Remotisation Activities and Projects in Elettra and FERMI

George Kourousias

Lorenzo Pivetta

Roberto Pugliese

Overview

- Internal Project on Remotisation

- In-house Developed Systems

- Relevant EU Projects

- Data Policy issues, Security and Privacy

- Experience from Beamtime Experiments

Project on Essential Remotisation (EsRe)

- inline with EU projects ExPaNDS & PaNOSC
  - joint work ELETTRA - CERIC

1. Remote data access

2. Remote control of data acquisition computers

3. Investigation of new technologies (ie. distributed logbooks, wearable cameras, telepresence robots)

14 Elettra beamlines and 4 in FERMI already in the EsRe process (*work in progress*).
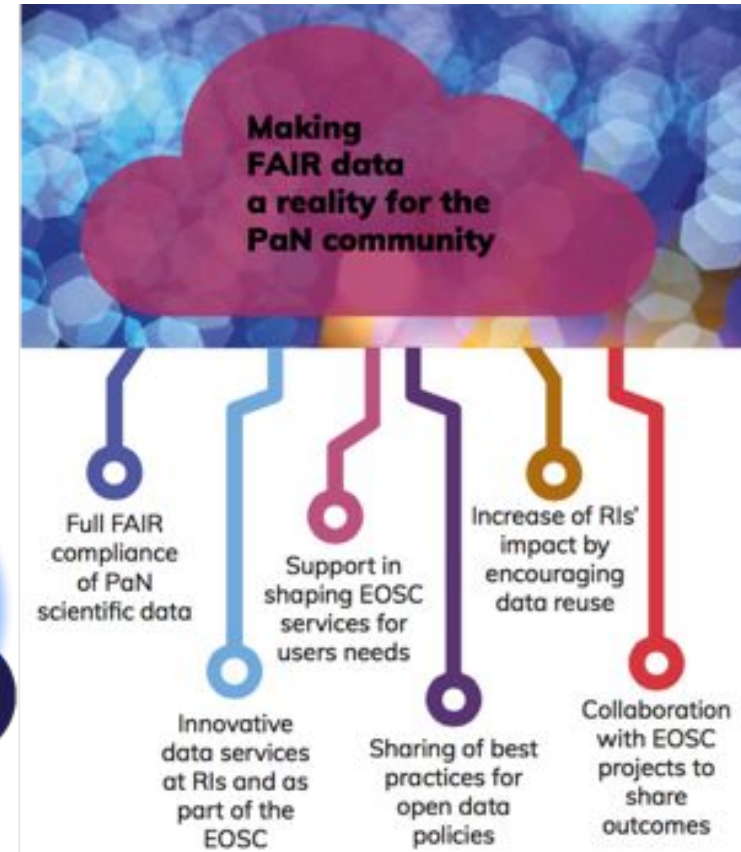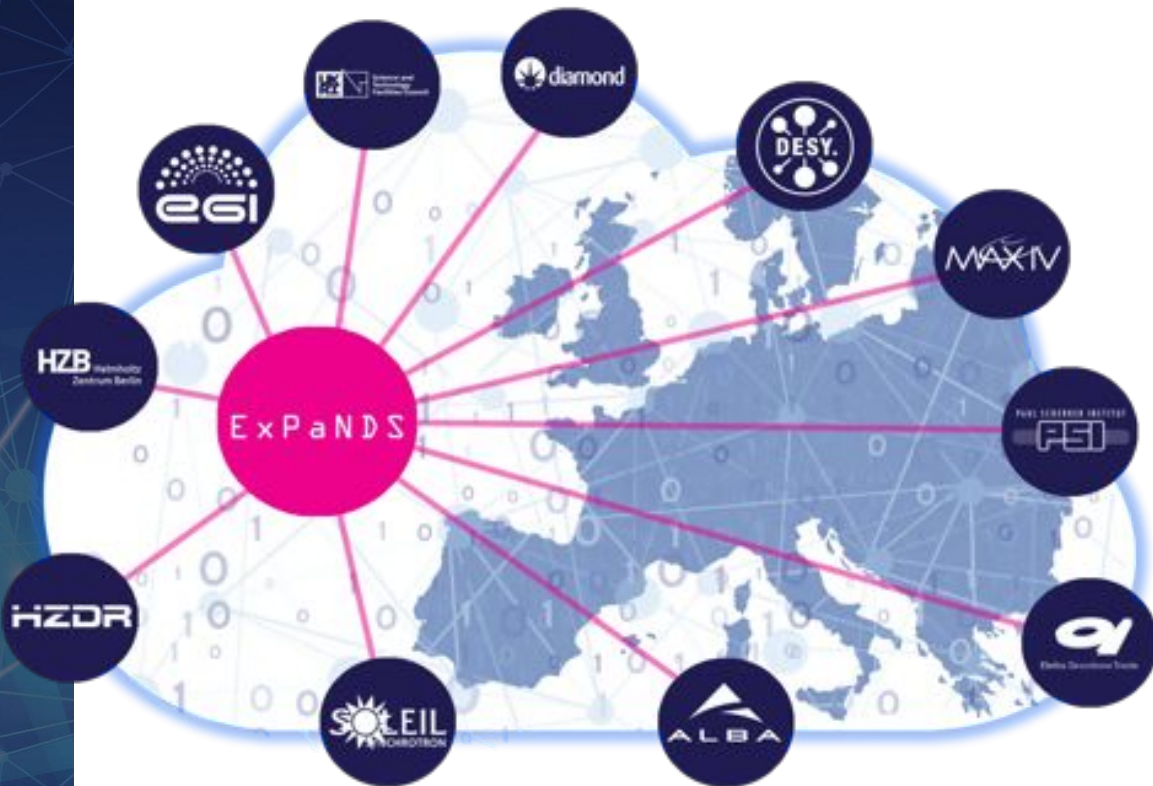
Enables science during the lockdown but should also **improve the workflow** even after that.

