GUI Strategies Workshop

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My experience in GUI development

1998 – 2001 : 

- LLB spectrometers at CEA of Saclay
- C++ developer on High Level Application - ILOG Views
- A new generation of software control spectrometers – NOBUGS 2000

2004 – 2017 :

- SOLEIL synchrotron – Beamlines & Accelerator - TANGO 

- Java developer on High Level Application – Swing and COOX
- COMETE: A Multi Data Source Oriented Graphical Framework – ICALEPCS 2011

Since 2017 :

- IRFU CEA Saclay – MUSCADE & EPICS
- Java developer on High Level Application – Swing and CS-Studio
- Data Visualization With Data Browser Software – ICALEPCS 2019

What technologies and for what ?

TANGO @ SOLEIL :

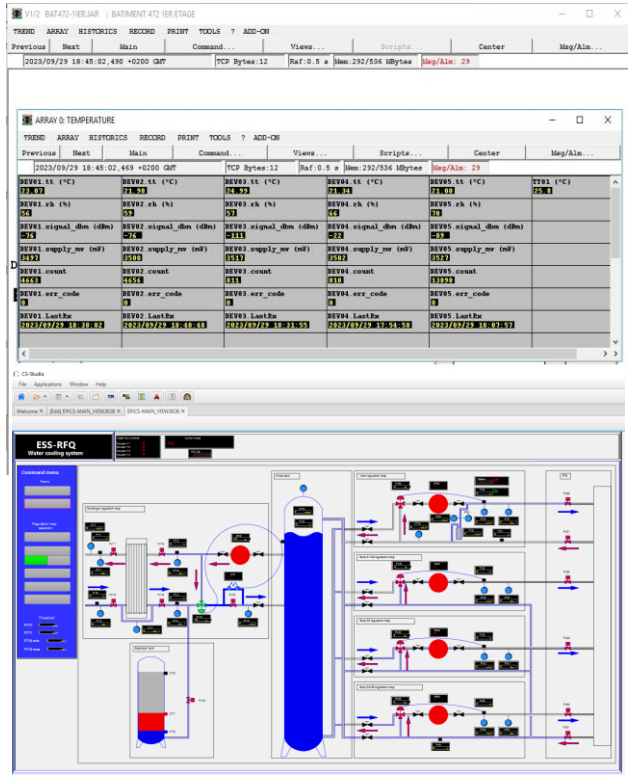
- Java rich client application(ATKPanel, Jive, DataBrowser)
- COOX SCADA in Java for beamline
- LabVIEW for accelerator supervision

MUSCADE @ IRFU :

- Java rich client application (ANIBUS) and
- Android application for Smartphone
- Java Web Start

EPICS @ IRFU :

- Java rich client application CS-Studio
- DBWR – Web View (Tomcat & JSP)



What issues with these technologies?

Framework	Pros	Cons
TANGO	➢ QT, Python, Java, LabView ➢ Color code is fixed ➢ Object Oriented, common interface ➢ Device database => naming and dynamics GUI ➢ Documentation ➢ Interoperability COOX ➢ Common Layer ➢ Reusable widget ➢ Drag & Drop technology ➢ Java portability ➢ Security management	➢ No web solution widely used by all institutes ➢ COOX (not free) (but JDraw is free) ➢ No common strategy between institutes ➢ No security management on TANGO ➢ GUI only dedicated to TANGO devices
MUSCADE	ANIBUS ➢ Optimized for small experiences ➢ Adapted to PLC Programmer needs ➢ Java portability ➢ Security management (certificates) ➢ Android application	➢ Support java only ➢ Java Web Start not supported anymore ➢ Not user friendly to build a GUI => AutoCAD ➢ AWT GUI is old fashion look and feel ➢ In-house solution on all stacks (No developer, no support anymore)
EPICS	➢ QT, Python, Java, LabVIEW ➢ DBWR ➢ Archiver Appliance CS-STUDIO ➢ Open source ➢ Widely used ➢ Embedded Display ➢ Based on known technologies ➢ *Java portability (with issues sometimes Java FX)* ➢ Several data sources EPICS, TANGO, MQTT …	➢ No web solution widely used ➢ No common strategy between institutes (color code) ➢ A PV is read or write ➢ CS-STUDIO has no security management ➢ Documentation is not clear and complete ➢ No dynamic GUI ➢ No PV index (Channel Finder have to be filled) ➢ A PV can be defined several times on the same network ➢ OS dependent due to Java FX

What is our GUI strategy ?

