Current developments and future perspectives of beamline control environment MXCuBE Qt

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Content

- MXCuBE collaboration
- European Molecular Biology Laboratory and MX beamlines
- MXCuBE Qt frontend
- Future perspectives
MXCuBE collaboration

- Initially developed by ESRF
- Currently supported by 8 members
- More than 20 beamlines currently uses MXCuBE
- Several prospective members
- Steering, scientific and developers committees
- Monthly developers meetings
- Two full committee meetings per year
MXCuBE structure

**mxcubeqt**

**mxcubecore**

**mxcubeweb**

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Beamline control system
EPICS, TANGO, TINE, …
MXCuBE core

- Individual configurable python classes defines beamline equipment and procedures.
- Beamline object defines basic set of python objects and provides an unified api to the gui.
- Default values and limits of data collection parameters defined via “beamline” configuration.
- Abstract classes forces to implement methods required by api.
- Extensive set of mockup classes.
- Functional tests and continues integration.

mxcube

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<th>beamline object</th>
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EMBLDetector

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MXCuBE frontend

Qt

Web
MXCuBE Qt

- 2005 - Python Qt3 based on the BlissFramework (internal ESRF development)
- 2012 - introducing gevent
- 2012 - MXCuBE 2: abstract and mockup classes, sample live view
- 2014 - Porting to Qt4/5, PySide
- 2015 - Qt4 version deployed at EMBL-HH
- 2016 - No Qt3 support.
- 2018 - repository clean up and python3 support
- 2019 - api, unit tests and continuous integration
- 2020 - project refactoring
- 2021 - mxcubecore, mxcubeqt and mxcubeweb
Variable beam size and high flux
Tunable energy between 4.5 and 17.5 KeV
MD2 diffractometer (Arinax)
Pilatus6MF (Dectris)
Marvin sample changer (EMBL Hamburg)

Micro-beam conditions with 5 x 5 micron beam
Tunable energy and CRLs (ESRF/CINEL)
MD3 diffractometer (Arinax)
Eiger16M (Dectris)
Marvin sample changer (EMBL Hamburg) and plate scanning

Time resolved pumb/probe experiments
Beam shaping unit (Arinax)
Compound reflective lenses CRLs
Eiger4M (Dectris)
Beam characteristics
Mesh and collect
Serial crystallography

Phase contrast xray imaging

Future perspectives

- DataPublisher
- Extended and configurable queue and tasks
- State persistence and message broker (apache airflow, kafka, redis)
- Not just MX
Thank you for your attention