The first version was deployed at the ESRF in 2005
Soon after followed by installation/adaptation to other soon-to-be partners
In 2012 the collaboration is established between

- In 2013 the deployment of **MXCuBE2** at ESRF and soon after at the other sites
- In 2014 two new partners join the collaboration

- In 2016 MAXIV and ESRF start working on the new GUI **MXCuBE3**

- In 2018 **MXCuBE3** is being deployed
- Two new partners are in the process of joining the collaboration
• MXCuBE2 introduced a decoupling of interface and an abstraction layer to boost collaboration

• A GUI independent of the control system

• Data collection methods, on sample tools (points, grid, lines) and a door for external descriptors

• An abstraction layer to ease compatibility and deployment at any site

<table>
<thead>
<tr>
<th>Graphical User Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Abstraction Layer</td>
</tr>
<tr>
<td>Beamline abstraction layer (Hardware Objects)</td>
</tr>
<tr>
<td>Hardware access layer (Control system)</td>
</tr>
</tbody>
</table>
MXCuBE2 was explicitly designed for:

- High-throughput data collection
- Hands-off data collection
- Perform more elaborated data collection for complex experiments
- Adaptable to any hardware environment
- Scalable with time

- But the MXCuBE collaboration eventually became not just MXCuBE
- But it stimulates and facilitates collaboration and sharing on EDNA, Workflows, Device servers (CATS), kappa goniometers, automatic centring libraries, autoprocessing pipelines, …
MXCuBE2 works by sample:position:data collection.
Any arbitrary combination is possible.
BUT IN THE MEANIME

• Sample changers got larger capacity
• Data collection got faster and faster
• And experiment sessions shorter
• More demand for Remote Access
• Synergy with LIMS got stronger
• Novel data collection methods need to be implemented

• In other words: MXCuBE2 GUI had to be improved and evolve!
• We prepared a survey for the user community to understand (or confirm)
• What users like of MXCuBE2, and what they would improve
• What are their working protocols
• And use the outcome as inspiration for a new GUI
• In close collaboration with MAXIV we started the MXCuBE3 project
• Design a new GUI, with minimal adaptation to the other parts
• This ensures back-compatibility and facilitates transition to the new interface to every partner

• Qt3 was becoming obsolete
• Design the new interface in web technology: MXCuBE3 as a web app!
• The advantages of a web application:
  • Remote by design
  • No need to install extra software but a recent browser
  • Large developer community
  • Use of modern Library developed and maintained by large IT companies
  • Faster to modify, test, maintain
  • See Marcus’ talk for technical details
• An overview on all the projects present in the sample changer robot, with smart filtering and sorting
• Synchronized with ISPyB
• A Data collection view, with interactive operation on the crystal
• Only pertinent options presented to users (if a mesh only mesh data collection types, if a line helical data collections are proposed, etc)
Interleave
Mesh
A docker image is available here

https://hub.docker.com/r/oscarssso/mxcube3_debian9/

Install and start docker

follow the instruction in the page above

I have tested successfully in windows (where command should be given in powershell), Linux, and others on MacOS
DEPLOYMENT PLAN

- ID29 now
- ID23-2 and MASSIF-1
- ID30B and MASSIF-3
- ID23-1
• The MXCuBE Collaboration
• The ESRF Structural Biology Group
• The ESRF Beamline Control Unit (M. Oscarsson, M.Guijarro, A.Beteva)
• MAXIV Biomax team