Technical criteria :

- Portability and interoperability
- User autonomy (Drag and Drop technology)
- Modular and MVC design pattern
- Reusable views
- Web client without software installation (not Java Web Start)

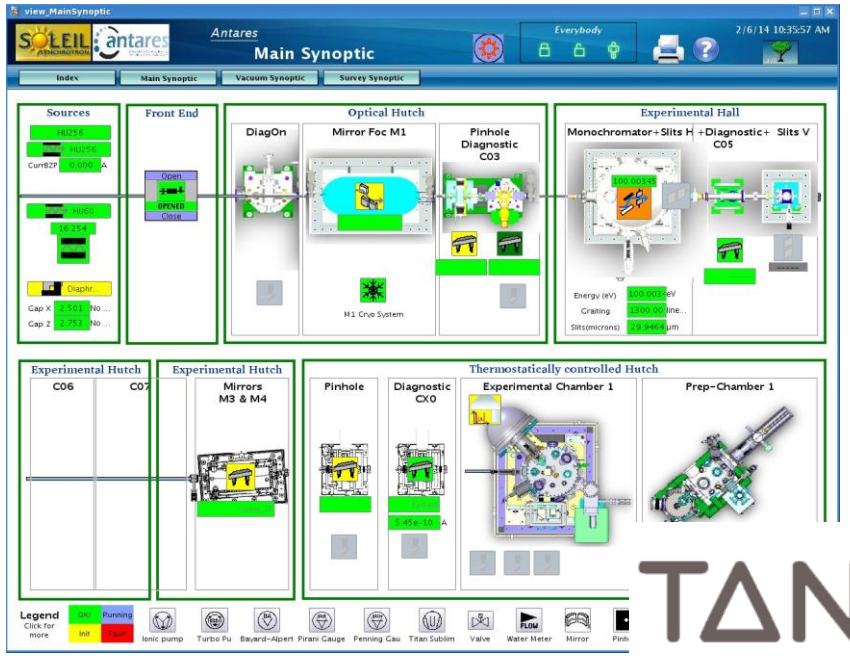
GUI guideline : Document defined at SOLEIL and at IRFU (see guideline for CEA)

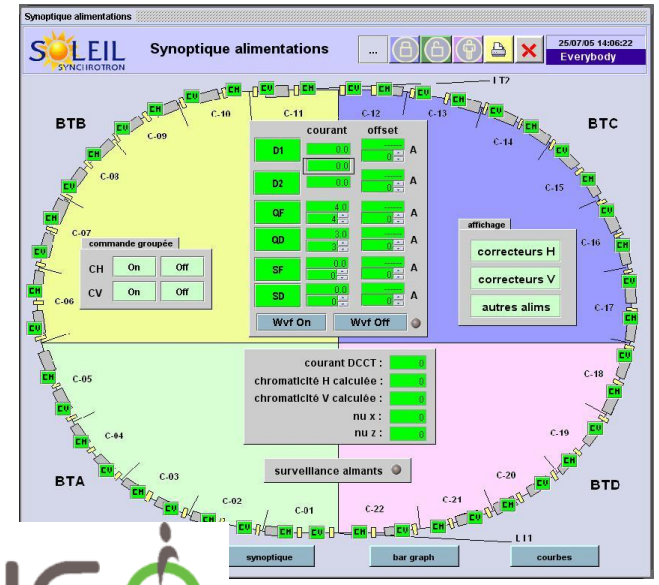
- Common layer definition
- Code color fix (TANGO CS it is fixed by the framework , for EPICS color.def configuration file for CS-STUDIO)
- LSAP (Less Smart As Possible) , all the business and logical should be managed by server. (Avoid script in the client)
- Name the widget according to its function . Ex : Textfield_VoltageValue for a Textfield which displays a voltage value
- Reuse embedded display and defined MACRO or parameters

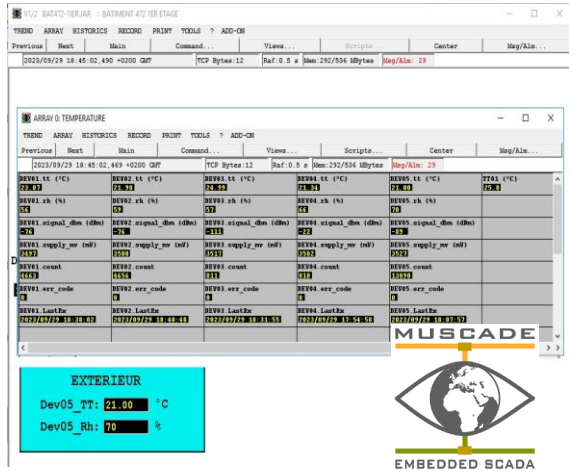
Future development :

