



Joint Meeting
Trieste 2018



MXCuBE3 – Installation and User Experience

Annie Heroux and Roberto Borghes

First MXCuBE3@ELETTRA installation

- ✓ MXCuBE3 installation started in late August 2017 (almost no scientific activity during holidays around here...)
- ✓ Step by step:
 1. Installed a CentOS7 x64 virtual machine (with Tango)
 2. Downloaded MXCuBE3 from GitHub repository
 3. Followed “Installation and testing” instructions (GitHub wiki)
 4. It did not work: installed missing python packages
 5. mxcube3-server started !
 6. Strong help needed for the npm part (thanks Emiliano)
 7. MXCuBE3 login page works... and now?



```

===== MXCuBE3 INSTALLATION on CentOS7 x64 =====
as root on porro
sudo yum install epel-release
sudo yum install -y gcc
sudo yum install -y gcc-c++ make
sudo yum install git
sudo yum install redis
sudo yum install python-pip

cd /opt
git clone https://github.com/mxcube/mxcube3.git --recursive
cd /opt/mxcube3

sudo pip install -r requirements.txt
sudo pip install event==1.1.2 redis flask flask-socketio==2.8 Flask-Session
sudo pip install mock pydispatch PyDispatcher
sudo pip install numpy pillow v4l2 jsonpickle

curl -sL https://rpm.nodesource.com/setup_0.x | sudo -E bash -
sudo yum install -y nodejs

ln -s /opt/mxcube3/mxcube3/HardwareRepository/HardwareObjects/ mxcube3/
python setup.py build
sudo python setup.py install

===== MXCuBE3 STARTUP SERVER =====

redis-server &

(Nota per monitorare l'attivita' di redis: 'redis-cli monitor')

Copio la directory di default test in ELETTRA
cp -r test ELETTRA

Questi due comandi di esecuzione lavorano in maniera diversa a seconda di come e' stata installata la libreria mxcube3
./mxcube3-server -r ELETTRA/HardwareObjectsMockup.xml --log-file mxcube3.log
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Note:
Sembra che tutti i files in ELETTRA/HardwareObjectsMockup.xml vengono caricati ed i relativi HardwareObjects sono di default in ./
HardwareRepository. Ci sono delle API particolari nell'HardwareObject per leggere la configurazione dal relativo XML, ad esempio:
- self.getProperty("image name")
oppure per postare un log message:
- logging.getLogger("HWR").info("initializing camera object")
- se mi collegio a localhost:8081 con il browser viene caricato il file ./mxcube3/routes/Main.py

===== MXCuBE3 STARTUP WEB CLIENT =====

npm install
npm install fabric
npm start

- se mi collegio a localhost:8090 con il browser... MAGIA!
- se utilizzo la login 'user' tutto sembra OK ma non appare nulla...

Per capirci qualcosa installo l'ambiente di sviluppo (webpack, babel,...)
sudo npm install webpack-dev-server -g
sudo npm install webpack-dev-server webpack babel-loader babel-core babel-preset-es2015 babel-polyfill

===== Consulenza di Emiliano (sulla macchina virtualBOX) =====

npm lavora con un file di configurazione nella directory corrente che e':
package.json
questo file contiene le dipendenze che devono essere installate ed anche gli scripts a disposizione, ad esempio quando si lancia
'npm start' la keyword 'start' automaticamente viene interpretata come "npm run dev", che a sua volta esegue la keyword custom 'dev'
interpretata come ".".

(Nota: Tutte le dipendenze si trovano nella cartella ./node_modules)

webpack-dev-server e' un'applicativo che compila un package JavaScript ed automaticamente implementa un HTML server per esportarlo.
Si basa su un file di configurazione che si chiama ./webpack.config.js. Nel file di configurazione ci sono diverse sezioni: "entry"
definisce il file .js o .jsx che rappresenta la root del progetto, "output" definisce la posizione dell'output della compilazione
del package, "devServer" definisce le caratteristiche per il server HTML.

Teoricamente il comando ./node_modules/.bin/webpack-dev-server dovrebbe compilare e lanciare il server ma in realta' non crea alcun
file di risultato. (da ricerca postuma di Emiliano webpack-dev-server si tiene il bundle in memoria e lo serve al percorso
specificato da publicPath, che attualmente dovrebbe essere una stringa vuota; PublicPath e' relativo al percorso specificato in
contentBase).

Per ottenere il package JavaScript compilato abbiamo dovuto eseguire ./node_modules/.bin/webpack

Per utilizzare il package appena compilato abbiamo dovuto modificare il file webpack.config.js sostituendo:
contentBase: path.join(__dirname, "mxcube3/ui")
  
