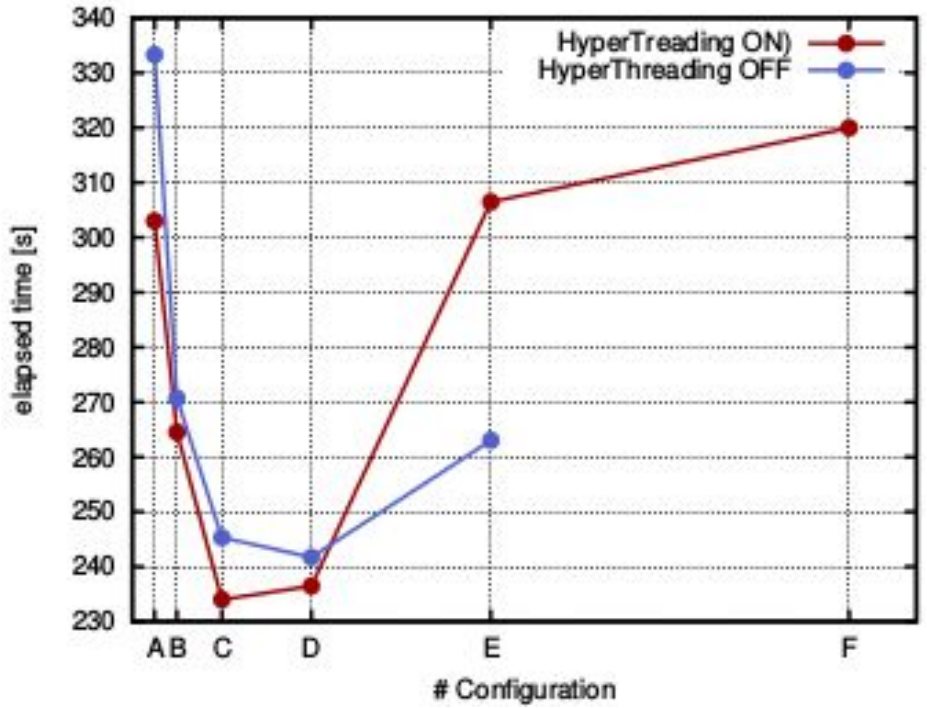


- Lysozyme (1800 images set)

Cluster geometry for XDS
http://xds.mpimf-heidelberg.mpg.de/html_doc/xds_parameters.html