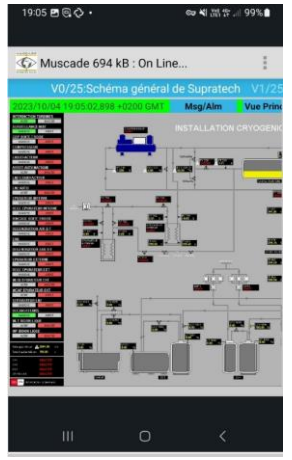
- Alarm management web client for EPICS
- Security implementation in CS-Studio
- PV Access IOC Migration => avoid Read and Write PV

Screenshots (common layer and color code)

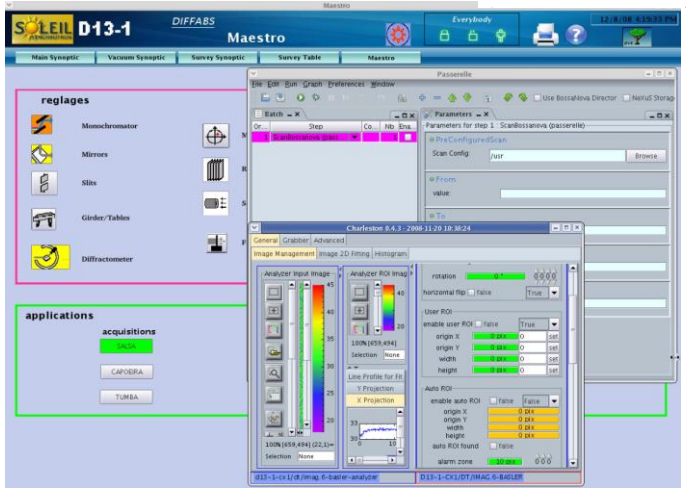


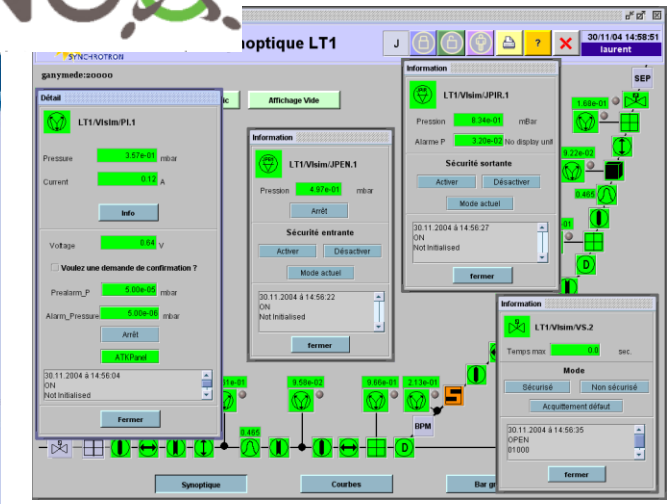




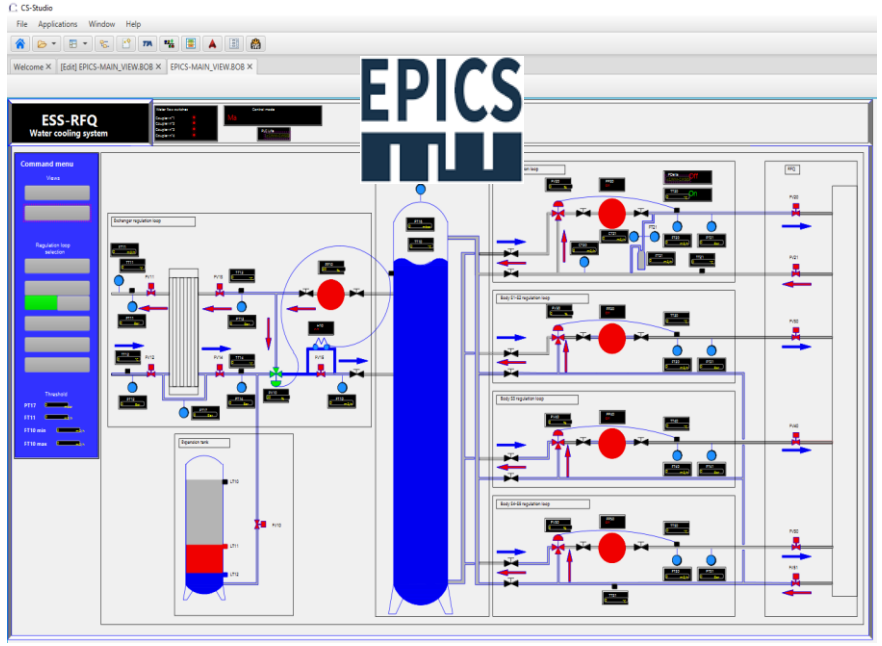


TANGO



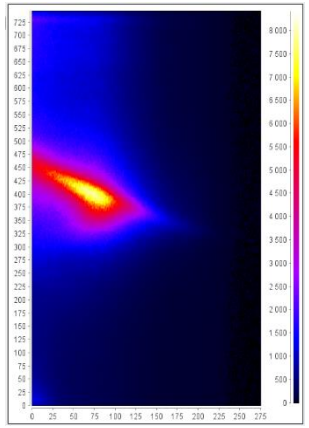


EPICS



Screnshots (COMETE MVC design pattern)