```

Personal notes for a DIY approach:

- There is not so much documentation for developers
- The analysis of Python console errors is a good starting point for investigating the underlying architecture and object connections
- Use extensively “grep -r”: following log messages helps in discovering who is doing what
- The customization process should concern only the XML configuration files and the HardwareObjects, other stuff is part of the ‘core’
- An installation log file could be useful
- If you get stuck ask the MXCuBErs, they always help you



MXCuBE3@ELETTRA status

January 2018

- Login :

- still mockup

- Data Collection Tab:

- Machine Status (Tango)
- Beamline Valves and shutters (Tango)
- Detector Distance (Tango)
- Beamline Actions
- Energy
- Wavelength
- Resolution
- Transmission
- Cryo
- Flux

Diffractometer (MD2):

- Motors (Tango)
- Phase Control
- Aperture Control
- Lights (Tango)
- Zoom (Tango)
- Camera: MD2 JPG (Tango)
- 3 Click centring: MD2 command (Tango)
- Automatic centring

- Sample Changer Tab:

- XRD2 sample changer under development

- Sample Overview Tab:

- ISPyB: not yet installed
- Tab content synchronized with SampleChanger Tab Info
- Only Standard Data Collection
- Other Data Collection modes

September 2018

- Login :

- Rest authentication through ELETTRA VUO

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MXCuBE3@ELETTRA status

MxCuBE-3 Proposal: IDTEST000 - Mozilla Firefox

MxCuBE-3 Proposal: IDTEST X | annie.heroux@elettra.eu X | +

localhost:8090/datacollection

MXCuBE 3 | Sample Overview | **Data collection** | Sample Changer | System log | Help | RA | Sign out

Beamline Actions ▾

Energy: 13.4992 keV | Resolution: 1.528 Å | Transmission: 100.000 % | Cryo: 100.02 K
Wavelength: 0.9185 Å | Detector: 302.608 mm | Flux: 1331 ph/s

Sample change: LOADED | Safety Shutter: CLOSED | Fast Shutter: CLOSED | Beamstop: IN | Ring Current: 160.3 mA

Beam size: 100

Omega: 271.18 | 90 °

Kappa: -2 | 0.1 °

Phi: 55.22 | 0.1 °

Y: -1.835 | 0.1 mm

Z: -0.037 | 0.1 mm

Focus: -0.127 | 0.1 mm

Samp-X: 0.606 | 0.1 mm

Samp-Y: 1.216 | 0.1 mm

Snapshot | Draw grid | 3-click Centring | Focus | Zoom | Backlight | Frontlight | Video size

Point-4

50 µm

Run Queue | Finish | Settings ▾

Sample: CaBP101 - JNU11 | Queued Samples (0)

Point-1: Data Collection

Path: CaBP101_1_####.cbf

Start °	Osc. °	t(ms)	# Img	T (%)	Res. (Å)	E (KeV)	φ °	κ °
0.00	1.00	1.000	1	100.00	2.720	13.4991	57.21	-2.00

View Results in ISPyB

Point-1: Data Collection

Path: CaBP101_2_####.cbf

Start °	Osc. °	t(ms)	# Img	T (%)	Res. (Å)	E (KeV)	φ °	κ °
90.00	1.00	1.000	1	100.00	2.720	13.4991	57.21	-2.00

View Results in ISPyB

MXCuBE3@ELETTRA authentication

- ✓ ISPyB not yet available
- ✓ 1st stage: the user logs in using a dedicated interface to setup the current investigation (info from the VUO)
- ✓ 2nd stage: the user logs in MXCuBE3 and can select only the current investigation