Wearables, Robotics and VR for telepresence @Elettra
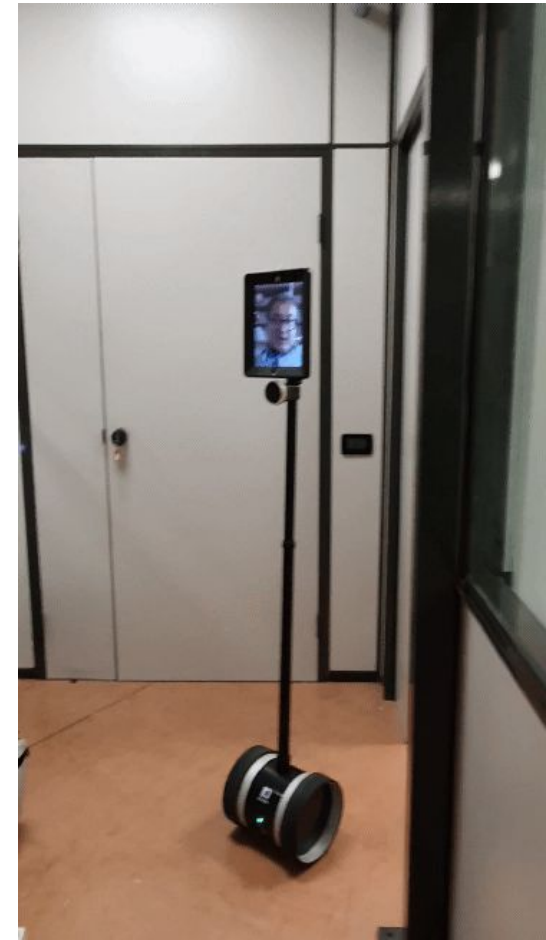
ExPaNDS and PaNOSC EU Projects

- EsRe relies on the developments of multi-year projects which regard scientific Data Policy and aim at Openness

Data Policy issues, Security and Privacy

- Remotisation is not only a technical issue
- Data **Policy**, **Security** and **Privacy** should be considered
- Elettra has a new Scientific Data Policy compliant with PaNOSC and ExPaNDS
- We are working towards having the PaNOSC data policy adopted by all the CERIC-ERIC partner facilities (***not easy**, different member states, different institutes, different instruments*)
- Privacy has a huge importance:
  - In Italy (it's EU-wide) , if you put a camera that can potential capture people at work you have to discuss and sign an agreement with labour unions, …
- In other terms, when dealing with remotisation, laws have to considered and respected in order to avoid problems down the road!