COMmunity of **E**xtendable **T**oolkit for **E**xperiment



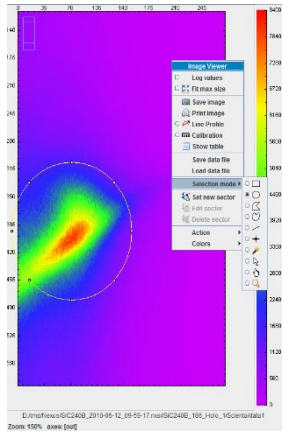
ImageViewer SWT

COMETE Widgets

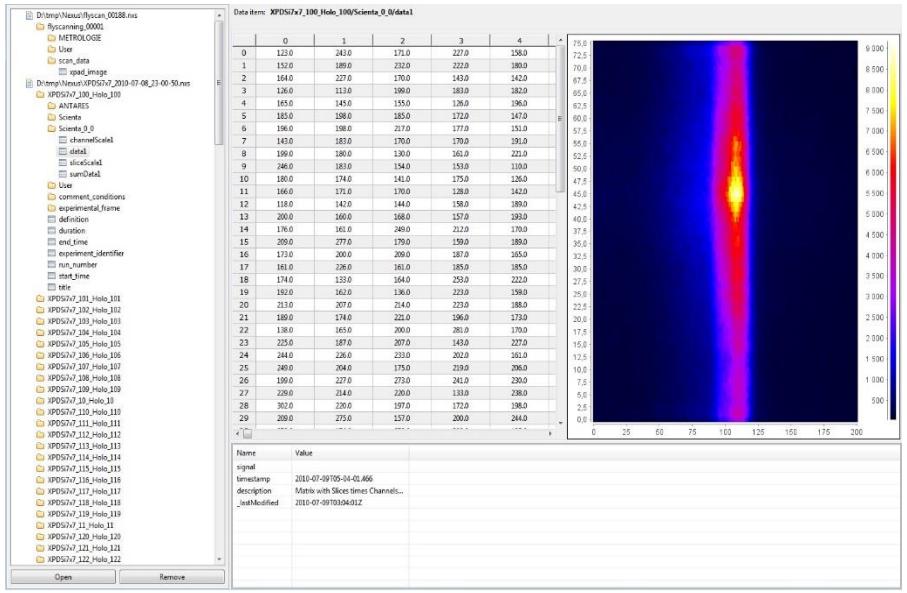
