# Itk module testing/production DB @LPNHE

F. Crescioli, F. Derue LPNHE Paris

Local DB (Local Database) is the data management/storage system based on MongoDB for YARR, developped at Tokyo Inst. of Technology to :
- store the test data associated with some information; chip, user, site …
  - → each subsite of Paris cluster will do different test (+some overlap)
    - + shipping from one site to another
- retrieve the config or result data into local directory
- check the data on browser via web interface
- one regional LocalDB (master server) + synchronization of data between LocalDB of each lab → specificity of the Paris cluster
- regional DB upload/download the data to/from Production Database
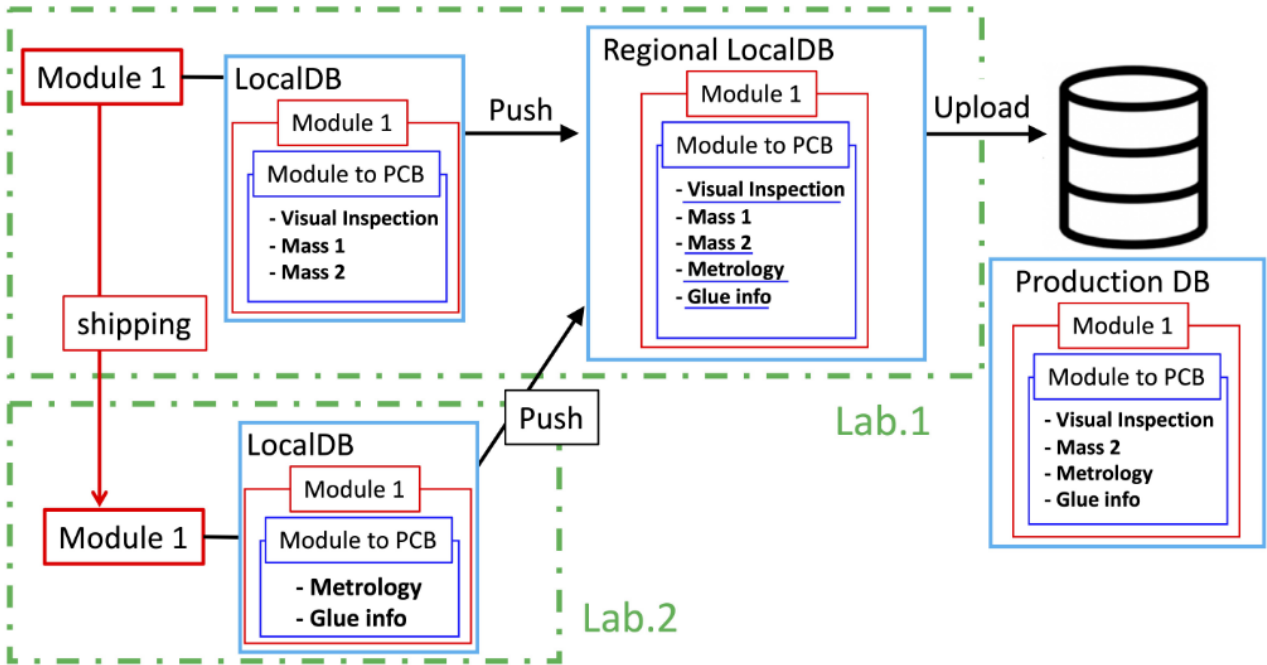
DAQ PC & DB machine

## Hardware is separated between the Data Acquisition and the Data Base

DAQ PC
- DCS data : timestamped data of monitoring, control measurements of captors (temp., humidity, dust), power supply, logs
- PC in grey room

DB Virtual Machine

- influxdb + viewer/grafana mongodb + localdb
- 1 VM cloud openstack
  - easy/fast deployement thanks to IT/cloud team (A. Bailly-Reyre, V. Mendoza)
  - disk space : 0.9 GB/module
    → for the moment 1 TB of disk