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3 in-house developed EsRe technologies

Remote Desktop in a Web browser (RAFEC by Marco De Simone et al. - CERIC)
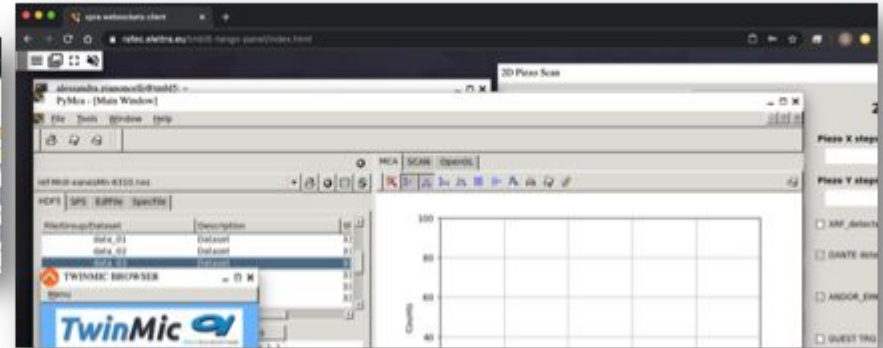
Cloud Storage with Metadata association (Upload2Online by Alessandro Olivo et al. - CERIC)

Chat as distributed LogBook (Borghes et al.)
a WhatsApp Group but better

Automated REST messages from the TANGO, LabView, Data Portal, etc

Experience from an actual "remote" beamtime experiment

- A new method for X-ray Fluorescence imaging @ TwinMic
- Remote data acquisition, access and analysis
- Mostly through a web-browser!
- Slower but still feasible
- Certain instruments are not remotely controlled yet
- Elephant in the room: Sample preparation / change
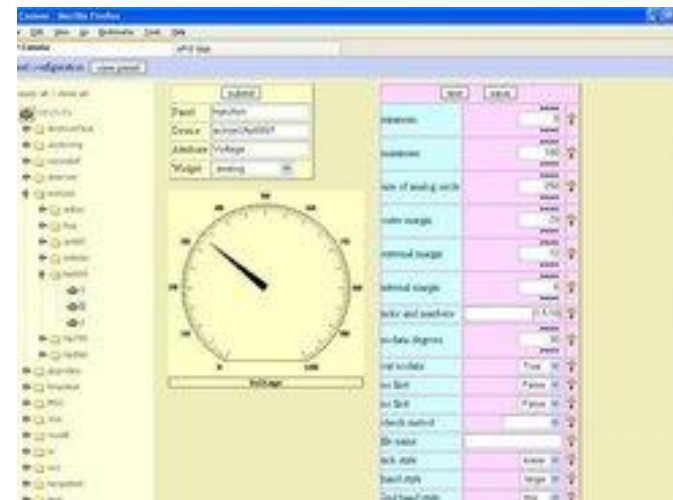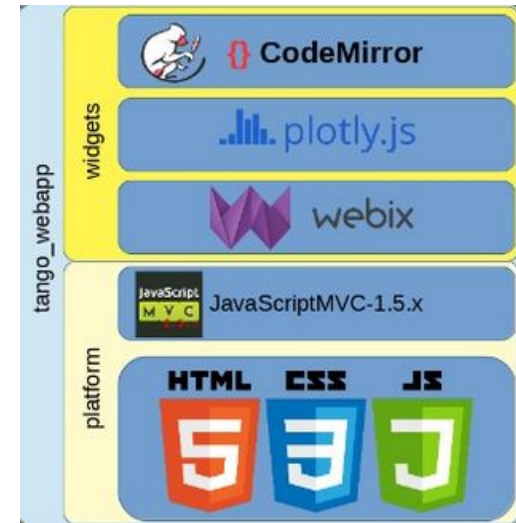- What does really "remote" means?
- Overall: ★★★★☆

