



Elettra Sincrotrone Trieste

WP5 and DonkiOrchestra in Elettra Sincrotrone Trieste



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www.elettra.eu

Elettra Synchrotron

- ✓ Electron Storage Ring
 - Third generation synchrotron light source
 - 28 beamlines
 - Elettra 2.0

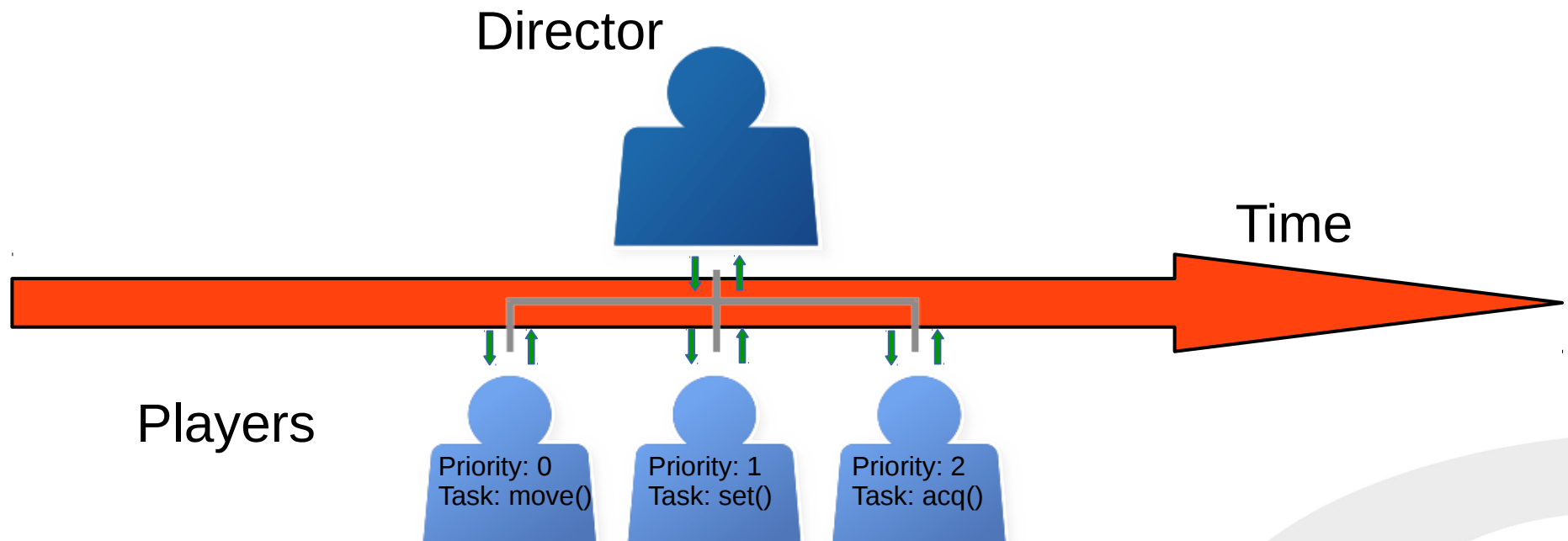
FERMI @Elettra

- ✓ Free Electron Laser (FEL)
 - Ultraviolet and soft x-ray range
 - 6 beamlines
 - 2 wavelengths range

Continuously (H24) operated and supplying light of the selected “color” and quality to more than **30 experimental stations** and almost **1500 users** per year.