Software for Itk pixel module testing
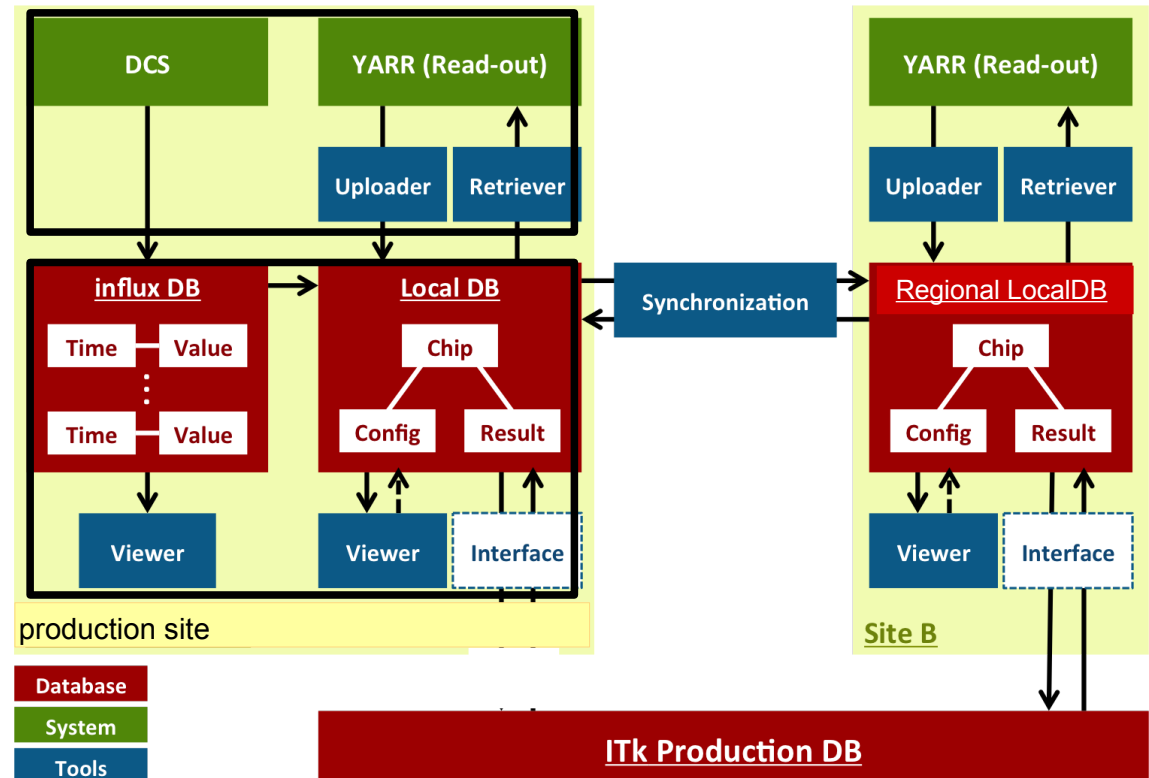
● DAQ

- ○ FPGA: xpressk7_325
- ○ Modified Ohio RD53 multi mode adapter card
- ○ Firmware: rd53 ohio 16x1 640 MHz

● Monitoring & Control

- ○ set of C++/python3 app.
- ○ DCS data
- ○ labRemote as @Saclay?
  → some of our hardware is not (yet) supported
  or MQTT/mosquitto (standard tools of IoT)?

● Module Readout & Tuning (YARR)

- ○ compile and run scripts locally (→ dockerised?)
- ○ need to read InfluxDB and push to localDB

● InfluxDB & Grafana

- ○ storage/visualization of DCS data
- ○ DB readable by Grafana
- ○ DB writable by Monitoring & Control

● MongoDB & LocalDB

- ○ storage/visualization of module data
- ○ DB writable by Module Readout & Tuning

- no local compilation but installation based on docker/portainer
- same solution as developped @Saclay

Used tools (open source):
YARR : readout system from the FPGA firmware to the host computer software (@CERN, RD53)
InfluxDB : time series database developed by *InfluxData*
Grafana : standard dashboards
*MongoDB* : distributed document NoSQL DB (json format), access on cloud
LocalDB : developer oriented, on-demand managed instance of the SQL Server engine