TANGO Controls framework
"Connecting things together"
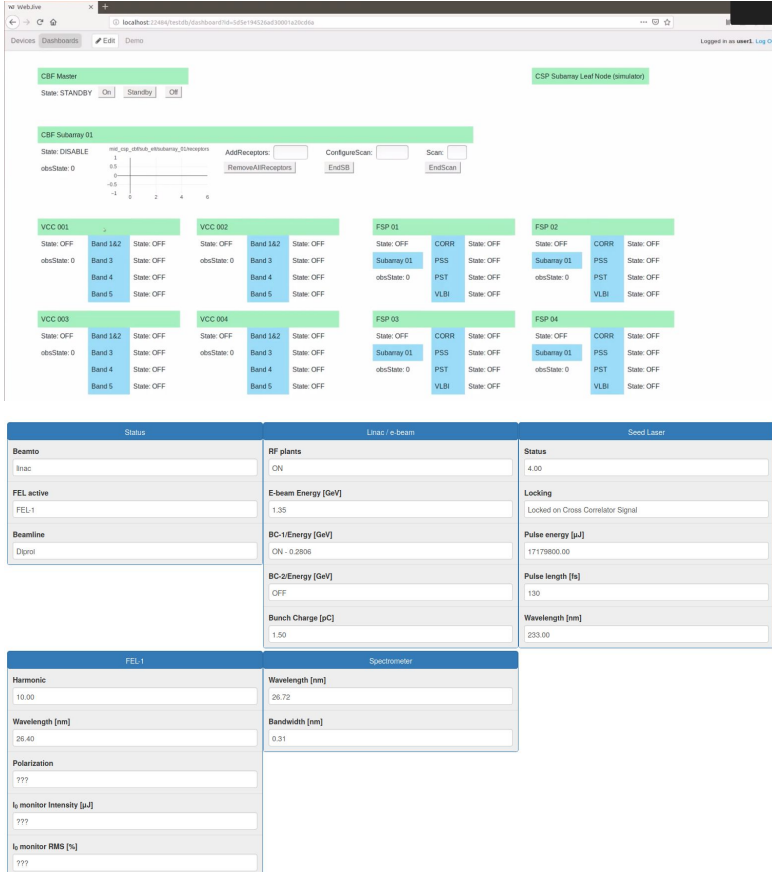
www.tango-controls.org

- Elettra and FERMI control systems are based on TANGO
- Legacy approach for GUIs based on Qt or Java
- But also support for WEB-based GUIs

- TANGO REST API
  - https://github.com/tango-controls/rest-api

- Waltz
  - https://github.com/waltz-controls/waltz

- Canone (PHP and JavaScript using AJAX and SQL)
  - https://sourceforge.net/projects/canone/

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TANGO Controls framework
"Connecting things together"

www.tango-controls.org

- Webjive (REACT and TangoGQL)
  - A GraphQL interface for Tango.
    - https://gitlab.com/MaxIV/web-maxiv-tangogql
  - A React client to interface with Tango
    - https://gitlab.com/MaxIV/webjive
  - An API for saving and loading dashboards
    - https://gitlab.com/MaxIV/dashboard-repo

- PWMA
  - Websockets + Server Sent Events (SSE)
    - https://gitlab.com/PWMA

- **Take advantage of web technologies for encryption, authentication, authorization...**

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Thank you!
We need <u>your assistance</u> and feedback on:

- Remote Desktops: Advanced setups of Nomachine NX, FastX, Other?

- Alternatives to OwnCloud, Google Drive?

- Wearable devices?

- Conversion of legacy TANGO GUIs to the Web?

- Other stuff we may be missing?

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Elettra and Fermi Remotisation Activities - June 2020
G. Kourousias, L. Pivetta, R. Pugliese

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