Comete SWT	Comete AWT	Comete SWING

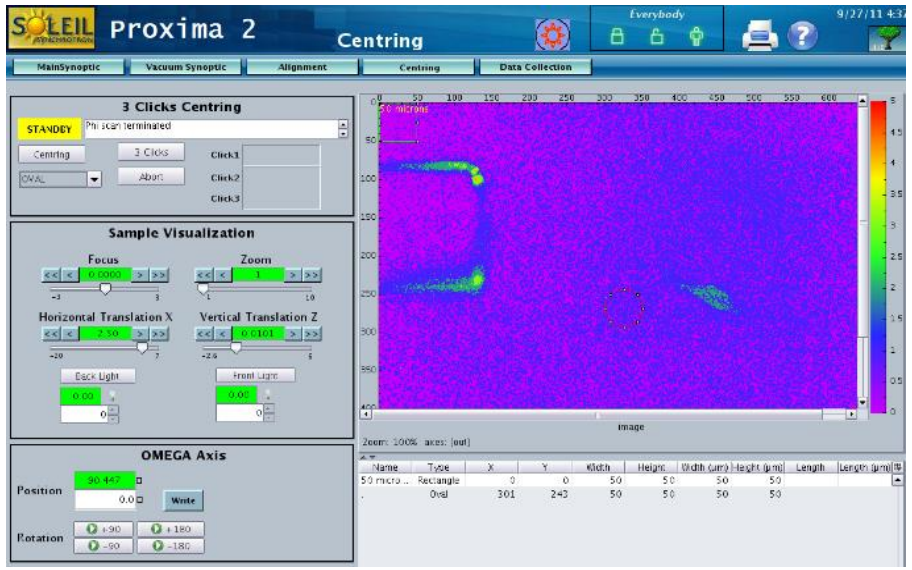
Data Source

CDMA

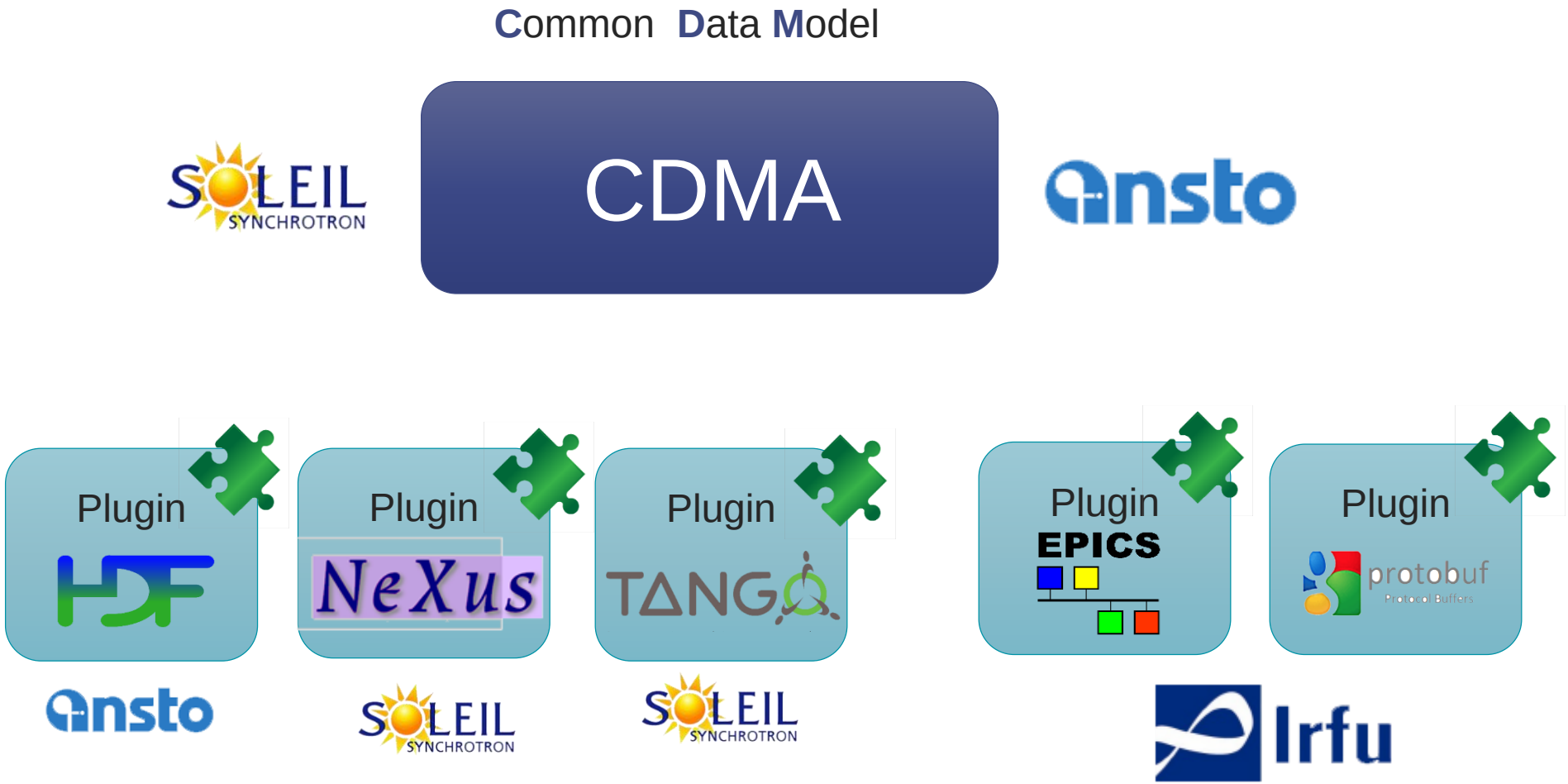