Deployement using the cloud and docker
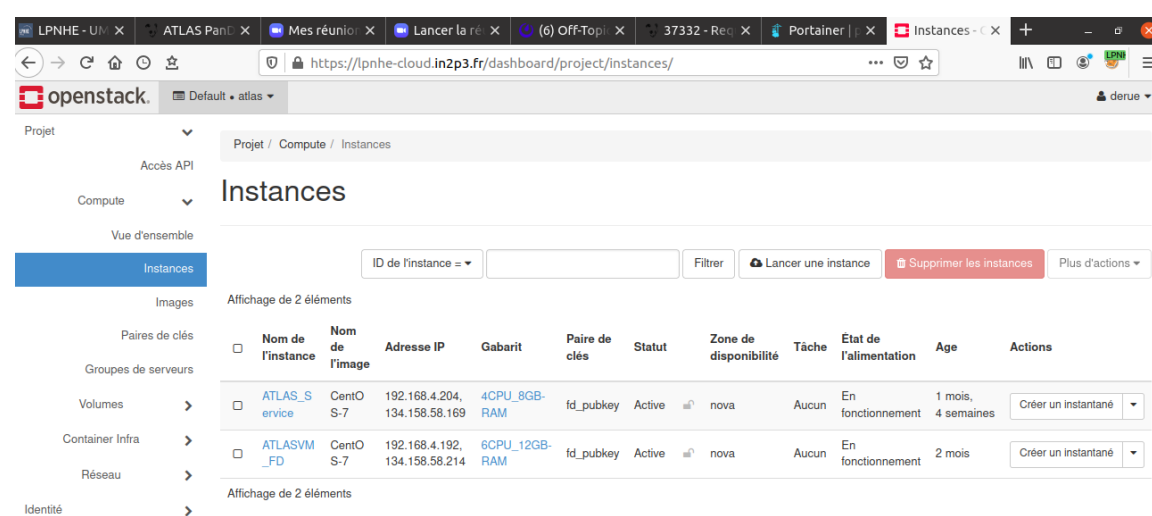
Automatic deployement of the Virtual Machine using a template using Web Interface
→ 5mn work + 30mn to wait for all soft to be installed
→ help of SI for template file + network ports to be opened

Deployement of software using docker-swarm
+ portainer (GUI interface) allowing to deploy, manage update, restart each component of the software
+ easy/fast replication of same solution in different sites
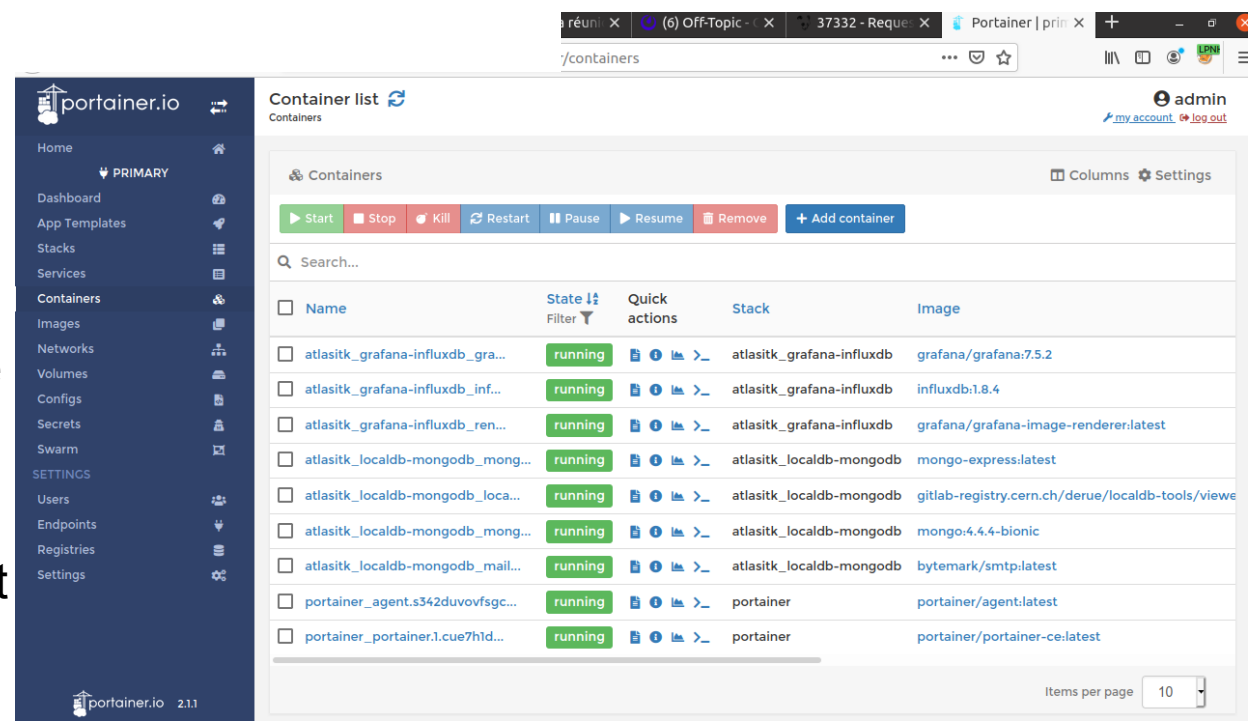
Example of monitoring plots

To be followed :
- ○ choice of software for monotiring (labRemote vs others)
- ○ synchronization vs future RegionalDB