DonkiOrchestra at a glance

- ✓ Workflow management framework for end-station software development
- ✓ Tasks like moving motors, activating pumps and acquiring images can be arranged to run sequentially or in parallel according to the experiment requirements
- ✓ Core language is Python (Director) and supports Python, C++ and Java (Players)



D.O Structure

- ✓ Director is designed as a workflow manager
- ✓ An XML file configures the Players (name/address, will it acquire/send data, acknowledgment signal)
- ✓ Players can be any sequence of instructions e.g a python/C++/Java script
- ✓ The PRIORITY level can be defined after the workflow is running
- ✓ DAQ stores data in different HDF5 files

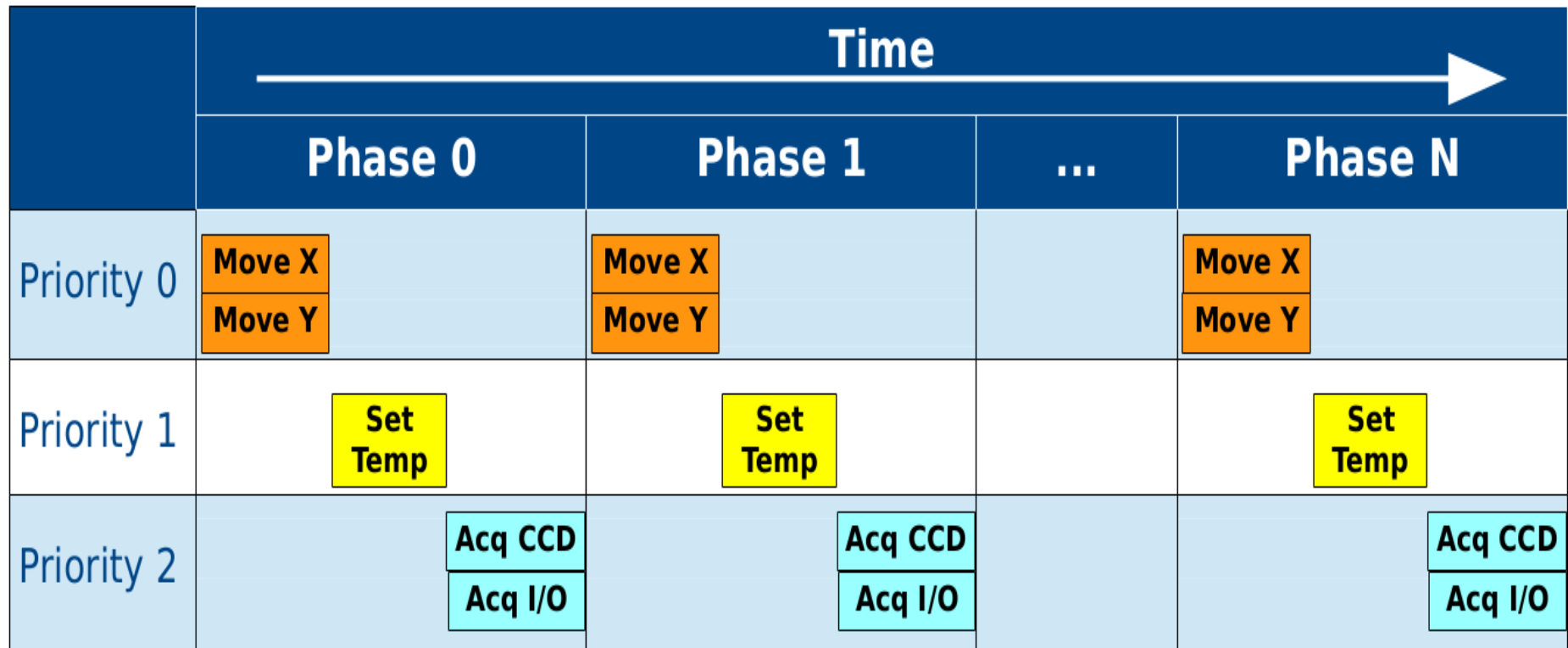
1. ESS stream generation in Kafka (ESS data simulator)

- Datatypes: images
- Frequency: e.g FERMI runs at 50 Hz
- Timings: (which comes first, etc)
- Data structure: datasets structure
- Should produce (simulate sophisticated data/trigger streams)