User Login

Elettra Sincrotrone Trieste

Username
annie.heroux

Password

LOGOUT

Logged In

	Investigations
1	1111111
2	20180456
3	20180457
4	20180495
5	20180498

Active Investigation
20180457

New Start



MX³ MXCuBE 3

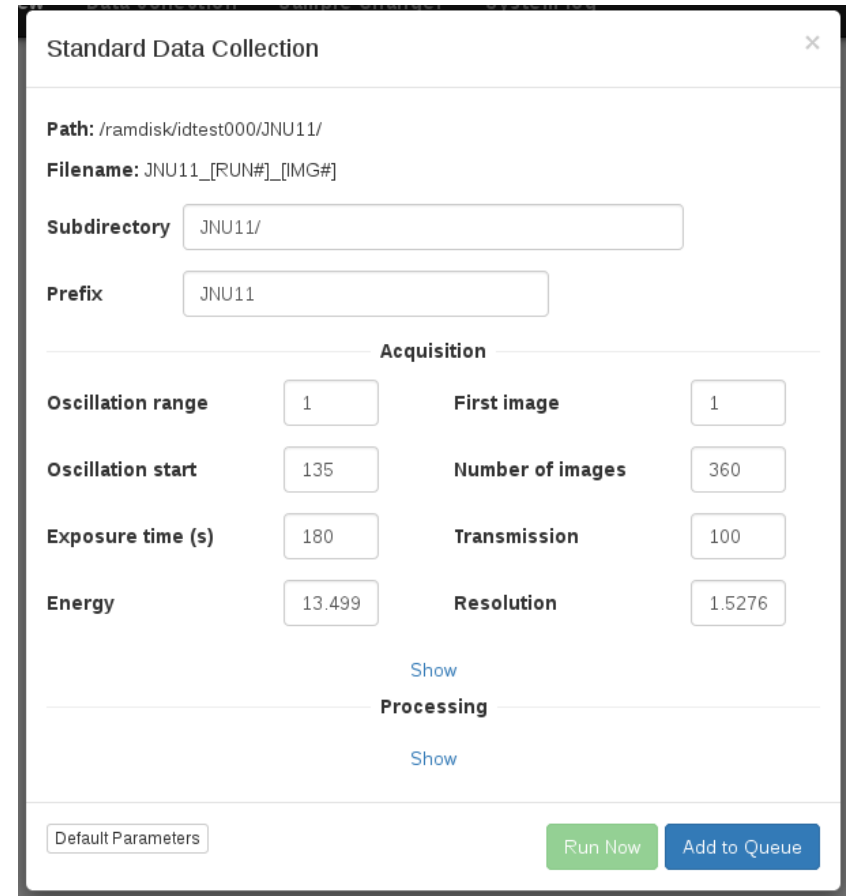
LoginID

Password

Sign in

MXCuBE3@ELETTRA open questions

- **Filenames:**
 - is it possible to modify current default naming (Sample XX:YY) ?
- **Data Collection:**
 - more info in the web gui (units, params meaning,...)
 - is it possible to modify the right-click menu when a sample is selected? (less options)
 - Is it possible to raise a popup box?
- **3-Click Centering:**
 - is it possible to customize it? (no multiple points)
- **Stop/Abort:**
 - is not clear to us which actions are triggered
- **Final installation:**
 - does exists a standard installation (Linux service?)



Standard Data Collection

Path: /ramdisk/idtest000/JNU11/
 Filename: JNU11_[RUN#]_[IMG#]

Subdirectory: JNU11/
 Prefix: JNU11

Acquisition

Oscillation range	1	First image	1
Oscillation start	135	Number of images	360
Exposure time (s)	180	Transmission	100
Energy	13.499	Resolution	1.5276

[Show](#)

Processing

[Show](#)

Default Parameters [Run Now](#) [Add to Queue](#)

Fist external user experience

- ✓ Period: 1-3 September 2018
- ✓ Samples mounted using the XRD2 samplechanger (used a CSV descriptor file)
- ✓ Only standard Data Collection on the samples
- ✓ Data stored and shared on the ELETTRA central storage
- Data analysis pipeline implented manually
- Pilatus communication errors (under investigation)
- Abort actions raised problems with some instrumentation