



# **LImA @ ALBA**

# Usage and Experiences

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27.09.2024

NOBUGS@ESRF

# LImA @ ALBA

- Goal:
  - Standard interface for:
    - 1) Diagnostic cameras, for live viewing
      - Currently: several inhouse viewer applications
      - Under evaluation: Lavue, BPM GUI web,qt
    - 2) Detectors, integrated with the Sardana Scan Framework
- Deployment standards:
  - Conda community distribution
  - Note: always as a Tango device-server; with Tango Starter

# Diagnostic Cameras

- Multiple Basler GigE models in all beamlines
- Architectures:
  - 1) Connected to local network, LImA Tango on a virtual Linux host
  - 2) Directly connected to a LImA Tango Linux host on an extra network interface
- Experiences:
  - Perfect for our needs; minor bugs fixed back to community
  - In progress: selection of a single viewer application for all beamlines

# Arinax B-Zoom

- Sample viewer, dual-camera with integrated zoom
- XALOC beamline (ethernet cameras)
  - Standard ALBA environment: Conda with Arinax plugin (Tango Starter)
    - <https://gitlab.esrf.fr/limagroup/lima-camera-arinax>
- XAIRA beamline (USB cameras)
  - Specific environment: vendor's Tango device server, which mimicks the LimA interface (systemd service)
  - Planned: migration to a standard ALBA environment and to a IT Systems-managed computer

# Dectris Mythen

- Silicon photon counter
- NOTOS beamline
  - Old version: SLS embedded Linux controller by SLS Detector Group
  - Standard environment: Conda with Mythen plugin
    - <https://github.com/ALBA-Synchrotron/sls-detector/>
- MSPD beamline
  - Newer version: DCS embedded Linux controller by Dectris
  - Standard environment: Conda with Mythen Python plugin
    - Code in internal ALBA repository...

# Photonic Science GSENSE 4040

- MINERVA beamline
- CMOS image sensor, 4096x4096, 9um pixel size
- Windows-based, RJ45 with proprietary ethernet device-driver
- ALBA solution: REST server on Windows, LImA plugin in Python inside Conda
  - Code in internal ALBA repository...
- Issues: "only" with vendor's software
- Planned: elimination of REST server; plugin will talk directly with Photonic Science software

# Dectris Pilatus 6M 3X

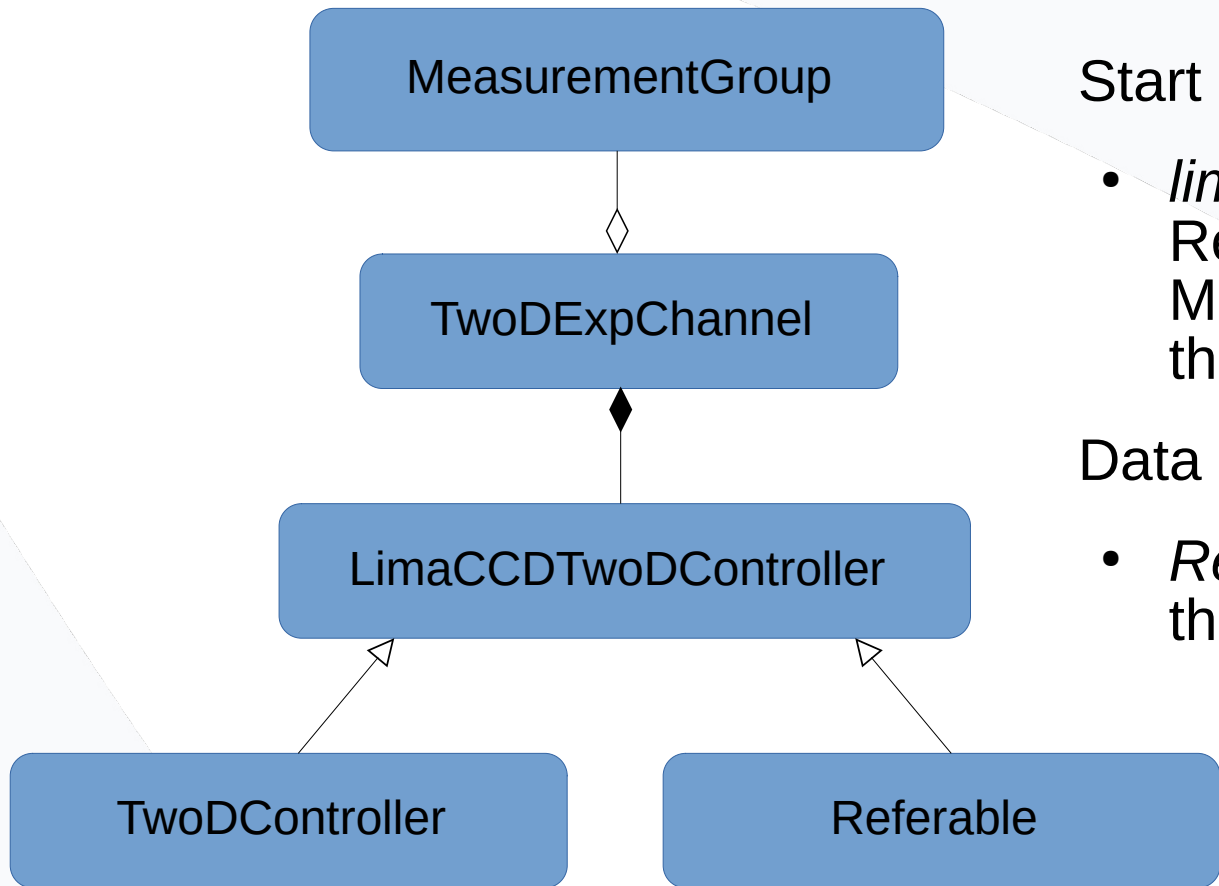
- XALOC beamline
- Deployed in Conda in the vendor's *PPU* computer
- Issues with plugin for 3X model:
  - Hardwired `.edf` file extension to *Exposure* command of *camserver* causes files to be too large to handle (at higher framerates)
  - Current solution:
    - MXCuBE uses the *sendCamserverCmd* Tango command to start the exposure in `.cbf`