1.1 Dynamic Experiment Configuration

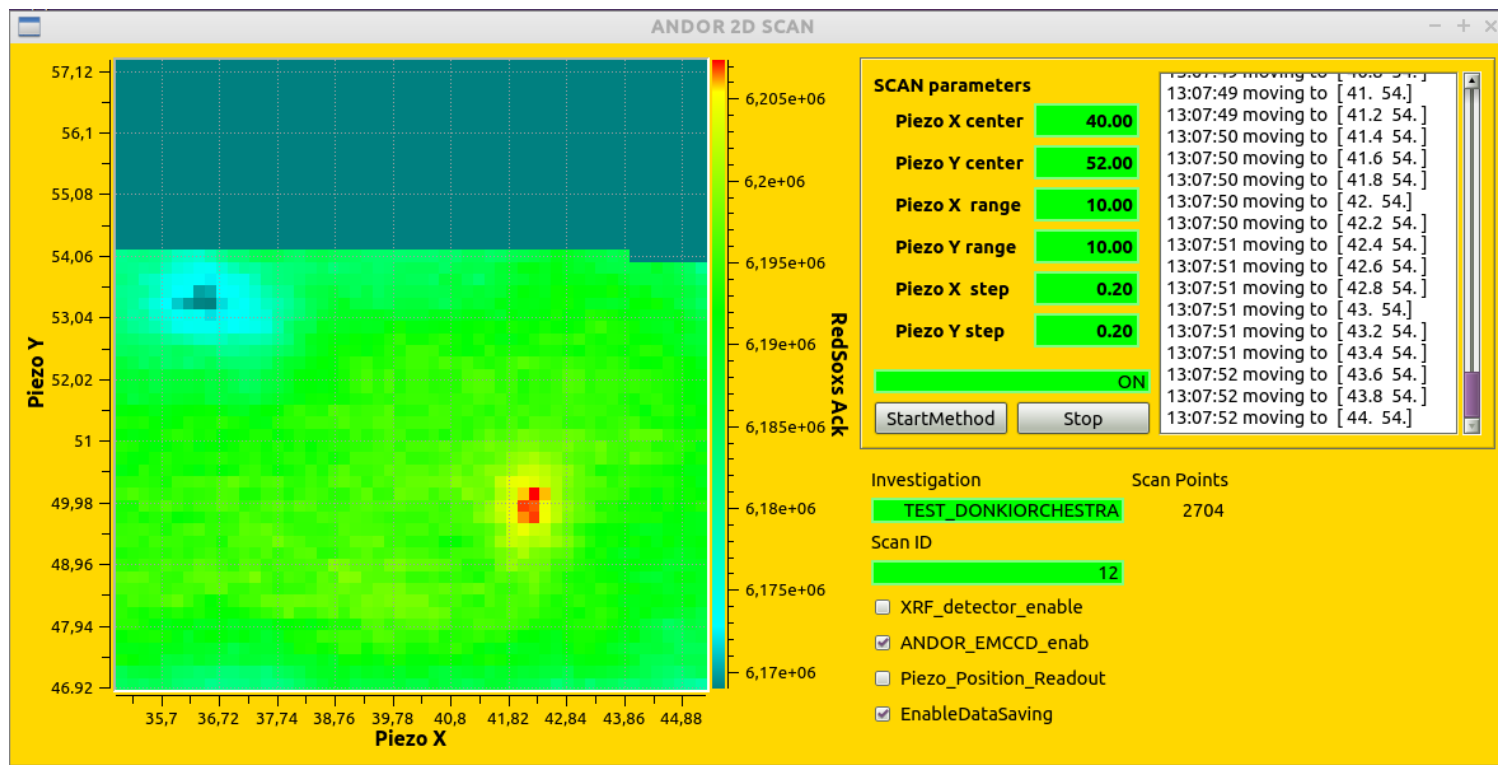
- Example: Energy Scan
- An experiment in which the voltage varies and we collect data (images) in different voltages through time. The time of exposition of the samples can also be a variable

1.2 Two dimensional (2D) raster Scan (concurrency)



2. Simulate an end-station Software

- Save (& visualization) in HDF5 files
- Conditional saves
- START-STOP resource



Other people involved:

- Roberto Pugliese
- George Kourousias
- Roberto Borghes
- Milan Prica

Thank you!