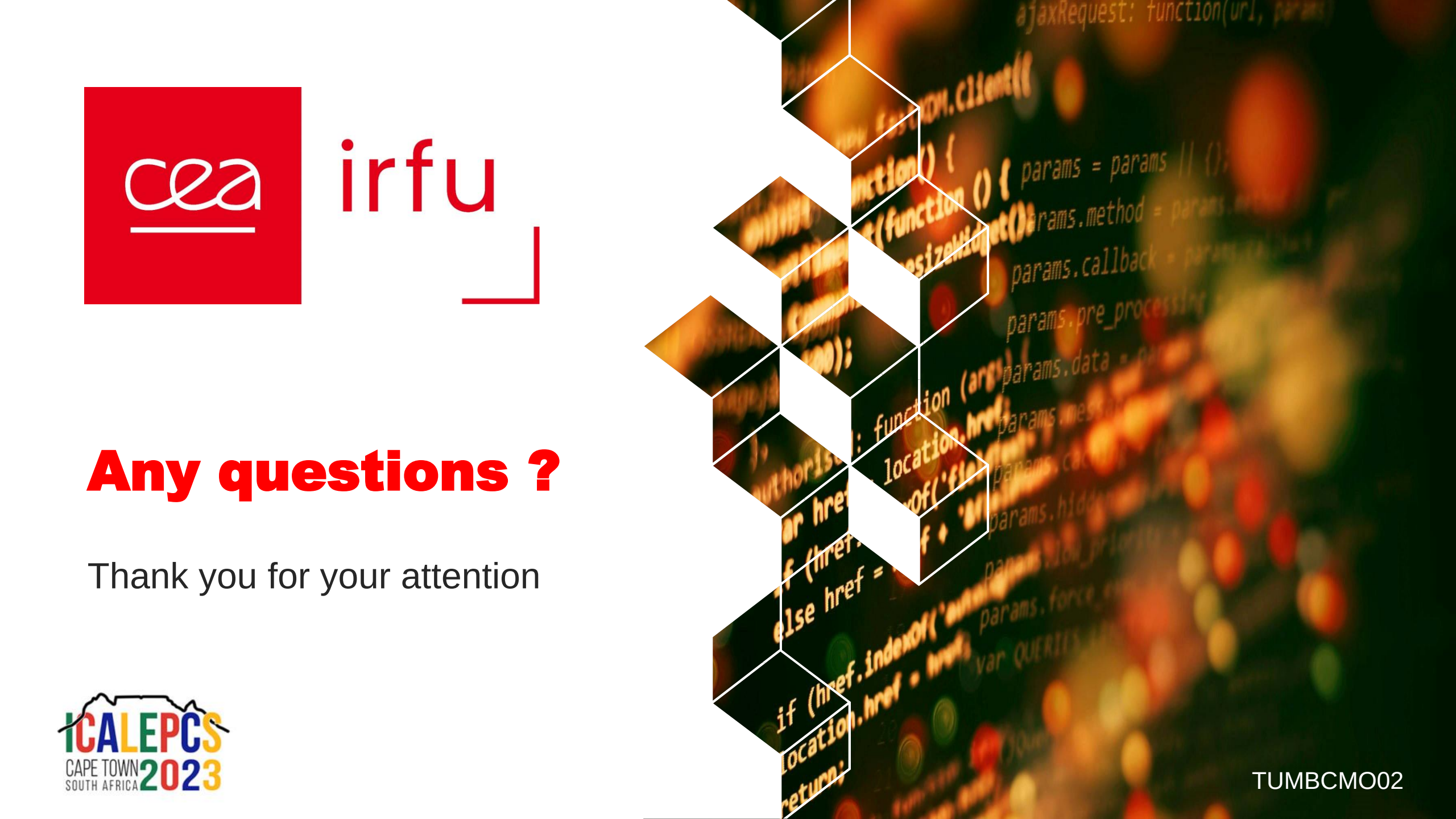
ImageViewer SWING





CDMA Framework (Data source abstraction)





Any questions ?

Thank you for your attention