config	# procs	# jobs
A	1	32
B	2	16
C	**4**	**8**
D	**8**	**4**
E	16	2
F	32	1

JOBS: independent subprocesses
PROCS: parallel OpenMP



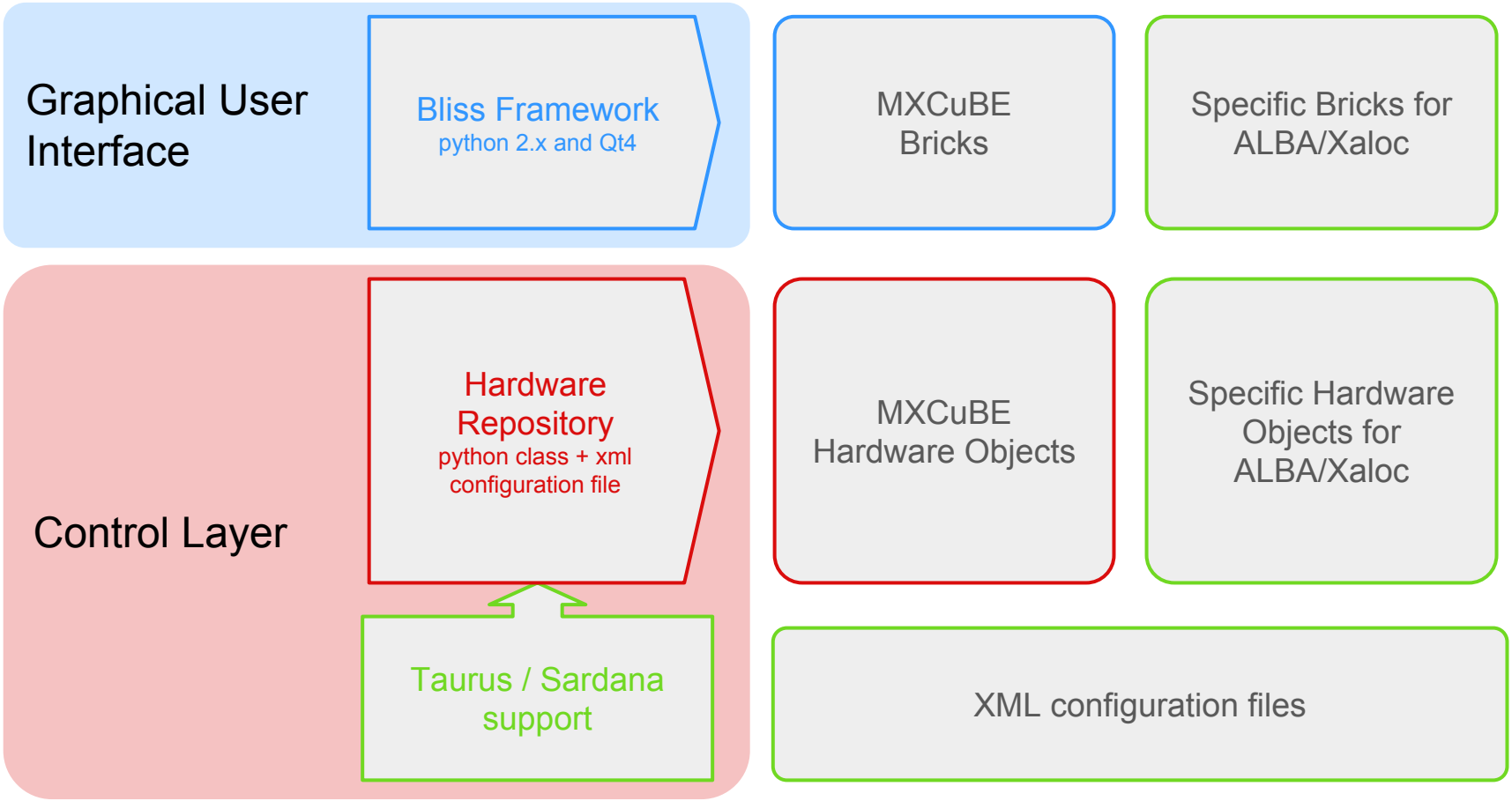
Thank you for your attention

MXCuBE 2 @ ALBA

Based on SARDANA & TAURUS Control System

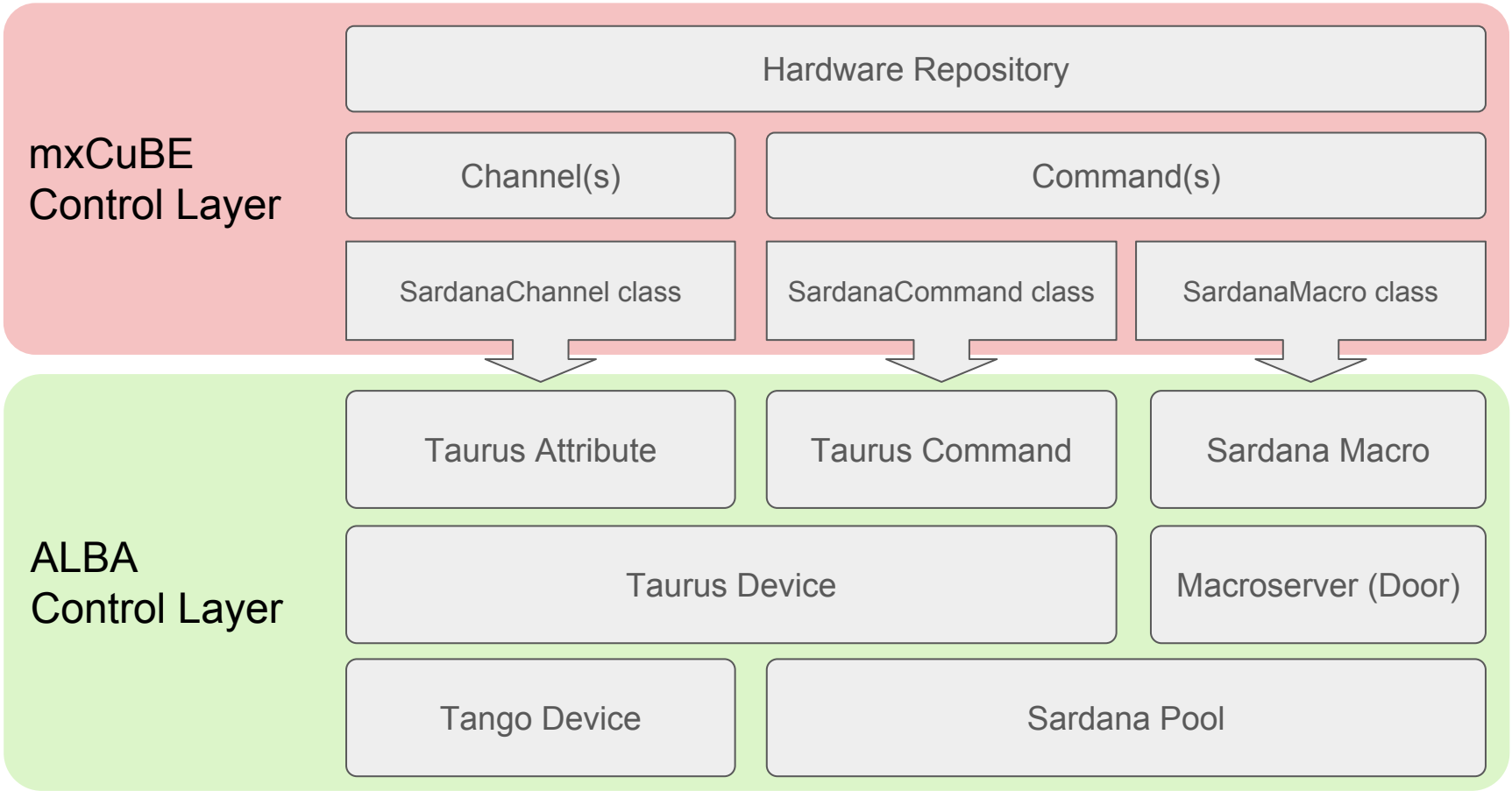
Integration of MXCuBE 2 @ ALBA

Over Sardana Control layer



Integration of MXCuBE 2 @ ALBA

Sardana Support for Hardware Repository (V. Rey)



*Imlemented by V. Rey in *CommandContainer.py* and *Sardana.py* files from Hardware Repository (ALBA branch @ github)

Integration of MXCuBE 2 @ ALBA

Sardana Support for Hardware Repository

Hardware Object configuration (Sardana Layer):

```
<object class="SardanaXfeSpectrum">
  <doorname>door/mxcube/1</doorname>
  <command type="sardana" name="configure">senv ActiveMntGrp mg_fluodet</command>
  <command type="sardana" name="acquire">ct %s</command>
  <channel type="sardana" taurusname="fluodet_timer" name="spectro">spectrum</channel>
</object>
```

macro name

taurus device name

attribute name

Integration of MXCuBE 2 @ ALBA

Sardana Support for Hardware Repository

Sardana Motor:

Position and State (channels) and Stop (command) are defined by default...

```
<device class="SardanaMotor">
  <username>Omega Z</username>
  <taurusname>omegaz</taurusname>
</device>
```

...even they can specified in the configuration file:

```
<device class="SardanaMotor">
  <username>Omega Z</username>
  <taurusname>omegaz</taurusname>
  <channel type="sardana" polling="events" name="position">Position</channel>
  <channel type="sardana" polling="events" name="state">State</channel>
  <command type="sardana" name="stop">Stop</command>
</device>
```

Integration of MXCuBE 2 (Qt4) @ ALBA

Evolution of MXCuBE & EDNA implementation @ ALBA

Bessy (June 2015)

ALBA (December 2015)

DESY (June 2016)