# Dectris Eiger2 XE 9M

- XAIRA beamline
- Deployed in Conda in the vendor's *DIU* computer
- Issues:
  - Plugin doesn't allow for simultaneous streaming and FileWriter
    - Current solution: plugin merge-request
      - <https://github.com/esrf-bliss/Lima-camera-eiger/pull/3>
  - Performance issue in Hardware Saving Mode: `curl` unable to handle high framerates



# Sardana Integration



Start of a scan:

- *lima\_hook()* configures the RefPattern attribute of the MeasurementGroup using the Sardana environment

Data retrieval during a scan:

- *RefOne()* for reference to the actual data

# Summary of Detectors and Cameras

- LImA detectors: 14
  - Dectris Mythen, Pilatus, Eiger
  - Rayonix, Quantum, Photonic Science
  - Etc...
- LImA baslers: 18 (1 B-Zoom)
- Non-LImA:
  - Detectors: 12
    - Phantom S710, Bruker Hyperion, Amptek, Mantis
    - Etc...
  - Cameras: 63
    - 1 Arinax B-Zoom (but LImA-like)
    - 62 under [ds\_]ImgGrabber

# Bonus Camera: VisionResearch Phantom S710 + 2x Euresys Framegrabber

- ALBA solution: C++ REST server (Crow) with Egrabber SDK and HDF5 libraries
  - Best performance: saving HDF5 files directly to GPFS (1 tomography per file, ~360 images)
  - Host: Dell running Ubuntu (AMD CPU)
  - User interface: HTMX webui
- Issues:
  - ZMQ streaming performance
  - Compatibility with other Linux distributions

# Bonus Camera: VisionResearch Phantom S710 + 2x Euresys Framegrabber



## HTMX Application

Pixel-Format

Trigger-Mode

Trigger-Source

Control-Method

Unpacking-Mode

Exposure-Time

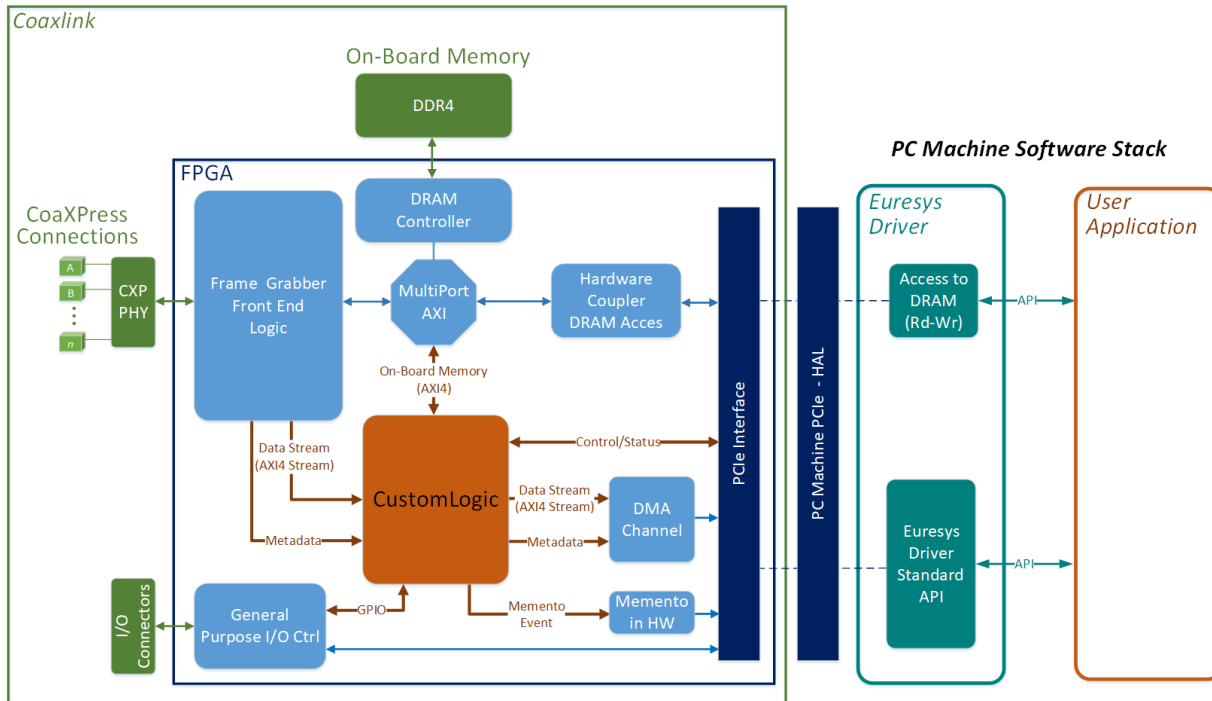
Frame-Rate

Cycle-Minimum-Period

Buffer-Part-Count

Prefix

Images-Per-File



A large, close-up photograph of many bright green lemons, filling most of the slide. A white diagonal shape cuts across the top right corner, where the title text is placed.

# **LImA @ ALBA**

# **Final Thoughts**